30 PROGRAMS FOR THE SPECTRUM AND ZX-81

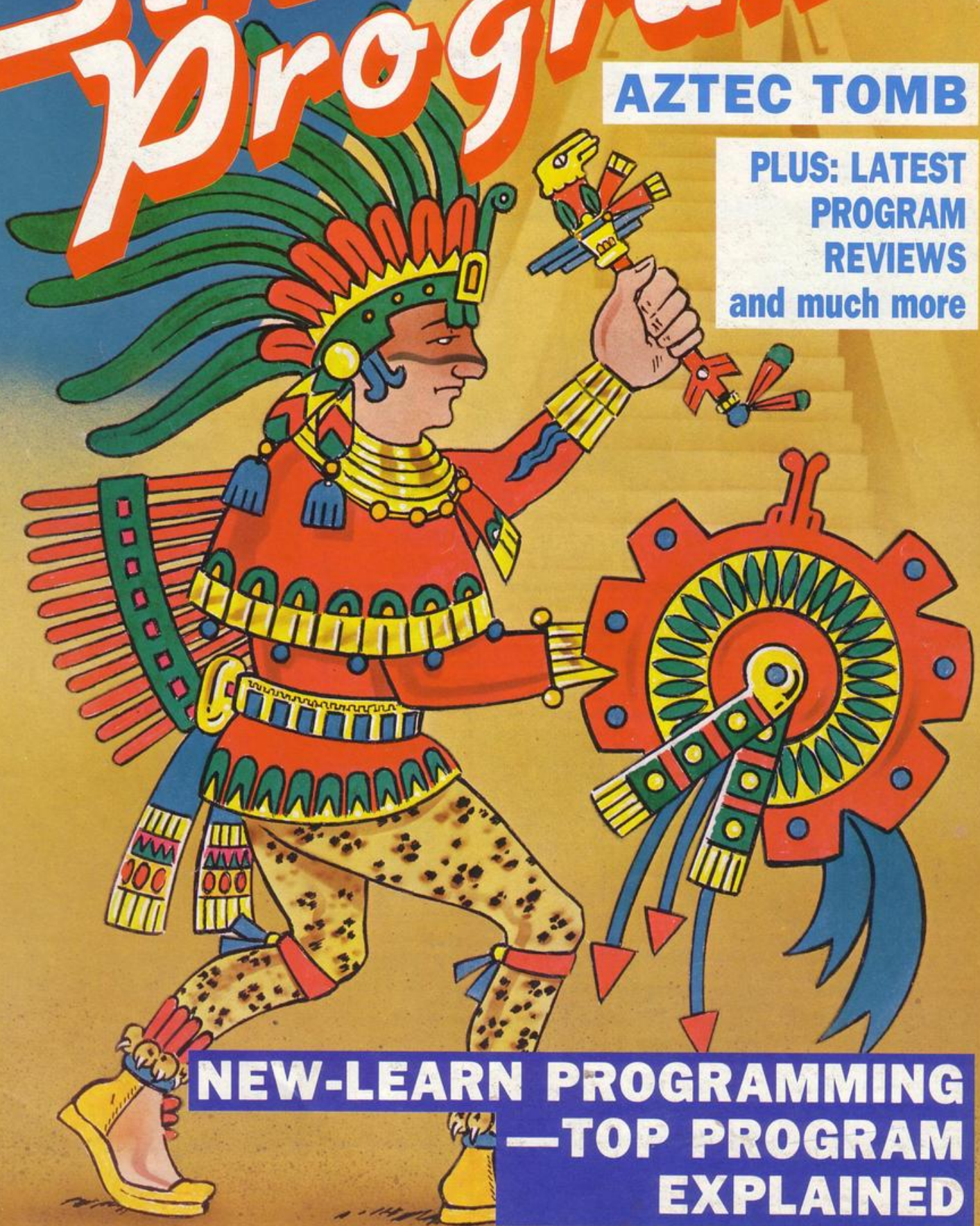
95p An independent magazine published by ECC Publications

April 1984

Sinclair Programs

AZTEC TOMB

PLUS: LATEST PROGRAM REVIEWS and much more

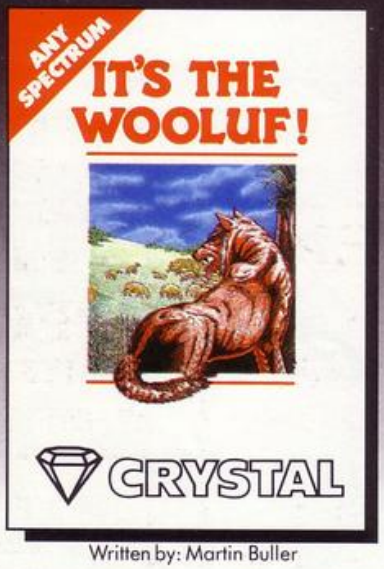


NEW-LEARN PROGRAMMING —TOP PROGRAM EXPLAINED

TWO NEW RELEASES FROM CRYSTAL

IT'S THE WOOLUF!

TUBE WAY ARMY



Written by: Martin Buller

Written by: Rainbow Software

From the creators of 'Halls of the Things,' 'Invasion of the body snatchas,' and many other software classics come these exciting new games.
Games to tax your judgement and puzzle and frustrate you for months on end.
Don't forget our other titles, which have attracted enthusiastic reviews like
"Spectacular, one of the best games I've seen"... POPULAR COMPUTING WEEKLY and
"Excellent, dangerously addictive, could change the Spectrum games scene overnight" ... SINCLAIR USER.

COMING SOON RETURN OF THE THINGS

HALLS OF THE THINGS
Written by: Neil Mottershead, Simon Brattel and Martin Horsley

INVASION OF THE BODY SNATCHAS
Written by: Simon Brattel and Neil Mottershead

Written by: Graham Stafford

ROMMELS REVENGE
Written by: Martin Horsley

THE DUNGEON MASTER
Written by: Graham Stafford

All titles for 48K Spectrum unless otherwise stated

PROGRAMMERS! WRITTEN ANY SOFTWARE THAT COMES UP TO OUR STANDARDS? IF SO SEND IT TO US FOR EVALUATION. WE OFFER GENEROUS ROYALTIES.

Selected titles available from:–
Boots spectrum
John Menzies
HMV
WOOLWORTH
other large department stores and all good major software retailers. Alternatively, send the coupon to:–

CRYSTAL

CRYSTAL COMPUTING, 2 ASHTON WAY,
EAST HERRINGTON, SUNDERLAND SR3 3RX.
TRADE ENQUIRIES WELCOME:– Tel: 061-205 6603.
CRYSTAL COMPUTING IS THE TRADING NAME OF CHANDREX LTD.
The name Crystal is used under license

Please supply:

HALLS OF THE THINGS	£7.50	INVASION OF THE BODY SNATCHAS	£6.50
IT'S THE WOOLUF	£6.50	THE DUNGEON MASTER	£7.50
TUBE WAY ARMY	£7.50	ROMMELS REVENGE	£6.50
CATALOGUE OF LATEST SOFTWARE		ZEUS 64	£9.95

NAME _____

ADDRESS _____

_____

I enclose cheque/p.o. for .....
P & P included. Overseas orders, please add £1.50 per item.

SP4

ABC
MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

Contents

7 LETTERS

9 SOFT FOCUS

16 PROGRAM TUTOR

55 COURSE GUIDE

ERRORS AND MISHAPS

BEGINNERS' SECTION SPECTRUM

11 ADDRESSER
REVOLVING TETRAHEDRON

12 MULTI-COLOURED PYRAMID
FOOL YOUR TEACHER

ZX-81

13 RECKLESS RUSSIAN ROULETTE
ALPHABET GAME

15 SUPA SNAIL
Beginner Tutor

ZX-81

18 AZTEC TOMB
24 PERIODIC TABLE
25 PIRANHA
39 FEED THE FISH
46 MATCHES
47 SWAG
48 JUNGLE OF DEATH
49 DEPTH CHARGE
50 APPLE JACK
51 CALENDAR
VALLEY OF DEATH
54 OBSTACLE COURSE

SPECTRUM

22 MYSTERY MAZE
27 DIFFERENTIATION

PROGRAM OF THE MONTH
30 ANT RAID

33 CENTIPEDE RUN
34 RESCUE
36 RACE TRACK
37 YES AND NO
40 MORSE CODE
41 SQUARE GAME
43 SPIDER
52 AIR DROP

Editor
Rebecca Ferguson

Managing production editor
Harold Mayes MBE

Staff writer
June Mortimer

Design
Elaine Bishop

Advertisement manager
Gary Price

Advertisement executive
Frank Humphrey-Gaskin

Production assistant
Dezi Epaminondou

Editorial assistant
Colette McDermott

Managing editor
Nigel Clark

Managing director
Terry Cartwright

Assistant managing director
Barry Hazel

Chairman
Richard Hease

U.S. Press representative Mr J. Eisenberg, JE Publishers' representative, 6855 Santa Monica Blvd., Suite 202, Los Angeles, CA 90038.

Sinclair Programs is published monthly by ECC Publications Ltd.

Telephone 01-359 3525

If you would like your original programs to be published in Sinclair Programs, please send your contributions, which must not have appeared elsewhere, to:
Sinclair Programs,
ECC Publications,
196-200 Balls Pond Road,
London N1 4AQ

Programs should be on cassette. We cannot undertake to return them unless a stamped-addressed envelope is included. We pay £10 for the copyright of each program published.

© Copyright 1984 Sinclair Programs
ISSN No 0263-0265

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 Design—Ivan Hissey

Instructions for graphics characters are printed in lower-case letters in our listings. They are enclosed by brackets and separated by colons to distinguish them and the brackets and colons should not be entered.

Inverse characters are represented by the letter "i" and graphics characters by "g". Thus an inverse W would be represented by "iw", a graphics W by "gw", and an inverse graphics W by "igw".

Spaces are represented by "sp" and inverse spaces by "isp". Whenever any character is to be used more than once, the number of times it is to be used is shown before it, together with a multiplication sign. Thus "6*isp" means six inverse spaces and "(g4:4*i4:g3)" would be entered as a graphic four, followed by an inverse four repeated four times, followed by a graphics three.

Where whole words are to be written in inverse letters they appear in the listings as lower-case letters. Letters to be entered in graphics mode on the Spectrum are underlined.

Inverse characters may be entered on the ZX-81 by changing to graphics mode and then typing the appropriate characters and on the Spectrum by changing to inverse video and typing the appropriate letters. Graphics characters may be entered on the ZX-81 by changing to graphics mode and then pressing symbol shift while the appropriate characters are entered. On the Spectrum graphics characters may be obtained by changing to graphics mode and then pressing the appropriate character. User-defined graphics will appear as normal letters until the program has been RUN.

48K SPECTRUM

TASWORD TWO THE WORD PROCESSOR

64 CHARACTERS PER LINE ON THE SCREEN AND TO PRINTERS!
MICRODRIVE COMPATIBLE — instructions supplied

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

PERSONAL COMPUTER WORLD September 1983

"What makes a word processor more or less versatile is its control features. Tasword Two offers an impressive selection and the tutor program succeeds in demonstrating them admirably."

ELECTRONICS AND COMPUTING November 1983

"Tasword is showing a degree of sophistication that business computers took many years to develop."

WHAT MICRO? October 1983

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.

Tasword Two drives the following interfaces:

Cobra RS232 I/O Port	*Kempston Interface*
Euroelectronics Interface	*Morex Interface*
Hilderbay Interface	*Tasman Interface*
Sinclair ZX Interface 1	*ADS Interface*

The same program drives these interfaces. A short easy to follow set of instructions takes you through setting up your Tasword Two to drive the interface you have or choose to buy. Tasword Two also drives the ZX printer.

Tasword Two is readily adapted for the microdrives to give super-fast saving and loading of both program and text. The microdrive instructions are supplied with the Tasword Two manual.

£13·90 fully inclusive mail order price.

TASWORD TWO TUTOR

TASWORD TWO comes complete with a manual and a cassette. The cassette contains your TASWORD TWO **and** TASWORD TWO TUTOR. This teaches you word processing using TASWORD TWO. Whether you have serious applications or simply want to learn about word processing, TASWORD TWO and TASWORD TWO TUTOR make it easy and enjoyable.

TASWORD TWO £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.

All prices include VAT and post and packaging

* Available from larger branches of Boots

For further information on all these products send an s.a.e. with "Tasman Brochure" written on the flap.

Access

Send cheque/P.O. or Access number with order.
Telephone Access orders: Leeds (0532) 438301

TASWIDE – 64 characters per line!

A machine code utility program, TASWIDE **doubles** the information that your own programs can display. Make a simple change to your print statements and your output appears on the screen at 64 characters per line instead of the normal 32. Both print sizes can be mixed on the screen. 16K and 48K versions supplied on the same cassette.

£5·50 fully inclusive mail order price

TASMATH 1

Mathematics education. Three programs on one cassette:
TASIMEQ – simultaneous equations
TASQUAD – quadratic equations
TAS-TRIG – trigonometry of right angled triangles.
Available for the 16K and 48K Spectrum and for the BBC model B.

£5.95 fully inclusive mail order price

TASPRINT

A must for dot matrix printer owners! Print your program output and listings in a choice of five impressive print styles. Drives all the printer interfaces listed under Tasword Two and all dot matrix printers with bit image graphics capabilities. You can also use TASPRINT to print Tasword Two text files. TASPRINT gives your output originality and style! Send s.a.e. for brochure which includes TASPRINT output.

£9.90 fully inclusive mail order price

TASMAN PARALLEL PRINTER INTERFACE

Plug into your Spectrum and drive any printer fitted with the Centronics standard parallel interface. Supplied complete with ribbon cable and driving software. The cassette includes LLIST, LPRINT, and **text** screen copy software for **all** centronics printers. The user changeable interface software makes it easy to send control codes to your printer using the method so successfully pioneered with Tasword Two. The cassette **also** contains fast machine code high resolution screen copy software for Epson, Star, Seikosha, Shinwa, and Tandy Colour Graphic (in colour!) printers. Send s.a.e. for brochure which includes sample print-outs and a full list of printers supported by screen software. Compatible with microdrives/ZX Interface 1.

£45 fully inclusive mail order price

TASMAN RS232 PRINTER INTERFACE

Specification and software as above but drives printers fitted with the RS232 standard interface. A low cost route to printing – especially suitable for use with the Tandy Colour Graphic printer and the Brother portable typewriter/printers. Supplied complete with cable – please specify whether 4 pin DIN or 25 way D plug required.

£38 fully inclusive mail order price

TASMAN SOFTWARE

Dept. SP

17 HARTLEY CRESCENT LEEDS LS6 2LL

AGF

PROGRAMMABLE JOYSTICK INTERFACE

ONLY 26-95 +£1·00pp

MICRODRIVE COMPATIBLE

for

Spectrum or ZX81

AGF PROGRAMMABLE INTERFACE

Recognised as the only true Hardware Programmed joystick interface this product offers all the features associated with such a design.

You can use *any* Atari-compatible joystick controller with *any* software for your Sinclair Spectrum or ZX81, not just those with a joystick option.

Movement of the joystick is recognised by the computer *exactly* the same as pressing the appropriate control keys, and can therefore give the most immediate response to that movement. The hardware programmed design works with *all* possible key-reading methods, both BASIC and Machine Code.

Eight directional movement, with or without the fire button being pressed, can be achieved by only programming the left, right, up, down and fire keys required by the game.

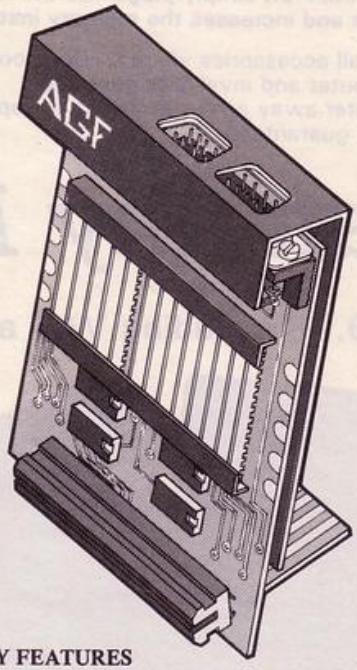
Programming is achieved by a two-digit code, which is looked up on the Programming Chart supplied, for each direction and firing button. These two numbers are then selected on a pair of leads which are clipped onto appropriately numbered strips on the interface.

Once configured this can be marked onto a Quick Reference Programming Card for storing with the game. As the programming is *not* power dependent the interface can be immediately used when next switched on.

The keyboard remains fully functional and can be used simultaneously with the joystick.

An integral rear expansion connector means there is no need to remove the interface to connect other peripherals.

NB. A recent design improvement now means that the AGF Programmable Interface works with the new Quickshot II rapid "Auto Fire" feature.



KEY FEATURES

- ★ Programmable design gives TOTAL software support.
- ★ Accepts Atari, Competition Pro, Wico, Starfighter, Quick Shot, Le Stick etc.
- ★ Rear extension connector for all other add-ons.
- ★ Free demo program and instructions.

PACKAGE CONTENTS SUPPLIED

- Programmable Interface Module as illustrated, complete with clip-on programming leads.
- Self adhesive programming chart detailing how to define which key is simulated by UP, DOWN, LEFT, RIGHT, and FIRE.

- One pack of ten Quick Reference Programming Cards for at-a-glance setting to your games requirements.

- 12 months guarantee and full written instructions.

