June 1983

An independent magazine published by ECC Publications

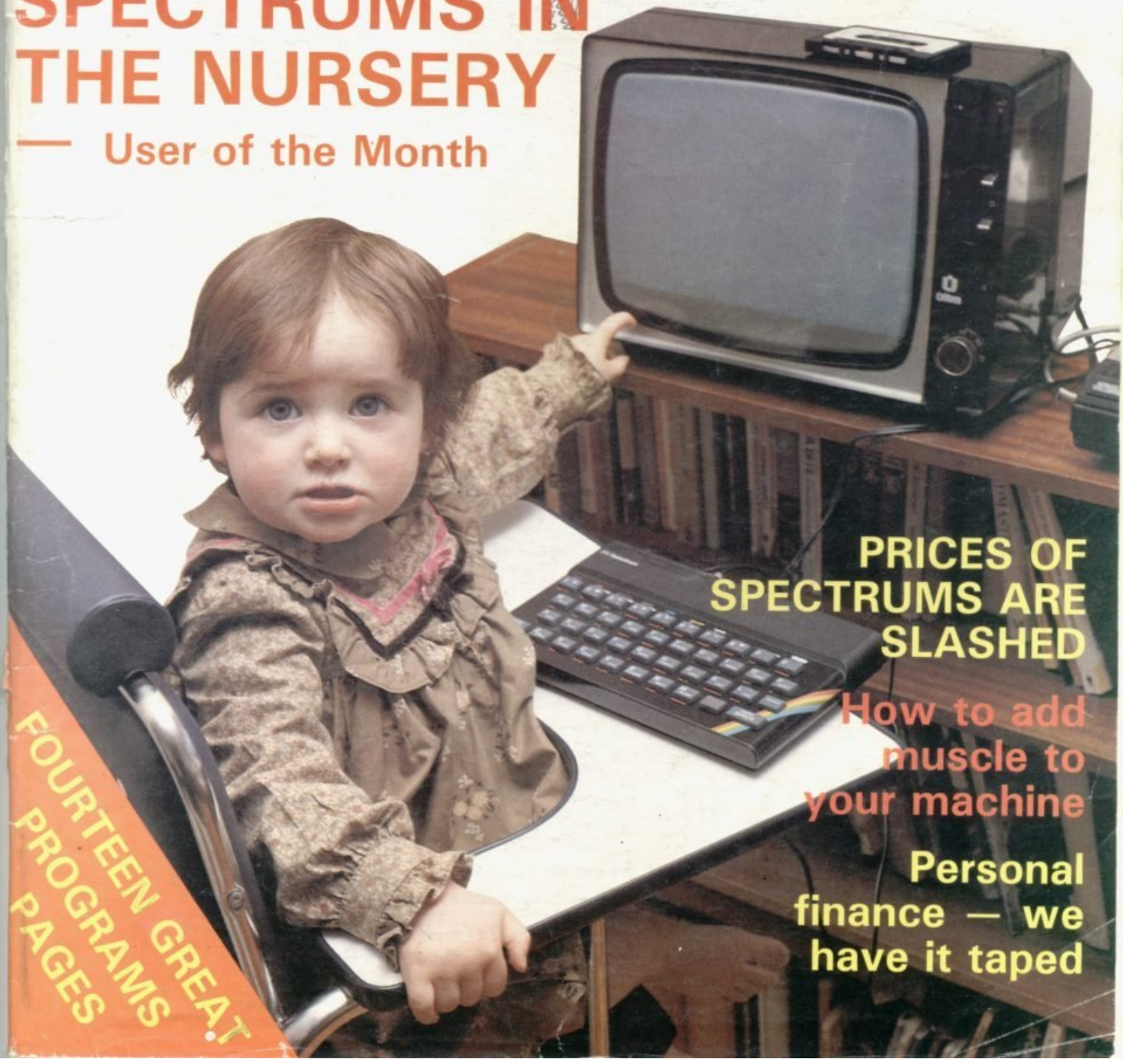
sinclair user

75p

Issue No 15

SPECTRUMS IN THE NURSERY

— User of the Month



PRICES OF SPECTRUMS ARE SLASHED

How to add muscle to your machine

Personal finance — we have it taped

FOURTEEN GREAT PROGRAMS PAGES

COMPETITION-PRO JOYSTICK

PRECISION GAME CONTROL!

SPECTRUM JOYSTICK NOW AVAILABLE FROM WHSMITH Boots

Outstanding Features

- Self centreing stick
- Super strong nylon and steel construction
- A total of 8 directions *plus* 2 large fire buttons (for left or right handed operation)
- Arcade proven moulded leaf switches ensure incredible reliability
- Complete with boxed interface on Spectrum models
- A wide range of Joystick compatible software readily available from W H Smith and leading computer shops or direct from us

ACCESS
BARCLAYCARD
VISA

Hardware			
☐ Spectrum Joystick @ £25·00		@	
☐ VIC 20, Commodore 64 Joystick @ £16·50		@	
☐ Atari 400/800 Joystick @ £16·50		@	
Software			
☐ Cosmic Guerilla	16K Spectrum Crystal	@	£5·95
☐ Android 1	16K Spectrum Kempsoft		£5·95
☐ Jetpac	16K Spectrum Ultimate		£5·95
☐ Blind Alley	16K Spectrum Sunshine	@	£5·95
☐ Mazeman	16K Spectrum Abersoft	@	£5·95
☐ 3D Tunnel	16/48K Spectrum New Gen	@	£5·95
☐ Galaxians	16K Spectrum Artic	@	£5·95
☐ Spookyman	16K Spectrum Abbex	@	£4·95
☐ Slippery Sid	16K Spectrum Silversoft	@	£5·95
☐ Cyber Rats	16K Spectrum Silversoft	@	£5·95
☐ Night Flite	16K Spectrum Hewson Cons	@	£5·95
☐ Time Gate	48K Spectrum Quicksilva	@	£6·95
☐ Meteoroids	16K Spectrum Softek	@	£4·95
☐ Gulpman	16K Spectrum Campbell Systems	@	£5·95

Please tick appropriate boxes
Please add £1.00 P&P on hardware
Software post FREE

Post & Package
Total (VAT inclusive)

Cheques/postal orders should be made payable to Kempston (Micro) Electronics Ltd
For Access/Barclaycard please give your card number and signature

Card No

Signature

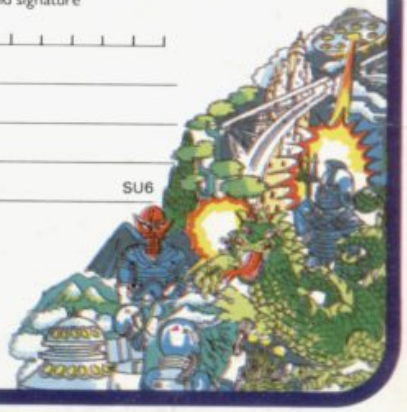
Address

SU6

Please post to Kempston (Micro) Electronics, Dept
180a Bedford Road, Kempston, Bedford, MK42 8BL

SOLE UK DISTRIBUTOR

KEMPSTON MICRO ELECTRONICS



Contents

sinclair user

incorporating Spectrum User

Editor
Nigel Clark

Deputy editor/designer
William Scolding

Consultant editor
Mike Johnston

Production editor
Harold Mayes MBE

Staff writer
John Gilbert

Editorial director
John Sterlicchi

Advertisement manager
John Ross

Sales executive
Annette Burrows

Editorial assistant
Margaret Hawkins

Managing director
Terry Cartwright

Chairman
Richard Hease

Sinclair User is published monthly by ECC Publications Ltd.

Telephone
All departments
01-359 7481

If you would like to contribute to any of the Sinclair User group of publications please send programs, articles or ideas for hardware projects to:
Sinclair User and Programs,
ECC Publications,
30-31 Islington Green,
London N1 8BJ

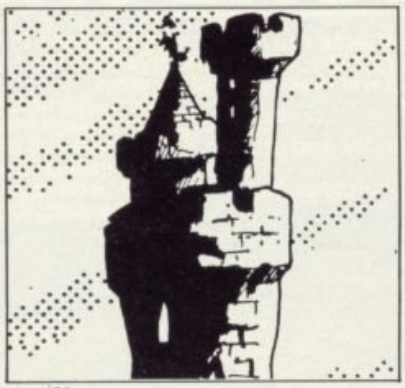
Programs should be on cassette and articles should be typed. We cannot undertake to return them unless a stamped-addressed envelope is included.
We pay £10 for the copyright of each program published and £50 per 1,000 words for each article used.

© Copyright 1983
Sinclair User
ISSN No 0262-5458

Printed and typeset by
Cradley Print PLC,
Warley,
West Midlands

Distributed by
Spotlight Magazine Distribution Ltd,
1 Benwell Road,
Holloway,
London N7
01-607 6411

Cover Photograph,
Caters News Agency Birmingham



page 58

page 72

5 SINCLAIRVOYANCE This month we look to the developments in the U.S. to see if there are indications as to what could be happening in the U.K. in the near future.

9 SINCLAIR USER CLUB Two of the top software houses offer discounts on their ranges exclusive to club members.

13 NEWS The reduction in the price of the Spectrum is the major item, with many other pieces of interesting information.

17 LETTERS Our April Fool program elicited a mixed response.

23 HARDWARE WORLD A mains filter plug, the expandable RAM pack from Stonechip, and keyboard buttons are features in our round-up of the add-ons.

27 [illegible] ews between the

36 BASICARE Stephen Adams looks in detail at the expansion modules which add muscle to your ZX-81.

44 DATABASES John Gilbert examines the main contenders for the personal finance market.

49 RETAIL TRADE We consider the machines which are now available through retail outlets.

53 PROGRAM PRINTOUT Fourteen more pages of listings for the Spectrum and ZX-81.

72 USER OF THE MONTH Sophie is 18 months old but already is an experienced user of the Spectrum.

78 ADVENTURE PROGRAMMING Following our series on how to program, Donald Hughes gives some tips on writing adventure programs.

83 BOOKS The market is becoming more competitive. John Gilbert assesses the situation.

87 EDUCATION A West Yorkshire council is using the ZX-81 to interest schools in computing. Amrit Surya explains how it is developing.

93 STARTING FROM SCRATCH Our popular feature to help new users become accustomed to their machines.

94 SINCLAIR SIMON With the Spectrum price falling, what will happen to the ZX-81? Simon thinks he has the answer.

100 HELPLINE Your problems answered by our expert, Andrew Hewson.

107 MIND GAMES Quentin Heath goes underground.

NEXT MONTH
Stephen Adams reviews the full range of memory expansions for the ZX-81 and John Gilbert assesses programming aids.

A SPECTRUM CONSOLE THAT EVERYONE CAN AFFORD!

For about the cost of the average games cassette you can now have a truly professional console for your ZX SPECTRUM!

At only £7.50 it's an incredible bargain, and will make your programming or playing so much easier.

How did we do it?

By designing a unique method of self-assembly, and using relatively inexpensive materials!

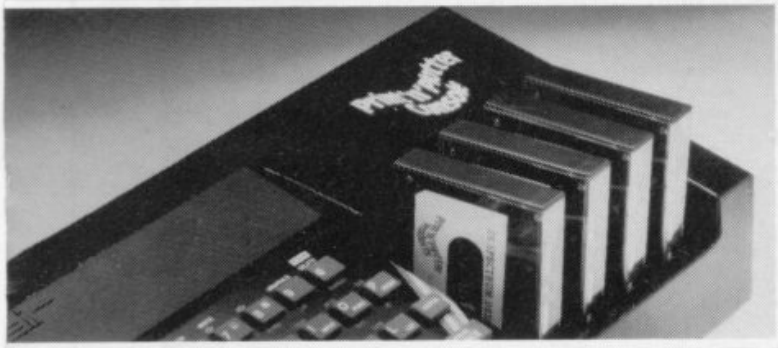
The result is a console that's tough, light, professionally designed and very highly finished!

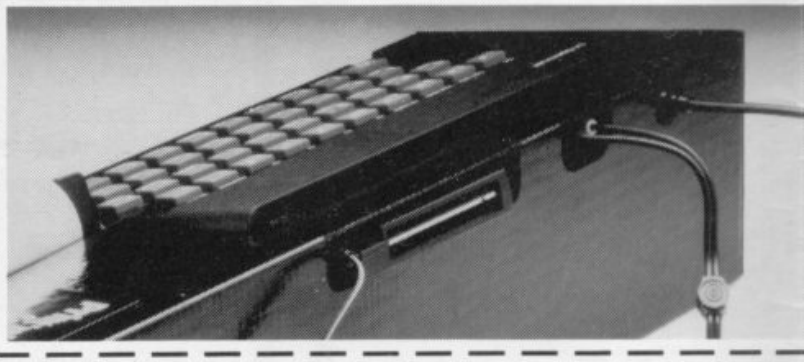
For instance: it is made of double-laminated corrugated board with a final laminate of tough, spongeable high gloss vinyl.

When assembled (about 10-15 minutes) it is completely rigid and tough enough to take years of useful work!

Of course, we designed into it all the facilities you would need for ease of use and performance . . . making it neat, tidy and good looking.

So why pay more for a ZX SPECTRUM console? Send today!





ONLY £7·50
(plus 75p post + packing)

Post today to Print'n'Plotter Products, 19 Borough High Street, London SE1 9SE or phone 01-660 7231 for credit card sales.

Please send me ..... Consoles @ £8.25 (inc Post & Packing)
Please send me illustrated leaflet of Print'n'Plotter products (please enclose stamp).

Remittance enclosed £.....
Please bill my Access/Barclaycard/Visa/Mastercard No:

.....

Name: .....

Address .....

.....

SB

Please note: Overseas orders please add £1.00 postage for additional surface mail.

Print'n'plotter Products

SEE US AT THE ZX MICROFAIR ALEXANDRA PAVILLION JUNE 4th AND THE COMPUTER FAIR EARLS COURT JUNE 16-19th

The year of consolidation

AFTER the hectic activity of the last three years, with a new computer every year, there are signs of 1983 becoming the year of consolidation. After the long-awaited Microdrive finally makes an appearance, nothing is scheduled until next year. The next machine is then likely to be the much-heralded portable business machine, making use of the flat-screen television and Microdrive technology.

The apparent slowing in Sinclair activities probably has less to do with the company's inability to think of new ideas than it has with its desire to ensure that it is better-placed to avoid the problems and criticisms which it faced when the ZX-81 and the Spectrum were first put on sale.

It gives the impression, however, of a certain amount of complacency, the result of a lack of serious competition at the bottom end of the market.

It could be said that that argument does not stand close examination. A company which cuts the prices of its leading products by 25 percent and 20 percent is scarcely complacent and unworried by the competition. On the other hand, while much of the vast expansion of the home computer market has been the result of the fall in the price of programming power, there is still a large number of consumers looking for quality

as well as low price who are willing to pay a little extra for it. There are limits, therefore, to which price-cutting will satisfy the new computer owners who are becoming increasingly sophisticated.

With the basic ZX-81 now available for less than £40, it will not be long before consumers begin to consider factors other than price — factors such as ease of use, programming power and the number of special functions which can be obtained from a machine without the bother of difficult conversions or complicated software.

Compare that to what is happening in the States.

Although it has been denied officially on both sides of the Atlantic, Timex is looking to make a hybrid ZX-81 and Spectrum to be known as the T/S1500. With 16K RAM on board, it is intended to have a Spectrum-type keyboard.

In addition, there is the U.S. version of the Spectrum, to be called the T/S200. Although no details of the specification have been announced, it is known that most of the bugs discovered in the ROM by people such as Dr Ian Logan are to be corrected and another port to allow pre-recorded cartridges to be used is to be included, thus ending all those saving and loading problems. Sinclair says it has no plans to bring either machine to Britain.

A possible argument for the upgraded Spectrum not being adapted for the British television system would be that software would have to be re-written. At present, no details of the new memory organisation for the machine have been revealed, so that it is not known whether existing Spectrum software would be compatible.

The present thinking is that with the cartridge port it is likely that some parts of the memory would be taken over for it, thus making any software using those particular addresses unworkable. Thus some, but by no means all, software would need changes. The advantages to be gained by having a debugged ROM and easier saving and loading would easily outweigh such problems.

Those difficulties would not exist with the T/S1500 but the comments of Sinclair are easier to understand. Until Timex is willing to say that such a machine exists, giving price and

launch details, there is no point in Sinclair announcing plans for it. That will change when Timex makes its announcement and there can only be advantages for putting such a machine on sale in Britain.

At a time when competitors, despite their difficulties, are beginning to move into the market it would provide an extra incentive to join the family of Sinclair users. It would remove the problems of coping with the ZX-81 keyboard and the unstable RAM packs.

It is a pity that it was not until the machines faced the fiercer competition in the more mature U.S. market that moves were not made to make such improvements. Neither of the new computers is revolutionary in concept but they are logical steps to improve on successful products.

Past experience, particularly in the field of pocket calculators, has shown that it is impossible to maintain a leading position in any sphere of life by standing still. Competitors have a habit of seeing what can be achieved and, learning by the mistakes of the pioneers, are able to provide something more acceptable to the consumer.

In Britain, the home computing market was created by Sinclair Research and the competitors have taken some time to get themselves properly organised. In the U.S. the market was already there. The machines were more expensive but they were used extensively in the home and set the standard for what people expected their computers to do and how easy it should be to use them. Timex thus thought it would be worthwhile to upgrade the machines.

While suggesting that it has been more competition which has prompted the moves, none of the improvements would have been unacceptable to British users and would have

helped to answer some of the complaints which people make about the machines. If Sinclair wishes to stay in the popular end of the computer market it had better start taking notice of those comments before the competition does and leaves Sinclair with a smaller share of a potentially large market.

It is always possible, of course, that Sinclair is fully aware of the situation but had preferred to concentrate on the frontiers of computer development, leaving the less exotic tidying work to be done by Timex, thus saving itself time and expense.

It would be a pity if the fruits of that endeavour were to stay in North America, leaving the rest of the world with the first thoughts.

The June Top Ten in Spectrum software at W.H.Smith.

Flight Simulation
Sinclair
48K **£7.95**

Penetrator
Melbourne House
48K **£6.95**

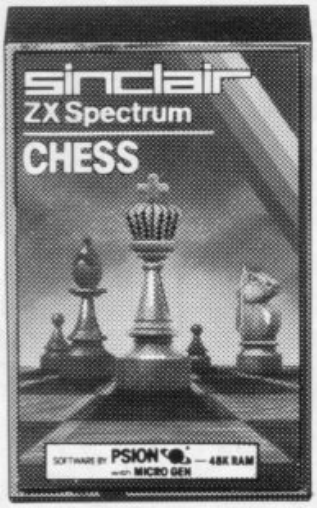
The range of software available for the Sinclair Spectrum is to say the least, extensive.

So every month at W. H. Smith, we review the range with particular reference to presentation, challenge, excitement and value for money. And because we're quite severe it's a difficult job finally to arrive at a Top Ten. But as you can see, not impossible.

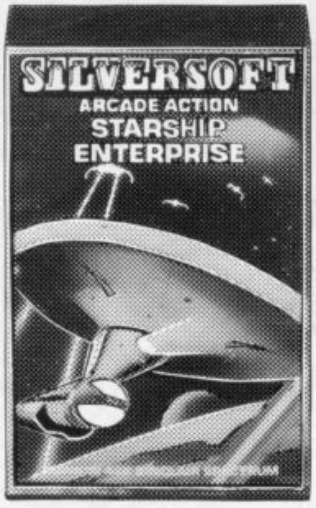
You don't have to take our word for it.

At W. H. Smith we stock the widest selection of Spectrum Software, so you can judge for yourself.

Title	Producer	K RAM	Price
Arcade Games			
Meteor Storm	Quicksilva	16	£4.95
Space Intruders	Quicksilva	16	£4.95
Time Gate	Quicksilva	48	£6.95
Gulpman	Campbell	16	£4.95
Spectral Invaders	Bug-Byte	16	£5.00
Meteoroids	Softek	16	£4.95
Planetoids	Sinclair	16	£4.95
Hungry Horace	Sinclair	16	£5.95
Space Raiders	Sinclair	16	£4.95
Mazeman	Abersoft	16	£4.95
Nightflight	Hewson	48	£5.95
Ground Force Zero	Titan	16	£5.00
Caterpillar	CDS	16	£5.95
Leapfrog	CDS	16	£5.95
Gobble-A-Ghost	CDS	16	£5.95
Centi-Bug	DK Tronics	16	£4.95
3D Tanx	DK Tronics	16	£4.95
Cruising	Sunshine	16	£4.95
Blind Alley	Sunshine	16	£4.95
Derby Day	Computer Rentals	48	£5.95
Jackpot	Computer Rentals	48	£4.95
Escape	New Generation	16	£4.95
3D Tunnel	New Generation	16	£5.95
Gobbleman	Artic	16	£4.95
Galaxians	Artic	16	£4.95
Invasion Force	Artic	16	£4.95
Sentinal	Abacus	16	£4.95



Chess
Sinclair
48K **£7.95**



Starship Enterprise
Silversoft
48K **£5.95**

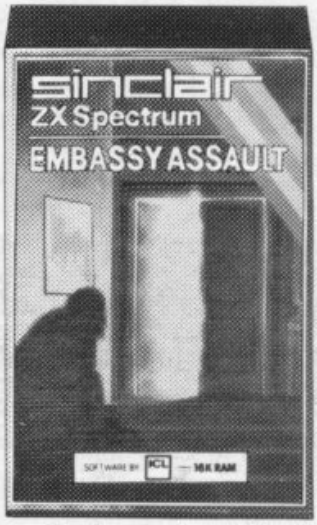
Horace Goes Skiing
Sinclair
16K **£5.95**

Schizoids
Imagine
16K **£5.50**

Muncher
Silversoft
16K **£5.95**

Mined-Out
Quicksilva
48K **£4.95**

Transylvanian Tower
Shepherd
48K **£6.50**



Embassy Assault
Sinclair
48K **£4.95**

Title	Producer	K RAM	Price
Avenger	Abacus	16	£4.95
Cyber Rats	Silversoft	16	£5.95
Arcadia	Imagine	16	£5.50
Ground Attack	Silversoft	16	£5.95
Orbiter	Silversoft	16	£5.95
Slippery Sid	Silversoft	16	£5.95
Strategy Games			
Battle of Britain	Microgame	48	£5.95
Novotnik Puzzle	Phipps	16	£4.95
Chess	Artic	48	£9.45
Voice Chess	Artic	48	£9.95
Superchess II	C P Software	48	£7.95
Football Manager	Addictive	48	£6.95
Chess–The Turk	Oxford	48	£8.95
Dictator	DK Tronics	48	£4.95
Everest Ascent	Shepherd	48	£6.50
Dallas	CCS	48	£5.95
Adventure			
Labyrinth	Axis	16	£5.95
Planet of Death	Sinclair	16	£6.95
Inca Curse	Sinclair	48	£6.95
The Hobbit	Sinclair	48	£14.95
Ship of Doom	Artic	48	£6.95
Espionage Island	Artic	48	£6.95
Rescue	Computer Rentals	48	£5.95
The Orb	Computer Rentals	48	£5.95
Utility			
M/C Code Test Tool	Oxford	16	£9.95
Editor/Assembler	Oxford	16	£9.95
Compiler	Softek	16	£14.95
Soft Talk II	C P Software	48	£6.95
Spectsound	PDQ	16	£5.95
Family Games			
Reversi	Sinclair	16	£7.95
Othello	CDS	16	£5.95
Golf	R and R	16	£3.75
Conflict	Martech	48	£11.95
Test Match	Computer Rentals	48	£5.95
Backgammon	C P Software	48	£5.95
Draughts	C P Software	48	£6.95
Practical			
Vu-Calc	Sinclair	16	£8.95
Vu-File	Sinclair	16	£8.95
Vu-3D	Sinclair	48	£9.95
Collectors Pack	Sinclair	48	£9.95
Club Record Controller	Sinclair	48	£9.95
Address Manager	Oxford	16	£8.95
Finance Manager	Oxford	16	£8.95
Dietron	Custom Data	16	£4.75
Program Collections			
Shiva Special 1	Shiva	16	£5.95
Over The Spectrum 1	Melbourne House	16	£5.95
Over The Spectrum 2	Melbourne House	16	£5.95
Over The Spectrum 3	Melbourne House	16	£5.95

WHSMITH

Prices correct at time of going to press. Subject to availability. At selected branches only.

ZX MICROFAIR

THERE'S ROOM FOR EVERYONE AT THE BIGGEST ZX MICROFAIR OF ALL TIME!

EVERYTHING FOR THE SPECTRUM, ZX81 AND MOST POPULAR MICROS!

- **BIG** Twice as big as the last show!
- **BIG** Even more exhibitors and interesting new computer products!
- **BIG** Plenty of space to move, eat, drink and relax!
- **BIG** Biggest value from any exhibition — admission £1 (50p for kids under 14)!
- **BIG** Choice of hardware, software, books, peripherals, programs — even a bring-and-buy sale!
- **BIG** Exhibition hall in parkland — big space — big car park!
- **BIG** Big choice of "how to get there" — rail, road, bus, tube, foot — see right!
- **BIG** Big day out for all the family!
- **BIG** Big savings on most manufacturers' "show offers".

CUT OUT AND KEEP HOW TO GET TO THE BIG SHOW.

By Road
Follow signs from the A1 (Links with M1 and North Circular). Plenty of parking space available!
Variety of routes from Central London.

By British Rail
From London (Kings Cross or Moorgate) — about every 10 minutes to Alexandra Palace station — free shuttle bus or short walk from there!
From any part of the U.K. enquire from Kings Cross Travel Centre, London N1 9AP (phone 01-278 2477) about special day trips to the ZX MICROFAIR!

ALEXANDRA PALACE
Free shuttle service to Exhibition
KINGS CROSS
MOORGATE

By London Transport
Underground: Victoria Line from Victoria (also Oxford Circus, Kings Cross/St Pancras) to Highbury and Islington — change (cross platform) to BR Suburban Service to Alexandra Palace — free shuttle bus or 5 minute walk from there!

Alternative: Piccadilly Line (from Heathrow etc) to Finsbury Park or Wood Green — Link with W3 bus service to the fair.

BRITISH RAIL ALEXANDRA PALACE
Suburban
change for B.R. Suburban service
HIGHBURY ISLINGTON
KINGS CROSS
VICTORIA
Link with W3 bus to exhibition
WOOD GREEN
FINSBURY PARK
KINGS CROSS
Piccadilly Line
HEATHROW
OXFORD CIRCUS

Come to the big one...

7th ZX MICROFAIR

ALEXANDRA PALACE, SATURDAY, JUNE 4th 1983

SATURDAY JUNE 4th at ALEXANDRA PAVILION, ALEXANDRA PALACE, WOOD GREEN, LONDON N22. FROM 10am to 6pm.

Advance tickets available from: Mike Johnston, 71 Park Lane, Tottenham, London N17 0HG. Adults £1.00. Kids (under 14) 50p.
Please make cheques payable to ZX MICROFAIR and enclose S.A.E.

Save 10 percent on top software ranges

THIS month we are able to make one of the biggest offers since the club began. Exclusive to members we have arranged with Quicksilva and New Generation Software to sell all their ranges at a discount of 10 percent.

As a change from previous months all orders should be sent to the club at the usual address.

As usual the offer is open only to club members and is available until the end of June.

Quicksilva	List price	Offer price
ZX-81		
Asteroids	£3.95	£3.55
Defenda	£3.95	£3.55
Scramble	£3.95	£3.55
Invaders	£3.95	£3.55
Croaka Crawla	£3.95	£3.55
Galaxians and Gloops	£4.95	£4.45
Munchees	£3.95	£3.55
Black Star	£4.95	£4.45
Cosmic Guerilla	£3.95	£3.55
Damper and Glooper	£4.95	£4.45
Ocean Trader	£3.95	£3.55
Pioneer Trail	£3.95	£3.55
Trader	£9.95	£8.95
Subspace Striker and Zor	£3.95	£3.55
Starquest and Encounter	£3.95	£3.55
SPECTRUM		
Time Gate (48K)	£6.95	£6.25
Frenzy	£4.95	£4.45
Mined Out	£4.95	£4.45
Speakeasy (48K)	£4.95	£4.45
Astro Blaster	£4.95	£4.45
Meteor Storm	£4.95	£4.45
The Chess Player (48K)	£6.95	£6.25
Space Intruders	£4.95	£4.45
Word Processor (48K)	£5.95	£5.35
Trader	£9.95	£8.95
New Generation		
ZX-81		
3D Defender	£4.95	£4.45
3D Monster Maze	£4.95	£4.45
Full Screen Breakout (1K)	£1.95	£1.75
SPECTRUM		
3D Tunnel	£5.95	£5.35
Escape	£4.95	£4.45

International membership continues its fast growth

Tee-shirts get Sinclair habit

THE CLUB can now offer tee-shirts to its members. They have the Sinclair User Club logo in blue on a white background. The price is £4.80 and small, medium and large sizes are available.

All correspondence for the Club, including orders for software or tee-shirts, should be addressed to Sinclair User Club, ECC Publications, 30–31 Islington Green, London, N1 8BJ.

Our overseas membership continues to grow, as illustrated by a letter from one of our latest members. E Austin is employed by the British Aircraft Corporation in Saudi Arabia. He reports that in his circle of personal acquaintances there are owners of at least six Spectrums and a number of ZX-81s.

Although Saudi television is broadcast only on VHF, there are apparently a number of multi-standard sets available which will accept a PAL signal—the Spectrum generates a PAL standard signal. For instance, Austin uses a multi-standard Sony Trinitron, though he is experiencing minor difficulities with the colour display. That is a known problem, of course, and can be cured by a small adjustment on the Spectrum; our Helpline will be supplying the appropriate information to help him alleviate it.

The appeal of Sinclair machines never fails to amaze us for it is not only international but spans many age groups as well. The most senior member of which will be 80 next year but the point is best illustrated by a letter from a member, who is a mere 64 years old. He writes:

"I have had my ZX-81 for four months and have found an exceedingly fascinating hobby. At my time of life, who says it's a young man's hobby?". Not us, but we believe our youngest member is only nine. If you know better, tell us.

MEMBERSHIP FORM

I wish to join the Sinclair User Club and enclose my subscription of £12

Name .....

Address .....

.....

.....

.....

Which computer do you own?

ZX-81 ☐ Spectrum ☐

Send your coupons to Sinclair User Club, ECC Publications, 30-31 Islington Green, London N1 8BJ. Cheques should be made payable to Sinclair User Club.

Sinclair User Club

Britain

Aylesbury ZX Computer Club: Ken Knight, 22 Mount Street, Aylesbury (5181 or 630867). Meetings: first Wednesday and third Thursday of the month.

Basildon Microcomputer Club: Roger Sims, Wickford 63032, after 6.30pm. Meetings every other week on Tuesdays from 7.30 to 10pm at Healey Management Services, The Hemmels, Laindon, Essex.

Bristol Yate and Sodbury Computer Club: 99 Woodchester Yate, Bristol, BS17 4TX.

Colchester Sinclair User Group: Richard Lown, 102 Prettygate Road, Colchester CO3 4EE.

Doncaster and District Micro Club: John Woods, 60 Dundas Road, Wheatley, Doncaster DN2 4DR; (0302) 29357. Meetings held on second and fourth Wednesday of each month.

Eastwood Town Microcomputer Club: E N Ryan, 15 Queens Square, Eastwood, Nottingham NG16 3BJ.

Edinburgh ZX Users' Club: J Palmer (031 661 3183) or Ken Mitchell (031 334 8483). Meetings: second Wednesday of the month at Claremont Hotel.

EZUG-Educational ZX-80–81 Users' Group: Eric Deeson, Highgate School, Birmingham B12 9DS.

Furness Computer Club: R J C Wade, 67 Sands Road, Ulverston, Cumbria (Ulverton 55068). Meets every other week on Wednesday evenings.

Glasgow ZX-80–81 Users' Club: Ian Watt, 107 Greenwood Road, Clarkston, Glasgow G76 7LW (041 638 1241). Meetings: second and fourth Monday of each month.

Gravesend Computer Club: c/o The Extra Tuition Centre, 39 The Terrace, Gravesend, Kent DA12 2BA. Bi-monthly magazine and membership card.

Hassocks ZX Micro User Club, Sussex: Paul King (Hassocks 4530).

Inverclyde ZX-81 Users' Club: Robert Watt, 9 St. John's Road, Gourock, Renfrewshire PA19 1PL (Gourock 39967). Meetings: Every other week on Monday at Greenock Society of the Deaf, Kelly Street, Greenock.

Keighley Computer Club: Colin Price, Redholt, Ingrow, Keighley (603133).

Lambeth Computer Club: Robert Barker, 54 Brixton Road, London SW9 6BS.

Liverpool ZX-Computer Centre: Keith Archer, 17 Sweeting Street, Liverpool 2.

Merseyside Co-op ZX Users' Group: Keith Driscoll, 53 Melville Road, Bootle, Merseyside L20 6NE; 051-922 3163.

Micro Users' Group: 316 Kingston Road, Ewell, Epsom, Surrey KT19 0SY.

National ZX-80 and ZX-81 Users' Club: 44-46 Earls Court Road, London W8 6EJ.

Newcastle (Staffs) Computer Club: Meetings at Newcastle Youth and Adult Centre, Thursday, 7.30 to 10 pm. Further information from R G Martin (0782 62065).

North Hertfordshire Home Computer Club: R Crutchfield, 2 Durham Road, Stevenage; Meetings: first Friday of the month at the Settlement, Nevells Road, Letchworth.

Northern Ireland Sinclair Users' Club: P Gibson, 11 Fitzjames Park, Newtownards, Co Down BT23 4BU.

North London Hobby Computer Club: ZX users' group meets at North London Polytechnic, Holloway Road, London N7 each Monday, 6pm.

Nottingham Microcomputer Club: ZX-80–81 users' group, G E Basford, 9 Holme Close, The Pastures, Woodborough, Nottingham.

Orpington Computer Club: Roger Pyatt, 23 Arundel Drive, Orpington, Kent (Orpington 20281).

Perth and District Amateur Computer Society: Alastair MacPherson, 154 Oakbank Road, Perth PH1 1HA (29633). Meetings: third Tuesday of each month at Hunters Lodge Motel, Bankfoot.

Regis Amateur Microcomputer Society: R H Wallis, 22 Mallard Crescent, Pagham, Bognor Regis, West Sussex PO21 4UU.

Scunthorpe ZX Club: C P Hazleton, 26 Rilestone Place, Bottesford, Scunthorpe; (0724 63466).

Sheffield ZX Users' Club: A W Moore, 1 Ketton Avenue, Sheffield S8 8PA, Yorkshire. Annual subscription 10, monthly newsletter and cassette.

Sittingbourne: Anurag Vidyarth (0795 73149). Would be interested to hear from anyone who wants to start a club near the Medway towns.

Stratford-on-Avon ZX Users' Group: Chris Parry, 16 Sackville Close, Stratford-on-Avon, Warwickshire.

Swansea Computer Club: B J Candy, Jr Gorlau, Killay, Swansea (203811).

Swindon ZX Computer Club: Andrew Bartlett, 47 Grosvenor Road, Swindon, Wilts SN1 4LT; (0793) 3077. Monthly meetings annd library.

Worle Computer Club: S W Rabone, 18 Castle Road, Worle, Weston-super-Mare BS22 9JW (Weston-super-Mare 513068). Meetings: Woodsprings Inn, Worle, on alternate Mondays.

ZX-Aid: Conrad Roe, 25 Cherry Tree Avenue, Walsall WS5 4LH. Please include sae. Meetings twice monthly.

ZX Guaranteed: G A Bobker, 29 Chadderton Drive, Unsworthy, Bury, Lancashire. Exchanges information and programs throughout the country.

ZX-80/ZX-81 Users' Club: PO Box 159, Kingston-on-Thames. A postal club.

Overseas

Belgium: ASBL BDMA Belgium National Sinclair Club; P Glenisson, Rue De l'Epeestraat, 14, 1200 Bruxelles.

Belgium, France and Luxembourg: Club Sinclair, Raymong Betz, 38 Chemin du Moulin 38, B-1328 Ohain, Belgium (322 6537468).

Denmark: Danmarks National ZX-8081 Klub (DNZK), Jens Larson, Skovmosevej 6.4200 Slagelese, post giro 1 46 24 66.
ZZ-Brugergruppen i Danmark, Boks 44, 2650 Hvidovre, Gratis medlemskab og gratis blad til enhver interesseret.
J Niels-Erik Hartmann, OZ-ZX-Radioamator, Bruger Gruppe, Bredgade 25 DK-4900, Nakskov.

East Netherlands: Jonathon Meyer, Van Spaen Straat 22,6524 H.N. Nijmegen; (080 223411).

Germany: ZX-80 Club, a postal club; contact Thomas Jencyzyk. Hameln, Postfach 65 D-3250 Hameln, Germany.

Indonesia: Jakarta ZX-80/81 Users' Club, J S Wijaya, PO Box 20, Jkukg, Jakarta, Utara, Indonesia.

Irish Amateur Computer Club: Martin Stapleton, 48 Seacourt, Clontarf, Dublin 3. (331304).

Italy: Sinclair Club, Vie Molimo Veccho so/F, 40026 Imola, Italy.

Micro-Europe: Belgium or Club Paris-Micro, 19 Rue de Tilly, 92700, Colombes, France; associated with Club Micro-Europe.

Republic of Ireland: Irish ZX-8081 Users' Club, 73 Cnoc Crionain, Baile Atha, Cliath 1.

Singapore: Sinclair Users' Group: Eric Mortimer, 1D Wilmer Court, Leonie Hill Road, Singapore.

South Africa: Johannesburg ZX-80–81 Computer Users' Club: S Lucas, c/o Hoechst SA (Pty) Ltd, PO Box 8692, Johannesburg.
Johannesburg ZX Users' Club: Lennert E R Fisher, PO Box 61446, Marshallstown, Johannesburg.

Spain: Club Nacional de Usuarios del ZX-81, Joseph-Oriol Tomas, Avda. de Madrid, No 203 207, 10, 3a esc. A Barcelona-14 Espana. International ZX Spectrum Club: Gabriel Indalecio Cano, Sardana, 4 atrico 2a, San Andres de la Barca, Barcelona. Send international reply coupon. Produces a bi-monthly magazine. Spanish ZX Micro Club: Apartado 181, Alicante (Costa Blanca), Spain.

Swedish ZX-club: Sinclair Datorklubben, Box 1007, S–122, 22 Enskede, Sweden.

United States: Bay Area ZX-80 User Group, 2660 Las Aromas, Oakland CA94611.—Harvard Group, Bolton Road, Harvard MA 01451: (617 456 3967).

IMPORTANT NOTICE
ZX SPECTRUM 48K

CYCLE PLANNER is not a game.

MEDIDATA announces a unique software package which establishes a genuine and lasting use for the home computer.

Program 1: **CYCLE PLANNER** — Intelligent and friendly program designed to be run monthly. Analyses the female monthly cycle and computes:
1. Shortest, longest and average cycle lengths.
2. Starting date of next period.
3. Date of maximum fertility (ovulation).
4. "Unsafe" (and "safe") dates.
5. Birth date if conception occurs.

Option for recording dates on Sinclair printer.

Program 2: **GROWTH TRACKER** — Menu-driven, highly interactive guide to:
1. 40 weeks of growth before birth.
2. 24 months of development after birth.
3. The common childhood illnesses.

The MEDIDATA package, which has been designed by a London Teaching Hospital doctor, exposes the potential of the home computer to women, men and families.

Both programs available on a single cassette (48K Spectrum).

Send orders to **MEDIDATA, PO Box 26, London NW9 9BW.**

Enclose a cheque/P.O. for £7.25 *(includes P&P).*

JRS
SOFTWARE COMPETITION
(FOR ZX SOFTWARE)

RESULTS

1st Prize (Colour TV and £250)	K. D. Pridmore
2nd Prize (£150)	D. A. Elliott
3rd Prize (£50 or JRS 64K RAM)	K. R. Browne
3rd Prize (£50 or JRS 64K RAM)	N. Beer
3rd Prize (£50 or JRS 64K RAM)	W. I. Cooksey

PROGRAMMERS—The competition may be over, but we are always interested in purchasing high quality, original ZX Spectrum software. We pay up to 25% royalties or will make a **SUBSTANTIAL CASH OFFER,** payable **IMMEDIATELY** on completion of the purchase agreement.

INTERESTED?

Then send your program on cassette (returnable) today!!

JRS SOFTWARE

19 WAYSIDE AVENUE, WORTHING, SUSSEX. BN13 3JU Telephone: (0903) 65691

THE NEW SPECTRUM
'ADD-ON'
NOW WITH ADDITIONAL SWITCH-TYPE JOYSTICK PORT

BLADAMM!

ONLY **£22-50** PLUS VAT

COMPLETE your SPECTRUM with our Multi-purpose Sound Generator and Joystick-port Board!! With one low-cost purchase you can obtain the following outstanding improvements to your ZX SPECTRUM:

- THREE CHANNEL sound effects. PROGRAM three independent sounds with music, gun shots, explosions etc.
- AMPLIFICATION of the standard sound output.
- TWO ports for Potentiometer Joysticks;
- ONE port for Switch-type Joystick.

The 'ADD-ON' uses the amazing AY-3-8910 SOUND Chip, which gives you an enormous range of sound effects. The output and volume of each channel can be separately controlled, with gun shots, explosions, drums etc., produced under the 'sound envelope'. MOST IMPORTANT TO NOTE — the CHIP is 'processor independent.' This means that sounds can continue to be produced without any noticeable effect on the speed of your program!!
The 'ADD-ON' contains its own speaker and amplifier chip and is supplied with a cassette containing sound demonstration routines and some sample sounds. The 'ADD-ON' simply plugs straight onto the back of your SPECTRUM. No soldering is required.

COMPLETE YOUR SPECTRUM NOW!!

JOYSTICKS (POTENTIOMETER-TYPE)
KIT (incl. case) **each £5.35** + VAT BUILT **each £6.75** + VAT

NEW **COWBOY SHOOT-OUT**
(Machine Code) **£3.95** + VAT
Full feature, TWO PLAYER, cowboy shooting game. Hide behind the cactus plants and moving chuck wagons until they are shot away. Shoot your opponent and avoid getting hit yourself. The second player can be the computer, but you set its skill from 10 levels. Excellent colour graphics and sound.

CABMAN (Machine Code) **£3.95** + VAT
You are the owner of a fleet of yellow taxis. A rival firm competes with you, trying to steal your fares and run you off the road, if they can. Ten skill levels determine the number of opposing taxis, the speed at which they drive and the amount you earn per completed journey. MAXIMISE your earnings before you lose your entire fleet. This program is FIRST CLASS.

MACHINE CODE PROGRAMMERS — ACS SOFTWARE
ASSEMBLER ..... **NOW ONLY £5.95** - VAT
DISASSEMBLER ..... **NOW ONLY £4.95** - VAT

BOOKS
LARGE RANGE FOR SPECTRUM AND ZX81

BBC, DRAGON & ACORN DEALERS

NOTE: We stock (and market) PROGRAM POWER SOFTWARE for the BBC, ACORN, SPECTRUM and DRAGON 32. Send S.A.E. for appropriate catalogue.

MICRO POWER
All programs are now available at all good dealers or direct from MICROPOWER LTD.
Dept. SU6
8/8a REGENT STREET,
CHAPEL ALLERTON,
LEEDS LS7 4PE
Tel. (0532) 683186 or 696343

Please add 55p order P & P - VAT at 15%

WRITTEN ANY PROGRAMS? WE PAY 20% ROYALTIES FOR DRAGON, SPECTRUM BBC PROGRAMS

POWER MICRO PROGRAM POWER

Put everything you need on the keyboard with a Custom Keypanel Kit.

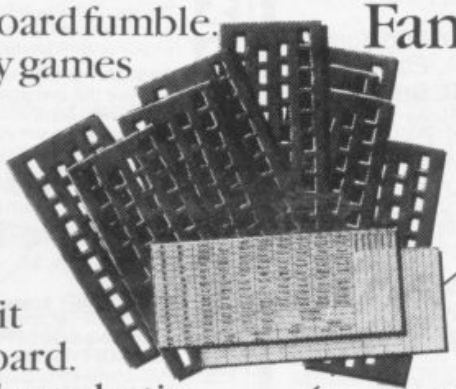
At last! An end to keyboard fumble.

A must for all multikey games and a revolution for flight simulation, VU-CALC, VU-FILE and other sophisticated software.

Instantly changeable precision die-cut panels fit over your Spectrum keyboard.

Each kit comes in a clear plastic wallet and contains: 10 matt black Keypanels plus a sheet containing over 140 bright red self adhesive command labels, pre-printed with words and symbols – arrows, left, right, FIRE!, POWER!, etc, plus a sheet of blanks for your own designs.

The FIRST add-on for your Spectrum.



Fantastic value at only £2.95 plus p&p. for 10 Keypanels.

Post today to **Softeach Limited**, 25 College Road, Reading, Berkshire, RG6 1QE.

Please send me:

..... Custom Keypanel Kits at £2.95 + 25p p&p each (overseas should add 25% for additional surface mail)

I enclose a total remittance of £ ..... cheques/postal orders payable to **Softeach Limited**.

NAME .....

ADDRESS .....

.....

Softeach Limited have no connection with any other software product mentioned in this advertisement.

Marathon sponsor

THE CAMBRIDGE half-marathon, sponsored by Sinclair Research for £5,000, is to be run on Sunday, July 17. It is the second year of the annual race and up to 2,000 competitors are expected, including keen marathon runner Clive Sinclair.

The half-marathon is part of Cambridge Festival Week, which begins on July 16. The co-sponsors of the event are Cambridge City Council and the local athletic club, Cambridge and Coleridge. They hope to build on the success of last year's event which was won by the fastest U.K. marathon runner, Ian Thompson.

The funds raised will be used to develop the local sports club's new track and field headquarters.

The race will start at 10 am from Parker's Piece. The two-lap course round the city will be by way of Fen Causeway, Grantchester and Trumpington.

Spectrum prices are slashed

PRICES of the Spectrum have been slashed. The 48K version now costs £129.95 and the 16K £99.95. That is a reduction of £55 on the 48K and £25 on the 16K.

The move is expected to cause chaos in the home computer market. It is believed the reductions were prompted by competition which, while it is not yet a serious threat, is thought to be growing quickly.

The price of the 16K is now the same as that of the 16K Oric, which many see as the most immediate threat. The 48K price, however, is a good deal less than that of the corresponding Oric.

Smiths has also cut the price of the ZX-81 by £10 to £39.95.

The price of the ZX Printer has been reduced by Sinclair Research from £59.95 to £39.95.

The announcement was a great surprise to many in the market. There had been rumours of a reduction when the TS2000 version of the Spectrum was announced in the States. The prices of that greatly-modified machine were put at $149.95 for the 16K and $199.95 for the 48K. Depending on exchange rates, that is equivalent to British prices of about £95 and £125.

It would not be possible to use the TS2000 in Britain because of the different television systems, so an early fall in the price was thought unlikely.

A sharp increase in sales is now expected. Production of the Spectrum is now running at about 50,000 a month and the company has plans to increase that number substantially this year.

Language course

A TWO-DAY course in Z-80 assembly language programming is scheduled for the City of London Polytechnic.

The Z-80 processor is at the heart of Sinclair machines and the course is for anyone wanting to learn machine code or how the Z-80 functions.

The organisers hope that it will strip some of the mystery from the subject and extend the programming abilities of a microcomputer user. They claim that by the end of the course a student will be able to write machine code programs which can either be called as routines from Basic programs or stand alone.

The course will be staged on June 28 and 30. The fee is £15 and application forms are available from The Short Course Unit, City of London Polytechnic, 84 Moorgate, London EC2.

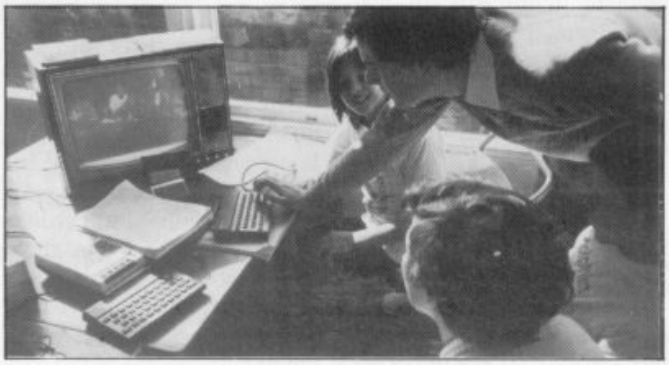
Summer fun at Dolphin

SINCLAIR Research is providing 200 computer systems for use in a network of summer camps run for children by Dolphin, an activities holiday group.

The group was formed last year with the assistance of the Department of Industry Education Unit and the equipment was provided then by Apple Computers. This year it is the Sinclair ZX-81 and Spectrum which will be the focus of attention. Nicholas Goddard, Dolphin publicity co-ordinator, says:

"The people at Sinclair Research have been very helpful. We would like to thank them for all the assistance they have given to us."

The camps were set up to provide week or weekend holidays for children and Goddard says they are not just summer schools. The emphasis is on having fun and enjoying computing. There is a wide variety of other pursuits available, so it is not all to do with computers.



The other pursuits include video film and cartoon making, go-carting, windsurfing and horse-riding. They are to complement the work done indoors on the computers.

Dolphin concentrates on three main areas of technology — computer programming in Basic and then in other languages such as Pascal and Logo. The children will also have an opportunity to learn the techniques of interfacing to control and even build robotic devices.

Further information can be obtained from Nicholas Goddard, Dolphin Activity Holidays, 68 Churchway, London NW1 1LT.

Contest winner

THE WINNER of the competition at Northern Premier Exhibition Pudsey computer show was James Wilson, aged eight.

The prize was a Spectrum, with which he was delighted. Wilson already owned a ZX-81 and had been saving for a Spectrum. Now, he says, his dreams have come true.

The competition was in aid of the Hyperactive Childrens' Support Group.

More news on page 14

Move forced by high sales of tracer

SALES of the RD Digital Tracer have been so buoyant that the company which manufactures it, RD Laboratories Ltd, has had to move to new premises in Wales.

A new manufacturing base has been set up at Cwmbran, Gwent because delivery dates were beginning to slip. With the new facilities, managing director Bob Dickens claims that orders which are now being placed will be met well within the 28-day delivery period promised by the company.

The Tracer costs approximately £50 and allows a Spectrum or ZX-81 owner to transfer a picture from a book straight into the computer and on to the television screen.

The device already has a number of serious uses, including one in the medical profession to produce a fast read-off of areas of irregular shapes.

The new facilities will make it possible for RD Laboratories to make its range of consumer products available through retailers. The move has already begun.

Memotech computer

MEMOTECH, manufacturer of alternative RAM packs for the Sinclair ZX-81, is launching a computer this month. Until recently the new £200 machine had been shrouded in secrecy. Few people would talk about its specification or even confirm that such a machine existed.

The computer, which as yet has no name, has a black aluminium body, a three-channel sound generator and the capacity to hold up to 512K of switchable RAM. It has two joystick ports as standard, with the addition of disc drives, will take any combination of 8in. and 4½in. floppies.

The standard screen resolution is 40 columns wide, with an option of 80 columns. That makes the machine capable of supporting business software. The 16 colours available will appeal to games players, as will the availability of large graphics characters, called sprites, which have so far been implemented only on two other microcomputers.

The machine can be used by beginners in computing, as the option of a 'very basic' Basic will be available. At the other end of the scale the computer will be the first inexpensive micro to support the CP/M operating system. That means that complex business programs which, until now, have been suitable only for such machines as the Apple will run on the new machine.

Cartridges on Spectrum

THERE HAVE been suggestions in the last few months that Sinclair Research will be producing a number of ROM cartridges for the Spectrum.

Those cartridges would plug directly into the machine and allow instant access to programs such as games or utility routines, assemblers or new languages.

A spokesman for the company declined to comment on what would be a new development in the Sinclair market. There is still no further news on Microdrive.

Microfair's new venue

THE NEXT ZX-Microfair will be at Alexandra Palace, London, on June 4, from 10am to 6pm. The price of admission will be £1 for adults and 50 pence for children and senior citizens, but the new venue will give exhibitors and visitors twice the amount of space available at the last show.

Extra seating facilities will be available for people who want to rest after looking at the exhibits and there will also be three bars and two buffets for hot snacks.

All the usual features will be in the show, including the Bring and Buy stand and the showguide, which will contain programs and articles about Sinclair machines. New features will include a chess tournament, played between Sinclair-based programs.

There is a rail link to the venue from King's Cross and an Underground link from Moorgate. It is also possible to travel by the Victoria Line to Highbury and Islington, then cross to the British Rail train to Alexandra Palace. If you travel by car there are full parking facilities.

Advance tickets for the show can be obtained from Mike Johnston, 71 Park Lane, London N17 0HG.

Trial sales satisfied

THE LEGAL differences between the software house Quicksilva and a London-based shop operating a buy-and-try scheme have been resolved.

Under the original scheme, customers were able to return cassettes bought in the normal way from The Software Centre of Wigmore Street and obtain an 80 percent refund. The refund was available only against the purchase of another cassette of equal or greater catalogue value and could be claimed only within a six-month period.

Three software houses, including Quicksilva, protested at the length of the period. They claimed that it might be possible for customers to make pirate copies of tapes before returning them to the shop.

Quicksilva has withdrawn its complaint because of undertakings by The Software Centre. The period during which customers can return cassettes has been shortened to one month and the shop will make clear on all its advertisements that Buy 'n Try is not a form of software library. Customers are being asked to sign a declaration to the effect that they will not copy tapes.

Top Twenty

Program	Last Month	Company	Machine
1 The Hobbit	1	Melbourne Hse.	48K Spectrum
2 Football Manager	10	Addictive Gms.	48K Spectrum
3 Transylvanian Twr.	—	Richard Shepard	48K Spectrum
4 Compiler	—	Softek	48K Spectrum
5 Penetrator	6	Melbourne Hse.	48K Spectrum
6 Vu-3D	4	Psion	48K Spectrum
7 Time Gate	3	Quicksilva	48K Spectrum
8 3D Tunnel	—	New Generation	16K Spectrum
9 Voice Chess	—	Artic Computing	48K Spectrum
10 Hungry Horace	7	Psi/Ml. Hse.	16K Spectrum
11 Conflict	—	Martech	48K Spectrum
12 Flight Simulation	5	Psion	48K Spectrum
13 Nightflight	—	Hewson	16K Spectrum
14 Horace goes Skiing	—	Psi/Ml. Hs.	16K Spectrum
15 Arcadia	—	Imagine	16K Spectrum
16 Planet of Death	—	Artic Computing	48K Spectrum
17 Vu-File	—	Psion	16K Spectrum
18 Derby Day	—	Computer Rntls.	16K Spectrum
19 Golf	—	R and R	16K Spectrum
20 Spectral Invs.	—	Bug Byte	16K Spectrum

Compiled by W H Smith and Microware.

Hewson Consultants

We proudly announce our 1983 range of

SPECTRUM SOFTWARE

40 BEST MACHINE CODE ROUTINES FOR THE ZX SPECTRUM £5.95

By Andrew Hewson and John Hardman

Section A: Three chapters explaining what you need to know about Z80 machine code on the Spectrum.

- How to load and save machine code.
- How to use the system variables.
- How program lines are stored.
- How to use the stack, the display, the attribute files.

Section B: 40 routines including,

- Scroll – up, down, side to side by pixel or by character.
- Search and replace, token swap, string search.
- Rotate character, invert character – horizontally and vertically.
- Line renumber – including GOSUBs, GOTOs, RUN etc.

20 BEST PROGRAMS FOR THE ZX SPECTRUM £5.95

By Andrew Hewson

Program titles include:

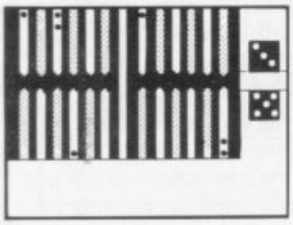
Machine Code Editor – Write, modify, extend and load machine code using this all-basic program. No need to use an Assembler when you have this program.

Index File – Learn about fixed length records, save numeric and string information, add to, sort, modify, delete and print your records. Ideal as a computer based filing system.

Duckshoot – Learn how to manipulate the attributes file *and* have fun at the same time.

Graphix – Construct up to 210 graphics characters with the full on-screen editing facilities, enhance and modify them and recall them later to build a detailed display to save on cassette.

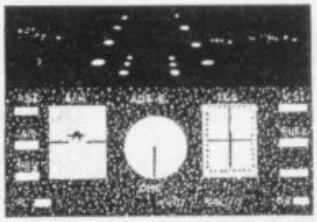
Plus: FOOTBALL, DIGITISER, DIARY and many more.



BACKGAMMON 16K £5.95

8 Levels of play from novice to expert.
Full colour display of tables and dice.
Gamble on a single game or a series, double or quits. All the features of the ancient game.

NIGHTFLITE 16 and 48K £5.95

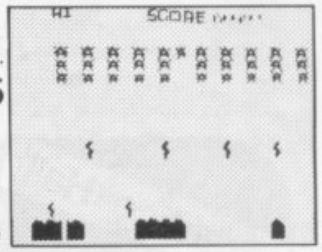


NIGHTFLITE puts you at the controls of a light aircraft flying at night. You can:
Climb, descend, take off,
Land, bank left or right,
Navigate between beacons,
Raise/lower the flaps,
Raise/lower the undercarriage,
Adjust engine rpm,
Raise/lower the nose varying amounts.
Runway lights appear on approach.
5 modes including Autopilot.
Written by a qualified light aircraft pilot.

COUNTRIES OF THE WORLD £5.95

16 and 48K on one cassette
Countries of the World is an educational package designed to give an appreciation of the location of all the main countries and some information about them.
16K version displays a world map, shows the position of each country and names its capital.
48K version; all the above plus prints the population, size, currency, and main languages of each country, and statistics on largest and smallest countries etc.

PLUS : Two complete world map screen displays for you to include in your own programs.



SPECVADERS £4.95

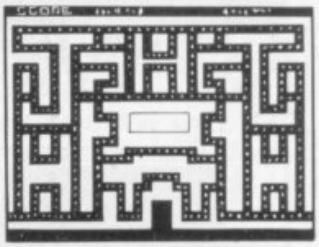
16K

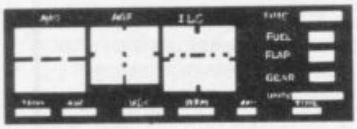
Defeat each squadron of Beeple Zaps and another appears only closer.
Cyrian mothership with ejecting Zeetle Baps.
5 levels of play from Orions snails pace to close your eyes and hope.
Real time scoring. 3 lives. Pan galactic gargle blaster for highest score.
Descending asteriods.

MAZE CHASE £ 4.95

16 and 48K

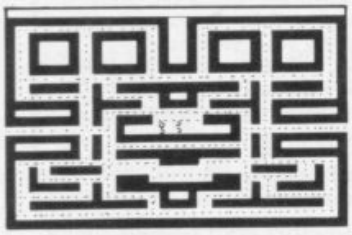
4 or 8 Mazes, Highest score to date,
4 independent guardians, 3 lives,
Full colour, Fast machine code action,
magic strawberries, eat lemons to score more, real time scoring.





PILOT 16K (ZX81) £5.95

Fly your own aircraft.
Instruments and readouts:
A/H, ALT, HDG, FL, GR, VOR, VSI, WIND, DME, ADF, and ILS
see "NIGHTFLITE". Essentially the same as "NIGHTFLITE" but without the Hi Res Graphics.



PUCKMAN 16K (ZX81) £5.95

3 Mazes.
Highest score to date.
4 Independent guardians.
Magic strawberries.
Real time scoring.

ORDER FORM — Make cheques/PO's payable to Hewson Consultants

Quantity	Product	Cost

Name _____ Total _____
(Block Capitals Please)

Address _____ Signed _____

My Access/Barclaycard No. is _____

Post to: **HEWSON CONSULTANTS**, 60A St Mary's Street, Wallingford, Oxon OX10 0EL.
Tel (0491) 36307.

MARKET YOUR SOFTWARE

K-tel (International), leaders in the field of Marketing and Distribution of leisure products to major retail chains are expanding their catalogue of Home Computer software.

Software accepted for inclusion in this catalogue will have the benefit of experienced packaging designers and artists, and exposure to major outlets.

PUT THE EXPERIENCE OF K-TEL BEHIND YOUR PRODUCT

Send a tape and documentation for evaluation now to:

K-tel International (UK) Ltd.,
Computer Software Department,
620 Western Avenue, London W3 0TU

K-tel

Prentice-Hall

computer books month

June '83

New and best-selling computer books published by Prentice-Hall and its associated imprints—Brady, Reston, Reward and Spectrum—will be on display throughout the country in June.

FEATURING–

The ZX Spectrum—Your Personal Computer

Ian McLean, Simon Rushbrook Williams & Peter Williams

Written in an informal, friendly style, this practical guide to the ZX Spectrum is ideal for first-time users. Clear diagrams show you how to master the Spectrum's keyboard and press the correct keys for various functions. Storing information, making calculations, sound, and graphics are carefully explained, and there is a special section on making music on the Spectrum.

£5.95 240 pages 13-985028-7 May 26th '83

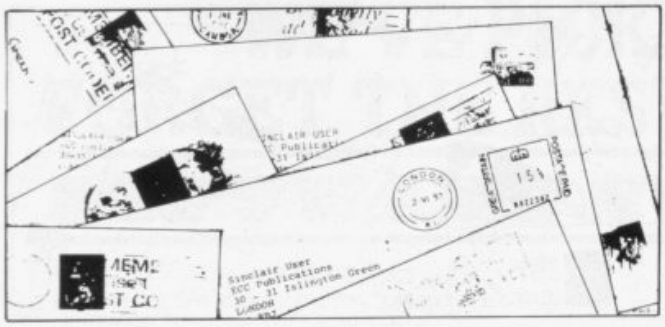
Also on display will be books on the BBC Micro, IBM PC, Commodore 64, ATARI, VIC, Z-80, 6502, CP/M, UNIX, Interfacing UCSD Pascal . . .

Visit Prentice-Hall computer books displays at

Austicks, Cookridge Street, Leeds
Blackwells, Broad Street, Oxford
Dillons, Malet Street, London
Foyles, Charing Cross Road, London
Georges, Park Street, Bristol
Haigh & Hochland, Oxford Street, Manchester
Heffers, Trinity Street, Cambridge
John Smith, St. Vincent Street, Glasgow
Modern Book Co., Praed Street, London
Smiths, London Street, Reading
Thorn's, Percy Street, Newcastle
Willshaws, John Dalton Street, Manchester
and major branches of W. H. Smith as well as leading computer dealers.

Prentice/Hall International

66 Wood Lane End, Hemel Hempstead, Hertfordshire HP2 4RG, England.



Divide and confuse

THIS IS to let you, John Gilbert and anyone who read my previous letter (April) know that I am not crazy. The improvement which I suggested to John Gilbert's program was, unhappily, misprinted. It should read:

GOSUB 1000+(VAL A$*1000)

The idea can be extended to any number of subroutines whose line numbers are related directly to menu inputs. The version printed substituted '÷' for '+' which made nonsense of the whole thing and I apologise to anyone whose machine is still searching for a sub-routine numbered 0.3333333333333.

M Gordon,
London N14.

Heading for good sound

I THOUGHT your readers would be interested that at the back of the Spectrum is an ear socket into which one can plug in a pair of personal headphones. The sound is greatly improved.

Roy Graham (aged 12),
Wimborne,
Dorset.

Will not get fooled again

WE HAD a wide range of reactions to our April Fool program in the April edition. We were surprised by the irritation it caused some of our readers, since we assumed that most people have a sense of humour.

To those who say they feel cheated we can only say that *Sinclair User* contains much more than one small program to interest users of Sinclair machines.

ON APRIL 1, I programmed the Machine Code Converter program into my ZX-81. I was about to load my game from my tape recorder on to my computer to be converted into machine code when I typed in the name of my program, pressed New Line and I was an April Fool. I thought that the machine code converter program was too good to be true and I was going to see how it worked when I had used it but I was so excited I just got down to work typing-in the program and had a complete surprise.

I must congratulate you; this was the best April Fool trick anybody ever played on me.

Robert Courtney,
Isleworth,
Middlesex.

I WAS impressed when I saw the machine code converter. I thought that at last a sensible program had been published instead of the continual games programs; but I was to be proved wrong. If you think that this April Fool was a clever trick, I feel sorry for you.

S Mercer,
Sutton Coldfield,
West Midlands.

CONGRATULATIONS. I fell for it, hook line and sinker. I even read the address 1 April Way and it did not register. One good thing is that it is the first time I have seen the inverse screen, so I have ordered a video inverter from one of your advertisers.

E Solari,
Leamington Spa.

I AM annoyed with Machine Code Converter as I was going to buy a program to do this when I saw that program, so I bought the magazine and thought I could spend the money I saved. I did so and now I have to save again.

John Clark (aged 11),
Glenrothes, Fife.

continued on page 18

Illustrations waste space

WITH A ZX-81 and a Spectrum I am naturally a regular reader of your excellent magazine. Normally I do not mind, and accept as a challenge and a useful learning exercise the mistakes and misprints we find in many programs.

I feel sure, however, that most readers would appreciate more attention being given to program accuracy and less to the superfluous Yankee-type illustrations. For example, the neat little program from Alistair Mullins in your April issue does not work as printed and the useless illustration takes up more than 50 percent of the page area. Yet in your editorial you say that "important items have still had to be omitted or postponed because of lack of space."

On the other hand, in the same issue there is the clever, albeit light-hearted program compiled by John Sidney

which works perfectly without the support of a space-wasting stupid illustration.

Would you please credit your readers with a little more intelligence than the need for these wasteful comic-strip type drawings and consider using the space they occupy with something more stimulating to a computer user's mind?

J Johnson,
Stockport,
Cheshire.

● *The reason we include illustrations is that we believe computer users to be human beings who find it easier to assimilate information if it is presented in a pleasant format. If space were saved by removing the drawings it would mean complete pages of listings which would be almost impossible to enter. The comment about the Muncher program on page 65 is incorrect. It has been checked again and found to work if the instructions are followed.*

continued from page 17

Long listings made easier

YOU MAY have noticed that when typing-in a long listing on the ZX-81, three or four listings sometimes have to be made by the ZX-81 to get the current line on the screen. That can be tiresome but I think I have discovered a cure.

When the screen starts to get filled by the listing, you merely POKE the number of the bottom line into the system variable S-TOP. So if 'B' is the number of the bottom line, you would POKE 16419,B-256*INT(B/256) and POKE 16420, INT(B/256). That then makes the bottom line the top line in any automatic listing, e.g., when 'NEWLINE' is pressed, leaving plenty of room for further lines without re-listing.

I think your magazine is great and get it every month but I still feel you could cater for ZX-81 users a little more.

D Sargent (aged 13), London E13.

Horace gets a good meal

YOU SAY in *Sinclair User* that the testers of Hungry Horace cannot get out of the third maze. I have found an easy way of getting points which works only on the third and fourth mazes; it works by hitting the bell slightly and then quickly getting back. I have made more than 100,000 points and get in and out of the third and fourth maze without much trouble.

Ben Reavell (aged 9), Basingstoke, Hampshire.

Customised beeping

COLIN KOSTYRAKA — letters, April 1983 — may be interested to learn that Uncle Clive made the keyboard beep a system variable so that it could be altered to suit individual taste and application. I dislike a protracted beep because I find it irritating and because it slows program entry. On the other hand POKE 23609, 50 provides adequate keyboard beep without loss of speed.

Simon Hothersall, Fulwood, Lancashire.

Program fade-out

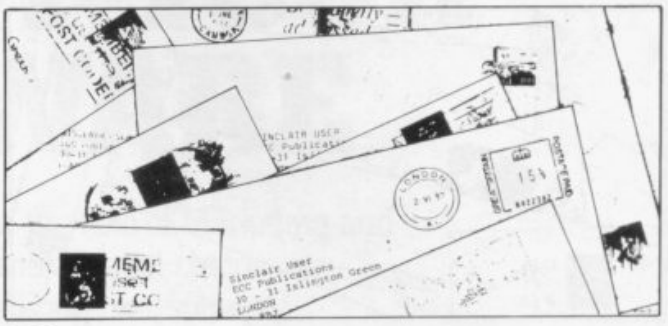
HOW ABOUT treating your dot matrix printer to a new ribbon before producing copy for printing? Even the ZX-81 syntax checker sometimes cannot tell the difference between "equals"(=) and "minus" (−).

Edward Heron, London, SW4.

I AM writing about a query and that is this ~ what is it? How do you print it?

Richard Kellett, Hastings, East Sussex.

● *The little sign is the way the cursor key is represented by our new printer and should be ignored. We are attempting to ensure that it does not appear again in listings.*



Spectrums still annoy

MANY PEOPLE are saying that Sinclair's troubles are all in the past. I beg to differ. Since mid-December I have had four Spectrums and I am praying that this one does not go wrong; if it does, I shall personally want to thump Uncle C.

I think a company such as Sinclair Research should be able to produce a computer which works and does not break down when it is switched on, as did my third computer.

I respect that my predicament is probably one-in-a-million but I feel very annoyed that it happens. Why does not Clive spend some of that £130 million of personal wealth on researching why the computers do not work and why the colour does not work on some colour televisions, such as Toshiba, on which I spent more than £250.

T Laycock, Fleet, Hampshire.

Slow pain in the neck

FOR ZX-81 users without an add-on keyboard, try this to avoid computer-neck, a painful condition caused by looking at the TV each time you press a key to make sure entry has been registered.

Before entering your program, put the computer into FAST mode. That causes the video display to shake when a key is depressed and, without moving your head, the shake can be seen with the corner of your eye. When entry has been completed, switch, if you wish, to SLOW mode.

I use this method and find it very effective.

Ivor Brooks, Southend, Essex.

Pontoon's colour conversion

HERE IS an idea which will enable your readers with a 16K Spectrum to make use of the excellent game of Pontoon in the January edition. Start by typing-in the program from line 2260 to 2400, but change line 2400 to read — 2400-LOAD, then save that on tape by — SAVE "GRAPHICS" line 2260, stop the tape, and leave it there. Clear the computer and type-in the main program, lines 10 to 2250. Add two lines to this, lines 2260 and 2270, as follows:

2260 RETURN — and — 2270 RUN.

Then save this on the tape immediately after the graphics by SAVE "PONTOON" line 2270.

The whole program can then be run on the 16K Spectrum by LOAD and will auto-run. This will enable readers with a 16K Spectrum to make use of this superb 48K game.

K Kiteley, West Kingsdown, Kent.

Vocabulary growth

MY FIVE-YEAR-OLD, computer-crazy son made the following contribution to computer language — "computiful", meaning someone completely at one with his computer.

D B Forrest, Leyland, Lancs.

WE'VE PICKED THE BEST, FORGET THE REST! SPECTRUM/ZX81

SOFTWARE SUPERMARKET

All we do at Software Supermarket is play every Spectrum/ZX81 program we can find, pick out the very best and offer only those to our customers - in our ads and our catalogues.

From over 30 countries you write, praising our free selection service (it's impartial, too: we produce no programs ourselves). You say we save you plenty - in postage and mistakes.

And we're quick. *We usually send your order out on the same day we get it.* Faulty tapes, if any, replaced at once.

OUR NEW CATALOGUE IS OUT NOW. Here's a few - the best of the new, the all-time greats. Free catalogue with every order. You've got a great computer: we've got the great programs.

Mail order only, please. If we had to run a shop, we wouldn't have time to run all the programs.

48K SPECTRUM ONLY

LET 'E.T.X.' TALK TO YOU The clearest speech we've ever heard in this *"adventure/graphic arcade game utilizing every byte of computing power in the Spectrum" (Abbex).* Enchanting graphic adventure: 16 landscapes: 1400 power zones: 4-levels: 16-page on-screen manual: up to 9 players: it's amazing what a Spectrum can do. (Abbex) £5.95

TRANSYLVANIAN TOWER *"Enthralling and addictive" (PCW). An excellent game at a reasonable price" (PCN).* Stunning 3D graphic adventure. Fight (and shoot) your way through the 500 3D rooms in Count Creepie's castle. Combines adventure and arcade games with great skill. We can't give it up! (R. Shepherd) £6.50.

KNOT IN 3D Brand new mind-boggler from the author of 'Escape' and 'Tunnel'. Absolutely brilliant. Untangle yourself - or get knotted. Avoid collisions: worry about the chasers as you roam through an apparently empty 3D space. But is it? Are you? (New Generation) £5.95

BLACK CRYSTAL *"An excellent graphics adventure" (S. User).* The massive 180K of program, 'loads' from 2 cassettes in 6 chapters. You must solve each of the 6 stages to defeat the Lords of Chaos. Real-time monster battles, 16 command keys. Instruction manual, (Carnell) £7.50

THE HOBBIT *"Takes first place for quality and value for money" (S. User) "A marvellous game...should set the standard" (ZX Comp).* Free 285 p illustrated book contains clues to help you. 30 beautiful full-screen pictures; 500 word vocabulary; 16 page instruction manual: it took 4 people 18 months to write! (Melbourne House) £14.95

PENETRATOR *"The graphics are truly impressive... definitely in the top 5" (CVG).* The most sophisticated 'SCRAMBLE' ever. Demo. Training programs. Plus amazing Customizing Mode lets you build your personal 'Scramble'. Write your own unique arcade game - without all the effort! (Melbourne House) £6.95

GREAT BRITAIN LTD *"About as complex as such a program can be...excellent value for money" (Which Micro?).* Choose your party and run the country. Watch what happens as the results come in on election night. Even plays Rule Britannia. (Hessel) £5.95

PIMANIA *"Amusing and brilliant...the graphics are excellent" (S. User).* A wonderfully witty adventure, great graphics and music and you could win the £6,000 Golden Sundial of Pi. (Automata) £10.00

ANY SPECTRUM

FROGGY The best frog there is, we reckon. This game uses so much memory, you even have to unplug your printer. Loads in 2 parts. As you get better, the game gets harder. Just great. (DJL) £5.95

ARCADIA *"Stunning graphics have no equal" (S. User). "In the top 3 arcade games" (ZX Comp).* The most aliens you've ever met. Move in 4 directions to avoid them. Choose your own keys. Incredible. (Imagine) £5.50

INVASION FORCE Stop the invasion by blowing away the bomb ship by shooting through the force field. Suicidal game option. (Artic) £4.95

MINED OUT *"It is impossible to fault...maddeningly adictive" (PCN).* Just crawl across a mine field to rescue Bill. Bonuses for speed and for damsels. Watch out for walking mines. Action replay drives you crazy. (Quicksilva) £4.95

COSMIC GUERILLA Yet another mind-bending variation on Invaders. 4 game options: 6 skill levels for each gives you 24 games in 1. Will make your wrist ache. (Crystal) £5.50

AIR TRAFFIC CONTROL If you've outgrown your flight simulator, get in charge at Heathrow. Land your planes safely. Watch out for rogues. 6 skill levels, plus demo. (Hewson) £5.95

WINGED AVENGER *"Hard to beat" (CVG). "One of the best Sinclair games so far" (PCW).* Very fast 'PHOENIX', 7 play levels, 3 attack waves, laser shield: mothership with smart bombs. A best-seller. (Work Force) £4.50

3D TUNNEL *"Superb graphics and game presentation" (CVG).* Fly down the winding 3D tunnel, shooting bats, spiders, frogs and rats. Demo mode: 3 speeds: training program for each phase. (New Generation) £5.95

3D TANX Shoot the enemy tanks from your moving 3D turret. 3 play levels: accurate ballistics: 1 or 2 players: pause: demo game: training program: even plays God Save The Queen. (DK'tronics) £4.95

FAUST'S FOLLY The first adventure we've seen that's worth playing in 16K. It's great and it's graphic! Loads in 2 parts: clear instructions: then a smashing adventure with directions, inventory, look, score, save. (Abbex) £5.95

ZX81 OWNERS

Special 16K ZX81 versions of 6 of these programs are available. Use the coupon to order. Free catalogue with every order or phone for catalogue only

BLACK CRYSTAL	**£7.50**	**WINGED AVENGER**	**£4.50**
GREAT BRITAIN LTD	**£4.95**	**FROGGY**	**£5.95**
PIMANIA	**£8.00**	**INVASION FORCE**	**£4.95**

SOFTWARE SUPERMARKET
87 HOWARD'S LANE, LONDON SW15 6NU, ENGLAND
Telephone: 01-789 8546 (24 hours: no credit cards)

To: Software Supermarket, 87 Howard's Lane, London, SW15 6NU.

If you do not want to cut this magazine, write your order out carefully on plain paper and quote this number **(SU7)**

I own a 16K Spectrum ☐ 48K Spectrum ☐ 16K ZX81 ☐ (please tick).

I enclose my Cheque/PO for £.....payable to Software Supermarket.

Please use block capitals. If we can't read it, you won't get it.

Name .....

Address .....

.....

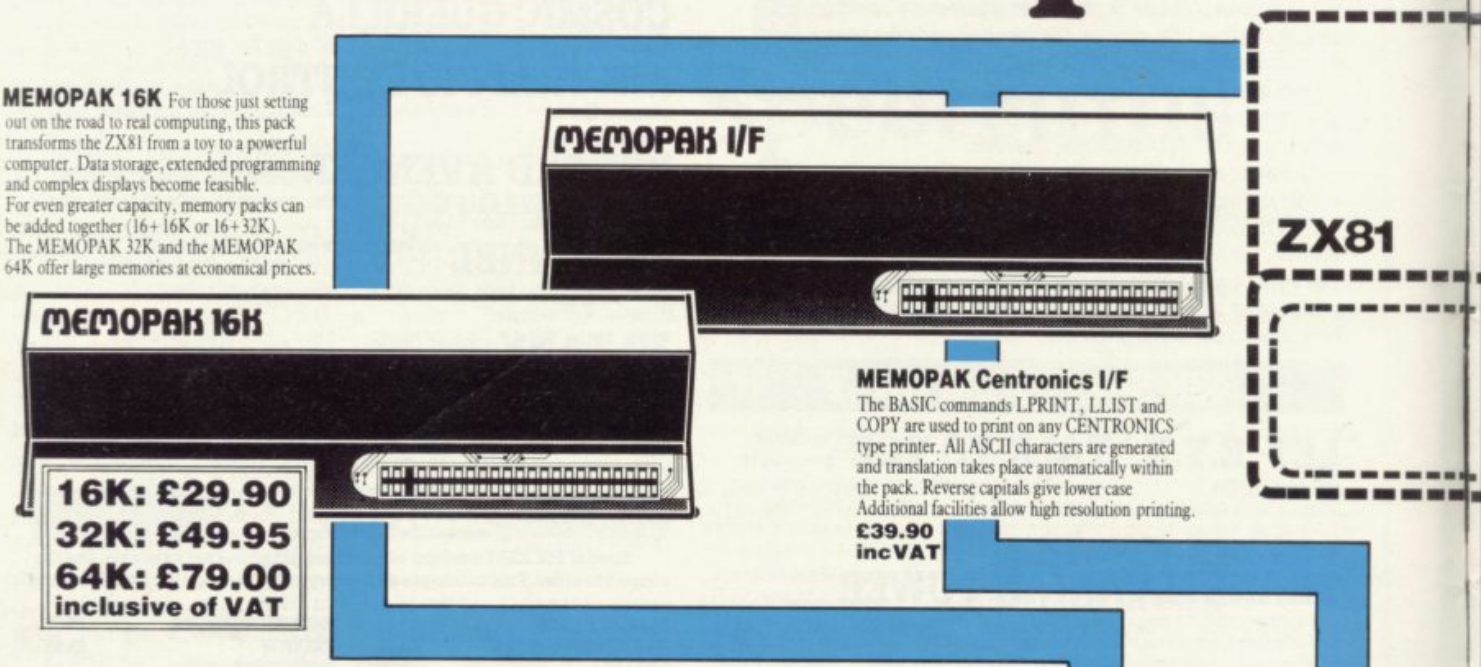
.....Postcode .....

Phone, if any, in case we have a query .....

Program Name	Computer	Price
		£
		£
		£
		£
		£
		£
POSTAGE AND PACKING	U.K. Add 55p only per order	£0.55p
	EUROPE. Add 55p for each program	£
	OUTSIDE EUROPE. Add £1 for each - program airmail.	£
	TOTAL	£

At Mem
we realise the poten

MEMOPAK 16K For those just setting out on the road to real computing, this pack transforms the ZX81 from a toy to a powerful computer. Data storage, extended programming and complex displays become feasible.
For even greater capacity, memory packs can be added together (16+16K or 16+32K). The MEMOPAK 32K and the MEMOPAK 64K offer large memories at economical prices.



MEMOPAK Centronics I/F
The BASIC commands LPRINT, LLIST and COPY are used to print on any CENTRONICS type printer. All ASCII characters are generated and translation takes place automatically within the pack. Reverse capitals give lower case Additional facilities allow high resolution printing.
£39.90 incVAT

It all adds up to an efficient, modular computer system

The **Memotech** approach to microcomputing is to take the well-proven and popular ZX81 as the heart of a modular system. This small computer houses the powerful Z80A processing unit and acts as the central processor module through which the **Memopaks** operate.

Memotech has a reputation for professional quality, producing units which are designed to fit perfectly, to look well-balanced, and to work efficiently and reliably.

The modular approach gives ZX81 owners the freedom to design the system they really need. Furthermore, the intercompatibility of the modules ensures that later additions will click straight in, to give you a system that grows with your ambitions and abilities.

To ensure that your expectations are realised, care is taken at every stage to design features into the system to anticipate your needs. For example:
1) Memories are cumulative e.g. 16K and 32K can be added to the **Memopak 16K** or even to the Sinclair 16K RAM pack. 2) The **HRG** firmware allows commonly used constructions (such as scrolling, shading and labelling graphs), to be called by a few simple commands. 3) The **Centronics I/F** converts ZX81 character codes into ASCII and extends the print line to the width of the printer, still using the LLIST, LPRINT and COPY commands.

As one example, a system with 16K of memory and **Memocalc** is all that is required to perform the same sophisticated numerical projections as a computer at 10 times the price. The problem may be as complicated as a cash flow or production schedule, or as simple as household accounts or pocket money budgeting. If your bank manager wants to see a cash flow, then a single print instruction to the **Centronics I/F** will give a printout which is more than acceptable.

The example system which is shown, on the other hand, would satisfy the needs of someone who wanted to enter data

How it all fits together

You can see from the diagrams how various Memotech/Sinclair units can be combined.

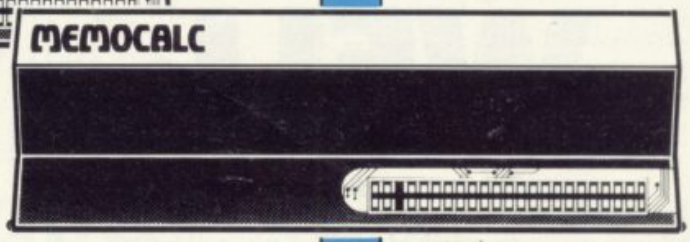
otech,
tial of your ZX81...

MEMOPAK HRG This pack breaks down the constraints imposed by operating at the ZX81 character level and allows high definition displays to be generated. All 248 × 192 individual pixels can be controlled using simple commands, and the built in software enables the user to work interactively at the dot, line, character, block and page levels. Scrolling, flashing and animation are all here.

£39.90 inc VAT

MEMOCALC The screen display behaves as a 'window' on a large sheet of paper on which a table of numbers is laid out. The maximum size of the table is determined by the memory capacity, and with a MEMOPAK 64K a table of up to 7000 numbers with up to 250 rows or 99 columns can be specified. Each location in the table can be either a number which is keyed in or a formula which generates a number.

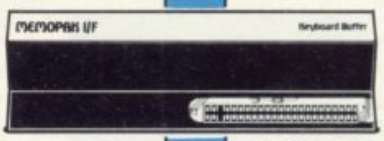
£29.90 inc VAT



MEMOTECH KEYBOARD

The Memotech plug-in Keyboard plus buffer pack takes the effort out of data entry for ZX81 users. The Keyboard has a light professional touch and is housed in an elegant aluminium case. The simple plug-in system means that you are not obliged to open up your ZX81, use a soldering iron or invalidate your ZX81 warranty.

£49.95 inc VAT



KEYBOARD BUFFER PAK
The Buffer Pak performs a "housekeeping" function for the Keyboard, interfacing directly with the port at the back of your ZX81.

via a light-touch keyboard, construct and label graphs, and then copy the screen to an 80-column printer. Only 16K of memory is shown here but with additional memory, more than one video page can be stored. Up to 7 pages can be displayed in rapid succession to give animated displays.

Looking forward, **Memotech** will continue to back the ZX81 through 1983 with fast storage devices, pressure sensitive electronic drawing boards and more software packs including a **Wordprocessor,** an **RS232 Interface** and a **Z80 Assembler.**

Memotech products are available from major branches of **W.H. Smith & John Menzies**

To: Memotech Limited, Witney, Oxon, OX8 6BX
Tel: Witney 2977, Telex 83372 Memtec G
Please send me the following Memotech products:

Please add £2.00 per item to cover post and packing

I enclose a cheque/P.O. for _____
or please debit my Access/Barclaycard account number

Signature _____ Date _____

Name and Address _____

OIL WELL THAT ENDS WELL

Dallas. The task of oil exploration and exploitation in Texas is no game. You'll have to decide how much you'll sell the stuff for – where to find it – how to get to it and where to pump it.
That's just for starters.
Can you take over the Euing Empire or will you be taken over in the attempt?
We've warned you – but then we think you're just about ready for it.

Other titles in the range include Airline, Autochef, Print Shop and Farmer.
Prices: ZX81 and Spectrum 16K £5
Spectrum 48K £6
Available from W.H. Smith and all good computer shops or Dept. S6
Cases Computer Simulations
14 Langton Way London SE3 7TL

Strategic Games. They're no pushover.

ZX SPECTRUM ZX SPECTRUM ZX SPECTRUM

CENTRONICS printer/RS232 serial INTERFACE

2 INTERFACES IN 1

To complement the 'best computer in the World' we have developed a superb interface. A CENTRONICS parallel *AND* a bi-directional RS232 interface in the same box.
Professional applications are now in easy reach.

Line length limited only by printer
Uses standard PRINT/LPRINT/LIST/LLIST statements
High resolution graphics with EPSON and NEC printer
Will print anything from the screen in graphics mode
Compatible with SINCLAIR printer and most other add-ons
Easy to use. Supplied with demonstration software on cassette
Uses standard printer cable available as an extra
Handshaking provided for both ports
Full bi-directional RS232 link
Software selectable BAUD rates
50/110/150/300/600/1200/2400 BAUD
Fully assembled, boxed and tested

This interface uses the built-in operating system to simplify use giving a highly professional performance that will enable the SPECTRUM to be used for real applications, e.g., Word-processing, computer aided design, process control, intelligent V.D.U., etc, etc.

ZX-81 ZX-81 ZX-81 ZX-81

CENTRONICS printer/RS232 INTERFACE

Easy to use
Line length limited only by printer
Uses inverse characters for lower case
Compatible with SINCLAIR printer, RAM packs etc.
Control codes can be sent to use your printer to the full
Firmware in ROM so LLIST and LPRINT functions always available
Will drive any printer with standard interface from your ZX-81
CENTRONICS and RS232 ports may be used to drive two devices together
Most popular BAUD rates available selectable by link
110/150/300/600/1200/2400/9600 BAUD
Handshaking provided for both ports
Fully assembled, boxed and tested with instructions manual

Word-processing and graphics software available soon.
S.A.E. for details.

CHEQUE / PO
Price £29.95 (+£4.50 VAT+£1.50 p&p. TOTAL: £35.95)

Please allow 10 working days for delivery

MOREX PERIPHERALS LTD
(Mail order only)

Dept. SU, 2 Balliol Road, Caversham, READING, Berkshire.
Tel: (0734) 478854. Telex: 849911 MOREXG

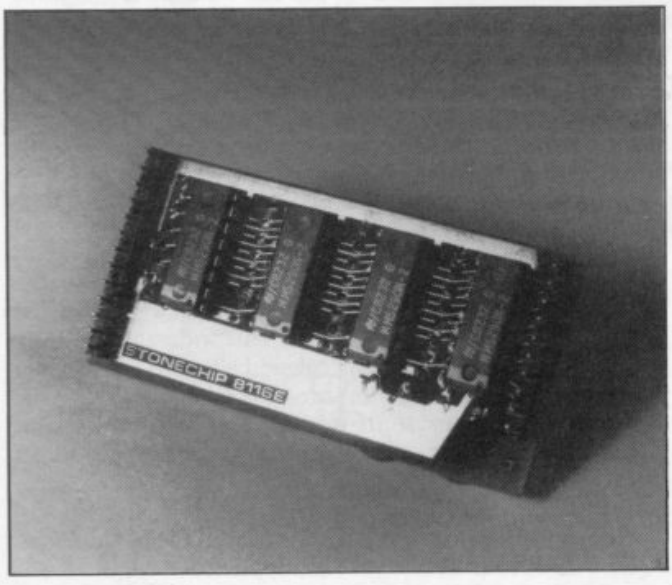
Thumping good memory expansion

THE ZX PANDA is a 16K expandable RAM pack from Stonechip Electronics. The black plastic case is designed to wrap neatly round the back of the ZX-81 and thus not to wobble. The edge connector is also different in that it is tin-plated like the edge connector on the ZX-81 to stop dirt build-up due to dissimilar metals.

Most RAM packs use a high-quality gold connector and that can cause a battery-type effect on the contacts, which causes oxide to be formed on the edge connector.

The RAM pack worked first time under test and exhaustive thumping of the keyboard — far in excess of normal use — could not budge it. A red miniature LED on the top of the case also indicates that power is reaching the RAM pack. There is no extension PCB at the back but an expansion board containing another 16K can be added inside the plastic case. That brings the total RAM to 32K.

To attach the extra RAM the case can be pulled apart — there are no screws — and the expansion board plugged-in. Care must be taken plugging-in the board as the sockets used are strip ones which have to be lined-up underneath the pins. The board is designed, however, so that it can go only in the correct way. The ZX Panda can be obtained from Stonechip Electronics, Unit 9, The Brook Industrial Trading Estate, Dead Brook Lane, Aldershot, Hampshire. Tel: 0252-318260. The cost is £19.95 and the 16K expansion module is £14.50. Both are available from Fox Electronics and other shops as well as Stonechip.



Buttons for keyboard

KEYBOARD BUTTONS is an idea from Ian Samways and consists of clear acrylic discs ⅜in. in diameter which stick to your ZX-80 or ZX-81 keyboard. The buttons allow you to "feel" where the centre of the key is while looking at the TV.

They have a piece of paper stuck to the back which, when you have cleaned the keyboard with methylated spirit or something to remove the grease, can be removed and stuck in the centre of the key. Being clear, it does not obscure the markings on the keyboard.

Easy to use and simple to apply, this should be popular for most ZX users at a price of £1.95 for a packet of 40. Schools which use ZX-81s could benefit with a few spares as they are sure to be easier to use. Contact Ian Samways at 20 Erica Drive, Corfe Mullen, Wimborne, Dorset BH21 3TQ.

Stopping wobbles cheaply

AUDIO COMPUTERS can supply the same anti-wobble device as fitted to its 16K RAM packs. It consists of a plastic shape which is fitted over the edge connector. When the RAM pack is inserted into the back of the ZX-81, two tongues are forced between the edge connector and the case. Two other plastic feet slip underneath the RAM pack.

The cost of the anti-wobble device is 50 pence and at first it looks good value but tried on the 16K Sinclair and other RAM packs it has been discovered that using the keyboard vigorously makes the

continued on page 24

continued from page 23

RAM pack 'wiggle' its way out of the expansion port and fall off. That is disadvantageous both to computer and RAM pack.

On its own RAM packs it also has two double-sided sticky pads stuck above the edge connector to hold the RAM pack on to the ZX-81. Tried with the ZX-81 without the anti-wobbler, the problem was solved, so be advised that a pack of sticky fixers will work wonders; they cost about the same as the device but they fix 20 ZX-81s. Audio Computers is at 87 Bournemouth Park Road, Southend-on-Sea, Essex, SS5 2JJ. Tel: 0702-613081.

Plug-in cushion

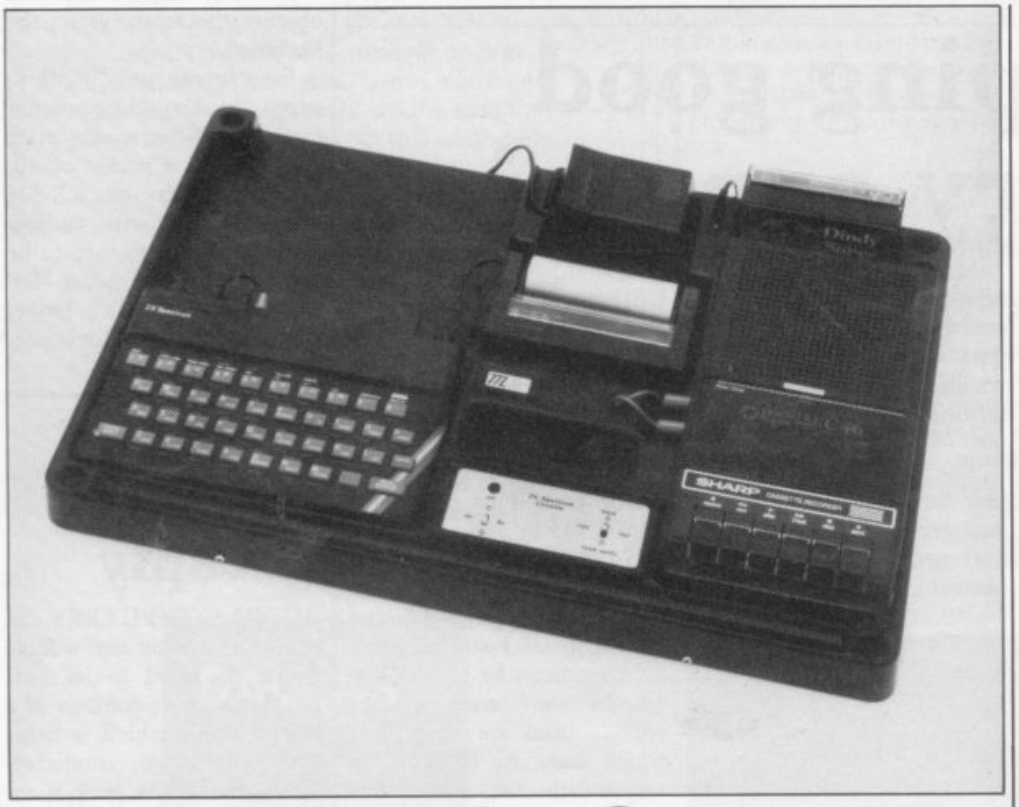
THE PLUG-IN mains plug with a difference contains an interference filter as well. The plug is in white plastic and is about 4½in. high and 2in. wide. The fuse in the plug is rated at 3.15 amps and is of the small glass type usually found in radios and TVs, about 1in. long. That should not be replaced with a fuse of a high rating as it would damage the filter inside the plug.

The filter is made up of a ferrite ring wound with two coils, one in the live lead, the other in the neutral. Earth connection is provided but not usually used on Sinclair and other computer game power supplies. The filter is encased in a plastic block and has an additional transient suppressor capacitor to stop high voltages reaching the power pack.

The connection to the computer is via a screw-down terminal block at the bottom of the plug and should be easier to use than a normal plug.

The plug will protect a computer against high voltages due to motors and other equipment being switched on near them. It will also filter-out any radio interference generated by refrigerators and TVs coming through the mains. It should be ideal for those experiencing unexplained white-outs due to mains interference but not voltage drops and can easily be transferred to another computer when you upgrade at a later date.

The plug is available from Power International Ltd, 2A Isambard Brunel Road, Portsmouth PO1 2DU, Tel: 0705-756715 at £15.50 inclusive. Also offered is an advice service for users still having problems.



Consoling the Spectrum

TRAFFIC TECHNOLOGY has updated its desk Console range to include the Spectrum. To keep a desk tidy it is ideal as it will take a tape recorder, two cassettes, printer, power pack, Spectrum and Microdrive RS232 for which we are all waiting.

The console also has a switch panel on the front to allow you to change the cassette leads from LOAD to SAVE, plus an on/off switch for the 9V power supply to act as a re-set switch. The case is made from tough ABS plastic and is 555mm. wide by 370mm. deep and 50mm. high. The bottom of the case is held together by four screws for easy maintenance.

Optional extras are stacking pillars for more than one unit, and dust covers. The cost of the Console is £42.18 including post and VAT in the U.K. People outside the U.K. should allow for a package of 1.5kg. Traffic Technology Ltd, PO Box 2, Warminster, Wiltshire BA12 7QX. Tel: 037388-316.

Printing in colour

SOFTEST has produced an interface to allow you to use the Tandy four-colour printer plotter. Although the Tandy has RS232 and Centronics inputs, an interface box and software are required to use the printer. Softest provides them in a package costing £35.

The printer can be used to LIST programs from the Spectrum using a machine code routine and the three-part program also allows you to draw graphs and print characters in a 40- or 80-column width. Plain paper is used 4in. wide and the four-colour ballpoints in the unit are black, red, blue and green. The paper can also be moved up and down under software control. For more details contact Softest, 10 Richmond Lane, Romsey, Hampshire.

The Cheapest Rampacks In The World

Available Now

ZX SPECTRUM 32K RAMPACK

Simply plugs into user port at rear of computer and increases your 16K Computer instantly to 48K **£39.95**

- Fully Compatible with all accessories.
- No need to open computer and invalidate guarantee.
- Why send your computer away and wait weeks for upgrade.
- Fully cased, tested and guaranteed.

ZX81 16K RAMPACK _____ **£19.75**

ZX81 64K RAMPACK _____ **£44.75**

JUPITER ACE 16K RAMPACK ___ **£24.95**

All Units: Fully Cased and Guaranteed. Secure No Wobble Design.
Fully Compatible with all accessories.

ZX SPECTRUM HOLDALL To protect your computer from dust, dirt and grime. During storage and transport. **£7.99**

PRICES INCLUDE VAT and P&P. *Delivery normally 14 days.*
Export orders at no extra cost.

Send cheque/P.O. Payable to:–

CHEETAH

MARKETING LTD
359 THE STRAND
LONDON WC2R 0HS
Tel: 01-240 7939
Telex: 8954958

Professional Software for ZX81 and Spectrum

SPECTRUM 48K

■ **Payroll:** Weekly, monthly, hourly. All tax codes, and pay levels. Guaranteed correct. £25.00 ■ **Statutory Sick Pay:** Better than programs costing 10 times as much on other machines. £40.25 ■ **Stock Control:** Over 1500 lines. Find, add, delete, in 2 seconds! Sinclair or full-width plain paper printer (with interface) supported. £25.00 ■ **Spectrum Demo Tape:** Demonstration versions of payroll, stock control, SSP. On one tape. £3.95 ■ **Critical Path Analysis:** Enter network of over 500 activities. Program finds critical path. Durations and costs can be modified, and the calculation repeated. Full-width printer supported. £15.00

SPECTRUM 16K (usable on 48K)

■ **Mortgage:** See how repayment amount affects duration and total amount paid. While paying: see how much interest and how much capital you are paying. Month-by-month table printed. On the same tape – ■ **Loan:** Calculates true interest when paying instalments etc. £8.00 (both programs together)

Parallel Printer Interface:

Allows you to use a full-width plain paper printer with your 16K or 48K Spectrum! Has too many features to list here! COMPLETE with cable, connectors, and supporting software – nothing else to buy! £45.00. A runaway best-seller – so please contact us about delivery. ■ **Printers:** We can help you to choose the best printer for YOU and get it to you fast at a sensible price. FREE on request with orders for printer or interface: simple word processing program for Spectrum!

Tape Loading Problems With Your Computer?

■ **The Microcomputer User's Book of Tape Recording:** Is a practical guide to help you get programs in and out of your computer. Written for the computer user – but several audio and computer professionals have found it useful! ISBN 0 946476 00 4. ONLY £3.15 incl. postage (£2.90 in shops) ■ **Test and Alignment Cassette:** Tape loading problems are often due to a mis-aligned tape head. Align your tape head by ear with our tape – no instruments required! £4.90 ■ **Loading Aid:** Allows you to get tape playback level right first-time. Helps with dropouts and to ease tape quality too! Standard model £5.95, De luxe model £7.95

ZX81 16K

■ **Beamscan:** Computers bending moment and shear force diagrams for a simply supported beam with 1-99 point, uniform and uniformly tapered loads. £25.00 ■ **Time Ledger:** For up to 17 employees, 200 clients. £15.00 ■ **Optimax:** A powerful linear optimisation program up to 75 variables <,=>, constraints. £40.00 ■ **Payroll:** As above but only up to 30 employees. £25.00 ■ **Stock Control:** As above but 400 stock lines in 16K or 2000 lines in 64K. £25.00 ■ **Critical Path Analysis:** Up to 500 activities in 16K. Over 500 activities in 48K. £15.00 ■ **Budget:** Keeps track of expenses and compares with budget. 50 headings plus 12 months or 12 categories. £15.00 ■ **Financial Pack:** Contains three programs: Mortgage, Loan and VAT £8.00

All items are post free and include VAT. Programs are supplied with comprehensive manuals.

Remember – We at Hilderbay pride ourselves in the development of high quality professional software that is fully functional and with full support. Not fancy packaging, fancy prices or fancy names.

COMING SOON

■ **Word Processing Package** will allow the use of a daisywheel typewriter, linked to Spectrum, as keyboard and printer.

Contact us now for further information on these products and our full range of Apple II and CP/M Software.

TRADE ENQUIRIES WELCOME ON ALL PRODUCTS

Hilderbay

Professional Software

Hilderbay Ltd Dept. 8-10 Parkway
Regents Park London NW1 7AA
Telephone: 01-485 1059 Telex: 22870

SPECTRUM 48K : ZX81 16K SIX PART ADVENTURE

BLACK CRYSTAL

THE QUEST IS ABOUT TO BEGIN

The ultimate role-playing adventure for the SPECTRUM/ZX-81. You can become a warrior, elf or wizard on a quest to find and use the rings of creation: to destroy the Black Crystal and defeat the Lords of Chaos. Held within six programs lies a land of fabulous treasures and mythical monsters. Journey through the land of Beroth, explore the castle of shadows, descend into the Shaggoths lair, search for diamonds in the sea of sand but beware of sand sharks! Confront the fire demon in his temple, battle against the Lords of Chaos and win your way to the Black Crystal.

By splitting Black Crystal into six programs we can provide more variety and detail than any other adventure for the Sinclair computers.

Real time monster battles. Superb graphics. Save game feature. All six parts are supplied together on cassette, boxed with instruction booklet.

SPECTRUM 48K: 180K OF PROGRAM IN SIX PARTS – ONLY £7.50
ZX81 16K: OVER 100K OF PROGRAM IN SEVEN PARTS – ONLY £7.50
WHY PAY MORE FOR LESS OF AN ADVENTURE

To: **CARNELL SOFTWARE, DEPT 2, 4 STAUNTON RD, SLOUGH. SL2 1NT.**
Please send me: Black Crystal for my,

Spectrum 48K..... £7.50
ZX8 16K..... £7.50

I enclose a cheque/postal order (payable to Carnell Software) for £

NAME.....

ADDRESS.....

.....

TRADE ENQUIRIES WELCOME

Processing the MiCROL way

MiCROL is now moving its attention from the Spectrum to the 16K ZX-81. The company has released a word processor and VisiCalc emulator on one tape. Both programs have been built around existing software which has already been market-tested for the ZX-81.

The word processor was originally called ZTEXT. The program allows full editing facilities and the cursor can be moved up, down and across the text to alter mistakes in type-script. You can also move around the text file with specific commands to transfer you to the beginning or end.

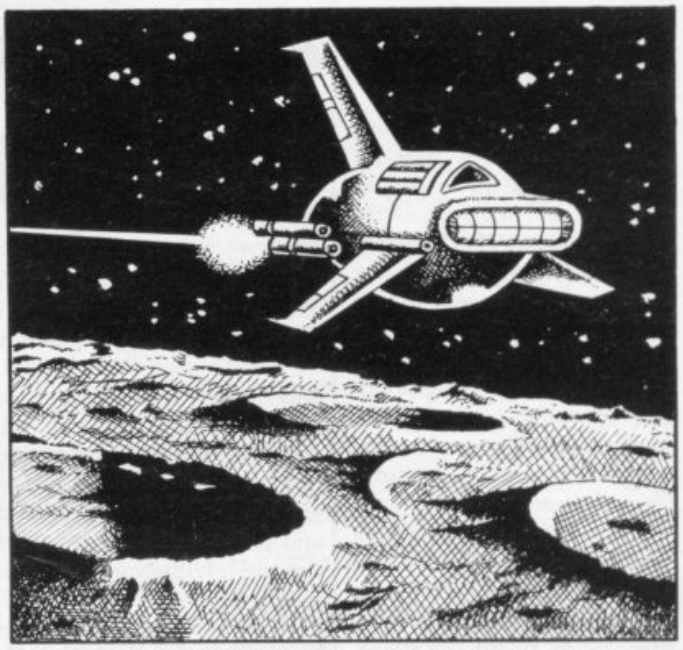
The processor will search for and replace strings specified by you — for instance, if you want to change the tense of a piece of text.

Incorporated into the word processor is a formatter/printer routine. With a Centronics interface on the ZX-81 it would then be possible to print text in upper- and lower-case.

A spreadsheet program is also being provided on the same tape as the word processor. It works in much the same way as the Sinclair VuCalc and consists of a matrix of squares in which numbers and formulae can be entered and processed.

The package provides the same kind of cover that MiCROL is providing for the Spectrum. Both programs are of a good quality and as they are being offered together, they are good value.

The cassette is accompanied by full documentation and is available at the usual MiCROL rate of £9.95 from MiCROL, Freepost, 38 Burleigh Street, Cambridge CB1 1BR.



Trading with Crystal

YOU CAN now take part in the re-building of the economy of the planet Venus and make money on the side.

Your adventures on Venus are all part of a new graphics game for the 16K ZX-81 called **The Merchant of Venus.** A corporation on Venus has employed you to make its investment programme profitable. You must decide where you will invest the money given to you under your contract and, if you fail, from where you will get that pound of flesh.

You make all your decisions from your Hi-liner freighter while flying around the planet. You must use your judgment to decide which spacecraft you want. You can deal in machinery, robots or fuel; it does not matter so long as you make a profit.

Crystal Computing should make a profit with this complex action-graphics game.

Crystal also provides a series of 1K games on cassette. They include a version of asteroids which takes some beating, a ski-run slalom game, a dungeons and dragons adventure and the inevitable but excellent space invaders.

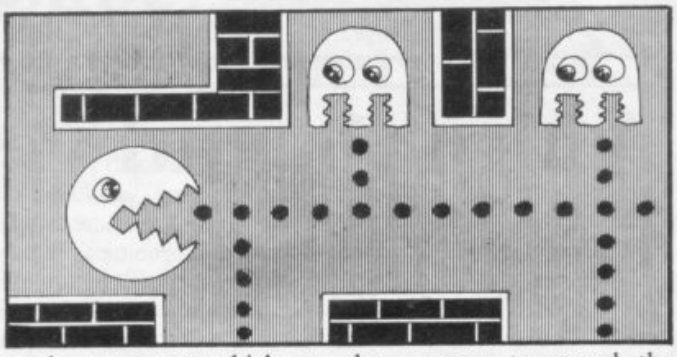
The standard of programming is technically excellent to put the games into 1K and the games are fast and addictive.

The Merchant of Venus is available from Crystal Computing, 2 Ashton Way, East Herrington, Sunderland SR3 3RX. It costs £5.95. The ZX-81 1K Games pack is priced at £4.95.

Getting the Munchees

A MUNCHEE is a Pacman-like creature which wanders around a maze in the new Quicksilva game, **Munchees,** for the 16K ZX-81. The game is slightly different from the usual Pacman mould because you can choose with how many ghosts you want to play. The number of ghosts does not matter much, as they are not very intelligent. Unless you are only two centimetres away from a ghost it does not want to know about you and in some cases it does not seem to know you exist.

The keyboard layout is difficult, as only three of the cursor keys are used and the keys are grouped into UP and DOWN and LEFT and RIGHT. Once you are used to that, however, the game is very addictive.



The graphics of Munchees equal some games which are available commercially for the Spectrum. It is, on the whole, the best Pacman-type game we have seen for the 16K ZX-81.

Quicksilva also has a good version of the popular arcade game **Galaxians.** The game is fast — perhaps too fast — and it is almost impossible to stay alive very long.

High scores reaching the thousands are possible and a high score table is included in the program to record the names of those who are most adept at the game.

Also included on the Galaxians tape is another maze game, **Gloops.** Two games on the one cassette is good value for money. Both are for the 16K ZX-81.

Munchees and Galaxians are available from Quicksilva, Department SU, 92 Northam Road, Southampton SO2 0PB. Galaxians costs £4.95 and Munchees £3.95.

More ZX-81 Software

Astral obstacle course

THE MASSIVE asteroid chunks spinning across the screen are only some of the obstacles you will meet in your efforts to conquer **ZX Asteroids** from MikroGen. The asteroids, large hulking crustations, are supplemented by UFOs and space mines which appear often.

The keyboard layout is slightly disconcerting. You use the '7' key to start each round, '2' to rotate anti-clockwise, '4' to rotate clockwise, '8' to thrust your ship forward and the usual '0' to fire. Those keys are not easy to remember during the game and when the pressure is on a game could be lost if you have to fumble for the clockwise key and confuse it with another key.

The game starts when you enter your level of difficulty, measured by the speed at which objects move around the screen. There are 10 levels of difficulty, marked by the keys from '0' to '1', where '0' is slow and '1' is very fast.

ZX-81 owners should beware because once bought and played, you will never be able to put it down. ZX Asteroids is produced by MikroGen, 24 Agar Crescent, Bracknell, Berkshire. It costs £3.95.

Go on safari and beat the evil Bongo

IF YOU WANT a quiet day at the zoo, we advise you not to visit **Dr Bongo's Safari Park.** The park is a base for the evil doctor's missiles. Any player brave enough to enter this adventure, for the 16K Spectrum, accepts the task of finding the island base at the centre of safari-land and the missiles which could destroy civilisation as computers know it.

One thing we noticed during our wander through the park was that very few of the dangerous animals attacked us. We were, however, stung by a swarm of bees for stealing honey.

Some simple commands are not understood by the adventure. For instance, you must use 'e' for east and 'n' for north. That is the same for most of the direction keys.

The game is ideal for someone who enjoys trying to discover which words will work and which will not during an adventure. Others may be disenchanted by it.

We found the game frustrating — we seemed to be getting nowhere fast. The concept is good and the plot is unusual but it would have been better to present the player with some easy tests at the beginning and grade them upwards as the game progresses.

The game is rather slow and the reason seems to be that it is written in Basic, although slowness should not worry the player as it gives a certain amount of time for thought.

Apart from those criticisms, Dr Bongo's Safari Park is certainly recommended as an adventure game and its complexity should keep players happy for hours.

It can be obtained from Custom Software, 44 Aireview Terrace, Skipton, North Yorkshire. It costs £4.95.

Animals and vegetables

MUNCHER, Slippery Sid and the Cyber Rats are all arcade creatures from three new games for the 16K Spectrum. The games are from Silversoft, no stranger to the Sinclair arcade scene.

Cyber Rats is the most impressive of the three. The game is a little like Centipede but instead of one long worm there are dozens of metal rats moving down the screen towards your laser base. The hopping spiders of the centipede game are replaced by deadly purple rats which appear from nowhere.

The second is **Slippery Sid.** You must drive your snake around the screen, eating the mushrooms as you go but not hitting the stones. You must also beware of poisonous toadstools which cannot be eaten unless you have first devoured a mushroom.

When you have cleared one screenful another screenful appears with more obstacles between Sid and the mushrooms.

The final new release is **Muncher,** which is almost a standard Pacman game. There are a few subtle differences between it and the traditional game. The Pacman is a skull and the ghosts are slimmer than normal. The centre of the maze is no longer the home of the ghosts — it houses a prize cherry. During the game two doors will slide open, giving Muncher access to the prize.

All three games are excellent but there are a few errors in the documentation accompanying them. In Cyber Rats the location of the fire button, the space key, is not disclosed and in Muncher the down key should be 'N' and not 'M'.

Each of the games costs £5.95 and they are available from Silversoft, London House, 271–273 King Street, London W6.

Besieging the Basic Embassy

HOW ANYONE seriously could market a game like the ICL **Embassy Siege** we may never know. The program is arguably the worst piece of software around for the 16K Spectrum. The player has to enter a three-dimensional representation of the embassy of a foreign power, search for the code room and escape with the codes.

The program is annoying because you have to wait up to three minutes for the maze to be defined. You also have to wait a long time for each 3D position to be drawn on the screen after you have made your move.

The reason for those problems is that most of the program is written in Basic and, as a result, everything is slowed. It almost makes one enquire whether ICL has discovered machine code.

Another side-effect of using Basic is that the clock against which you have to play stops when an operation is being performed by the computer. When you have your finger on the buttons to make a move the time stops ticking away. We managed to enter the code room and finish the game in two seconds.

It is a pity that Sinclair Research had to associate its name with such a program. Embassy Siege can be obtained from Sinclair Research, Freepost, Camberley, Surrey, GU15 3BR. The program costs £4.95.

Useful tool from Zeus

ZEUS was father to the gods and the new Zeus assembler for the 48K Spectrum is the big daddy of all assembler programs. It is very simple to use for the beginner but for someone who has even a basic knowledge of the subject the program can be a powerful machine code tool.

The lines of assembly code are given line numbers so that it is possible to enter new lines or to alter old ones. There is an auto-line number routine in the program, which will prevent the user having to put in line numbers, and a re-number routine which will re-number the whole program or only part of it.

If errors occur during the assembly process the computer will list the errors with the line on which they occur. If there are no errors you can save the machine code and run it using a one-letter command "X".

Crystal Computing, the manufacturer of Zeus, also produces a monitor and disassembler for the Spectrum. As well as doing a full disassembly, the program will display the current state of the registers and alter them if necessary. It will also substitute lines of code and move around blocks of memory.

The Zeus assembler and the monitor and disassembler have been sadly neglected in the past. Both packages can be used together and form a very powerful tool. Zeus costs £8.95 and the disassembler and monitor cost £8.95. Both packages can be obtained from Crystal Computing, 2 Ashton Way, East Herrington, Sunderland SR3 3RX.

Simply wonderful

SIMPLE GAMES are often the best and most addictive to play. That is the case with **Hot Foot** and **Crevasse** for the 16K Spectrum from Microsphere. Both are sold on the same cassette.

We found Crevasse to be the most addictive. The player must manoeuvre a buggy across the ice to the other side of the screen. The buggy is easy to move and smoothness of movement is an interesting part of the game. That may seem very easy until the ice starts to shift under you and cracks begin to appear. It will take all your skill and cunning to move the buggy around the continually-changing gaps without falling over the edge. Some cracks may close just when you want them to do so, but others will appear. Who knows, they may even start under your buggy.

The second game is more complex. You are a rabbit and you have to find the carrots which are strewn around the fields. When you have collected all you need to eat you must return to your burrow.

There is, however, danger in those fields and the fatter you become through eating carrots the bigger target you make for your enemies.

Both games are enjoyable and are suitable for young children, although we are sure adults will be intrigued.

The cassette is available from Microsphere Computer Services Ltd, 72 Rosebery Road, London N10 2LA and costs £4.95.

Illustrations by Stuart Briers

Superior games with Superchess

IF YOU want a chess program for the 48K Spectrum, **Superchess Two,** from CP Software, is one to choose. Apart from its quality, the program offers an amazing range of options.

To view the options available all you have to do is to type 'help' and the commands page is displayed. They include recommended move, change of playing level, resignation, self-play and even a technical information page about how the program works. It is also possible to set up a board and let the computer analyse the positions of the pieces.

The self-play mode will continue a game in which the computer will play itself. One move is made at a time and the next move is not made until the user presses 'enter' as a prompt. The computer will ignore any other instructions you try to give it in that mode.

The amount of time and quality of play from the program is governed by the level number. There are seven levels, numbered from zero to six. At level zero the computer gives its answering move almost immediately but when playing at level two the time taken between moves lengthens considerably.

The Superchess Two program costs £7.95. It is available from CP Software, 17 Orchard Lane, Prestwood, Great Missenden, Bucks HP16 0NN.

GAMES FOR 16K SPECTRUM

SUPERPLAY-1 £5
by William Smith

Five different games, some of them entirely original, which should appeal to fourteen year olds of all ages!

Using a combination of BASIC and machine code – for extra zip this cassette contains the following:-

KONGO Move your man along girders and up ladders to reach the terrible kongo. Avoid the deadly patches of red jelly and watch out for kongo's patrolling warriors.

ROBOT RESCUE Guide your ship through a meteor storm to reach the landing pad and bring the stranded astronaut back to the mother ship.

HIGHWAY RUNNER Get your family of frogs safely across the M1.

BIG GAME HUNTER Shoot the advancing hordes of wild lions and rhinos.

UFO Protect your planet from the aliens with their deadly torpedoes. Be sure you don't exhaust your supply of lasers.

ALL FIVE GAMES FOR £5.

All games feature high score and on-screen score total.

SOLO-WHIST £5
by J.A. Yates

This is an excellent simulation of the well known card game and makes a fascinating change from the usual arcade type computer game.

The computer deals the cards and you play your hand against three opponents who are controlled by the computer.

A running total of tricks won is kept on the screen and you have to use considerable skill to beat the computer.

The graphics are of a high standard and you will soon forget that you are using a computer and you will become absorbed in the battle of wits with your three hard bitten opponents.

VIDEO
SOFTWARE LIMITED
STONE LANE, KINVER, STOURBRIDGE
WEST MIDLANDS DY7 6EQ, ENGLAND
TEL: KINVER 2462 STD 038 483 2462

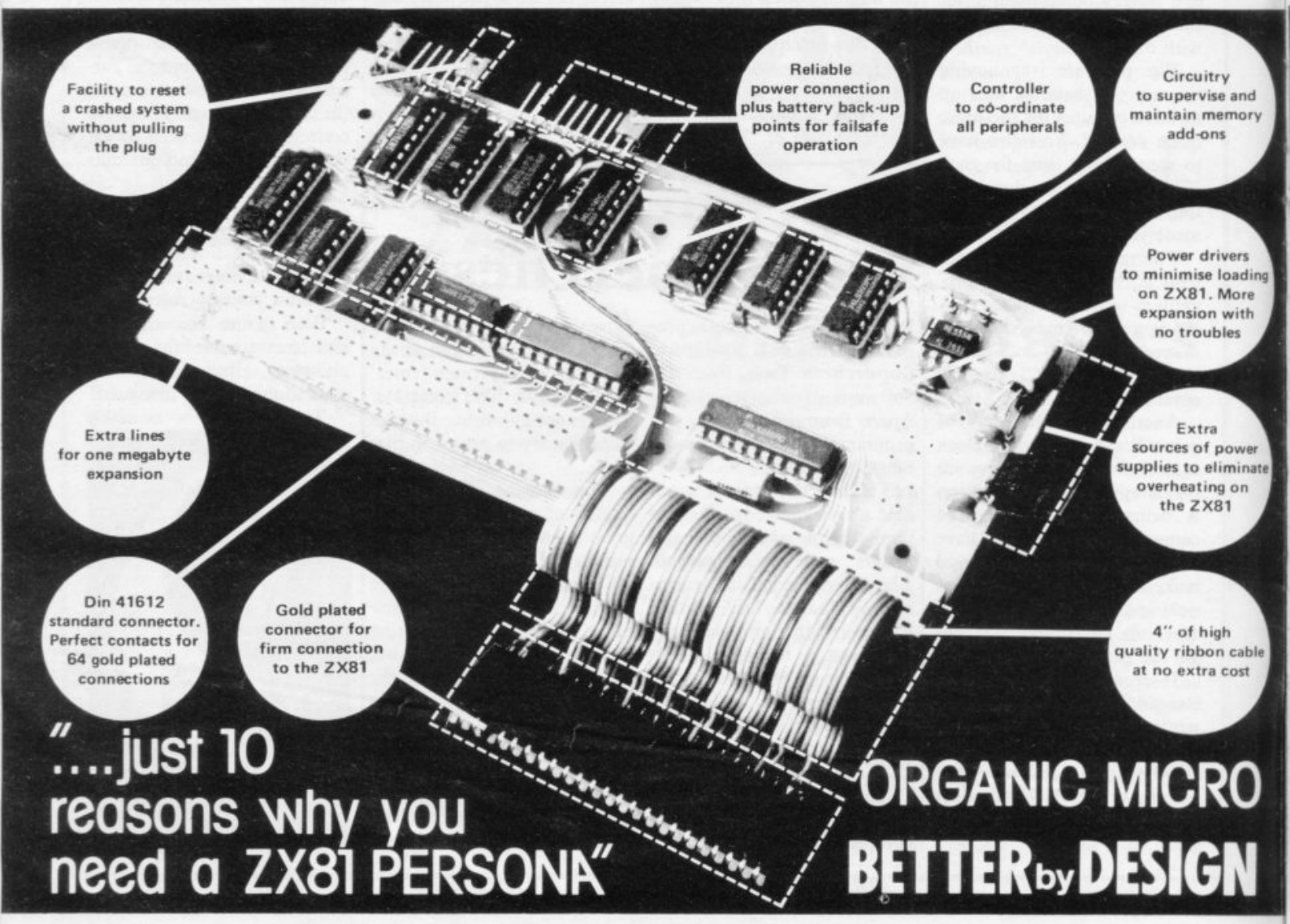
ELECTRONIC
Klik Keyboard
AN ALTERNATIVE NOT AN ADD ON

Installed in 3 easy steps . . .

1. Peel of the touch sensitive key pad.
2. Plug in Klik-Keyboard (no soldering) and place in position.
3. Apply self adhesive two-colour legends to the keys.

This full 40 key keyboard has a positive click feel as the keys are depressed but as it replaces the original touch pad it becomes a permanent part of the ZX81 without bulky boxes or trailing wires.

KEMPSTON
MICRO ELECTRONICS
Dept , 180a Bedford Road, Kempston, Bedford MK42 8BL



"....just 10 reasons why you need a ZX81 PERSONA"

ORGANIC MICRO
BETTER by DESIGN

the i-ching

The ancient Chinese art of telling fortunes.

NOW AT YOUR FINGERTIPS!!!

for the SPECTRUM 48k

FOR ONLY £6·95

special offer!

The person from whom we recieve our first order for the 'I CHING', will get it and one copy of the next two new programs that we create for the SPECTRUM.

FREE!

COMING SOON!!!

CREATOR 1.

Please make all Cheques or Postal Orders payable to; SIRIUS LOGIC.

40,Byerley Road,
Fratton,
Portsmouth.

PO1 5AX. (allow 14 days for delivery).

SIRIUS LOGIC

Are your finances driving you mad?

Do you find that working out your finances makes your head buzz? Do you see red?
Don't worry, now you can have Hilton's **Personal Banking System** on your side, giving you a clear head start and (hopefully) putting you back into the black!
Maintain permanent records and fully detailed statements of your finances including:
★ **All** cheque book transactions and bank receipts
★ **All** standing order payments
Automatically Processed (monthly, quarterly, six-monthly or annually **and** for set number of payments)

In addition the ability to search, locate, delete or correct previous entries. List by category facility is included.
Additional **Bank Reconciliation** module available to automatically match your Bank Statement to your **Personal Banking System** account.
Full instructions included and **guaranteed** after sales maintenance provided.

★ **PBS ZX81 £8.95 (16K)**
★ **ZX SPECTRUM £9.95 (48K)**
★ **DRAGON £9.95 (32K)**
Bank reconciliation (for use with above) £5.

Ask for the PBS at your local computerstore.
ORDER by POST (specifying machine)
OR at the POST OFFICE using TRANSCASH ACCOUNT 302 9557

HILTON COMPUTER SERVICES

Hilton Computer Services Ltd (Dept SU) 14 Avalon Road, Orpington, Kent BR6 9AX

★ YOUR PBS IS NEVER OUT OF DATE ★

PERSONA ZX

YOUR KEY TO THE TOWER OF POWER

You simply choose the following modules you want and plug them into the PERSONA and turn your ZX81 or ZX SPECTRUM into a total computing package ... into an ORGANIC MICRO.

PERSONA ZX81	£30.35
PERSONA ZX SPECTRUM	£45.00
RAM 08 (2K)	£24.50
RAM 16	£26.75
RAM 64	£76.25
MINIMAP	£35.95
DROM (2K)	£39.50
TOOLKIT	£22.20
PERICON a	£27.90
PERICON b	£33.75
PERICON c	£41.75
SONUS	£30.15
Options: USERFRONT	£8.00
Additional 2K for RAM 08	£6.50
Additional 2K for DROM	£7.50

Prices include VAT, Postage and Packing for U.K. deliveries. Overseas Orders: please add 15% to price for surface mail.

Post to: BASICare MICROSYSTEM LTD.
12 Rickett Street, London SW6 1RU.
Tel: 01 - 385 2135

BASICARE MICRO SYSTEM

EVERY ONE A

ORBITER

ALIEN DROPOUT

CYBER RATS

SLIPPERY SID

INVADERS

THE SILVERSOFT COLLECTION

Silversoft, Masters of the video canvas present the first of a timeless collection of Electrik Artwork for the connoisseur. Our skilled artists have toiled over their electronic easels to produce these moving masterpieces - now being exhibited throughout the galaxy. Complete details of these classic programs may be found in our fully illustrated catalogue.* Your local software gallery can arrange a viewing - so beam down there and pick up an original. Don't forget Silversoft still deliver direct to anywhere in the known universe (Post Office willing). If your local (art) dealer is out of stock then please contact us straight away.

* A must for serious collectors.

ALSO AVAILABLE FROM BRANCHES OF W.H.SMITH, BOOTS, JOHN MENZIES & ALL GOOD COMPUTER STORES.

Send to: **SILVERSOFT Ltd**
LONDON HOUSE
271-273 KING ST
LONDON W6
TEL: 01-748 4125

Please note: Due to expansion we have moved to larger premises, we apologise in advance for any inconvenience to our customers.

MASTERPIECE

ASTEROIDS

STARSHIP ENTERPRISE

GROUND ATTACK

ZX SPECTRUM SOFTWARE

ORBITER	£5.95		☐
GROUND ATTACK	£5.95		☐
CYBER RATS NEW	£5.95		☐
SLIPPERY SID NEW	£5.95		☐
STARSHIP ENTERPRISE	£5.95	48K ONLY	☐
MUNCHER	£5.95		☐

ZX81 SOFTWARE (16K ONLY)

INVADERS	£3.95	☐
ASTEROIDS	£3.95	☐
ALIEN DROPOUT	£3.95	☐
MUNCHER (ZX81)	£4.95	☐
STARTREK	£3.95	☐
ZX COMPILER	£5.95	☐

Response Coupon

Tick box(es) as required

I enclose a cheque/PO for .....

Name.....

Address .....

.....

.....

I require a free catalogue ☐

ONLY 19·95 +£1·00pp

....Introducing the AGF JOYSTICK INTERFACE II for sinclair ZX Spectrum 81

SEE US AT THE 7th ZX MICROFAIR ALEXANDRA PALACE, SATURDAY, JUNE 4th 1983

ABOUT OUR JOYSTICK INTERFACE

Following in the footsteps of our extremely popular original interface, which has sold over 1,000 worldwide since October last year, we have improved its performance.

The Interface Module II has been specially designed to plug on to the rear connector of your ZX Spectrum or ZX81 and allow you to connect any standard Atari type digital Joysticks. All of the computer's connections are duplicated on an extension connector so that you can still use any other devices intended for use with your computer.

The Interface Module II resides in the same memory space as the keyboard, which remains fully functional at all times, therefore it will not interfere with anything else connected.

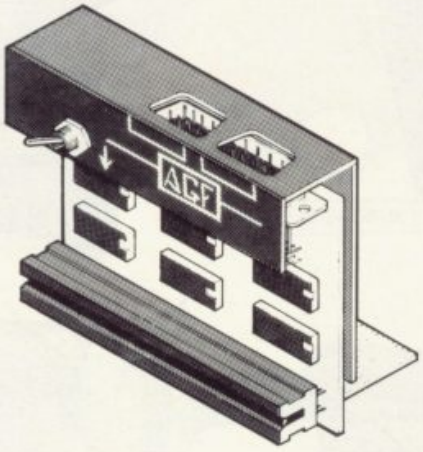
When a suitable joystick is plugged into 'Player 1' socket its action will mimic pressing the cursor keys, up "7", left "5" and so on. The firing button will simulate key ϕ. This unique feature guarantees the best software support.

Take a look at the selection of compatible games we have listed. More are being added all the time as a result of our contact with the various software companies.

A second Joystick may be connected in the 'Player 2' position which simulates in a parallel fashion keys T-Y-U-I-P. This will allow you to play a whole new generation of two player games.

An added advantage of using our Joystick Interface is that you relieve your keyboard of the key-thumping strain of game playing whilst increasing the enjoyment.

Using joystick control in your own programs is as easy as reading keys. Eight directions and Fire are all read by simple BASIC. With every order there comes a free demonstration program called 'Video Graffiti' plus a full set of instructions.



KEY FEATURES

- ★ Proven cursor key simulation for maximum software support
- ★ Accepts Atari, Competition Pro, Wico, Starfighter, Le Stick, etc Joysticks
- ★ Second Joystick facility
- ★ Eight directions programmed in simple BASIC
- ★ Rear extension connector for all other add-ons
- ★ Free demo program, 'Video Graffiti' + full instructions

A SELECTION OF COMPATIBLE SOFTWARE

ZX SPECTRUM

Abersoft	Mazeman	
Axis	Labyrinth	
Campbell Ststems	Gulpman	
DK 'Tronics	☐ 3D Tank	£4.95
	Meteroids	
ICL	Star Trail (Man.Dock)	
New Generation	☐ Escape	£4.95
Software	☐ 3D Tunnel	£5.95
Psion	* Flight Simulation	
	VU–3D	
Silversoft	Ground Attack	
	☐ Cyber Rats	£5.95

ZX81

Artic	Galaxians
J.K. Greye	3D Monster Maze
P.S.S.	Krazy Kong
	Ghost Hunt
	Maze Drag Race
Silversoft	Asteroids

NB ☐ *Available from us, please tick*
* *Not suitable for original interface*

JOYSTICKS

ATARI CONTROLLERS

FOR USE WITH OUR INTERFACE
Module II or VIC 20, Commodore 64, Atari VCS, Atari 400, Atari 800

If you require extra Joysticks for our original interface module mark order 'OLD' Joysticks

ONLY £7.54 inc VAT + P&P

FROM: MR/MRS/MISS

ADDRESS

SEND C.W.O. ONLY TO: A.G.F. HARDWARE, DEPT. SU
26 VAN GOGH PLACE, BOGNOR REGIS, WEST SUSSEX PO22 9BY

QTY	ITEM	ITEM PRICE	TOTAL
	INTERFACE MODULE II	20.95	
	JOYSTICK(S)	7.54	
	SOFTWARE AS TICKED ON LIST		
	SOFTWARE AS TICKED ON LIST		
ZX81 ☐	ZX SPECTRUM ☐ Please tick	FINAL TOTAL	

DEALER ENQUIRIES WELCOME *EXPORT PRICES ON APPLICATION*

P.S.S. THE FUTURE MAKERS
FANTASIES FOR ZX81 AND SPECTRUM

TAI

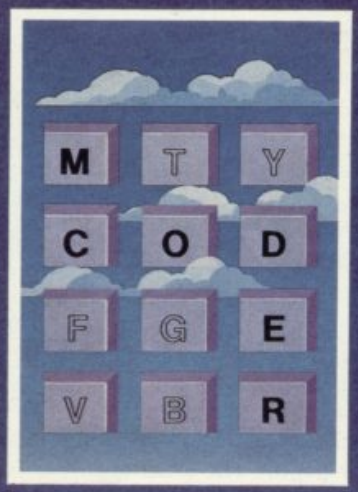
In any other time or galaxy, the dust ball world called TAI would have been quite unimportant. TIMES CHANGE.... Now it is the last remaining out-post between the advancing Imperial Fleet and the main planets of the Dorfian System. Unless the Imperial Forces can be held off untill the Republican battle fleet arrives, an entire civilization will be betrayed.... You have been chosen to defend TAI. The Galactic future depends on you.