ONLY 16.95 +£1 P&P

Quickshot II® JOYSTICK

NEW IMPROVED GRIP : BUILT-IN STABILIZING SUCTION CUPS

TRIGGER FIRE BUTTON : RAPID AUTO FIRE SWITCH : TOP FIRE BUTTON

FROM: MR/MRS/MISS

ADDRESS

SEND C.W.O. (NO STAMP NEEDED) TO: A.G.F. HARDWARE, DEPT.SP.

FREEPOST, BOGNOR REGIS, WEST SUSSEX, PO22 9BR.

QTY	ITEM	ITEM PRICE	TOTAL
	PROGRAMMABLE INTERFACE	27.95	
	JOYSTICK(S)	17.95	
	PACK(S) QUICK REFERENCE CARDS	1.00	
ZX81 ☐ ZX SPECTRUM ☐ Please tick		FINAL TOTAL	

DEALER ENQUIRIES WELCOME *EXPORT PRICES ON APPLICATION*

Upgrade your 16K ZX SPECTRUM Now!

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

- ★ Fully compatible with all accessories via rear edge connector
- ★ No need to open computer and invalidate guarantee
- ★ Why send your computer away and wait weeks for upgrade
- ★ Fully cased tested and guaranteed.

Why wait any longer?

Only £39.95 including VAT and P&P.

Now make your Spectrum and ZX-81 Talk

The Cheetah "SWEET TALKER" just plugs into the back of the computer using the existing power supply. Based on an allophone system you can easily program any word sentence or phrase. Fully cased, tested guaranteed and compatible with all accessories via rear edge connector. Complete with demonstration cassette and full instructions. No more lonely nights! Simply incredible at **£29.75** (Please quote when ordering whether Spectrum or ZX81 owner)

16K RAM Pack for ZX-81	**£19.75**
64K RAM Pack for ZX-81	**£44.75**

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

Send cheque/PO now to:

CHEETAH MARKETING LTD
Dept SP4
24 Ray Street
London EC1 R3 DJ
Tel: 01-278 6954

Cheetah products also available from

branches of John Menzies Boots WH SMITH and RUMBELOWS

Ideas, opinions and advice

I BOUGHT my ZX-81 in 1982. At the time I knew little about computing and I rooted around for a suitable magazine to help me with my problem. I found it — *Sinclair User*. Later I discovered *Sinclair Programs*, a magazine full with 40 programs for use on Sinclair computers. I rushed home, took £1 from my brother's savings, and bought the magazine. I was disappointed to find only a few 1K programs. I knew I could buy an extension for my ZX-81, so I decided to buy the magazine until I got a RAM pack.

Now we flip forward in time to about August/September, 1983. I had just bought a RAM pack for my ZX-81. So far, so good until, to my dismay, I found that the *Sinclair Programs* had been reduced to 30 programs. I was horrified and distressed to see that about 20 programs were for the Spectrum. I think I would speak for many by saying bring back 40.

L Godley,
Blackburn.

Fair shares

WHEN my *Sinclair Programs* arrives each month the first thing I do is open it at the first page and look for Program of the Month. In January I was very disappointed. I own a Spectrum and Program of the Month was for the ZX-81.

Why don't you have a Program of the Month for both computers? Also I expect all your readers get very frustrated flicking through the magazine trying to find programs for their computers. Why do you not put all the ZX-81 programs first and the Spectrum programs after them?

A M Samler
Didcot, Oxon.

● *Program of the Month is considered to be the best program received by our reviewer in one month. As such, it can be for any Sinclair machine. Whichever machine it is for, we always try to include 15 ZX-81 and 15 Spectrum programs in the magazine.*

Randomized screech

I DECIDED to experiment with the striped borders technique and produced a wide variety of two-coloured striped borders. Each one listed is disabled by pressing BREAK. They are called-out of the ROM by typing RANDOMIZE USR x, where x is one of the numbers listed:

x	colours
1289 =	blue/white
1333 =	cyan/blue
1334 =	yellow/blue
1290 =	red/blue
1292 =	green/blue
1288 =	black/blue

The following three also make a striped border but they are chunky and are exited by pressing BREAK only after two or three seconds, when the border goes into fast stripes:

x	colours
1244 =	magenta/green
1245 =	blue/yellow
1243 =	red/cyan

M Hargreaves,
Bradford.

Zuckman

RECENTLY I sent for a tape called Zuckman which was advertised in *Sinclair Programs*. When I received it, it took five minutes to load. The tape has plenty of instructions which were easily understandable; then I ran the program. It was easily the best game I have. When you reach your highest score it is entered into the Zuckman hall of fame — the game is very similar to Pac-man. One problem is that when you reach 7,000 points your score goes to 0 and it does not go on your hall of fame.

My record is 11,370 on a ZX-81 16K.

Andrew Lamb, aged 11,
Edgbaston,
Birmingham.

So much

I WOULD recommend *Sinclair Programs* to anybody who owns either a Spectrum or ZX-81. It is always crammed with really good programs and reviews. I had a ZX-81 for Christmas and with cassette software not being exactly cheap, I buy *Sinclair Programs* every issue, so that I can type-in your programs and save them on to cassette.

Many of my friends own a Sinclair computer and when I buy my magazine everybody wants to borrow it. I do not like that because if I lend it I never see it for weeks. If any other magazine could offer so much for less than £1 I would certainly buy it.

The magazine is very well put together and easy to understand. It has an index and an explanation of how to type-in graphics notes. It always has glossy pages with interesting programs and advertisements. I usually look for good software at reasonable prices.

On the whole I would say *Sinclair Programs* is one of the best computer magazines.

Charlie Wood,
Stockport,
Cheshire.

Old problem

IN THE January/February, 1983 issue you featured an extensive program called Frogger. I have tried very hard to make it run on my 16K Spectrum but nothing happens. Line 1140 is the problem, I think; OUT OF MEMORY 1140 is a regular happening. Is there an error?

J A Green,
Breaston, Derbyshire.

● *Since publication of this Frogger program more than a year ago we have received a continuous stream of queries about it from readers who bought the January/February, but not the March/April issue. Corrections are: First, replace PRINT VAL$ Q$ in lines 50, 130, 160, 305 and 400 with GOSUB 15. Next, delete lines 1120 to 1160 inclusive. Finally, enter 15 FOR I=1 TO 6: PRINT AT Y(I),0;P$ (I,X(I) TO); P$ (I, TO X(I)-1): NEXT I: RETURN.*

Translation

HAVING HAD a ZX-81 for nearly two years, like others caught by the computer bug I am moving to the Spectrum. I find one big disadvantage in the fact that I have to re-type all the 50-odd ZX-81 tapes all over again and I feel sure that this fact alone prevents many people changing to the Spectrum.

Surely a firm like Sinclair, with three computers on the market, and a fourth launched, could find some method where a new model could receive the tapes of the preceding model. All I hear is talk of different commands and speed. With their knowledge they should be able to overcome that type of problem.

I have a thing called a slow loader which has been a waste of money. Even programs with the same commands on the ZX-81 and Spectrum will not load. My friend who is a computer programmer cannot get it to work so I have a long boring time ahead.

F E W Jugg
Cambridge.

Complete your computer

with the sensational **KELWOOD SOUND POWER BASE**

has all the 'basic bits' that Sinclair left off.

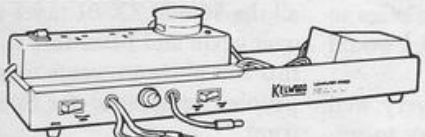
- **Fully adjustable sound amplification**
- **ON-OFF re-set switch**
- **LOAD/SAVE switch**
- **Angled stand**

● Does not take up any extra space ● All wires included ● Saves wear and tear on connections ● Gives distinct click with each key depression ● Amplifies all sound on program and on cassette ● Does not need batteries ● Does not interfere with inside of Spectrum or any other add-ons ● No soldering required, simply plugs in
REF SPBI £19.90

Standard Power Base without sound
SPECTRUM REF PBSI £13.50
ZX81 REF PBZXI £13.00
For the above with cool-it units included please add £5.05

KELWOOD add-its for Sinclair addicts

BACKPACKS



Six versions of this indispensable unit complete your computer. All have SAVE/LOAD and ON/OFF switching and a housing for the transformer. Compatible with interface one. Ideal for use with cased keyboards

Ref **BP1** – Fully variable sound amp – 3 x 13 amp sockets, switch and neon indicator – cable and plug £27.50
Ref. **BP2** – as BP1 but no sockets, cable and plugs. Has room to fix your own 'Duraplug' sockets £19.50
Ref. **BP3** – as BP1 but no sound £21.50
Ref. **BP4** – as BP1 but no sound or sockets £13.05
Ref. **BP5** – ZX81 version inc. sockets, mains switch neon, cable and plug £20.85
Ref. **BP6** as BP5 but no cable or sockets £12.85

WOBBLE STOPPER

STOPS ZX81 RAM-PACK WOBBLE

Flat: Ref **SW** £5.25. Tilted: Ref **STW** £6.25
Extra long for printer – Flat: Ref **LW** £5.75. Tilted: Ref **LTW** £6.75

COOL-IT UNIT

Takes the heat out of your computer. Lets your Spectrum or ZX81 run much cooler.

Separate Cool-it Unit
ZX81 Ref **ZXC** £11.65 Spectrum Ref **SC** £11.85

Cool-it units built into other Kelwood add-its
Power Base (Spectrum) Ref **PBSIC** £18.55 ● Power Base (ZX81) Ref **PBZXIC** £18.05 ● Sound Power Base (Spectrum only) Ref **SPBIC** £25.00 ● Back Pack 1 Ref **BP1C** £32.55 ● Back Pack 2 Ref **BP2C** £24.55 ● Back Pack 3 Ref **BP3C** £26.55 ● Back Pack 4 Ref **BP4C** £18.60 ● Back Pack 5 Ref **BP5C** £26.90 ● Back Pack 6 Ref **BP6C** £18.90 ● Wearsaver (Spectrum) Ref **WSSC** £16.00 ● Wearsaver (ZX81) Ref **WSZXC** £15.80

WEAR SAVERS

● Cuts out wear and tear on plugs and sockets ● Switching for SAVE/LOAD and 9 volts ON/OFF. ● Simply plugs in
Spectrum Ref **WSS** £9.95
ZX81 Ref **WSZX** £9.75

MICROSTATION

The compact way to work ● Room for all essential peripherals ● Ideal for use in restricted spaces ● Allows the computer etc to be moved around with the minimum of effort

Ref. **MS** £7.50

KELWOOD *almost a* WIRELESS WORKSTATION

● Mains ON/OFF switch ● 3 x 13 amp sockets inside ● Supreme quality ● All wires stow away ● Carrying handle ● Easily stored ● Sturdily built in stove enamelled steel ● Ideal for schools ● Suitable for most micros including Sinclair and BBC ● Acres of room for all peripherals

Desk top model
Ref **CW1** £49.00
Legs Ref **LCW** £11.00

Name_____

Address_____

Access
Barclaycard No_____

CREDIT CARD HOTLINE TEL: (0709) 63242 8am-10pm

QUANTITY	REF	AMOUNT
	TOTAL ENCLOSED	

Items under £10 plus 60p P&P
Items over £10 plus 95p P&P
Workstations plus £3 P&P

KELWOOD COMPUTER CASES Downs Row, Moorgate, Rotherham *PERSONAL CALLERS WELCOME* *All prices include VAT*

Well-worn themes re-appear

THE TREND in software production appears to be to take stock, build on successful ideas and await new developments. New games tend to be new variations on well-worn themes rather than startlingly original concepts. The number of games based on the premise that all computer owners love shooting as many things as possible is decreasing and giving way to games which need thought and strategy as well as fast reactions.

Unfortunately for ZX-81 owners, although their computer has remained consistently among the top five best-selling computers, new software for the ZX-81 is almost non-existent and W H Smith is not intending to accept any new ZX-81 software for sale in its shops. Due to the shortage of new software, no ZX-81 programs have been received for review this month.

THE SNOWMAN

The Snowman — Quicksilva, 48K Spectrum — is based loosely on the book of the same name by Raymond Briggs. The aim is to collect snow and build a snowman. The wandering flames must be avoided, as they melt your snow and turn it to water.

Falling off the ice structure of pathways and ladders will result in the player being sent back to bed, as will running out of energy. On the higher levels, sleep monsters must also be avoided or confronted with alarm clocks. The Snowman combines the best of many games already on the market and should become a best-seller.

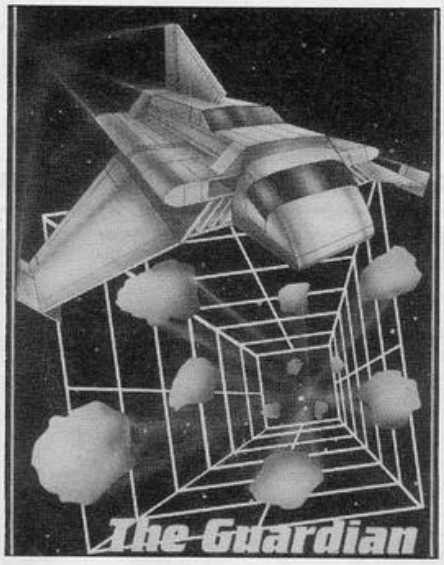
The latest sequel to Pimania, Pi-Eyed and other Automata productions is **Pi-Balled** — 48K Spectrum. Once again the Pi-man is the hero of the game, this time accompanied by two bouncing balls and Sid the Snake.

It is a fairly straightforward arcade game. The mystical pyramid of Pi must be changed in colour by jumping from square to square. Sid the Snake must be avoided, as must the bouncing balls, which can also change the colour of the pyramid but not necessarily in a way which is helpful.

Pi-balled has lively graphics; the bouncing balls and spinning discs are particularly convincing and the degree of difficulty is well-judged to suit beginners and experienced players. Shades of Manic Miner are apparent in **Loony Zoo** — Phipps Associates, 48K Spectrum. The storyline is that, while surveying another planet, you have been captured by its vastly superior inhabitants and placed in one of their zoos, together with various other alien specimens.

It is possible to escape by jumping from ledge to ledge to reach the door pressure-pad at the top of the screen. Needless to say, you escape only into other cages from which it is more difficult to escape. Despite its simple graphics and slow pace, Loony Zoo is a difficult and addictive game.

Killer Knight — Phipps Associates, 48K Spectrum — thinly disguises a



Kong-type game with medieval trappings. The player must climb from platform to platform, using ladders and avoiding rolling objects. Beginners will find it difficult to progress very far, while experienced players will soon realise that a high score can be obtained simply by running back and forth along the bottom level.

MONKEY BIZNESS

In a very similar vein is **Monkey Bizness** — Artic, 48K Spectrum. The monkey mentioned in the title is King Kong and the object is to rush up the scaffolding, dodging or destroying the barrels which Kong rolls at you, to rescue the woman at the top of the scaffolding.

Monkey Bizness is an amusing and colourful game, although many Spectrum owners will find they already possess similar games.

Like Donkey Kong, Pac-man is a game which spawned a multitude of imitations. **Dinky Digger** — Postern, 48K Spectrum — has a distinctly Pac-man-like air to it. The object is to clear the screen of cherries and grab the cake in the middle, while avoiding the monsters which are trying to eat you.

One monster is followed quickly by another and the game is so difficult that it should be attempted only by the experienced or very nimble-fingered user.

3D Star Wars — Addon Electronics, 48K Spectrum — is one of the less worthwhile pieces of software on the market. The graphics are lifeless and confusing, the three-dimensional effect is jumbled, and the number of keys to be used complicates the game still further.

THE GUARDIAN

The Guardian — PSS, 48K Spectrum — is the first version of the arcade game The Tempest to appear for the Spectrum. The site is a spaceship on the edge of a vortex to another universe. Aliens appear through the doorway and must be destroyed by the use of laser bolt gun or star smasher weapons. The game has had to be simplified for microcomputer use but it is easy and fun to play.

CCS has begun its **Games for Girls** series with three games for the 48K Spectrum. **Hicksted,** a simulation of a show jumping event; **Diamond Quest,** which is a straightforward adventure; and **Jungle Maze,** in which prizes are won with a Mastermind-style guessing game which is fun, although unoriginal. Apart from a tenuous link with show jumping in one game and a heroine rather than a hero in another, it is difficult to see in what way CCS has changed its strategy to aim it at females rather than males.

Computers are bound to affect everyone's future in some way, so encouraging more people to use and understand them is a worthwhile project.

To attempt to increase a software company's market vastly by selling to women is unlikely to succeed unless the software market is changed substantially.

THE BEST OF

Sinclair Programs

100 TOP PROGRAM LISTINGS FOR ONLY £2.25* plus 60p p&p
GAMES, ADVENTURES, EDUCATION AND BUSINESS
LISTINGS FOR THE SPECTRUM AND ZX-81

Since its launch two years ago, **Sinclair Programs** has become well-known for its high-quality programs.

Now we have decided to collect the best 100 programs from the last year's magazines with all the usual features, such as Programs of the Month and the Beginners' section.

Make sure of your copy by completing the order form for **The Best of Sinclair Programs '84** today.

*U.K. only. Overseas rates available on request

To Sinclair Programs ECC Publications, 196-200 Balls Pond Road, Islington, London N1 4AQ

Name .....

Address .....

I enclose cheque for £_____ for _____ copies of **The Best of Sinclair Programs '84.**

Make cheques payable to ECC Publications.

Please charge my credit card: Card name_____

Number_____

THE FABULOUS **CASSETTE 50** FROM **cascade**

ONLY £9.95 (INC. P&P and VAT)

VALUE that's out of this world

50 GAMES ON ONE CASSETTE

DRAGON · BBC A/B · Spectrum · apple · ATARI · ORIC-1 · ZX81 · VIC 20

It is impossible to tell you everything about the 50 games on CASSETTE - 50 but they include many types such as maze, arcade, missile, tactical and logic games, to suit most tastes in computer game playing.
CASSETTE - 50 will appeal to people of all ages and the games will provide many hours of entertainment for all the family at a fraction of the cost of other computer games.