ZX81 16K 4·95

HOPPER

Can you help Fergy and his friends get across the 4 lane highway and back to the lilly pond?
Includes Crocodiles, Logs, varying traffic speed etc.

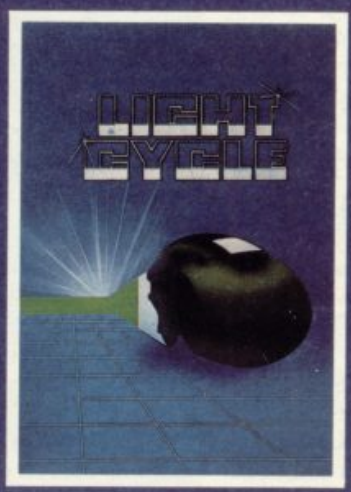
ZX81 16K 3·95



M CODER

Quite simply the most flexible integer compiler available today for either the 16K ZX81 or the Spectrum 16K/48K.

ZX81 16K 7·95
SPECTRUM 48K 8·95



LIGHT CYCLE

All the speed and excitement you could want, very addictive. Race and block the computer or another player.

SPECTRUM 16K 48K 4·95

KRAZY KONG

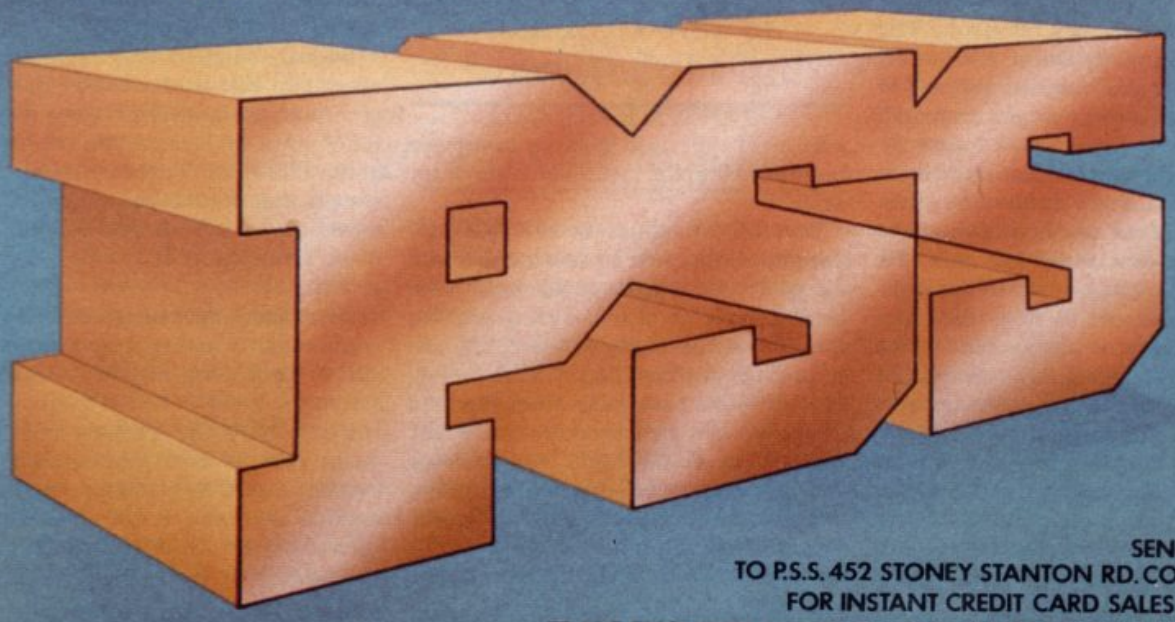
All machine code version of the popular arcade game.
This program has all the features of the original and is every bit as fast.
3 different screens make it difficult to beat.

ZX81 16K 3·95

MAZE DEATH RACE

Drive through a giant maze, 9 times the size of the screen picking up points as you go – but watch out for other cars rocks, oil and ice.
Superb machine code game. Highly recomended.

ZX81 16K 3·95
SPECTRUM 48K 4·95



SEND CHEQUE OR P.O.
TO P.S.S. 452 STONEY STANTON RD. COVENTRY CV6 5DG.
FOR INSTANT CREDIT CARD SALES TEL (0203) 667556
TRADE ENQUIRIES CONTACT JOHN FLETCHER, COVENTRY (0203) 667556

Maximum expansion with Basicare

Stephen Adams reviews a system which gives the ZX-81 limitless flexibility

THE BASICARE system consists of a set of modules all housed in the same long, flat, silver, shaped boxes. The boxes are stacked vertically on top of each other, connected by a 64-way white edge connector. The edge connectors act as the spine of the system and have additional control signals to those from the back of the ZX-81. The extra control signals are used to expand the memory size beyond the 64K limit of the computer and also give it its flexibility in design.

The system can be expanded at any time by plugging-in another module on to the top of the stack and the range of modules allows you to have as much RAM as you need in small or large jumps and to attach any number of printers and ports to the system.

The basic module is the Persona which has to be at the bottom of the stack and is the device through which the computer communicates with the RAM and other devices. The Persona contains refresh circuitry so that the dynamic RAM does not have to rely on the REFRESH address from the computer.

As the REFRESH (R) register is used for a different purpose on the ZX-81 that is a good idea. It also means that if the computer is changed to a type which did not have a refresh signal for dynamic RAM — a Vic, for instance — dynamic memory could still be used. The reason for using dynamic memory is that it reduces the number and size of the chips dramatically when compared to static RAM.

The Persona also buffers all the address and data lines so that no great strain is placed on the signals from the ZX-81. The Sinclair ROM and 1K internal RAM can be turned-off if required to insert your ROM — the internal RAM on the ZX-81 has to be turned-off when using any other RAM pack anyway but that facility is provided to give the user a choice.

Two pins are provided to re-set the system without pulling-out the power plug. Basicare even supplied a switch mounted across those pins on the system I was using. On a larger system each page has to be set up using the re-set switch on powering-up the system, so that can be very useful.

The other thing about the re-set switch is that it effects only the page of RAM on which you are at the moment and so does not erase any of the program or data in other pages. The other two pins are for selecting DATA or Toolkit sections of memory using the Minimap or changing the use of a particular RAM pack. In that case a jumper wire must be used with a plug on each end to connect between the back of the Persona and the module concerned. Basicare can supply the jumpers if required.

All the modules have one or two holes in the back either for connection to other equipment — in the case of the Pericon printer module — or choice-selection pins. The selection is made usually by inserting small blue pins on to the Molex pins to join them together. All the blue pins required are supplied by Basicare when you buy the module.

It is a pity that some standardisation could not have gone into the positioning of the choice pins, as every module seems to have a different set-up and the pins on the Pericon module have even been moved to the right-hand side of the case.

> 'Apart from printer routines, the user is left to make up his software'

The RAM modules for 16K and 64K have to be allocated a bank number and a page number via the choice pins. Each bank is made up of four 16K pages. On the 16K RAM modules the RAM can be put into any page of any bank so long as there is not another module allocated there. On the 64K modules the RAM must all be in the same bank because they use single 64K chips. The system is set up for four banks when using the Minimap module and only one when it is omitted. If you want more than 32K of dynamic memory on the system you have to include the Minimap in your calculations.

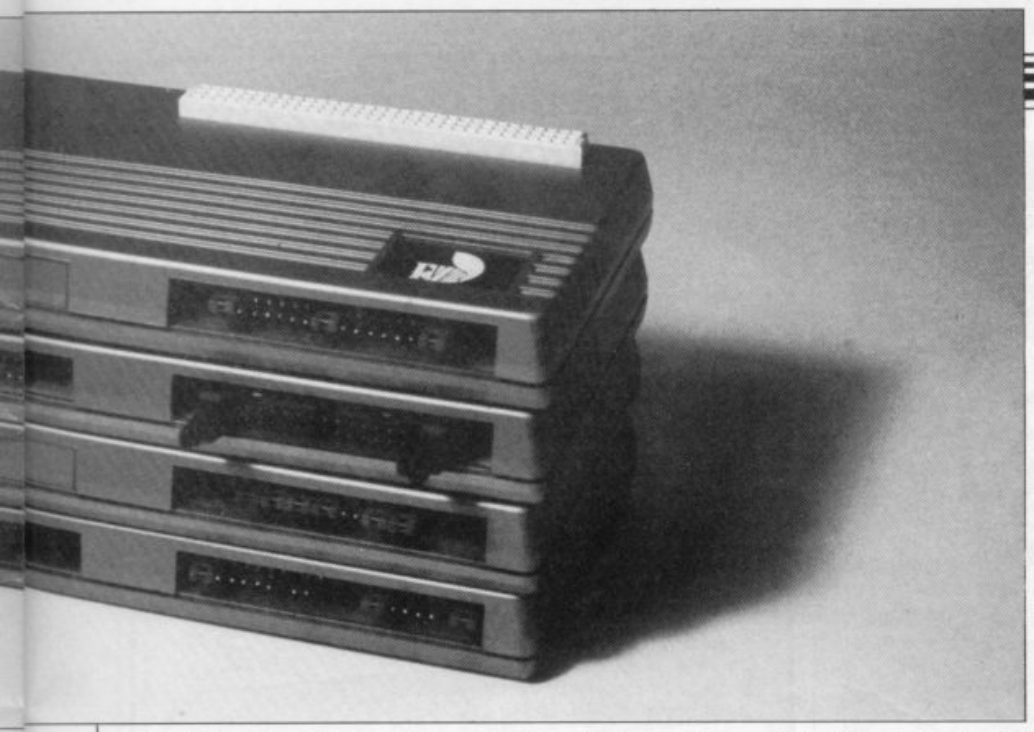
The memory map under the Basicare system is divided into 16K sections, with some sections divided into 4K and 8K sections due to the way the ZX-81 hardware was designed. The two biggest sections, called File A and File B on the normal ZX-81 system, would be covered by the 16K RAM pack as it appears twice in the memory map. That is because the File A area is used to store the program and data and the File B area used to display the screen created in File A.

On the Basicare system those two areas are switched together, even though the two RAM areas may be split to make better use of the RAM. Some provision for a TV display must be made in Page 0 so that the user can see that the system is working. In other pages the File B area may be used as a data store, but not by Basic, or as an alternative TV display.

Basicare suggests that alternating between two File Bs would be a good way of providing animation. Any dynamic RAM must be located into one or both of the File areas. Under a non-Minimap system that would limit the user to a maximum of 16K, as File B would have to be a reflection of File A to see any results.

The bank and page number of each module and whether it appears in File A/B or both is on without crashing the system.

Using only the Persona and RAM packs, 56K of RAM can be used as the system needs a Minimap module to control the extra RAM. The Persona plugs into the ZX-81 expansion port — the large hole at the back — and the



only device you can use with the Basicare system is the Sinclair printer. That is because it is an I/O-mapped device which is excluded from the Basicare system, which operates only on memory-mapped devices.

I/O ports could be used but the ports must provide a PCB edge on which to connect the Basicare system and they must not draw too much power.

Power must be a consideration on such a system as the ZX-81 is supplied only with a 700ma power pack, unless you have bought a printer with a larger 1.2 amp power supply. Every module you use must be supplied with power from somewhere; at the moment that is from the ZX-81 power supply via the 9V output on the edge connector and the internal +5V regulator in the Persona. Provision is made at the back for power to be provided direct into the back of the Persona but a power pack is not yet available from Basicare as a standard item.

Users therefore will have to limit their systems to what the Sinclair power pack can provide — a 16K RAM and Persona on the 700ma power pack — or build their own.

The connections at the back are via standard Molex plugs — 0.1in. spacing — and the system can be driven from a +12V or a full +12V/−12V/+5V supply. A car battery, for instance, could be used as a standby or main supply for the system.

The other set of Molex pins on the back of the Persona module selects the different set-ups which can be required, determined by the pins on the back of each RAM module. Switching between RAM pages — 16 in all, from banks of four pages — is done by one POKE to a memory location inside the Minimap. The Minimap is located in the SLOT area at Slot 0 or memory location 45440. By PEEKing at that location the page number for both the File A/B and the Data/Toolkit areas can be determined.

That is the main area where machine code can be stored and EPROMs and user-definable graphics modules can be located. It is 8K long and is over-used at the moment on the ZX-81 for everything from speech to graphics add-ons. None of them will work with the Basicare system, as no Sinclair PCB connection is provided on any of the available modules. Putting them on the computer PCB and then plugging-in the Basicare system at the back would knock out both systems.

Basicare provides two modules which can go into that area. Both are based on 6116-type static RAM chips. RAM 08 can give up to 8K of RAM and the DROM provides up to 8K of battery-backed memory — a nickel-cadmium cell inside the module charged by the computer.

> 'The user is restricted at the moment to Basicare modules'

The DROM module can have a USERFONT option fitted which gives user-definable graphics. The RAM 08 can also contain EPROMs up to the same 8K and the DROM can have 2K sections write-protected so that you cannot wipe out data or machine code accidentally.

With the Minimap in place and a few jumpers the Toolkit section can have four different pages using the same POKE to switch pages as the dynamic RAM. The Toolkit and Data areas are switched together and the page numbers can be different from the dynamic RAMs. Using the Toolkit or Data areas to store variables is the only way to exchange them between programs in different pages.

For example, to transfer number A from the current page to page 0 would require to use a program like this:

```
100 LET PAGE=PEEK 45440
110 LET FILEAPAGE=INT
    (PAGE/16)
120 LET
    TOOLKITPAGE=PAGE-INT
    (FILEAPAGE*16)
130 REM FIND TOOLKIT PAGE
    NUMBER AND CURRENT
    FILE A PAGE NUMBER
140 POKE RAM08,A
150 REM MUST BE 0 TO 255
160 LET FILEAPAGE=0*16
170 POKE 45440,FILEAPAGE+
    TOOLKITPAGE
```

The program would find from the Minimap the current Toolkit and File A (program) page numbers. The Minimap number is always made up of File A "Page" number multiplied by 16 plus the Data/Toolkit page number. Then POKE the RAM — RAM08 — in the Toolkit area with A.Strings and decimal numbers would take more than one memory location to store them, so the user must devise a system to transfer them correctly.

The new POKE to be made to the Minimap must then be calculated to keep the Toolkit page the same but to alter the File A page to 0. When the POKE has been done the program in the File A section of Page 0 will then be operating, so the number must be retrieved by a LET A=PEEK RAM08 somewhere in the program.

Basicare has provided no hints in the documentation on how variables should be passed between pages and has left it to the user to devise a system which will lead to non-compatible software on the same system. Apart from some printer routines, the user is left to make up his software. Each system may be individual to the user but it would have been pleasant to see some software available.

The Data area can also be used to transfer variables from one page to another but cannot be used for machine code. That is because of the way the ZX-81 hardware was designed. On a non-Minimap system that can be used as part of Basic memory by POKEing

continued on page 40

THIS SPACE INTENTIONALLY LEFT BLANK

Your masterpiece could appear here. We need good, original machine-code programs for the Spectrum and Oric. Excellent royalties or cash payments offered for high quality games. If you have written an exceptional program, please send a copy to the address below for immediate evaluation.

NIGHT GUNNER

Enemy aircraft approaching . . . BATTLESTATIONS!! Waves of enemy fighters swooping in for the attack? Can you survive another mission? This is the ULTIMATE challenge. An entertaining machine code game with excellent graphics. Requires 16K RAM pack only.

Highly addictive! **£4.95 inc.**

Now Available at major branches of WHSMITH

FIGHTER PILOT

15 feet . . . 7 feet . . . TOUCHDOWN! Instrument landings are not always as easy as this. You are in full control from take-off to landing during this real-time flight simulation of a jet fighter. Written by pilots — tested by pilots — for you to fly like a pilot.

'An excellent program!' Capt. H. Senior British Airways pilot.
Requires 16K RAM only **Super value at £4.45**

DIGITAL Integration

DIGITAL INTEGRATION
Dept. SU
22 Ash Church Road,
Ash, Aldershot
Hants GU12 6LX.

MAIL ORDER ONLY

TRADE ENQUIRIES WELCOME

All prices inclusive
(Overseas add £0.55 p&p per tape, £2.00 for HRG board)
All products guaranteed, refund if not satisfied.

ZX SPECTRUM & ZX81 EDUCATIONAL SOFTWARE

Spectrum Junior Education **£7.50**

Use your Spectrum to help your children with their school work. This cassette contains eight attractive, easy-to-use programs for the 7 to 11 age group.

* Topics include English comprehension, spellings, homophones, junior science, maths and history.
* Entering your own questions and answers allows you to adapt two of these programs for exercises in any subject area.
* Moving colour graphics and sound are extensively used to improve motivation.
* Use the "draw" programm to produce pictures, maps and diagrams.

Suitable for the 16K or 48K Spectrum. Program notes are supplied.
OVERSEAS ORDERS £8.50

O-Level Chemistry (C1) **£5.50**

This cassette contains four clearly presented revision/tutorial programs. The subject matter has been carefully structured to cover the most important aspects of:

* Elements, compounds and mixtures.
* Structure, bonding and properties.
* Redox, electrolysis and the activity series.
* Acids, bases and salts.

48K Spectrum and 16K ZX81 versions of the cassette are available. Please specify which you require.
OVERSEAS ORDERS £6.50

Professional Computer Assisted Learning materials from:

CALPAC COMPUTER SOFTWARE
108 Hermitage Woods Crescent, St Johns, Woking, Surrey GU21 1UF.

BIGGER★BETTER

Buffer

MICRO SHOP

ZX81·ZX SPECTRUM·

DRAGON 32·VIC-20·BBC

The very best mail order items available "over the counter"

Games, Keyboards, Serious Programs, Rams, Books, Peripherals and much, much more!

FAST MAIL ORDER SERVICE PHONE **01-769 2887**
WITH ACCESS/VISA (24hr Ansafone)
or send large S.A.E. for catalogue (state which computer)

Open 10.30 — 5.30 Tues. to Sat. (closed Mondays)
310 STREATHAM HIGH ROAD, LONDON SW16

VISIT OUR STAND AT THE MICRO FAIR. ALEXANDRA PALACE. JUNE 4. 10am/6pm.

MASSIVE DEMAND
AND TECHNICAL SUCCESS FOR THE SP48

East London Robotics are happy to announce a memorable price reduction!

With an increasing demand for our ZX Spectrum accessories we invite you to share in our success, with a special price reduction. You'll still enjoy the same efficient product support, by post, phone, or for personal callers as our long established customers.

EAST LONDON ROBOTICS

SP48
32K MEMORY EXTENSION
(giving you the standard 48K)

£23

Designed to fit inside the Spectrum case, and using the identical chips that Sinclair uses (Texas and Oki) to upgrade a 16K Spectrum issue 2 to a 48K Spectrum, for less than half the price of having Sinclair do it for you.

Fully compatible with all Sinclair add-ons (ZX printer, RS232, Micro drive etc) and very low in power consumption, requiring no soldering, easy to fit and remove, and carrying our full warranty. Plug the chips into the sockets provided by Sinclair on the issue 2 Spectrum, and you are ready to go! You have a completely standard 48K Spectrum. Both issue 1 and issue 2 SP48's are upgradable on a part exchange basis for SP80's.

FIT AND TEST SERVICE. Available on all memories. For personal callers while-you-wait £3. 2-5pm Mon-Fri, or by return registered post £7.

EAST LONDON ROBOTICS

SP80
64K MEMORY EXTENSION
(giving a massive 80K paged)

£46

This unit is more sophisticated than the SP48 and we do not recommend it for beginners, unless bought for use with commercially available software specifically written for the SP80.

The additional paging circuitry and the 64K memory chips fit identically to the SP48, and removal, power consumption and add-on compatability are also identical. 48K software will also continue to run on the SP80. This product has tremendous potential for the serious user for storing a wide range of data. For customers wishing to upgrade their SP48 to full SP80 in easy financial stages we offer a unique part exchange service.

STOP PRESS

REVOLUTIONARY MULTIPLE JOYSTICK SYSTEM
- New concept in games control.
- Makes all existing Joystick systems obselete.

ISSUE 1	ISSUE 2

In order to determine whether you have issue 1 or issue 2, look at the rear of your Spectrum where you would plug in the Sinclair printer, and compare the edges of the printed circuit board to the illustrations.

All products advertised on this page are in stock at the time of going to press.

Same day despatch for telephoned Access and Visa orders.

Please send me by return the following items (tick products required).

	Quantity	£	p
☐ SP48 issue 1 £35			
☐ SP48 issue 2 £23			
☐ SP80 Issue 1 £50			
☐ SP80 Issue 2 £46			
☐ ZX Slowloader £10			
P&P 65p			

I enclose cheque/P.O. payable to East London Robotics Ltd for £
Send s.a.e. for FREE catalogue to East London Robotics Ltd,
Gate 11, Royal Albert Dock, London E16.
Prices include VAT. Please tick if you require VAT receipt ☐

Name _____

Address _____

SU1

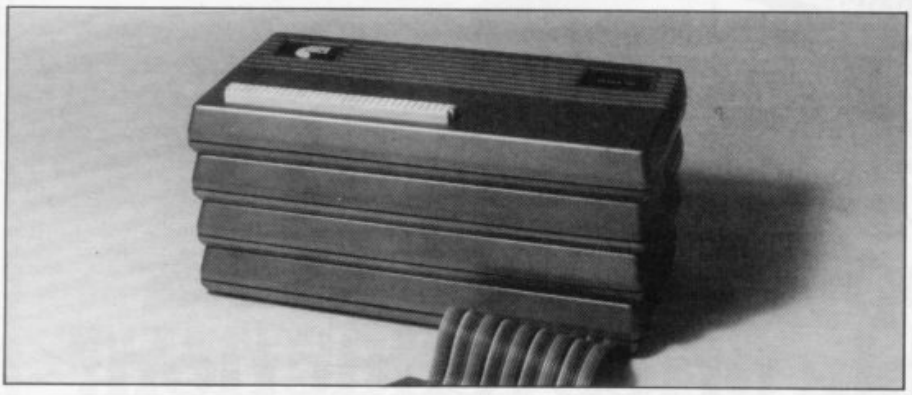
A TOTALLY ORIGINAL SOFTWARE PRODUCT.

ZX SLOWLOADER £10.

Transfers contents of ZX 81 tapes on to your Spectrum in minutes. Ready for SAVEing and EDITing. Send s.a.e. for details.

EAST LONDON ROBOTICS

GATE 11. ROYAL ALBERT DOCK. LONDON E16.
24 HOUR INFORMATION SERVICE TEL: 01 471 3308
24 HOUR ACCESS AND VISA ORDERING TEL: 01 474 4715
SPECIAL ENQUIRIES TEL: 01 474 4430



continued from page 37

two of the system variables to alter RAM-TOP. On the Minimap system, however, the program must be stopped from using that area for Basic as it would destroy the program when any switching was done.

The same method as used in the Toolkit area therefore must be used to transfer variables from page to page. Using that area — 8K long — for the transfer of variables leaves the Toolkit area free for the controlling routines in EPROM or RAM. The RAM08 module can be used only in that area and requires a jumper wire to change it from its normal Toolkit area place.

The use of the path area is not mentioned in the documentation but I assume that it might be something similar to the BBC computer TUBE interface which allows you to have a common memory area between various computers.

The SLOT area is where all the input-output devices are located, such as printers, disc drives and ports for controlling devices outside the computer. It is divided into seven SLOTs and each has its own set of addresses with the 4K area of memory. The device types-in each SLOT which can be divided into four device types and each device type has up to 32 addresses allocated to it.

The Pericon and Minimap are the only devices available for that area. The Minimap uses SLOT 0 and the Pericon SLOT 7. The Pericon modules contain 8255-type, three-port chips, one of which is used to drive a parallel Centronics-type printer.

The Pericon-C module can be used to drive any printer as the software program is stored in one of the File A pages. Storing different routines in different pages allows you to use them as one long program, since when you jump to a new page all the system variables are changed, too, so you continue where you ceased when you last used the page. When you set up a program you must go through all the pages to be used and RUN the program in them, so that when you return to a page you do not have only a LIST of the program. Menus in each page would help to give you the choice of jumping to another page or using the routine in the current page.

The hardware is fairly simple to use; if there are any complications with a particular module Basicare provides a program of part Basic and part machine code which will help you. That is true only of the USERFONT and the Pericon printer modules.

The details on the system are of a technical nature and very sparse on how the system works inside the modules. The details are split into sections to go with each module and although there is a brief description of the system at the beginning, it is not sufficient to help the first-time, non-professional user.

Programs and routines to enable you to make an easier use of the system, which is complex, are non-existent. It would have been better if Basicare had produced a manual which described the system in its entirety than to split the information into details on the individual modules.

Some software routines should be made available on tape or in EPROMs to allow the user to control the system he is trying to use. Routines such as the automatic transfer of certain variables between pages using a specified module in the Data or Toolkit areas would help. The storage of printer routines, for instance, should not occupy RAM space in the main program — File A — area. I know that restricts the use of the system but it allows users to swap software or for Basicare to provide some standard programs on tape.

The minimum usable system would therefore have to consist of a Persona Minimap — because there are cheaper ways on the ZX-81 to have more memory in a 64K memory map — at least two pages of RAM and a RAM08 module in which to store data and machine code routines.

All of the software would have to be run in from tape, unless you invested in a DROM module or had someone program it into a ROM. That means that the program and data would first have to be loaded into the File A area and then transferred to the Toolkit area. In that case the high-speed cassette system or disc system Basicare says it is producing would be useful, as well as some machine code routines to transfer data from one area of memory to another.

Dynamic memory of 52K and up to 64K of Toolkit/Data area memory can be provided on the system — not 1MB as the advertising suggests — and this will take some organising. Any commercial software bought for use on the ZX-81 will have to be limited to 16K, unless modifications are made to it to make use of the Basicare system way of doing things.

The hardware works well and so long as the power can be supplied will allow the user to extend the RAM and ports to its maximum. The connection to the ZX-81 is good and the system should not suffer from white-outs.

The user can extend the system as and when he wants but is restricted at the moment to Basicare modules; none of the Sinclair equipment apart from the printer will work.

The software and documentation with the system needs to be expanded to make it easier to use. Its popularity will depend on whether Basicare can produce Personas for different computers and whether it and other manufacturers produce sufficient modules for it. The cost must be compared to the need to have extra memory, as its initial cost is reasonably high.

Memory map of the ZX-81 using Basicare.

64K	
	FILE AREA B (SWITCH 2) 16K
56K	
	SLOT AREA (NOT SWITCHED) 4K
52K	
	PATH AREA (NOT SWITCHED) 4K
48K	
	DATA AREA (SWITCH 1) 8K
32K	
	FILE A AREA (SWITCH 2) 16K
16K	
	TOOLKIT AREA (SWITCH 1) 8K
8K	
	ROM AREA (NOT SWITCHED)
0K	

The two switches shown are independent of each other and switch 2 can choose only the first four pages.

R & R

STAR TREK 48K

Rid the Galaxy of the evil Klingons, Protect your Star Bases from attack. *("Easy to play. Difficult to beat". Sinclair User Dec '82)*

ONLY £4.95

16K Spectrum GOLF

Hi-Res Full colour graphics. A game for 1 or 2 players, All the features of a full size course. THE family game. *(Reviewed Sinclair User Oct '82)*

ONLY £3.75

P-E-P

THE PROGRAM ENHANCEMENT PACKAGE FOR THE ZX81 (16K)

A suite of easy to use machine code routines designed to transform your Basic programs.

- **DEFINED SCROLL REGION** 1 line to whole screen. ■ **SCROLL** up or down.
- **FILL SCREEN** any character.
- **CHANGE BACKGROUND**
- **CHANGE FOREGROUND**
- **INVERSE VIDEO** ■ **FLASH SCREEN**
- **CLEAR SCREEN** without changing print position.

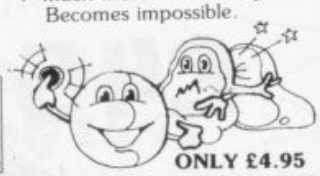
Supplied on tape with a **6K DEMO PROGRAM** and a FULL instruction booklet

ONLY £5.95

SEE US AT THE 7th ZX MICROFAIR ALEXANDRA PALACE SATURDAY, JUNE 4th 1983

GNASHER 16K

THE ULTIMATE MAZE GAME. Ghosts, Energy Pills, Bonus Fruit, Sound, Colour + much more. Starts easy, Becomes impossible.



ONLY £4.95

Send to: **R & R SOFTWARE (SU)**
34, Bourton Road,
GLOUCESTER GL4 0LE
Tel: GLOS (0452) 502819

48 HOUR DISPATCH
Overseas + 10% please
Large Dealer Discounts

ZX SPECTRUM

30 Hour BASIC
(ZX81 edition)

Britain's top selling BASIC course

Over 100,000 users

8 chapters
155 programs
30 worked examples
53 self-checks *with* answers
35 exercises *with* answers
43 figures
full index
spiral bound — opens flat
two colour text

You've got Britain's most popular computer.

Now get Britain's most popular programming course.

Amazing value at £5.95

Send for your copy/ies direct, enclosing payment, to:

The National Extension College, 18 Brooklands Avenue, Cambridge CB2 2HN

Dedicated ZX81 Typewriter-style Keyboards

from Steatite the industry professionals

ONLY £30.95 inclusive of Post, Packing & VAT

- ☐ Full-travel keys, rated at 15 million ops
- ☐ 0.65 newtons professional mechanism for touch-typing feel
- ☐ Complete complement of legends supplied for ZX81, with clear plastic inserts for superior long-term readability
- ☐ Sturdy low-profile sloping top case
- ☐ Fitted flat cable for no-hassle connecting
- ☐ Full instructions for disconnecting existing keyboard and fitting your new keyboard

Steatite Group

Professional Products Division
Steatite Insulations Ltd, Hagley House, Hagley Road, Birmingham B16 8QW. Telephone: 021-454 6961

Send the coupon – today!

To Steatite Insulations Ltd., Hagley House, Hagley Rd., B'ham B16 8QW.
Cheques/P.O. payable to Steatite Insulations Ltd: allow 28 days for delivery.

Please send me ___ keyboard(s). I enclose cheque/P.O. value _____

Name _____

Address _____

dk'tronics

ZX KEYBOARD FOR USE WITH/81 SPECTRUM

Our new cased keyboard has 52 keys, 12 of these are used for the numeric pad. The numeric pad offers some useful features, you can cursor with one hand and it will be a boon for anyone who enters a lot of numeric data. The pad is a repeat of the 1-9 keys plus it has a full stop and a shift key. The numeric pad keys are coloured in red, the normal keyboard keys are grey, with the case being black which makes the whole thing very attractive. The case measures 15 x 9 x 2½. The computer (either 80/81 or spectrum) fits neatly inside. You will have to remove the computer from its original case, it is then screwed to the base of the case. The case had all the bosses already fitted and the screw holes are marked. Also fitted inside the case is a mother board (81 model only) which allows 16K, 32K and 64K to be fitted in the case. All the connections are at the rear of the case i.e. Power, Mic, Ear, T.V. and the expansion port. The case is large enough for other add ons also to be fitted inside. One of these could be the power supply, then you could very quickly fit a mains switch, or a switch on the 9V line. This means you have a very smart self-contained unit. This case does not stop you from using any other add-ons that you may have e.g. Printer etc. We are convinced that this is the best keyboard available at present. It offers more keys and features than any other keyboard in its price range.

£45

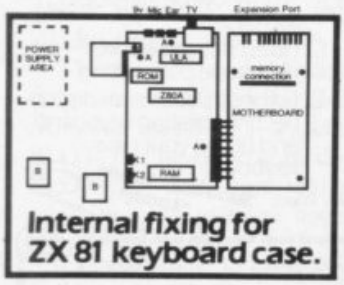
KEYBOARD (SPECTRUM/81)

NOTE

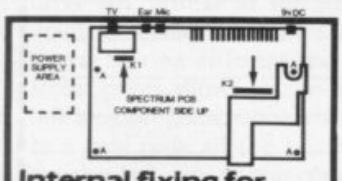
The case can be purchased separately with the keyboard aperture uncut, so if you have one of our early uncased keyboards, or in fact any other suppliers' keyboards, these could be fitted. The keyboard is connected to your computer by a ribbon cable and this has connectors fitted which simply push into the Sinclair connectors. It is a simple two minute job and requires no electronic skills. This keyboard does not need any soldering. Please specify on order whether you require the ZX 81 or Spectrum case.

SPECTRUM MODEL

This is supplied with spectrum legends, and a slightly different base for fitting the spectrum inside, again all the connectors are at the rear of the case and there is plenty of room for the power supply (and other add-ons). Should you want to change, we can supply both the Spectrum legends and details of updating your case which will enable modification from the ZX 81 to spectrum. PLEASE specify on your order whether you require the ZX 81 or spectrum case.



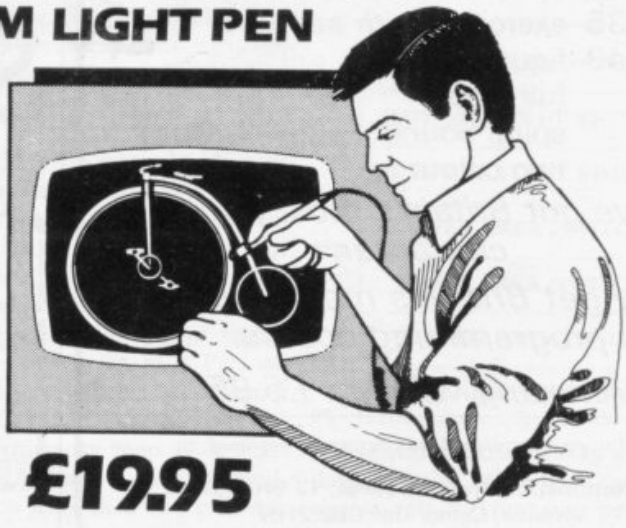
Internal fixing for ZX 81 keyboard case.



Internal fixing for spectrum keyboard case.

SPECTRUM LIGHT PEN

The pen enables you to produce high resolution drawings on your own television set, saving a vast amount of time over using basic programming statements, such as Plot, Draw etc. You can erase, modify and save drawings and it comes complete with software program. The superb light pen is available from D.K. tronics.



£19.95

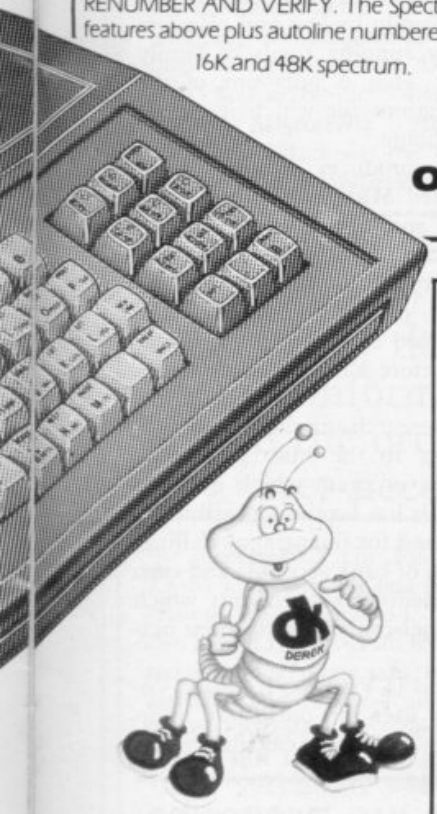
16K Memory Exp
The 16K uses 4116 D
Static Ram and occu
using the Static Ran
speed low power R
the computer. All t
which comes to yo
where. Position in

64K Memory Exp
All the above infor
advantage lies in th
56K of usable mem
the use of other ad
8192-65536. The Bl
Spectrum Memor
Upgrade your Spect
it is simply slipped in
are supplied, and th
time. The fitting req
same as Sinclair's u

ZX 80~81 Spectrum HARDWARE

SPECTRUM/81 TOOLKIT

This is the toolkit which won acclaim in the feature in the August 1982 issue (pages 29 and 30) of Sinclair User, "It is the most impressive program, fast in execution with clear and full instructions...it stands out from the rest of the field." The ZXED is a powerful editor for use on the expanded ZX81. It is intended for use by the serious BASIC programmer and offers several useful and time saving features most helpful during all stages of program development. The facilities provided are as follows: ALTER, BYTES, COPY, DELETE, FIND, HELP, INSERT, KEEP, MOVE, RENUMBER AND VERIFY. The Spectrum Toolkit contains most of the features above plus autoline numberer and append, and will run in the 16K and 48K spectrum.



Both at only £6.95

4K GRAPHICS ROM £24.95

The DK Graphic module is our latest ZX 81 accessory. This module unlike most other accessories fits neatly inside your computer under the keyboard. The module comes ready built, fully tested and complete with a 4K graphic ROM. This will give you an unbelievable 448 extra pre-programmed graphics, your normal graphic set contains only 64. This means that you now have 512 graphics and with their inverse 1024. This now turns the 81 into a very powerful computer with a graphic set rarely found on larger more expensive machines. In the ROM are lower case letters, bombs, bullets, rockets, tanks, a complete set of invaders graphics and that only accounts for about 50 of them, there are still about 400 left (that may give you an idea as to the scope of the new ROM). However, the module does not finish there, it also has a spare holder on the board which will accept a further 4K of ROM/RAM. This holder can be fitted with a 1K/2K/RAM and can be used for user definable graphics so you can create your own custom character sets.

WHY WAIT?
ORDER TODAY FOR FAST DELIVERY

FLEXIBLE RIBBON CONNECTOR

If you have ever had whiteouts or system crashes this could be the answer. It stops the movement between the computer and the RAM expansion, it is supplied with a ribbon, 6 inches long, with a male connector at one end and a female at the other, at only

£10

16/64 MEMORY FOR ZX 81

16K Memory £22.95
16K (uncased) £19.95
64K Memory £52.95
64K (uncased) £49.95

The above illustration shows the casing for the 16K or massive 64K.

ansion £22.95
ynamic Ram Chips. We use the dynamic as they are much denser than py less space. They are also much cheaper than the equivalent product . The Ram is manufactured with high quality materials, and uses high ms. It is supplied ready-built and only needs to be plugged into the rear of he components are fitted into holders. This massive add-on memory fully assembled and tested is the cheapest 16K memory available anyemory from 16384 to 32768. (Same as the Sinclair memory.)

16K (UNCASED) £19.95

ansion £52.95
nation on the 16K also applies to the 64K Memory Expansion, but the e 64K giving nearly FOUR times the memory. This advanced model has ry. In addition, the block from 8K to 16K can be switched out to enable -ons. The graphics ROM is to be used in this area. Position in Memory: ck From 8192-16384 is switchable.

64K (UNCASED) £49.95

Expansion MK1 £35.00, MKII £30.00.
um to 48K of user Ram. The Spectrum memory expansion is simple to fit, side the case, and then only requires plugging in. Full fitting instructions e only tool you will need is a screwdriver and just two minutes of your ires no electronic skills. Position in memory from 32768 to 65536. (The grade to 48K).

Please state type of machine, which Rom memory size, quantity and place when ordering.

Please send me . . . . . @ £ . . . . .

Please send me . . . . . @ £ . . . . .

Please send me . . . . . @ £ . . . . .

Please add on £1.25 for P/P

In enclose cheque/P.O. payable to DK Tronics total £ . . . . .

or debit my Access/Barclaycard

Signature . . . . .

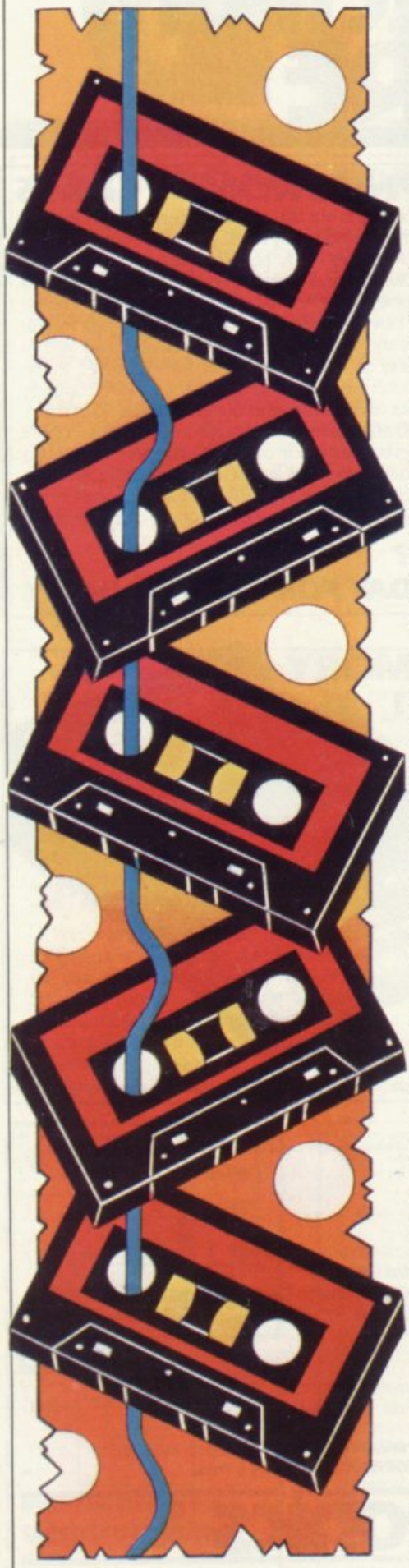
Name . . . . .

Address . . . . .

Send to DK tronics, Unit 2, Shire Hill Ind Est, Saffron Walden, Essex CB11 3AQ. Tel: (0799) 26350 (24 hrs) 5 lines. SU6

dk'tronics

New colour brochure now available, send SAE for quick return



Applications for the Sinclair at home and the office

Why not stop playing games and do something interesting with your computer? John Gilbert assesses the software

BOTH SINCLAIR machines can be used for storing data of any kind, such as names and addresses, telephone numbers and even an ever-changing record of appointments. The ZX-81 needs the 16K RAM pack for any kind of data storage and both information and program have to be SAVEd together. That operation can take up to six minutes and is not very reliable.

The **Business and Household** cassette was one of the first packages available from Sinclair for the ZX-81. It contains three programs. One will keep a record of names and addresses, the next will keep a diary of events and the final program will handle all your financial transactions.

The first two programs worked well but the **Bank Account** program on side two took six minutes to load and SAVEing the program back on to tape with the data proved very difficult.

The Business and Household cassette may not be very reliable but it is good value at £3.95.

One of the best data management systems available for the ZX-81 is **The Fast One,** from Campbell Systems. It allows the user to set up files of information in any way which suits him. The program will sort and search for specific bits of data and if numbers are being used it is possible to total them. The program is a step forward for the ZX-81 and is very flexible. It will do any kind of filing job, given the limitations of the machine. The Fast One costs £15 and has a comprehensive manual.

Spreadsheet programs are an easy way to store numerical data in a format in which it can be used for calculations. The spreadsheet is a matrix, or table, on the screen and any box, or cell, in the table can be addressed by using the letters and numbers which run horizontally and vertically at the sides of the sheet. This type of program can be used to plan the family budget and calculate automatically running totals of family expenditure. That is only one of the many applications for which it can be used in the home.

MiCROL produces a spreadsheet program called **Matrix Planner.** It is easy to use and has a spreadsheet of eight rows by 30 columns. That configuration can be changed by the user through the program variables. Approximately 300 cells can be created in the matrix before all the 16K of memory is used.

Sinclair Research markets two programs similar to the Matrix Planner. **Vu-Calc** is a program which uses the spreadsheet. It has limitless possibilities and can be used for financial modelling, keeping track of bank accounts and even setting-up scientific experiments which rely on number-crunching for their outcome.

The second is **Vu-file.** It is like Vu-Calc but the user can only store information and not perform calculations on data. Both programs are available for the ZX-81 and Spectrum. ZX-81 versions cost £7.95 and Spectrum versions £8.95.

> 'There are programs for data storage on the Spectrum but most of them can be used only on the 48K version'

The arrival of the Spectrum set software houses the task of writing programs which can use data files separate from the programs. It has opened the way to storing large amounts of data on cassette and, when the Microdrive ar-

rives, on floppy tape. There are several good programs for data storage on the Spectrum but most of them can be used only on the 48K version.

The Database from MiCROL is one such program. The files can be split into documents. Those documents are useful in splitting-up topics within the machine. You can give each document a heading, such as tax, income or budget, and you can have several of them in memory at one time.

Documents are split further into records, with one record corresponding to each datum. With that system it is possible to do your tax and budgets at the same time, without having to load the computer twice with information. The program can store up to 999 record lines in memory. The Database costs £9.95 and is complete with handbook.

The **Masterfile** program from Campbell Systems is the most comprehensive of the databases available. It is the successor to The Fast One for the ZX-81 and provides fast access to large amounts of information. The user can also model the program to meet specific requirements. Data can be sorted and searched and reports can be compiled using the system. Masterfile costs £15 for the 48K version and £12 for 16K.

> 'Most data processing programs can already deal with more information than the ordinary user needs'

The spreadsheets which proved so popular with the ZX-81 are starting to creep on to the Spectrum market. The best, so far, are from MiCROL and Microsphere. Both are remarkably similar. The MiCROL version costs £9.95 and provides the basic calculating power of most spreadsheet programs. It is easy to use and can help the business or home user with complicated calculations.

Omnicalc is the spreadsheet from Microsphere. It is ideal for someone who has just found the spreadsheet concept but it is also a very powerful tool for anyone who has used one previously. The program seems to work faster than the MiCROL spreadsheet and information can be accessed almost immediately.

The screen format is easily understandable and very clear for the first-time user. The program contains a help option which lists the commands available through the spreadsheet. Omnicalc costs £9.95. It is complete with a user manual.

All-Sort is an interesting utility program for the 48K Spectrum. It enables a user to sort data which has been set up within a home-built program. The data is stored initially in an array and All-Sort can sort up to four of them at once. It can be obtained from Alan Firminger. The program is useful and very fast but at £18 exclusive of VAT it is expensive.

Listfile is a program which does exactly what its name suggests. The program allows a user to store lists of data, such as names and addresses, and to access that information very quickly. Data is entered in blocks which can be up to eight lines of 26 characters long. An extra line, called the info line, can be used to index information but that is not printed-out when the printer is used to list the information.

Listfile is available for the 16K and 48K Spectrum and can be obtained from G and J Bobker. It costs £10 and has full documentation.

Now that the Spectrum has arrived, software manufacturers are beginning to think about software uses other than games on Sinclair machines. The data processing programs could handle many tasks which are centred on the home. Databases, such as the one from MiCROL, are useful for storing textual information, such as a list of favourite records or even knitting patterns.

The Microdrive could expand the data processing capabilities of the Spectrum. Information can be accessed more quickly and as a result bigger programs could be stored in memory and data could be fed in bit by bit.

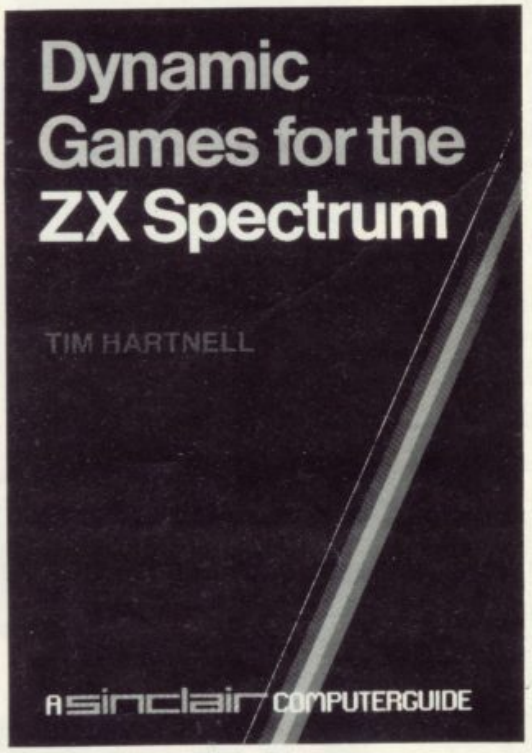
The capabilities of the Spectrum could be extended in this way but soon we will have to decide whether it is necessary. Most data processing programs can already deal with more information than the ordinary user needs. It may be proved that that type of application for the Microdrive is a waste of time.

Sinclair Research, Camberley, Surrey GU15 3BR.
MiCROL, 31 Burleigh Street, Cambridge CB1 1BR.
Campbell Systems, 15 Rous Road, Buckhurst Hill, Essex IG9 6BL.
Microsphere Computer Services Ltd, 72 Rosebery Road, London N10 2LA.
Alan Firminger, 171 Herne Hill, London SE24 9LR.
G and J Bobker, 29 Chadderton Drive, Unsworth, Bury, Lancs.

sinclair COMPUTERGUIDES

PUBLISHED BY SINCLAIR BROWNE LIMITED SB

Dynamic Games for the ZX Spectrum



by **Tim Hartnell**

Tim Hartnell has selected 20 dynamic games of lasting interest. They range from board games like *CHESS* and *PIRANDELLO*, to arcade action in *JOGGER* and *DEATHRACE 2000*, and include a major adventure game, *REVENGE OF CASTLE DREAD*.
A detailed introduction is provided for every game and, in most cases, the program is explained line by line, highlighting the tricks the programmers have used and suggesting how these can be applied in other programs and games. At the end of the book a chapter is devoted to suggestions on how to improve your own programs.

0 946195 13 7 — 192pp
May 1983 — (paper) £5.95

The ZX Spectrum Explored

by **Tim Hartnell**,
Foreword by **Clive Sinclair**

In this practical guide — with programs throughout — Tim Hartnell takes his readers from their first steps in programming to how the ZX Spectrum can be used as a tool at home, at work and for education. He looks at the use of sound, colour and 3D graphics, and shows how to write programs in BASIC, as well as how to use machine code on the ZX Spectrum.

The ZX Spectrum Explored is complete with many programs for education, business and — not least — pure fun!

0 946195 00 5 — 218pp — October 1982 — £5.95

Marketed by
John Wiley & Sons Limited
Baffins Lane · Chichester · Sussex PO19 1UD · England

Sensational Spectrum Games

16K / 48K

ABBEX the games people

JOYSTICK COMPATIBLE

COSMOS

WAVE AFTER UNRELENTING WAVE OF ZENOPHOBIC ALIEN ATTACK, INTERSPERSED WITH EVER MORE FREQUENT ASTEROID + COSMIAD RAIDS. THE TWO COMBINE INTO AN UNENDING RAIN OF DEADLY DEBRIS. WITH RADAR, THERMOCLASTIC HEAT LANCES LET RIP IN THIS GRAPHIC MAELSTROM.
16K/48K £5.95

'OUR FAVOURITE NEW GAME'
Software Supermarket

ETX

SPEECH AND SPRITE/PIXEL GRAPHICS THE LITTLE MAN STILL ON HIS ENDLESS SEARCH HAS WANDERED INTO THIS SENSATIONAL GAME. IT'S OUR LATEST AND GREATEST. TRUE GRAPHICAL ELEGANCE.
16K/48K £5.95

'ONCE YOU'VE SEEN IT IN ACTION IT'S ALMOST A NECESSITY!'
Sinclair User

SPOOKY MAN

EXTRA MAN, ONE OR TWO PLAYER OPTION, HIGH SCORE, JOYSTICK CONTROL, 255 LEVELS OF DIFFICULTY, DIAMONDS, HEARTS, CLUBS, MYSTERY SCORE, FOUR INDEPENDENT GHOSTS. IT'S THE CLOSEST TO THE ORIGINAL AND THE BEST. 16K/48K £5.95

FAUST'S FOLLY

16K/48K £5.95. RECOVER FAUST'S LOST SOUL FROM THE GRASP OF SATAN AND HIS EVIL FIENDS. YOU'LL NEED A COMBINATION OF MACHIAVELLIAN MACHINATION AND SUBTLE WIT TO OUTWIT THE CRYPTIC POWERS OF THE DARK LORD HIMSELF.

GALAXIAN 5

THIS IS IDENTICAL TO THE ORIGINAL. SOUND PIXEL GRAPHICS. 255 LEVELS OF DIFFICULTY. 2 PLAYER FUNCTION. FAST AND FURIOUS. REQUIRED PLAYING FOR ANY SPECTRUM OWNER.
16K/48K £5.95

☐ COSMOS	Price £5.95
☐ FAUST'S FOLLY	Price £5.95
☐ ETX	Price £5.95
☐ SPOOKYMAN	Price £5.95
☐ GALAXIAN 5	Price £5.95

ABBEX ELECTRONICS LTD
20 ASHLEY COURT, GREAT NORTHWAY, LONDON NW4
Tel: 01-203 1465

PLEASE COMPLETE IN BLOCK CAPS
NAME (Mr/Mrs/Miss) .....
ADDRESS .....
(CARD HOLDERS) .....
POST CODE ..... PHONE NO .....

Make cheques payable to ABBEX
I enclose my cheque for £

I wish to pay by ☐ CHEQUE ☐ ACCESS
Please debit my creditcard a/c
Number ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Signed .....
date .....

THE SPECTRUM POCKET BOOK

160pp £6.50 Trevor Toms, best selling author of the ZX81 Pocket Book and the Sinclair Learning Lab, turns his attention to the ZX Spectrum — the book you have been waiting for! All the material in the book is totally new.

Programs

- Castle walls; boiling oil and lovely slurping noises
- Great Fire of London; try and change the course of history
- Chase; outwit the pursuing robots and lead them to their doom
- Truly amazing; generate a new maze puzzle every go
- Reversi; the classic oriental strategy game with board screen display
- 3D Maze; race against time and three dimensions to escape.

Hints & Tips

Discover new ways of using PRINT; INSTR functions, VAL, PRINT USING, hexadecimal conversion, upper case conversion, load and save arrays. BEEP with sliding tones, automatic scroll and how to use all the machine features within machine code.

Machine Code

All the tools you need to write machine code effectively. Graphics tool kit — debug monitor — symbol assembler (with labels, all ED commands, ORG statements, forward and relative jumps) — disassembler (with label assignment); now you can really dig into the Sinclair ROM! This section alone would be stupendous value for money!

Spectrum Cassettes

Knight's Quest (48K)	£5.95
Nowotnik Puzzle (16K)	£4.95
Spectrum Pocket Book	£5.95

Cassettes for ZX81 Prices include VAT

Knight' Quest (16K)	£4.95
Nowotnik Puzzle, Demolition & Tenpin	£5.00
3 Adventures: Greedy Gulch, Magic Mountain, Pharaohs Tomb	£5.00
ZX81 Pocket Book Cassette	£5.00

PHIPPS ASSOCIATES

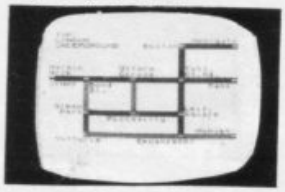
Dept B FREEPOST EM463 (No stamp required)
99, East St, Epsom, Surrey KT17 1BR.
Telephone 03727-21215. 24hr phone service.

Prices include postage but for air mail delivery in Europe add 90p (outside Europe add £2.20) per item.

Access and Barclaycard accepted

TUBE TRAIN TERROR

(ZX Spectrum – 48K)
by Douglas Elliott



Total anarchy rules in London. Can you deliver the bullion using the only means of transport available, the London Underground system. Many perils await you! This program uses the full 48K and features excellent graphics and sounds. Can be played with either keyboard or Competition-Pro Joystick.

ONLY £5.95 **ref: S.202**

UPGRADE YOUR SPECTRUM TO THE FULL 48K

ISSUE I upgrade + Tube Train Terror ONLY £45.95 ref: S.301
ISSUE II upgrade + Tube Train Terror ONLY £35.95 ref: S.302

NOTE: Issue I computers have a rear edge connector in which the grey solder lines are the same widths as the gaps in between them. On the Issue II the solder lines are twice as wide as the gaps).

Spectrum Joystick "Competition-Pro™"

ONLY £25.00 **ref: S.103**

8 directions + 2 fire buttons. Complete with self contained boxed interface which simply plugs into the Spectrum edge connector. Superb quality. Built to last.

NEW

VIC–20
16K memory expansion

ONLY £47.95

Superbly reliable memory for your VIC–20. Simply push on to your expansion connector. External switch allows 3K, 8K or 16K for compatibility with all your software. ref: V.101

JRS SOFTEWARE

19 WAYSIDE AVENUE, WORTHING, SUSSEX. BN13 3JU Telephone: (0903) 65691

SPECTRUM SOFTWARE

NEW

POT-POURRI (Ref: S.203) ONLY £4.95
(formerly sold by Keyword Software)

Track 'n Attack – Chase and shoot down the helicopters. Superb graphics.

Blackjack – The popular game of 21's.

Superscript – Enables you to produce large high definition characters to give your programs the 'professional' touch.

Char-Wallah – Over 50 pre-defined characters for use in your own programs.

SPECTRUM GAMES (ref: S.201) ONLY £4.95
Our popular games pack featuring AIRPORT, CRABS and ALIEN.
(Reviewed in *Sinclair User* December 1982)

Send £1.00 for our new comprehensive Summer Catalogue (refundable against first purchase). Please include a large stamped addressed envelope.

ACCESS and BARCLAYCARD (VISA) ORDERS
For your convenience we now offer a 24-HOUR ANSAFONE service (Tel. Worthing 65691)

ORDER FORM: To JRS SOFTWARE LTD, (Dept. SU6), 19 Wayside Avenue, Worthing, West Sussex BN13 3JU

Please supply the following:–

Quantity	Reference No.	Price

(VAT and p&p are incl.) Total £

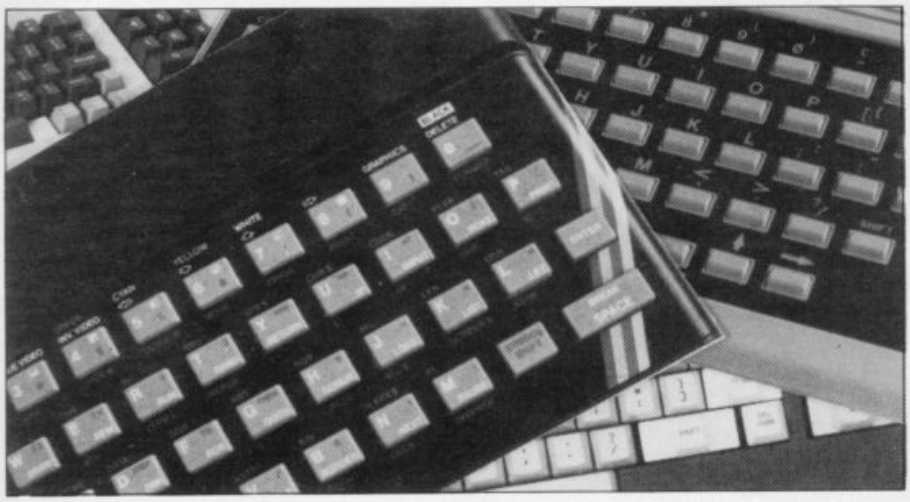
I enclose my cheque/P.O./Money Order for £_____
or charge my Access/Barclaycard Account No:

_____

Name _____

Address _____

_____ Signature _____



Competition in the retail market is increasing. We assess the present situation on availability of the main machines and software support.

High Street war into new phase

THE REDUCTION in the Spectrum price has thrown the home computer market into turmoil. Just as some manufacturers were beginning to pose a threat to Sinclair Research's dominance in Britain the company has taken steps to confirm its position.

With most companies switching their marketing strategies from mail order to retail the battle will now be fought in the high streets.

Sinclair Research was one of the first companies to do so. It started to sell the ZX-81 in Smiths more than a year ago and now the machine is also being sold in Boots, Currys, Dixons and Debenhams. Sinclair announced at the launch of the Spectrum that sales would be by mail order only but it was not long before the machine found its way into the shops.

Other computer manufacturers followed the Sinclair lead. Texas Instruments started to sell the TI 99/4A in specialist computer and video shops but soon it, too, had made the move into Boots and other popular chain stores.

The machine did not do as well as the Sinclair computers and one reason is that it entered the market very quietly. Since then, with advertising in national newspapers and on television, together with a reduction in the price to £149.95, it is giving machines like the Dragon 32 and the Oric a run for their money. It is now easily obtainable but software is limited.

Boots is also responsible for introducing the Vic-20 into the high street. The Vic is an American machine manufactured by Commodore Computers, the company which also produces the Pet series. The machine was an immediate success in the States and its impact on the British public has been as great.

The Vic-20 is still a good seller at £129.95 with standard memory of 5K and some worthwhile software. Commodore hopes that its new machine, the Commodore 64, will do even better.

The entrance of the Dragon 32 into the high-street market was preceded by a fanfare concerning its capabilities. The machine sold well for two months but it was not until Christmas that sales took off in the festive boom.

After a slow start software houses are taking more interest in the machine and the public is just beginning to realise what it can do.

The standard 32K Dragon costs £198.95. That is much more expensive than the 48K Spectrum, although the Dragon has a more extensive version of Basic and better graphics facilities. There are supplies in the shops but dealers are experiencing some difficulties in getting machines.

The Atari computers, the 400 and 800, have not yet been introduced into the W H Smith or Boots chain stores but is sold in Currys and Dixons. They have been regarded as games machines but now Atari has introduced a series of programs for the business user.

Atari is an American company and it has the biggest amount of software for one machine on the market. As a result, it is also the loudest protester against software piracy. It has already proved that it has the resources to tackle that industry within the industry.

The company seems to have a monopoly on ideas at the moment, as many of the programs available for home computers in Britain are spin-offs of Atari games.

The Atari 400 has fallen in price recently. It now costs £159 and its upgraded counterpart, the 800, has 48K of memory to replace the original 16K specification. The company hopes that will make the machines more competitive.

Plenty of stocks are available with no shortage of software.

The Oric-1 is produced by Oric International Products. It was introduced to the large electrical stores, such as Micro C, at the beginning of April and is now starting to appear in W H Smith and Boots. The machine was launched originally through mail order outlets and was described as a serious contender to the Sinclair Spectrum.

Oric says that the software is available for the machine but one month after the 48K version was introduced to the shops, stores such as Currys were not able to support it with programs.

The 16K Oric costs £99.95 and the 48K £169.95. The computer is being backed with some software, which includes a database, an adventure called Zodiac, and a cassette which contains several games.

'Dragon, Vic-20 and Sinclair are most in evidence with the best back-up'

The Spectrum still seems to be the best buy in the high street and the ZX-81 is still selling in large quantities. There is also no difficulty in obtaining software. When the machine was launched in Smiths there was already a full list of titles. Now Smiths has several thousand cassette titles on its books.

Of all the computers available in stores, the Dragon, Vic-20 and Sinclair computers are most in evidence with the best back-up.

TERROR-DAKTIL 4D

In a place forgotten by time, the beating of wings heralds an incarnation too horrifying to believe – Terror Daktil 4D. A game so terrifyingly real that you'll need all your courage just to remain at your 48K Spectrum screen. As the dreaded prehistoric monsters swoop down, intent on your destruction, a battered pistol and marksmanship are your only defence.
You must fight for your life and as the sun sets, your chances of survival begin to slip away. For at night, you'll only see the gleam of their eyes!
Terror Daktil 4D – a game beyond your wildest dreams; not just 3-dimensional graphics reaching out of your Spectrum to engulf you, but also the 4th dimension of time that turns day into menacing night at an alarming rate.
Unbelievable thrills await those brave enough to enter the lost world of Terror Daktil 4D.

Two more super 48K Spectrum programs.
PENETRATOR "...immensely playable, yet very difficult and horribly addictive" – **Computer & Video Games.**

THE HOBBIT "The Hobbit is far superior to any other adventure game available for the Spectrum" – **Your Computer**
"A game by which future games will be judged." – **P.C.T.**

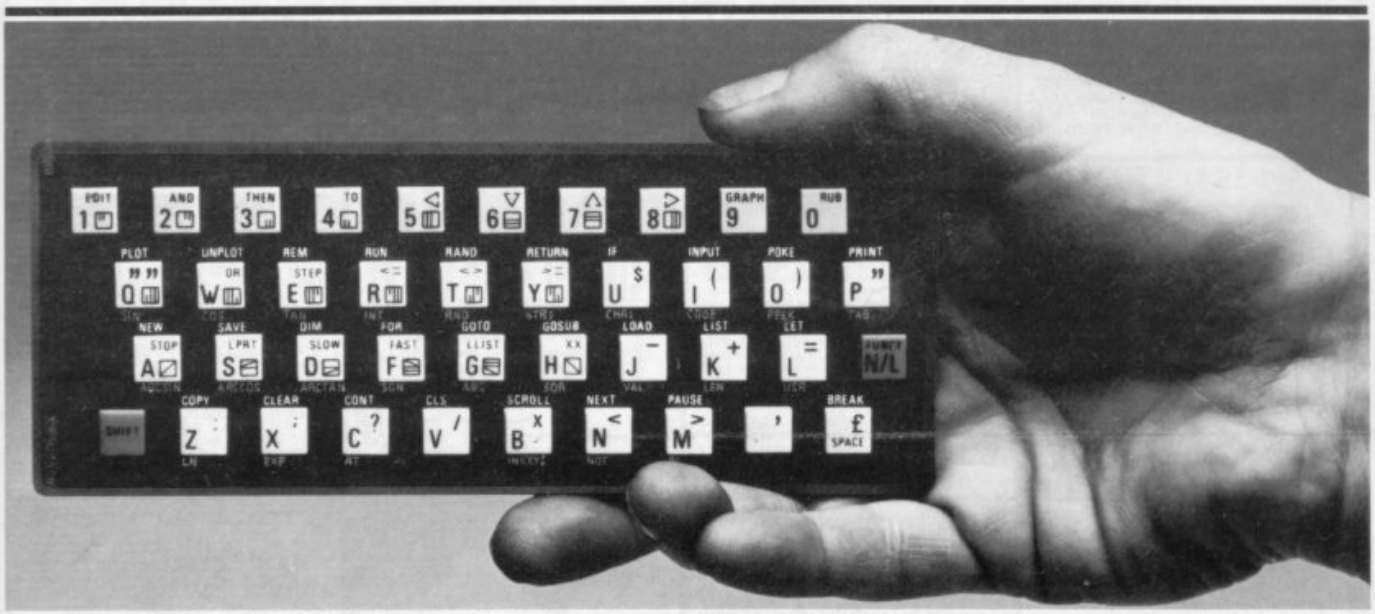
MELBOURNE HOUSE PUBLISHERS

SU6

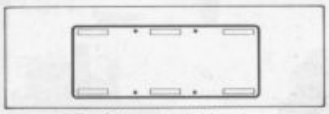
Melbourne House Publishers
Orders to: 131 Trafalgar Road, Greenwich, London SE10
Correspondence to: Glebe Cottage, Station Road, Cheddington, Leighton Buzzard, BEDS LU7 7NA

Please send me your **free** Catalogue.
☐ Please send me:
☐ Terror Daktil 4D – 48K Spectrum cassette – £6.95
☐ The Hobbit package – 48K Spectrum cassette, full colour instruction manual and Hobbit book – £14.95
☐ Penetrator – 48K state-of-the-art arcade game – £6.95
Please add 80p for post & pack.) I enclose cheque/money order
£
or debit my Access card No.
Expiry date
Signature
Name
Address
Postcode
Access orders on 24-hour ansaphone (01) 858 7397

NOW. A ZX81 PUSH-BUTTON KEYBOARD FOR UNDER £10.

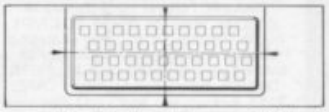


1. Make sure the original keyboard is clean and check that all the keys function.



2. The Buttonset is held in place by self-adhesive pads.

3. So all you do is remove the protective backing.



4. And place it centrally on your ZX81.

At last there's a really cheap but efficient way of ironing out the ZX81's only real bug: its keyboard. The Filesixty Buttonset offers:

■ A full-travel calculator-type moving keyboard for only £9.95. ■ Installed in seconds. The peel-off adhesive backing means you just register into position and press. ■ No messy labels, dismantling or soldering. ■ 3 groups of colour keys to pick out shift, numerals and newline. ■ Precision moulded in ABS to match your ZX81, with contrasting legends for maximum legibility.

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

Orders to Filesixty Ltd., FREEPOST, London W9 2BR.

Cheques/PO made payable to Filesixty Ltd.

Please send me _____ (qty) Buttonset(s) at £9.95 each (including VAT and P&P).

Total £ _____ BLOCK CAPITALS

Name _____

Address _____

SU7

FILESIXTY

PROGRAMS WANTED

SPECTRUM DRAGON
BBC ZX81

WORK FORCE

THE BIGGEST LITTLE SOFTWARE HOUSE AROUND

DO NOT PASS GO

Now the SPECTRUM VERSION IS READY D.N.P.G. is a complete simulation of THAT BOARD GAME you know PARK LANE and all that. Up to SIX PLAYERS can compete with the MICRO doing all the work. Acts as DICE THROWER, BOARD, RENT COLLECTOR, UMPIRE, BANK, RULE BOOK, ACCOUNTANT, ESTATE AGENT and ASSET RECORDER. SUPERB GRAPHICS by GARRY KENNEDY (thanks mate). GAME SAVE with winner so far report. Complete with full instructions. The ULTIMATE in FAMILY GAMES. DON'T MONOPOLISE YOUR MICRO. AMAZE your friends and family. (Can you imagine your GRANNY on a MICRO?). A 16k ZX81 version also available. 48k SPECTRUM or 16k ZX81 versions **ONLY £6.95.**

THE WINGED AVENGER

Fast and furious. Two versions of the same game on the SPECTRUM tape,, the original and the NEW VERSION. SOUND, GRAPHICS, SEVEN SKILL LEVELS. Full ARCADE ACTION including THREE WAVES OF ALIENS, HIGH SCORE, REFUELLING, RAPID REPEAT FIRING, SMART BOMBS and LASER SHIELD. P.C.W. "ONE OF THE BEST SINCLAIR GAMES YET". HOME COMP WEEKLY "FOUR STAR WINNER". 16k ZX81 VERSION "PROBABLY THE FASTEST ZX81 GAME". NOTED as EXCELLENT by the INTERNATIONAL BUREAU OF SOFTWARE TEST. 16k ZX81 & 16+48k SPECTRUM VERSIONS AVAILABLE. **NOW £5.00.**

BASE INVADERS

S.USER "DIFFICULT TO BEAT . . ONE OF THE MOST ADDICTIVE" . . 16 & 48k SPECTRUM. CURRENTLY THE FASTEST VERSION FOR THE SPECTRUM. SHIELD AVAILABLE if you can't HANDLE THE ACTION.

YAHTZI

48k SPECTRUM. All ELECTRIC VERSION of the classic dice game of STRATEGY. More CHUNKY graphics from GARRY KENNEDY. No extras required up to SIX PLAYERS can compete, or practise if you wish. SPECTRUM acts as UMPIRE, SCORE SHEET and DICE THROWER. Update your games cupboard for just **£5.50.** 48k only.

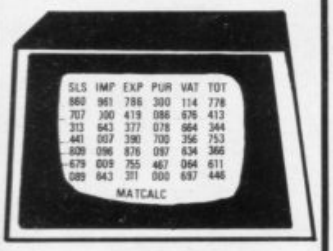
SCRAMBLE

Spectrum SCRAMBLE (Condition Red) EIGHT DIRECTIONAL KEYS. All MACHINE CODE. LASERS, BOMBS, ROCKETS, INSTANT RESPONSE, CONTINUOUS SCORING, SOUND, FUEL DUMPS, RED METEORS, DEFENDER CRAFT and HIGH SCORE. BEWARE CONDITION RED you must REFUEL. "THE REVIEWERS DIDN'T GET TO THE FINAL STAGE". 16 & 48K SPECTRUM. **JUST £4.95.**

PROGRAMMERS DREAM

16k or 48k SPECTRUM.

An advanced SPECTRUM TOOLKIT. Comprised of just 1450 BYTES of POSITION INDEPENDENT MACHINE CODE. RENUMBER lines or blocks. Allows START, FINISH, INCREMENT and new START to be defined. BLOCK or line MOVE including RENUMBER to fit available GAP. RENUMBER will renumber ALL GOTO, GOSUB, LIST etc without further action. CHANGE strings (NAMES or CONTENTS. DUMP VARIABLE NAMES and CONTENTS to DISPLAY PROGRAM SIZE with or without VARIABLE SIZE. This package is FAST, CLEAN, PRODUCES ERROR MESSAGES and is WELL DOCUMENTED. S.USER "WORKS LIKE A DREAM" SPECTRUM ONLY **£6.95.**



"SHIFTY" 48k SPECTRUM

A WORD PROCESSOR FOR THE SPECTRUM. "SHIFTY" was designed to overcome the limitations of the standard SINCLAIR HARDWARE, specifically the PRINTER. Using the STANDARD PRINTER all output over 32 CHARACTERS PER LINE is PRINTED SIDEWAYS allowing pages to be formatted from the printer paper. Any width from 20 to 80 characters per line may be specified. Text can be viewed prior to printing and can be JUSTIFIED to the RIGHT MARGIN. SHIFTY will WORD SEARCH, MOVE PARAGRAPHS, SPLIT PARAGRAPHS, APPEND PARAS, SAVE and LOAD from TAPE, INDENT PARAS and allow standard PHRASES to be STORED and accessed from DATA STATEMENTS using DEFINED KEYS. EDITING is ON SCREEN using 4 way CURSOR MOVE. SHIFTY comes complete with a sample letter and full instructions. Requires ZX printer. **ONLY £7.50.**

NEW RELEASE
"JAWS REVENGE"
48k SPECTRUM

Disappointed with his box office returns JAWS brings his GORY EATING HABITS to the SPECTRUM in his very own ARCADE GAME. JAWS eats his way through a mixed diet of DIVERS, BOATMAN, JELLYFISH, SWIMMERS and FISH. You control JAWS in this FAST MOVING trail of carnage. Avoid DEPTH CHARGES, EXPLODING JELLYFISH, HARPOONS, ARMED SCUBA DIVERS and EAT everything you can. 5 LIVES, SCRAMBLE type SEA BED, current and HIGH SCORE. ALL MACHINE CODE and FAST, DEMO SCREEN. BONUS LIVES, FASTER GAME FOR 10,000 POINTS. WREAK HAVOCK ON THE HUMAN RACE. "THE BEST GAME YET" ANIMAL RIGHTS MOVEMENT". 16 & 48k SPECTRUM **£5.00.**

MATCALC
16 & 48k SPECTRUM

This is our SPREADSHEET PROGRAM with a difference. This ONE has the option of the standard display or a 64 CHARACTER per LINE display or printout. Ideal for WHAT IF, CASH FLOW PROJECTIONS, and analysing related figures. FORMULA may be MATHEMATICAL or LOGICAL. MENU DRIVEN. SAVE and LOAD to TAPE. FULL instructions and TWO matrices on TAPE with a full explanation of their formation. P.C.W. "MORE FLEXIBLE overall than . . . ". Both the 16k & 48k versions on ONE TAPE. SIMPLY HUNDREDS OF USES. **JUST £7.00.**

DISPLAY

How would you like 273 different USER DEFINED GRAPHICS on a 16k SPECTRUM or a FULL 336 on a 48k. All can be displayed on screen at the SAME TIME. U.D.G's are stored as PAGES and any two pages may be EXCHANGED in MEMORY. FILES may be SAVED or LOADED from TAPE at a USER specified location. TURN a UDG one quarter or half turn. FLIP a UDG over, REVERSE a UDG, EXPAND a quarter UDG into a FULL CHARACTER. MOVE a UDG one PIXEL at a TIME, UP, DOWN, LEFT or RIGHT. FIVE complete TAPE FILES are INCLUDED on tape ONE CONTAINING a 64 CHARACTER DISPLAY. DESIGN GRID for constructing CHARACTERS and SHAPES. FULL INSTRUCTIONS and ANIMATED DEMO SCREEN. **£7.00.** 16 & 48k SPECTRUM.

CLONE

"CLONE" is probably the BEST BACK UP TAPE around. We are confident it will make BACK UP COPIES of your current SOFTWARE. CLONE will COPY both HEADERLESS and STANDARD TAPES. CLONE will PROTECT your SOFTWARE INVESTMENT by ensuring you have BACK UP. All PROTECTION routines are COPIED and a description of FILE TYPES is GIVEN. If you want a COPY TAPE then BUY the BEST. CLONE is AVAILABLE on the STRICT UNDERSTANDING THAT IT WILL NOT BE USED TO INFRINGE COPYRIGHT. TAPES up to 38k can be copied, COPIES are made of each program as it appears on tape. UNLIKE SOME COPY TAPES "CLONE" DOES NOT NEED TO BE RELOADED AFTER EACH SAVE. CLONE copies TAPES that can't be BROKEN INTO. USE our knowhow for just **£5.00.** ALL SPECTRUM. P.S. CLONE WILL COPY MOST COPY TAPES SHOULD YOU WISH.

THE PROGRAMS ON THIS PAGE ARE ONLY AVAILABLE FOR SINCLAIR COMPUTERS 16K ZX81

CONDITION RED **£3.95**
TOOLKIT **£5.00**
ADVENTURE IN TIME . . Nearly 60k of ADVENTURE in parts for the 16k ZX81 . . . **£7.00.**
WINGED AVENGER **£4.50**
DO NOT PASS GO **£6.95**

Most programs available from BUFFER, MICROWARE, SOFTWARE SUPERMARKET, GREENWELDS, HEFFERS, JOHN MENZIES and selected SPECTRUM COMPUTER FRANCHISES. DEALER ENQUIRIES WELCOME.

WORK FORCE

140, WILSDEN AVENUE
LUTON BEDS.

Post Included

PROGRAM PRINTOUT

DANIEL WOLFE of Muswell Hill, London has adapted **Tell Me** for the 16K ZX-81.

The computer asks a question, such as "A river beginning with A". The first player to find an answer enters his initial and thus wins a point.

When each question has been asked, players' scores will be displayed. If a question is asked which no-one can answer, the letter can be changed by pressing NEWLINE. More questions can be included after line 500.

The questioning game is successful because, although the questions remain the same, the initial letter always varies.

```
  50 GOSUB 7000
  60 PRINT "HOW MANY PLAYERS ?"
  70 INPUT P$
  80 GOSUB 5000
 145 GOTO 230
 150 PRINT W$;CHR$ M;"."
 153 PRINT
 154 PRINT
 155 PRINT
 157 INPUT X$
 160 IF X$=A$(1) THEN LET E=E+1
 170 IF X$=B$(1) THEN LET F=F+1
 180 IF X$=C$(1) THEN LET G=G+1
 190 IF X$=D$(1) THEN LET H=H+1
 200 IF X$<>A$(1) AND X$<>B$(1)
AND X$<>C$(1) AND X$<>D$(1) THEN
 GOTO 240
 230 LET P=P+20
 240 CLS
 250 LET L=INT (RND*26)+1
 270 LET M=L+37
 280 GOTO P
 290 PRINT Q$;"A FISH"
 300 GOTO 150
 310 PRINT Q$;"AN ANIMAL"
 320 GOTO 150
 330 PRINT Q$;"A TV PERSONALITY"
 340 GOTO 150
 350 PRINT Q$;"A RIVER"
 360 GOTO 150
 370 PRINT Q$;"A GIRL/S NAME"
 380 GOTO 150
 390 PRINT Q$;"A COLOUR"
 400 GOTO 150
 410 PRINT Q$;"A DRINK"
 420 GOTO 150
 430 PRINT Q$;"A BOY/S NAME"
 440 GOTO 150
 450 PRINT Q$;"A LANGUAGE"
 460 GOTO 150
 470 PRINT Q$;"A COUNTRY"
 480 GOTO 150
 490 PRINT Q$;"A FLOWER"
 500 GOTO 150
1170 CLS
1175 PRINT D$;" HAS ";H;" POINTS
"
1180 PRINT C$;" HAS ";G;" POINTS
"
1185 IF P$="2" THEN GOTO 1220
1190 IF P$="3" THEN GOTO 1210
1200 IF P$="4" THEN GOTO 1205
1205 PRINT A$;" HAS ";E;" POINTS
"
1210 PRINT B$;" HAS ";F;" POINTS
"
1220 STOP
5000 PRINT "ENTER THE NAMES OF T
HE PLAYERS"
5010 IF P$="2" THEN GOTO 6040
5020 IF P$="3" THEN GOTO 6020
5030 IF P$="4" THEN GOTO 6000
6000 INPUT A$
6010 PRINT A$
6020 INPUT B$
6025 IF P$="3" THEN LET A$=" "
6030 PRINT B$
6040 INPUT C$
6045 IF P$="2" THEN LET A$=" "
6048 IF P$="2" THEN LET B$="P"
6050 PRINT C$
6060 INPUT D$
6070 PRINT D$
6080 RETURN
7000 LET F=0
7010 LET G=0
7020 LET H=0
7030 LET E=0
7040 LET P=270
7050 LET Q$="NAME "
7060 LET W$="BEGINNING WITH "
7100 RETURN
```

TANK BATTLE

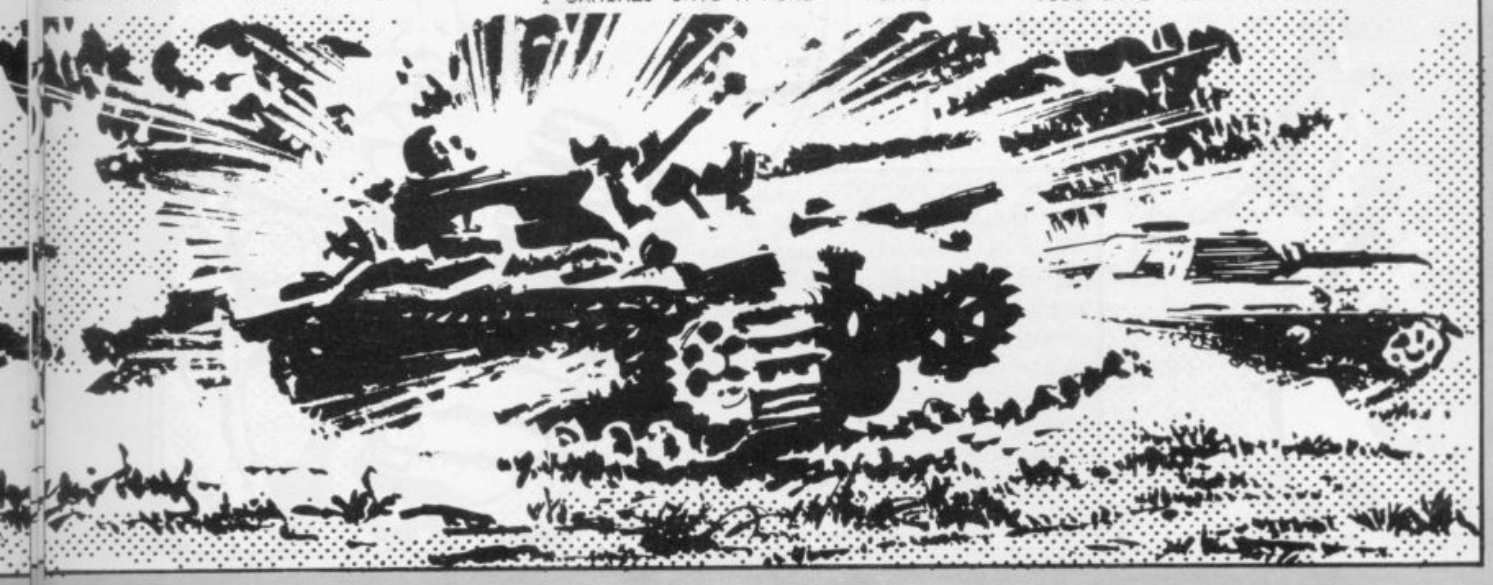
COLLECT two treasure vases, or destroy your opponent before he destroys you. Those are the games aims of **Tank Battle,** written for the 16K Spectrum by William Webb of Woking, Surrey.

You must negotiate blockades, avoid bombs and collect fuel at special dumps. Remember not to shoot the bombs or you will be destroyed. It is an exciting game which needs two players.

All underlined letters should be entered in graphics mode, except the letters "isp" on lines 560 and 570 which should be entered as an inverse space.

```
L
  10 REM 2 Player tank battle
  20 BEEP .2,0
  30 GO SUB 970
  40 BORDER 7: PAPER 7: INK 0: C
LS : FOR f=0 TO 60 STEP 5: BEEP
.1,f: NEXT f
  50 PRINT TAB 4;"TWO PLAYER TAN
K BATTLE"
  60 PLOT 32,168: DRAW 176,0
  70 REM instrutions
  80 PRINT '" The object of this
 adventure isto collect two tres
ure vases (i)or to destrow your
oPPonent      before he destrows
you."
  90 PRINT '" You must negotiate
 blockades    (s) 9ain extra fuel
 and          missiles at bases(d
) and avoid   bombs e.NB If you r
un out of     fuel you lose,missi
les of which you start with 10 a
nd 9ain 5 at fuel bases,you cann
ot fire"
 100 PRINT " If you fire into a
bomb the     missile will rebound
 into you!  Dia9onal movement is
 Possible"
 110 PRINT '" Controls are:-"'"
          lt rt uP dn fire"'"Playe
r 1 e  r  4  d  3"'"Player 2 i
o  9  k  0"
 120 INPUT "Press enter to start
"; LINE a$
 130 REM screen disPlay
 140 CLS
 150 BORDER 0
 160 LET P1t=0: LET P2t=0: LET P
1f=500: LET P2f=500
 170 FOR f=1 TO 100: PRINT INK 2
;AT RND*20+1,RND*31;"s": NEXT f
 180 FOR f=1 TO 10: PRINT AT (RN
D*20)+1,(RND*31); INK 5;"d": NEX
T f
 190 FOR f=1 TO 25: PRINT AT (RN
D*20)+1,(RND*31); INK 2; PAPER 6
; FLASH 1;"e": NEXT f
 200 PRINT AT 0,0;"1 FUEL ";P1F;
"          ";"2 FUEL ";P2F
 210 PRINT AT 1,0;"    ";AT 2,0;"
   ";AT 3,0;"    ";AT 19,29;"  "
;AT 20,29;"    ";AT 21,29;"    "
 220 PRINT AT 21,0; INK 3;"i": L
ET u=RND: PRINT AT 20,0; INK 2;(
"s" AND u<.5): PRINT AT 21,1; IN
K 2;("s" AND u>.5)
 230 PRINT AT 11,15; INK 3;"i":
LET u=RND: PRINT AT 10,14; INK 2
;"sss";AT 12,14; INK 2;"sss";AT
10,15; INK 2;("s" AND u<=.5): PR
INT AT 12,15; INK 2;("s" AND u>.
5)
 240 PRINT AT 1,31; INK 3;"i": L
ET u=RND: PRINT AT 1,30; INK 2;(
```

```
"a" AND u<.5): PRINT AT 2,31; IN
K 2;("a" AND u>=.5)
 250 REM main loop

 260 LET y1=2: LET x1=0: LET y2=
20: LET x2=31
 270 BEEP .001,20
 280 PRINT AT y1,x1; INK 4;"b";A
T y2,x2; INK 1;"c"
 290 LET x3=(IN 64510=247 AND x1
<31)-(IN 64510=251 AND x1>0)
 300 LET y3=(IN 65022=251 AND y1
<21)-(IN 63486=247 AND y1>1)
 310 LET x4=(IN 57342=253 AND x2
<31)-(IN 57342=251 AND x2>0)
 320 LET y4=(IN 49150=251 AND y2
<21)-(IN 61438=253 AND y2>1)
 330 IF IN 61438=254 AND IN 6348
6=251 THEN LET fi=INT (RND*2)+1:
 GO SUB 610
 340 IF IN 63486=251 THEN LET fi
=1: GO SUB 610
 350 IF IN 61438=254 THEN LET fi
=2: GO SUB 610
 360 LET z1=ATTR (y1+y3,x1+x3):
LET z2=ATTR (y2+y4,x2+x4): IF z2
=58 THEN LET y4=0: LET x4=0
 370 IF z1=58 THEN LET y3=0: LET
x3=0
 380 IF z1=178 THEN LET bo=1: GO
SUB 530
 390 IF z2=178 THEN LET bo=2: GO
SUB 530
 400 IF z2=61 THEN LET fu=2: GO
SUB 490
 410 IF z1=61 THEN LET fu=1: GO
SUB 490
 420 IF z1=59 THEN LET tr=1: GO
SUB 870
 430 IF z2=59 THEN LET tr=2: GO
SUB 870
 440 IF x3<>0 OR y3<>0 THEN LET
p1f=p1f-5: IF p1f<=0 THEN GO TO
740
 450 IF x4<>0 OR y4<>0 THEN LET
p2f=p2f-5: IF p2f<=0 THEN GO TO
740
 460 PRINT AT 0,0;"1 FUEL ";P1F;
"      ";"2 FUEL ";P2F
 470 PRINT AT y1,x1;" ";AT y2,x2
;" ": LET y1=y1+y3: LET y2=y2+y4
: LET x1=x1+x3: LET x2=x2+x4
 480 GO TO 280
 490 REM fuel
 500 IF fu=1 THEN LET p1f=p1f+IN
T (RND*100): LET p1m=p1m+5: BEEP
.2,24: BEEP .2,12: BEEP .2,24
 510 IF fu=2 THEN LET p2f=p2f+IN
T (RND*100): LET p2m=p2m+5: BEEP
.2,12: BEEP .2,24: BEEP .2,12
 520 LET fu=0: RETURN
 530 REM bomb
 540 LET x1=x1+x3: LET x2=x2+x4:
LET y1=y1+y3: LET y2=y2+y4
 550 FOR f=60 TO -40 STEP -3: BE
EP .01,f: NEXT f
 560 IF bo=1 THEN PRINT AT y1,x1
; INK 2; FLASH 1; BRIGHT 1;"f":
FOR f=1 TO 150: NEXT f: PRINT AT
 y1,x1; INK 2;"g"
 570 IF bo=2 THEN PRINT AT y2,x2
; INK 2; FLASH 1; BRIGHT 1;"f":
FOR f=1 TO 150: NEXT f: PRINT AT
 y2,x2; INK 2;"g"
 580 FOR f=1 TO 150: NEXT f
 590 BEEP 1,1
 600 GO TO 740
 610 REM fire
 620 LET g=0: IF fi=1 THEN LET f
1=y1: LET f2=x1: LET fd=1: LET p
1m=p1m-1: IF p1m<0 THEN RETURN
 630 IF fi=2 THEN LET f1=y2: LET
 f2=x2: LET fd=-1: LET p2m=p2m-1
: IF p2m<0 THEN RETURN
 640 FOR f=1 TO 10: LET g=g+1: I
F ATTR (f1,f2+(g*fd))<>56 THEN G
O TO 700
 650 IF f2+(g*fd)<=0 OR f2+(g*fd
)>=31 THEN NEXT f
 660 PRINT AT f1,f2+(g*fd);("g"
AND fd=1)+("h" AND fd=-1)
 670 IF g>1 THEN PRINT AT f1,f2+
(g*fd)+(1 AND fd=-1)-(1 AND fd=1
-);" "
 680 IF f=10 THEN FOR f=1 TO 60:
 NEXT f: PRINT AT f1,f2+(g*fd);"
"
 690 NEXT f: RETURN
 700 LET f2=f2+(g*fd)
 710 IF ATTR (f1,f2)=58 OR ATTR
(f1,f2)=61 THEN BEEP .2,20: BEEP
 .15,10: BEEP .12,5: LET f=1: PR
INT AT f1,f2-(1 AND fd=1);"  ":
RETURN
 720 IF ATTR (f1,f2)=178 THEN BE
EP .05,20: BEEP .05,12: BEEP .05
,6: LET fd=-fd: LET g=0: PAUSE 2
0: LET f=1: LET reb=1: NEXT f
 730 IF ATTR (f1,f2)=60 OR ATTR
(f1,f2)=57 THEN FOR f=-30 TO 60
STEP 3: BEEP .05,f: NEXT f: PRIN
T AT f1,f2; FLASH 1;"f": PAUSE 5
0: LET hit=(f1=y1 AND f2=x1)-(f1
=y2 AND f2=x2)
 740 REM end routine
 750 PAUSE 20
 760 CLS
 770 IF p1f<=0 THEN PRINT "PLAYE
R 1 RAN OUT OF FUEL-        PLAYE
R 2 IS THE WINNER!"
 780 IF p2f<=0 THEN PRINT "PLAYE
R 2 RAN OUT OF FUEL-        PLAYE
R 1 IS THE WINNER!"
 790 IF p1f<=0 OR p2f<=0 THEN BE
EP .2,25: BEEP .2,18: BEEP .2,15
: BEEP .2,8: BEEP .2,7
 800 IF bo=1 THEN PRINT "PLAYER
1 CRASHED INTO A MINE-   PLAYER
2 IS THE WINNER": LET bo=0
 810 IF bo=2 THEN PRINT "PLAYER
2 CRASHED INTO A MINE-   PLAYER
1 IS THE WINNER": LET bo=0
 820 IF reb=1 THEN LET reb=0: PR
INT "PLAYER ";("1" AND fd=-1)+("
2" AND fd=1);" SHOOT A BOMB AND
SO    CAUGHT A REBOUNDING MISSIL
E": LET hit=0
 830 IF hit=1 THEN PRINT "PLAYER
 2 DESTROYED 1 AND SO IS  THE WI
NNER": LET hit=0
 840 IF hit=-1 THEN PRINT "PLAYE
R 1 DESTROYED 2 AND SO IS  THE W
INNER": LET hit=0
 850 INPUT "ANOTHER GO (y/n)? ";
a$: IF a$="y" THEN CLS : GO TO 1
60
 860 STOP
 870 REM treasure
 880 IF tr=1 THEN LET p1t=p1t+1:
 PRINT AT y1+y3,x1+x3; FLASH 1;
INK 3;"i"
 890 IF tr=2 THEN LET p2t=p2t+1:
 PRINT AT y2+y4,x2+x4; FLASH 1;
INK 3;"i"
 900 BEEP .2,25: BEEP .2,30: BEE
P .2,23: BEEP .2,15: BEEP .2,20
 910 IF p1t=2 OR p2t=2 THEN GO T
O 930
 920 RETURN
 930 REM won
 940 PAUSE 20: CLS
 950 PRINT '" Player ";("1" AND
tr=1)+("2" AND tr=2);" has colle
cted two      treasure vases and
so is the     winner"'"CONGRATULA
TIONS!"
 960 GO TO 850
 970 REM USR graP
 980 RESTORE
 990 FOR f=144 TO 152: FOR g=0 T
O 7: READ a: POKE USR CHR$ f+g,a
: NEXT g: NEXT f
1000 DATA 170,127,254,127,254,12
7,254,85,16,56,127,248,254,255,2
38,68
1010 DATA 8,28,254,31,127,255,23
8,68,126,195,157,255,255,255,255
,126
1020 DATA 0,48,125,255,253,120,4
8,0,132,73,178,92,252,26,107,74,
0,4,6,255,255,6,4,0,0,32,96,255,
255,96,32,0,24,126,255,126,60,24
1020 DATA 0,48,125,255,253,120,4
8,0,132,73,178,92,252,26,107,74,
0,4,6,255,255,6,4,0,0,32,96,255,
255,96,32,0,24,126,255,126,60,24
,24,24
1030 LET p1m=10: LET p2m=10
1040 LET reb=0: LET p1t=0: LET p
2t=0: LET bo=0: LET hit=0
1050 RETURN
1060 SAVE "tank": VERIFY "tank"
```

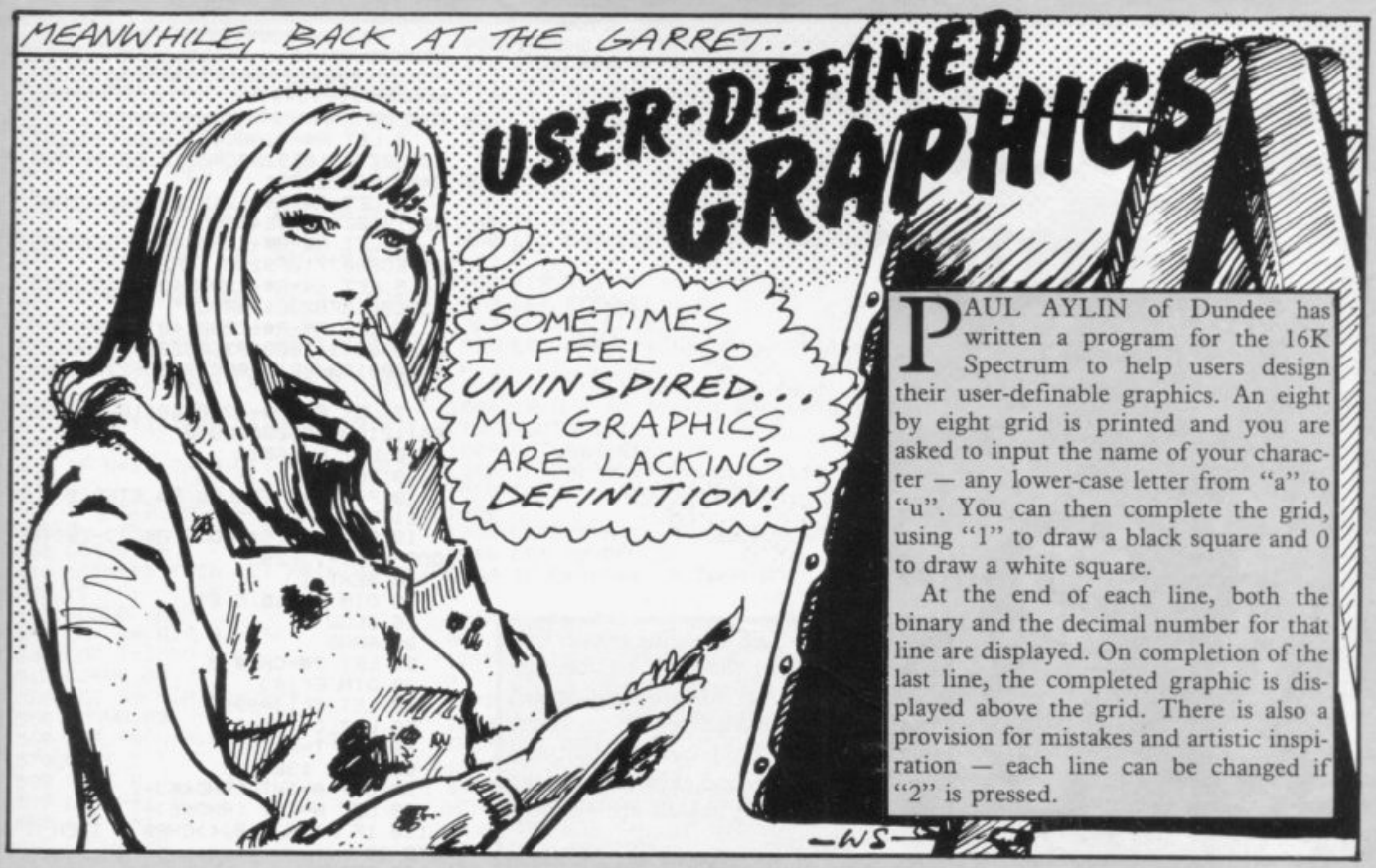


```
   1 REM  * CASSETTE *
   2 PLOT 0,0: LET c=0
   3 LET v=0: LET n=0
   4 INPUT "INSTRUCTIONS? (y/n)"
;d$: IF d$="y" THEN GO SUB 1000
   5 INPUT "level? (2 FOR CASSET
TES)";g
   6 IF g<.8 THEN PRINT "Too Lit
tle": GO TO 5
   7 INPUT "ENTER DENSITY";dist
   8 INPUT "AMPLITUDE BEEPS?";d$
: IF d$="y" THEN LET ad=.01: CLS
 : GO TO 10
   9 LET ad=.001
  10 LET a=254+256*(255-2^7)
  20 FOR x=1 TO 5
  21 LET v=v+IN a
  22 NEXT x
  26 IF ad=.01 THEN BEEP ad,2500
0/v
  27 LET w=v -(255*5): LET v=0
  30 DRAW dist,(-w/9)-(-n/9)
  31 LET n=w
  35 LET c=c+1: IF c>=(220/dist)
 THEN CLS : PLOT 0,10: LET n=0:
LET c=0: LET d=0
  40 GO TO 20
1000 PRINT "          * CASSETTE *
 "'''"THIS PROGRAM USES "'"THE IN
 FUNCTION TO SCAN"'"THE MIC AND
EAR SOCKET INPUTS."''"ALTHOUGH T
HE SCANNING IS NOT"'"VERY SENSIT
IVE,IT WILL PICK UP"'"SIGNALS FR
OM A CASSETTE RECORDER"'"AT HIGH
 VOLUME"
1010 PRINT ''"IF YOU SEND THE SI
GNAL VIA THE"'"MIC SOCKET,YOU WI
LL NOT BE ABLE"'"TO HEAR THE SIG
NAL THROUGH THE"'"COMPUTER'S SPE
AKER SO YOU SHOULD"'"ENTER 'y' W
HEN ASKED FOR :"'"'AMPLITUDE BEE
PS'"'"THIS SOUNDS BEEPS,THE PITC
H OF   WHICH SIGNIFIES THE AMPLI
TUDE      OF THE SIGNAL "
1020 PRINT "PRESS ANY KEY TO CON
TINUE": PAUSE 0: CLS : PRINT "YO
U WILL ALSO BE ASKED TO INPUT  T
HE 'DENSITY'"'"THIS MEANS THE SP
EED OF DRAWING"''''''''"ANY KEY T
O CONTINUE": PAUSE 0
1050 RETURN
```

OSCILLOSCOPE

OSCILLOSCOPE uses the IN function to scan the MIC and EAR sockets. It then draws the response on screen, acting like an oscilloscope. By recording your voice on cassette, playing that back while the program is running, you can obtain a representation of your voice pattern on-screen.

The program was written for the 16K Spectrum by Robert Horsfall of Eastburn, Yorkshire.



USER-DEFINED GRAPHICS

PAUL AYLIN of Dundee has written a program for the 16K Spectrum to help users design their user-definable graphics. An eight by eight grid is printed and you are asked to input the name of your character — any lower-case letter from "a" to "u". You can then complete the grid, using "1" to draw a black square and 0 to draw a white square.

At the end of each line, both the binary and the decimal number for that line are displayed. On completion of the last line, the completed graphic is displayed above the grid. There is also a provision for mistakes and artistic inspiration — each line can be changed if "2" is pressed.

```
  4 REM Graphic Desi9ner By
    Paul Aylin
  8 REM Grid
 10 PLOT 112,119
 20 DRAW 63,0
 30 DRAW 0,-63
 40 DRAW -63,0
 50 DRAW 0,63
 60 DRAW 7,0
 65 FOR 9=1 TO 6
 70 DRAW 0,-63
 80 DRAW 8,0
 90 DRAW 0,63
 92 NEXT 9
 95 DRAW 8,0
 97 FOR h=1 TO 4
100 DRAW 0,-8
105 FOR h=1 TO 6
110 DRAW -63,0
120 DRAW 0,-8
130 DRAW 63,0
135 NEXT h
140 PRINT "ENTER YOUR LETTER "
150 PRINT "(a-u,in small case)"
160 PRINT "FOR USER GRAPHIC"
170 INPUT a$
180 FOR h=0 TO 2
185 FOR 9=0 TO 31: PRINT AT h,9
;" ": NEXT 9
188 NEXT h
190 PRINT AT 0,0;"ENTER EITHER
0 F0R BLANK"
193 PRINT "(13*sp) FOR(98)"
195 PRINT "                2 TO RE
WRITE LINE"
200 FOR a=0 TO 7
210 LET f=0
220 FOR b=0 TO 7
223 IF INKEY$<>"" THEN GO TO 22
3
224 IF INKEY$="" THEN GO TO 224
225 IF INKEY$="1" THEN LET c=1
230 IF INKEY$="0" THEN LET c=0
235 IF INKEY$="2" THEN GO TO 21
0
237 REM Bin to Dec
240 LET d=2^(7-b)
250 LET e=c*d
260 LET f=e+f
270 IF c=1 THEN PRINT AT 7+a,14
+b;"(98)"
280 IF c=0 THEN PRINT AT 7+a,14
+b;" "
290 PRINT AT 7+a,b;c
400 NEXT b
410 PRINT AT 7+a,27;f
415 POKE USR a$+a,f
417 BEEP 0.25,0
420 NEXT a
424 FOR h=0 TO 2
425 FOR 9=0 TO 31: PRINT AT h,9
;" ": NEXT 9
426 NEXT h
430 PRINT AT 4,16;A$;"= ";CHR$
(CODE A$+47)
450 BEEP 1,4
```

Phoenix Tower

YOUR QUEST begins as you find yourself in the dark on the first floor of a fifteen-level tower. Your ultimate goal is to climb the tower and find the Great Jewel of Light. On the way you must find keys, armour and many other objects which are essential to your progress.

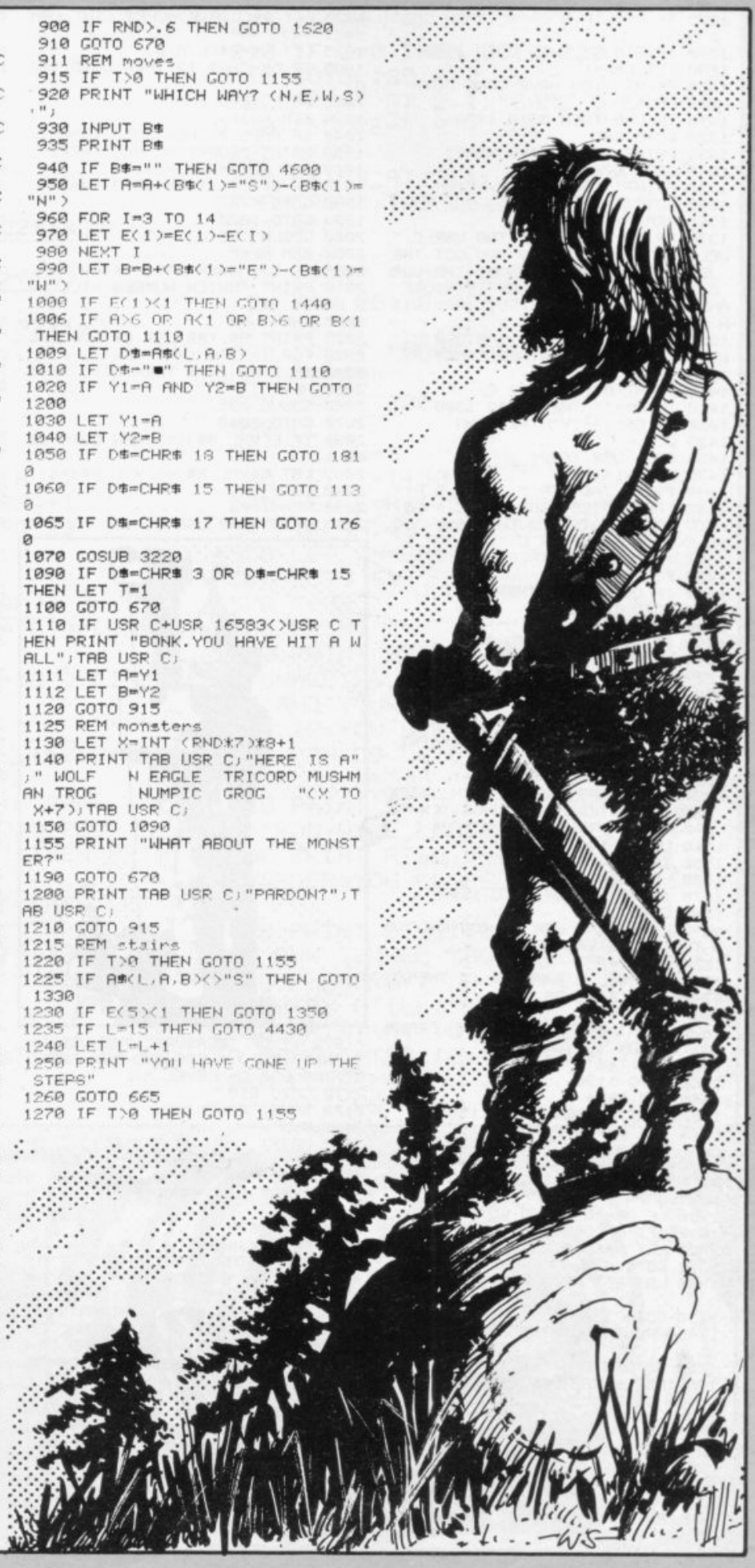
Opposition is in the form of weird and wonderful creatures which appear from the gloom and which must be destroyed. With luck you will climb the tower, find the jewel and find the ring which tells you how to leave the tower. You may even be helped by the Great Wizard.

Enter "INFO" to obtain a complete vocabulary list, including the code numbers of certain vital objects. Commands should be entered when "NEXT?" is displayed. To use an object, enter its code number.

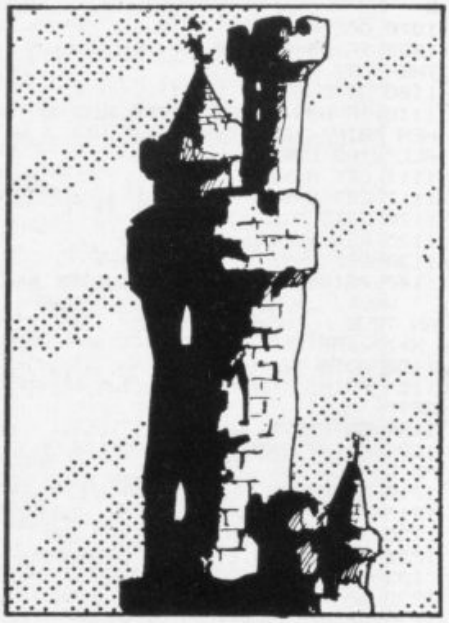
The program was written for the 16K ZX-81 by Colin Hunniford of Berkhamsted, Herts, and is the first adventure game to be published in *Sinclair User*. We hope that, as well as providing enjoyment, it will also provide hints and inspiration for those interested in writing adventure games.

```
   1 REM MMMMMMMMMMMMMMMMMMMMMMMM
MMMMMMMMM146 charactersMMMMMMMMMM
MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
   2 LET A$="2A0C4011B6021906207
EC680772310F92A0C4011210019ED5B0
C4001D602EDB0"
   3 LET A$=A$+"2121032239402A0C
4011B60219220E40C9"
   4 LET A$=A$+"2A0C400615C50620
237EC6807710F923C110F2C9"
   5 LET A$=A$+"2A0C400615C50620
23368010FB23C110F4C9"
   6 LET A$=A$+"2A0C40110E001936
00233634112000193603233680233603
1120001936801120001936062323368
6"
   7 LET A$=A$+"2A0C40110E001936
861121001936000C3D940"
   8 LET C=16513
   9 FAST
  10 FOR I=1 TO LEN A$ STEP 2
  11 LET C=C+1
  12 POKE C,16*(CODE A$(I)-28)+C
ODE A$(I+1)-28
  14 NEXT I
  15 DIM A$(15,6,6)
  16 SLOW
  20 RAND
  25 LET D$=CHR$ 0
  30 DIM E(14)
  40 LET E(1)=9999
  50 LET C=16514
  60 LET T=0
  80 GOTO 130
  90 LET A=INT (RND*6)+1
 100 LET B=INT (RND*6)+1
 110 IF A$(N,A,B)<>CHR$ 0 THEN G
OTO 90
 120 RETURN
 130 IF USR 16583<>USR C THEN PR
INT "WELCOME TO ";TAB USR C;"MU
RKY ADVENTURE 2:PHOENIX TOWER";T
AB USR C;TAB USR C;"YOU ARE ABOU
T TO ENTER THE TOWER";TAB USR C;
"IN WHICH YOU MUST FIND A KEY,";
TAB USR C;"A JEWEL,A TORCH AND M
ANY OTHER";TAB USR C;"THINGS TO
SURVIVE.";TAB USR C;"WOULD YOU L
IKE INSTUCTIONS?";
 140 INPUT B$
 150 PRINT " ";B$;TAB USR C;TAB
USR C;
 160 IF B$="" THEN GOTO 130
 170 IF B$(1)="Y" THEN GOSUB 185
 180 GOTO 220
 185 PRINT "YOUR TASK IS TO GET
THE GREAT";TAB USR C;"JEWEL FROM
 THE PHOENIX THAT";TAB USR C;"LI
VES ON THE 15TH FLOOR";TAB USR C
;"WHEN  next !  IS DISPLAYED,ENT
ER";TAB USR C;"THE WORD OR NUMBE
R YOU WANT TO ";TAB USR C;"USE.Y
OU WILL LEARN THE RULES OF";TAB
USR C;"THE GAME AS YOU PLAY.";TA
B USR C;"Good luck"
 190 PRINT TAB USR C;TAB USR C;"
WORDS:MOVE,HELP,BASH,UP,DOWN,";T
AB USR C;"TAKE,DROP,INFO,SAVE,SN
EEZE.";TAB USR C;TAB USR C;"1=ST
RENGH","2=TREASURE"
 195 PRINT TAB USR C;"3=JEWEL","
4=SPELL BOOK";TAB USR C;"5=KEY",
"6=SWORD";TAB USR C;"7=RING","8=
LIGHT";TAB USR C;"9=SHIELD","10=
WATER";TAB USR C;"11=WAND";TAB U
SR C;"13=ARMOUR","14=CLUB";TAB U
SR C;TAB USR C;
 196 PRINT "PRESS A KEY AND WAIT
"
 200 IF INKEY$="" THEN GOTO 200
 210 RETURN
 215 REM here the levels are set
 220 FAST
 240 FOR N=1 TO 15
 250 FOR I=2 TO 8
 260 GOSUB 90
 270 LET A$(N,A,B)="■"
 280 GOSUB 90
 290 LET A$(N,A,B)="G"
```

```
 300 NEXT I
 310 GOSUB 90
 340 IF N=1 THEN LET A$(N,A,B)=C
HR$ 5
 350 IF N=2 THEN LET A$(N,A,B)=C
HR$ 14
 360 IF N=5 THEN LET A$(N,A,B)=C
HR$ 11
 370 IF N=6 THEN LET A$(N,A,B)=C
HR$ 13
 380 IF N=7 THEN LET A$(N,A,B)=C
HR$ 10
 390 IF N=8 THEN LET A$(N,A,B)=C
HR$ 9
 400 IF N=9 THEN LET A$(N,A,B)=C
HR$ 8
 410 IF N=10 THEN LET A$(N,A,B)=
CHR$ 7
 420 IF N=11 THEN LET A$(N,A,B)=
CHR$ 6
 430 IF N=13 THEN LET A$(N,A,B)=
CHR$ 4
 450 IF N=15 THEN LET A$(N,A,B)=
CHR$ 3
 460 GOSUB 90
 470 IF N=15 THEN LET A$(N,A,B)=
CHR$ 18
 480 GOSUB 90
 490 LET A$(N,A,B)="S"
 500 FOR I=1 TO 5
 510 GOSUB 90
 520 LET A$(N,A,B)=CHR$ 17
 550 GOSUB 90
 560 LET A$(N,A,B)=CHR$ 15
 570 NEXT I
 580 NEXT N
 590 LET N=1
 600 LET L=1
 610 GOSUB 90
 615 LET Y1=A
 620 LET Y2=B
 630 SLOW
 640 FOR I=0 TO 5
 650 NEXT I
 660 PRINT TAB USR C;TAB USR C;T
AB USR C;"YOU ARE ON THE GROUND
FLOOR OF";TAB USR C;"THE DARK TO
WER"
 665 PRINT TAB USR C;"YOU ENTER
THROUGH AN OPEN DOOR";TAB USR C;
"THE DOOR SLAMS SHUT BEHIND YOU"
;TAB USR C
 666 REM input routine
 670 IF USR C=0 THEN GOTO 4900
 675 IF E(1)<200 THEN PRINT "YOU
ARE FEELING TIRED";TAB USR C;
 680 PRINT "NEXT ? ";
 690 INPUT B$
 700 PRINT B$;TAB USR C;
 705 IF B$="" THEN GOTO 680
 710 IF B$(1)="M" THEN GOTO 915
 720 IF B$(1)="H" THEN GOTO 1840
 725 IF B$(1)="U" THEN GOTO 1220
 730 IF B$(1)="B" THEN GOTO 1490
 734 LET B$=B$+" "
 735 IF B$( TO 2)="DO" THEN GOTO
 1270
 740 IF B$(1)="T" THEN GOTO 1660
 750 IF B$( TO 2)="DR" THEN GOTO
 2005
 755 IF B$="SAVE " THEN GOTO 445
0
 760 IF B$(1)="I" THEN GOTO 2100
 770 IF B$( TO 2)="SN" THEN GOTO
 800
 780 FOR I=1 TO 14
 790 IF STR$ I+CHR$ 0=B$ THEN GO
TO 830
 800 NEXT I
 810 GOSUB 190
 820 GOTO 670
 830 IF E(VAL B$)>0 THEN GOTO VA
L B$*100+3000
 840 PRINT "SORRY,CANNOT DO THAT
"
 850 GOTO 670
 880 IF T>0 THEN GOTO 1155
 885 PRINT "YOU HAVE JUST SNEEZE
D"
 890 LET E(1)=E(1)-1
 900 IF RND>.6 THEN GOTO 1620
 910 GOTO 670
 911 REM moves
 915 IF T>0 THEN GOTO 1155
 920 PRINT "WHICH WAY? (N,E,W,S)
.";
 930 INPUT B$
 935 PRINT B$
 940 IF B$="" THEN GOTO 4600
 950 LET A=A+(B$(1)="S")-(B$(1)=
"N")
 960 FOR I=3 TO 14
 970 LET E(1)=E(1)-E(I)
 980 NEXT I
 990 LET B=B+(B$(1)="E")-(B$(1)=
"W")
1000 IF E(1)<1 THEN GOTO 1440
1006 IF A>6 OR A<1 OR B>6 OR B<1
 THEN GOTO 1110
1009 LET D$=A$(L,A,B)
1010 IF D$="■" THEN GOTO 1110
1020 IF Y1=A AND Y2=B THEN GOTO
1200
1030 LET Y1=A
1040 LET Y2=B
1050 IF D$=CHR$ 18 THEN GOTO 181
0
1060 IF D$=CHR$ 15 THEN GOTO 113
0
1065 IF D$=CHR$ 17 THEN GOTO 176
0
1070 GOSUB 3220
1090 IF D$=CHR$ 3 OR D$=CHR$ 15
THEN LET T=1
1100 GOTO 670
1110 IF USR C+USR 16583<>USR C T
HEN PRINT "BONK.YOU HAVE HIT A W
ALL";TAB USR C;
1111 LET A=Y1
1112 LET B=Y2
1120 GOTO 915
1125 REM monsters
1130 LET X=INT (RND*7)*8+1
1140 PRINT TAB USR C;"HERE IS A"
;" WOLF   N EAGLE  TRICORD MUSHM
AN TROG    NUMPIC  GROG   "(X TO
 X+7);TAB USR C;
1150 GOTO 1090
1155 PRINT "WHAT ABOUT THE MONST
ER?"
1190 GOTO 670
1200 PRINT TAB USR C;"PARDON?";T
AB USR C;
1210 GOTO 915
1215 REM stairs
1220 IF T>0 THEN GOTO 1155
1225 IF A$(L,A,B)<>"S" THEN GOTO
 1330
1230 IF E(5)<1 THEN GOTO 1350
1235 IF L=15 THEN GOTO 4430
1240 LET L=L+1
1250 PRINT "YOU HAVE GONE UP THE
 STEPS"
1260 GOTO 665
1270 IF T>0 THEN GOTO 1155
```



```
1275 IF A$(L,A,B)<>"S" THEN GOTO
 1330
1280 IF E(5)<1 THEN GOTO 1350
1290 LET L=L-1
1300 PRINT "YOU HAVE GONE DOWN T
HE STEPS"
1310 IF L=0 THEN GOTO 1370
1320 GOTO 665
1330 PRINT "NO STAIRS HERE"
1340 GOTO 670
1350 PRINT "YOU NEED A KEY"
1360 GOTO 670
1365 REM escaPed
1370 PRINT TAB USR C;TAB USR C;"
WELDONE";TAB USR C;("YOU GOT THE
 JEWEL AND " AND E(3)>0);TAB USR
 C;"£";E(2);" WORTH OF TREASURE
AND YOU";TAB USR C;"GOT AWAY WIT
H ";E(1);" SP$"
1380 PRINT TAB USR C;TAB USR C;"
WOULD YOU LIKE ANOTHER GAME? ";
1390 INPUT B$
1400 PRINT B$;TAB USR C;
1410 IF B$="" THEN GOTO 1380
1420 IF B$(1)="Y" THEN RUN
1425 CLS
1430 RAND USR 16601
1435 REM died
1440 PRINT TAB USR C;"WHAT A PIT
Y,YOU HAVE DIED";TAB USR C;("BUT
 YOU STILL GOT THE JEWEL AND " A
ND E(3)>0);TAB USR C;"YOU GOT £"
;E(2);" WORTH OF TREASURE"
1450 FOR I=0 TO 9
1460 IF USR 16563 THEN NEXT I
1485 GOTO 1380
1486 REM fight
1490 IF T<1 THEN GOTO 4700
1495 LET MS=INT (RND*2000)
1500 LET M=INT (RND*MS)
1505 IF E(13)>0 THEN LET M=M-INT
 (RND*100)
1510 LET Y=INT (RND*E(1))
1515 IF E(9)>0 THEN LET Y=Y+INT
(RND*E(1))
1520 LET X=INT (RND*6)*6+1
1530 PRINT TAB USR C;"OUCH  KICK
  KNOCK BATTERBASH  PUNCH "(X TO
 X+5)
1540 LET E(1)=E(1)-M
1550 IF E(1)<1 THEN GOTO 1440
1560 LET MS=MS-Y
1570 IF MS<1 THEN GOTO 1590
1580 GOTO 1500
1590 PRINT TAB USR C;"YOU KNOCKE
D THAT MONSTER A MILE"
1600 LET T=0
1605 IF A$(L,A,B)=CHR$ 15 THEN L
ET A$(L,A,B)=CHR$ 0
1610 GOTO 670
1620 PRINT TAB USR C;" AND DRAWN
 ATTENTION TO YOURSELF"
1625 LET T=1
1630 GOTO 1130
1640 REM take
1660 IF T>0 THEN GOTO 1155
1670 LET D$=A$(L,A,B)
1675 IF D$=CHR$ 15 OR D$="■" OR
D$=CHR$ 0 OR D$="S" OR D$=CHR$ 1
7 OR D$=CHR$ 18 THEN GOTO 1740
1676 PRINT "OK"
1680 IF D$="G" THEN GOTO 1720
1690 LET E(CODE D$)=E(CODE D$)+1
1700 LET A$(L,A,B)=CHR$ 0
1710 GOTO 670
1720 LET E(2)=E(2)+INT (RND*1000
)
1730 GOTO 1700
1740 PRINT "NOTHING HERE TO TAKE
"
1750 GOTO 670
1760 PRINT TAB USR C;"YOU HAVE F
ALLEN INTO MUSH"
1770 LET E(1)=E(1)-INT (RND*100)
1780 IF E(1)<1 THEN GOTO 1440
1790 PRINT TAB USR C;"BUT YOU AR
E ALL RIGHT"
1800 GOTO 670
1810 PRINT "HERE IS A WIZARD AND
 HE GIVES";TAB USR C;"YOU AN OBJ
ET AND HE SAYS:"
1820 LET A$(L,A,B)=CHR$ (INT (RN
D*11)+4)
1825 LET D$=A$(L,A,B)
1830 IF D$=CHR$ 12 THEN GOTO 182
0
1835 GOTO 1070
1836 REM help
1840 IF RND>.7 THEN GOTO 1990
1950 PRINT "SORRY,NO HELP HERE"
1960 LET E(1)=E(1)-10
1970 IF E(1)<1 THEN GOTO 1440
1980 GOTO 670
1990 GOTO 1820
2000 GOSUB 195
2004 REM drop
2005 IF T>0 THEN GOTO 1440
2010 PRINT "WHICH NUMBER WILL YO
U DROP? ";
2020 INPUT B$
2025 PRINT B$;TAB USR C;
2030 FOR I=3 TO 14
2040 IF STR$ I=B$ THEN GOTO 2080
2050 NEXT I
2060 GOSUB 195
2070 GOTO 2010
2080 IF E(VAL B$)<1 THEN GOTO 45
00
2085 LET E(VAL B$)=E(VAL B$)-1
2090 GOTO 670
2095 REM info
2100 PRINT TAB USR C;"YOU HAVE £
```



```
";E(2);" OF TREASURE";TAB USR C;
" AND ";E(1);" SP$ AND YOU ARE O
N";TAB USR C;"LEVEL ";L
2110 GOTO 810
2120 SAVE "PHOENIx"
2130 RUN
3100 PRINT "YOU HAVE ";E(1);" SP
$"
3110 GOTO 670
3200 PRINT "YOU HAVE £";E(2);" O
F GOLD"
3210 GOTO 670
3215 REM objects
3220 PRINT TAB USR C;"HERE IS A"
;TAB USR C;("PIT OF MUSH" AND D$
=CHR$ 17);("WISE WIZARD" AND D$=
3220 PRINT TAB USR C;"HERE IS A"
;TAB USR C;("PIT OF MUSH" AND D$
=CHR$ 17);("WISE WIZARD" AND D$=
CHR$ 18);("SOLID WALL" AND D$="■
");("SILVER SWORD" AND D$=CHR$ 6
);("GOLD RING" AND D$=CHR$ 7);("
TORCH" AND D$=CHR$ 8);("POSH SHI
ELD" AND D$=CHR$ 9);("BUCKET OF
WATER" AND D$=CHR$ 10);("SILVER
WAND" AND D$=CHR$ 11);("SUIT OF
HEAVY ARMOUR" AND D$=CHR$ 13);("
WOODEN CLUB" AND D$=CHR$ 14);("S
TAIR CASE" AND D$="S");("GRAND P
HOENIX GUARDING A JEWEL" AND D$=
CHR$ 3);("NASTY LOOKING MONSTER"
 AND D$=CHR$ 15);("HOARD OF TREA
SURE" AND D$="G");("BOOK OF SPEL
LS" AND D$=CHR$ 4);(" LOAD OF NO
THING" AND D$=CHR$ 0);("GOLDEN K
EY" AND D$=CHR$ 5);TAB USR C;
3230 RETURN
3240 REM light
3300 PRINT TAB USR C;"THE JEWEL
LIGHTS UP";TAB USR C
3305 PRINT TAB USR C;"NORTH";TAB
 USR C
3310 LET D$=A$(L,A-(A>1),B)
3315 GOSUB 3220
3320 PRINT TAB USR C;"SOUTH";TAB
 USR C
3325 LET D$=A$(L,A+(A<6),B)
3330 GOSUB 3220
3335 PRINT TAB USR C;"EAST";TAB
USR C
3340 LET D$=A$(L,A,B+(B<6))
3345 GOSUB 3220
3350 PRINT TAB USR C;"WEST";TAB
USR C
3355 LET D$=A$(L,A,B-(B>1))
3360 GOSUB 3220
3365 GOSUB 196
3370 GOTO 670
3400 IF T>0 THEN GOTO 1155
3405 PRINT TAB USR C;"THE SPELL
BOOK MAKES SOMETHING";TAB USR C;
" FOR YOU"
3410 LET E(1)=E(1)-INT (RND*E(1)
)
3420 GOTO 1820
3500 GOTO 5100
3600 IF T<1 THEN GOTO 4700
3610 PRINT TAB USR C;"YOUR SWORD
 KILLED THE MONSTER"
3620 GOTO 1600
3700 PRINT TAB USR C;"TO GET OUT
 OF THE TOWER,YOU MUST";TAB USR
C;"GO DOWN THE STEPS ON THE BOTT
OM";TAB USR C;"FLOOR"
3710 GOTO 670
3800 PRINT TAB USR C;"YOU SWITCH
 ON THE LIGHT AND SEE:"
3810 GOTO 3305
3900 GOTO 5100
4000 IF A$(L,A,B)=CHR$ 3 AND T>0
 THEN GOTO 4020
4010 GOTO 5100
4020 PRINT TAB USR C;"WATER HAS
PUT OUT THE PHOENIX"
4030 GOTO 1600
4100 PRINT TAB USR C;"WITH A WAV
E OF YOUR WAND,YOU ARE";TAB USR
C;"ON THE NEXT LEVEL"
4110 IF L<15 THEN LET L=L+1
4120 GOTO 1600
4300 GOTO 5100
4400 IF T<1 THEN GOTO 4700
4405 PRINT TAB USR C;"YOU SURE B
ASHED THAT MONSTER"
4410 GOTO 1600
4430 PRINT "THESE STEPS DO NOT G
O UP"
4440 GOTO 670
4445 REM Place save
4450 IF USR 16583<>USR C THEN PR
INT "START TAPE RECORDER AND PRE
SS";TAB USR C;"NEWLINE WHEN READ
Y.";TAB USR C;TAB USR C;"rem loa
d !xx!";TAB USR C;
4460 INPUT B$
4470 SAVE "Xx"
4480 GOTO 670
4500 PRINT "NOTHING TO DROP"
4510 GOTO 670
4600 PRINT TAB USR C;
4610 GOTO 920
4700 PRINT "NOTHING HERE TO BASH
"
4710 GOTO 670
4800 REM scroll off last words
4900 PRINT TAB USR C;
5000 IF PEEK (PEEK 16396+PEEK 16
397*256+1)<>128 THEN GOTO 4900
5010 GOTO 675
5100 PRINT "YES,YOU HAVE IT"
5110 GOTO 670
```

```
  10 GOSUB 1000
  20 CLS
  30 LET W=0
  35 LET SH=1
  40 LET T=30
  45 LET S=0
  50 LET Z=3
  60 LET R=250
  65 FAST
  70 PRINT AT 1,0;"(32*is)"
  75 FOR L=2 TO 20
  80 PRINT "(is:30*sp:is)"
  85 NEXT L
  90 PRINT AT 20,0;"(32*is)"
  91 PRINT AT 0,0;"..... EN
ERGY"
  95 LET C=10
 100 LET B=10
 105 FOR A=1 TO T
 110 LET X=INT (RND*18)+2
 115 LET Y=INT (RND*29)+1
 120 PRINT AT X,Y;CHR$ 23
 125 NEXT A
 127 SLOW
 130 PRINT AT C,B;"(gh)"
 135 LET C=C+(INKEY$="6")-(INKEY
$="7")
 140 LET B=B+(INKEY$="8")-(INKEY
$="5")
 145 PRINT AT C,B;
 150 LET P=PEEK (PEEK 16398+256*
PEEK 16399)
 155 IF P=23 THEN GOTO 200
 160 IF P=128 THEN GOTO 220
 166 IF P=CODE "(gh)" THEN PRINT
 AT 0,W;" "
 167 IF P=CODE "(gh)" THEN LET W
=W+1
 168 IF W=10 THEN GOTO 230
 170 IF P=58 THEN GOTO 500
 180 PRINT AT C,B;"O"
 185 LET S=S+1
 190 IF S>R THEN PRINT AT 20,10;
"UUU"
 195 GOTO 130
 200 LET Z=Z-1
 205 PAUSE .5
 210 IF Z=0 THEN GOTO 220
 215 GOTO 130
 220 PRINT AT 2,1;"GAME OVER";TA
B 20;"SCORE=";S
 225 STOP
 230 PRINT AT 2,1;;"YOU RAN OUT
OF ENERGY";TAB 15;"SCORE=";S
 235 STOP
 500 CLS
 510 PRINT "YOU COMPLETED SHEET
";SH;TAB 20;"SCORE=";S
 515 PRINT "LIVES=";Z
 520 PRINT "MORE OBSTACLES WILL
NOW APPEAR"
 525 PAUSE 200
 530 CLS
 535 LET W=0
 540 LET T=T+30
 545 LET R=R+175
 547 IF SH>=3 THEN LET R=R+125
 550 LET SH=SH+1
 560 GOTO 65
 570 STOP
1000 PRINT "      MOLE"
1010 PRINT AT 2,0;"YOU STEER YOU
R TUNNELING MOLE,  AVOIDING THE"
"*""AND YOUR OWN      TUNNELS""(g
h)"".IF YOU HIT ONE OF THE""U""S
 YOU CAN GO ONTO ANOTHER    SCRE
EN."
1020 PRINT AT 7,0;"IF YOU HIT A"
"*""YOU WILL LOOSE A LIFE."
1030 PRINT AT 9,0;"IF YOU HIT TH
E BORDER YOU LOOSE ALL YOUR LIVE
S."
1040 PRINT AT 11,0;"IF YOU HIT Y
OUR OWN TUNNEL YOU  LOOSE SOME O
F YOUR ENERGY.      THE SAME IF
YOU STAY STILL."
1050 PRINT AT 15,0;"CURSOR KEYS
TO MOVE.";TAB 10;"PRESS A KEY."
1060 PAUSE 4E4
1070 RETURN
```

STEER your tunneling **Mole** through the ground. Hitting a stone will cause you to lose a life and hitting the border will kill you. If you remain still, or hit your tunnel, you will lose some energy. Eating a worm "V" will move you to another screen.