EXPRESS DELIVERY - ORDER NOW

Name _____

Address _____

_____ Post Code _____

Country _____

Dealers & Stockists enquiries welcome.

Please send me by return of post, Cassette 50 at £9.95 per tape. I enclose a cheque/postal order for

£ _____ made payable to Cascade Games Ltd.

Please debit my [ ] No. _____

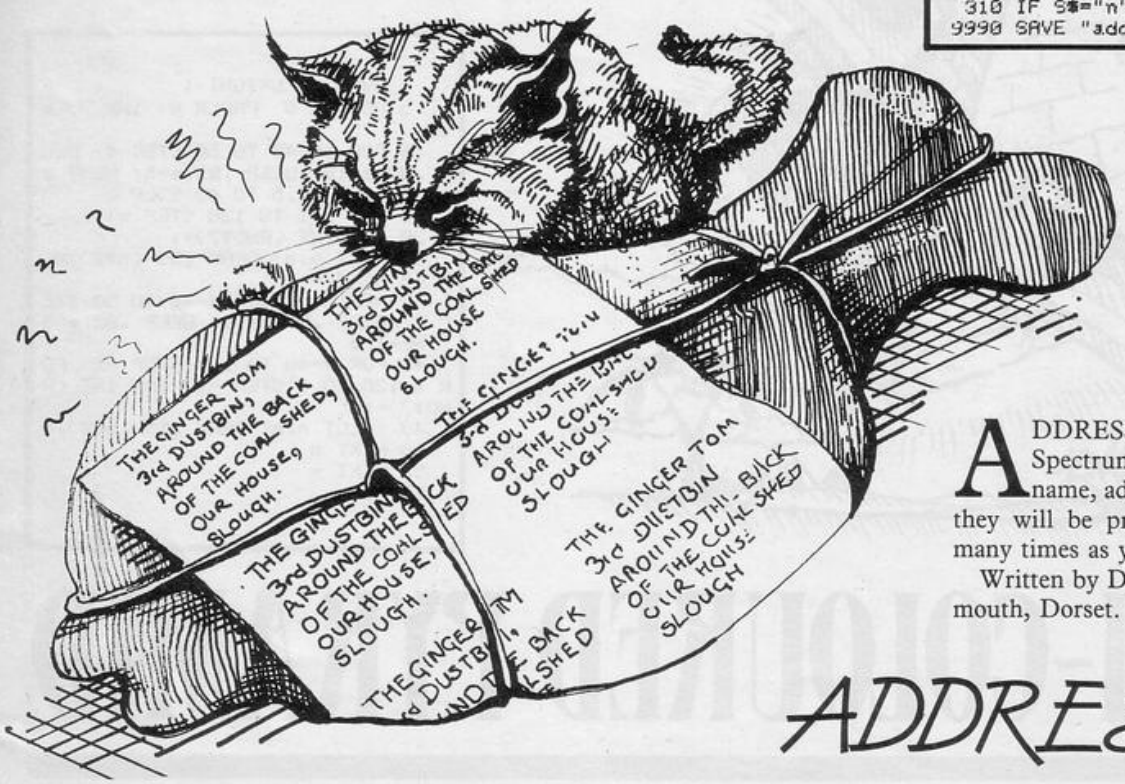
SPECTRUM ☐ ORIC-1 ☐ ZX 81 ☐ VIC 20 ☐
BBC A/B ☐ DRAGON ☐ ATARI ☐ APPLE ☐ ☑

cascade

Cascade Games Ltd.,
Suite 4, 1-3 Haywra Crescent, Harrogate,
North Yorkshire, HG1 5BG. England.
Telephone: (0423) 504526.

SP 4/84

```
  20 PRINT "This Program Prints
out address labels on the Printe
r.Just      follow the Prompts g
iven by the Program."
  30 INPUT "Any Key to continue"
;X$
  40 CLS
 100 INPUT "NAME OF PERSON/FIRM
";A$: PRINT A$
 110 INPUT "1st LINE OF ADDRESS
";B$: PRINT B$
 120 INPUT "2nd LINE OF ADDRESS
";C$: PRINT C$
 130 INPUT "3rd LINE OF ADDRESS
";D$: PRINT D$
 140 INPUT "4th LINE OF ADDRESS
";E$: PRINT E$
 150 INPUT "POSTCODE ";F$: PRINT
 F$
 160 PRINT AT 19,0;"Information
correct ? (Y/N)"
 170 INPUT G$
 180 IF G$="y" THEN  GO TO 200
 190 IF G$="n" THEN  PRINT AT 19
,0;"O.K. TRY AGAIN.ANY KEY TO "'
"RESTART FROM BEGINNING"
 195 PAUSE 0: CLS : GO TO 100
 200 LET Z=INT (32-LEN A$)/3
 210 LPRINT TAB Z;A$
 220 LPRINT TAB Z+1;B$
 230 LPRINT TAB Z+2;C$
 240 LPRINT TAB Z+3;D$
 250 LPRINT TAB Z+4;E$
 255 LPRINT TAB Z+5;F$
 260 FOR y=1 TO 5: LPRINT : NEXT
 y
 270 INPUT "Copy again (Y/N) ";R
$
 275 CLS
 280 IF R$="y" THEN  GO TO 200
 290 IF R$="n" THEN  INPUT "NEW
LABEL (Y/N) ";S$
 300 IF S$="y" THEN  GO TO 100
 310 IF S$="n" THEN  STOP
9990 SAVE "add-ress" LINE 1
```



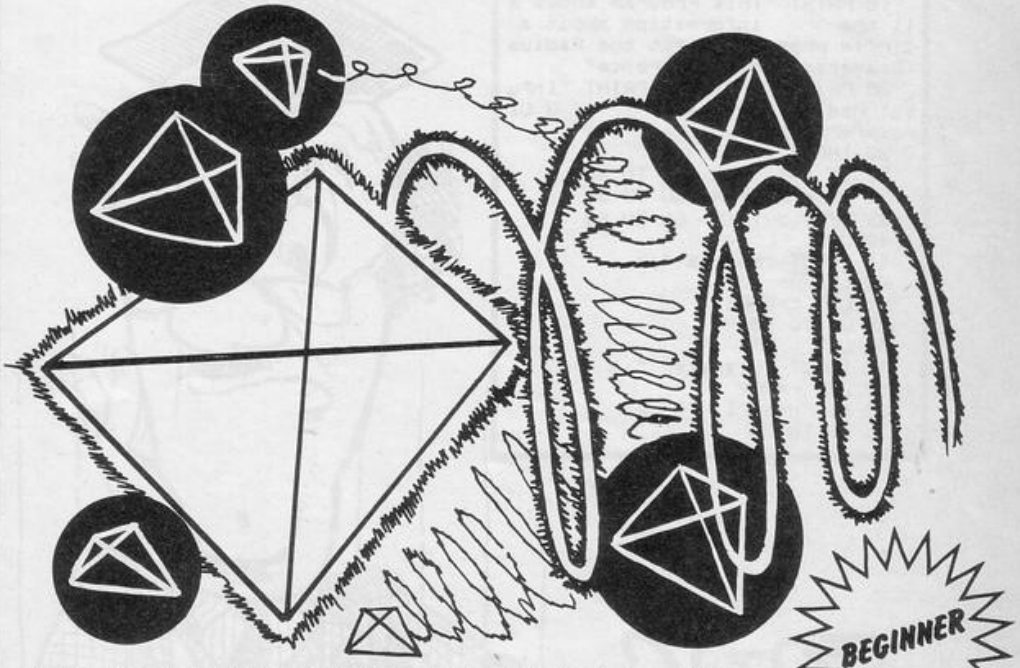
BEGINNER

ADDRESSER is for use with the Spectrum and printer. Type-in a name, address and postcode, and they will be printed-out separately as many times as you wish.

Written by Dennis Green of Bournemouth, Dorset.

ADDRESSER

```
  9 CLS : PRINT  FLASH 1;"STOP
THE TAPE": PAUSE 0
  10 BORDER 6: PAPER 1: INK 7: C
LEAR 32199: LET P=32200
  20 FOR X=0 TO 2*PI STEP .2
  30 LET A=((SIN X)*50)+140
  40 LET B=((COS X)*25)+50
  50 LET C=(SIN (X+(2*PI/3))*50)
+140
  60 LET D=(COS (X+(2*PI/3))*25)
+50
  70 LET E=(SIN (X+(4*PI/3))*50)
+140
  80 LET F=(COS (X+(4*PI/3))*25)
+50
  85 POKE P,A: POKE P+1,B: POKE
P+2,C: POKE P+3,D: POKE P+4,E: P
OKE P+5,F
  90 CLS
 100 PLOT A,B: DRAW C-A,D-B: DRA
W E-C,F-D: DRAW A-E,B-F
 110 DRAW 140-A,170-B: DRAW C-14
0,D-170: PLOT E,F: DRAW 140-E,17
0-F
 120 LET P=P+6
 130 NEXT X
 200 FOR P=32200 TO 32391 STEP 6
 210 LET A=PEEK P: LET B=PEEK (P
+1): LET C=PEEK (P+2): LET D=PEE
K (P+3): LET E=PEEK (P+4): LET F
=PEEK (P+5)
 220 PLOT A,B: DRAW C-A,D-B: DRA
W E-C,F-D: DRAW A-E,B-F
 230 DRAW 140-A,170-B: DRAW C-14
0,D-170: PLOT E,F: DRAW 140-E,17
0-F
 240 CLS
 250 NEXT P
 260 GO TO 200
```

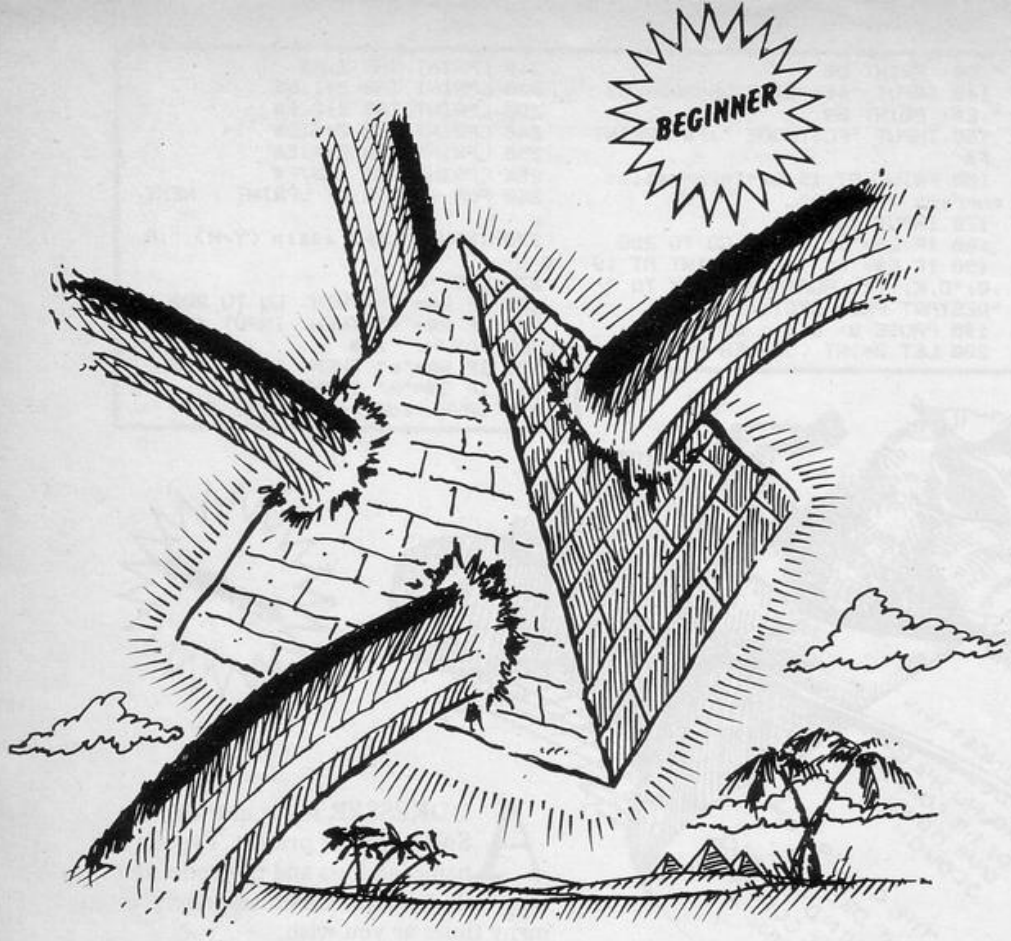


BEGINNER

REVOLVING TETRAHEDRON

IN ONE revolution the corners which make up the base of the tetrahedron all lie on the same ellipse. The computer compiles a look-up table containing the co-ordinates of the corners during one revolution. Those values are poked into the memory and once in position increase the speed of execution.

Revolving Tetrahedron was written for the Spectrum by Tim Gilpin of Bishopsteignton, Devon.

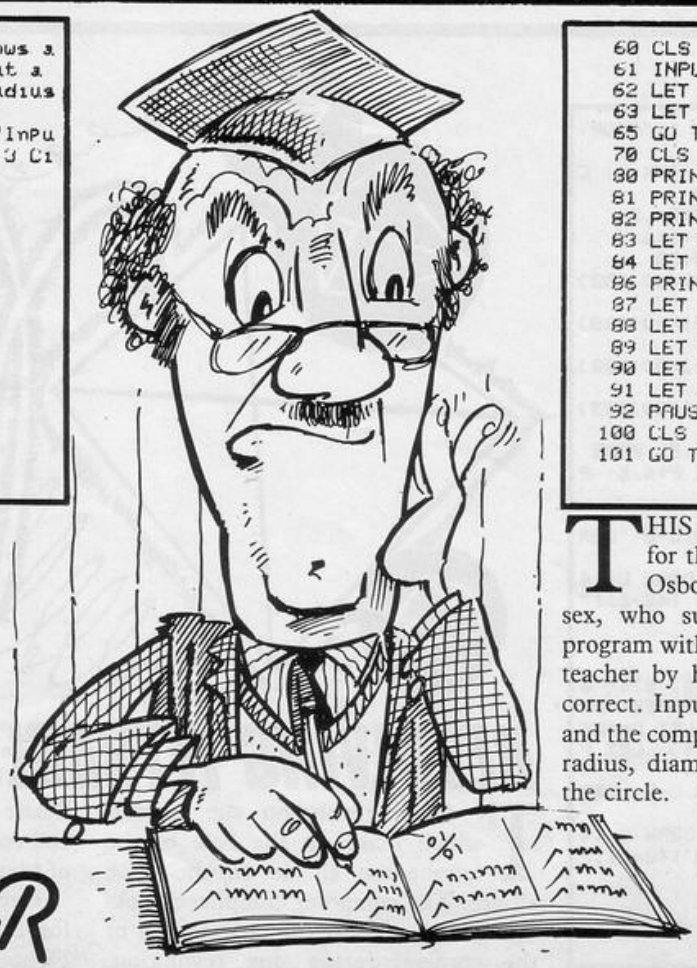


STEVEN DAY, aged 12, of Portsmouth, Hampshire submitted this beginners' program for the 16K Spectrum. It could be inserted at the beginning or end of another program and draws a multi-coloured triangle which fluctuates with colour and plays a tune.

```
  4 OVER 1: BRIGHT 1
  5 BORDER 0: PAPER 0: INK 7: C
LS
  6 FOR e=-40 TO 50 STEP 4: BEE
P .02,e+10: BEEP .02,e-5: NEXT e
  7 FOR x=1.5 TO 40 STEP 2
 10 FOR n=1 TO 128 STEP x
 20 INK INT (RND*7)+1
 30 PLOT n,n: DRAW 255-(n*2),0
 45 NEXT n
 47 NEXT x: FOR e=-40 TO 50 STE
P 4: BEEP .02,e+10: BEEP .02,e-5
: NEXT e
 48 FOR x=40 TO 1.5 STEP -2: FO
R n=128 TO 1 STEP -x: INK INT (R
ND*7)+1
 49  PLOT n,n: DRAW 255-(n*2),0
 50 NEXT n
 55 NEXT x
 60 RUN
```

MULTI-COLOURED PYRAMID

```
 10 PRINT "This program shows a
ll the      information about a
circle when you input the Radius
,Diameter orcircumference"
 20 PRINT : PRINT : PRINT "Inpu
t 1 radius:2 Diameter       3 Ci
rcumference"
 30 INPUT e
 31 IF e=1 THEN  GO TO 40
 32 IF e=2 THEN  GO TO 50
 33 IF e=3 THEN  GO TO 60
 40 CLS
 41 INPUT "Radius ";r
 42 LET d=r*2
 43 LET c=d*PI
 45 GO TO 70
 50 CLS
 51 INPUT "Diameter ";d
 52 LET r=d/2
 53 LET c=d*PI
 55 GO TO 70
```