The program was written for the 16K ZX-81 by Simon Reeve of Chessington, Surrey.

Graphics instructions are given in lower case letters within brackets. A space is represented by 'sp', a graphic character by 'g', and an inverse character by 'i'. Thus 'gh' represents graphic H.

MEXICAN GUNNER

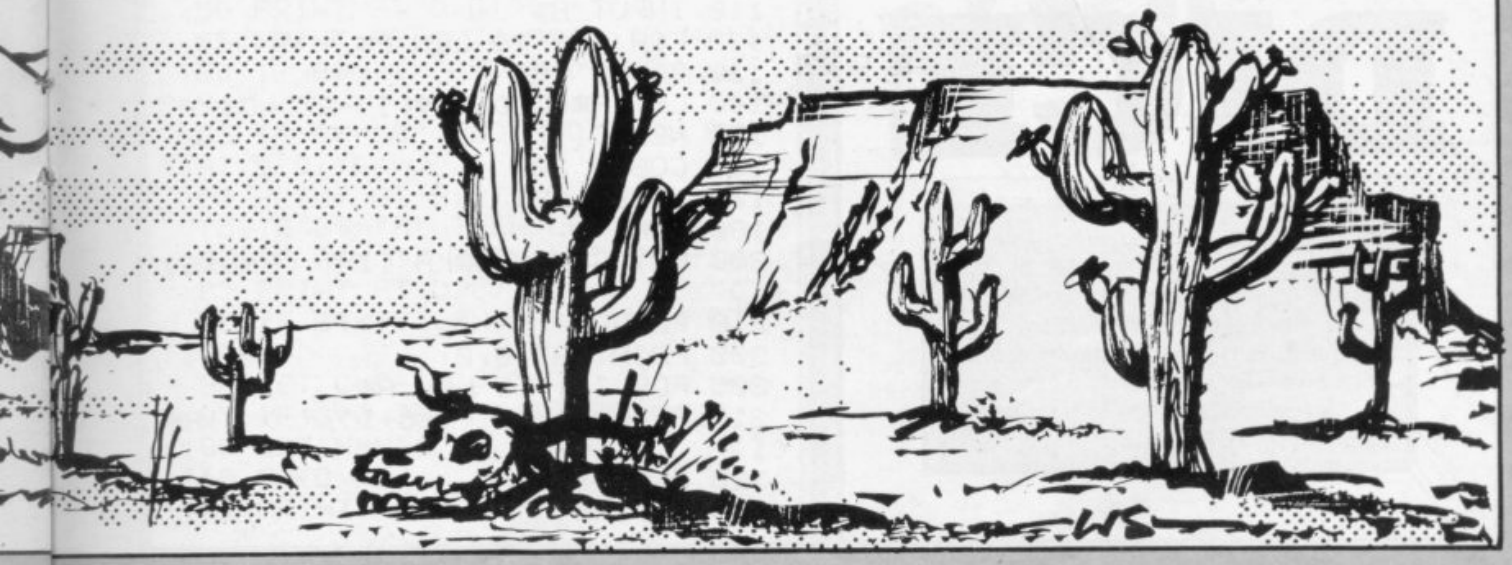
YOU stand in the desert, wearing your sombrero, determined to shoot every cactus in sight. Every time you fire your gun the cacti all move around. You have a time limit within which to clear all the cacti on the screen and if you succeed you gain bonus points. If a cactus lands on top of you, you lose a life.

Mexican Gunner was written for the 16K Spectrum by R Tutton of Rhondda, Mid-Glamorgan.

Underlined letters should be entered in graphics mode.

```
  1 DIM f(30)
  2 DIM 9(30)
  3 GO SUB 320
  4 LET tt=0
 10 PAPER 7: CLS
 20 LET a$="G U N N E R"
 30 LET a=-20
 40 FOR t=1 TO LEN (a$)
 50 PRINT AT 8,t+8; INK 2; FLAS
H 1;a$(t): BEEP .2,a
 60 LET a=a+2
 70 NEXT t
 75 PAUSE 150
 80 FOR t=1 TO LEN (a$)
 90 PRINT AT 8,t+8; INK 7; FLAS
H 0;" ": BEEP .2,a: LET a=a-2
 95 NEXT t
 98 PRINT AT 10,10; INK 1;"by P
.TUTTON": PAUSE 150
100 NEXT t
101 PAUSE 100
102 PRINT AT 10,2; INK 2;"do yo
u want instructions ?"
103 PAUSE 0: IF INKEY$<>"y" THE
N GO TO 110
104 CLS
105 PRINT AT 5,2; INK 2;"you mu
st shoot the "; INK 4;"E";AT 7,2
; INK 2;"with the man "; INK 0;"
A";AT 10,13; INK 2;"KEYS";AT 12,
10;"A - UP";AT 14,10;"Z - DOWN";
AT 16,10;"B - LEFT";AT 18,10;"N
- RIGHT";AT 20,10;"M - SHOOT"
106 PAUSE 300
107 CLS : PRINT AT 10,2; INK 2;
"you have "; FLASH 1;"limited ";
FLASH 0;"time";AT 16,2; FLASH 1
;"bonus "; FLASH 0;"if level cle
ared"
109 GO TO 115
110 IF tt=1 THEN STOP
115 PAUSE 300
120 LET s=0: LET liv=3: LET l$=
"AAA": LET lev=1
130 POKE 23561,8
155 PAUSE 100
160 IF lev=1 THEN LET tot=10: L
ET bon=1000: LET tim=30: GO TO 1
```

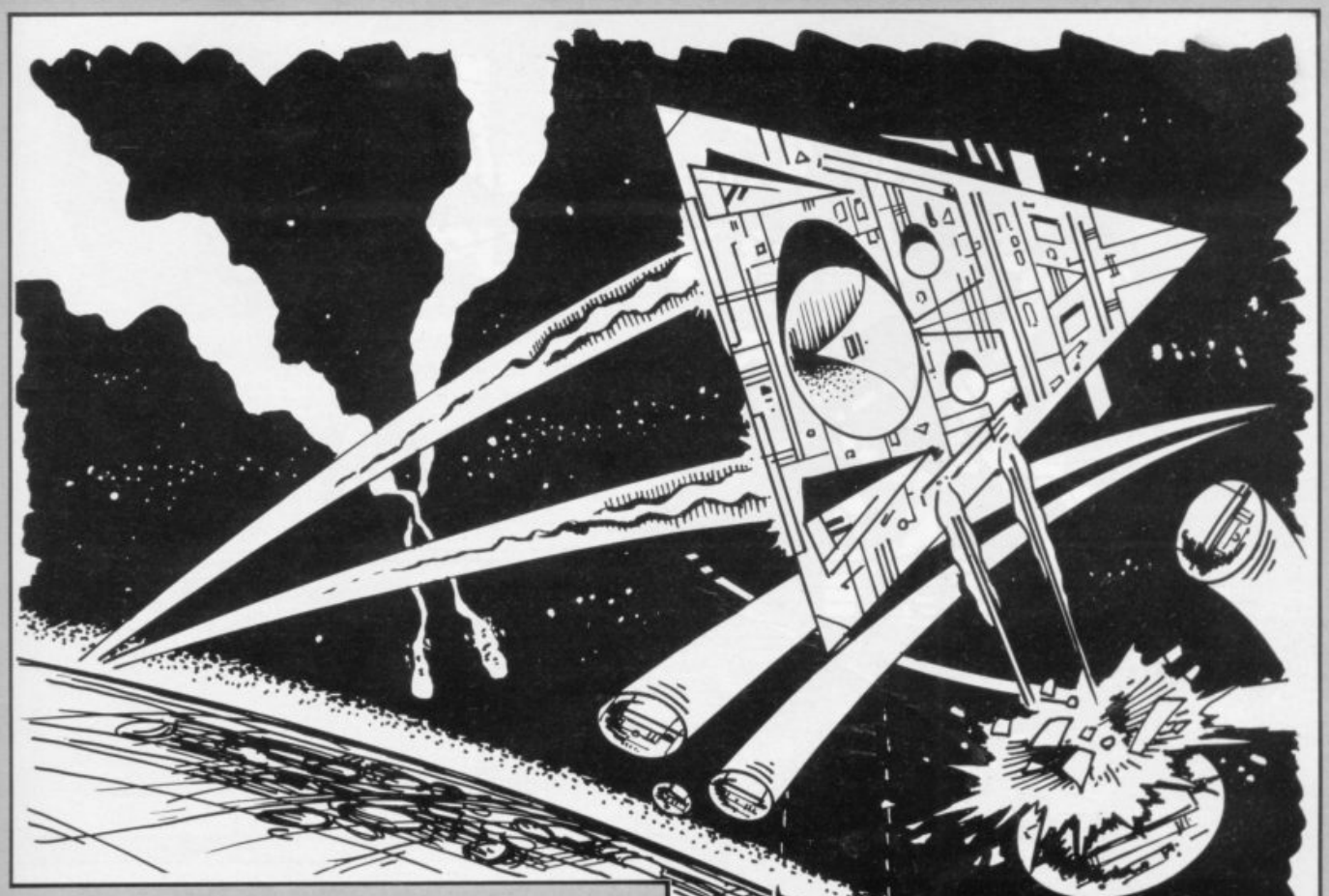
```
000
 170 IF lev=2 THEN LET tot=15: L
ET bon=2000: LET tim=35: GO TO 1
000
 180 IF lev=3 THEN LET tot=20: L
ET bon=3000: LET tim=50: GO TO 1
000
 190 IF lev=4 THEN LET tot=20: L
ET bon=4000: LET tim=65: GO TO 1
000
 200 IF lev=5 THEN LET tot=20: L
ET bon=5000: LET tim=80: GO TO 1
000
 210 IF lev=6 THEN PRINT AT 10,1
0; INK 7;"                    ": PRI
NT AT 10,10; PAPER 1; INK 6; FLA
SH 1;"EXCEPTIONAL": PAUSE 150: G
O TO 4
 320 FOR m=1 TO 5
 330 READ c$
 340 FOR n=0 TO 7
 345 READ x
 350 POKE USR c$+n,x: NEXT n: NE
XT m
 360 DATA "a",124,16,56,63,56,40
,68,130
 370 DATA "b",62,8,28,252,28,36,
6,129
 380 DATA "c",62,8,28,62,28,28,4
2,73
 382 DATA "d",16,16,124,56,124,5
6,72,132
 386 DATA "e",130,84,56,124,56,8
4,130,0
 399 RETURN

 400 PRINT AT 2,1; PAPER 6; INK
1;"SCORE=";s: RETURN
 500 IF liv<0 THEN PRINT AT 10,1
0; INK 3;"                ": PRINT AT
10,10; INK 3; FLASH 1;"HARD LUCK
": PRINT AT 12,10; INK 3;"
  ": PRINT AT 12,10; INK 3; FLAS
H 1;"AGAIN ?": LET tt=1: GO TO 1
03
 510 GO TO 550
 520 STOP
 550 PRINT AT 2,13; PAPER 6; INK
 1;"lives:";"   ";AT 2,19;l$(1 T
O liv)
 600 PRINT AT 2,23; PAPER 6; INK
 1; FLASH 1;"level ";lev: RETURN

1000 PAPER 7: CLS : BORDER 5: GO
 SUB 400: GO SUB 500: GO SUB 600
: LET a=-20
1001 DIM a(30)
1002 FOR n=1 TO 20: LET a(n)=n*1
00: NEXT n

1004 LET t$="A"
1005 FOR t=1 TO 30
1010 PRINT AT 3,t; INK 2;"-": BE
EP .1,a: PRINT AT 20,t; INK 2;"=
": BEEP .1,a: LET a=a+2
1020 NEXT t
1030 PAUSE 50
1040 FOR t=3 TO 20
1050 PRINT AT t,1; INK 2;"H": BE
EP .1,a: PRINT AT t,30; INK 2;"H
": BEEP .1,a: LET a=a-2
1060 NEXT t
1061 LET at=58
1062 LET tot1=tot
1064 LET x=INT (RND*14)+5: LET y
=INT (RND*26)+3
1066 PRINT AT x,y; INK 0;t$: BEE
P .1,3
1067 POKE 23674,0: POKE 23673,0:
 POKE 23672,0
1070 LET a1=(65536*PEEK 23674+25
5*PEEK 23673+PEEK 23672)/50: LET
 a2=(65536*PEEK 23674+255*PEEK 2
3673+PEEK 23672)/50
1071 IF a2>a1 THEN LET a3=a2: GO
 TO 1073
1072 LET a3=a1
1073 IF a3-0>=tim THEN PRINT AT
10,10; INK 7;"          ": PRINT A
T 10,10; PAPER 1; INK 6; FLASH 1
;"TIME OUT": GO SUB 8000: GO TO
160
1075 FOR n=1 TO tot
1080 LET x1=INT (RND*14)+5: LET
y1=INT (RND*26)+3
1090 IF x1=x AND y1=y THEN PRINT
 AT x1,y1; OVER 1; FLASH 1; INK
4;"E": BEEP .5,3: BEEP 1,-2: LET
 liv=liv-1: GO SUB 500: PRINT AT
 x1,y1; FLASH 0; INK 0;t$: GO TO
 2002
2000 PRINT AT x1,y1; INK 4;"E":
BEEP .01,10
2001 LET f(n)=x1: LET g(n)=y1
2002 NEXT n
2005 PAUSE 0
2010 IF INKEY$="m" THEN GO TO 20
20
2012 GO SUB 9000: GO TO 2010
2020 IF t$="A" THEN GO TO 2040
2030 GO TO 2060
2040 FOR q=y+1 TO 29: PRINT AT x
,q; INK 0;"-": BEEP .01,0: PRINT
 AT x,q; INK 7;" ": IF ATTR (x,q
+1)=60 THEN LET a1=x: LET b1=q+1
: GO SUB 2500: GO TO 1070
2050 NEXT q: GO SUB 2550: GO TO
1070
2060 IF t$="B" THEN GO TO 2080
2070 GO TO 2100
2080 FOR q=y-1 TO 2 STEP -1: PRI
NT AT x,q; INK 0;"-": BEEP .01,0
: PRINT AT x,q; INK 7;" ": IF AT
TR (x,q-1)=60 THEN LET a1=x: LET
 b1=q-1: GO SUB 2500: GO TO 1070
2090 NEXT q: GO SUB 2550: GO TO
1070
2100 IF t$="C" THEN GO TO 2120
2110 GO TO 2140
2120 FOR q=x+1 TO 19: PRINT AT q
,y; INK 0;"!": BEEP .01,0: PRINT
 AT q,y; INK 7;" ": IF ATTR (q+1
,y)=60 THEN LET a1=q+1: LET b1=y
: GO SUB 2500: GO TO 1070
2130 NEXT q: GO SUB 2550: GO TO
1070
2140 FOR q=x-1 TO 4 STEP -1: PRI
NT AT q,y; INK 0;"!": BEEP .01,0
: PRINT AT q,y; INK 7;" ": IF AT
TR (q-1,y)=60 THEN LET a1=q-1: L
ET b1=y: GO SUB 2500: GO TO 1070
2150 NEXT q: GO SUB 2550: GO TO
1070
2500 PRINT AT a1,b1; OVER 1; FLA
SH 1; INK 0;".": BEEP 1,10: PRIN
T AT a1,b1; FLASH 0; INK 7;" ":
LET tot=tot-1: LET s=s+a(tot1-to
t): GO SUB 400: LET tot=tot+1: G
O SUB 2550: LET tot=tot-1
2510 IF tot<>0 THEN RETURN
2520 PRINT AT 10,10; INK 7;"
          ": PRINT AT 10,10; PAPER 2
; INK 6; FLASH 1;"BONUS ";bon: P
AUSE 150: LET s=s+bon: GO SUB 40
0: PAUSE 200
2521 PRINT AT 10,10;"
    ": PRINT AT 10,10; PAPER 2;
INK 6; FLASH 1;"END OF LEVEL ";l
ev: PAUSE 200: LET lev=lev+1: GO
 SUB 600: GO TO 160
2550 FOR t=1 TO tot: PRINT AT f(
t),g(t); INK 7;" ": NEXT t: RETU
RN

8000 PAUSE 200: LET lev=lev+1: G
O SUB 600: RETURN
9000 LET x2=x: LET y2=y: PAUSE 0
9005 IF INKEY$="b" AND ATTR (x,y
-1)<>at AND ATTR (x,y-1)<>60 THE
N LET t$="B": LET y=y-1: GO TO 9
040
9010 IF INKEY$="z" AND ATTR (x+1
,y)<>at AND ATTR (x+1,y)<>60 THE
N LET t$="C": LET x=x+1: GO TO 9
040
9020 IF INKEY$="a" AND ATTR (x-1
,y)<>at AND ATTR (x-1,y)<>60 THE
N LET t$="D": LET x=x-1: GO TO 9
040
9030 IF INKEY$="n" AND ATTR (x,y
+1)<>at AND ATTR (x,y+1)<>60 THE
N LET t$="A": LET y=y+1: GO TO 9
040
9035 GO TO 9050
9040 PRINT AT x2,y2; INK 7;" "
9044 PRINT AT x,y; INK 0;t$

9045 BEEP .01,0
9050 RETURN
```



DICE

DICE is a poker dice game for the 1K ZX-81 written by M J Page of Godalming, Surrey. RUN the program then, using your judgment, decide which dice you want re-thrown. To re-throw the dice enter the corresponding letters. To replay the game press NEWLINE.

```
  1 REM  POKER DICE
  3 REM
 10 RAND
 20 DIM A$(5)
 30 FOR I=1 TO LEN A$
 40 GOSUB 200
 50 LET A$(I)=C$
 60 NEXT I
100 GOSUB 300
110 INPUT P$
120 FOR I=1 TO LEN P$
130 GOSUB 200
140 LET A$(CODE P$(I)-37)=C$
150 NEXT I
160 GOSUB 300
170 PAUSE 4E4
180 RUN
200 LET C$="9TJQKA"(INT (RND*6)
+1)
210 RETURN
300 PRINT AT 0,0;
305 FOR I=1 TO LEN A$
310 PRINT CHR$ (165+I);" > ";A$
(I)
320 NEXT I
330 RETURN
```

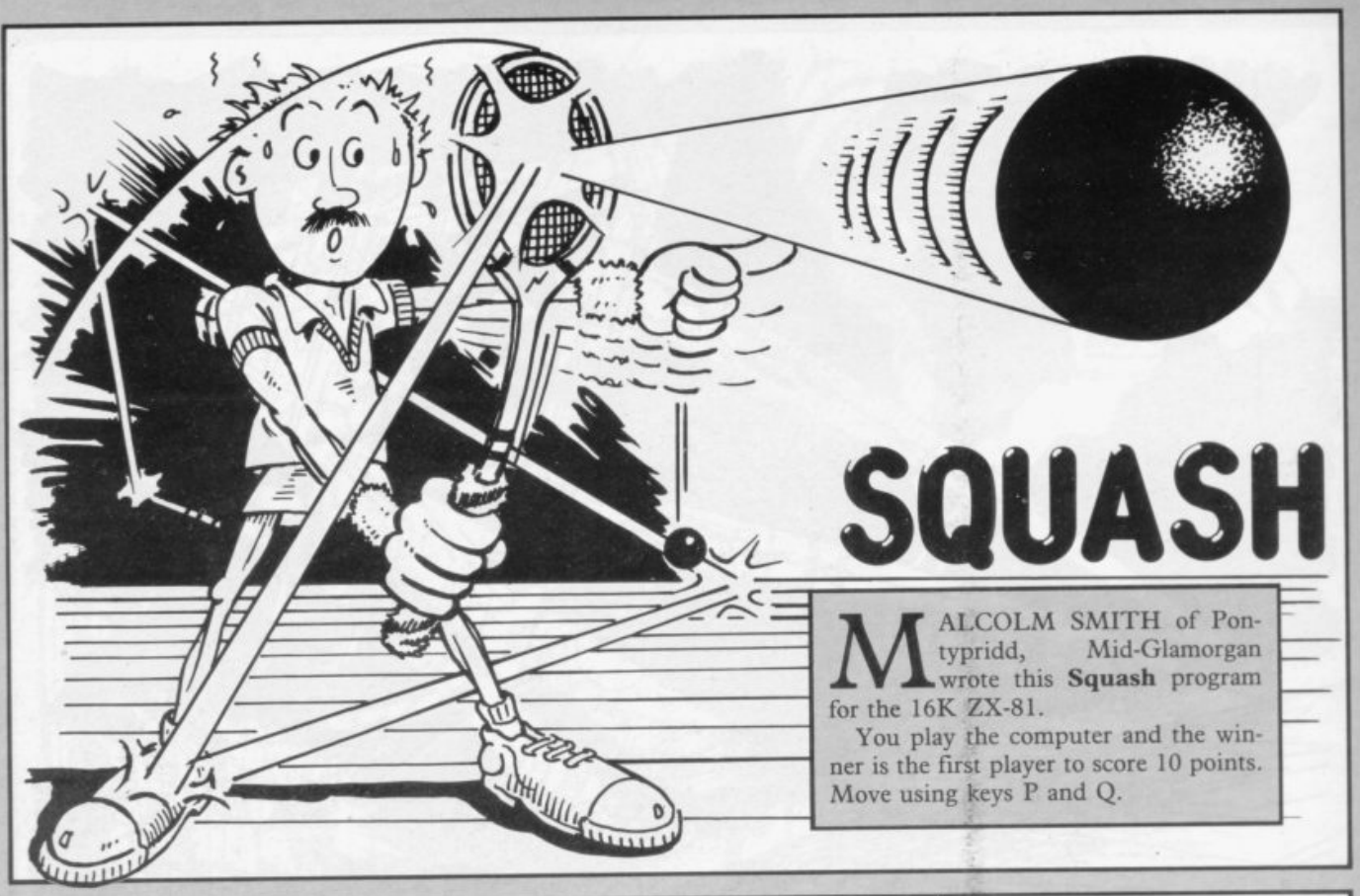


1K DEFENDER

```
  1 REM "DF"
 10 LET A=5
 11 LET N=1
 15 LET B=0
 20 LET S=0
 25 LET A$="(9g'9w'3*sp'98:3*sp
'2*9w'2*sp'96:2*sp:*)"
 26 PRINT AT 11,0;"(12*97)"
 30 LET D=INT (RND*9)+1
 35 LET C=12
 40 IF A$(N+12)="*" THEN LET N=
1
 41 LET B$=INKEY$
 45 PRINT AT A,B;">"
 50 PRINT AT D,C;"(i=)"
 55 PRINT AT 10,0;A$(N TO N+11)
 60 IF B$="0" AND A=D THEN LET
S=S+1
 65 IF B$="0" AND A=D THEN PRIN
T AT D,C;"(9h)"
 70 PRINT AT A,B;" "
 75 IF B$="A" THEN LET A=A+1
 80 IF B$="1" THEN LET A=A-1
 85 PRINT AT D,C;" "
 86 IF B$="0" AND A=D THEN GOTO
 30
 90 LET C=C-1
 95 IF C=0 THEN GOTO 200
100 LET N=N+1
110 GOTO 40
200 PRINT AT 10,20;"SCORE=";S
```

YOU SWOOP over the surface of the planet, shooting at the attacking spacecraft. Do not let any of them pass you, or you will be destroyed. Move up with the "1" key, down with the "A" key, and fire with the "0" key.

This game was written for the 1K ZX-81 by B Kirk of Windermere, Cumbria.



SQUASH

MALCOLM SMITH of Pontypridd, Mid-Glamorgan wrote this **Squash** program for the 16K ZX-81.

You play the computer and the winner is the first player to score 10 points. Move using keys P and Q.

```
  2 LET C=0
  3 LET X=0
  4 LET Y=0
  5 LET M=1
  6 LET L=1
  7 LET H=10
  8 LET F=0
  9 GOSUB 1000
 10 REM ***BUILD COURT***
 15 FOR A=6 TO 14
 20 PRINT AT A,8;"(is P)"
 30 PRINT AT A,19;"(is P)"
 35 NEXT A
 40 FOR B=8 TO 19
 50 PRINT AT 5,B;"(96)"
 60 NEXT B
 65 REM *SCORE AND BAT CONTROL*
 70 PRINT AT 3,0;"SINCLIAR SCOR
E..0"
 75 PRINT AT 1,0;"YOUR SCORE IS
...0"
 80 PRINT AT 15,H;"(is P:97:is P)"
 90 LET H=H+(INKEY$="P" AND H<1
7)-(INKEY$="Q" AND H>8)
 120 PRINT AT 6+Y,9+X;" "
 130 IF L+X>9 OR L+X<0 THEN LET
L=-L
 140 IF M+Y>8 OR M+Y<0 THEN LET
M=-M
 150 LET X=X+L
 160 LET Y=Y+M
 170 PRINT AT 6+Y,9+X;"O"
 180 REM *CHECKS BALL POSITION*
=8 AND ABS (H-X)>=9 THEN GOSUB 2
000
 200 IF Y=8 AND ABS (H-X)=8 THEN
 GOSUB 3050
 210 GOTO 80
1000 PRINT "********** SQUASH *
**********"
1030 PRINT
1060 PRINT "*** FIRST TO SCORE 1
0 WINS ***"
1100 PRINT
1110 PRINT "*USE P AND Q KEYS TO
 MOVE BAT*"
1120 PRINT
1130 PRINT "***PRESS  .P.  KEY T
O PLAY.***"
1140 IF INKEY$<>"P" THEN GOTO 11
40
1150 CLS
1160 RETURN
2000 LET C=C+1
2050 PRINT AT 3,16;C
2060 IF C<10 THEN RETURN
2070 CLS
2080 PRINT AT 10,1;"***** COME O
N TRY AGAIN *****"
2090 STOP
3050 LET F=F+1
3060 PRINT AT 1,16;F
3070 IF F<10 THEN RETURN
3080 CLS
3090 PRINT AT 10,1;"* I WILL BEA
T YOU NEXT TIME *"
```

QUEST

FOR ANY SPECTRUM

SIMPLY THE BEST

THE BLACK HOLE

THE SCENE: Alien spacecraft are using hyperspace drive to enter our universe through a black hole. Their intent is destruction.
YOUR MISSION: To uphold the defence of your universe as long as possible while inflicting the maximum damage on alien forces.
YOUR WEAPONS: Positive and Negative Ion Guns are deadly at any range but the ion stream is bent by the massive gravitational field of the black hole. The Neutron Blaster is equally deadly but has only limited range.
YOUR BATTLE: You are under constant attack from the alien force which pits fiendish offence craft against you in ever increasing intensity, in deadlier and deadlier form.
How long can your fleet of ships survive? How many enemy craft can you destroy?
100% super efficient machine code allows all this action to be packed in to run on the 16K (or 48K) Spectrum. Superb animation, high resolution graphics, incredible explosive and full sound effects combine to make "Black Hole" set a new standard in Spectrum software.
Also features a special learning mode to help develop your skills.
Embedded in the software is our unique score validifier which enables us to introduce a new dimension to computer games. The top ten scorers in each calendar month from April through September will receive a "I'm a Black Hole addict" T-shirt and the chance to compete for prizes to the value of £500 in a championship to be held at the end of the year. We will then publish a list of the top 1000 scorers so you can find out just how good you are.

HOW GOOD ARE YOU? Take up the "BLACK HOLE" challenge NOW and find out. Send £5.50 to QUEST, 119 THE PROMENADE, CHELTENHAM, GLOS GL50 1NW to receive your copy of "BLACK HOLE" by return first class post together with a membership number entitling you to discount on our forthcoming blockbusting software.

Trade enquiries welcome excellent terms available

A NEW DIMENSION IN SPECTRUM SOFTWARE

ZX81 + ZX SPECTRUM SOFTWARE BOOKS

also BBC Micro

Cambridge Computer Store

1 Emmanuel Street
Cambridge CB1 1NE
Telephone (0223) 358264/65334
(closed 12.30 – 1.15 except Saturday)

SOFTWARE LIBRARY

FOR

SPECTRUM

Low-cost weekly hire of Games, Adventures, Utilities and Business Programs.

We have a large selection of software, with licenses from leading software publishers.

- **Membership only £6 for 12 months.**
- **Program hiring from only 80p (plus 25p p&p).**
- **New titles constantly being added.**
- **All titles with publishers permission and royalties paid.**
- **Purchase software at discount prices.**
- **Return of post service.**

Join today by clipping the coupon below, or send S.A.E. for further details.

☐ YES, please send me my free catalogue and selection sheet. I enclose my £6 cheque/Postal Order.
☐ I enclose a S.A.E., please send further details.

NAME .....

ADDRESS .....

.....

..... TEL .....

Send to:

KERNOW SOFTWARE LIBRARY
(DEPT SU)
55 ELIOT DRIVE, ST GERMANS
SALTASH, CORNWALL PL12 5NL

SPECTRUM UPGRADE ONLY

(ISSUE 2 MACHINES ONLY)

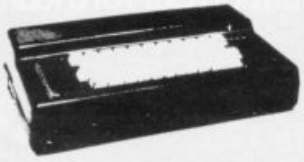
£23·99

incl VAT + P&P

KEYBOARD £29·95

INCL

FOR THE SPECTRUM OR ZX-81. A42 KEY FULL TRAVEL, CASED KEYBOARD WHICH YOUR MACHINE SITS INSIDE, PLUGS IN (NO SOLDERING REQ).



ZX-81

THE BEST AVAILABLE EXPANDABLE RAM PACK AT THESE NEW LOW PRICES!!

16K
£19·50
+45p P&P

32K
£34·00
+45p P&P

The ZX-Panda a specially contour unit designed to eliminate wobble and memory loss, housed in a very attractive case with red LED on/off indication.

ZX-81

ANOTHER REPLACEMENT KEYBOARD. THIS ONE WITH A CALCULATOR TYPE FEEL, PEEL OFF BACKING AND PRESS TO FIT. ONLY £10·00.

SEND NOW TO: **FOX ELECTRONICS**

Please send me:–		
Qty	Item	Total

141 ABBEY ROAD,
BASINGSTOKE, HANTS
Tel: 20671 (0256)
Overseas customers, please add £2.50 P&P.
Send SAE for full catalogue.

SAVE YOURSELF £40 ON ORIGINAL PRICE BY SENDING NOW!!!

Do you own a computor? — Thinking of getting one? — or are you just interested in computors?
WHICHEVER CATEGORY YOU COME UNDER — **THIS OFFER IS FOR YOU**

DO YOU SINCERELY WANT TO BE RICH? WOULD YOU LIKE TO MAKE SOME REAL MONEY JUST WORKING WHEN YOU FEEL LIKE IT

It is a very TRUE saying—"More than half of the People in the World are Asleep"—it is the rest who make the **REAL MONEY**

Let me first of all tell you a little about myself. I am 52 years of age and I am placing this advertisement at a time that is near to my contemplated retirement. I wish retirement in order that I can find time to commence writing my second book, more of this later.

Are you unemployed?—maybe recently made redundant?—or are you just fed up with your work and need a change?—then why not **BECOME YOUR OWN BOSS** and start making some **REAL MONEY** for **YOURSELF**.

CHANGE YOUR WHOLE LIFESTYLE.

THIS WILL BE THE SUCCESS STORY, of not only 1983—**BUT OF ALL TIME**.

Let me tell you—it is not so very long ago that I was BROKE, yes completely and utterly BROKE. The Bank Manager would not even see me for a loan, let alone grant me one, and I was paying off my debts by small instalments to avoid Court Action for Recovery or even Bankruptcy.

We were renting a very small, very old house (since demolished) paying at that time 10/- weekly rent—this sum we had to literally 'scrape' together each week.

We did have (I say **did** have) an old 'banger' of a car, for which I had originally paid £140 on Hire Purchase.

One day along came the Hire Purchase Company Representative to repossess the car—as I then owed them two monthly rentals of £9 each (that was the amount of the monthly rental)—so that was the end of the car and the money paid on it—all lost.

I knew then that I had to do something about this terrible state of affairs—**I KNEW I COULD DO IT**. I had been 'working on' an idea that I had held **SECRET** for many, many years.

Remember—**I WAS BROKE**—in fact, somehow I managed to save the sum of TWO POUNDS (£2) assisted by my wife who had such great faith in me, however just this two pounds to commence—I have never looked back since and I have come a very, very long way, believe me.

I NOW HAVE THREE CARS.

I HAVE A LUXURY HOME and builders have recently completed an extension for me, quite costly of course, it is worth a SIX FIGURE SUM (£100,000) to me now, or if you prefer American Dollars, about $189,000.

My wife, our daughter and myself live very, very comfortably—TO SAY THE LEAST, surely this you now realise.

To give you just two recent examples of my **weekly** payments into my bank account, WORKING PART TIME ONLY REMEMBER—

They were £3,649—THREE THOUSAND, SIX HUNDRED AND FORTY-NINE POUNDS, or if you prefer it in American Dollars, about $6,896.

The second one for £1,836—ONE THOUSAND, EIGHT HUNDRED AND THIRTY-SIX POUNDS, again if you prefer it in American Dollars, about $3,470.

Proofed this paper.

Remember, THESE ARE JUST TWO RECENT WEEKS AS EXAMPLES FOR YOU, working only PART TIME, now are you interested?

This advertisement has been written for YOU—YOU can decide which is best for you—to be broke or to HAVE MONEY—YOU DECIDE, you have my MONEY REFUND INCLUDED of course. There are ONLY TWO KINDS OF PEOPLE IN THIS WORLD—Those who say it can't be done—**AND THOSE WHO DO IT**—like Myself and now, very shortly YOU.

The book I sell is NOT a book of ideas, whereby you have to 'sort out' and secure your own eventual business ideas—It is NOTHING LIKE THAT—it details ONE BUSINESS ONLY at which I've succeeded and at which you will now succeed—it trains you for this ONE BUSINESS ONLY, there is NOTHING ELSE.

I knew what I wanted, when I was down and out—at that time NO ONE WAS INTERESTED IN MY PROBLEMS, this is natural of course—do you know what you want? If it is the ROAD TO RICHES and you SINCERELY wish it, this is for you.

Protect your future and your self respect, whilst at the same time protecting your Family in the future—START MAKING SOME REAL MONEY FOR YOURSELF and STOP DREAMING about it. I've known absolute poverty, been right down, on the floor, it is not very nice—but I DID NOT INTEND TO REMAIN THERE—compare that position with what I have today—apart from my income—THREE CARS—LUXURY HOME—and, Oh Dear so much more than words can ever tell you.

I made all the mistakes, discovered all the pitfalls along the way—**and I paid for them**—none of these will befall you, as you have MY BOOK to guide you and to train you.

Operate entirely from your own Home. No telephone is necessary. No car is necessary. No knocking on doors to sell. Operate solely by post. Every man and woman is a potential customer for you.

Within THREE WEEKS of my commencing on my own, in this business, I can tell you—

I HAD PAID OFF ALMOST ALL OF MY DEBTS AND BOUGHT A CAR, yes within the first THREE WEEKS.

YOU can decide how big you wish to become, it was my intention never to get too large, so I simply 'cut down' and worked only part time, enjoying life to the full and the rest of the time doing whatever I WISHED TO DO, no matter what it was—Fantastic—yes, BUT TRUE.

I make my offer at this time, to enable me to secure more time to write my second book, it will take me at least 12-18 months, but when it is published it will prove to be a sensation, believe me.

It is my intention to pass on the SECRET OF MAKING MONEY to YOU, I KNOW you are already very anxious to learn about it. Even if you are at present employed, you will commence part time, you will soon be presenting your notice to your present employer—TO WORK FOR YOURSELF—remember my own first three weeks—I EVEN BOUGHT A CAR.

Why 'line the pockets' of your employer any longer, start 'lining your own' before you leave it too late. I am not making this offer to MAKE YOU RICH, in order to make myself rich, it is not necessary, you already know why. Working part time, my last financial year shows income well in excess of £70,000 with profits at over £11,000—yes JUST PART TIME, this can be multiplied many times if necessary. For those who wish it, in American Dollars again, this amounts to about $132,300 and profits about $20,790.

I mentioned already that "More than half of the people in the World are Asleep", this is what allows the rest of us (Me and You) to MAKE THE REAL MONEY—because you are about to become one of the AWAKE people—if you WISH TO GROW RICH.

The pessimists say—"It is not possible to succeed on your own any more"—what utter rubbish and absolute nonsense—these people belong to the category that are ASLEEP—believe me, it is easier now than ever it was, but only those who WANT TO MAKE MONEY do so, I KNOW.

I was talking to a Rolls-Royce Owner recently, who said, 'the roads are paved with gold—people just will not help themselves'—it is TRUE you know, it is there for you to help yourself. Just taking, as a small example for you my most recent four years of part time working—on each of those years my income has increased each year over the preceding one—whilst others around me have closed down and gone into Bankruptcy.

Just examine again some of the cash figures I have given you herein, this is only a part, I'm not disclosing everything to you of course, just sufficient to give you an idea of what YOU can now do in my line of business. I started with a capital of just TWO POUNDS.

This offer is made under my MONEY REFUND, it is your GOLDEN OPPORTUNITY OF A LIFETIME TO MAKE MONEY, it is YOUR SUCCESS that matters to me, hence this REFUND OFFER.

Are you prepared to send me just ten pounds (£10) to receive My Book with details of this new business for yourself, you can commence right away. The ROAD TO RICHES awaits you, despatched to your within 48 hours of your order reaching me. Money Refunded if you do not agree and you return to me within 7 days—can I be any fairer than this?

A. W. E. SUMMONS

P.O. Box 30, 8 Dew Street,
Haverfordwest,
Dyfed, Wales.

What have I got to lose. Here is my ten pounds and at the end of the first three months of my new business venture operation, **IF**, I repeat **IF** I've made a clear profit of at least £3,000 I will send you a further £40 completing payment for my book, if I have NOT made this profit, I OWE YOU NOTHING FURTHER, the balance is cancelled—on this understanding and MONEY REFUND here's my tenner.

Name .....

Address .....

.....

..... SU1

STOP PRESS LETTERS PROOFED TO THIS PAPER

Mr. K. P. of Lancs writes: My account for the first two months of operations.

Expenses (all detailed)	£615.15
Income	£3,196.00
CLEAR PROFIT	£2,580.15

He adds—"may I take this opportunity to thank you for introducing me to this most successful business venture. I am confident that it will provide me with financial security for the years ahead."

Mr. R. O. of London writes: How grateful I am in sending you a cheque for £40, for I have made a CLEAR PROFIT of £3,256.86 at the end of my 3 months period of operations, I'm now more confident that my business will provide me with financial security for the years ahead.

'I would like to add that I am very pleased you have introduced me to this profitable venture'. **J. B., Devon**.

'I have been absolutely amazed by the PROFIT I have made from it . . . thanks to YOU'. **P. J., London**.

'I am having good success . **E. H., Yorks**.

© SOFTWARE

SUPER CHESS II

For Sinclair 48K SPECTRUM

THE BEST AT £7.95

● Six levels of play ● Plays a variety of openings e.g. French Defense, Sicilian Defense, Ruy Lopez, Queen's Gambit etc. ● Self play mode ● Analyse mode ● Enhanced end-game play ● Recommended move option.

Specialists in high quality, intelligent games

CP Software

NOW for the JUPITER ACE
Superchess II £11.95

NOW
16k SUPERCHESS £6.95
The best 16k Spectrum Chess program. 3 levels of play with playing strength similar to the 48k version's first three levels. Analyse mode, plays several openings e.g. Queens Gambit, Ruy Lopez, plus more features. Runs on 16k and 48k Spectrum.

*STOP PRESS!
COLOSSAL CAVES
(Adventure 1)
£6.95

ORIGINAL SUPERCHESS
10 levels of play, plus many features
16k ZX81 £4.95 **48k Spectrum £4.95**

ZX DRAUGHTS
10 levels of play, very fast
48k Spectrum £5.95

BACKGAMMON
Very popular
48k Spectrum £5.95

★ SNAIL LOGO
An implementation of turtle style graphics. Regardless of age, SNAIL LOGO is an ideal way to explore the concepts of form and design and to learn the associated programming procedures, or just to have fun creating interesting patterns.
SNAIL LOGO supports standard Logo commands, e.g. Procedures, Repeat, Parameters, Replace, it includes syntax checking and an editor plus other detail features.

★ SPECTRUM FORTH
FORTH – 10 times faster than Basic, much easier than machine code. If you want to discover the advantages of Forth or are already converted, Spectrum FORTH is the ideal package. It is cassette based and includes Spectrum Forth, a sample Forth program and comprehensive user documentation. It has all Forth structures and allows full use of the Spectrum's colour, hi-res graphics. Specify 16k or 48k when ordering.

16k version, about 114 new words can be defined **16k Spectrum £9.95**
48k version, about 1000 new words can be defined **48k Spectrum £9.95**

★ SPECTRUM BRIDGE TUTOR
Improve your Bridge with Spectrum Bridge Tutor. Uses the Acol bidding system including Blackwood and Stayman conventions. Each of the 40 hands illustrates a particular aspect(s) of the bidding and play. Following the card play is an explanation of those aspects highlighted in the hand. The correct bid and play must be made in order to progress but a help feature is included.

For 16k and 48k Spectrum –
Beginners (40 hands) £5.95
Advanced (40 hands) £5.95

★ Speech from the Spectrum 48k
SOFTALK I 'Multiwords' 70 plus words £5.95

SOFTALK II 'Spacegames' 80 plus words £5.95

★ BEEPER AMPLIFIER
Plugs directly to the Spectrum's EAR or MIC socket. Battery powered (not supplied)
£5.95
or SAVE £1 when ordered with any program
Please add 35p for p&p.

UK Prices include post & packing. Despatch within 48 hours of receipt of order.
(For orders outside UK add 80p for postage). Send SAE (8"x4") for catalogue
Send cheque or postal order to:

CP SOFTWARE, Dept. 3su, 17 Orchard Lane, Prestwood, Bucks. HP16 0NN

Also available from:
Buffer Microshop – Streatham, London
Philip Copley – Ossett, West Yorks
Georges – Bristol
Screen Scene – Cheltenham
WH Smith – Computer Branches
ZEDXTRA – Kinsen, Bournemouth
Computers of Wigmore Street, London
Fal-Soft Computer – Falmouth

TOP RATES PAID FOR HIGH QUALITY PROGRAMS – SEND YOUR MATERIAL FOR EVALUATION AND PROMPT REPLY.

campbell systems

THE VERY BEST IN MACHINE CODE FOR THE **ZX SPECTRUM & ZX81**

All programs supplied double-recorded and mailed 1st class by return. Prices include VAT and postage within Europe. SAE for full list.

for 48K Spectrum **MASTERFILE** business/domestic filing and reporting system. So flexible that it is equally usable for your mailing lists, catalogues, stock control, text extracts ..... applications are endless. Fully user-defined data and report display formats, dynamic variable-length file, records and data items. Fully menu-driven with powerful search facilities, sorting, total/average, update, multiple independent files, printing. Yes, we aim to support microdrive when Uncle delivers. Nearly all the 8K we use is machine code, so you get 32K per file. Comes with example file and 22 page manual. £15.00

NEW Masterfile-16 for 16K Spectrum owners. We have produced a subset version of MASTERFILE called MASTERFILE-16. It has most of the features of big MASTERFILE, with 7 pre-defined report formats and 6 pre-defined fields e.g. name, address, etc., and we have found a useful 4500 bytes of file space. MASTERFILE and MASTERFILE-16 are fully 'file-compatible' and will happily process each other's files, so that 16K owners who upgrade to 48K can use their old files immediately. Complete with 12-page manual, priced at £8.95.

PLEASE REMEMBER TO STATE CLEARLY WHICH VERSION OF MASTERFILE YOU REQUIRE.

for 16K Spectrum **GULPMAN** game of the '.....man' variety with 15 mazes, 4 chasers, laser defence, 9 grades, 9 speeds, demo mode, choice of joystick control. "An extraordinarily good program" raves Boris Allan for Popular Computing Weekly. We think you will agree. £5.95

for 16K ZX81 **GULP 2** almost identical spec to GULPMAN £4.75

for 16-64K ZX81 **THE FAST ONE** is the predecessor to MASTERFILE and is in use all over the world now. Specification is very similar to MASTERFILE. £12.00

Campbell Systems, Dept.(SU), 15, Rous Road, Buckhurst Hill, Essex, IG9 6BL, England. Telephone: 01-504-0589

CS

ASTROLOGY

truly AVAILABLE AT YOUR FINGERTIPS

USER PROMPTING PROGRAMS: merely key in birth information as requested by the computer — READ OUT (and/or PRINT OUT) what is normally the result of many hours of painstakingly tedious and complex mathematical calculations using tables, ephemera, etc.

THE SIDEREAL TIME OF BIRTH.

THE ASCENDANT AND MIDHEAVEN in Sign, Degrees, Minutes, and Seconds for EQUAL HOUSE SYSTEM.

THE SIGNS AND POSITIONS OF THE HOUSE CUSPS in Sign, Degrees, and Minutes for the PLACIDEAN SYSTEM.

THE SUN AND MOON POSITIONS in Sign, Degrees. Minutes and Seconds.

ALL THE PLANETS POSITIONS in Sign, Degrees and Minutes. THE LUNAR NODE — THE PART OF FORTUNE — THE VERTEX, AND A HOST OF OTHER BIRTHCHART INFORMATION AT THE TOUCH OF A KEY.

ZX81 16K

ZOCIAC I ONLY **£10.00**
ZODIAC II ONLY **£8.00**

GIVES YOU THE ASPECTS AND MIDPOINTS

FOR 48K SPECTRUM AND DRAGON 32

ZODIAC F

Full combined program on one cassette

FOR ONLY **£15.00**

Other programs in course of preparation include: PROGRESSING THE HOROSCOPE; RECTIFICATION OF THE BIRTH TIME, etc.

Send orders with cheque payable to

STELLAR SERVICES

8 FIR TREE VALE, LEEDS LS17 7EY

Tel: (0532) 692770

The affordable FORTH

FORTH	: A full implementation of this very fast running language. Ideal for writing fast moving arcade type games. Allows the full colour and sound facilities of the Spectrum to be used. Future Microdrive enhancements will be made available. 48K Spectrum only.		14.95
Chess 1.4	: 10 Levels m/c. Graphic screen display. 16K ZX81 only.		8.95
Invaders	: Very fast m/c action. Includes mystery ship and increasingly difficult screens. 16K ZX81 only.		4.45
Mazeman	: A fast action m/c game that reproduces the spirit of the original. The Spectrum version includes excellent graphics and sound. 16K ZX81 & 16/48K Spectrum.	ZX81 4.45	4.95
Adventure 1	: Based on the original game by Crowther, this game was the start of the Adventure craze. Reviewed Sinclair User.Iss.2. Features Save game routine as the game can literally take months to complete. 16K ZX81 & 48K Spectrum.	ZX81 8.95	9.95

ABERSOFT

7 MAES AFALLEN, BOW ST, DYFED, SY24 5BA

24-hour Ansafone for Access orders on (0970) 828851

Claudia Cooke interviews a West Midlands doctor who is finding ways of using a Sinclair computer to help educate his children

The smiling Spectrum is Sophie's first choice

SOPHIE DENT has found life enriched since the arrival of a Sinclair Spectrum in her home six months ago. It is not that she has spoken of that enrichment but speaking is altogether a problem, since Sophie is only 18 months old.

Her shrieks of delight are sufficient proof as she hurls herself towards the keyboard for another intense session with one of her two programs. Both were written specially for Sophie by her father, Dr Tom Dent, who shares Sophie's enthusiasm for home computers.

His other children, 10-year-old James and Rhian, aged seven, both fell in love with the Spectrum as soon as it arrived. It soon became apparent that the role of onlooker was too much for little Sophie; she wanted to play, too.

At first her father was not sure how he could write a program for Sophie—for pressing specific keys and refraining from resting an elbow on the others is difficult for any baby—but found the answer with two colourful and instantly-rewarding programs which operate whichever key is pressed.

The first allowed Sophie to produce a smiling baby's face on the screen, something with which she could identify and recognise from an early age. Her father, a 35-year-old general practitioner, explains: "Faces are the first things to which a baby responds and understands. It was a happy, smiling face and Sophie loved it".

The second baby-proof program is called Ghastly Graphics and has proved equally popular with the older children. Again, it operates by random pressing of the keys. Gradually it produces a mass of random graphics which eventually will fill the screen in a colourful pattern. Each graphic is accompanied by a note, making a cheerful tune which further captures Sophie's attention.

Dent admits that at that stage the Spectrum is just another toy to Sophie and an expensive one were it not also used by other members of the family.

He is already looking to the future, when Sophie is three or four, and hopes the Spectrum will be able to teach her to read quicker and more efficiently than either he or his wife, 36-year-old Janet, could do.

"The marvellous thing about a computer is that it has infinite patience. Where anyone else might be bored with a reading lesson after half an hour or so, it will carry on until Sophie has had enough; and when children are really interested in something, they can go on for hours.

"The computer also makes things much more fun; learning becomes a game. I have written two educational programs for James and Rhian and they love them. Yet if I showed them the same facts in a book they would tell me to get lost. Books do not tend to be fun".

One of Dent's educational programs is for learning tables, a tedious task for most schoolchildren. Yet James and his

friend both worked their way through the program during my visit with evident enjoyment, not to mention great accuracy.

The other program is on elementary physics, an explanation of the differences between gases, solids and liquids. A simple explanation of each is followed by a simple question to test the child's comprehension of what has just been read. An incorrect answer takes the child back to the relevant text, which may be read again for a better understanding.

There are no pictures, no tunes—only words. Yet the program has proved popular with the children in a way no physics text book could hope to do.

"If you want to know the answer in a text book, you have to look it up each time at the back of the book but here it tells you immediately whether you are correct. It also means you cannot cheat or skip pages as you can do in a book. It is programmed so that you cannot move on until you have understood and answered a question correctly on one particular section".

The Dent family does not use the Spectrum only for serious programs. They use many of the games programs on the market, too, and Dent was forced to admit that he is usually beaten by James.

He sees the implications of the computer generally as far-reaching. Already the health authority at Walsall, where he works in a group practice, has a computer which can recall children for vaccinations more accurately than human labour could do.

There is also the potential for computers to be used in many other forms of recall in medicine, such as women needing regular cervical smear tests.

Dent feels that if individual practices could have their own computers they could prove invaluable in assessing individual practitioners' performances. He has already written a Basic program as an experiment for patient use. It assumes that the patient is complaining of a stomach pain and asks a series of relevant questions to which the patient responds by pressing a key.

The computer assimilates the various responses so that Dent can press another key and be given one or several possible diagnoses.

I was invited to try the program and, being unable to remember the full details of any stomach pain I might have had, caused a rather confusing diagnosis which ranged from dyspepsia to gall bladder trouble. The point was that it

was fun and I think I would have thought so even if I had a pain at the time. It also seemed more private and I could take my time in pinpointing the exact spot of the pain without worrying that the doctor might become impatient.

The program is not something Dent will use with his patients; it is simply a test for himself at this stage.

"I think a computer could become very useful in this field. Certainly it would save some time if a patient were to answer the questions before going in to see the doctor. It is a fact that a doctor, being only human, cannot ask the same questions without some form of bias".

With a computer, a patient is given no hint of an expected answer, or the possible element of surprise at any given answer, but Dent is quick to point out that the computer is not in itself sufficient because it does not see the patient.

"The computer cannot possibly notice that the patient looks more tired than the previous week, for example, or seems to be depressed about something, but it might have a function in producing, very quickly, a list of possible diagnoses for a given complaint".

Dent, who lives with his family and his Spectrum at Streetly, near Sutton Coldfield in the West Midlands, trained as a doctor in London and has been practising at Walsall for five years. One or two of his friends in the area have their own home computers but he says his children know more computer owners than he does.

"By and large, children seem to love them. If they think a computer is fun and it helps them to learn, I cannot see anything wrong. I certainly do not feel it is indoctrination or anything. When a child becomes bored with the computer, he has only to switch it off and walk away".

> 'The computer also makes things much more fun; learning becomes a game'

Dent is hesitant about predicting the success of a computer as a replacement for school because of the social implications.

"It is a good teacher but I think the children would miss school friends, football and so on. We hope that Sophie might learn from the computer to read and perhaps to write before she begins school.

"If there were no school in the area which seemed acceptable to us, I suppose we might consider teaching her at home but that is not the case and, anyway, I think we would make that decision with or without the computer".

At the moment the Spectrum is Sophie's toy, one of many. She understands that to press a key will produce something entertaining on the screen. She does not yet know that it can make a difference which key you press and she certainly does not understand that tapes were not designed for unravelling with a little finger and trailing across the floor but given that she is still a baby, her familiarity with computers should make all those things far easier to learn in the next few years.

Her seven-year-old sister already enjoys entering programs, with a child's unquestioning acceptance of the repetitive details required in instructing a computer—and she started only six months ago.

The Dent family has found a toy, a teacher and a potential secretary all in one. The next stop will be to buy an interface to enable them to use the Spectrum as a word processor.

With an age range spanning one-third of a century, they have found something from which each can benefit. As a family they have been converted.

If readers would like to nominate people for User of the Month, please write to Sinclair User, *30-31 Islington Green, London N1 8BJ giving name, address and daytime telephone number and the reasons for the nomination.*

J. K. GREYE ENTERPRISES LTD

... is a new company, from J.K. Greye, set up specifically to bring you High Quality/Low Cost games for your Sinclair ZX Computers.

THE ARCADIAN

4 Games plus Menu

for th 16/48k SINCLAIR Z SPECTRUM

only **£4.95** incl.

ludes

Invasion · Kamikaze

Minefield · UFO

Games as sold elsewhere for £5+ each, why pay more for less, when you can get all four for the price of one!

The **ARCADIAN** includes games to suit all ages, from 5 to 105

INVASION: Our version of the Classic Arcade Game, surely one of the best around. Includes Full Colour High Res. Graphics, Sound and it's incredibly fast at the end.

KAMIKAZE: If you like Scramble, you'll love this. 16 levels (long ones at that), of tortuously twisting caverns, Missiles, Starmines (which move in between games, so it's never the same next time around), Bases, Fuel Dumps (watch you don't run out of fuel!), and two speeds (difficult and impossible). Definitely a game for those amongst you with a suicidal tendency, when playing games, because you can score even when you crash! (If you can make it past level 8, write and let us know, 'cause that's as far as we've managed!).

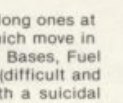
MINEFIELD: A totally new game, in which you have to lay mines in a forest. Sounds simple doesn't it? But, once you start, you can't stop and there lies the rub (or to be more exact the explosion!). Guaranteed to get your fingers in a twist!

UFO: Dodge the Asteroids, blast the Alien Craft and work off your aggressive instincts on the keyboard. Gets progressively more difficult the longer you last!

All of these for only £4.95, can you afford to miss out on this one!

ZX81 GAMESTAPES as previously sold by J.K.Greye Software ltd.

GAMESTAPE 1 for 1K _____ **only £3.95**
10 Games incl. ASTEROIDS, UFO, CODE, BOMBER, GUILLOTINE, KALIEDESCOPE, etc.
PROBABLY THE BEST VALUE 1k TAPE AVAILABLE.
We've done in 1k, games which some of our competitors require 16k to do!



GAMESTAPE 2 for 16K _____ **only £3.95**
★ **STARFIGHTER** Superb machine code Space Battle. Set against a background of twinkling stars, with stunning explosions — if you can hit the enemy!
PYRAMID Can you move the Pyramid? Make a mistake and it will collapse! A thinkers game.
ARTIST The ultimate Graphic Designers aid. 8 Directions, 10 Memories, SAVE, COPY, RUBOUT, CLS, etc.

GAMESTAPE 3 for 16K _____ **only £4.95**
★ **CATACOMBS** A Multi-Level Graphics Adventure. Each level can contain up to 9 Rooms, 8 Passages, 7 Monsters, Food, Gold, Traps, Phantoms, an Exit (to the next level), and there's an infinite number of levels.
NOTE .....This is NOT one of the necessarily limited text Adventures as sold elsewhere.
"An excellent addictive game which will keep you amused for hours".....COMPUTERS & VIDEO GAMES.

Send your order to: **J.K.GREYE ENTERPRISES LTD. 16 Park St. Bath BA1 2TE**

Please tick boxes of required tapes.

The ARCADIAN at £4.95 ☐
GAMESTAPE 1 at £3.95 ☐
GAMESTAPE 2 at £3.95 ☐
GAMESTAPE 3 at £4.95 ☐

All Software sold subject to the condition that Hiring, Lending, Unauthorised Copying or Resale is Strictly Prohibited

Name .....

Address .....

..... Postcode .....

I enclose a cheque/P.O. for £.....
made payable to **J.K. GREYE ENTERPRISES LTD.**

TRADE & EXPORT ENQUIRIES WELCOME

PROGRAMMERS! Do you think you can write brilliant games Software for the spectrum? If so, contact us and we'll market it for you. If you don't think your games are the best around, try the other Software Houses, because we will only sell the best!

If you prefer to see before buying, our range of Gamestapes are stocked by W.H.Smith, John Menzies and good computer stores Nationwide

---

SINCLAIR OWNERS READ THIS FROM OCP

You've probably heard about MACHINE CODED PROGRAMS and thought "so what! How can they help me?"

Well now you can find out and taste the very real difference by purchasing our latest MACHINE CODED programs. These emulate features of the most modern professional computers (12 years writing machine coded programs for IBM, ICL, UNIVAC and Sinclair means we know what we're talking about).

Just read the specification and you'll see what we mean.

MACHINE CODE TEST TOOL

The ultimate professional tutor and de-bug program, we wrote this to help us write our own programs.

- **TEST** and display machine code instructions as they're written.
- **IDEAL** for both the novice and the expert.
- **FULLY** documented with a 32 page tutorial
- **HEX:DECIMAL** conversion as standard.
- **CHARACTER GENERATOR** — of unbelievable quality!!! supplied free with the Spectrum version.

Available for the 16K ZX81 and 16/48K Spectrum.

SPECTRUM CHESS

Dare you face The Turk

The original Turk was an eighteenth century automaton, a life- size mechanical figure resplendent in Turkish costume and seated behind a wooden cabinet on which a chess board and pieces were placed.

OCP now offer you the twentieth century equivalent of that Turk — a chess-playing computer program.

The Turk challenges you to a game of chess!

MANY OPTIONS INCLUDE:

- 6 LEVELS OF DIFFICULTY
- DEMONSTRATION MODE
- BOARD EDITOR
- GAMES PRINTOUT FACILITY
- BLITZ CHESS AGAINST THE CLOCK
- TWO PLAYER MODE
- UNFINISHED GAMES CAN BE STORED
- RECOMMENDED MOVE

FULL INSTRUCTIONS PROVIDED

ADDRESS MANAGER.....

Works on the 16K and 48K Spectrum, in 48K it will store, file, select and retrieve over 400 full addresses (over 1500 individual names); Dynamic Memory Management and compression techniques makes all this possible and there's a lot more:

- **FULL SCREEN INPUT and EDITING** — see it as a page as it happens with insert, delete and TAB Commands.
- **MULTIPLE INDEXING** — 3 way user-defined index enables you to define, catalogue, select and print entries as needed, (essential for the more sophisticated applications.)
- **INSTANT RESPONSE** — yes, this program is very very fast.
- **SUPER FRIENDLY** — crash-proof, extremely easy to use and efficient in a way that BASIC can never be.

MANY USES

- **AT HOME** — (storing addresses, printing out Xmas Card lists etc.)
- **AT WORK** — for mail-order work, internal telephone directory, sorting customers into types, areas, size . . . you choose.
- **CLUBS** — print-out members list, sort different categories etc.

MACHINE CODE..IT MAKES ALL THE DIFFERENCE.....

Post order to: Oxford Computer Publishing Ltd., P.O. Box 99, Oxford.

Please rush me: ADDRESS MANAGER at £8.95 each. ☐ Spectrum only.
CHESS THE TURK at £8.95 each. ☐ Spectrum only.
MACHINE CODE TEST TOOL at £9.95 each.

Tick box for edition required: ☐ ZX81 ☐ Spectrum

Send cheque, postal order or ACCESS No. to above address. Or telephone order with ACCESS No. to (0753) 888866

NAME: .....

ADDRESS: .....

..... POSTCODE: .....

Available from most branches of **W H SMITH** and other retailers

OCP

Push your Sinclair to the limit

ZX81/SPECTRUM ARCADE GAMES

NEW **ZX INVASION FORCE** (ZX81)
Use your skill to fire through the energy band to destroy the menacing alien ship — **£3.95**

NEW **SPEC INVADERS**
SPEC GOBBLEMAN
These exciting high-speed classic games incorporate hi-resolutiongraphics and sound to bring you the best in arcade action at only **£4.95** each (16/48K)

NEW **SPEC FROG 5/SHOWDOWN** (16/48K)
Hop across the dangerous road avoiding the lethal cars, then lorries. Go back to the wild west for a gunfight battle amongst cacti and wagons. Features include western music. **£4.95**

NEW **NAMTIR RAIDERS** (ZX81)
High speed, quick action arcade game with four separate groups of attackers. **£3.95**

Gobbleman also available for ZX81 at **£3.95**

UTILITIES

NEW **TOOLKIT**
Nine powerful new functions for your ZX81 (including re-number lines (goto, gosub), program merge, string finding and replacement. **£5.95**

SPEC BUG
A 30 in 1 machine code tool and disassembler for your ZX Spectrum. **£6.95**

ZX BUG
A 30 in 1 machine code tool and disassembler for your ZX81. **£6.95**

Improve your machine code programs with this new 48K Spectrum Assembler

Just released by Artic, this new professional quality assembler is also available for 16K ZX81 and features:—

* Word-processor-like text editor. * High-speed, versatile two-pass mnemonic assembler with labels and detailed error-trapping. Will assemble to any address. * Essential support facilities such as memory-edit, register inspect/modify and search for de-bugging. * Full output to ZX-printer. * Memory-status report and comprehensive user-manual.

ONLY **£9.95**

ZX81 & SPECTRUM

NEW LOW PRICE ADVENTURE GAMES

ONLY £5.95 for ZX81 and £6.95 for SPECTRUM

INCA CURSE (Adventure B)
In a jungle clearing you come across an ancient Inca temple. Your mission to enter, collect the treasure and escape alive. But beware! Includes a cassette save routine.

SHIP OF DOOM (Adventure C)
You are unavoidably drawn to an alien cruiser. Can you reach the control room and free yourself? Or will they get you first? Includes a cassette save routine.

ESPIONAGE ISLAND (Adventure D)
While on a reconnaisance mission your plane loses control and you are forced to land. Can you survive and escape with the island's hidden secret?

PLANET OF DEATH (Adventure A) 16/48K
You find yourself stranded on an inhabited alien planet. Can you reach your ship and escape?

also available for SPECTRUM

ZX FORTH
Supplied on cassette with editor cassette, user manuals and keyboard overlay. ZX Forth combines the simplicity of basic with the speed of machine code now **£14.95**

THE ULTIMATE ADVENTURE FOR THE SPECTRUM/ZX81 for only £9.95

AND THE CHANCE TO WIN £10,000 or more IF YOU KRAKIT™

RULES AVAILABLE FROM ARTIC

Your eccentric father has left you £10,000 in his will. In order to claim your windfall you must solve twelve clues and gain access to a bank account in which the money has actually been deposited. Be the first to crack the puzzle and the prize is yours! Plus you will win two tickets to the city of the secret KRAKIT™vault location. The Prize money is increased weekly. A telephone number will be supplied so you have the opportunity to find out just how much you could win.

DON'T MISS YOUR CHANCE TO WIN A FORTUNE!

SPECTRUM MICRO CHESS

The only Chess program for a 16K or 48K Spectrum. Allows all legal moves, castelling; en-passant and pawn promotion.
Options to play black/or white. Sets board in any position. Full colour and graphics display.

ONLY **£6.95**

new releases for 16K & 48K SPECTRUM

SPECTRUM INVASION FORCE

A popular arcade game for 16K or 48K Spectrum. Fires through the force field to destroy the menacing alien ship. Sounds easy?? Two levels of play — normal or suicidal. Full colour. Sound and hi-res. graphics.

NOW ONLY **£4.95**

A GREAT CHESS GAME FOR YOUR ZX81 OR SPECTRUM*

*SPECTRUM CHESS 48K

ZX CHESS I
Very popular machine code program, with six levels of play and an analysis option. Available for ZX81. **£6.50**

ZX CHESS II
A new improved version, with a faster response time, seven levels of play, analysis option and in addition a recommended move option. **£9.95**

ZX 1K CHESS
An incredible game in 1K for only **£2.95**

As featured on ITV

NEW **SPECTRUM VOICE CHESS**

This incredible program talks you through your game.
It tells you its move, recommends a move, and contains a range of facetious comments. The game is based on the highly successful ZX Chess II and is offered at the Christmas offer price of £9.95.

SPECTRUM CHESS now only **£9.45**

ALWAYS AHEAD WITH ZX81/SPECTRUM SOFTWARE

Cheques & P.O. made payable to: Artic Computing Limited. Dealer enquiries welcome.
Please state whether your order is for ZX81 or Spectrum. Send S.A.E. (6in × 9in) for catalogue.

VISA

ARTIC COMPUTING LTD.
396 JAMES RECKITT AVENUE,
HULL, N. HUMBERSIDE,

To: Artic Computing Ltd., 396 James Reckitt Avenue, Hull, N. Humberside, HU8 0JA.

Please supply.....

.....

.....

Cheque for total amount enclosed.

Name.....

Address.....

.....

SU6

NEW RELEASE FROM IMPULSE SOFTWARE

SHOCK WAVE

A compelling game for ZX Spectrum 16K & 48K on one cassette

Price £4.95 including P&P

ALSO

We are official Mail Order Suppliers of
NEW GENERATION SOFTWARE

3D Tunnel 16K/48K £5.95 including P&P

Escape 16K £4.95 including P&P

Order direct from:—

IMPULSE MARKETING SERVICES
31 & 32 THE COLONNADE
PIECE HALL
HALIFAX
WEST YORKSHIRE

SPECTRUM COMPILER

For both 16K and 48K

Almost any BASIC program can be speeded up, by a factor of up to several hundred times. It will produce machine code which can be located at any address.

Handles nearly all BASIC commands. Some of the features unique to this compiler are:

1. Noise generator (explosions, gunshots)
2. Mini sprite graphics
3. Selected Screen Scrolling
4. Special BEEP commands
5. Special INPUT statement and normal INPUT statement
6. Fill the screen with current attributes, and many more, too numerous to mention

All this for only £7.99 both versions

We have a number of original machine code games under development, which will use the full HI RES graphics and sound facilities of the compiler. These will be coming shortly.

Send PO/Cheque payable to:
WYE VALLEY SOFTWARE,
PARTON HOUSE, KINNERSLEY,
HEREFORDSHIRE

How Good is your Spectrum

If you're interested in finding out what your Spectrum can really do then you must go beyond the limitations of BASIC. Now, mastering machine code can be a reality with CRYSTAL COMPUTING'S MACHINE CODE UTILITIES.

Zeus Z80 Assembler

If you own a 48K Spectrum and want to exploit the potential of your computer to the full then Zeus is the ideal introductory aid. There has never been an easier way to enter and modify your machine code programs.

For the beginner, Zeus is the perfect companion for the serious machine code programmer.

- Over 65,000 multi-statement lines.
- Auto-line numbering.
- List, search through, re-number and delete any section of the text.
- Full screen editor - simply move the cursor up into the program listing for instant user definable tab stops.
- User Manual - with detailed explanations of assembler terminology and all Z80 commands.

Zeus is simply the fastest and most flexible Z80 programming system available today. The high speed two pass assembler accepts all Z80 mnemonics and features:

- Tokenized text maintained separately from BASIC.
- The ultimate in error trapping with extensive report codes.
- Operators, expressions, directives and comments.
- Up to 14 character alphanumeric labels and symbols.
- Hex, decimal or character constants.
- Optional parallel output to ZX printer.

For the experienced user, Zeus offers a wealth of features including:

- 9 invaluable monitor support facilities, including memory modify and a hex/decimal converter.

The Zeus Z80 operating system - more than a piece of software - an investment.

Available NOW from Crystal Computing.

Spectrum Monitor & Disassembler

A superb memory editor, monitor and disassembler to enable easy entry, inspection and analysis of your machine code routines. Fast debugging is aided by breakpoint, register display, block print and tabulate, block copy, verify, a unique jump relative calculator and a versatile find command which displays all occurences of a specified set of bytes. Plus insert message, substitute, output to ZX printer and more. Accepts input in decimal or hex and there's even a command to convert between the two forms.

A machine code system designed to provide all the facilities you'll ever need.

This utility has been designed as the perfect compliment to Zeus. Having both co-resident in memory turns your Spectrum into a truly comprehensive Z80 programming unit. Now you can explore the excellence of your computer and open up a whole new world of programming.

Each utility comes complete with user manual for just £8.95 each.

ZX-81 Superfast Load & Save

Our Monitor and Disassembler as available for the 16K ZX-81 also includes commands to LOAD and SAVE any block of memory (including BASIC programs) at up to FOUR TIMES normal speed!...only £7.95

Alternatively, try our own range of exciting and original ZX games:

COSMIC GUERILLA

Bring your Spectrum to life with the most infuriatingly difficult arcade style action around.

As commander of the earth's last line of defence, your task is to zap wave after wave of marauding alien attackers as they obliterate the protecting force field in an attempt to overrun your supply of ion laser cannons.

Four game variations, six levels of difficulty on each, full sound effects plus the smoothest hi-res colour graphics you've ever seen for endless hours of action packed fun all for just £5.50.

The Dungeon Master

Let the 48K Spectrum be your guide into a new dimension in adventures with the first program to enter into the spirit of traditional role playing games. Two programs on one cassette. The unique **DUNGEON CREATION PROGRAM** helps you build up your own complex scenarios simply and quickly.

Then, with the **DUNGEON MASTER**, create your character and battle your way through an infinity of fantasy worlds.

Complete with detailed manual and sample 140 location dungeon. The only adventure you'll ever need to buy for just £7.50.

Merchant of Venus

Have you the wit and reflexes to control a leviathan space freighter from lift-off to touch-down?

Have you the business head to trade successfully throughout the length and breadth of an entire planet?

Find out by becoming a

Where a complex economic scenario is combined with a superb graphic simulation to produce an entirely new concept in real time adventures.

By studying the current market and wheeling and dealing in Cyborgs, Robodrones and much more, you must plan your business strategy.

But ultimately your success depends on your ability as a pilot: from lift-off as you thrust skyward... during flight as you control your ship's flight over mountains, lakes and oceans, to landing where your destiny is displayed in incredible graphic detail. A compelling game of skill and strategy for the 16K ZX81. £5.50.

ZX 81 Games Pack

...simply brilliant. Seriously recommended for 16K RAM pack owners. Interface, Fep 831, 4 full screen, fast action graphics games all with on screen scoring. Invaders, Asteroids, Bomber and Super slalom, plus a challenging adventure, dungeon quest.

All 100% machine code to run on the unexpanded ZX81. Great value at £4.50.

Written any software? Send it to us for evaluation and details of our excellent royalties scheme.

Send sae for our latest catalogue.

P & P included. Please make cheques/PO's payable to Crystal Computing.

dealer enquiries welcome

Crystal Computing
2 Ashton Way
East Herrington
Sunderland SR3 3RX

ZX SPECTRUM 48K GAMES

voyage to another world with

NEPTUNE

COMPUTING

VELNOR'S LAIR **ONLY £6.50 inc P&P**

Can you find and destroy VELNOR and so prevent his evil reign of terror on earth?
*You can be a wizard, warrior or priest.
*Use spells such as polymorph, teleport, fireball, heal, shield and dispel undead as well as relics of powerful magic.
*Collect treasures and objects to help you on your quest.
*Encounter vampires, mummies, goblins, orcs, trolls and other creatures too vile to speak of.
*Score, save game facility and full documentation.

STAR TREK **ONLY £4.95 inc P&P**

A great new version of the popular classic
All the usual features plus
*Automatic short range scan
*Galaxy chart
*Anti-matter bombs
*Klingon attacks on starbases
*Graphic warp
*Excellent use of colour graphics and sound
*New rank at end of mission
*9 levels of play

GENEROUS TRADE DISCOUNTS

Post coupon to NEPTUNE COMPUTING, 98 HOWE STREET, GATESHEAD, TYNE & WEAR NE8 3PP.

Please rush me copies of
☐ **VELNOR'S LAIR** ☐ **STAR TREK**

I enclose P.O./CHEQUE for £ . . . . .

NAME .....

ADDRESS .....

.....

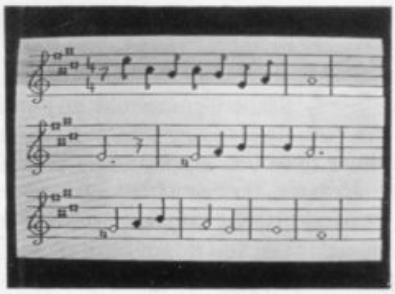
ORDERS DESPATCHED WITHIN 24hrs BY 1st CLASS POST

MUSIC MAKER

NEW

FOR 48K SPECTRUM

PLAY AND COMPOSE MUSIC

- Real musical notation
- Easy to use
- 11 major keys

£5.75

FOR EXPERTS AND BEGINNERS

To: Bellflower Software, 6 Rosewood Avenue, Greenford, Middlesex

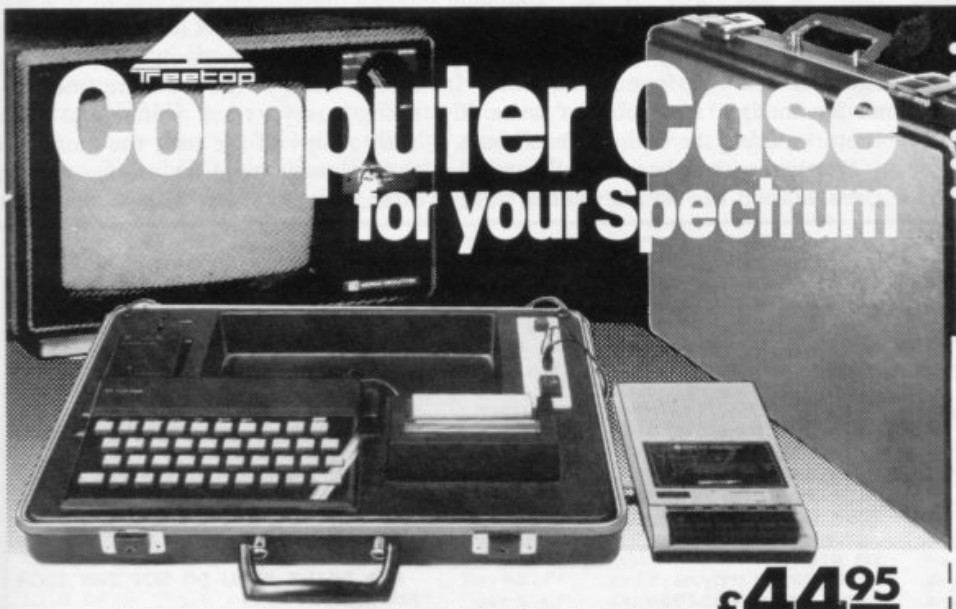
Please send me ..... Music Maker cassette(s). I enclose a cheque /postal order for £ ..... payable to Bellflower Software.

Name .....

Address .....

.....

SU2



- **Solves storage problems**
- **Computer angled for convenient use**
- **Avoids lengthy setting up**
- **Hides most of wiring**
- **Case and console moulded in black grained ABS plastic**

Treetop Designs, 61 Widmore Road, Bromley. Kent. BR1 3AA.

£44.95 (plus p & p)

Smart executive type case, purpose built, with locks, special hinges and lift-off lid.

Internal console allows neat installation of computer, power supply and printer in fitted recesses. Provision for housing tape recorders up to 28cm x 15cm.

Aluminium switch panel eliminates constant removal of plugs for both save/load and power off facilities and provides sockets for tape recorder leads, to allow operation in convenient position shown.

All internal wiring and leads supplied to allow easy plug-in installation.

Case lid fitted with shock absorbing foam to protect components when closed and with retaining straps for neat storage of mains and T.V. aerial leads.

To: Treetop Designs
Freepost, Bromley, Kent. BR1 3UZ

Please supply _____ cases at £47.45 each (incl. p&p and insurance)

My cheque/P.O. for £ _____ is made payable to Treetop Designs

PLEASE PRINT NAME AND ADDRESS

Mr/Mrs/Miss

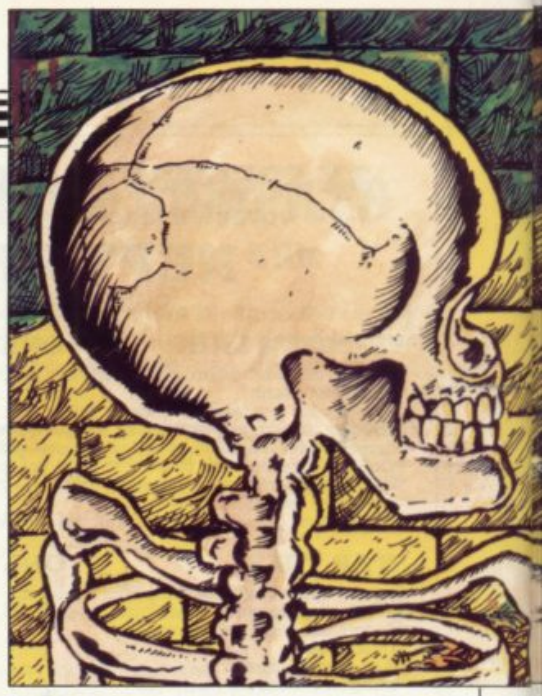
Address

Please allow up to 28 days for delivery.

If you are not satisfied we shall of course refund your money, if you return the case undamaged within 14 days.

Putting the brains into monster heads

Following our series on Basic programming Donald Hughes devises ways of building yourself a game with simple intelligence.



HOW MANY TIMES have you wished you could write adventure programs? How many times have you started, only to cease an hour later, frustrated by the awful complexity? If the answer to the second question is too many times, you are probably approaching the problem from the wrong end.

An adventure game should be split into two parts — the brain and the adventure.

The brain is the interactive part of the program which communicates with the adventurer, answers queries, picks up items and drops them. The adventure can then be rendered into data suitable for the brain.

The brain is a loop, normally large, which uses a READ statement to take data for the adventure from successive DATA statements. Normally the brain program will run its course once per adventure location, so when a location is left, it draws new data from the adventure. Using such a brain, each adventure location can be stored in one DATA statement of set format.

You must start by deciding what initial intelligence the brain will have. I recommend you do not aim for anything more intelligent than the simple example. The example brain understands only one word at a time and they must be keywords. If the command given is not a keyword, the brain is so unreceptive that it proceeds merrily along as if it had found a keyword. It works, though, and you can write adventures, using the brain, in two hours.

Starting with a brain similar to the example, you can add keywords slowly until it is reasonably intelligent, and you can have complex adventures, but start simply, or you will find yourself trying to debug a program which does not work far enough for you to find the bugs, let alone see what is not correct; and it will be back to the frustrations.

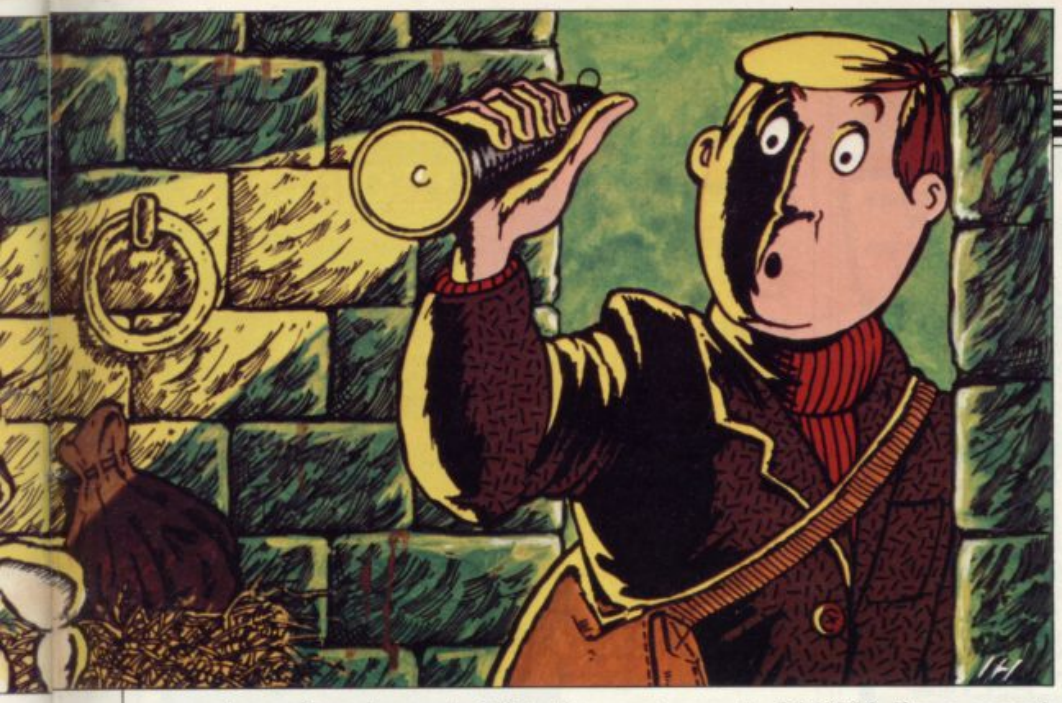
Do not expect your first brain, or the example, to run adventures of a professional standard; that is not the aim — it is to let anyone starting on a Spectrum have fun with programs they thought were only in the realm of professionals.

A simple brain operates in this way. The text of the first location is read in; the number of items in a room is read in; the items in the room are read into a string array, then printed-out along with a copy of the text; the monster in the room is read in, along with its strength. Logically, before the player

List of variables used in the program.

T$	=text
rc	=number of items in a room
A$	=array of room contents
M$	=monster name
M	=monster strength
W$	=answer to fight/run option
C$	=command word
C	=used in loops
Z	=used in loops
S	=your strength
F$	=answer in fight routine
Y$	=answer in take routine
d$	=answer in drop routine
e$	=exit direction

```
 10 LET s=350
 15 DIM y$(10,10)
 20 LET N=0
 95  REM basic first view
 97 CLS
100 READ t$
105 IF t$="end" THEN GO TO 9900
110 PRINT t$
120 PRINT "IN THIS ROOM THERE I
S"
130 READ rc
135 DIM a$(rc,40)
140 FOR q=1 TO rc
150 READ a$(q)
160 PRINT a$(q)
170 NEXT q
180 REM monsters
190 READ m$,m
195 IF m$="none" THEN GO TO 265
200 PRINT "YOU SEE A ";m$;"."''
DO YOU WISH TO FIGHT/RUN (F/R)"
210 INPUT w$
220>IF w$="f" THEN GO TO 450
230 IF w$="r" THEN PRINT "BY WH
ICH EXIT DO YOU WISH TO MAKE YOU
R ESCAPE"
240 INPUT e$
250 GO TO 430
260 REM return fromfight
270 PRINT "YOU MAY NOW TAKE OR
DROP AN ITEM OR YOU MAY LEAVE"
280 INPUT c$
290 IF c$="take" THEN GO TO 570
300 IF c$="drop" THEN GO TO 620
315 IF c$="leave" THEN GO TO 41
0
320 IF c$="inve" THEN GO TO 820
330 PRINT "USE COMMANDS TAKE ,D
ROP,INVE,LEAVE"
340 GO TO 280
400 REM
410 PRINT "IN WHICH DIRECTION"
420 INPUT c$
430 GO TO 9000
440>STOP
450 REM fighting
460 PRINT "THE ";m$;" HAS ";m;"
STRENGTH PTS,DO YOU STILL WISH
TO FIGHT"
470 PRINT "(Y/N)"
480 INPUT f$
490 IF f$<>"y" THEN PRINT "BY W
HICH EXIT DO YOU WISH TO MAKE YO
UR COWARDLY ESCAPE"
495 IF f$="y" THEN GO TO 510
500 GO TO 240
510 LET s=s-(m*(RND+1))
520 IF s<=0 THEN PRINT "HA HA ,
YOU ARE DEAD,BYE"
525 IF s>0 THEN GO TO 540
530 GO TO 440
540 PRINT "THE ";m$;" IS DEAD"
550 GO TO 260
560 REM taking
570 PRINT "WHAT DO YOU WISH TO
TAKE"
575>LET N=N+1
580 INPUT Y$(n)
582 IF N>=5 THEN PRINT "YOU MUS
T DROP AN ITEM BEFORE YOU MAY TA
KE AGAIN"
600 PRINT "YOU MAY NOW CONTINUE
"
610 GO TO 270
620 REM dropping
630 PRINT "WHAT DO YOU WISH TO
DROP"
635 DIM d$(10)
640 INPUT D$
650 FOR C=1 TO N
660 IF d$=y$(c) THEN GO TO 710
670 NEXT c
680 PRINT "YOU DO NOT OWN SUCH
AN ITEM"
690 PRINT "TRY AGAIN"
700 GO TO 630
710 FOR z=c TO n
720 LET y$(z)=y$(z+1)
730 NEXT z
735 LET n=n-1
740 PRINT "O.K."
750 PRINT "DO YOU WISH TO TAKE
AN ITEM (y/n)"
760 INPUT C$
770 IF c$<>"y" THEN GO TO 600
780 PRINT "WHAT ?"
790 LET n=n+1
800 INPUT y$(n)
810 GO TO 600
```



may take an item he must defeat the monster. Once the monster is dead, the brain asks what function is required. The functions understood are:

Take — to pick up an item.
Drop — to drop an item.
Inve — produces an inventory.
Leave — leaves the room.

Those instructions, combined with an imaginative adventure, are sufficient to entertain.

The brain then asks a question, depending on the keyword used. For example, What do you want to take? Type-in, e.g. "sword". What do you wish to drop? Type-in, e.g., "coin". If INVE was used, the brain prints-out an inventory.

When LEAVE is typed-in, the brain asks in which direction. That is merely for show as, when a direction is typed-in, it PRINTS "you are going to the next room"; PAUSES for a second; CLEARS the screen; and RESTARTS THE LOOP, reading in the next portion of DATA.

One of the first improvements to the brain you should make is a way of flipping through the DATA to find any adventure location, so one can go N., S., E., W. The example brain suffices without that.

In writing adventures, first examine the listing. The brain is obvious, lines 95 to 850. Remove the data statements, 1000 to 8000. Insert your own data, in this form:

1000 DATA "A", X, "B", "B", "B", "M", S

A is text describing the room; X is the number of items in the room and must be equal to the number of strings following it; B is a string, an item in the room; M is the name of the monster; S is the strength of the monster. Should you not want a monster, type-in the DATA positions for M and S "none", 0

Try typing-in the adventure below into your Spectrum and playing it to see the possibilities, within the limitations, of even a simple brain. You should have plenty of fun. After that, write your adventure for it. Real beginners should be very careful when typing-in the adventure; a bug will make itself immediately and annoyingly apparent.

To use the brain on a ZX-81, you will have to circumvent the "who needs READ statements" problem.

Combat works this way; your strength is S; monster strength is M. In combat, this operation takes place

LET S=S-(M*(RND+1))

which means a random figure varying between M and nearly M*2 is removed from your strength in defeating the monster. For different adventures, different Ss can be given, so only by choosing carefully what to fight can you win.

SCORE SHEET

Due to the limitations of the brain, here is how to score your performance in this adventure:

If you cheated with the priests, 0; if you took the heavenly being, 0; if you died, 0.

You should have with you a sword, bag of coins, box of coins, ruby and Spectrum — the most valuable item.

If you have all five, excellent; only four, good; only three, fair; only two, bad; only one — have you not played an adventure game previously?

```
815 REM inventory
820 FOR C=1 TO N
830 PRINT y$(c)
840 NEXT c
850 GO TO 600
1000>DATA "You have entered the
dun9eon of desPair.Many adventur
ers have    failed before you,wil
l YOU       succeed? After travel
lin9 for    many days you found t
he          forbidden entrance ,a
nd entered  within.This room is a
n entrance  hall with one exit,no
rthwards.   The room is torchlit,
and         somewhat dank and mus
ty.",3,"A TORCH","A COIN","A SWO
RD","ORC",30
1010 DATA "This room has one exi
t,          eastwards.A 9old key
is lyin9    on the floor,it mi9ht
 be         valuable.Bear droPPin
9s cover    most of the north cor
ner.A ba9   of coins is lyin9 amo
n9 the      Pile of straw in the
west        corner.",2,"Key","Ba9
","GRIZZLY !",80
1020>DATA "You are in an antecha
mber ,the   skeleton of a less fo
rtunate     adventurer lies on th
e floor.    Exit is westwards.",1
,"Goat muck"," weedy 9oat",4
1030 DATA "These are the PRIESTL
Y chambers,9arments for various
ceremonies  litter the floor and
wall        han9ers.Exits are nor
thwards.",1,"a richly embroidere
d robe"," DRUNKEN PRIEST",10
1040>DATA "An endlessly lon9 cor
ridor       stretches off towards
 infinity,  suddenly you are suck
ed down it  at breakneck sPeed by
 a          whirlwind . You are d
ePosited    in a heaP in a small
cubicle.    Exits are westwards."
,4,"A box of coins","A Pair of m
a9ic sPectacles","A toy Poodle",
"A ruby"," mad Mathematician arm
ed with a ma9ic Pencil",90
1050>DATA "You have entered a hu
9e hall ,   exit in the east,some
 sort of    sacrificial rite seem
s to be in  Pro9ress hundreds of
            EVIL PRIESTS line the
 walls.     Unless you fancy bein
9 the       victim ,follow these
instruc-    tions: If you have th
e richly    embroidered robe ,you
 just run   from the PRIESTS.If y
ou do not   have the robe ,you MU
ST choose   to fi9ht them.",1,"No
thin9 you could sneak Past the P
RIESTS.","Horde of evil PRIESTS"
,400

1060>DATA "This is a small room,
exit to thenorth,servin9 as a to
ilet for    desPerate Priests.One
 of them    has droPPed a letter
with <400   tins of corned beef ,
Please>     written on it",2,"Pri
estly Offerin9s !!!!","a letter"
,"Sewer rat",20
1070 DATA "You are now in 9uite
a lar9e     room,exit north,a loo
ny is       Playin9 with ZXsPectr
um and      seems to be enjoyin9
himself     enormously,it will ne
ver catch   on you say to yoursel
f.",1,"ZXsPectrum","loony",45
1080>DATA "A heavenly fi9ure rea
ches out    to you and says,Well
my son,let  us see how you have d
one then.   Get an inventory,writ
e down      what you have,then le
ave the     dun9eon,and compare y
our         inventory with the sc
ore sheet.  Exits are OUT.",1,"Th
e heavenly beinq","none",5
8990 DATA "end"
9000 PRINT "you are 9oin9 to the
 next room"
9002 PAUSE 200
9003 GO TO 95
9010 STOP
9900 PRINT "YOU HAVE REACHED THE
 END OF THIS ADVENTURE GOODBYE"
9910 PAUSE 200
9920 CLS
9930>PRINT "(32*ISP)"
```

Illustration by Ivan Hissey

EDUCATIONAL COMPUTING

on the

ZX81

Suit children ages 5-11

No comparable collection offers so much for so little

strongly recommended by educational authorities

Fifty high-quality programs to turn your ZX81 or Spectrum into a powerful educational tool.

And you don't even need to know programming. There are clear instructions and plenty of tips & advice. Designed to go beyond drill & practice the promote learning through interaction & discovery.

Almost all programs work on the **SPECTRUM**

All programs fit 1K

Creative use of graphics

Many innovative ideas

Fully documented

Includes many games

Educare's

50

1K PROGRAMS for PRIMARY EDUCATION

Includes:-

TORTOISE
A simplified version of the famous Turtle programme

CODED MISSILE
Combines the fun of arcade games with learning

£5·95 only
paperback 110 pages
plus Spectrum supplement

Graph-plotter ● Histogram ● Simon-spell ● Sketchboard ● Times-table ● Sets
Series-quiz ● XY-coordinates ● Count ● Equations ● Areas ● Guess-a-Volume
Angles ● Upstairs-Downstairs ● Music-notes ● See-saw ● Wipe-out ● Spell
Temperature ● Clock ● Money ● Snake
Mastermind ● Number-shoot ● +26 more **EDUCARE**

To: EDUCARE, 139a Sloane St, London SWIX 9AY

Please send me.....copies Educare's 50.
I enclose cheque/postal order for £.....
Name.....
Address.....

Let your child benefit early - Send now

Roman Empire

For details of this great wargame for your computer, your attention is drawn to the review on page 35 of April *Sinclair User*. Can you do better than the reviewers and win at level 3?
ZX-81 16K £4.50
Spectrum 16K £5.50

OTHER TITLES

Tyrant of Athens
(As reviewed in December 1982 *Sinclair User*).

Samurai Warrior
ZX-81 16K £4.50 each title
Spectrum 16K £5.50 each title

Peloponnesian War
ZX-81 16K £4.50

Privateer
(A real time naval encounter at the time of Nelson).
Dual Purpose Cassette — combines.
ZX-81 16K and 48K Spectrum versions.
Price Only £4.50

LOTHLORIEN

Latest Release for the Spectrum 48K Warlord

This challenging game is now available for the **48K Spectrum.** You can now discover your abilities both as an absolute ruler of a fortified village and also as a military ruler. Can you defeat the pirates at sea before they capture all your merchant ships whilst at the same time conquering all the forces of 5 other Warlords which are ranged against you?
ZX-81 version is text only, **Spectrum, Dragon, and Tandy** versions feature **graphics maps** for sea battles and full supporting **graphics for land battles.** 3 levels of play, each one a challenge not to be missed.

Prices: ZX-81 16K £4.50 Spectrum 48K £5.50

Authors . . . if you have written a wargame (any historical or futuristic period is of interest) which is good enough to publish then contact us **First. We are the computer wargames specialists.**

Access number, cheques or PO's please payable to:

M. C. LOTHLORIEN
Dept. SU6, 4 Granby Road, Cheadle Hulme, Cheshire SK8 6LS
or from good computer software shops

If you're a *serious* Sinclair user — why don't you stop playing games?

If you need a new challenge that doesn't involve saving the universe from destruction, beating off green monsters or flying a spaceship — we can bring you down to earth with stimulating, practical projects for the ZX81 and Spectrum in **Sinclair Projects** magazine!

In recent issues we have shown how to use your Sinclair for controlling your central heating . . . improving the graphics . . . build a printer interface . . . and many more ideas that tax your ability and ingenuity.

Sinclair Projects is published every two months as a glossy, instruction-packed magazine that gives you all the encouragement you need to exercise your talent and take a serious look at what your Sinclair can do for you.

Each issue can contain as many as FIVE step-by-step projects — yet it's yours for JUST 95p. So if you want a break from playing games, make sure you order YOUR **Sinclair Projects** from your newsagent today — or fill in the form below and we will send it direct to you, six times per year.

Mail to: ECC Publications Limited: 30-31 Islington Green, London N1 8BJ Yes — I'd like to subscribe to Sinclair Projects (6 issues — price £6.60 including P&P) I enclose a cheque for £ _____
Please charge my credit card: Card name _____ Number _____
Name _____ Address _____
Signature _____ Date _____
NB This offer applies to UK subscribers only. Overseas rates available on request.

University Software

LIBRARY OF ADVANCED MATH/STAT/ECON

TAPE 1: MATRIX OPERATIONS — **SPECTRUM £6.95, ZX81 £5.95**

Side A: Inversion, multiplication, addition, subtraction and scalar multiplication of matrices and vectors within one single program. Any output can in turn be used as the input of the next operation without re-typing. Capacity: 16K ZX81: 25×25, 16K Spectrum: 17×17, 48K Spectrum: 48×48.
Side B: Determinants of square matrices.

TAPE 2: POLYNOMIALS — **SPECTRUM £6.95, ZX81 £5.95**

Side A: Includes quadratic equations (as degree 2 polynomials) and Newton-Raphson and half-interval search methods for higher degree polynomials. Computes the roots with 8 digits of precision.
Side B: You can plot polynomials in any interval and examine their roots, extremum points.

TAPE 3: INTEGRATION — **SPECTRUM £6.95, ZX81 £5.95**

Side A: Integration of functions by Simpson's and trapezoidal rules. Also computes the area enclosed by two functions.
Side B: Plot of integrals. Integration can be visualised on the screen.

TAPE 4: REGRESSION — **SPECTRUM £7.95, ZX81 £6.95**

Side A: A highly developed multivariate regression program featuring Log/Ln option on each variable (thus allowing exponential and geometric regressions), R^2, corrected R^2, standard errors, t-statistics, F-statistics, degrees of freedom, Durbin-Watson statistic, interpolation. Capacity (no of variables × no of observations); 16K ZX81: 2×500, 5×250, 10×140, 16K Spectrum: 2×220, 5×100, 10×50, 48K Spectrum: 2×1800, 5×900, 10×500.
Side B: Plot of bivariate regressions. You can see how your computer draws a best-fitting line on a set of numbered data points.

TAPE 5(a): LINEAR PROGRAMMING — **SPECTRUM £7.95, ZX81 £6.95**

Side A: A user friendly optimisation program capable of handling all sorts of linear programming problems (any combination of $<, =, >$, constraints and $x_j>$, $x_j<0$, $-\alpha < x_i < \alpha$ sign constraints). Features the cannonical equivalent of the primal, values of slack variables and the dual. Capacity (no of variables × no of constraints); 16K ZX81: 10×23, 15×20, 20×15, 16K Spectrum: 10×10, 48K Spectrum: 10×50, 25×40, 50×30.
Side B: Solutions of simultaneous equations.

TAPE 5(b): PROFESSIONAL LINEAR PROGRAMMING — **£14.95**

Available for 16K ZX81 and 48K Spectrum with above features plus 'save-data' and 'change-data' facilities. Any single data entry can be changed without re-typing the whole data.

- Cheques payable to: UNIVERSITY SOFTWARE, 29 St Peter's Street, London N1 8J9
- All incl. prices for the UK.
- Tapes 1 – 5(a) Spectrum £35, ZX81 £30

ZX81-16K/DRAGON 32/BBC A+B
SPECTRUM 16/48

ADVENTURE 200 (16k)

OVER 200 PLACES to explore. Written in machine code and using advanced data compression techniques it squeezes a true fixed-map adventure into just 16K – all held in ram – no extra cassette reads or books of text. Unlike a randomly generated maze type game this is a real test of your tactical skill. It starts easy but the further you progress the more dangerous and difficult the problems become as you use objects around you to overcome obstacles and evade enemies! More like a thriller than an arcade game – and you are the hero! Flexible command format allows abbreviations and multiple word lines.

Other games from Foilkade include:-

AWARI – Ancient African game of logic

FANTASTIC VOYAGE – (ZX81 16K only) Real-time simulation of micro-sub in human body. Real vascular map and fast m/code graphics.

THE FOILKADE CHALLENGE: Buy both Adventure and Awari and enter our prize competition. SAE for details.

All games £5.95 inc. 2 for £9.95 3 for £13.95

£1000 IN PRIZES

FOILKADE LTD

'SU5' 66 LITTLEDEAN, YATE, BRISTOL BS17 4UQ

New from ...

MIKRO-GEN

SPECTRUM "" Software

COSMIC RAIDERS (16K) £5,95

You — the only remaining pilot of the "Earth Defence Fleet" — have the daunting task of defending the Earth from attack by alien beings that have already set up a base of their own on earth.

*** Radar Scanner display in hi-res ***
*** Full colour and sound effects ***
*** From the author of Spectrum 'Scramble' ***
*** 100% machine code ***

SPACE ZOMBIES (16K) £5,95

Shooting through space you are ambushed by a fleet of Space Zombies flying at you in formation, swooping and diving at you. Destroy them, if you can! But in destroying them, you attract more to the area, and the game gets progressively harder.

*** Full screen hi-res graphics ***
*** 1 or 2 players * Joystick option ***
***Full sound and colour ***
***Three playing speeds ***

MINES OF SATURN and RETURN TO EARTH £5,95

(16K) Text Adventure

Mines of Saturn While piloting a routine orbit of Saturn, you are caught up in a radiation storm which forces you into the giant planet's rings. Your energy drained, you make a forced landing on the planet's surface. Luckily you crashed near an abandoned mining base and you set off in search of some di-lithium crystals to refuel your stranded space ship. Can you do it?

Return to Earth Having escaped from your previous dilemmas, you reach Earth Station 1, but fail to make radio contact. You effect a safe if harrowing manual ducking. On entry you find it deserted, and the control room destroyed. You must explore the station and find some way to alert Earth of your predicament, but beware, many of the rooms are identical, there is extensive damage, and signs of alien intruders.

Graphic Adventure (48K)

MAD MARTHA £6,95

Poor little Henry is the hen-pecked hero of this domestic tale. One night he can take no more. He steals his wages from his wife's purse, sneaks out of the house being careful not to wake the baby or trip over the cat, and heads for the bright lights to have some fun. Trouble is he runs out of money. His only way to raise some cash is to gamble his few remaining pounds on the spinning wheel of the roulette table. Just as Henry is getting into his evening his wife — Mad Martha — has noticed his absence. Realising Henry has absconded with the housekeeping she sets out after him with an axe. Guess what part you play in this happy tale? That's right, you're Henry. Watch out for that axe!

Access or Visa Card holders please telephone (0344) 27317 (9am-6pm)

Please add 40p per order for post & packing

Name _____ Address _____

☐ Cosmic Raiders ☐ Space Zombies
☐ Mines of Saturn/Return to Earth ☐ Mad Martha

MIKROGEN, Dept SU, 24 Agar Crescent, Bracknell, Berkshire, RG12 2BK

ORWIN SOFTWARE: ZX81 CASSETTES

THE BEST SOFTWARE (BY VARIOUS AUTHORS) AT LOW PRICES

"Michael Orwin's £5 Cassette Two is very good value. It contains 10 stolid well designed games which work, offer plenty of variety and choice, and are fun."

Your Computer, May '82

"Michael Orwin has built a reputation for value-for-money software and his Cassette 4 offers quantity as well as quality."

Sinclair User, October '82

"If each game was on a separate tape and selling for £5 each I would still recommend them. But all on one for £5 . . . ! This sort of value for money just has not been seen before on any personal computer."

"Without sounding pushy I would like to conclude this review by saying — if you have a ZX81 and like games, then you should buy Michael Orwin's cassette 4."

2 extracts from *ZX Computing*, Oct/Nov '82

"Eight games, including an excellent version of the Scramble arcade game, three-dimensional noughts and crosses, dropping bombs on sprouting plants and a western style shoot-out. Easy to operate, graphically impressive and good value for money."

The Times, Saturday 11th December 1982
(*about Cassette 4*)

CASSETTE 1
(eleven 1k programs)
Machine code:
React, Invaders, Phantom aliens, Maze of death, Planet lander, Bouncing letters, Bug splat.
Basic:
I Ching, Mastermind, Robots, Basic Hangman. PLUS Large screen versions of Invaders and Maze of Death, ready for when you get 16k.
Cassette One costs £3.80

CASSETTE 2
Ten games in Basic for 16k ZX81
Cassette Two contains Reversi, Awari, Laser Bases, Word Mastermind, Rectangles, Crash, Roulette, Pontoon, Penny Shoot and Gun Command.
Cassette Two costs £5.

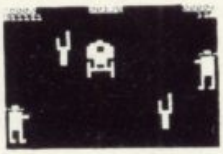
CASSETTE 3
8 progams for 16k ZX81
STARSHIP TROJAN

Repair your Starship before disaster strikes. Hazards include asphyxiation, radiation, escaped biological specimens and plunging into a Supernova.
STARTREK This version of the well known space adventure game features variable Klingon mobility, and graphic photon torpedo tracking.
PRINCESS OF KRAAL An adventure game.
BATTLE Strategy game for 1 to 4 players.
KALABRIASZ World's silliest card game, full of pointless complicated rules.
CUBE Rubik Cube simulator, with lots of functions including 'Backstep'.
SECRET MESSAGES This message coding program is very txlp qexi jf.
MARTIAN CRICKET A simple but addictive game (totally unlike Earth cricket) in machine code. The speed is variable, and its top speed is very fast.
Cassette Three costs £5.

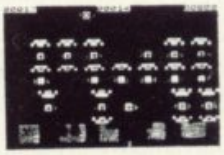
CASSETTE 4 **8 games for 16k ZX81**

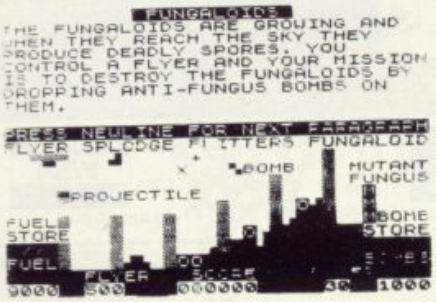
ZX-SCRAMBLE (machine code) with 3 stages.
Bomb and shoot your way through the fortified caves.

GUNFIGHT
(machine code)



INVADERS
(machine code)





GALAXY INVADERS (machine code)
Fleets of swooping and diving alien craft to fight off.

SNAKEBITE (machine code)
Eat the snake before it eats you. Variable speed. (very fast at top speed).

LIFE (machine code)
A ZX81 version of the well known game.

3D TIC-TAC-TOE (Basic)
Played on a 4 × 4 × 4 board, this is a game for the brain. it is very hard to beat the computer at it.

7 of the 8 games are in machine code, because this is much faster than Basic. (Some of these games were previously available from J. Steadman). Cassette 4 costs £5.

Please make cheques payable to ORWIN SOFTWARE. Recorded on high quality cassettes, sent by first class post from:
ORWIN SOFTWARE, Dept. OSU, 26 Brownlow Road, Willesden, London NW10 9QL.
ZX81 & SPECTRUM SOFTWARE WANTED

Publishers fight it out for best names

The market for technical information is growing. John Gilbert assesses the new names which are adding computer titles to their lists

THE MICROCOMPUTER book market has turned into a battlefield. Companies already established in the market are fighting to acquire the best names and a number of companies are trying desperately to enter this area of publishing.

At the London Book Fair it was apparent by the number of new technical titles on display that publishers which have, until now, been in the arts field have begun to find their way into the technical side of the business.

Penguin is one such company. Until recently it had been best-known for its wide range of general interest books, especially in the field of the arts. Now Penguin has decided to put a series of computer books on to the market. They will have a standard format and provide an introduction to the Sinclair machines, as well as to other microcomputers.

Although some publishing companies which entered the race when the ZX-81 was launched have now disappeared, many names are still in the running. One of them is Bernard Babani Publishing. Michael Babani, managing director of the company, thinks that the collapse of some companies was the result of lack of technical experience. He says:

"These companies have jumped on to the bandwagon. The people who work for them are editors who have no technical expertise. They may have some good outlets but if a book is not good in the first place, it will not sell."

Babani also thinks that many of the books which are being produced are too costly. "What we want to see is a situation where books are being sold for £1.95 or £1.50 and not at some of the prices being quoted now," he says.

Babani's company is already established in the electronics field and that should give it a firm base when it launches its next computer book, *Easy Add-on Projects for the Spectrum, ZX-81 and Ace.* All those machines use the Z-80 processor, so the add-ons should be compatible between them.

A company which is no stranger to the technical book world but which has just discovered the Sinclair machines is W Foulsham. Most people remember the name of the company because of the *Old Moore's Almanack* which it produces annually. Now it is publishing a series of machine-specific books.

Foulsham is one of the first publishers to launch a book on computer programming specially for children. It is called *Spectrum Magic* and is levelled at the very young.

The company is also producing a book for ZX-81 users called *Family Fun on the ZX-81 — Top 20 Programs.* It is aimed at all the family and not just one enthusiast at home. It contains programs which will interest children and adults alike and is trying to popularise family use of the machine, something which has been neglected by other publishers.

A series of books on computers with the general name of *Up and Running Today* is also being launched by Foulsham. The series has been designed specially so that all the books will allow the user to switch on a machine and do something with it immediately. The books will again be machine-specific and cover most of the popular machines on the market.

Shiva Publishing is a company which has made its name in the microcomputer market. It has produced several books on the ZX-81 and Spectrum, including *Peek, Poke, Byte and RAM* by Ian Stewart and Robin Jones, and has started to produce software. Stephen Bishop, Shiva editor, says:

"The software came into existence because of our computer books. Two of our authors improved on programs which they had put into their books and we started to sell them. Obviously the programs had to be better than those in the book, or no-one would bother to buy the tape. On the other hand, nobody would type-in programs from the books if they were available on cassette, so we have had to make them different."

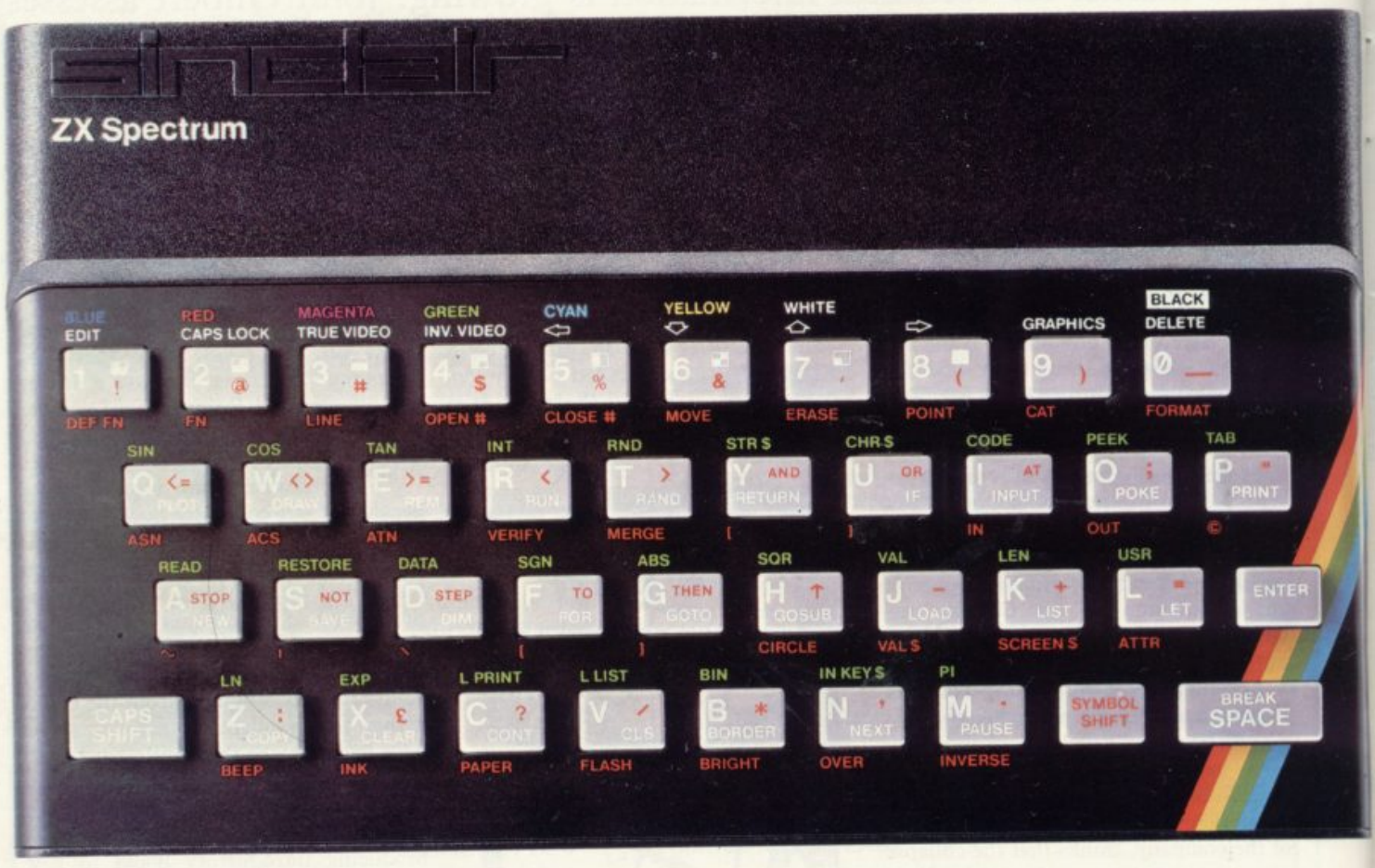
The company has a series of educational titles which it plans to launch this month but Bishop sees its policy of producing introductory books to new machines as something with which it will stay. He says:

"Obviously this part of the market will reach saturation point at some time but we will continue to produce books for new machines as they reach the market. We have a good relationship with most manufacturers, so usually we can produce books more quickly than some of the other larger publishing houses. That gives us an advantage over most other publishers in this field."

Shiva policy seems to be working well, as the company has just moved offices and doubled the number of people it employs. That is a general reflection of the publishing scene at the moment in a sellers' market.

The growth of the market will continue unless publishers start to panic and publish anything they acquire. If that becomes the case, the computer book business could take a turn for the worse so far as publishers are concerned and become a buyers' market.

Sinclair ZX Spect



The growing range of Spectrum Software

You'll know already that the Spectrum has generated an enormous range of peripherals and independent software. Our own range is growing very fast and is shown in the Sinclair Software Catalogue – *free* with every ZX Spectrum.

trum-news!

16K now £99·95

Previously £125.

48K now £129·95

Previously £175.

ZX Printer now £39.95

Previously £59.95

How to order your ZX Spectrum
Access, Barclaycard or Trustcard holders – call 01-200 0200 24 hours a day, every day. By FREEPOST – use the coupon below. Please allow up to 28 days for delivery. 14-day money-back option.

sinclair
ZX Spectrum

Sinclair Research Ltd., Stanhope Road, Camberley, Surrey, GU15 3PS.
Tel: 0276 685311. Reg. no: 1135105.

At last, a 16K colour computer with graphics for under £100!

Why have we done it?

Partly because the sheer volume of Spectrums sold (over 300,000 so far) has brought down unit production costs.

And partly, of course, because we hope you'll buy a Sinclair computer – and not some competitor's promise! We've all heard about colour computers breaking the £100 barrier. Here's the computer that's done it. A colour computer with advanced graphics that's fully supported, and widely available.

Right now, you can order a Sinclair Spectrum at these prices direct from Sinclair on the order form below. And to make it even easier to handle high-level computing at the lowest possible price, we've cut the cost of the printer, too. At £39.95, it's almost unbelievable!

At prices like these, there's really no reason to wait.

To: Sinclair Research, FREEPOST, Camberley, Surrey, GU15 3BR. **Order**

Qty	Item	Code	Item Price £	Total £
	Sinclair ZX Spectrum – 16K RAM version	3000	99.95	
	Sinclair ZX Spectrum – 48K RAM version	3002	129.95	
	Sinclair ZX Printer	1014	39.95	
	Printer paper (pack of 5 rolls)	1008	11.95	
	Postage and packing: orders under £90	0028	2.95	
	orders over £90	0029	4.95	
			Total £	

Please tick if you require a VAT receipt

*I enclose a cheque/postal order payable to Sinclair Research Ltd for £

*Please charge to my Access/Barclaycard/Trustcard account no.

*Please delete/complete as applicable.

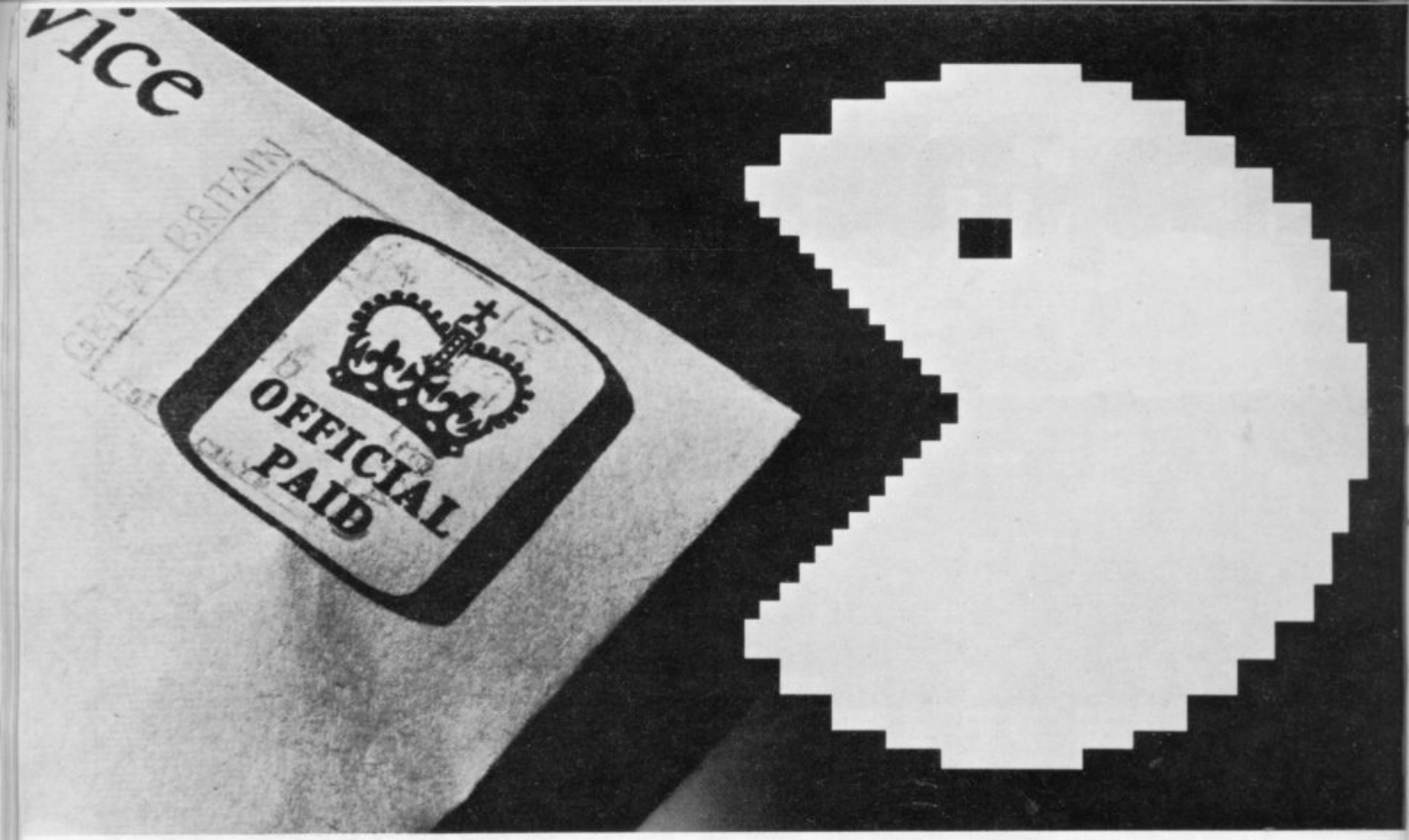
Signature PLEASE PRINT

Name: Mr/Mrs/Miss

Address

SUS906

FREEPOST – no stamp needed. **Prices apply to UK only.** **Export prices on application.**



Now you can use your 48K Spectrum to solve your tax problems.

When you're as overworked as the Inland Revenue, it's easy to make mistakes.

So if you want to make sure you never pay more tax than you have to, you need advice you can rely on.

The new Microtax Income Tax system, compatible with your 48K Spectrum, gives you accurate, up-to-date guidance on tax and financial planning.

At £24.94 it's a lot cheaper than consulting an accountant.

And as you'll never pay more tax than the absolute minimum, you can at last make a real return on your investment in a home computer.

A complete personal tax system

Microtax takes you step by step through this year's tax return, telling you exactly what to fill in. (And if you have a print-out facility, it will reel the whole lot off for you, which you can just attach to the form).

It will calculate your tax liability for 1982/3, so you don't get any unpleasant surprises.

And where you're in doubt, it will show you which tax elections are most advantageous to you, and where you can claim rebates and allowances.

Designed by experts for non-experts

The system is all laid out on a straightforward question and answer basis, and it's as easy to operate as any computer game. You can take it at your own pace, and naturally it's completely confidential.

If you're not sure how to answer a question, or you need some extra information, you can look it up in the comprehensive 138-page back-up tax guide which is fully cross-referenced to the programs.

Microtax Limited, Barratt House, 4th Floor, 7 Chertsey Road, Woking, Surrey GU21 5AB.

Microtax helps you plan ahead

Microtax can also help with all kinds of financial planning decisions – whether to opt for a company car for instance, or how to maximise your earnings without entering a higher tax bracket.

So send off for your Microtax system today, and get your Sinclair working to best advantage.

Available from branches of W.H. Smith or by post using this coupon. If you are not completely satisfied, just return the package within 10 days for a full refund. Allow 21 days for delivery.

£24.94
(including p&p)

To: **Microtax Limited,** Barratt House, 4th Floor, 7 Chertsey Road, Woking, Surrey GU21 5AB.
Please send me the Microtax system for use with my Spectrum 48K. I enclose cheque/postal order for £24.94 made payable to Microtax Ltd. or charge my Barclaycard number.

VISA _____ Signed _____

Name _____ Address _____

_____

_____

MICROTAX

SU50

An enterprising local authority has produced a briefcase computer system for schools. Amrit Surya investigates

Comprehensive education in computer awareness

THE COMPUTER-in-a-briefcase concept has been around for many years, from the James Bond-style fiction of book and film to the new breed of battery-powered micros with built-in LCD screens today. A West Yorkshire local authority was thinking neither of spies nor busy executives when it produced its offering.

Kirklees Metropolitan Council has produced three briefcases, each containing a 1K ZX-81, cassette-player, selection of 1K software, slide-show with taped commentary, set of 20 books and instructions for using the pack. The idea was to design a neat, low-cost and easily-portable Computer Awareness Pack which would provide schools with a comprehensive and easily-understood introduction to computers and computing.

The pack was designed by Peter Gilmartin, childrens' services organiser, and Tim Scratcherd, curriculum development officer for microelectronics. They decided that to make the pack as simple as possible to use; the ZX-81, power pack and cassette player had to be supplied already connected, so that all a school had to do was to connect the TV output lead to the aerial socket of a television set and plug it in. One of the technical people responsible for constructing the packs had the idea of mounting the computer in a briefcase.

The ZX-81 was the obvious choice for the computer — probably the only real choice at the time — being small, light and, of course, cheap. Its low cost meant that three packs could be built, while at the same time offering a reasonably standard version of Basic so that schools can make the transition to more powerful machines of their own at a later date.

The pack was aimed primarily at the 7–11 age range but has been borrowed by primary, middle and secondary schools and all seem equally impressed with it. Among the comments Gilmartin received was a remark to the effect that the pack had been of as much value to the staff, many of whom had had little or no previous experience of computers, as to the pupils.

The software supplied with the pack consisted of six programs supplied on three cassettes. **Count** is a program intended for first-year primary pupils. The program displays a random number of spots on the screen and waits for the user to count them and then enter the correct total. Incorrect responses are ignored and the time allowed for the correct number to be entered is variable. That fact lends the program some interest to older age-groups, since it can be used to test reaction speed.

Stairs is a program which draws a number line to help the user solve the simple addition problems it presents. The number line takes the form of a set of stairs leading diagonally across the screen, with zero being halfway up the

continued on page 88

continued from page 87

stairs. A correct answer results in a ball moving up or down the appropriate number of stairs. Incorrect responses again are ignored.

Face is similar to the classic **House,** where a picture is drawn on the screen one part at a time — in this case, eyes, ears, mouth — and the user is required to name the parts as they are presented. Correct spellings are rewarded by the label being added to the appropriate part of the picture.

Crunch is a fine example of a program which is both simple and effective. An addition problem is presented between two horizontal bars. At the beginning of the program, the two bars are at the top and bottom of the screen respectively. Each incorrect response moves the two bars slightly closer together, while correct responses move them slightly further apart and a new problem is offered.

The idea is to hold the bars apart as long as possible by solving successive addition problems. After too many incorrect answers, the two bars meet with a crunch.

The other two programs are intended to demonstrate useful tasks which can be carried-out by a computer. One draws histograms to illustrate data entered via the keyboard and the other is an alphanumeric sort. The sort program is particularly good, since it shows how much faster computers are than people at processing information — even one of the slowest micros on the market.

The 20 books included give a very good overview of the state of the art. They range from very simple books designed for very young children to more detailed books written at an adult level. *The Usbourne Guide to Computers,* written by Brian Smith and published by Usbourne Electronic World and acclaimed by almost everyone, is included, along with two Science in Action books, *The Silicon Chip* and *Living with Computers.*

Two teachers to whom I spoke, at different schools and dealing with different age groups, felt that the overall quality of the books was extremely high. The only omission seems to be the excellent *Ladybird Book of Computers.*

The slide show begins by illustrating the part played by computers in everyday life — traffic light networks, barcodes, libraries, banks — and then looks at the component parts of a computer system — CPU, RAM, input, output — together with a brief look at programming. Modesty prevents me telling you just how clear and informative the slide-show is, since I produced it.

The accompanying documentation is simple, comprehensible and thorough. It explains how to set up the system, how to load and run the software, and describes each program in detail. It also explains how to LIST programs, though not how to SAVE or EDIT.

The packs are lent to schools in the Kirklees local education association area for half a term, though longer loans may be arranged when they are not required by another school. The pack went into a school for the first time in November and I visited one of the schools which has been using it to discuss what the staff and pupils think of it.

St Peter Clavet's College is a secondary school for 11–16-year-olds. At the time the pack was offered, very few of either staff or pupils had any experience of computers. Mary Bushaway, a mathematics teacher with programming experience on RML 380-Zs, says that the pack has proved to be a very useful introduction to computers for pupils of every age in the school.

Formal teaching using the pack was done during mathematics lessons but the computer and other materials were also made available to pupils during break, lunch-times and evenings, when they were used regularly.

Having seen the slide show and run the software supplied, the next stage pupils reached was to want to know how to edit programs to adjust them. That has led some of the pupils naturally into simple programming. Pupils also began taking ZX-81 listings, taken from books and magazines, on their own initiative. Mrs Bushaway also wrote some programs to show how the ZX-81 can be used to prove or check mathematical formulae.

Pupils have read some of the books, again on their own initiative, and a number of them have become interested in learning to program in Basic.

The briefcase is robust as well as convenient, with none of the loading and saving problems often associated with ZX-81s through problems with the connecting leads. Some of the pupils were so impressed with the briefcase arrangement that they wanted to know where they could buy a ZX-81 in a briefcase.

Overall, the Computer Awareness Pack appears to be an extremely effective introduction to computing and is an idea other local authorities may well like to consider.

'The briefcase is robust as well as convenient, with none of the loading and saving problems associated with ZX-81s'

EXCITING ADDITIONS FOR YOUR HOME COMPUTER

THE MAPLIN TALK-BACK for ZX81 and VIC20

Now your computer can talk

- ★Allophone (extended phoneme) system gives unlimited vocabulary.
- ★Can be used with unexpanded VIC20 or ZX81 — does not require large areas of memory.
- ★In VIC20 version, speech output is direct to TV speaker with no additional amplification needed.
- ★Allows speech to be easily included in programs.

Complete kits. Order As:
LK00A (VIC20 Talk-Back). Price £24.95.
LK01B (ZX81 Talk-Back). Price £19.95.
Full construction details in Maplin Projects Book 6. Price 70p. Order As XA06G.

SOUNDS GENERATOR FOR ZX81

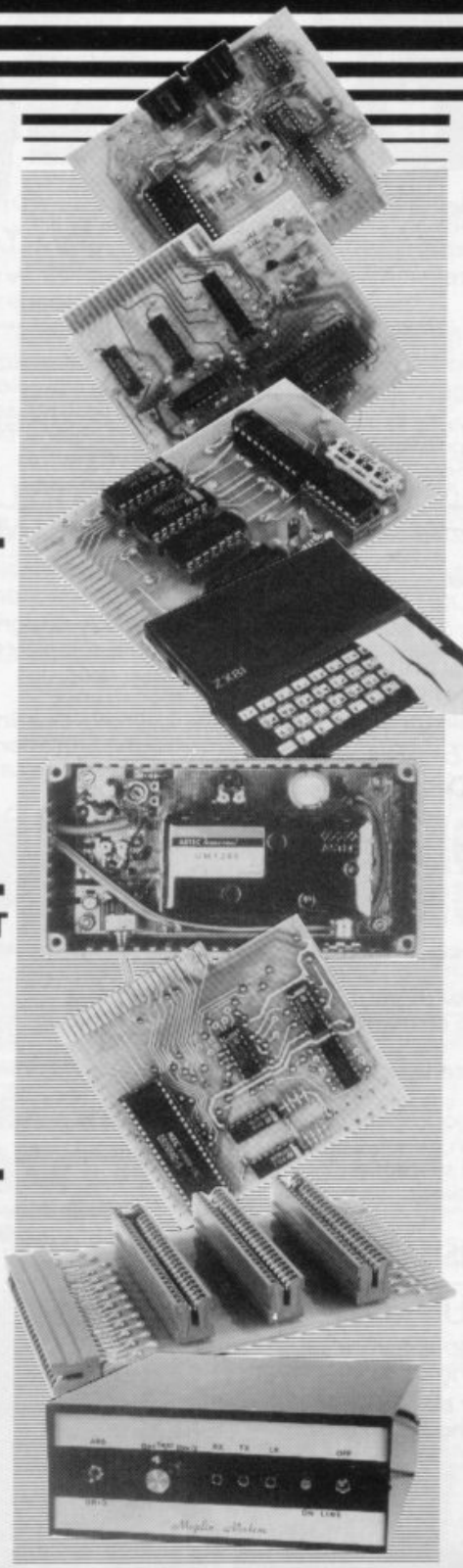
3-Programmable tone generators with programmable attenuators turns your ZX81 into a mini-synthesiser.
Noise generator with 3 pitch levels enables the creation of most special effect sounds.
Single address access via BASIC with PEEK and POKE. Connects directly to expansion port socket or motherboard.
Complete kit. Order As LW96E. Price £10.95.
Full construction details in Maplin Projects Book 5. Order As XA05F. Price 70p.