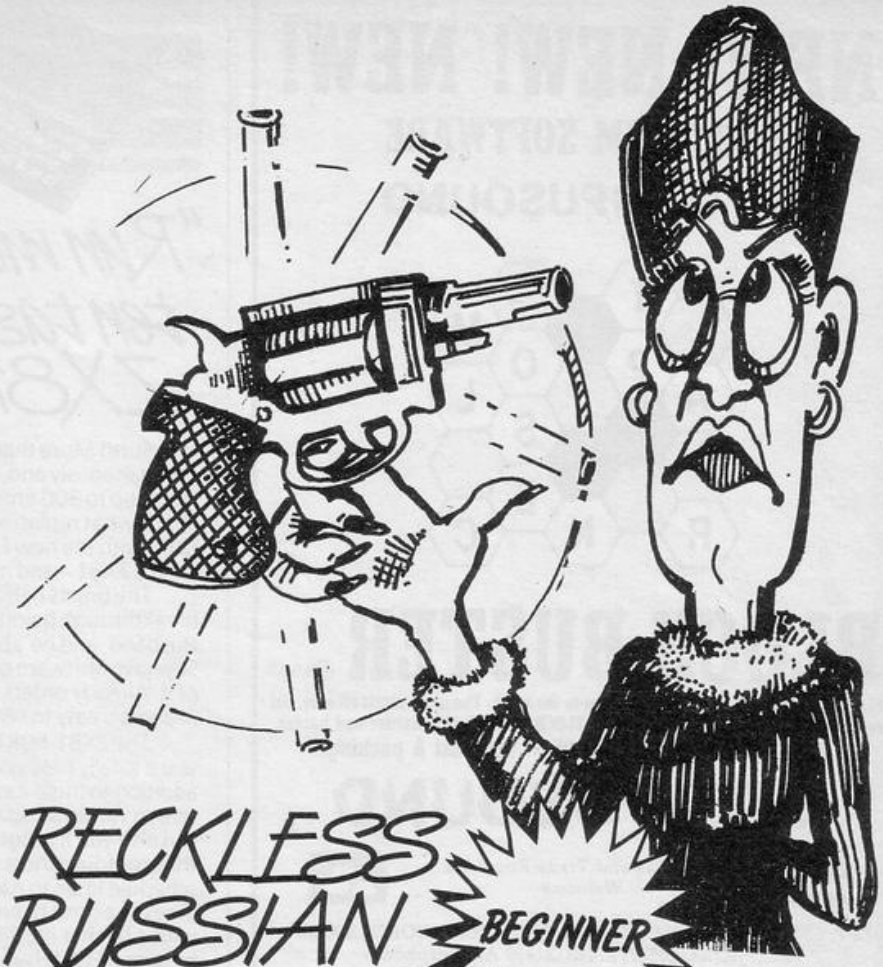


```
 60 CLS
 61 INPUT "Circumference ";c
 62 LET d=c/PI
 63 LET r=d/2
 65 GO TO 70
 70 CLS
 80 PRINT "Circumference ";c
 81 PRINT "Diameter ";d
 82 PRINT "Radius ";r
 83 LET z=r*r
 84 LET a=PI*z
 86 PRINT "Area ";a
 87 LET a=0
 88 LET z=0
 89 LET r=0
 90 LET d=0
 91 LET c=0
 92 PAUSE 4e4
100 CLS
101 GO TO 1
```

FOOL YOUR TEACHER

THIS IS a short program written for the 16K Spectrum by Mark Osborne, aged 12, of Hove, Sussex, who suggests that it is a good program with which to tease your maths teacher by having all your homework correct. Input the relevant information and the computer will give you the area, radius, diameter and circumference of the circle.

```
  5 CLS
 10 PRINT "     RUSSIAN ROULETE"
 15 LET R=VAL "1"
 20 PRINT
 30 PRINT "  PLEASE INPUT BARRE
L";
 40 INPUT A
 50 PRINT A
 60 PRINT
 70 LET X=INT (RND*5)+1
 80 FOR F=1 TO 15
 85 NEXT F
 90 PAUSE 0
100 PRINT "THE BARREL WITHOUT T
HE BULLET   IS ";X
110 PRINT "YOU CHOSE BARREL ";A
120 IF X=A THEN GOTO 200
130 PRINT "YOU ARE DEAD"
140 PAUSE 4E4
150 RUN
200 LET R=R+VAL "1"
210 PRINT "WELL DONE.YOU NOW AR
E ON ROUND ";R
220 PAUSE 4E4
230 GOTO 20
```

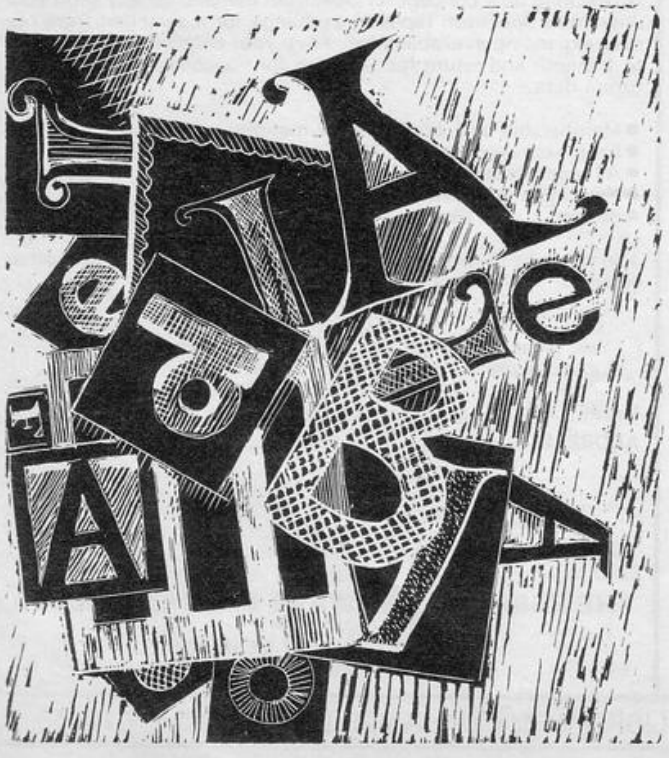


RECKLESS RUSSIAN ROULETTE

BEGINNER

WRITTEN for the 1K ZX-81 by N J Watkins of Penn, Wolverhampton, **Reckless Russian Roulette** is a game with a difference. The gun has six barrels and five of them are loaded. If you are fortunate enough to pick the empty barrel, you will go to the next round.

THE ALPHABET GAME is a beginners' program for the 1K ZX-81 by John Gregory of Preston, Lancs. The letters of the alphabet appear on the right-hand side of the screen and are then mixed. A letter will appear from the left-hand side and when it is below the corresponding letter you must press a key. If you do not press at the proper time or miss the letter, the game ends and you are told how long you lasted.



ALPHABET GAME

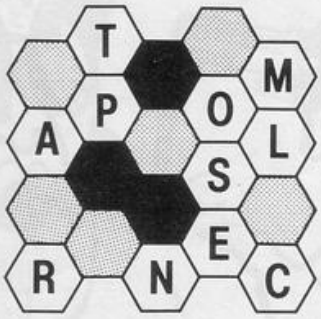
```
  1 LET S=-1
 10 FOR I=38 TO 63
 11 PRINT AT 10,I-32;CHR$ I
 12 NEXT I
 13 FOR I=1 TO 30
 14 LET X=INT (RND*26)+6
 15 LET Y=INT (RND*26)+6
 16 PRINT AT 10,X;
 17 LET P=PEEK (PEEK 16398+256*
PEEK 16399)
 18 PRINT AT 10,Y;
 19 LET Q=PEEK (PEEK 16398+256*
PEEK 16399)
 20 PRINT AT 10,X;CHR$ Q;AT 10,
Y;CHR$ P
 21 NEXT I
 24 LET S=S+1
 25 LET V=INT (RND*26)+38
 26 FOR G=0 TO 31
 27 PRINT AT 11,G;CHR$ V;AT 11,
G;CHR$ ((V-V)*V)
 28 IF INKEY$<>"" THEN GOTO 40
 29 NEXT G
 30 PRINT AT 0,0;"YOU LASTED ";
S;" GOES";A
 40 PRINT AT 10,G;
 42 IF PEEK (PEEK 16398+256*PEE
K 16399)=V THEN GOTO 24
 43 GOTO 30
```

BEGINNER

NEW! NEW! NEW!

SPECTRUM SOFTWARE

by COMPUSOUND



BLOCK BUSTER ©1983

BLOCK BUSTER will test your knowledge to the brink. The game starts off easy, but as you pass the 'commercial breaks', BLOCK BUSTER gets harder and harder.

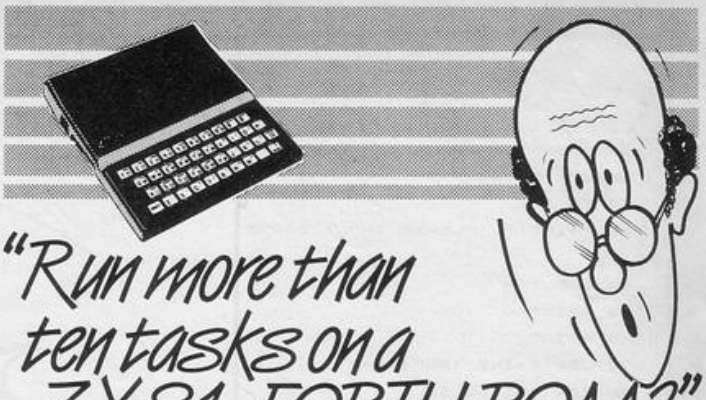
48k SPECTRUM. ONLY £5.95 + 50p post & packing.

COMPUSOUND

BARCLAYCARD VISA

Overseas and Trade Enquiries Welcome

DEPT: SP4 32-33 LANGLEY CLOSE, REDDITCH, WORCS B98 0ET
TELEPHONE: (0527) 21429 (21439 Answerphone)



"Run more than ten tasks on a ZX81-FORTH ROM?"

Sure! More than 10 tasks simultaneously and, in some cases, up to 300 times faster! That's what replacing the basic ROM with the new FORTH does for the ZX81 – and more!

The brains behind the breakthrough belong to David Husband, and he's building Skywave Software on the strength of it. Already orders are flooding in and it's easy to see why.

The ZX81-FORTH ROM gives you a totally new system. In addition to multi-tasking and split screen window capability, you can also edit a program while three or four others are executing, schedule tasks to run from 50 times a second to once a year, and with a further modification switch between FORTH and BASIC whenever you like.

The ZX81-FORTH ROM gives you a normal keyboard with a 64 character buffer and repeat, it supports the 16k, 32k, 64k RAM packs, it is fig-FORTH compatible and it supports the ZX printer.

The price, too, is almost unbelievable. As a "fit it yourself Eprom", complete with manual, it's just £25+VAT.
Add £2 p&p UK (£5 Europe, £10 outside Europe) and send your order to the address below.

Skywave SOFTWARE
David Husband
73 Curzon Road, Bournemouth,
BH1 4PW, ENGLAND.
Tel: (0202) 302385.
International +44 202 302385.

KERNOW SOFTWARE SERVICES LTD

SOFTWARE LIBRARY
FOR
SPECTRUM

Low cost weekly hire of the best arcade games, adventures, utilities, languages and business programs.

- Membership only £6.00 for 12 months.
- Program hiring from only 80p (plus p&p).
- Free fully descriptive catalogue for members.
- New titles constantly being added.
- Purchase new programs at discount prices.
- Return of post service.
- All tapes despatched using first class post.
- We have full permission and licences from the leading software publishers, to whom royalties are paid.

Compare these features with our competitors and you will see why more Spectrum owners are joining the Kernow Software Library. Join today by clipping the coupon below or send a S.A.E. for further details.

☐ YES, please send me my free catalogue and selection sheet. I enclose my £6 cheque/Postal Order.

NAME .....

ADDRESS .....

.....

.....TEL .....

Send to:

KERNOW SOFTWARE LIBRARY
(DEPT. SP)
55 ELIOT DRIVE, ST GERMANS
SALTASH, CORNWALL PL12 5NL

THE KERNOW SOFTWARE EXCHANGE CLUB

An exciting new concept for Spectrum owners. Simply send your unwanted Spectrum tapes in exchange for a selection from our ever-expanding availability list. Keep your exchange tapes for up to 1 month and return for others or for vouchers to be used at a future date.

- Membership only £6.00 for 12 months.
- Each exchange only £1.20 (plus p&p)
- All tapes despatched using first class post.
- New titles constantly being added.
- Return of post service.

Join today by clipping the coupon below or send S.A.E. for further details.

☐ Yes, please enrol me as a member of the exchange club. I enclose my £6 cheque/postal order.

NAME.....

ADDRESS .....

.....

.....Post Code .....

Send to:

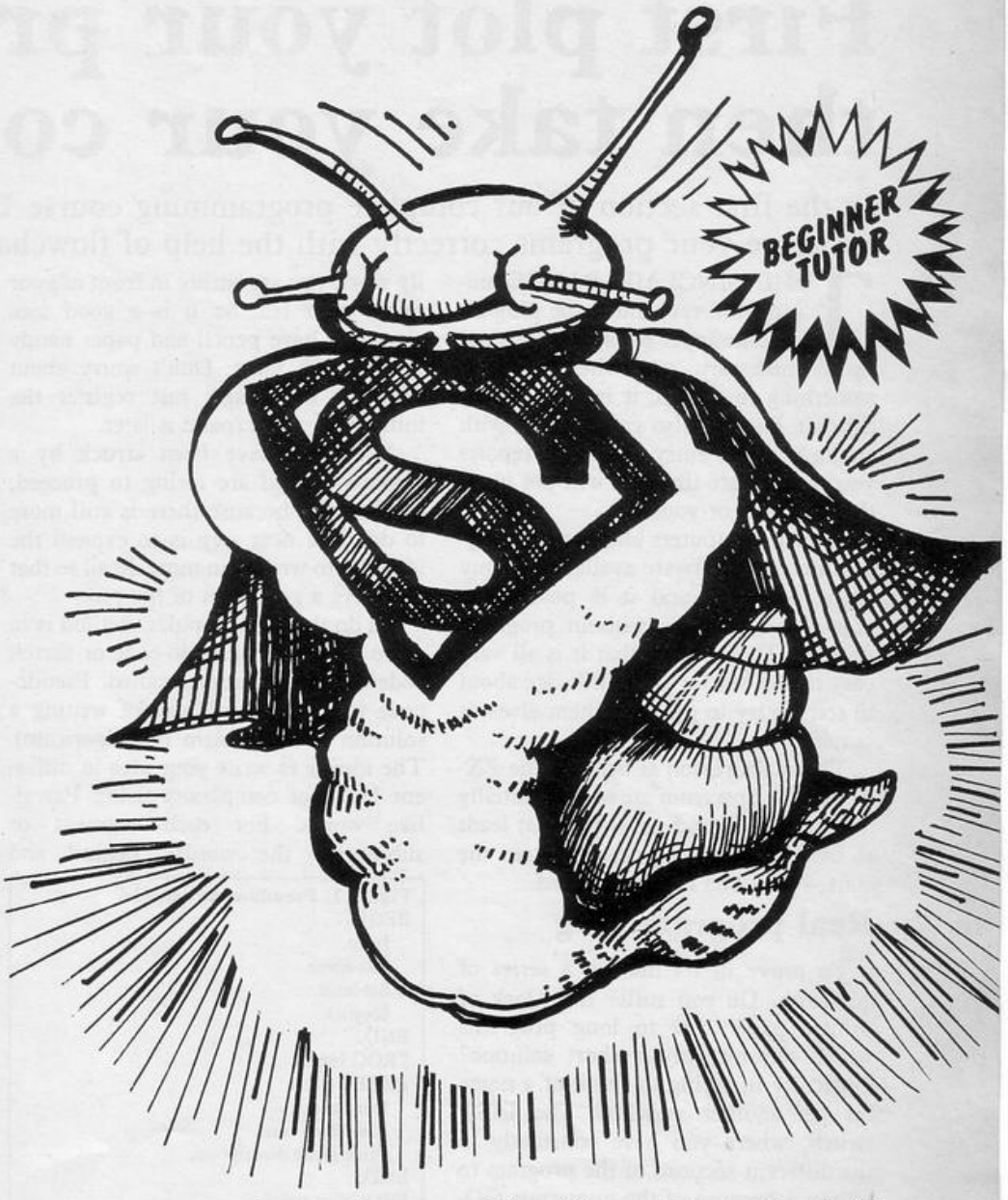
THE KERNOW SOFTWARE EXCHANGE CLUB
(DEPT. SP)
55 ELIOT DRIVE, ST GERMANS,
SALTASH, CORNWALL PL12 5NL

SPECIAL OFFER—JOIN BOTH SOFTWARE LIBRARY & EXCHANGE CLUB—ONLY £10.00

SUPA SNAIL

SUPA SNAIL was written for the 1K ZX-81 by Robert Courtney of Isleworth, Middlesex. You have to protect the crops on your farm by driving away the snail with your pea-shooter. To do so you have to type-in the row and column number of what you regard as the position of the snail. A hit will send the snail to another farm and a miss will result in the loss of crops.

```
  4 LET S=0
  5 FOR M=1 TO 10
  7 CLS
  9 PRINT AT 0,23;"SCORE=";S
 40 LET A=INT (RND*20)+1
 41 LET B=INT (RND*27)
 42 FOR C=0 TO B
 44 PRINT AT A,C;" ▄▟"
 46 NEXT C
 48 PRINT AT 0,0;"WHICH NUMBER
ROW?"
 50 INPUT Z
 52 PRINT AT 0,0;"WHICH NUMBER
COLUMN?"
 54 INPUT Y
 56 PRINT AT Z,Y;"*"
 59 PAUSE 100
 60 IF Z<>A THEN GOTO 91
 61 IF Y>B+4 THEN GOTO 91
 62 IF Y<B+1 THEN GOTO 91
 65 PRINT AT 0,0;"HIT
    "
 66 PAUSE 100
 70 LET S=S+1
 85 NEXT M
 90 GOTO 120
111 FOR N=B TO 28
112 PRINT AT A,N;" ▄▟"
114 NEXT N
115 NEXT M
120 PRINT AT 0,29;S
```



VARIABLES used by the program: S, your score; M, the number of attempts you have to find the snail; A&B, the X/Y position of the snail; X&Z, your guesses at the position of the snail; C&N, general loop counters.