ZX81 INPUT/OUTPUT PORT

Two bi-directional ports for a total of 16 input or 16 output lines.
Includes one buffered output which can interface directly to CMOS.
On board address selection allows for expansion to 6 ports with two boards.
Complete kit. Order As LW76H. Price £9.25.
Full construction details in Maplin Projects Book 4. Order As XA04E. Price 70p.

MODEM

A CCITT standard modem that connects directly to your telephone line via a B.T. approved transformer. Transmits and receives simultaneously on European standard frequencies at 300 baud. May be used to talk to any other 300 baud European standard modem including the Maplin Computer Shopping modem on 0702 552941 and any British Telecom Datel 200/300 Service modem.
The modem's computer interface is RS232 compatible.
A complete kit excluding case is available. Order As LW99H. Price £39.95.
Full construction details in Maplin Projects Book 5. Order As XA05F. Price 70p.



KEYBOARD with ELECTRONICS for ZX81

- ★ Full size, full travel keyboard that's simple to add to your ZX81 (no soldering in ZX81).
- ★ Complete with electronics to make "Shift Lock", "Function" and "Graphics 2" single key selections.
- ★ Powered (with adaptor supplied) from ZX81's own standard power supply.

Full details in Project Book 3 (XA03D). Price 70p
Complete kit (excl. case) £21.90.
Order As LW72P.
Case £4.95. Order As XG17T.
Ready built-in case £29.95.
Order As XG22Y.

ZX81 TV SOUND

ZX81 sound on your TV set.
Video reversing switch for normal or inverse video display. Can be used with the Talk-Back or Sounds Generator kits.
Complete kit. Order As LK02C. Price £19.95.
Full construction details in Maplin Projects Book 6. Order As XA06G. Price 70p.

ZX81 EXTENSION BOARD

Our ZX81 Extendiboard plugs directly into the ZX81 expansion port and will accept a 16K RAM pack and three other plug-in modules simultaneously. Parts are sold separately as follows:
PCB Order As GB08J. Price £2.32.
Edge Connectors (4 needed) Order As RK35Q. Price £2.39 each.
Track pins (1 pack needed). Order As FL82D. Price 85p per pack of 50.

INTERFACES for MODEM

Interfaces for most popular home computers which do not have RS232 ports will be available shortly. An interface for the ZX81 that includes a complete Machine Code Communications Program is available. Order As LK08J (ZX81 Modem Interface Kit). Price £24.95.
Full construction details in Maplin Projects Book 7. Order As XA07H. Price 70p.

MAPLIN

**Maplin Electronic Supplies Ltd., Mail Order: P.O. Box 3, Rayleigh, Essex SS6 8LR.
Tel. Southend (0702) 552911 (Sales).**

**159-161 King St., Hammersmith, W6. Tel. 01-748 0926. 284, London Road, Westcliff-on-Sea, Essex. Tel. (0702) 554000. Lynton Square, Perry Barr, Birmingham. Tel. (021) 356 7292.
All prices include VAT & carriage. Please add a 50p handling charge to orders under £5 total value.**

FABULOUS!

SINCLAIR ADD-ON OFFER

from 16k – 48k

With our ME48 memory expansion add-ons your ZX Spectrum can increase its capacity by up to three times.

★ No soldering ★ easy to fit ★ simply plug in ★ fully guaranteed ★ no loss of memory through wobble or white out.

NB. Before ordering your Spectrum add-on please check which Spectrum you have in your possession.
At the back of the ZX Spectrum the metallic contact strips can be clearly viewed. In the series A the space separating the strips is the same width as the strips. In the series B the strips are twice as wide as the space between.

SPECTRUM

ME48 Series A £34.50
Series B £24.50

ZX81 ME16 £19.25
ME64 £44.25

NEW The External ME16-48K plugs into the back of your Spectrum, suitable for series A & B.

EXTERNAL ME16-48K £39.95

FANTASTIC

ZX81 & SPECTRUM SS1 SPEECH SYNTHESISER

SIZE 3½"x 5¾"x 1"

- ★ Make amazing speech effects with your ZX Spectrum.
- ★ Specially designed for use with your Spectrum. Just plugs in, no dismantling or soldering.
- ★ No power pack, leads, batteries or other extras.
- ★ Ample volume for built in loudspeaker, Manual Volume Control on panel. Can be plugged in to Existing hi-fi system.
- ★ Uses only one memory address.
- ★ Free Dictionary of Sounds.

SS1 SPEECH SYNTHESISER £39.00

NEW LEVEL-VU PRISM

Allows you to see your tape counter without moving from your seat!

- ★ attaches easily to recorder body or lid
- ★ fits most recorders including Radio Shack, Vic-20, Atari
- ★ greatly magnifies counter numerals

LVP £3.99

NEW TAPE LOAD ANXIETY?

Vu-Load takes the frustration out of loading your ZX81 or Spectrum programmes.

- ★ insures programme load every time
- ★ monitors tape output level
- ★ gives positive save indication
- ★ detects blank tape without disconnecting cassette wires
- ★ ready to use – no wiring

TL £19.99

NEW MICRO TAPE

Save it – first time, on American micro-tape

- ★ Specially designed for use with micro-computers
- ★ Low drop-out occurrence
- ★ Uniform Coating
- ★ High saturation level
- ★ So good, we can guarantee them for 12 months!

*NB. Add 40p Post & Packaging to the price of all items.

AUDIO DIGITAL AD.C12 – 55p
AD.C20 – 65p

★ Free 23 line memory test programme with every add-on.

Please tick the appropriate box to order your Computer Add-on:

Memory Expansion Spectrum ME48 Series A ☐ Series B ☐
ZX81 ME16 ☐ ME64 ☐ Speech Synthesiser SS1 Spectrum ☐
ZX81 ☐ Tape Load TL ☐ Level VU LVP ☐
Audio Digital AD.C12 ☐ AD.C20 ☐ External ME16-48K ☐

*NB. Add 40p Post & Packaging to the price of all items.

I enclose a cheque or postal order for _____ made payable/crossed to Computer Add-ons, or I would like to pay by Access and I enter my number and signature accordingly

*Allow 28 days for delivery.

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Signature _____

Date _____

Name _____

Address _____

_____

Occupation _____ SU3

COMPUTER ADD ONS
7-9 Thane Works, Thane Villas London N7

COMPUTER ADD-ONS 7-9 Thane Works, Thane Villas London N7

Home Computer Show Manchester

April

THURSDAY 21 (12am — 7pm)
FRIDAY 22 (10am — 6pm)
SATURDAY 23 (10am — 6pm)

AT THE **Midland Hotel**
PETER STREET

VISIT THE COMPLETE SHOW FOR THE HOME USER AND SEE:
A COMPLETE cross section of all hardware and software available to the home user.
A FULL RANGE of home computers priced from £50 upwards.
A COMPUTER ADVICE CENTRE run by independent experts for the answers to all your questions.

WIN WIN WIN TWO COMPUTERS — one for you, one for a school of your choice — to be won at each show: FREE entry form with advance tickets

ADULTS: £2.00 UNDER 8s & OAPs: FREE 25% DISCOUNT for parties of 20 or more

COMING SOON
MAY BRIGHTON
JUNE BIRMINGHAM

Sponsored jointly by:
Computing Today Personal Software
Personal Computing Today
Home Computing Weekly ZX Computing

SU

Home Computer Show One person per coupon only
Send £1.00 Save £1.00
Please enclose SAE
Mr. Mrs. Miss
Address

ASP Exhibitions
145 Charing Cross Road
London WC2H 0EE
01-437 1002

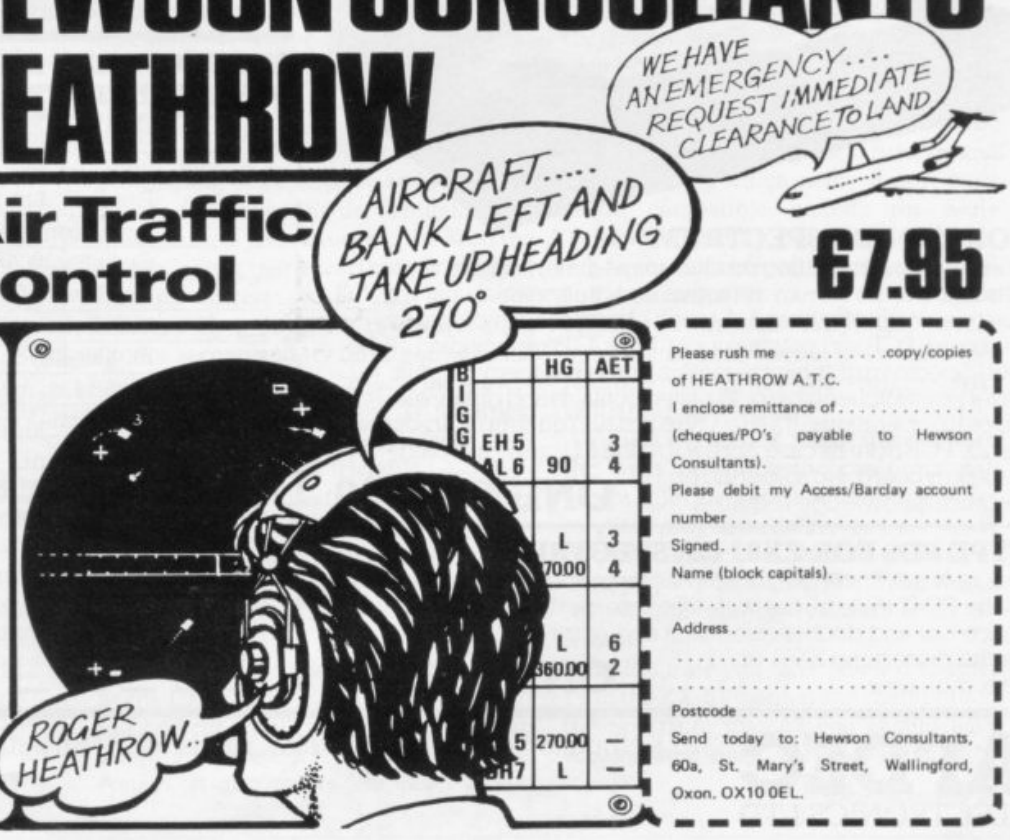
HEWSON CONSULTANTS

bring you **HEATHROW**

For the 16 or 48K ZX spectrum

Air Traffic Control

£7.95



YOUR TASK: to direct incoming aircraft from holding stacks to runway — smoothly, safely and expeditiously.

YOUR INSTRUMENTS: Radar screen showing aircraft call signs, blips and trails. Four stack displays giving altitude, heading, speed and size.

SEVEN levels of play including a demonstration mode.

Choose an EASY mode to begin with — landing light aircraft any way you can.

Progress to more TRICKY situations — mixed aircraft, restricted airspace, minimum separation, outbound traffic.

The ULTIMATE CHALLENGE — emergencies, unknown aircraft, radio failure, loss of a runway, instrument failure . . .

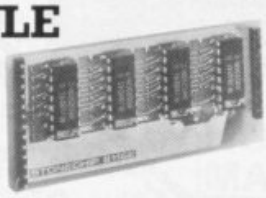
Please rush me . . . . . .copy/copies of HEATHROW A.T.C.
I enclose remittance of . . . . . (cheques/PO's payable to Hewson Consultants).
Please debit my Access/Barclay account number . . . . . .
Signed . . . . . .
Name (block capitals) . . . . . .
. . . . . .
Address . . . . . .
. . . . . .
. . . . . .
Postcode . . . . . .
Send today to: Hewson Consultants, 60a, St. Mary's Street, Wallingford, Oxon. OX10 0EL.

SPECTRUM AND ZX81 HARDWARE

PANDA

The famous Panda Expandable Ram Pack. Massive 16K add-on memory which can easily be expanded to 32K with an optional plug-in module. Supplied in rugged no-wobble design, rugged, injection moulded case, contoured to fit the ZX81 snuggly. Compatible with other add-ons (printer etc). LED on/off indicator. No additional power needed just plug in an go. British designed and made from top quality components throughout, guaranteed 12 months. **ONLY £19·95**

EXPANSION MODULE



The 16K 'Panda' is easily expanded from 16K to 32K by adding this expansion module as and when you need it.

ONLY £14·50

GIANT PANDA

Giant Panda the two together. Buy the Panda and the Expansion Module at the same time for a gigantic 32K bytes and save.
Complete at a special price of **ONLY £34·00**

PROFESSIONAL CASED KEYBOARD TYPE FD42

FOR ZX81 OR SPECTRUM

This famous, best selling product immediately converts your ZX Computer into a sturdy, attractive and professional unit, with full size typewriter keyboard. A tough plastic case encloses the keyboard, PCB and power supply. It has 42 keys including all the ZX81/Spectrum graphic characters printed on them. The full travel key switches have gold plated contacts and guaranteed life of 10^6 operations. It's so easy to install! You simply unscrew the ZX PCB from its case, screw it to the FD case, and plug in the keyboard. No soldering or technical knowledge required. **ONLY £29·00**

TYPE FDS FOR ZX81 OR SPECTRUM

Our new advanced keyboard has the same, fine specifications as the FD42 system, but with a new re-designed case, space bar and double-sized shift and enter keys. A must for the discerning ZX81 or Spectrum user. **ONLY £39·95**

ZX KLIK – KEYBOARD

If, like many ZX81 users, you are fed up with the dead feel of the touch sensitive keypad then consider the well tried 'Klik-Keyboard'. This is a simply fitted genuine push button keyboard which has been designed as an exact replacement for, and is no larger than, the existing keypad. ■ Fits on to the ZX81. ■ Full 40 keys plus one spare for any purpose. ■ No soldering – just plug in. ■ No trailing wires. ■ Clear permanent two colour legends. ■ Positive feel and sound as data is entered. ■ Speeds up programming enormously and reduces errors. ■ Fitting service offered £2·00 extra (remember to send your ZX81). **ONLY £24·50**

THE SOUND EXPANDER

A superb economical addition to your ZX Spectrum. Clear, dynamic sound effects will really enhance your enjoyment of the new exciting programs available for the Spectrum. Our new sound amplifier comes complete with leads, volume control and built-in loudspeaker. Simply plug into the mic input, it fits neatly on to the back of the Spectrum. **ONLY £7·50**

STOP PRESS

16K Spectrum owners – upgrade to 48K with a Spectrum Upgrade Pack complete with full instructions. No soldering. **ONLY £35·00**

COMING SOON!

Our range of products is constantly under development and review. We have selected products from leading manufacturers in the UK and believe these represent the best value and quality combination on the market today.

PRODUCTS ARE STOCKED AND USUALLY DESPATCHED WITHIN 10 DAYS.

I wish to order the following:

Quantity	Item	Amount
	Panda @ £19·95 inc.	
	Expansion Module @ £14·50 inc.	
	Giant Panda @ £34·00 inc.	
	FD 42 Keyboard ZX/Spectrum* @ £29·00 inc.	
	FDS Keyboard ZX/Spectrum* @ £39·95 inc.	
	ZX Klik-Keyboard @ £26·50 inc.	
	Sound Expander @ £7·50 inc.	
	Spectrum Upgrade Pack @ £35·00 inc.	
	TOTAL	

All prices include VAT and post and packaging. All items include a full year guarantee. Products are stocked and usually despatched within 10 days. Overseas customers add £4 post and packing. Cheques/Postal Orders etc. should be made payable to AFDEC Electronics Ltd.

Card No. | | | | | | | | | | | | | | | | |

Signature _____ DINERS CLUB INTERNATIONAL

Name _____

Address _____

SU6

AFDEC ELECTRONICS LTD 318 Kempshott Lane Basingstoke Hants RG22 5LT

GLOSSARY

Basic — Beginners' All-purpose Symbolic Instruction Code. A programming language resembling English which is used by beginners because most popular microcomputers have it as standard.

Bug — an error in a program.

EPROM — Erasable Programmable Read-Only Memory. Semi-permanent storage. Information is not erased if the power is turned off in the computer. Programs can be erased by subjecting the memory chips to ultra-violet light. The memory can then be re-programmed using an electrical device called an EPROM blower.

Interface — RS232 and Centronics. A device which enables other computers or add-ons, such as printers, to be connected to the computer. It converts non-standard signals from add-ons to the standard signals of the computer in use.

Kilobyte — (K). A measurement of memory size. Most machines use 16K as a minimum but 48K is generally agreed to be necessary for serious work.

Machine code — an electronic pulse code used by the computer to perform functions and communicate with memory and other devices.

Mnemonics — abbreviated instructions — for example LD for Load — used in machine language programming.

Motherboard — an external printed circuit board which is used like a multi-way plug planner. It enables other printed circuit boards, such as graphics boards and colour boards, to be slotted-in.

Port — a link to the outside world which can be used by programs and the computer.

PCB — printed circuit board. A board which has on it the electronic circuits of the computer.

RAM — Random Access Memory. Information and programs can be stored in this type of memory as electronic pulses which conform to a set of numbers — machine language — in which programs are represented in the computer. When the power is turned off the information will be lost.

ROM — Read Only Memory. Information stored in this type of memory is not lost when the power is switched off.

Software — programs which control the operation of the computer.

Syntax error — a bug caused by incorrect use of a programming language.

Our easy-to-follow guide for new owners

The basic route to a habit-forming hobby

BUYING a Sinclair machine can be the start of a life-time's obsession with home computing. It is easy, however, to become discouraged if everything does not go according to plan from the beginning.

For those with only a little knowledge of computers and their capabilities, the best way to approach the machines is to abandon any ideas for special uses. While the 48K Spectrum is big enough for simple uses in small businesses, the range of Sinclair computers does not contain machines for major uses. It is better to become accustomed to the many facilities and then decide how you wish to use them.

Begin by unpacking your machine, overcoming your surprise at its size and weight and, following the manual, set up the system. If you cannot get the K on the screen, check that everything is plugged into its correct socket and re-set the machine by pulling-out the power plug for one second and try tuning-in again. If still nothing appears, check the power supply unit by shaking it. If it rattles, return it. If it is satisfactory, check your system with that of a friend.

If you have a Spectrum you will have received an introductory booklet which explains what the computer can do and giving detailed instructions on how to set it up. Also included is a fault-finding guide.

Once the K appears you are ready to begin learning about your machine. It can prevent family arguments if you can afford a separate television set for your system. It also makes life easier if you find somewhere to leave your equipment set up permanently. You will find that a few power sockets are needed and a four-way block connector on a short length of extension cable will help to tidy trailing leads.

When using a Spectrum, a television set has to be more finely-tuned than when using a ZX-81 because of the added dimension of colour. If the set is not tuned properly, the colours will look hazy instead of sharp and clear. If no colour can be seen when it is switched on, the power supply or the television set may be at fault.

Some users have experienced some difficulty with some television sets, which include Hitachi, Grundig and Toshiba. Sets which many people have found compatible include the Sony Trinitron, Fidelity and Ferguson.

The manuals are written in great detail and are reasonably easy to follow. Some of the chapters may not seem immediately relevant but it is worthwhile reading them as you might miss something important.

Patience is needed at that stage to learn the ways in which the computer will accept information. It is tempting to try to enter programs before you are ready but that is likely to lead to errors. For example, words like AND, THEN and AT should not be typed-in letter by letter.

By the time you have reached chapter 11 in the ZX-81 manual and chapter 19 in the Spectrum manual you should have accumulated sufficient knowledge to be

continued on page 94

Starting from Scratch

continued from page 93

able to type-in other people's programs, such as those in *Sinclair User* and *Sinclair Programs*, without too much difficulty.

It is that important when using the ZX-81 that it is not jolted. Some of the connections can easily work loose and everything which has been entered will be lost.

The manuals are not to everyone's liking and if you find them difficult to follow a number of books on the market can help you. Find the one which suits you best.

As a way of relaxing you can buy some of the growing range of commercially-produced software. That can be loaded directly from cassette but make sure that your machine is big enough to take the tapes you buy.

For the ZX-81 there are a few tapes for the unexpanded 1K machine but the majority require the 16K RAM pack. Similarly on the Spectrum most companies are taking advantage of the possibilities provided by the larger 48K machine rather than providing cassettes for the 16K.

The tapes can vary in quality and it is advisable to read the reviews in *Sinclair User* and use your judgment to find the best.

An alternative method to learn about both the ZX-81 and the Spectrum is to plunge in at the deep end and see what the machines will do. Refer to the manuals when you have difficulties. You can ignore the functions and calculations initially and experiment with PRINT statements to obtain the feel of the machines.

You may already have heard about the problem involved in SAVEing and

LOADing your own cassettes. The manual gives detailed instructions but many of the early ZX-81s would not accept tapes from some recorders. That problem is said to have been overcome but there can still be difficulties.

Usually they occur when LOADing tapes recorded by other people. One simple method to overcome this is to wind the tape to the middle of the program and type LOAD "" followed by NEWLINE; then increase the volume of the recorder slowly with the tape running until the television screen shows four or five thick black bands. If you then re-wind the tape, the program should LOAD normally.

LOADing and SAVEing on the Spectrum is much easier and faster than the ZX-81. One difference is that when SAVEing on the Spectrum the LOAD lead must be disconnected either at the recorder or the Spectrum.

Finally, a health warning. Apart from any practical uses, computing with your Sinclair machine can be a very entertaining hobby and is almost certainly habit-forming. You may easily find yourself crouched over your machine, red-eyed, in the early hours of the morning thinking that in another five minutes you will solve the problem. Try to break that habit by getting into the fresh air and meeting other Sinclair users.

By obtaining a Sinclair computer you find that you have joined a not very exclusive club with many thousands of members, many of whom would be only too happy to advise you if you have difficulties.

Make sure of your regular copies of *Sinclair User* and *Sinclair Programs* and you can be guaranteed many happy hours.

THE
Computer
Fair
Personal computers
Home computing
Small business systems
Sponsored by Practical Computing and YOUR COMPUTER
EARLS COURT
16-19 JUNE 1983
Thursday: 1.00 pm-6.00 pm
Friday & Saturday: 10.00 am-6.00 pm
Sunday: 10.00 am-5.00 pm
Admission Prices
Adults: £3.00
Children under 16 and OAPs: £2.00
See copies of Practical Computing and Your Computer for reduced price voucher.
Advance Party Bookings
For groups of 20 people or more:
Adults: £2.00 Children: £1.00
(plus one free ticket per 20 sold for the organiser or teacher)
Super Savings from British Rail
all inclusive tickets available from:
The Travel Centre Kings Cross Station London NW1 9AP
Tel: 01-278 2477
Further information from:
The Exhibition Manager, The Computer Fair '83
Reed Exhibitions, Surrey House
Throwley Way, Sutton, Surrey SM1 4QQ

Play in the big league — with only the best, newest programs!

We've searched for brilliant new program sources throughout the U.K. and North America to find an exciting collection of new games — and business programs — many of which cannot be bought by mail order from any other source!

Every month, we'll be adding to our catalogue to bring you the best of new games, new business, educational and household software. And the good news is — **we're specialising in programs for your Sinclair!**

With our special new deal — you just CAN'T GO WRONG.

* A free offer every month [this time it's a free blank C20 cassette with every two games ordered]
* A money-back guarantee if you're not entirely satisfied with your purchase — that's how confident we are about the quality and value!

All you have to do is look at our first HOT selection, then order quickly to be among the first to own these games of skill, intelligence and excitement [fast delivery is another of our specialities — so you could be using these new programs SOON].

FREE BLANK C20 COMPUTER CASSETTE WITH EVERY TWO CASSETTES YOU ORDER!

Remember there's no limit to the number of free cassettes you receive if your order justifies them — so why not get together with friends or user group members and share the freebies?

GUARANTEE

Order with complete confidence. If you are not entirely satisfied with the quality of your purchase return it to us within 7 days and we will provide a replacement.

GREAT VALUE! TREMENDOUS SELECTION! PLUS A FREE OFFER EVERY TIME!

Fill in the order form right away — we're guaranteeing fast delivery, quality and satisfaction [after all, we want you to come back for more!]

The Software Workshop, Yew Tree, Selborne, Hants GU34 3JP

Here's a whole NEW selection of the latest games, the best-value software for your ZX-81 or Spectrum.

ZX81 Software

1-01 **Stock Market** — £3.95
Buy and sell your way to millions! 16K RAM

1-02 **Football League** — £3.95
First division fun for the soccer enthusiast. 16K RAM

1-03 **Test Match** — £3.95
Match your wits alongside the superstars. 16K RAM

1-11 **Arcade Action** — £4.95
Overtaker/Missile Man/Space Fighter/ Pilot/Greedy Gobbler/Extra Terrestrial. 1K

1-12 **Avenger** — £4.95
Avoid missiles and bombs to become the ruler. 16K RAM

1-13 **Protector** — £4.95
Defend your own ship from oncoming attackers. 16K RAM

1-21 **Football Manager** — £5.95
Manage your team through a hectic league season! 16K RAM

1-31 **Comp-U-Share** — £9.95
Investment management program for unit trusts, shares and loan stocks. Complete documentation included. 16K RAM

1-32 **Comp-U-Tax** — £9.95
Accurate personal income tax calculator for 82/83 tax year. Full documentation included. 16K RAM

Spectrum Software

2-12 **Avenger** — £4.95
[See 1-12 under ZX81]. 48K RAM

2-13 **Sentinel** — £4.95
Guard your mother ship against alien attacks. 48K RAM

2-14 **Meteor Storm** — £4.95
Spectrum version of the ever-popular arcade game. 16K or 48K RAM

2-15 **Star Trek** — £4.95
Popular space program brought to life by excellent graphics. 48K RAM

2-21 **Frogger** — £5.95
Manoeuvre the frog across the road avoiding heavy traffic. 48K RAM

2-22 **Crazy Balloons** — £5.95
Guide the balloons round the maze without bursting. 48K RAM

2-23 **Arcadia** — £5.95
The expert's version of the popular 'Invaders' game. 16K or 48K RAM

2-24 **Golf** — £5.95
The finest of golf handicap games. 48K RAM

2-25 **Test Match** — £5.95
More exciting than the real thing! 48K RAM

2-26 **Derby Day** — £5.95
This favourite has to be a winner. 48K RAM

2-27 **Rescue** — £5.95
Rescue the Princess from marauding patrols. 48K RAM

2-28 **The Orb** — £5.95
Discover the Orb in the depths of the temple but watch the monsters. 48K RAM

2-29 **Jackpot** — £5.95
The harmless way to take on the one-armed bandit. 48K RAM

2-31 **Football Manager** — £6.95
See 1-21 under ZX81. 48K RAM

2-41 **Comp-U-Share** — £9.95
See 1-31 under ZX81. 48K RAM

2-42 **Comp-U-Tax** — £9.95
See 1-32 under ZX81. 48K RAM

To: The Software Workshop, Yew Tree, Selborne, Hants GU34 3JP

I wish to order the following programs. I understand that:

* I will receive a FREE blank cassette with every 2 programs ordered
* I can return products within seven days if not entirely satisfied and receive a full refund or replacement programs to the same value.

Ref No	Qty	Title	Price

Postage, packing and handling: add 45p for the first cassette, and 25p for each additional cassette. Non-UK orders add extra 50%

Total

I enclose a cheque/postal order for _____

Name _____

Address _____

(Allow 28 days MAXIMUM FOR DELIVERY) SU1

EXAMS...? DON'T

PANIC!!

THINK TANK will help you **PASS**

GCE O LEVEL/CSE Cassettes for the **48K SPECTRUM** with COLOUR and MOVING GRAPHICS

PHYSICS 6 Programs for £6·50	✻ Solids, Liquids and Gases ✻ Vectors and Scalars ✻ Acceleration	✻ Graphs of Motion ✻ Gravity, Weight and Friction ✻ Newton's Laws
CHEMISTRY 6 Programs for £6·50	✻ Chemical Change ✻ Types of Reaction ✻ Rate of Reaction	✻ Chemical Combination and the Mole ✻ Chemical Equilibrium ✻ Energy Changes

OR BOTH for £12

Cheque/PO (payee THINK TANK) to:

think tank *Educational Software*

Dept SU(6Q), 35 Wellington Road, Wimbledon Park, London SW19 8EQ.

Computer Performance?

Fit HI-STAK for a better angle.

- comfortable, fast and reliable typing.
- easy to read keyboard

ZX81
SPECTRUM
VIC20
TRS80
NEW BRAIN
JUPITER ACE
ZX80
APPLE
etc.

HI-STAK by *WARP FACTOR EIGHT*

Order form: Please send me _____ HI-STAK set(s) (at £3.95 per set).

I enclose cheque/P.O. for _____

Name _____

Address _____

_____ Post code _____

To: Warp Factor Eight. (Dept SU)
6 Pelham Road, Braughing, Ware, Herts SG11 2QU.

BARGAIN-HUNTERS READ *THIS!*

Whatever your model of Sinclair computer—you can get HOURS of fun, intellectual satisfaction and education for just 95p per month!

A bargain?
That's **Sinclair Programs** magazine—the fat, glossy magazine that's PACKED with original, tested programs for you to load and run.

With **Sinclair Programs** every month you can build the library of programs that suits your mood: in recent issues we have challenged our readers with programs to test their skill at Sharpshooter or Laser Cannon . . . jolt their brain cells with Quadratic Equation or Monster Maths . . . or take a practical turn with their own word processor program or graphic generator.

That is just a fraction of what you get from **Sinclair Programs**. Each month we have 40 programs for owners of ZX80s, ZX81s and Spectrums. But make sure you don't have to hunt TOO far for your bargains—**Sinclair Programs** always sells out quickly, so order yours TODAY from your newsagent, or fill in the form below and we will send it direct to you, every month.

Mail to: ECC Publications Limited, 30-31 Islington Green, London N1 8BJ Yes — I'd like to subscribe to **Sinclair Programs** (12 issues — price £13.20) I enclose a cheque for £ ___ Please charge my credit card Card: name _____ Number _____ Name _____ Address _____ Signature _____ Date _____

NB This offer applies to UK subscribers only. Overseas rates available on request.

A MUST FOR ANYONE INTERESTED IN ZX MACHINE CODE!

The finest range of utility programs for ZX Computers. Used by professionals. Very useful for beginners

ZX SPECTRUM MACHINE CODE SYSTEM (The key to machine code success)

SPECTRUM EDITOR/ASSEMBLER A powerful and essential machine code programming aid.
16K and 48K on same cassette + full documentation.
Major features: EDITOR with Auto line number and renumber. 40 column screen display, tabulated into fields for easy reading; 5 character label names, easy line editing and cursor control; SAVE/LOAD/VERIFY routines, output to ZX PRINTER. TWO PASS ASSEMBLER accepts all Z80 mnemonics: decimal or hex numbers, simple arithmetic on operands; Assembler Directives — ORG, END, DEFB, DEFW, DEFS, DEFL, EQU, DEFM. **ONLY £8.50**

SPECTRUM MONITOR Machine Code Debug/Disassembler
Enter, Run, Debug M/C programs. Compatible with BASIC. Breakpoints and Registers Display. Disassembler to screen or ZX PRINTER. 16K and 48K on one cassette + 30 page manual. **ONLY £7.50**

ZX81 UTILITIES (For everyone . . . beginner to professional)

ZX81 REMLOAD Machine Code Debug/Monitor
Explore and master machine code. Compatible with BASIC. CREATE A REM line — any length. BREAKPOINTS & REGISTERS DISPLAY. Fully documented 30 page manual and cassette. **ONLY £6.95** 16K to 64K

ZX81 ZX-MC Machine Code Debug/Monitor
The professional one! ENTER/RUN/DEBUG M/C programs. SAVE/LOAD/VERIFY at double speed. BREAKPOINTS & REGISTERS DISPLAY. Self-contained machine code — cannot be used with BASIC. 36 page manual and cassette. **ONLY £7.50** 4K to 64K

ZX81 SCREEN KIT 1 More screen power in your BASIC programs!
BORDERS — any size anywhere on screen. SCROLL in 4 directions. CLEAR and REVERSE part of the screen. FLASHING CURSOR anywhere on screen — simulates INPUT. DATA FILES SAVE/LOAD BASIC variables — Double speed. 880 Bytes machine code for instant response. Becomes part of your BASIC program. **ONLY £5.70** 4K to 64K

SEND CHEQUE/P.O. FOR FAST MAIL ORDER!
S.A.E. for full details.
6 Corkscrew Hill, West Wickham, Kent BR4 9BB
* All prices include VAT & P&P

PICTURESQUE

Spectrum Software available from: Buffer Micro Streatham, Microware Leicester. Educational suppliers: Griffin & George.

NOW IN YOUR HIGH STREET SHOPS

FOOTBALL MANAGER 3D ACTION FROM THE SPECTRUM VERSION

by Addictive Games

for **SPECTRUM 48K AND ZX81 16K**

This superb game is **now available** from branches of **W.H. SMITH * and BOOTS.**

Manage your own team in this exciting game of skill which vividly captures the drama and excitement of real football.

FEATURES INCLUDE:
★ 4 DIVISIONS ★ F.A. CUP ★ PROMOTION & RELEGATION ★
★ TRANSFER MARKET ★ TEAM SELECTION ★
★ SAVE GAME FACILITY ★★★ *AND MUCH MORE!* ★★★

WHAT THE PRESS SAY ABOUT IT:—

IF YOU have always wanted to manage a football team, FOOTBALL MANAGER, from Addictive Games, is for you — The game is ideal for a football fanatic but the most interesting thing for us was the 3-D graphics used to create the goalmouth action — the game is a winner.
SINCLAIR USER FEBRUARY 1983

Although I'm no great football fan, I really enjoyed playing this game — excellent use is made of colour and user-defined graphics. The game is very logically put together, so that the development of strategy and tactics has a real effect. For example, one of my teams got through to the fourth round of the F.A. Cup where it was beaten by a second division side. This upset morale and meant that our promotion bid failed. Perhaps I should have given up the F.A. Cup run and held some good players back — the possibilities are endless. Brian Clough had better watch out!
* SPECTRUM VERSION ONLY. ZX COMPUTING FEB/MARCH 1983

ALSO AVAILABLE FROM THE FOLLOWING SHOPS
BUFFER MICRO SHOP (London)
MICROWARE (Leicester)
ANIROG COMPUTERS (Horley, Surrey)
SUCCESS SERVICES (Walsall)
THE COMPUTER SHOP (Newcastle)
DRAGON BYTE (Leeds)
AND OTHER GOOD COMPUTER SHOPS

PRICES
FOR THE SPECTRUM 48K £6.95, ZX81 16K £5.95
3D GRAPHICS ONLY IN SPECTRUM VERSION
To Order send Cheque P.O. payable to:
ADDICTIVE GAMES, Dept SU, P.O. Box 278, Connburrow, Milton Keynes MK14 7NE
PLEASE STATE COMPUTER

An Exciting range for 16K ZX81 from SOFTWARE FARM

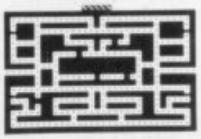
SUPER SCRAMBLE

YOUR MISSION
To penetrate the witches defences, enter her cavern and destroy her wicked heart.

THE WITCHES DEFENCES
Stalagmites and stalactites - which grow across your path.
Volcanoes - to get past alive - if you can!
Vampire Bats - that cling to your ship and make controls sluggish
Cave-ins - should you hit the side of the cave with your Laser Cannon or Bomb, part of the roof will cave in on you

- Written entirely in machine code
- Hall of Fame
- 1 or 2 players
- Mystery score positions to bomb
- 5 skill levels

GOBBLERS Mk 2



Beat that high score!
Gobble those dots before those meanies gobble you!
Your only aids are four 'Power Pills' which make the meanies edible. But not for long!

- Machine coded for fast action
- Extra 'Gobbler' for 10,000 points
- On screen scoring
- High score with enter name facility
- Up to 4 players

Improved Mk 2 version!

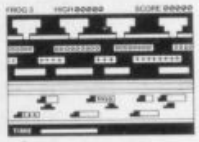
ASTEROIDS

Stay alive as long as possible in open space filled with flying rocks. Score by shooting them - which also causes them to break into lots of little bits and makes life even worse!

- Machine coded for fast action
- On screen scoring
- High score with enter name facility
- Up to 4 players
- Extra ship for 1,000 points (not as easy as it sounds!)
- Ship moves just like arcade version
- Rotate left/rotate right/thrust
- Fires in all 8 directions
- Increasing number of asteroids
- Three asteroid sizes
- alien spaceship (fires back!)

All games £5.95 each

NEW! FROG HOPPER



- 50 Skill levels!
- Played against the clock - froggie only has a short while to live!

Jump your frog over the lanes in the road - preferably without being turned into jam by the approaching traffic! Then cross the river by hitching a few rides on some passing logs and finally into the safety of your hole on the opposite bank. Once all 'Frog Holes' have been filled you start again with a different pattern and a bonus frog.

when more than one game purchased deduct £1.00 from each tape!

Send your order to:
Mail Order Dept THE SOFTWARE FARM, Craigo Farm, Botany Bay, Tintern, Gwent

Screen displays can be a moving experience

Scrolling and losing lines are problems dealt with in detail by our expert adviser, Andrew Hewson, in this month's column

A number of questions concerned with the screen display of the ZX-81 and the Spectrum are answered this month. The first is from John Pritchard of Cheltenham, whom I met while answering Help-line questions on the *Sinclair User* stand at the Bristol Computer Fair. He asked: **Is it possible to scroll the screen sideways or downwards on the ZX-81?**

It is. Before describing the technique I shall review the method used to organise the display in first the 1K and then the 16K machine. The ZX-81 display is byte-mapped, i.e., each byte of memory in the portion of RAM used for the display—the so-called display file—determines the contents of one character position on the screen.

As there are 24 lines of 32 characters, each 24*32=768 bytes of RAM would be required to hold the contents of the complete display. That is a great deal of space compared to the 1,024 bytes available in the 1K machine.

To avoid wasting precious memory the 1K ZX-81 rarely contructs a complete display. When the machine is switched on, and after the CLS, NEW and RUN commands, the display file is at its minimum size of 25 bytes only. Each byte contains decimal 118 which is the newline character. The 25 newline characters indicate the beginning of the display and the end of each of the 24

```
100 LET A=PEEK 16396+256*PEEK
16397
110 LET B=PEEK 16400+256*PEEK
16401
120 DIM C(25)
130 FOR I=1 TO 25
140 LET C(I)=PEEK (A+I-1)
150 NEXT I
160 FOR I=1 TO 25
170 PRINT C(I)
180 NEXT I
190 PRINT
200 PRINT "LENGTH OF DISPLAY
FILE WAS ": B-A
```

Table 1. A program to PRINT the initial length of the ZX-81 display file and the contents of the first 25 bytes.

● *Please address problems and queries to Andrew Hewson, Helpline, Graham Close, Blewbury, Oxfordshire.*

lines. To see that effect plug-in a ZX-81 without a RAM pack and RUN the program listed in table one.

Variable A is set to the address of the beginning of the display file as held in the D-FILE system variable—see page 178 of ZX-81 Basic Programming. Variable B is set to the address of the end of the display file as held in the VARS system variable. Array C is then used to store the contents of the 25 bytes of the display. When all 25 values have been stored they are PRINTed on the screen. The original length of the display file is then PRINTed.

Note that it is not possible to PRINT the 25 values immediately they are determined, because to do so would alter the display as it was being studied. Similarly, it is the original length of the display file which is shown, not the length to which it grows as the program runs. Then RUN the program with the following lines inserted:

```
10 PRINT "AAA"
20 PRINT "BBB"
```

The six letters AAA BBB appear on the first two lines at the top left of the screen, followed by the contents of the first 25 bytes. The first byte contains 118 as before. The second, third and fourth bytes contain 38, the code for A—see page 182 of ZX-81 Basic Programming—and the fifth byte contains 118, indicating the end of the first line of the display.

The next three bytes contain 39, which is the code for B and are followed by 118, indicating the end of the second display line. All subsequent bytes contain 118, indicating that the remaining lines of the display were blank when the contents of array B were set. The length of the display, as calculated after AAA and BBB are PRINTed, increases from 25 to 31 bytes to accommodate the six letters shown on the screen.

With a 16K RAM pack added, the ZX-81 pads the display file with bytes containing 0, the code for a space. Thus a blank display file consists of an initial byte containing 118, followed by 32 bytes containing 0, terminated by another byte holding 118 to indicate the end of the first line. The subsequent lines are held similarly as 32 bytes of zeros, terminated by a byte containing 118.

To scroll the screen downwards or from side to side it is necessary to rearrange the contents of the display file in the appropriate logical fashion. There is one rule which must be obeyed while such re-arrangements are in progress. It is that while running in SLOW

```
100 LET A=PEEK 16396+256*PEEK
16397
110 LET B=PEEK 16400+256*PEEK
16401-1
120 LET D=1
130 LET I=B
140 IF PEEK I=118 THEN GOTO 210
150 LET S=PEEK I
160 LET I=I-D
170 IF PEEK I=118 THEN GOTO 200
180 POKE I+D, PEEK I
190 GOTO 160
200 POKE I+D,S
210 IF I=A THEN STOP
220 LET I=I-D
230 GOTO140
```

Table 2. A program to scroll the ZX-81 display from left to right. To scroll the display from right to left alter lines 120, 130 and 210 as follows:

```
120 LET D=-1
130 LET I=A
210 IF I=B THEN STOP
```

mode the ZX-81 display file must contain at least 25 bytes holding 118 at all times. If that rule is broken, the consequences are dire; the machine crashes and the only remedy is to pull out the plug and start again.

Tables two and three consist of programs to scroll the display from side to side and downwards respectively. A few simple alterations as shown to the program in table two will change the direction of scrolling from right to left to left to right as required.

Nasser Gazi of Coventry and Chris Cooper of Broxbourne both ask: **How can the Spectrum display be scrolled?**

The Spectrum display is bit-mapped from the 6K display file to the screen i.e., the screen is divided into 256×192=49,152 pixels and each bit of each of the bytes in the display file determines whether one pixel is illuminated. There are eight bits in each byte, 6,144 bytes in the display file, and 8×6,144=49,152, so for each bit there is one corresponding pixel.

The display file is held at the bottom of RAM between addresses 16384 to 22527 inclusive. If the number 255 is POKEd into a location in that area of RAM, a short horizontal line appears on the screen. For example:

POKE 16384,255

causes a line to appear at the top of the first character position at the top left-hand corner of the screen. There are no breaks in the line, because all the eight bits are set in a memory location containing 255. Thus the length of the line is 1 byte=8 bits=8 pixels.

Any other number POKEd into the display file will cause a broken short horizontal line to appear on the screen. A regular broken line can be produced by POKEing 170 or 85.

The order in which the mapping takes place from the display file to the screen can be seen using a loop of the form:

```
10 FOR I=16384 TO 22527
20 POKE I,255
30 NEXT I
```

That loop POKEs 255 into each memory location in the display file in turn. When it is RUN the screen fills with horizontal bars, which cover the screen gradually as the loop proceeds.

The first line appears at the top of the screen, the second appears eight locations below it, and so on until there are

eight bars on the screen. The ninth bar appears below the first, the tenth bar below the second, and then the seventeenth appears below the tenth. That method of stepping down the screen is repeated until the top one-third is filled completely. The second third and the final third are drawn in the same way.

The same effect can be seen if a copy of the display is LOADed from cassette using the SCREEN$ command. The display file controls only the illumination of each pixel. The colour information is held in the attributes file, which occupies locations 22528 to 23295 inclusive in RAM. Thus the attributes file immediately follows the display file.

POKEing a number into the attributes file will cause the status of the INK, PAPER, FLASH and/or BRIGHT of a entire character position to alter. The following routine fills the screen with characters and then sets them one by one to flash in magenta on red:

```
10 FOR I=1 TO 22
20 FOR J=1 TO 32
30 PRINT CHR$ (J+47);
40 NEXT J
50 NEXT I
60 FOR I=22528 TO 23295
70 POKE I,147
80 NEXT I
```

The order in which the attributes are mapped to the screen is as one might expect, starting at the top left and working from left to right down the screen. In that respect the Spectrum attributes file resembles the full ZX-81 display file but without an extra byte to terminate each line. Thus it is a straightforward matter to write a Basic program to scroll the attributes. An example is shown in table four.

Scrolling the Spectrum display file is more difficult and while it is possible to write routines in Basic they would have little practical value, because the large number of memory locations to be manipulated would make them very slow. Hence machine code routines are more or less essential.

If a fast but rather jerky scroll is acceptable, each byte of a display line can be transferred to left or right in an analogous manner to the method used for scrolling the attributes. Remember, however, that eight bytes are used to determine the form of each character position.

If a smooth scroll is required, the contents of each byte must be rotated, one bit at a time to right or left. After each rotation the final bit is displaced altogether and can be transferred to the next byte via the carry flag. Fortunately the Z-80 machine language is well-supplied with suitable byte rotation instructions.

Thus there are at least 12 ways of scrolling the Spectrum display; both the attributes and the display file can be scrolled, character by character, and the display file can also be scrolled pixel by pixel. Each mode can also be scrolled in all four directions and by calling two routines one after the other diagonal scrolling can be achieved.

It is not practicable to list all 12 routines and so I have included just two examples as listed in table five. The

continued on page 102

```
100 LET A=PEEK 16396+256*PEEK
16397
110 LET B=PEEK 16400+256*PEEK
16401-1
120 LET C=I
130 IF PEEK (B-C)=118 THEN GOTO
160
140 LET C=C+1
150 GOTO 130
160 FAST
170 FOR I=B-1 TO A+C STEP -1
180 POKE I,PEEK (I-C)
190 NEXT I
200 FOR I=A+1 TO A+C-1
210 POKE I,O
220 NEXT I
```

Table 3. A program to scroll the ZX-81 display file downwards.

```
10 FOR I=O TO 767
20 POKE 22528+I,INT(I/3)
30 NEXT I
100 LET A=22528
110 LET B=23295
120 LET D=1
130 FOR I=A TO B STEP D*32
140 LET S=PEEK I
150 FOR J=I TO I+D*30
160 POKE J,PEEK (J+D)
170 NEXT J
180 POKE I+D*31,S
190 NEXT I
```

Table 4. A Basic program to scroll the Spectrum attributes from right to left. To scroll the attributes from left to right alter lines 100, 110 and 120 as follows:

```
100 LET B=22528
110 LET A=23295
120 LET D=-1
```

continued from page 101

examples are taken from a book I wrote with John Hardman, *40 Best Machine Code Routines for the ZX Spectrum.* Hence you can either study the examples to determine the remaining nine or buy the book.

The routines can be loaded using an assembler or a simple decimal loader, such as the following, which POKEs each number in turn into the printer buffer:

```
10 LET D=0
20 LET S=22928
30 LET L=0
40 FOR I=1 TO 12
50 FOR J=0 TO L
60 LET D=D+.03
70 LET K=INT (127*SIN D)
80 POKE S+J,K
90 POKE S-J-1,K
100 POKE S+32-31*I-32*J,K
110 POKE S-31*I-32*J,K
120 POKE S-33*I+31+32*J,K
130 POKE S-33*I-1-32*J,K
140 POKE S-64*I+31-J,K
150 POKE S-64*I+32+J,K
160 NEXT J
170 LET L=L+1
180 LET S=S+32
190 NEXT I
200 GO TO 20
```

Table 6. A Kaleidoscope program for the Spectrum.

```
10 LET I=23296
20 INPUT J
30 PRINT I,J
40 POKE I,J
50 LET I=I+1
60 GOTO 10
```

To call the routine enter:

```
RAND USR 23296
```

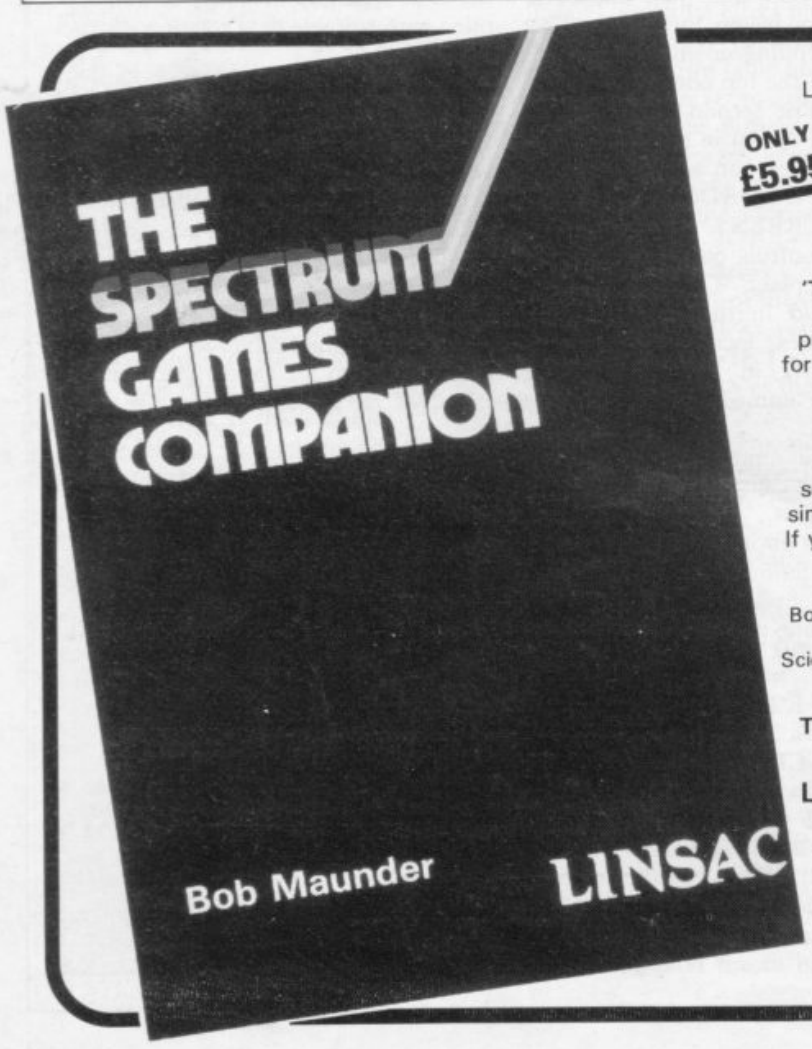
It appears that there are Sinclair users scattered all over the globe. Mel Carter in Lusaka, Zambia has a Spectrum and says: **When an input line goes over to a second or subsequent line, sometimes the machine deletes the bottom display line and sometimes it scrolls the display. Is there a way of predicting and controlling which event occurs?**

That effect is dependent entirely on the current PRINT position. If the last line PRINTed appeared at the bottom of the screen on line 21 the display will be scrolled upwards. Thus a PRINT AT statement immediately before the INPUT statement will provide the control required.

Finally, Spectrum owners may like to try the Kaleidoscope program listed in table six. It works entirely by POKEing the attributes file and shows what can be achieved in a few lines. Be warned that its effect is rather hypnotic.

Assembly code	Numbers to enter	Comment
		Right scroll by one character
ld hl, 22527	33 255 87	End of display
Id d,O	22 0	
ld a,192	62 192	No. of lines
ld b,31	6 31	32 characters per line
dec hl	43	Previous byte
ld e,(hl)	94	into e
inc hl	35	and back to
ld (hl),e	115	display
dec hl	35	Repeat for entire
djnz -7	16 249	line
ld (hl),d	114	Fill final byte
dec hl	43	Repeat for
dec a	61	each line
jr nz,-14	32 242	
ret	201	Return
		Left scroll by one pixel
ld hl, 22527	33 255 87	End of display
ld c,192	14 192	No of lines
ld b,32	6 32	32 characters per line
or a	183	Clear carry
rl (hl)	203 22	Rotate left
dec hl	43	Previous byte
djnz -5	16 251	Next byte
dec c	13	
jr nz,-11	32 245	Next line
ret	201	Return

Table 5. Two machine code routines to scroll the display file right by one character and left by one pixel respectively.



Linsac's ZX Companion series has received excellent press reviews:

ONLY £5.95

"Far and away the best" — *Your Computer*

Thoughtfully written, detailed and illustrated with meaningful programs ... outstandingly useful" — *EZUG*

'The Spectrum Games Companion' is the latest addition to the series and is aimed at the games player and programmer alike. Twenty-one games designed specifically for the ZX Spectrum are included, with clear instructions on entry and play. Each program is explained fully with complete details on how it is designed and written. Introductory chapters show how to set up and use the Spectrum and how to create your own games. Later sections cover number games, word games, board games, simulation games, dice games, card games and grid games. If you want to enjoy your ZX Spectrum and learn its secrets at the same time then this is the book for you!

Bob Maunder is co-author of 'The ZX80 Companion' and author of 'The ZX81 Companion'. He is a Senior Lecturer in Computer Science at Teesside Polytechnic, holds an MSc degree in Computer Science, and is a Member of the British Computer Society.

The Spectrum Games Companion is available from good book shops, or send £5.95 to:

LINSAC, (SU) 68 Barker Road, Middlesbrough, Cleveland TS5 5ES

Postage is free within the U.K. — add £1 for Europe or £2.50 outside Europe.

ISBN 0 907211 02 X

CONSOLE FOR ZX SPECTRUM/ZX81

The professional desktop Console for the ZX Spectrum/ZX81 raises and tilts the TV/Monitor to minimise eyestrain, holds in place the ZX printer, RAM packs (and other add-ons), power supply pack, tape recorder, ZX Microdrive and hides most of the wiring. Provides storage space for cassettes.
TV/Monitor stand removable for access to add-ons, wiring etc.
Optional: Two built-in illuminated power switches.

Date.....

Your name and address (In capital letters please) .....

.....

.....

.....

Qty	Description	Item Price	Total
	Console for ZX Spectrum/ZX-81	£36.95	
	Power switch for ZX Spectrum/ZX-81	£3.00	
	Power switch for Tape Recorder	£3.00	
		Sub Total	
		Post & Packing	£3.50
		Total Due	

Console colour finish: Matt black.
Approximate dimensions:
Width 660mm, Depth 442mm, Height 300mm.
All Prices inclusive of V.A.T.
Delivery: Please allow up to 28 days.

Cheques/P.O. Made payable to:

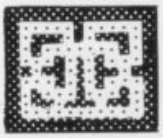
COMPUTERLOCK, 2 Wychperry Road, Haywards Heath, West Sussex RH16 1HJ.
Telephone: (0444) 451986.

Selec Software

NEW!

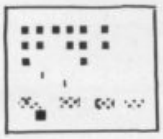
1K ZX81

MACHINE CODE PROGRAMS



Maze Guzzler

- The only 1K version of maze chaser game
- Intelligent monsters
- Energy pills
- Speed up feature
- On tape with SUPERBREAKOUT
- £3-50



The Invaders

- Full feature space invaders
- £2-00

ZX Panic

- The most addictive game ever
- Guide yourself around the screen avoiding the poisonous gas or instant electrocution.
- On tape with ZXSQUASH (1-2 player)
- £3-50

(All programs run directly on 16K machines too)

Cheques / P.O. to ..... (Prices all inclusive - p+p free).

Selec Software
37 Councillor Lane
Cheadle, Cheshire.

TASWORD TWO THE WORD PROCESSOR

48K SPECTRUM

64 CHARACTERS PER LINE ON THE SCREEN AND TO PRINTERS!

TASWORD TWO The Word Processor

Your Spectrum becomes a **professional** word processor with TASWORD TWO. TASWORD TWO gives you an amazing **64 characters per line** on your screen. This is ideal for standard A4 paper and TASWORD TWO prints your text just as it appears on your screen.

A printer interface is required to send output to printers. Tasword Two is available now for the Hilderbay parallel interface. Versions for other interfaces may be ready by publication date. Send s.a.e. for details or order demonstration cassette. Tasword Two does drive the ZX printer.

£13·90 fully inclusive mail order price.

TASWORD TWO £2 Demonstration Cassette

See for yourself the powerful features of TASWORD TWO. Send just £2 for the Tasword Two demonstration cassette. A voucher is included which gives you £1 off the price of TASWORD TWO.

TASMAN SOFTWARE

Dept SU

17 HARTLEY CRESCENT LEEDS LS6 2LL

TASWORD The Word Processor

"This package is definitely value for money."
Educational Computing, April 1983

The first real word processor for the Spectrum and still great value for money. Thirty two characters per line make it ideal for use with the ZX printer.

£7·95 fully inclusive mail order price.

TASWORD £1 Demonstration Cassette

Send just £1 for the demonstration cassette and a voucher giving you 50p off the price of TASWORD.

ZX81 TASWORD

"Very good value and great fun to use."
"Unreservedly recommended." Popular Computing Weekly 19·8·82

No demonstration cassette available but send 50p (refundable against your subsequent purchase of ZX81 TASWORD) for a copy of the manual.

£6·50 fully inclusive mail order price.

TASWORD TUTOR

"an eloquent demonstration of Tasword's uses"

Every TASWORD program comes complete with a manual and a cassette. The cassette 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.

DRAFT

A really powerful and versatile computer spreadsheet program for the ZX81 – 16K. Will rapidly give you the answers to almost any type of repetitive calculations on lists or tables of numbers, e.g. maths homework, domestic accounts, school geometry, mortgages/insurance, trade discounts etc. Clear practical style quickly resolves lengthy and tedious calculations. Endlessly useful at home, college and work.

- Up to 80 columns or lines of data.
- Text, formulae, constants and data all fully listable.
- Proper 'report generator' displays any combination of columns on the screen or for printing.
- Range of 21 calculating functions: Arithmetic, Average, Percentage, Group Total, £0.00 justification and all the keyboard scientific and trigonometric functions.
- All reports and listings duplicated on the ZX printer as continuous copy.
- DRAFT files can be 'saved' either full or empty but structured for repetitive later use.
- Detailed instruction manual covers all facets of the program.

The DRAFT cassette and manual together are £7.50 from Myrmidon Software, PO Box 2, Tadworth, Surrey KT20 7LU, or send a stamped/ self addressed envelope for full details.

EXPLORING SPECTRUM BASIC
Complements the Sinclair manual by explanations of BASIC programming techniques supported by over 50 full games & serious programs. 191 pages. £4.95

THE EXPLORERS GUIDE TO THE ZX81
The book for the ZX81 enthusiast. 152 pages of games, application and utility programs plus much useful information on machine language and hardware. "Immediate and lasting value" (P.C.W.). £4.95

Available from leading bookshops and computer stores, or direct from Timedata (U.K. P&P free, overseas customers add £1.50 per item for surface mail).

TIMEDATA Ltd. Dept. H
16 Hemmells, Laindon, Basildon, Essex. SS15 6ED
Tel.: (0268) 418121

TIMEDATA

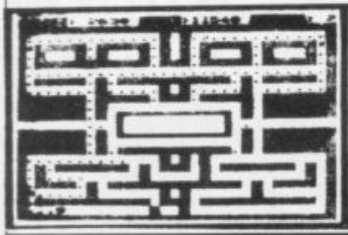
DJL SOFTWARE

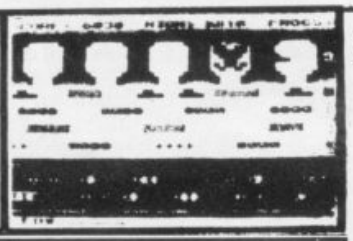
DJL

DEPT SP, 9 TWEED CLOSE, SWINDON, WILTS SN2 3PU

Tel: (0793) 724317 Trade enquiries welcome

Export Orders: **Please add £1.00 per tape airmail**





ZUCKMAN
ZX81 (16K)

- *ALL MACHINE CODE (10K)
- *FOUR INDEPENDENT GHOSTS
- * HIGH-SCORE 'HALL OF FAME'
- *AUTHENTIC ARCADE ACTION
- *TITLE/DISPLAY MODE

ONLY £5.95 INC. P&P

FROGGY
ZX81 (16K)

- *MOVING CARS, LOGS, TURTLES
- *ALLIGATORS, DIVING TURTLES
- *FOUR 'SCREENS' OF ACTION
- *ALL ARCADE FEATURES
- *ENTIRELY MACHINE CODE

ONLY £5.95 INC. P&P

★ NEW ★ **ZX Spectrum** ★ NEW ★

FROGGY
16K or 48K

SPECTRUM VERSION OF ARCADE GAME WITH FULL ARCADE FEATURES:

- ★ Fabulous Hi-Res Colour Graphics
- ★ Authentic Sound Effects + 3 Tunes
- ★ 3-D Logs, Swimming & Diving Turtles
- ★ 3 Lanes of Multi-coloured vehicles
- ★ On-screen Score, Hi-Score, Time-bar
- ★ Snake, Alligators and Baby Frog
- ★ 'Top 5' High-Score initials table
- ★ Demonstration Game routine

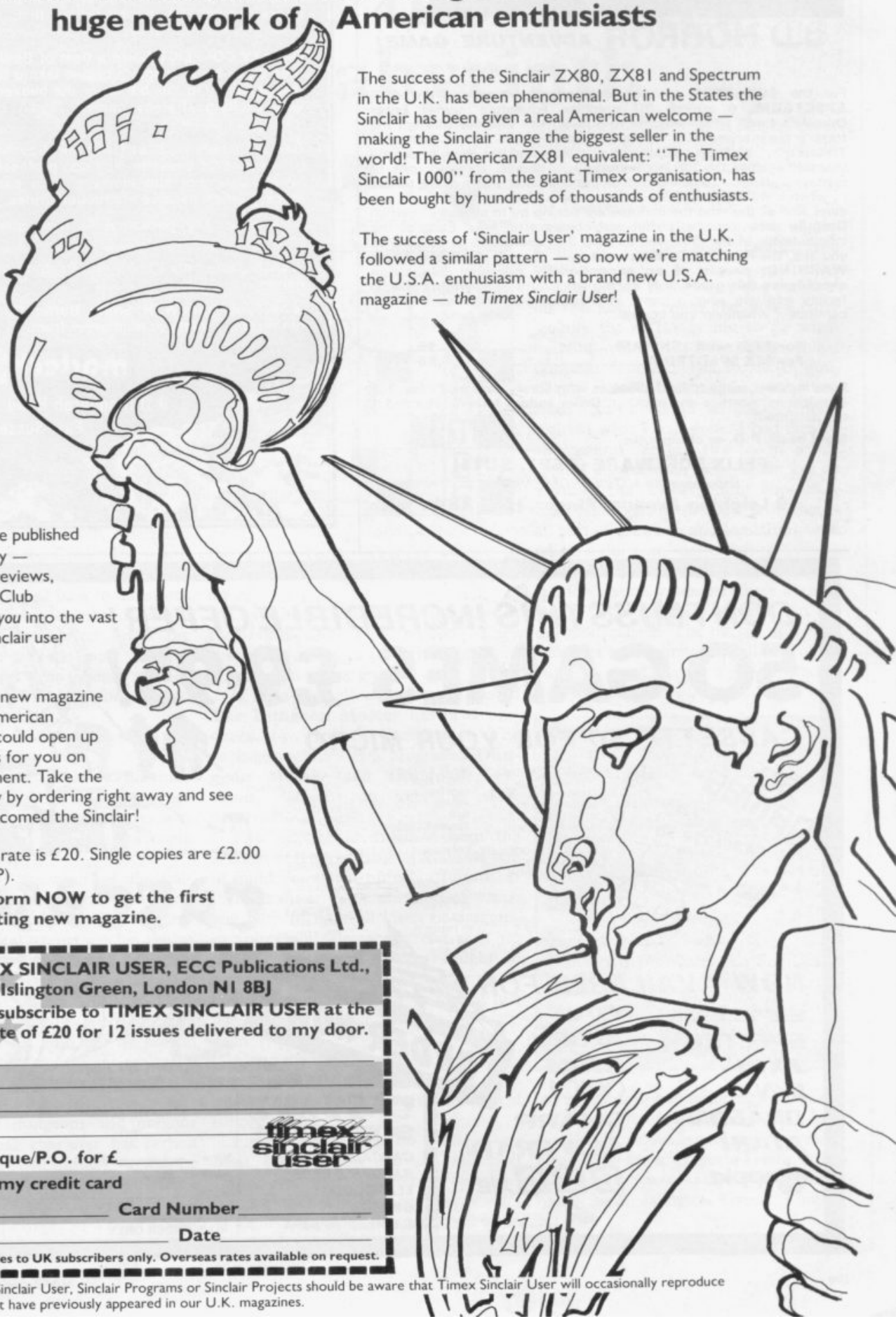
Your home-sick frog must leap across a busy main road, then onto logs and turtles in the river to reach safety of the river-bank frog-homes. THIS MACHINE-CODE GAME MUST BE SEEN TO BE BELEIVED!!

ONLY £5.95 INC. P & P

Now you can take a new

AMERICAN look at your Sinclair!

With the new Timex Sinclair User magazine to link YOU into a huge network of American enthusiasts



The success of the Sinclair ZX80, ZX81 and Spectrum in the U.K. has been phenomenal. But in the States the Sinclair has been given a real American welcome — making the Sinclair range the biggest seller in the world! The American ZX81 equivalent: "The Timex Sinclair 1000" from the giant Timex organisation, has been bought by hundreds of thousands of enthusiasts.

The success of 'Sinclair User' magazine in the U.K. followed a similar pattern — so now we're matching the U.S.A. enthusiasm with a brand new U.S.A. magazine — *the Timex Sinclair User*!