Line 4 sets your initial score to zero.

Line 5 the start of the loop; the program returns to this point at the end of every attempt.

Line 9 prints the score at the top left of the screen.

Line 40 and 41 pick a random position for the snail, from 1 to 20 down, and from 0 to 26 across the screen.

Lines 42–44 print the snail moving across the screen; note the space in front of the snail—it prevents it leaving a trail.

Lines 46–56 input your guesses and print an * at the position.

Lines 60–62 find if you have missed the snail, by checking your position against that of the snail; if you have done so, GOTO the miss routine.

Lines 65–85 print that you have hit the snail, increase the score, and go back to line 5 for another attempt.

Line 90. After 10 attempts, GOTO the end of the program.

Lines 111–114 move the snail across the screen.

Line 115—go back to line 5 for another try.

Line 120—the end of the game; prints the score.

To save memory, two things can be done. First, the loop counter in lines 111 and 114 could be C and not N. That will prevent having two variables in memory when one will do. Second, lines 60 to 62 could be made into one line:

```
60 IF Z<>A OR Y>B+4 OR
     Y<B+1 THEN GOTO 91
```

as if any of the statements is correct the program jumps to the same point.

First plot your program then take your computer

In the first section of our complete programming course David Janda explains how to structure your programs correctly with the help of flowcharts

THE SINCLAIR RANGE micros are very much the plug-in-and-go type. No special setting-up is necessary and when there is something to set up, it is done easily. Sinclair Basic is also easy to use; with single-keyword entry and error reports you can be sure that you will not harm the machine, or yourself.

Sinclair computers also have the biggest range of software available for any home computer and it is possible to enjoy your machine without programming it. The point is that it is all very easy to use but for those who are about to start to try to program themselves, it is not.

The main reason is because the ZX-81 and the Spectrum are so easy initially — just plug in and go — but that leads to bad programming practice from the start — and bad habits die hard.

Real programming

To prove it, let me ask a series of questions. Do you suffer from lack of printer paper due to long programs which require only a short solution? Difficulty in trying to think of a name for yet another variable? The LIST twitch, where you have constantly to list different sections of the program to follow it because of the numerous GO-TOs? Or amnesia when your friend asks whether you wrote that load of old rubbish? If you do, or you are about to start writing your own programs, read on.

When writing a computer program, large or small, the time to start thinking about the program is not when you switch on the TV and the micro but at the beginning, when the idea for the program surfaces. In fact, many 'proper' programmers consider that period the real programming and the entering of code just a mundane task.

Ideas for programs arrive at the strangest times and places, not necessarily when you are sitting in front of your micro after tea. So it is a good idea always to have pencil and paper handy to jot down ideas. Don't worry about detail at that stage; just register the initial idea and expand it later.

After you have been struck by a brainstorm and are raring to proceed, think again, because there is still more to do. The next step is to expand the idea and to write it in more detail so that you have a good idea of the task.

To do that, one popular method is to write the idea in pseudo-code or sketch code as it is sometimes called. Pseudo-code is a structured way of writing a solution to a problem (an algorithm). The idea is to write your idea in different levels of complexity using Pascal-like words. For each segment or subroutine the words "begin" and "end" are used and to specify a condition "if" and "while" are used.

Figure 1. Pseudo-code sample.

```
BEGIN.
  Intro.
  Get-name.
  Set-level.
  Joystick.
END.
PROC Intro.
BEGIN
  Print title.
  Play some tune.
  Print game description.
END,
PROC Get-name.
BEGIN
  Prompt player for their name.
  WHILE response is nothing DO BEGIN
  Print name request.
  get name.
  END,
END,
PROC Set-level.
BEGIN
  Prompt for level.
  Wait for response.
  Clear the screen.
  Print the display.
END,
  PROC Joystick.
BEGIN
  Ask if joystick is to be used.
  IF no THEN print keys to be used.
END,
```

When writing pseudo-code, indent the text slightly so that you can see at a glance the "begins" and "ends" in a particular routine. Also, and most important, you should have a section of pseudo-code which calls the rest by a name. Write the code in English and do not use Basic keywords or suchlike.

Looking at the example of pseudo-code — figure one — you can see that the main command module is at the top and the lower level procedures below. Following it through, the command module has names of procedures in it which would be called. The instructions would be executed and control would then pass back to the next line in the command module.

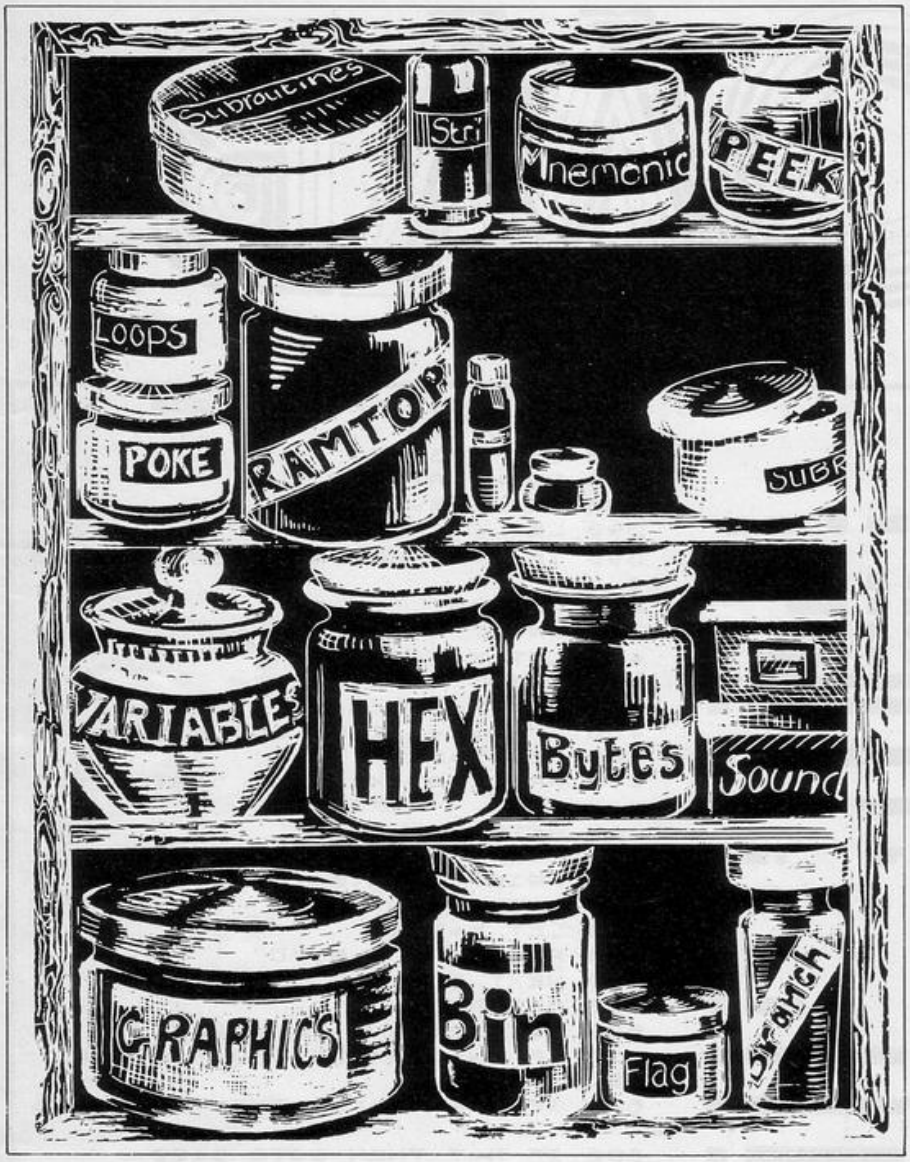
Use pseudo-code

If, while looking at the pseudo-code, you disagree with the order, you are then beginning to understand why they are used a good deal. They show the order very easily and at that stage it is possible to add or delete different procedures and to amend them, all on paper.

Do not put too much detail into a piece of pseudo-code. It is very good for giving an overview of the program but for a more detailed description of the logic of the program we should use flowcharts. They have been used for years and many think they are old-fashioned and not worth the trouble of writing. They have been around a long time but they can be an invaluable aid when following the logic of a program.

The time to use a flowchart is when you know what you want the program to do and have a good idea of how it will do it. Take the pseudo-code and try to draw a flowchart based on it and any other notes you have made; it is not difficult.

To draw a flowchart, a few basic symbols are required. Incidentally, to



draw a flowchart it is best to use a template designed for the job. They can be obtained from most good stationers and you can also look at advertisements for them.

The average flowchart uses only a few common symbols to represent different actions to be performed by the computer. Connecting lines join the symbols and arrows should be drawn along them to show the flow of control.

Two important points should be noted. First, every symbol must have only one connecting line going into it and one going out. The exception is the decision symbol — the diamond — which has one line going in and two out. That is because a test is being made and the result can yield one of two answers, true or false. Second, when drawing the flowchart, do not have an abundance of flowlines everywhere; use connectors, which are much neater.

Do not try to put too much detail into flowcharts or you will have a pile of paper. When drawing a flowchart, try to start from the top left of the page and work down and right. Any branching forward should be done from the right and backwards from the left.

As you can see from the example, flowcharts do not have to be used for programming and they are used in many areas of industry where planning in logic is required.

At that stage, you should have both the pseudo-code and a flowchart. Check them thoroughly twice for any errors in sequence or logic. If you feel the least doubtful or confused about a particular area, check it. Do not leave it and hope that all will be well when you program — it will not.

You must be itching to switch on and enter the program but do not do so yet. If your program requires graphics you should prepare a set of storylines.

To do that you will need either to buy or make your own graphic sheets on which you can draw the necessary shapes.

Spectrum owners should bear in mind that no two ink colours are allowed to cross each other.

For Spectrum owners again, any user-definable graphics should be first planned and the necessary bin or data numbers worked out. It is possible to obtain small UDG pads, which I have found a great help.

There are other things which should be planned before coding, such as working out how much memory will be used and so on. One of the most important things to be worked out is variable usage.

Variable usage

If you can plan ahead as to how many variables will be used, you can save a great deal of time and precious memory. Many people make up variables as they go along and that often leads them into difficulty.

Always use sensible names for variables, neither too long nor too short. Keep an eye on what you intend to use them for by making a table which lists the variable name, together with its function and the values you expect it to contain.

If you have subroutines which use variables nowhere else in the program, add a letter 'l' to the end of the variable to indicate that it is a local variable.

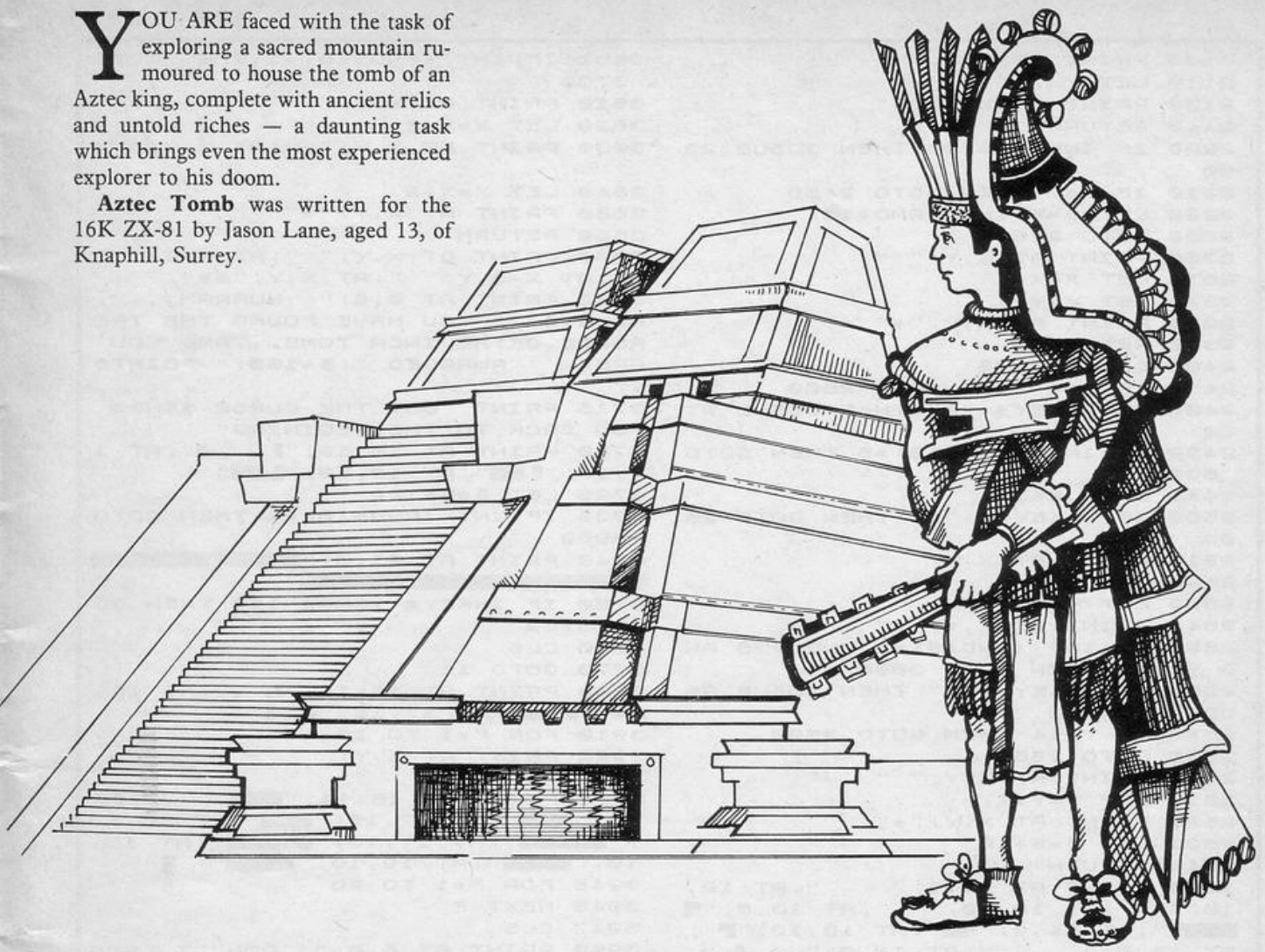
Do the same for variables which will be used through the program — global — and add a letter 'g' to the name. Better still, keep local variables particular to a subroutine by adding a number corresponding to a subroutine but remember that will take up more space. Finally, always start your program with REMs. That will allow you to know what your program does when you look at it six months later.

AZTEC TOMB

```
    1 LET H=500
    2 LET H$="ZX 81"
    5 GOTO 8000
   10 LET S=0
   11 CLS
   15 PRINT AT 3,0;"
■"
   20 PRINT "
   30 PRINT "
   40 PRINT "
   50 PRINT "
   60 PRINT "
   70 PRINT "
"
   80 PRINT "
■"
   90 PRINT "
■"
  100 PRINT "
■■■■"
  110 PRINT "
■■■■■"
  120 PRINT "
■■■■■■"
  130 PRINT "
■■■■■■■"
  140 PRINT "
■■■■■■■■"
  150 PRINT "
■■■■■■■■■"
  160 PRINT "
■■■■■■■■■■"
  170 PRINT "
■■■■■■■■■■■"
  180 PRINT "
■■■■■■■■■■■■"
  190 PRINT "
■■■■■■■■■■■■■"
  210 LET X=18
  220 LET Y=29
  230 LET A=8
  240 LET B=19
  250 PRINT AT A,B;"O"
  260 IF A=X AND B=Y THEN GOTO 50
00
  270 IF INKEY$="Q" THEN GOSUB 36
0
  280 IF INKEY$="P" THEN GOSUB 41
0
  290 IF X=8 THEN GOTO 600
  300 PRINT AT X,Y;"*"
  310 PRINT AT A,B;" "
  320 LET A=A+1
  330 LET B=B+1
  340 IF A=21 THEN GOTO 230
  350 GOTO 250
  360 LET S=S+10
  370 PRINT AT X,Y;" "
  380 LET X=X-1
  390 LET Y=Y-1
  395 IF A=X AND B=Y THEN GOTO 50
00
  400 RETURN
  410 PRINT AT X,Y;" "
  420 LET X=X-2
  430 PRINT AT X,Y;"*"
  440 LET X=X+2
  450 IF A=X-1 THEN GOSUB 500
  460 LET S=S-5
  470 PRINT AT X-2,Y;" ";AT X,Y;"
*"
  480 RETURN
  500 FOR F=1 TO 3
  510 PRINT AT A,B;" "
  520 LET A=A+1
  530 LET B=B+1
  540 PRINT AT A,B;"O"
  550 NEXT F
  560 RETURN
  600 LET S=S+INT (RND*200)
  610 IF INKEY$="P" AND X=8 THEN
GOSUB 700
  620 IF INKEY$="Q" THEN GOSUB 36
0
  630 IF X=7 THEN GOTO 5100
  640 LET S=S+2
  650 PRINT AT X,Y;"*"
  660 IF X=2 THEN GOTO 800
  670 GOTO 610
  700 PRINT AT X,Y;" "
  710 LET X=X-2
  720 PRINT AT X,Y;"*";AT X,Y;" "

  730 LET Y=Y-2
  740 PRINT AT X,Y;"*"
  750 RETURN
  800 LET S=S+100
  810 IF INKEY$="Q" THEN GOSUB 90
0
  820 IF INKEY$="P" AND Y>4 THEN
GOSUB 950
  830 IF Y=5 OR Y=7 OR Y=10 OR Y=
12 THEN GOTO 5200
  840 IF Y=3 THEN GOTO 1010
  850 PRINT AT X,Y;"*"
  860 GOTO 810
  900 PRINT AT X,Y;" "
  910 LET Y=Y-1
```

YOU ARE faced with the task of exploring a sacred mountain rumoured to house the tomb of an Aztec king, complete with ancient relics and untold riches — a daunting task which brings even the most experienced explorer to his doom.

Aztec Tomb was written for the 16K ZX-81 by Jason Lane, aged 13, of Knaphill, Surrey.



```
 920 PRINT AT X,Y;"*"
 930 RETURN
 950 PRINT AT X,Y;" "
 960 LET X=X-2
 970 LET Y=Y-2
 980 PRINT AT X,Y;"*";AT X,Y;" "

 990 LET X=X+2
1000 RETURN
1010 PRINT AT 12,3;" ";AT 13,3;"
 ";AT 14,3;" ";AT 12,1;"▐";AT 13
,2;"▐ ";AT 14,2;"▐"
1020 PRINT AT 12,1;" ";AT 13,2;"
 ";AT 14,2;" ";AT 12,0;" ▗";AT 13
,1;"▖";AT 14,2;"▖"
1030 PRINT AT 12,0;" ";AT 13,1;"
 ";AT 14,2;" ";AT 13,0;"▀▄";AT 1
4,2;"▀"
1040 PRINT AT 13,0;"  ";AT 14,2;
" ";AT 15,0;"▀▀▀"
1050 LET A=1
1060 IF INT (RND*10)=1 AND A=1 T
HEN GOSUB 1500
1070 IF A=0 AND INT (RND*10)=0 T
HEN GOTO 1010
1080 IF INKEY$="P" THEN GOTO 110
0
1090 GOTO 1060
1100 PRINT AT X,Y;" "
1110 LET X=X-2
1120 PRINT AT X,Y;"*";AT X,Y;" "

1130 LET Y=Y-2
1140 PRINT AT X,Y;"*"
1150 IF INT (RND*5)=0 THEN GOSUB
 1500
1160 FOR X=X TO 19
1170 IF A=1 AND X=14 THEN PRINT
AT X-1,Y;" ";AT X,Y;"*"
1175 IF A=1 AND X=14 THEN GOTO 2
000
1180 PRINT AT X-1,Y;" ";AT X,Y;"
*"
1190 NEXT X
1200 FOR F=1 TO 10
1210 PRINT AT X-1,Y;" ";AT X,Y;"
▒";AT X,Y;"*";AT X,Y;"+";AT X,Y;
"+"
1220 NEXT F
1230 CLS
1235 LET S=S-150
1240 PRINT AT 3,0;"  GOOD GREIF.
..";AT 5,0;"  WHO DO YOU THINK Y
OU ARE-      SUPERMAN?
             FANCY DOING A SWAN D
IVE OFF THE  TOP OF A CLIFF.
             WHAT SOME PEOPLE WIL
L DO FOR A   BIT OF INCA TREASURE
 I DON""T     KNOW..";AT 20,8;"YO
U SCORED ";S
1250 GOTO 6090
1500 PRINT AT 15,0;"    ";AT 13,0
;"▀▄";AT 14,2;"▀";AT 13,0;"  ";A
T 14,2;" ";AT 12,0;" ▗";AT 13,1;"
▖";AT 14,2;"▖";AT 12,0;" ";AT 13
,1;" ";AT 14,2;" ";AT 12,1;"▐";A
T 13,2;"▐ ";AT 14,2;" ▐";AT 12,1;"
  ▐";AT 13,2;" ▐ ";AT 14,2;" ▐"
1510 LET A=0
1520 RETURN
2000 LET S=S+300
2010 IF INKEY$="Q" THEN GOSUB 21
00
2020 IF Y=5 THEN GOTO 2200
2040 LET S=S-INT (RND*10)
2050 GOTO 2010
```

```
2100 PRINT AT X,Y;" "
2110 LET Y=Y+1
2130 PRINT AT X,Y;"*"
2140 RETURN
2200 IF INKEY$="Q" THEN GOSUB 23
00
2210 IF Y=7 THEN GOTO 2400
2220 LET S=S-INT (RND*10)
2230 GOTO 2200
2300 PRINT AT X,Y;" "
2310 LET X=X+1
2320 LET Y=Y+1
2330 PRINT AT X,Y;"*"
2340 RETURN
2400 LET S=S+50
2410 IF Y=9 THEN GOTO 2500
2420 IF INKEY$="Q" THEN GOSUB 21
00
2430 IF INT (RND*10)=5 THEN GOTO
 6000
2440 GOTO 2410
2500 IF INKEY$<>"Q" THEN GOTO 25
00
2510 PRINT AT X,Y;" "
2520 LET X=X-1
2530 LET Y=Y+1
2540 PRINT AT X,Y;"*"
2550 IF INT (RND*5)=0 AND Y>8 AN
D Y<=12 THEN GOTO 3000
2560 IF INKEY$="Q" THEN GOSUB 26
00
2570 IF Y=14 THEN GOTO 3500
2580 GOTO 2550
2600 PRINT AT X,Y;" "
2610 LET Y=Y+1
2620 PRINT AT X,Y;"*"
2630 LET S=S+10
2640 RETURN
3000 PRINT AT 11,9;"     ";AT 12,
10;"  ";AT 12,10;"  ";AT 13,8;"▜
▀▀▛ ";AT 14,9;"▀▀";AT 15,10;"▛";
AT 13,8;"      ";AT 14,9;"   ▟ ";
AT 15,10;" ▟▀▙▟▙"
3005 FOR F=1 TO 3
3006 PAUSE 2
3007 NEXT F
3010 FOR F=1 TO 50
3020 NEXT F
3030 CLS
3035 LET S=S-200
3040 PRINT AT 3,0;" WHOOPS...";A
T 5,0;"  WITH ALL THAT JUMPING A
BOUT   ABOVE YOU WEAKENED THE CE
ILING  AND IT COLLAPSED ON TOP O
F YOU.";AT 20,8;"YOU SCORED ";S
3050 GOTO 6090
3060 CLS
3500 LET S=S+100
3505 PRINT AT X-4,15;"$"
3510 LET X=X-1
3520 LET Y=Y+1
3530 PRINT AT X+1,Y-1;" ";AT X,Y
;"*"
3540 IF INKEY$="P" THEN GOSUB 36
00
3545 IF RND<.05 THEN GOTO 3700
3550 IF RND<.01 THEN GOTO 3570
3555 LET S=S-5
3560 GOTO 3540
3570 FOR F=1 TO 30
3580 NEXT F
3585 CLS
3590 PRINT AT 3,0;"  OH OH...";A
T 5,0;"  YOU JUST GOT BITTEN BY
A LARGEPOISONOUS KING COBRA.YOU
FORGOT TO BRING SOMEONE TO SUCK
OUT THEPOISON...IT""S A BIT LATE
 NOW.";AT 20,8;"YOU SCORED ";S-1
00;AT 21,5;"PRESS NEWLINE TO REP
LAY"
3595 GOTO 3050
3600 IF INT (RND*10)=1 THEN GOTO
 3700
3610 PRINT AT X,Y;" "
3620 LET X=X-2
3630 PRINT AT X,Y;"*";AT X,Y;" "
3640 LET X=X+2
3650 PRINT AT X,Y;"*"
3660 RETURN
3700 PRINT AT X,Y;" ";AT X-3,Y;"
*";AT X-3,Y;" ";AT X,Y;"*$"
3710 PRINT AT 0,0;"  HURRAH...";
AT 2,0;"  YOU HAVE FOUND THE TRE
ASURE OFTHE INCA TOMB...AND YOU
ARE     AWARDED ";S+100;" POINTS
."
3715 PRINT "BUT THE CURSE SENDS
YOU BACK TO THE BEGINING"
3720 PRINT AT 16,10;"▌   ▟";AT 1
7,10;"▌▒▒▒";AT 18,10;"▙▒▒▒"
3725 LET S=S+100
3730 IF INT (RND*10)=5 THEN GOTO
 3900
3740 PRINT AT 21,0;"     PRESS N
EWLINE TO START     "
3750 IF INKEY$<>CHR$ 118 THEN GO
TO 3750
3760 CLS
3770 GOTO 11
3900 PRINT AT 15,14;"▙ ▄";AT 16,
14;"▛ ▟";AT 17,15;"▙ ▌"
3910 FOR F=1 TO 10
3920 PRINT AT X,Y;" "
3930 NEXT F
3940 PRINT AT 15,14;"▀▀▀";AT 16,
14;"▀▀▀";AT 17,15;"▀▀▀";AT 16,10
;"▀▀▀▀▀";AT 17,10;"▀▀▀▀▀";AT 18,
10;"▀▀▀▀▀";AT 19,10;"▀▀▀▀▀"
3945 FOR F=1 TO 20
3946 NEXT F
3947 CLS
3950 PRINT AT 6,0;"  DON""T LOOK
 NOW BUT YOU HAVE   BEEN SWALLOW
ED UP INTO THE      GROUND-SO YO
U WON""T BE ABLE TO  SHOW EVERYO
NE AT HOME ALL THE   LOVELY TREA
SURE."
3960 PRINT AT 21,5;"PRESS NEWLIN
E TO REPLAY"
3970 GOTO 6090
5000 FOR F=1 TO 30
5010 NEXT F
5015 LET S=S-100
5020 CLS
5030 PRINT AT 3,0;"  OH DEAR..."
;AT 5,0;"  YOU JUST GOT FLATTENE
D BY A   WHACKING GREAT BOULDER.
..       NOT VERY ATHLETIC ARE Y
OU?";AT 20,8;"YOU SCORED ";S
5040 GOTO 6090
5100 FOR F=7 TO 20
5110 PRINT AT X,Y;" ";AT F,Y;"*"
;AT F-1,Y;" "
5120 NEXT F
5130 FOR F=1 TO 30
5135 PRINT AT 20,Y;"▒";AT 20,Y;"
+";AT 20,Y;"X";AT 20,Y;" "
5140 NEXT F
5150 CLS
5155 LET S=S-200
5160 PRINT AT 3,0;"  BLIMEY...";
AT 5,0;"  FANCY JUMPING DOWN A W
ELL     SHAFT JUST FOR A BIT OF
INCA    TREASURE.";AT 20,8;"YOU
SCORED ";S
5170 GOTO 6090
5200 FOR X=X TO 7
5210 PRINT AT X,Y;"*";AT X,Y;" "
5230 NEXT X
5240 FOR F=1 TO 20
```

```
5245 PRINT AT X,Y;" ";AT X,Y;"*"
;AT X,Y;"X";AT X,Y;"+"
5250 NEXT F
5260 CLS
5265 LET S=S-50
5270 PRINT AT 3,0;"  OOOOOH...";
AT 5,0;"  WHAT A TIME TO GO SWIM
MING... ESPECIALY IN ONE OF THE
MOATS   WITH SIDES THAT ARE TOO
STEEP TOCLIMB.";AT 20,8;"YOU SCO
RED ";S
5280 GOTO 6090
6000 PRINT AT 16,7;"   ";AT 16,9
;"▄▄";AT 17,7;"▄▄▀▀";AT 16,9;"▄▀";AT
 17,7;" ▄▀";AT 18,7;" ▀";AT 16,9;"
█";AT 17,8;" █";AT 18,7;"   █"
6010 FOR F=15 TO 20
6020 PRINT AT F,Y;"*";AT F-1,Y;"
 "
6030 NEXT F
6040 PRINT AT 20,Y;"▒";AT 20,Y;"
 "
6050 FOR F=1 TO 30
6060 NEXT F
6070 CLS
6080 PRINT AT 3,0;"  OH GAWD..."
;AT 5,0;"  THE OLD BRIDGE YOU CR
OSSED HADGONE A BIT ROTTEN OVER
THE YEARSAND SORT OF COLLAPSED..
.";AT 20,8;"YOU SCORED ";S
6090 IF S>H THEN GOSUB 9000
6091 PRINT AT 16,0;"TODAYS HIGH
SCORE IS ";H;"          ";AT 17,0;
" AND IS SCORED BY ";H$
6092 PRINT AT 21,0;"      PRESS NE
WLINE TO RE-PLAY      "
6096 IF INKEY$<>CHR$ 118 THEN GO
TO 6090
6100 CLS
6110 GOTO 10
7990 SAVE "INCA TOMB"
7991 RUN
8000 PRINT AT 0,8;"▒▒▒▒▒▒▒▒▒▒▒▒▒▒
▒▒▒▒                 ▒
 ▒                   ▒   INCA
 ▒                   ▒
 ▒"
8005 PRINT TAB 8;"▒
▒"
8006 PRINT TAB 8;"▒ TOMB
▒                    ▒
▒                    ▒
▒"
8010 PRINT TAB 8;"▒
▒                    ▒▒▒▒▒▒▒▒▒▒▒▒▒▒
▒"
8015 PRINT AT 19,0;"          DO YOU REQ
UIRE INSTRUCTIONS?
(Y OR N)        "
8020 IF INKEY$="Y" THEN GOTO 803
0
8025 IF INKEY$="N" THEN GOTO 10
8026 GOTO 8020
8030 CLS
8050 PRINT AT 0,0;"         ***IN
CA TOMB***          "
8060 PRINT AT 3,0;"  YOU ARE FAC
ED WITH THE ALMOST IMPOSSIBLE TA
SK OF EXPLORING A  SACRED MOUNTA
IN THAT IS RUMOUREDIN HOUSING TH
E TOMB OF AN INCA  KING."
8070 PRINT ,,"  IN THIS MOUNTAIN
 THE INCA KINGWAS BURIED WITH UN
TOLD RICHES INANCIENT RELICS,IT
IS THESE ALONETHAT BRING EVEN TH
E MOST          EXPERIANCED EXPLOR
ER TO HIS       DOOM."
8080 PRINT ,,"  BEWARE OF THE CU
RSE,AND THAT, IF NOT PAID ATTENT
ION TO COULD  SPELL YOUR DOOM."
8100 PRINT AT 21,0;"      PRESS NEW
LINE TO CONTINUE      "
8110 IF INKEY$<>CHR$ 118 THEN GO
TO 8110
8120 CLS
8130 PRINT AT 3,0;"  KEY ""P"" A
LLOWS YOU TO JUMP ANDKEY ""Q"" T
O WALK."
8140 FOR F=1 TO 20
8150 NEXT F
8160 PRINT AT 10,0;"GOOD LUCK"
8170 PRINT AT 21,0;"       PRESS N
EWLINE TO START      "
8180 IF INKEY$<>CHR$ 118 THEN GO
TO 8180
8190 CLS
8200 GOTO 10
9000 PRINT AT 16,0;"YOU HAVE GOT
 TODAYS HIGH SCORE  ENTER YOUR N
AME "
9010 INPUT H$
9020 IF H$="" THEN LET H$="SOME
IDIOT."
9030 LET H=S
9040 RETURN
```

YOU HAVE 200 seconds in which to find the invisible exit. There are 10 invisible mines dotted about the maze which you must avoid, so you will need to be careful. As the seconds tick away the maze grows, so take care not to get trapped.

Mystery Maze was written for the 16K Spectrum by Jason Crouch, aged 12, of Ashford, Kent.

MYSTERY MAZE

```
  1 GO SUB 3000
  2 BORDER 5
  5 PAPER 6
  7 BEEP .1,7: BEEP .1,8: BEEP
.1,9: BEEP .1,10: BEEP .1,9: BEE
P .1,7
 10 PRINT "**WOULD YOU LIKE INS
TRUCTIONS**"
 20 PRINT AT 10,10;"*(Y) OR (N)
*"
 30 IF INKEY$="y" THEN  BEEP .1
,-33: CLS : GO TO 60
 40 IF INKEY$="n" THEN  BEEP .1
,33: CLS : GO TO 100
 50 GO TO 30
 60 PRINT "YOU HAVE TO FIND THE
 INVISIBLE  EXIT IN A TIME UNDER
 200        SECONDS.THERE ARE TE
N INVISIBLE MINES IN THE MAZE SO
 BE         CAREFUL!!!. BEWARE,
THE MAZE IS GROWING SO DON'T GET
 BLOCKED    IN!!!"
 61 PRINT "KEYS."
 63 PRINT "Q=UP,A=DOWN,O=LEFT,P
=RIGHT"
 65 BEEP .1,7
 70 PRINT "Press any key to con
tinue"
 80 IF INKEY$<>"" THEN  GO TO 1
00
 90 GO TO 80
100 GO SUB 1900
1000 LET x=0: LET y=0: LET t=0
1001 LET q=x: LET w=y
1500 FOR a=1 TO 100
1510 PRINT  INK 4;AT INT (RND*20
),INT (RND*31);"(ig)"
1520 NEXT a
1530 FOR a=1 TO 11
1540 PRINT  INK 6;AT INT (RND*20
),INT (RND*31);"m"
1550 NEXT a
1555 FOR n=0 TO 2
1560 PRINT  INK 6;AT INT (RND*20
),INT (RND*31);"d"
1561 NEXT n
1562 FOR a=0 TO 200
1564 PRINT  INK 4;AT INT (RND*20
),INT (RND*31);"(ig)": LET t=t+
1
1566 IF t=200 THEN  GO TO 1720
1568 PRINT AT 21,8;"T  I  M  E
=  ";t
1570 LET x=x+(INKEY$="a")-(INKEY
$="q")
1580 LET y=y+(INKEY$="p")-(INKEY
$="o")
1590 LET x=x+(x<0)-(x>20)
1600 LET y=y+(y<0)-(y>31)
1601 IF SCREEN$ (x,y)="m" THEN
GO TO 1750
1602 IF SCREEN$ (x,y)="d" THEN
GO TO 1710
1603 IF SCREEN$ (x,y)="o" THEN
GO TO 1610
1604 GO TO 1800
1610 PRINT  INK 6;AT q,w;"o"
1620 PRINT  INK 3;AT x,y;"a"
1630 LET q=x: LET w=y
1635 NEXT a
1700 GO TO 1562
1710 CLS : PRINT "WELL DONE YOU
HAVE FOUND THE    EXIT IN ";t;"
SECONDS": BEEP 1.,-22: BEEP .1,-
22: GO TO 2500
1720 CLS : PRINT "YOU HAVE RUN O
UT OF TIME!!!": BEEP 2,-7: GO TO
 2500
1750 CLS : PRINT "YOU HAVE STEPP
ED ON A MINE AND  ARE DEAD": BEE
P 2,-7: GO TO 2500
1800 LET x=q: LET y=w: GO TO 162
0
1900 FOR n=0 TO 20
2000 PRINT  INK 6;AT n,0;"oooooo
oooooooooooooooooooooooo"
2010 NEXT n
2020 RETURN
2500 PRINT "DO YOU WANT TO TRY A
GAIN"
2510 PRINT "   (Y) OR (N)   "
2520 IF INKEY$="y" THEN  CLS : G
O TO 2
2530 IF INKEY$="n" THEN  STOP
2540 GO TO 2520
3000 FOR n=0 TO 7: READ l: POKE
USR "a"+n,l: NEXT n
3010 DATA 24,60,24,62,88,152,36,
102
3020 RETURN
```

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

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

Or rather its lack of one.