The first issue will be published in the U.S.A. in May — packed with news, reviews, programs and User Club information to link *you* into the vast American Timex Sinclair user network.

Remember, this is a new magazine written from the American viewpoint — but it could open up whole new horizons for you on your Sinclair enjoyment. Take the new, American view by ordering right away and see how the U.S.A. welcomed the Sinclair!

Annual subscription rate is £20. Single copies are £2.00 each (including P & P).

Fill in the order form NOW to get the first issues of this exciting new magazine.

Send to: TIMEX SINCLAIR USER, ECC Publications Ltd., 30-31 Islington Green, London N1 8BJ

Yes, I want to subscribe to TIMEX SINCLAIR USER at the special U.K. rate of £20 for 12 issues delivered to my door.

Name _____

Address _____

_____

_____

timex sinclair user

I enclose a cheque/P.O. for £_____

Please charge my credit card

Card Name_____ **Card Number**_____

Signature_____ **Date**_____

N.B. This offer applies to UK subscribers only. Overseas rates available on request.

N.B. Subscribers to Sinclair User, Sinclair Programs or Sinclair Projects should be aware that Timex Sinclair User will occasionally reproduce top articles that have previously appeared in our U.K. magazines.

THE TOMB OF DRACULA!

3D HORROR ADVENTURE GAME!

For the **16K ZX81** or with colour and sound for the **48K SPECTRUM,** a superb 3D graphics adventure game! **Enter** Dracula's tomb at 30 minutes to sunset . . . **wander** through the tomb's pre-mapped 300 vaults in search of the fabled Vampire's Treasure . . . **pick up** valuable silver stakes and use them to defend yourself against the lurking horrors . . . ghouls, zombies, pits of primaeval slime . . . **See** them all on the computer's plan of the tomb . . . when it will let you! **Take** a chance on a Mystery Vault . . . if you dare! And all the time the minutes are ticking by to sunset . . . when **Dracula** rises from his coffin and comes after **you!** Each of the infinite levels of the tomb has its own 300 vaults . . . go as deep as you like, the Prince of Darkness will seek you out in his blood-lust! **WARNING: people of an exceptionally nervous disposition should play this game only during the hours of daylight!** Special facility lets you save a game in progress onto tape so you can continue it whenever you choose.

For ZX81 with 16K RAM £3.95
For 48K SPECTRUM £4.95

Price includes ready-to-load cassette with library case and inlay, full instructions, postage and packing. **Order today!** Money refunded if not delighted!

Send cash, P.O. or cheque to:

FELIX SOFTWARE (DEPT. SU11)
(incorporating MOVIEDROME VIDEO)
19 Leighton Avenue, Pinner, HA5 3BW.

At last . . . Exciting AND Challenging Computer Games for Two Players.

CONFLICT A total war for two players involving both the machinery (armies, missiles, warships) and finance (stock market, oil, piracy) of conflict. *"I enjoyed this strategy game" (Computer and Video Games).*

GALAXY CONFLICT Raise a fleet of Battle Eoncruisers then move from bridge to bridge taking full control and responsibility in this battle for the heavens. A new and very exciting strategy game. *"Galaxy battle sets new trend" (Sinclair User).*

Games include — ZX81 (16K) and Spectrum (48K) programs on ONE cassette. Full size professionally printed board. Counters and markers. Two pads disposable maps. Comprehensive instructions/rules.

★Professionally packaged in high quality attractive box.

★Each game only £11.95 inc. Postage or £22 for both games.

★Available from W. H. Smith, Buffer, Currys and many other retail outlets or mail order from:

martech games
9 Dillingburgh Road, Eastbourne
East Sussex BN20 8LY

DON'T MISS THIS INCREDIBLE OFFER!

50 GAMES £9·95!

CASSETTE 50 FOR YOUR MICRO

GALACTIC ATTACK
SPACE MISSION
LUNAR LANDER
PLASMA BOLT
STARTREK
RADAR LANDING
ATTACKER
GALACTIC DOGFIGHT
ZION ATTACK
IVASIVE ACTION
OXO
BOGGLES
PONTOON
SKI JUMP
HANGMAN
OLD BONES
THIN ICE

MAZE EATER
ORBITTER
MOTORWAY
FORCE FIELD
NIM
TUNNEL ESCAPE
BARREL JUMP
CANNONBALL BATTLE
OVERTAKE
SITTING TARGET
SMASH THE WINDOWS
SPACE SHIP
JET FLIGHT
PHASER
INTRUDER
INFERNO
GHOSTS

SUBMARINES
ROCKET LAUNCH
PLANETS
BLACK HOLE
DYNAMITE
DO YOUR SUMS
DERBY DASH
SPACE SEARCH
UNIVERSE
RATS
TANKER
PARACHUTE
JETMOBILE
HIGH RISE
THE FORCE
EXCHANGE

CASCADE SOFTWARE

NOW AVAILABLE FOR

sinclair SPECTRUM
ZX81
LYNX
DRAGON
ATARI
apple (ON DISC & CASSETTE)
VIC 20
ACORN ATOM
ORIC-1
SHARP
NEW BRAIN
BBC A/B

ORDER NOW

DIRECT MAIL ORDER FORM

CASCADE SOFTWARE
CASCADES HOUSE
BARGAN'S LANE
LLANDOGO
GWENT
S.WALES NP54PA

SUPPLY CASSETTE 50 FOR _____ COMPUTER
I enclose cheque/P.O.
Name _____
Address _____
_____
MAIL ORDER ONLY SU1/4

Dungeons and dragons have spawned some exciting Sinclair offspring. Quentin Heath goes underground

Journey to the centre of the labyrinth

PREPARE THYSELF for battle and, with sword in hand, enter the dungeons to face terrors beyond your imagination. I expect you have guessed that I am writing about the dungeons and dragons craze which has hit manufacturers and users of Sinclair software. I also want to introduce newcomers to the cult mythos which surrounds the subject.

A dungeons and dragons adventure usually takes place in an underground labyrinth. You will meet monsters at almost every turn and the object is to defeat them and search for treasure or magic potions.

A new game called **Velnor's Lair** is an example of this kind of adventure from Neptune Computing, costing £6.50.

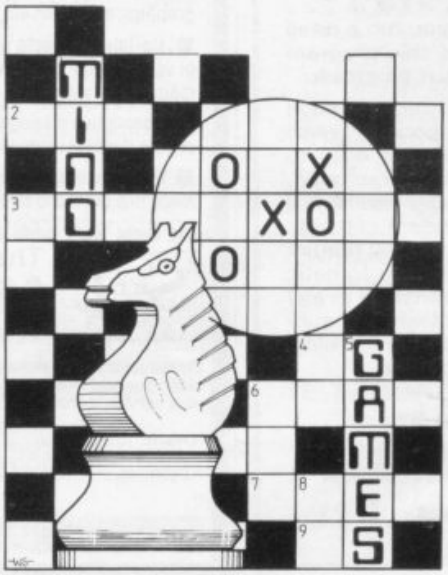
The game is for the 48K Spectrum and takes place in the Goblin Labyrinth under Mount Elk. The Black Wizard Velnor has discovered how to transform himself into a living demon on Earth and is hiding in the caves under the mountain. You are the poor, hapless creature who has been chosen to seek and destroy the wizard before he can realise his deadly aim.

Luckily you can choose whether you want to be a wizard, warrior or priest. The wizard can use magic and his three spells include a fireball which destroys everything, a zap to turn creatures into frogs, and a teleport spell to overcome difficult situations.

Unfortunately the wizard is physically weak and cannot stand prolonged attack by sword or club. He is also limited in magical strength as his ability of 10 decreases with each spell he casts.

The priest is like the wizard but his spells will heal, shield and dispel the 'undead.' The warrior is strong and does well with his club but he has no way of defending himself against magical beings. He is the most difficult to kill.

As with all dungeons and dragons adventures, your character has certain attributes. They determine how well he does in battle and may even determine whether he is magical enough to discover a secret passage. In Velnor's Lair



the screen border changes colour to denote how healthy or unhealthy you are.

I have included some playing ideas in the Hints and Tips section. They should help you to play the game and defeat a few monsters.

A do-it-yourself dungeon kit called **The Dungeon Master** has been produced by Crystal Computing. The package includes two programs, **Dungeon Master** and **Dungeon Creation,** which run on the 48K Spectrum.

The package is different from the average adventure game as it allows you to build your own tunnels of death. It includes an example dungeon in which you have to fight all kinds of dragons, vampires and elementals and pick up potions. You may also be caught in space and time warps which can throw you back into the room you have just left or into the last room in the dungeon.

Along the way you can pick up weapons and magical artefacts but the main purpose of the quest is to find a series of turquoise rings.

Fights need not be on a one-to-one basis. It is possible that you will meet two or even three monsters at one time. You can then select which one you want to fight first. Monsters are ranked in order of combat strength. The easiest to defeat is the giant centipede and the most dangerous is the Demogorgon.

The other program in the package is the Dungeon Creator. It enables you to create your own dungeon with all the monsters, pitfalls and rewards you want.

After being let loose on the program for two hours I could give you a fairly lengthy list of things not to do when building your friendly neighbourhood dungeon. One dungeon I created, ominously called Maximus, had me going around in circles for an hour before I realised what I had done. I had created an opening between two rooms which created a space-time loop. There was no warning but I was going alternately from one room to another. Still, that is all part of the game and something with which a dungeon master has to live.

I have been a dungeons and dragons fan for several years but there are few people who will play when I am the dungeon master. The package provides excellent entertainment to all fans of the cult and should prove a good introduction to the game.

Hints and Tips

If wizard's steps you are to tread,
A fireball knocks the spider dead.

Velnor's visions are just a sham;
Bridges made of stone are just illusion.

Ogres from little acorns do not grow;
They have to be fed.

In caves with dead-ends do not look in awe,
If it's exits you want seek the hidden door.

If you should fight and run
Be prepared for evil to follow.
It will usually get the better of you.

● *If you have any views on mind games or if you have hints and tips on adventure, computer-moderated games or chess, please write to me:* Quentin Heath, Mind Games, c/o *Sinclair User,* ECC Publications, 30-31 Islington Green, London N1 8BJ.

KEMP

STOCK CONTROL 48K SPECTRUM UP TO 15,000 ENTRIES PER YEAR — £14.95 (incl. P&P)

Improve your business now. Whether you run a retail or hire business, or a canteen you need this program now. Control stock values. **Never run out of stock.**

A sample system of three files of 100 records each can cope with up to 30,000 transactions a year! (Maximum file size is over 270 records). This easy to use menu-driven program has everything you need. Some of the many features include re-order levels, full correct/delete facilities, sorted lists — even audit trail. Full printer output provides all the hard copy you require — period transaction files, copy records, automatic output for entries etc. **Absolutely indispensible** in any small stock application, for keeping track of club subscriptions etc. Updates will be available at nominal cost. Supplied complete with 20 page manual.

Can you afford to be without it?

Kemp Ltd, 43 Muswell Hill, London, N10 3PN

Kemp — The perfect answer

HIRE ZX81/SPECTRUM PROGRAM TAPES

Make the most of your computer by hiring from the original and still the only software library offering all these features:

- Over 800 tapes stocked, offering more than 100 different programs from 27 suppliers (all with their permission)
- Includes the latest arcade, adventure and simulation games, business and home utilities, graphics, education etc.
- Up to 40 maker's original copies of very popular tapes enable us to maintain good service
- Descriptive catalogue helps you choose the best tapes for your needs
- **FREE** quarterly, illustrated magazine posted to all members
- Full-time staff of three offer you a friendly, efficient welcome & service
- Fortnight's hire for £1.40 inc p/p
- All tapes guaranteed loadable; help given with associated problems
- Overseas branches being set up (Malta already operating); franchises available for some countries
- Send SAE for details, or join on money-back no-risk approval today
- **"An exceptionally professional and thriving organisation"**—review in Eric Deeson's "Guide to ZX Spectrum Resources"

S L

The SINCLAIR OWNERS' SOFTWARE LIBRARY
Warren Road, Liss, Hants GU33 7DD.

Please send me on money-back approval my magazine, descriptive library catalogue and order form, on the understanding that if I'm not delighted with your service within 28 days you will refund my money in full.

NAME.....

ADDRESS.....

.....

Please enclose cheque/P.O. for £8.50 (year's ZX81 membership)/ £9.50 (Spectrum). Overseas £2 extra in each case. su

INTERNATIONAL SOFTWARE MARKETING COMPANY

WISHES TO RECRUIT EXPERIENCED HOME BASED MICROPROGRAMMERS

WE OFFER EXCELLENT REMUNERATION AND OTHER BENEFITS INCLUDING A SHARE OPTION SCHEME.

SEND YOUR PERSONAL DETAILS TO:

GATWICK COMPUTER CO.
THE GROVE, HORLEY,
SURREY.

DELTA RESEARCH

15 Church Street, Basingstoke, Hants
Tel: 0635 45373

UPGRADE YOUR SPECTRUM TO

48k

including FREE DELTA CHIPCHEK CASSETTE worth £3.50

Spectrum 1 **£33** SS32A

Spectrum 2 **£26** SS32B

EASY TO FIT — COMPLETELY ENCLOSED IN THE SPECTRUM CASE

DELTA RAM kits utilise components from the world's leading supplier, are engineered to provide reliable operation and are supported by the DELTA CHIPCHEK, a Memory Diagnostic Cassette provided Free with each kit giving computer standard testing of the existing 16k RAM and the 32k extension, searching tests for each RAM location and refresh operation.

CHIPCHEK is suitable for all Spectrums, 16k and 48k and brings your operating up to professional standards.

BEFORE ORDERING PLEASE CHECK THE ISSUE NUMBER INSIDE ON THE CIRCUIT BOARD AND WHETHER OR NOT INTEGRATED CIRCUIT 26 IS FITTED.

* My Spectrum is issue 1/issue 2
Integrated Circuit 26 is /is not fitted

Please supply RAM Kit No. SS32A/SS32B £33 / £26
CHIPCHEK Diagnostic Tape DTS5 £3.50/FREE

Name .....

Address .....

..... Postcode .....

Access Number .....

Prices include p & p and VAT. Make cheques payable to Servodata Ltd. * delete as applicable.

STAR DREAMS

Announce the most comprehensive and powerful Tool Kit available for the ZX Spectrum.

The ZX Tool Kit adds 11 commands to enable easier program writing and debugging.

Facilities include:
Line Merge
Block Delete
Block Move
Renumber (anything from a single line to the whole program)
Variables Dump (prints name and values of all variables in use)
Trace (available on 48K version only — shows program line and statement number being executed during Run)
All this and 5 other invaluable utilities for just £9.95.

ZX Tool Kit is available from better computer shops or direct from:

Star Dreams, 17 Barn Close,
Seaford, Sussex BN25 3EW.

For details of our full range of software, including games and business programs, please send an S.A.E. to the above address.

Coming soon: a revolutionary idea in computer gaming

DARK STAR DESTROYER

TELESOUND 84

(Patent Pending)

SPECTRUM BEEP BOOSTER

. . . Puts Sound Through TV . . .

Probably the world's smallest sound modulator, measuring 2½ x 1½ x 1cm. TELESOUND 84 fits inside the ZX Spectrum and most other home computers to enable the BEEP to be heard directly from an unmodified TV. Sound can be controlled by the TV from a whisper to a roar. Fitting takes only minutes with three easy snap-on connections, eliminating soldering. Dealer enquiries welcome.

TELESOUND 84 costs £9.95 inclusive from

COMPUSOUND
32 Langley Close, Redditch
Worcs B98 0ET

Brace yourself for a new generation of software

FOR 16/48K SPECTRUM

3D TUNNEL – 16K/48K Spectrum
A full action graphics game to test your skill and nerve. What lies in the depths of the tunnel? Flying bats, leaping toads, scurrying rats, crawling spiders all appear in the depths of the moving tunnel. The 48K version also holds a surprise in store! **ONLY £5.95**
Compatible with Kempston and AGF Joysticks. "3D Tunnel contains some of the most impressive graphics you're likely to see on the Spectrum" Computer and Video Games.

FOR 16K-SPECTRUM

ESCAPE – 16K Spectrum
You'll need plenty of stamina to escape the dinosaur infested maze. You'll have to find the axe and break out of the maze, but the Triceratops will be looking for you and the Pteranodon could swoop down on you at any time! **ONLY £4.95** "One of the best and most original games we have seen for the Spectrum so far" Sinclair User.

FOR 48K SPECTRUM

KNOT IN 3D – 48K Spectrum. This is an action game, that needs nerve and quick reactions! Hurtling through a void, your task is to travel as long as possible, scoring points along the way. Be careful though as you will have to avoid your own trail and those of up to four chasers. As trails are left you will have to thread your way through, but don't forget – the more trails the less space for manoeuvring. You will be terminated when you finally get caught in 'The Knot'. Compatible with Kempston, AGF and Mikrogen Joysticks. **ONLY £5.95.**

FOR 16K ZX81

3D DEFENDER* – 16K ZX81
Fancy yourself as a spacefighter? Here's your chance to find out how good you would be in defending your home planet. A fast moving machine code game in 3D with meteors, stars, explosions, plasma blasts, photon beams and of course alien space craft to look out for! Your cockpit display will show shield strength, altitude, proximity, forward radar and your score. **ONLY £4.95** "Another 3D winner" Sinclair User.

FOR 16K ZX81

3D MONSTER MAZE* – 16K ZX81
The ultimate 3D maze game for your ZX81, not only do you have to find your way out of the maze but you'll have to watch out for the T.Rex – it will actually run towards you when it sees you! Fast moving machine code graphics. **ONLY £4.95** "If I had to choose just one program to impress an audience with the capabilities of the ZX81, the 3D Monster Maze would be the one without doubt" ZX Computing.

Also available: **FULL SCREEN BREAKOUT*** – 1K ZX81. **ONLY £1.95.**

Please rush me:

	Price
☐ 3D Tunnel 16K/48K @ £5.95 inc.	
☐ Escape @ £4.95 inc.	
☐ 3D Defender @ £4.95 inc.	
☐ 3D Monster Maze @ £4.95 inc.	
☐ Full Screen Breakout @ £1.95 inc.	
Please tick box — Total inc.	

Cheques/PO payable to New Generation Software

Name _____

Address _____

New Generation Software Freepost BS3433 Oldland Common Bristol BS15 6BR

All games written by Malcolm Evans-The 3D expert. For instant despatch phone 01-930 9232 and quote your credit card number.

*These games have previously been available from J K Greye Software Ltd.

New Generation Software

ALL-SORT™ S-1

MACHINE CODE SORTING IN YOUR BASIC

ALL-SORT S-1 is an easy to use generator for the 48K Spectrum. It outputs to cassette lines of BASIC for any Spectrum. Each output includes an active line containing the machine code sort with its own call and return.

The code sorts data in BASIC arrays. It is relocatable, normally kept as a high numbered line. The sort is called by GO SUB or by use of a FN.

Options include single or multi sort; preset or controlled by programmer or by program. Four arrays may be sorted in parallel on four keys, all defined without restraint.

1,000 records each of 40 ch sort in 10 seconds.

ALL-SORT S-1 includes a comprehensive manual. A demonstration is given on the tape. Maintenance is by low cost replacement. A commercial user's licence is available.

EXTRA: A line to add and remove records at the end of arrays is now included with ALL-SORT S-1. You now have list processing in BASIC.

Get ALL-SORT S-1 from ZX software retailers.

ALAN FIRMINGER
171 Herne Hill SE 24

RRP £18 + VAT
replacement £6

SOUND with SINCLAIR

MAKE AMAZING SOUND EFFECTS WITH YOUR ZX 81, TIMEX Sinclair 1000 or SPECTRUM

THE ZON X

£25.95
incl p&p & VAT

- The ZON X SOUND UNIT is completely self-contained and especially designed for use with the ZX81, TIMEX Sinclair 1000 and Spectrum Computers. It just plugs in — no dismantling or soldering.
- No power pack, batteries, leads or other extras.*
- Manual Volume Control on panel — ample volume from built-in loudspeaker.
- Standard Sinclair — 16K Rampack or printer can be plugged into ZON X Sound Unit without affecting normal computer operation.
- Huge range of possible sounds for Games, Music, Helicopters, Sci-Fi, Space Invaders, Explosions, Gun-shots, Drums, Planes, Lasers, Organs, Bells, Tunes, Chords, etc., or whatever you devise!
- 8 full octaves. Uses 3-Channel sound chip giving programme control of pitch, volume of tones and noise, all with envelope control.
- Easily added to existing games or programmes using a few simple "BASIC" lines or machine code.
- No memory addresses used — I.O. mapped.

FULL instructions with many examples of how to obtain effects and the programmes, supplied. Fully guaranteed. British Made.

**Except with Spectrum you need the Spectrum Extension Board Order No. SE1 — Price £6.80 incl. V.A.T.*

Payment may be made by Cheque, PO Giro No. 388 7006, Postal Order or Credit Card.
Export orders: — Bank Cheque, International Money Order, U.S. $ or £ Sterling.

BI-PAK Dept. SU4. PO Box 6, 63A High Street, Ware, Herts.

Access & VISA accepted. Ring 0920 3182 for immediate despatch.

ZX 81 User

YOU deserve a High Quality Keyboard for only £39.95

Ten Good Reasons why the MUKBUS keyboard represents a quality product for the amateur/professional user.

★ Full Size Space Bar
MUKBUS Mother Board Compatible ★
★ Colour Coded Keycap Legends
Shift Lock with L.E.D. ★
★ Cursor Pad
No Separate Power Supply Required ★
★ Fire Button
Future User Function Key Capacity ★
★ Automatic Delete Key
Positive Tactile Key Response ★

Cheques/P.O. please to:
MICROTEXT (UK) Ltd,
22–24 John Street,
Luton
Beds LU1 2JE

Price £39.95
inc VAT
+ £2 P&P

Please Print Clearly
Name.....
Address.....
.....Tel: No .....

CHILDREN'S EDUCATIONAL SOFTWARE

(The Micro Master Series for SPECTRUM and ZX81)

A series of educational programmes for children aged 6-13 years.

All the programmes have been RESEARCHED AND TESTED by teachers. They are easy to use (just RUN) and they have been designed with just one aim in mind — fast and efficient learning. each programme requires 16K or more.

THE FOUR RULES OF NUMBER. *(A package of 5 programmes)*

Virtually all mathematics requires use of the FOUR RULES of number. Knowing how to use them (add, subtract, multiply and divide) is NOT ENOUGH. Children must learn to be FAST AND ACCURATE as well as learn to cope with more complex arithmetic. They must also learn their tables WELL. Only in this way can a child even BEGIN to deal effectively with mathematics.

The FOUR RULES package has been designed to achieve these goals QUICKLY. It will cater for an average 6 year old as well as for the best 11 year old aiming for a VERY HIGH STANDARD. Each programme will adjust to the child's ability and keep him reaching upward. Grading tables show the parent where the child stands for his age and ability.

LANGUAGE DEVELOPMENT SERIES *(For 7-13 year olds)*

Teach/test programmes which will develop VOCABULARY, SPELLING, CONCEPT ATTAINMENT, VERBAL REASONING and KNOWLEDGE OF THE ENGLISH LANGUAGE.

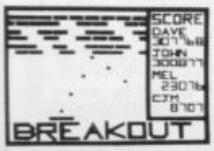
These programmes are specific to EACH age group, and for EACH age group there is a SERIES of carefully graded cassettes. For example, for a 9 year old there are cassettes 9A, 9B, 9C . . . 9H (progressing in difficulty from A to H). Each cassette contains 10 programmes and every programme requires 16K. Performance is monitored to determine whether or not the child should move to a higher level.

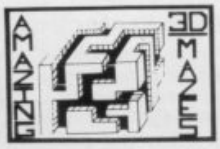
THE FOUR RULES PACKAGE	£7.60 (£11.70 after June 1 1983)
LANGUAGE DEVELOPMENT CASSETTE	£6.20 (£7.90 after July 1 1983)

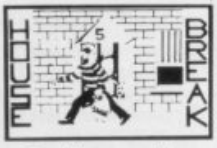
Cheques to Dr K. Glasson for CES, 94 Airedale Ave, Chiswick, London W4 2NN. For further details phone 01-747 1373 (Answer Phone for your address)

(SINCLAIR & COMMODORE PROGRAMMERS REQUIRED)

ZX SPECTRUM – ZX81 (16K) SUPER SOFTWARE PACK







25 great programmes on one pack: Star Wars, Gambling machine, Breakout, Trap It, Population Simulation, Corridors of Doom, Housebreak, Towers of Hanoi, Butterfly Chase, The Vault, Yahtzee, Maths, Calendar, Amazing 3D Mazes, 3D Noughts & Crosses, Jackpot Bandit, Hangman, Music, Bible, Chemistry and Sport, Mastermind, Spelling, Diary, Records File and Time Warrior.

We only have room here to fully describe one programme, but do not hesitate to phone or write for full descriptions of all the programmes.

HOUSEBREAK: You enter a house at night in an attempt to rob it of money and any gold and silver items you can find. Your aim is to clean out the whole house if you can. In the dark you must avoid bumping into the furniture. After a time an alarm will sound, and soon after the lights will be turned on. A vicious dog is then set loose and you have to use all your skill and cunning to avoid getting bit as he chases you around the house. Any injury from the dog will slow down your escape. The game is played in real time and has excellent graphics. A new house is generated each time the game is played.

25 SUPERB GAMES ONLY £8.95!

The full cassette of 25 games is sent for £8.95 inclusive

Trade enquiries are welcome. Telephone 0608 3059

SPARTAN SOFTWARE

9 Cotswold Terrace, Chipping Norton, Oxon.

HIGH RESOLUTION INVADERS FOR 16K ZX-81

No its not a printing error! We utillise a **SOFTWARE ONLY** technique developed by Steve Briers BSc to produce a stable 248 by 224 pixel display.

ABSOLUTELY NO HARDWARE MODIFICATIONS, ARE REQUIRED.

This is the only program that can achieve this without using expensive add-ons. But the graphics are just one feature from a long list:

- Game options — one or two players — taking turns or playing simultaneously!
- Adjustable bomb dropping and missile firing rates.
- Advanced keyboard scanning routines to aid game playing.
- All options selectable under program control (no POKEing around).
- Game can be stopped at any time.
- Three types of invader with graded scoring in a 5 × 11 array.
- Saucers appear at intervals.
- Protective shields.
- Difficulty increases as game progresses.
- Base explosion effect when hit.
- Uses 99% of available memory.
- Recorded twice on a high quality cassette.
- Instructions on how to load and play the game included.
- Only £4.95 from

ODYSSEY COMPUTING
28 BINGHAM ROAD,
SHERWOOD,
NOTTS
NG5 2EP

JOIN THE USERS' CLUB

FREE BOOK!

Make the most of your Spectrum or ZX81 by joining the country's strongest and most enthusiastic users' club–the National ZX Users' Club.

When you join us, we'll send you our 'new members welcome pack' with 30 programs (15 for the ZX81, 15 for the Spectrum), plus the first issue of our value-packed club magazine INTERFACE.

Inside INTERFACE as well as at least six programs for your ZX81 or Spectrum, you'll find letters from members as they share tips and ideas, and sound off on a variety of subjects (such as you-know-who's appalling delivery times record), a list of local ZX clubs, and special offers from software houses and book publishers–special offers just for members.

If you're having problems with your computer, we have experts on tap to try and help you. If you want to start a local users' club, we'll give you publicity, and let you buy books at a special discount for your club members.

If you're not a club member, you're missing out on making the most of your micro (and try saying that ten times quickly!) Come on in and join us, the water's fine. It's £9.50 for a year's INTERFACE, and we'll send you a sample issue for £1.00

Run by Tim Hartnell, the National ZX Users' Club is a resource just waiting to be tapped. Come on and start tapping.

National ZX Users' Club,
Dept. *SU*
44-46 Earls Court Road,
London, W8 6EJ

OK, Tim, you've convinced me:

( ) Send me my 'new members' welcome pack' plus my first issue of INTERFACE and keep those INTERFACES coming for the next year. I enclose £9.50 (UK), £12.50 (Europe)

( ) Just send me a sample of INTERFACE. I enclose £1.00

I have ( ) a ZX81 ( ) a Spectrum

Name .....

Address .....

.....

BUSINESS USERS

SPECTRUM 48K

Preparation of Accounts from Incomplete Records—An upgraded version of the popular ZX81 Accounts which is being used by many accountants and small businessmen. Produces Prime Entry Listings, Nominal Ledger, Trial Balance, Profit and Loss Account and Balance Sheet with supporting schedules. 73 nominal ledger accounts and automatic VAT calculations.

Sole Trader/Partnership (Up to 4) £25.00
Limited Company £25.00
(Combined Price £35.00)

Sales and Purchase Ledgers coming shortly.

ZX81 16K

Preparation of Accounts from Incomplete Records—
31 nominal ledger accounts
Sole Trader £17.50
Limited Company £17.50
(Combined Price £25.00)

Sales and Purchase Ledgers—
Produces day book, sales/purchase and VAT analyses, debtors/creditors listings, statements.
50 accounts and 200 monthly transactions.
Sales £20.00
Purchases £20.00
(Combined Price £25.00)

Mailing List £3.00
Handles up to 90 names and addresses.

All programs are supplied on cassette with operating instructions.

Full details:

HESTACREST LIMITED
P.O. Box 19, Leighton Buzzard, Beds. LU7 0DG
Tel. 052-523 785.

MAIL ORDER ADVERTISING
British Code of Advertising Practice

Advertisements in this publication are required to conform to the British Code of Advertising Practice. In respect of mail order advertisements where money is paid in advance, the code requires advertisers to fulfil orders within 28 days, unless a longer delivery period is stated. Where goods are returned undamaged within seven days, the purchaser's money must be refunded. Please retain proof of postage/despatch, as this may be needed.

Mail Order Protection Scheme

If you order goods from Mail Order advertisements in this magazine and pay by post in advance of delivery, *Sinclair User* will consider you for compensation if the Advertiser should become insolvent or bankrupt, provided:

(1) You have not received the goods or had your money returned; and

(2) You write to the Publisher of *Sinclair User* summarizing the situation not earlier than 28 days from the day you sent your order and not later than two months from that day.

Please do not wait until the last moment to inform us. When you do write, we will tell you how to make your claim and what evidence of payment is required.

We guarantee to meet claims from readers in accordance with the above procedure as soon as possible after the Advertiser has been declared bankrupt or insolvent (up to a limit of £4,250 per annum for any one Advertiser so affected and up to £10,000 per annum in respect of all insolvent Advertisers. Claims may be paid for higher amounts, or when the above procedure has not been complied with at the discretion of *Sinclair User*, but we do not guarantee to do so in view of the need to set some limit to this commitment and to learn quickly of readers' difficulties).

This guarantee covers only advance payment sent in direct response to an advertisement in this magazine (not, for example, payment made in response to catalogues etc, received as a result of answering such advertisements). Classified advertisements are excluded.

MICROSPHERE

MICROSPHERE COMPUTER SERVICES LTD
72 ROSEBERY ROAD · LONDON N10 2LA
TELEPHONE 01-883 9411

EVOLUTION (48K Spectrum)
Can you: Trace the course of evolution?
Start with primaeval soup & end up with man?
Survive the odd major disaster?
Should be easy... after all it's been done before!
Only £6.95

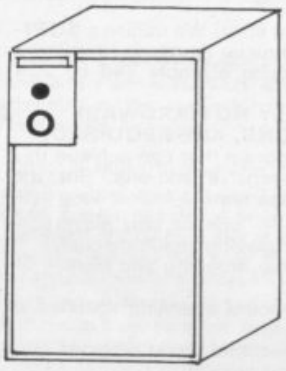
OMNICALC (48K Spectrum)
The best spreadsheet analysis program you can buy for the Spectrum. Uses include financial planning, home budgets etc.
Features: 99 columns or 250 rows
Fully prompted input
Extensive repeat facilities
Conditional expressions and RND
Totalling and sub-totalling
Comprehensive manual
£9.95

ZX-SIDEPRINT (For Spectrum or ZX81)
Print sideways on the ZX-Printer to give proper 80/132 etc.character print lines.
Easy to add to existing programs
Routines to take print lines direct from screen
Lower case letters even on a ZX81!
(State version req'd) £4.95

CREVASSE & HOTFOOT (16K Spectrum)
2 original games from Microsphere
Can you make it across the ice-cap whilst chasms open and close all around?
Help the rabbit get to fields full of carrots - but remember: the plumper the rabbit, the greater the danger.
Excellent value £4.95

AT LAST YOU CAN BEEP A SIGH OF RELIEF!

14" ×8" ×4"



the 8 watt BEEPAMP is here!
10 watt woofer and tweeter.
ready to use.
really loud!

Superb sound from games, beep, effects, etc. Mains operated, plugs into MIC socket.
Easily adapted for a variety of uses, other micros, add-ons, etc.
Headphone socket and volume control. £23.95 inclusive kit £18.55.
Hypnotech, 3 West Vale, Neston, South Wirral L64 9SE.

sinclair supermart

PROGRAMS WANTED

New and original programs for the ZX81 and ZX Spectrum are urgently required by a small mail order software company. We will pay up to 10% of the retail price as a royalty. Please send cassettes of programs (plus s.a.e. for return) to:

HARTLAND SOFTWARE (Dept. S2),
8 Penzance Place, London W11 4PA.

STARTERSOFT SPECTRUM 16/48K

EDUCATIONAL programs, tested in the Primary Classroom.
SPELLBIN: an amusing program with 24 spelling rules to encourage spelling/reading skills. £4.50 (p&p included).
COUNTING: encourages accurate counting and develops in 4 grades of difficulty. £4.50.

Cheques/PO's or S.A.E.'s for details to

STARTERSOFT
32 Parkfields, Chippenham, Wiltshire.

SINCLAIR PRINTER PROBLEMS?

If your ZX printer has paper feed problems, then send for a Tension modification kit. Illustrated instructions are provided, it is easily fitted in minutes and no tools are required. Money back guarantee. Forward £2.30 (incl. p&p) to L R Johnson, 4 Beeby Road, Scraptoft, Leicester LE7 9SG.

FOR HORSE RACING ENTHUSIASTS 'THE SETTLER'

Work out your winnings on accumulators, yankees, trebles etc. Available on cassette for ZX81 (16K) or SPECTRUM. Includes the professionally used **SAFE BET SYSTEM** and also the **NEW FORMULA STAKING PLAN** at no extra cost! (Both these plans have been advertised in the S.C.R.S. for two years at £27.) This whole package for only **£10.**

Also available: the highly successful **'POOLS FOR PROFIT'** system. NOT a forecasting program but a highly ingenious mathematically stratified method of entry. Complete checking program on cassette and full instructions etc. Price £10.

IMPORTANT—these are NOT games

But programs to help you earn money for a change. Mail remittance to:

BRITISH SPORTING SERVICES (SU)
45 Sandringham Road, Norwich

ZX81 (16K) also (64K)

Fast SAVE/ LOAD program

up to 20X Sinclair speed (4800 BAUD) now with VERIFY and any part of memory SAVE. Includes tape loading aid. £6.00 incl. VAT & P&P.
Tape loading aid on its own £3.00 incl. VAT & P&P.
Details: 50p refundable against purchase.

MUSAMY SOFTWARE
136 Brettenham Road,
Walthamtow, London E17 5BA.

RAM-SCAN-DESIGN

'ODDS-ON' SPECTRUM 16K/48K

Your own RACE meeting at home with friends. Full scope for straight bets/accumulators. Sound and fully animated horses with form sheets on screen and calculated odds. Quality cassette. Instructions. £4.75 post paid.
Special Double Bill: 'Space Towers' & 'Solo Attack'. Launched randomly, advance through enemy ships and mines using resupply craft, to reach docking gate on home Tower and Aliens attack singly, but rapidly. Your mission? Stop them over-running your base. Full use of Spectrum's Sound and Graphics. £3.95 post paid. (Buy both cassettes save £1.00)

R.S.D., 15 Clifton Road,
Prestwich, Manchester.

SHOPPING LIST PROGRAM

For use on ZX81 (16K) or Spectrum (16/48K) with ZX Printer

This useful program contains a comprehensive list of typical shopping items. Menu-driven, with full user facilities to list, print and add items. Easy to use.
Supplied on quality cassette with instruction sheet.
Send cheque/PO for £5.50 (stating machine type) to:

SD MICRO-SYSTEMS
PO BOX No 24
HITCHEN, HERTS SG4 0AE

ZX81 SPECTRUM, DRAGON, BBC AND VIC SOFTWARE LENDING LIBRARY

We have for hire from 50p (inc. post) programs for your computer.
£5 life membership (less than the cost of a single game) brings you the SOFTWARE LENDING LIBRARY membership kit, catalogue and news letter.

Send cheque or PO for £5 to:
SOFTWARE LENDING LIBRARY
PO Box 3, Castleford, West Yorks
Starting name, address and computer type.
All tapes used with manufacturers' permission

ZX-81 REPAIR SERVICE

At last no need to wait for weeks, send your faulty ZX-81 for a fast reliable repair.
We will repair any ZX-81 kit or Ready Built Unit.
Please describe the fault briefly and send a cheque/postal order to:

NEXT COMPUTER SYSTEMS
88 Harvest Road
Englefield Green
Surrey TW20 0QR

ONLY £15.95 + p&p £1.75
fully guaranteed.

SPECTRASOFT

SPECTRASOFT. Value for money Spectrum software at £4.50 incl. p&p. **TAPE BREAKER.** M/c tape which will copy any tape. Not to be used to infringe copyright. — 16/48K. **CHARACTER GENERATOR.** Literally the best and most versatile version to date — 16/48K.

BIORHYTHMS/PYRAMIDS OF EGYPT: Two for the price of one. The classical and a game on flipside — 16/48K. **ENGINE DIAGNOSTIC:** Has your car "crashed" recently. Use this to "de-bug" it. — 48K only. New programmers send tapes to SPECTRASOFT for possible marketing and royalties. Cheques and P/Os payable to Spectrasoft, Capital House, Market Place, London W3.

PHYSICS G.C.E. 'O' LEVEL

A.E.B. SYLLABUS 052 1983/4
16/48K SPECTRUM
COMPREHENSIVE EXAMINATION REVISION INCLUDING TUITION

£22

PROGRAMS AND DETAILS FROM:

HOMESTUDY LTD.
TRELEIGH WOODS FARM
REDRUTH CORNWALL

SPECTRUM OWNERS

First of all you had to back-up programs by making tape to tape copies. Now KEYSOFT present:

THE KEY

100% machine code! Copies any type of program! Order THE KEY for any ZX Spectrum, only £5.95:

KEYSOFT, Dept. SU,
8 Bruce Grove, London N17 6RA.

N.B. KEYSOFT advise users not to infringe the copyright Acts.
DEALER ENQUIRIES WELCOME

PROGRAMMES FOR 2-7 YR OLDS

Educational games for pre-school and primary children for the Spectrum with full colour animation and sound.

COUNTING: 4 graded programmes. Good as a first introduction to numbers.
ALPHABET: Pictures for each letter, with an option to present lower case letters. (16K or 48K—please specify.)
SHAPE SORTER: 3 programmes to aid shape recognition, observation and size sorting.
ADDING & SUBTRACTING: 3 animated programmes from a very simple level.
All tapes **£5.25** from

WIDGIT SOFTWARE
48 Durham Road,
London N2 9DT.

(All tapes 16K unless otherwise specified)

ZX Spectrum—CP48 32K Memory Extension

Upgrades your 16K ZX Spectrum to 48K. Simply fit internally with no soldering. Suitable for all 3 versions of Series 2 models. Unlike competitors, we use adaptor P.C. board to achieve results. Designed by ex-Sinclair engineer.

Quick delivery — only £23.95 incl.

Fitted by our engineers. (Don't send power supply) £29.50.

Citadel Products Ltd,
Dept SU, 50 High Street, Edgware,
Middlesex, HA8 7EP
Tel: 01-951 1848

SPECTRUM

Why wait for weeks for your favourite programs? As stockist of most of the best Spectrum Software we offer a fast return of post service and give 12 months guarantee on all tapes supplies. Over 100 different programs. Including those from silversoft, quicksilva, Artic, Melbourne House, imagine ect, plus books, Joysticks and Add-ons. Phone or S.A.E. price list.

Join our Software Club for £3.00 annual membership giving you the following benefits:

"10% discount on all orders of software".

"Monthly news letter with details of the latest releases".

"Special offers each month giving you even more savings".

Ivysoft
91 Cleeve Drive,
Ivy Bridge,
Devon.
Tel: 07554 4088

TO ADVERTISE IN THE SUPERMART

CALL ANNETTE ON 01-359 7481 NOW!

clamp 1 clamp 2

Mains Voltage Clamp Plugs

Protection for your computer against crashes, data loss and program loading failure caused by mains voltage surges, spikes and transients. Protection and improved performance for your hi-fi system by eliminating the damaging effects of the same faults. These plugs comprise Voltage Dependent Resistors built into the best mains plug we could find.
Clamp 1 is fitted to each component of your computer or hi-fi system in place of the conventional 13A plug. **£7.50 each**
Clamp 2 Lightning strike protector. This is not fitted to any equipment, but is plugged into the mains at a vacant socket somewhere on the same ring. Protects your home computer, television, hi-fi system etc., from lightning strike. **£10.50 each**

From your dealer or direct (including VAT & P&P) from:

RUSS ANDREWS
TURNTABLE ACCESSORIES
Edge Bank House, Skelsmergh,
Kendal, Cumbria LA8 9AS
Tel: Selside (053 983) 247

LOCATOR

EDUCATION : ARCADE : MIND GAMES

Get all your **MAJOR TITLES** from **ONE** source. Largest selection available of **EDUCATIONAL** software from **JUNIOR SCHOOL** to **GCE** standard. **SAE** (9×4) for **CATALOGUE.** Some other **'SPECTRUM' TITLES** are:

CHESS	48K-ARTIC	£9.45
CHESS PLAYER	48K-Q-S	£6.95
TIMEGATE	48K-Q-S	£6.95
MINED OUT	48K-Q-S	£4.95
STAR TREK	48K-R+R	£4.95
MICRO CHESS	16K-ARTIC	£6.95
GOBBLEMAN	16K-ARTIC	£4.95
GOLF	16K-R+R	£3.75
SPACE INTRUDER	16K-Q-S	£4.95
METEOR STORM	16K-Q-S	£4.95
TELESOUND 84	COMPUSOUND	£9.95
BEEP BOOST RADIO	COMPUSOUND	£5.95

1 Cassette 35p, p&p: 2 Cassettes p&p **FREE.**
Mail order and local deliveries only.
Locator, 12 Fernhall Drive, Redbridge,
Essex, IG4 5BN. Tel: 01-550 5575.

SPECTRUM SOFTWARE

Most of the games are in range of nearly 100 titles. We offer 5% discount on all orders and they will be returned on the day they are received (subject to availability). Delivery is free and by 1st Class Post. Send s.a.e. for FREE catalogue or telephone for further details.

EXETER SOFTWARE SUPPLIES
2 GUILDFORD CLOSE,
EXETER EX4 2HX.
TEL: 0392–50434.

adapt electronics

WOBBLY RAMPACK

RAMLOK

- RAMLOK kit is easily fitted requiring no specialist knowledge or skills.
- No cutting or drilling necessary.
- No special tools required just a soldering iron.
- Step by step instructions included.
- Access to the computer when modification is unaffected.
- Suits ZX81/-80 Spectrum version available shortly.
- Suitable for all popular RAMPACK'S including Sinclair, Memotech, Cambridge, Microsphere, Novus, Dk'tronics, Micro-Power, Fuller, Saga, Cheetah, Timex, Lambda, Grosvenor, Protek, Quicksilva, Ram, Memopak, Hilderbay, Interface, Kayde, Micro-Gen, Orbis, Ram Turbo, Shadow, Wizard, Wyse, Zebra.

PRICE £7.50 + 50p p&p inclusive
OPTIONAL MOUNTING FOR ZX PRINTER £1.50 EXTRA
SEND S.A.E. FOR FURTHER DETAILS

Please send ..... RAMLOK kit(s)
I enclose cheque/ PO value £ .....
Name .....
Address .....

ADAPT Electronics, 20 Sterling Close, Buckhurst Hill, Essex IG9 5TN.

E.S.P. 42

ESTUARY SOFTWARE PRODUCTS

A NEW NAME IN sinclair SOFTWARE

THE

HITCH-HIKERS GUIDE TO THE GALAXY

ADVENTURE GAME

For 48K Spectrum £8.95
Also for Apple 2 £16.95

AVAILABLE FOR ORIC 48K SOON

261 Victoria Avenue,
Southend on Sea, Essex.
Credit card holders may phone in their orders (0702) 43568

sinclair supermart

ZX80/ 81 NANOS Quick Reference Cards

Why waste time and frustration struggling with the books? this card has it all. "There is nothing like it in the world".
Send £3.50 per card to
ELKAN ELECTRONICS.
(Dept. SU)
FREEPOST, 11 Bury New Road, Prestiwich, Manchester M25 6LZ
or tel. 061-798 7613 (24 hours)
— other Sinclair items also available —

ANVIL COMPUTING

SUPERB NEW SELF TEACH PROGRAM

For ZX-81 (16K), Spectrum. TRS80. Video Genie.

★Now you can learn basic fast and efficiently★

★Forget your past programming problems. This program will make it all clear★

★ ★ ★ ★ ★ ★ ★

Cover Arrays, Sorting, Searching, Counting, Decision making tests, Error Trapping, Menu driving etc. You start with short simple programs and build up to full working programs with everything explained in full, precise detail.

★ ★ ★ ★ ★ ★ ★

★This is *NOT* a program you simply copy and run.★
★★ *YOU HAVE GOT TO WORK!!* ★★
But it is written in such a way that you can not get stuck.

★ ★ ★ ★ ★ ★ ★

This program has been fully tested over the past six months by 50 domestic and small business users and we have not received any adverse reports.

★ ★ ★ ★ ★ ★ ★

This program is our own product and is not available from any other source. Full money back guarantee. **£4.75** incl. Postage & Packing (state which computer).

51 Whitcliffe Lane, Ripon, Yorks HG4 2LB.

JUNIOR SCHOOL TUTOR 16K SPECTRUM

Fun for all ages from 4–44 years

Fantastic value for money!!

7 educational and stimulating programs on one cassette.

★Arithmetic—6 levels of play
★Drawing ★Spelling
★Music Teacher ★Numbers
★Keyboard Trainer ★Snap

Written by teachers
Suitable for home or schools
All 7 programs for just £4.95
Send cheque or PO to:

ESSEX SOFTWARE
16 Huntsmans Drive, Upminster, Essex

16K ZX81. Two months old, Manual, Leads and Six Games, including Invaders, Bombers, Maze Flight, Ireland. Worth well over £100, Bargain £80 o.n.o. Contact (Nottingham) L/Mill (07737) 60941.

16K ZX81 Sinclair built. Redditch keyboard, B/w TV, Manual, Books, Magazines, many games including Monster Maze, Chess, Defender. Worth over £200 for quick sale, £105 o.n.o. Alex Segre, 01-485 6010 (evenings).

16K SPECTRUM ISSUE TWO. Also Joystick and four cassettes. All as new. Manual and leads included £110. 'Phone: 0252 26536 (evenings only).

ZX SPECTRUM 48K. Sinclair built and printer, hardly used and in original packing plus 2 packs printer paper, 2 software cass. and over the spectrum book. The lot £200. Contact: T. C. Gan, 128 Allitsen Rd, London NW8 7AU or Tel: 01-722 0350.

Cassette Compuorder

Compatible with ZX-81, Spectrum and many other Computers.

Features: Tape Counter
MIC, Ear and Rem Sockets
5 pin Din Socket
Batteries/Mains

Money back guaranteed if you are not fully satisfied.

Price £22.95 (including P&P), cheques or postal orders to:
Leyden Enterprises,
41 Broomgrove Gardens,
Edgware, Middlesex.

ZX81, 64K MEMORY, with EPROM, user port, proper keyboard, PLUS 8 cassettes, including Chess, Flight Simulation, Football Manager, Airline, leads and manuals. Worth at least £160, super bargain £100 o.n.o. A Regan, 49 Walter Rd, Ammanford, Dyfed SA18 2NF.

FREE booklet and machine code Draughts with GRP Computer Products' ZX81 1K Games Pack, (Defender, Pontoon, Oxo, etc.). *Introductory offer:* Cassette £1.50, Listings £1.00. Programs also needed. G. Parkes, 18 Field View, York, YO3 6EJ.

ZX81 16K. Progs in M/C and basic Galaxy Gladiators Alien Attack with sound and Deathrace 2000 on cassette £5. D. J. Wilson, 105 Snowden Road, Ely, Cardiff CF5 4PT.

SPECTRUM 16K MATHS TUTOR. An enjoyable learning Method, destroys aliens by correct multiplication. Features laser beam attack and explosions. £3.95 to A D Software, 14 Roseville Road, Harrogate, North Yorkshire.

SPECTRUM 48K BARGAIN. Games Tape 1—Frogger, Hangman, Squash. Full colour/sound. £4.50 inc. post and packing. Cheques/POs to H. D. Walters, Omega Software, Bridge House, Frome, Somerset.

SPECTRUM TAPE COPIER. Spectrum Backup copies any Spectrum file type. (Program, Data, Code) up to 15½K or 47½K. Includes Header Reader, Cassette only £2 + 50p p&p. S. Giza, 37 Twyford Avenue, London W3.

ZX81 OWNERS! *Cure your 16K Ram Pack Wobble.* Secure method of holding pack firmly. Easily added. £4.50 (incl. p&p). Apply: F. Jones, 24 Highlands Drive, Burgess Hill, Sussex RH15 8JJ.

FOOTBALL POOLS PREDICTOR

For 16K ZX-81

3+3 methods of prediction. Enter names, played and draws. Program lists in order of preference. Works on British and Australian results only £4.95.
Matrix Software, 36 Yardley Wood Road, Moseley, Birmingham, B13 9JB.

FRUITLINE (16K Spectrum), the *definitive* fruit-machine simulation, with holds, nudges, super-realistic m/c graphics and amazing sound effects. Just £4.00! Mr P. A. Hanson, 6 Hanover Gardens, Fareham, Hants, PO16 7HE.

10 16K ZX81 Games. Original exciting cassette £2.99 (incl. p&p). UK only. Cheques POs to Oliver Driver, 9 Teak Drive, Rearsley, Bolton BL4 8RR. Quality cassettes send now. Tel: 061-793 0340.

CRICKET AVERAGES Spectrum 48K, 50 players, full sorting, automatic update, qualifying limit facility, batting, bowling, catches, cassette and instructions £6 to: Spartans C.C., 37 East Road, London N1 6BE.

Barrowquest. 16K Graphic fantasy adventure game for the ZX–81. Continuous graphic display, stats and monster encounters. Involving and challenging. **£4.50** to Sherry, Pepper Street, Keele, Staffs, ST5 5AQ.

TO ADVERTISE IN THE SUPERMART CALL ANNETTE ON 01-359 7481 NOW!

Sell your used computer or peripherals through Sinclair Supermart at low cost... up to 30 words for only £5.

Have you updated your computer or do you no longer use that add-on? Instead of leaving it lying around, turn it into cash be placing a classified advertisement in Sinclair Supermart and reach around 65,000 users of the Sinclair ZX systems. Please write your advertisement in the boxes below, one word per box. Underline words required in bold type. Your name, address and/or telephone number should be included *Please print in block capitals.*
Note—this service is open only to private advertisers. The advertisement will appear in the earliest possible issue.

Name: .....

Address: .....

..... Tel: .....

Have you included the fee of £5?

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.

Advertisement Index

AGF Hardware	34	Martech Games	106
ASP Exhibitions	91	Medidata	11
Abbex	47	Melbourne House Publishers	50
Abersoft	71	Memotech	20, 21
Addictive Games	99	Micro Power	11
Afdec Electronics Ltd	92	Microsphere	68
Artic Computing	75	Microtax	86
Basicare Microsystems	30, 31	Microtext (UK) Ltd	110
Bellflower Software	77	Mikro Gen	81
Bi-Pak	110	Morex	22
Buffer Micro Shop	38	Myrmidon Software	104
CCS	22	National Extension College	41
CP Software	70	Neptune Computing	77
Calpac	38	New Generation Software	109
Cambridge Computer Store	68	Odyssey Computing	111
Campbell Systems	71	Orwyn Software	82
Carnell Software	26	Oxford Computer Publishing	74
Cascade Software	106	PSS	35
Cheetah Marketing	25	Phipps Associates	48
Compusound	109	Picturesque	99
Computer Add-Ons	90	Prentice Hall International	16
The Computer Fair	95	Print & Plotter	4
Computerlock	103	Quest Micro Software	67
Crystal Computing	76	Quicksilva	OBC
DJL Software	104	R & R Software	41
DK'Tronics	42, 43	Selec Software	103
Digital Integration	38	Servodata	108
East London Robotics	39	Silversoft	32, 33
Educare	80	Sinclair Research Ltd	84, 85
Felix Software	106	Sirius Logic	31
File Sixty	51	W. H. Smith	6, 7
Mr. A. Firminger	110	Softeach	12
Foilkade	81	Software Farm	99
Football and Racing Proposals	69	Software Library	108
Fox Electronics	68	Software Supermarket	19
Gatwick Computer Co	108	Software Workshop	96, 97
Dr. K. W. Glasson	110	Spartan Software	111
J.K. Greye Enterprises	74	Star Dreams	109
Hestacrest	112	Steatite Insulations	41
Hewson Consultants	15, 91	Stellar Services	71
Hilderbay	26	Supermart	113, 114
Hilton Computer Services	31	Tasman Software	103
Hypnotech	112	Think Tank	98
Impulse Gift Shop	76	Timedata	104
Interface	111	Timex Sinclair User	105
JRS Software	11, 48	Tree Top Designs	77
Kayde Electronics Systems	IBC	University Software	81
Kemp Ltd	108	Video Software	30
Kempston Micro Electronics	IFC, 30	Warp Factor Eight	98
K-Tel International	16	John Wiley & Sons	46
Linsac	102	Work Force	52
M C Lothlorien	80	Wye Valley Software	76
Maplin	89	ZX Microfair	8

KAYDE

KEYBOARDS – ZX81 Spectrum.

Features include
ZX81 Repeat key and Spectrum Double shift key.
All keyboards are 'electric typewriter' quality, full size and are fully built and tested. They allow you to use all other add-ons. No extra power is needed. Fully guaranteed.
A fitting service is available for all our keyboards and costs £4.00 including postage and packing. Send for details.

Kayde Standard Keyboard
This is used for both computers, but does not accomodate them inside the casing. Open your computer and plug in the connector. (The ZX81 requires two simple solder connections). The keyboard comes complete with high-impact black plastic case and full fitting instructions. The ZX81 has a repeat key. £37.95

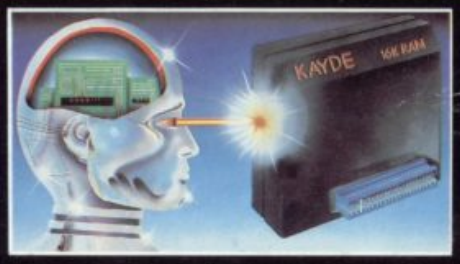
Kayde Super Plug-in Keyboard
This is the ultimate keyboard for your Sinclair computer, you simply plug it into the user port at the back. No disassembling. Complete with full-size space bar and ZX81 repeat key. £49.95

KAYDE DELUX KEYBOARD
This keyboard is only available for the spectrum. It will allow you to fit your computer inside. It also has a full sized space bar and double shift key. No soldering required. £45.00

NEW! NEW! NEW! NEW! NEW! NEW! NEW!

Kayde ZX81 16K RAM Pack
Low power feature allows you to use all other add-ons including ZX81 printer without wobble, overheating or memory loss. You should only have to buy one RAM Pack for your ZX81 so buy the best at the beginning and save yourself unnecessary problems. £19.95

NEW! NEW! NEW! NEW! NEW! NEW! NEW!



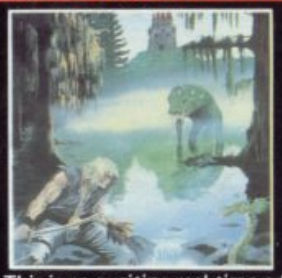
RAM Packs
All Kayde RAM Packs use state of the art technology and feature top-quality, low power memories. Housed in high-impact polysterene, they look good and are fully tested and guaranteed.

Kayde ZX81 64K RAM Pack
Totally the same design as our 16K but giving you a massive 64K turning your machine into a very powerful computer £59.95

Kayde Spectrum 32K RAM Pack (Issue II)
This brings your Spectrum up to a full 48K. It is easily fitted, and comes as a kit with RAM chips that slot into existing connectors. No soldering necessary. £35.95

NEW! **Kayde Spectrum 32K Plug-in RAM Pack**
The same design as our 32K RAM pack kit, but simply plugs in the back of your Spectrum. No need to open your machine. £44.95

NEW! NEW! NEW! NEW! NEW! NEW! NEW!



Kayde Software
The Valley
Available for 16K VIC 20, Dragon 32, New Brain, Oric 48 and 48k Spectrum

This is an exciting real time adventure. You can be a wizard, thinker, barbarian, warrior or cleric depending on your mood. Each character has its own strengths and weaknesses. You fight fearsome monsters, meet exciting challenges, solve mind-bending riddles in the most involving adventure game yet. £9.95

VALUE! VALUE! VALUE! VALUE! VALUE! VA

Kayde 4K Graphics ROM Pack
This comes complete with a pre-programmed 4K Graphics ROM to give you an extra 450 graphics. The board has facilities for either 2K of RAM (for user definable graphics) 4K of RAM or our 4K Tool Kit. The entire board fits neatly inside your computer.
A free fitting service is available on request.

4K Graphics Board	£19.95
4K Tool Kit	£9.95
2K UDG ROM and Character Generator Cassette	£10.95
16K Graphic Software Peckman	£5.95

VALUE! VALUE! VALUE! VALUE! VALUE! VAL

Kayde Spectrum Sound Module
This module fits neatly inside your Spectrum and lets the sound come through the more powerful speaker on your television rather than the Spectrum. No soldering required. £9.95

NEW! NEW! NEW! NEW! NEW! NEW!

Kayde Keys (VIC 20)
This program runs on just 300 bytes and yet gives you the use of function keys and characters on a VIC 20, and there are over 25 commands at your disposal. £6.95

Design/Restore (VIC 20)
A complete system to enable you to create your own characters. Also includes restore program to load characters into your VIC. Three character sets included. £9.99

SOFTWARE WRITERS WANTED
If you want the best deal for your original programs then send a copy to us for review. We offer highest royalties, security and marketing. Don't forget to include a description of the program and for what machine it is intended.

Mail Order Lists
For full mail order lists write to the address below.

We offer the fastest delivery time of all times.

Mail Order + Showroom
Kayde Electronic Systems Ltd.,
The Conge Great Yarmouth
Norfolk NR30 1PJ Tel:(0493) 55253/57867

New London Showroom
Kayde Home Computers Ltd
1 Station Approach
New Eltham London SE9 Tel: 01-859 7505

Dealer Enquiries to:–
Zone Distribution Ltd.
13 Old Court Long Melford
Sudbury Suffolk Tel:(0787)312234

ALL MAIL ORDERS
TO: **KAYDE ELECTRONIC SYSTEMS LTD, DEPT. SU6 THE CONGE, GREAT YARMOUTH, NORFOLK NR30 1PJ**

PLEASE PRINT AND STATE TYPE OF COMPUTER

Qty.	Item	Item Price £	Total £

Please allow £2.00 P&P for all Hardware 50p for all software

DON'T FORGET YOU CAN ALWAYS ORDER ON THE TELEPHONE WITH YOUR CREDIT CARD. DEALERS WELCOME.

*I enclose a cheque/postal order payable to ***KAYDE Electronic Systems Ltd,*** for £.....

*Please charge to my Access/Barclaycard/Trustcard account no.

*Please delete/complete as applicable.

Signature

Name Mr/Mrs/Miss

Address

SPECTRUM & ZX81 GAMES FROM QUICKSILVA

A WHOLE GALAXY OF ACTION AT YOUR FINGERTIPS

NEW RELEASES FOR THE ZX81 & SPECTRUM

SPECTRUM SOFTWARE

TIME-GATE
4D Space/time adventure in fast moving graphics. 48K.
Author: **John Hollis**

THE CHESS PLAYER
With Speech and personality. 48K.
Author: **Martin Wren-Hilton**

METEOR STORM
With speech and Hi Res Graphics. 16K or 48K.
Author: **John Hollis**

SPACE INTRUDERS
With mutants and Hi Res Graphics. 16K or 48K.
Author: **John Hollis**

EASYSPEAK
Add speech or music to your programs. 48K.
Author: **John Hollis**

MINED-OUT
With 9 levels of minefield. 48K.
Author: **Ian Andrew**

SOFTWARE FOR THE ZX81 WITH 16K RAM

QS ASTEROIDS
"...very good..."
"...addictive game!"
(C. & V.G.).
Author: **John Hollis**

QS DEFENDA
"...better than any other arcade game I've seen."
(Sync.).
Author: **Nick Lambert**

QS SCRAMBLE
"...amazing, fantastic!"
(P.C.W.).
Author: **Dave Edwards**

QS INVADERS
"...just like the real thing!" (C. & V.G.).
Author: **Dave Edwards**

MUNCHEES
Features 1 to 4 Ghosts, 3 Munchees, Power pills
Author: **A. Laird**

GALAXIANS & GLOOPS
Features two types of swooping Galaxian.
Author: **T. Beckwith**

CROAKA-CRAWLA
With Frogs, Lorries, Logs, Crocodiles, Turtles, Flies,
Author: **John Field**

SPECTRUM FRENZY

Arcade action
Features: Full colour hi-res graphics, sound, high score table, hold feature, 5 levels of robots, Evil Orville the minelayer, exploding pods, progressive difficulty, attract mode.
Author: **David Shea**

ASTRO BLASTER

Arcade action
Features: Full attract mode, 5 attack waves, 15 levels of difficulty, rapid fire, meteor storms, changing aliens, plasma bolts, killer bombs, full colour hi-res graphics, full sound.
Author: **John Edwards**
16K or 48K Spectrum

EDDIE A WORD PROCESSOR

Features:
Menu driven prompts given at all times.
Drastic commands — e.g. Clear Text — are automatically questioned.
Load/save commands... all text justified, on screen as well as printer.
Author: **P. Baker**
48K Spectrum

PIXEL GAMES FOR THE ZX81 WITH 16K RAM

TRADER
A trilogy of 16K programs that combine to give an epic 48K graphic adventure. As a galactic trader, you deal with some very bizarre customers indeed.

STOP PRESS
Trader now available for the Spectrum £9.95

SUBSPACE STRIKER/ZOR

With your deadly antimat torpedoes, you unleash havoc in the Federation's Spacelanes.

STARQUEST/ ENCOUNTER

With the help of your onboard computer you seek a habitable planet amidst the perils of deep space.

ZX81 GAMES

OCEAN TRADER

An adventure set in the 19th Century.
You own and captain a vessel, sail between 5 ports and deal in coal and whisky; with storms, pirates, sea mist and vessels adrift.
Author: **A. Morgan**
ZX81 with 16K RAM

COSMIC GUERILLA

Arcade action
Fast m/c action, will drive QS sound and character boards, responsive controls, high score tables.
Author: **C. K. Tame**
ZX81 with 16K RAM

3D BLACK STAR

Arcade action
Features: Fast 3D graphics, fast scoring, four types of target. Eight instrument displays, warp drive, resurging aliens, time limit, 17 levels of progressive difficulty, high score table.
Author: **M. Sudworth**
ZX81 with 16K RAM

DAMPER & GLOOPER

Arcade action
Features: Fast action, 5 dampers increase to 8 on later phases, 3 lives plus bonus lives, ever increasing speed, high score, stall frame features, spiral clear at end of games, bonus phase worth 5000 pts., high score save and display.
Author: **P. Crane**
ZX81 with 16K RAM

PIONEER TRAIL

A western adventure
Features: 20 levels of play. "Mind Game" plus shooting rifle speed uses all keys and is measured against the players personal average response. This game is based on historical data.
Author: **Marion Stubbs.**
ZX81 with 16K RAM

Quicksilva Limited,
Palmerston Park House,
13, Palmerston Road,
Southampton. SO1 1LL.
Telephone: (0703) 20169

SPECTRUM GAMES		PIXEL GAMES FOR ZX81		ZX81 GAMES			
Time Gate	£6.95 ☐	Trader	£9.95 ☐	QS Asteroids	£3.95 ☐	Black Star	£4.95 ☐
Frenzy	£4.95 ☐	Subspace Striker & Zor	£3.95 ☐	QS Defenda	£3.95 ☐	Cosmic Guerilla	£3.95 ☐
Mined-Out	£4.95 ☐	Starquest & Encounter	£3.95 ☐	QS Scramble	£3.95 ☐	Damper & Glooper	£4.95 ☐
Easyspeak	£4.95 ☐			QS Invaders	£3.95 ☐	Ocean Trader	£3.95 ☐
Astro Blaster	£4.95 ☐			Croaka-Crawla	£3.95 ☐	Pioneer Trail	£3.95 ☐
Meteor Storm	£6.95 ☐			Galaxians & Gloops	£4.95 ☐		
The Chess Player	£4.95 ☐			Munchees	£3.95 ☐		
Space Intruders	£5.95 ☐						
Eddie A Word Processor	£9.95 ☐						
Trader							

Total cheque/PO enclosed _____ Cheque payable to Quicksilva

Name _____

Address _____

Please send me the games as ticked. Supplied on Cassette

Send order to:
Quicksilva Limited, Palmerston Park House, 13, Palmerston Road, Southampton.

WARNING: These programs are sold according to QUICKSILVA Ltd's terms of trade and conditions of sale. Copies of which are available on request.