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

ZX81 KEYS FILESIXTY KEYS

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

Our new, improved push button keyboard changes all that.

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

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

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

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

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

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

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

Total £

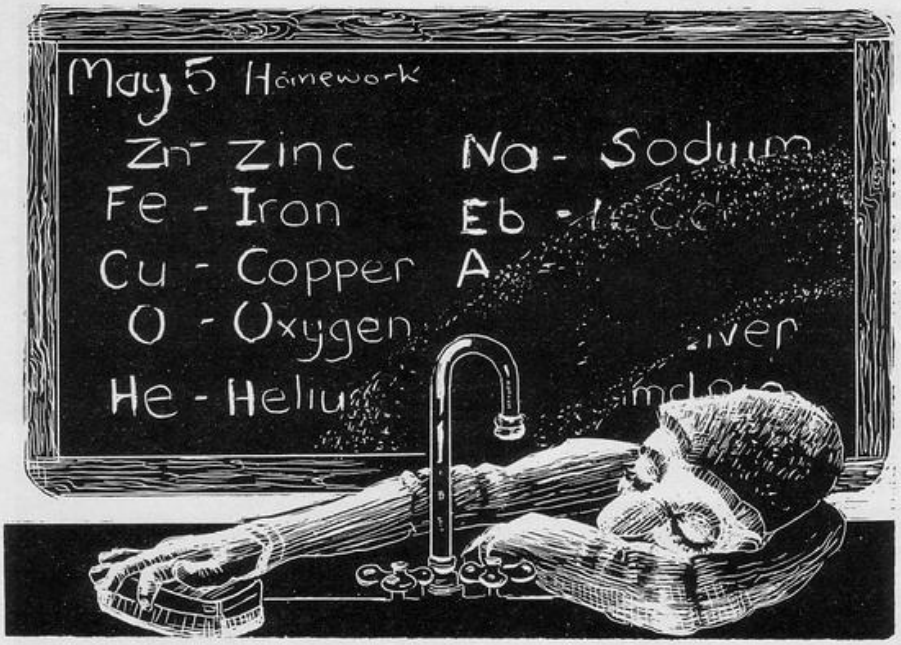
Name BLOCK CAPITALS

Address

B1

FILESIXTY

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

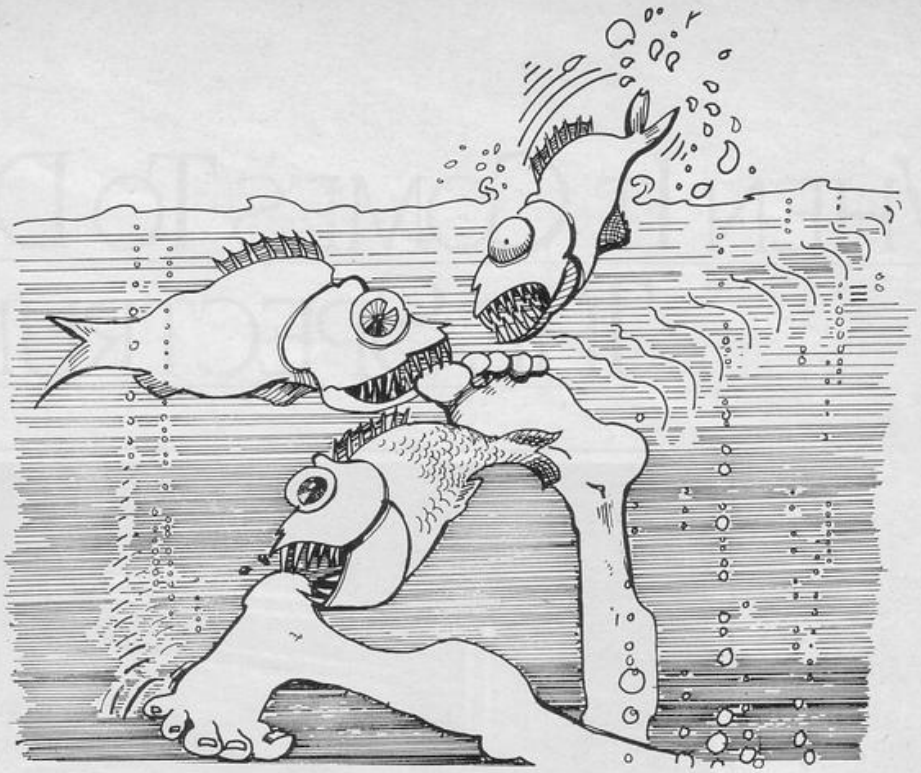


WHEN the program is RUN the **Periodic Table** is displayed on the screen. The table is bigger than the screen and therefore there is a scrolling facility which allows you to scroll left or right using keys 5 and 8. The abbreviations for the chemical elements are given and the author says that it is useful for students who, like him, are studying for chemistry O levels.

Written for the 16K ZX-81 by S Waller of Beeston, Nottingham.

PERIODIC TABLES

```
1000 CLS
1010 PRINT AT 0,7;"THE PERIODIC
TABLE";TAB 7;"
"
1020 PRINT ,,,," THE PERIODIC TA
BLE WILL BE DIS-",,"PLAYED. IT C
AN BE SCROLLED LEFT ",,"AND RIGH
T BY USING THE KEYS;     ",,"    5
 TO SCROLL LEFT",,,"    8 TO SCRO
LL RIGHT"
1030 PRINT ,,"    S TO STOP"
1040 PRINT ,,,,"PRESS ANY KEY WH
EN READY"
1050 IF INKEY$="" THEN GOTO 1050
1060 DIM A$(22,55)
1070 CLS
1080 PRINT AT 0,7;"THE PERIODIC
TABLE";TAB 7;"
"
1090 POKE 16418,0
1100 LET A$(1)="
1110 LET A$(2)="                H  HE"
1120 LET A$(3)="
1130 LET A$(4)=" 1A 2A
                          3B 4B 5B 6B
 7B"
1140 LET A$(5)="
"
1150 LET A$(6)=" LI BE
                          B  C  N  O
 F  NE "
1160 LET A$(7)=A$(5)
1170 LET A$(8)=" NA MG 3A 4A 5A
6A 7A =< 8A >= 1B 2B AL SI P  S
 CL AR "
1180 LET A$(9)="
"
1190 LET A$(10)=" K  CA SC TI V
 CR MN FE CO NI CU ZN GA GE AS S
E BR KR "
1200 LET A$(11)=A$(9)
1210 LET A$(12)=" RB SR Y  ZR NB
 MO TC RU RH PD AG CD IN SN SB T
E I  XE "
1220 LET A$(13)="
"
1230 LET A$(14)=" CS BA LA HF TA
 W  RE OS IR PT AU HG TI PB BI P
O AT RN "
1240 LET A$(15)="
"
1250 LET A$(16)="  FR RA AC  "
1260 LET A$(17)="
1270 LET A$(18)="
"
1280 LET A$(19)="                CE
PR ND PM SM EU GD TB DY HO ER TM
 YB LU "
1290 LET A$(20)=A$(18)
1300 LET A$(21)="                TH
PA U  NP PU AM CM BK CF ES FM MD
 NO LR "
1310 LET A$(22)="
"
1320 LET X=1
1330 LET Y=32
1340 PRINT AT 2,0;
1350 FOR N=1 TO 22
1360 PRINT A$(N)(X TO Y)
1370 NEXT N
1380 LET X$=INKEY$
1390 IF X$="" THEN GOTO 1380
1400 LET X=X+(X$="5")-(X$="8")
1410 LET Y=Y+(X$="5")-(X$="8")
1420 IF X$="S" THEN GOTO 1480
1430 IF X<=0 THEN LET Y=Y+1
1440 IF X<=0 THEN LET X=X+1
1450 IF Y=56 THEN LET X=X-1
1460 IF Y=56 THEN LET Y=Y-1
1470 GOTO 1340
1480 POKE 16418,2
1490 STOP
```



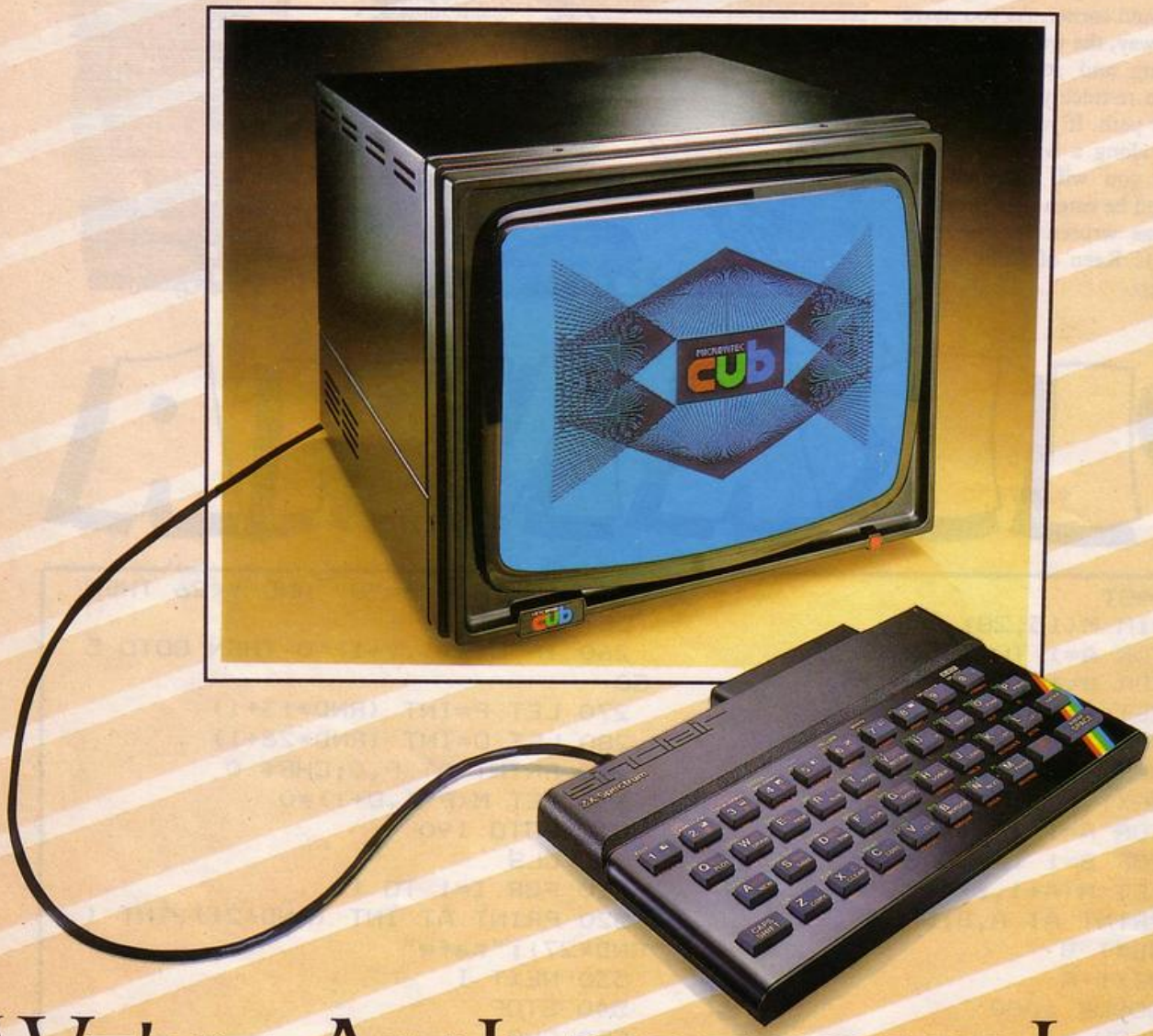
YOU ARE the "*" stuck at the top left-hand corner of the grid and the object is for you to work your way round the grid to reach the bottom right-hand corner. As you move along the walkway, the walls are continually crumbling and sometimes that compels you to re-trace your steps and choose another path. If you step off the wall or move along a walkway which has crumbled you will fall into the water below and be eaten by a piranha.

Piranha was written for the 16K ZX-81 by W C Keen of Cubbington, Leamington Spa.

PIRANHA

```
  10 FAST
  20 DIM M(15,28)
  30 FOR A=1 TO 13 STEP 3
  40 FOR B=1 TO 26
  50 LET M(A+1,B+1)=1
  60 PRINT AT A,B;CHR$ 128
  70 NEXT B
  80 NEXT A
  90 FOR A=1 TO 13
 100 FOR B=1 TO 26 STEP 5
 110 LET M(A+1,B+1)=1
 120 PRINT AT A,B;CHR$ 128
 130 NEXT B
 140 NEXT A
 150 GOSUB 1000
 160 SLOW
 170 LET X=1
 180 LET Y=1
 190 PRINT AT X,Y;CHR$ 23;AT X,Y
;CHR$ 0;AT 17,9;CHR$ 23;AT 17,9;
CHR$ 0
 200 IF X=13 AND Y=26 THEN GOTO
 200 IF X=13 AND Y=26 THEN GOTO
500
 210 IF INKEY$="" THEN GOTO 190
 220 IF INKEY$="5" AND Y>1 THEN
LET Y=Y-1
 230 IF INKEY$="6" AND X<13 THEN
 LET X=X+1
 240 IF INKEY$="7" AND X>1 THEN
LET X=X-1
 250 IF INKEY$="8" AND Y<26 THEN
 LET Y=Y+1
 260 IF M(X+1,Y+1)=0 THEN GOTO 5
50
 270 LET P=INT (RND*13+1)
 280 LET Q=INT (RND*26+1)
 290 PRINT AT P,Q;CHR$ 0
 300 LET M(P+1,Q+1)=0
 310 GOTO 190
 500 CLS
 510 FOR I=1 TO 10
 520 PRINT AT INT (RND*21),INT (
RND*27);"safe"
 530 NEXT I
 540 STOP
 550 CLS
 560 FOR I=1 TO 10
 570 PRINT AT INT (RND*21),INT (
RND*27);"help"
 580 NEXT I
 590 STOP
1000 PRINT AT 15,12;"piranha"
1010 PRINT AT 17,0;"MOVE THE   T
O THE BOTTOM RIGHT";AT 18,0;"COR
NER OF THE GRID USING KEYS 5,";A
T 19,0;"6,7 AND 8 WITHOUT STEPPI
G OFF";AT 20,0;"THE CRUMBLING WA
LKWAYS - IF YOU";AT 21,0;"DO, TH
E PIRANHAS WILL GET YOU."
1020 RETURN
```

WHEN IT COMES TO DISPLAYING THE SPECTRUM...



WE'VE AN IMPRESSIVE LEAD

Surprisingly enough, there's only one high performance BEAB approved colour monitor on the market with an input designed to accept the signal from the Sinclair Spectrum direct.

This same monitor also features a second input to receive T.T.L. signals for use with other micro computers including the BBC B.

This impressive lead over the competition in design specification is more than matched by the brilliance of the colour display, thanks to a standard resolution screen 585 pixels high by 452 wide, and a bandwidth of 18 MHz.

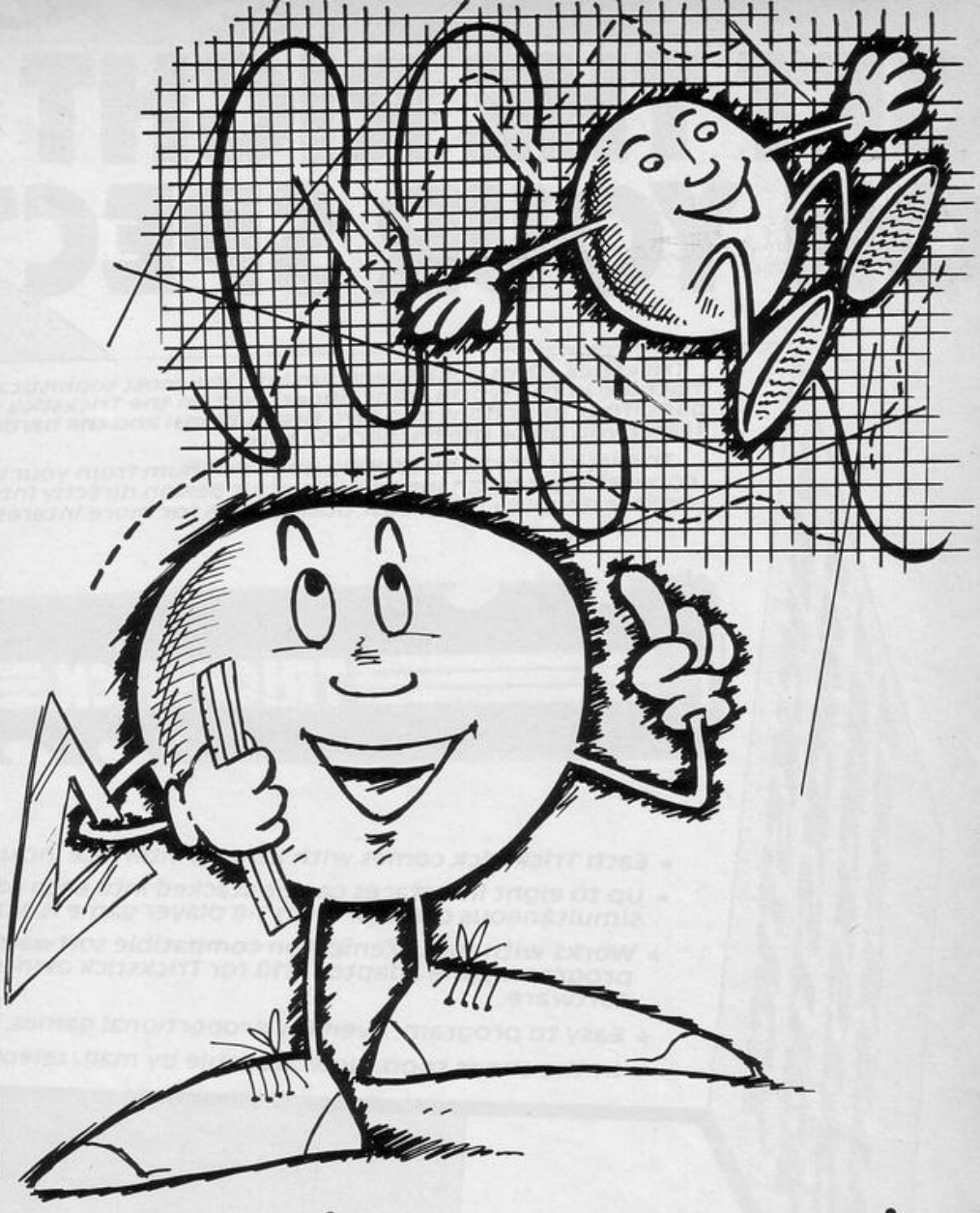
Needless to say, this gives colour reproduction far in excess of that available from an ordinary television.

And the monitor in question? **– The 1431/MZ from the MICROVITEC range of CUB colour displays.**

Call at your local dealer or contact us now and we'll rush you full information.

MICROVITEC cub COLOUR DISPLAYS

Microvitec Ltd., Futures Way, Bolling Road, Bradford BD4 7TU Tel: (0274) 390011 Telex: 517717



MARTIN LANGFORD of Handsworth, Birmingham, designed **Differentiation** to help him with his maths O level. Written for the 16K Spectrum, it will work out the value of dy/dx for any function entered and the results obtained can then be used to work out the gradient at any point.

```
  2 POKE 23609,25
  3 CLS
  4 PRINT "IF YOU JUST WANT A G
RAPH OF"'"THE FUNCTION,THEN PRIN
T "; BRIGHT 1;"0"'' BRIGHT 0;"IF
 HOWEVER, YOU ALSO WANT "'"TO DI
FFERENTIATE THE FUNCTION"'"THEN
PRINT "; BRIGHT 1;"1"
  5 INPUT d
  6 IF d=0 THEN  CLS : GO TO 30
10
  7 CLS
  8 IF d<>1 THEN  GO TO 1
  9 PRINT TAB 9; BRIGHT 1;"DIFF
ERENTIATION"
 10 PRINT '''''"NO.OF TERMS IN T
HE FUNCTION:": INPUT x
 12 DIM s(x): DIM i(x): DIM p(x
): DIM a$(x)
 15 FOR n=1 TO x
 20 CLS
 25 PRINT TAB 11; BRIGHT 1;x;"
TERMS": PRINT '
```

DIFFERENTIATION

```
 30 PRINT  INVERSE 1; BRIGHT 1;
"TERM "; FLASH 1;n
 40 PRINT '''"INTEGER OF THE TER
M :": INPUT i(n):
 50 PRINT '"  POWER OF THE TERM
 :": INPUT p(n)
 52 IF n=x THEN  GO TO 1000
 53 PRINT '"SIGN AFTER THE TERM
 :": PRINT  BRIGHT 1;"0 FOR ~-~,
1 FOR ~+~": INPUT s(n)
 55 IF s(n)>1 OR s(n)<0 THEN  G
O TO 53
 60 NEXT n
1000 CLS : PRINT TAB 12; BRIGHT
1;"f(x)": PRINT ; BRIGHT 1;'''"f
(x)"; BRIGHT 0;"  = ";
1010 FOR n=1 TO x
1012 PRINT  BRIGHT 1;i(n);
1015 IF p(n)=0 THEN  GO TO 1025
1020 PRINT  BRIGHT 1;"x";
1022 IF p(n)=1 THEN  GO TO 1025
1024 PRINT  BRIGHT 1;"^";p(n);
1025 IF n=x THEN  GO TO 2000
1030 IF s(n)=0 THEN  PRINT "-";
1035 IF s(n)=1 THEN  PRINT "+";
1040 NEXT n
2000 PRINT '''"WHEN f(x)  = Ax↑n
"'"     dy/dx = Anx↑(n-1)"
2010 PRINT AT 10,0; BRIGHT 1;'"d
y/dx"; BRIGHT 0;" = ";
2020 FOR n=1 TO x
2030  IF p(n)=0 THEN  GO TO 2130
2040 PRINT  BRIGHT 1;i(n)*p(n);
2050 IF p(n)-1=0 THEN  GO TO 213
0
2060 PRINT  BRIGHT 1;"x";
2070 IF p(n)-1=1 THEN  GO TO 213
0
2130 IF n=x THEN  GO TO 2200
2140 IF p(n+1)=0 THEN  LET s(n)=
3
2150 IF s(n)=0 THEN  PRINT "-";
2160 IF s(n)=1 THEN  PRINT "+";
2170 IF s(n)=3 THEN  PRINT " ";
2180 NEXT n
2190 PAUSE 100
2200 PRINT '''"DO YOU WANT TO HA
VE A GRAPH OF  THIS FUNCTION ?"
2210 PAUSE 0
2220 IF INKEY$="n" OR INKEY$="N"
 THEN  GO TO 2
3000 PAUSE 100: CLS
3010 PRINT "PLEASE TYPE IN THE F
UNCTION."'"N.B x↑2 SHOULD BE PRI
NTED AS x*x "
3020 INPUT b$
3030 PRINT '"THIS PROGRAM WILL P
LOT THE GRAPH"'"FROM A -VE VALUE
 OF x TO THE"'"SAME +VE VALUE OF
 x."
3040 PRINT '"PLEASE INPUT THIS V
ALUE OF x AS A +VE NUMBER."' BRI
GHT 1;"A VALUE LESS THAN 100 GIV
ES THE BEST RESULTS !!!"
3050 INPUT n
3060 CLS
3070 PLOT 0,87: DRAW 255,0
3075 PRINT AT 11,0;-n
3080 PLOT 127,0: DRAW 0,175
3085 PRINT AT 11,30;n
3090 LET t=0
3100 FOR f=0 TO 255
3110 LET x=(f-128)*n/128: LET y=
VAL b$
3120 IF ABS y>87 THEN  LET t=0:
GO TO 3150
3130 IF NOT t THEN  PLOT f,y+88:
 LET t=1: GO TO 3150
3140 DRAW 1,y-OLD y
3150 LET OLD y=INT (y+.5)
3160 NEXT f
3170 PRINT AT 0,17; BRIGHT 1;"y=
";b$
3180 PRINT AT 21,5;"OK. ANY KEY
TO RUN AGAIN"
3190 PAUSE 0
3200 GO TO 2
```

GET THE RIGHT ANGLE ON YOUR SPECTRUM

Trickstick turns your Spectrum into the most sophisticated games machine in the world. Your fingers rest on the Trickstick's six sensitive pads (four directions and two fire buttons) and the harder you press the faster you go or the harder you turn.

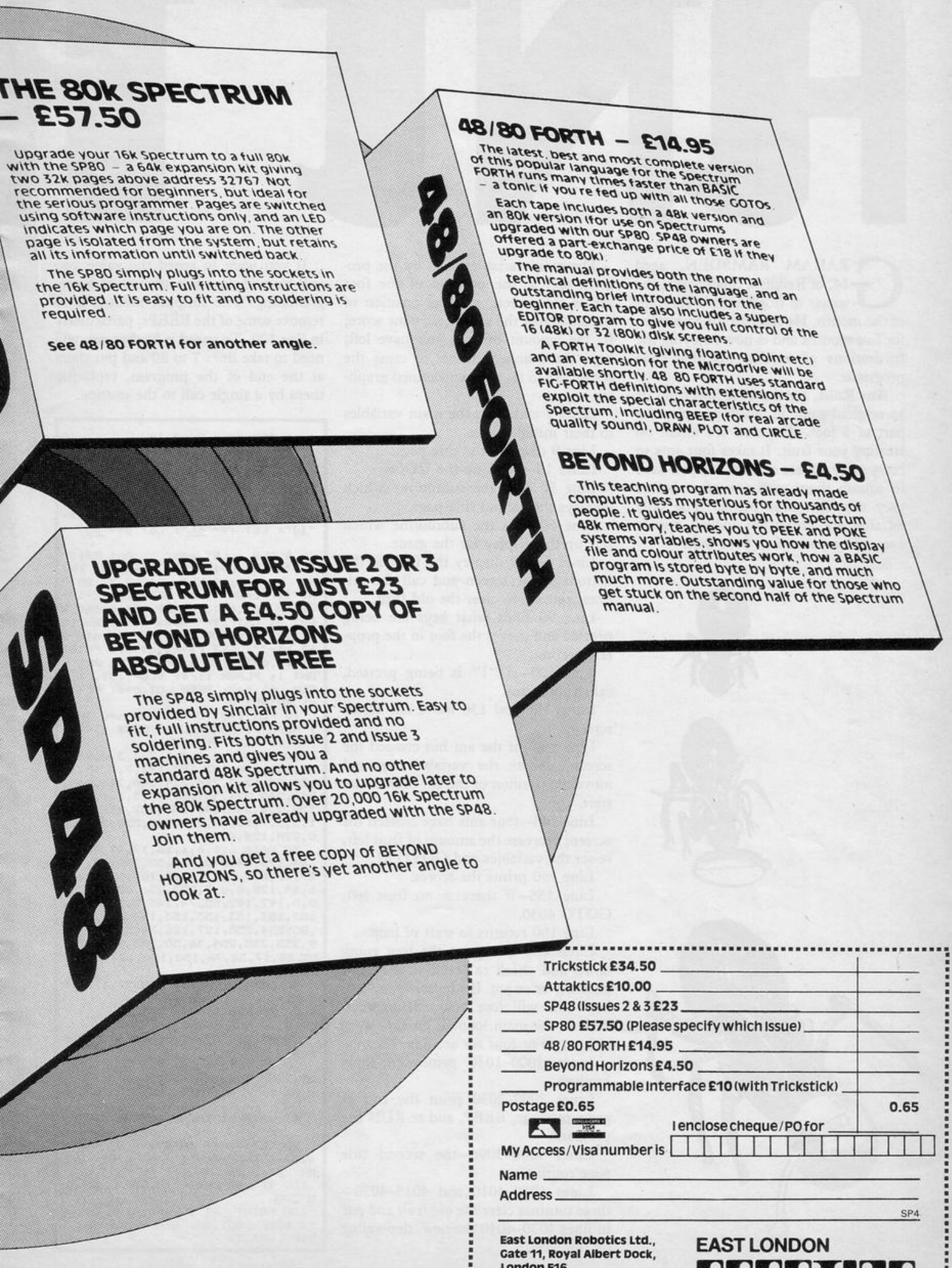
Trickstick works by picking up mains hum from your body and converting it by an ingenious circuit design directly into digital input. Proportionality gives vast possibilities for more interesting games.

- Each Trickstick comes with its own interface included in the price.
- Up to eight interfaces can be stacked into each other for 1-8 simultaneous players. (Own 1-8 player game is Attaktics at £10).
- Works with most Kempston compatible software, and with our new programmable adaptor (£10 for Trickstick owners) it works with ANY software.
- Easy to program, even for proportional games.
- In the shops soon. Now available by mail / telephone order at £34.50.

TRICKSTICK TRICKSTICK TRICKSTICK TRICKSTICK

SP80

TRICKSTICK - The revolution that Runs Rings round ordinary joysticks


THE 80k SPECTRUM
– £57.50
Upgrade your 16k Spectrum to a full 80k with the SP80 – a 64k expansion kit giving two 32k pages above address 32767. Not recommended for beginners, but ideal for the serious programmer. Pages are switched using software instructions only, and an LED indicates which page you are on. The other page is isolated from the system, but retains all its information until switched back.
The SP80 simply plugs into the sockets in the 16k Spectrum. Full fitting instructions are provided. It is easy to fit and no soldering is required.
See 48/80 FORTH for another angle.
48/80 FORTH
48/80 FORTH – £14.95
The latest, best and most complete version of this popular language for the Spectrum FORTH runs many times faster than BASIC – a tonic if you're fed up with all those GOTOs.
Each tape includes both a 48k version and an 80k version (for use on Spectrums upgraded with our SP80. SP48 owners are offered a part-exchange price of £18 if they upgrade to 80k).
The manual provides both the normal technical definitions of the language, and an outstanding brief introduction for the beginner. Each tape also includes a superb EDITOR program to give you full control of the 16 (48k) or 32 (80k) disk screens.
A FORTH Toolkit (giving floating point etc) and an extension for the Microdrive will be available shortly. 48 80 FORTH uses standard FIG-FORTH definitions with extensions to exploit the special characteristics of the Spectrum, including BEEP (for real arcade quality sound), DRAW, PLOT and CIRCLE.
BEYOND HORIZONS – £4.50
This teaching program has already made computing less mysterious for thousands of people. It guides you through the Spectrum 48k memory, teaches you to PEEK and POKE systems variables, shows you how the display file and colour attributes work, how a BASIC program is stored byte by byte, and much much more. Outstanding value for those who get stuck on the second half of the Spectrum manual.
SP48
UPGRADE YOUR ISSUE 2 OR 3 SPECTRUM FOR JUST £23 AND GET A £4.50 COPY OF BEYOND HORIZONS ABSOLUTELY FREE
The SP48 simply plugs into the sockets provided by Sinclair in your Spectrum. Easy to fit, full instructions provided and no soldering. Fits both Issue 2 and Issue 3 machines and gives you a standard 48k Spectrum. And no other expansion kit allows you to upgrade later to the 80k Spectrum. Over 20,000 16k Spectrum owners have already upgraded with the SP48. Join them.
And you get a free copy of BEYOND HORIZONS, so there's yet another angle to look at.
____ Trickstick £34.50 ____
____ Attaktics £10.00 ____
____ SP48 (Issues 2 & 3 £23 ____
____ SP80 £57.50 (Please specify which issue) ____
____ 48/80 FORTH £14.95 ____
____ Beyond Horizons £4.50 ____
____ Programmable Interface £10 (with Trickstick) ____
Postage £0.65 0.65
I enclose cheque/PO for ____
My Access/Visa number is
Name ____
Address ____
SP4
East London Robotics Ltd.,
Gate 11, Royal Albert Dock,
London E16
24 Hour Access and Visa
ordering 01-474 4430
EAST LONDON
ROBOTICS

ANT R

GRAHAM RAMSDEN, aged 14, of Reddish, Stockport is the writer of this month's program of the month. He has had his Spectrum for five months and is now enjoying the frustrations of writing machine code programs.

Ant Raid, for the 16K Spectrum, is an original game in which you play the part of a foot. The ants are intent on stealing your fruit. It takes four ants to carry away a piece of fruit and you have to squash them with your foot before they sabotage your picnic. The only hazards are butterflies, which appear every time you stamp your foot.

The main variables used by the program are: a, the position of the foot across the screen; ant, the position of the ant across the screen; sc, your score; fr, the amount of fruit you have left; bop, the number of ants to cross the screen; a$ to f$, the user-defined graphics.

Lines 7 and 8 set the main variables to their initial values.

Line 9 displays the title page.

Lines 10–40 set up the UDGs.

Line 50 calls the subroutine which displays the second title page.

Line 60 calls the subroutine which sets up the display for the game.

Lines 80–82 display the fruit at the bottom of the screen and call the relevant routine to clear the old fruit.

Line 90 finds what keys are being pressed and moves the foot in the proper direction.

Line 100—if "1" is being pressed, calls subroutine.

Lines 120 and 130 move ant across screen.

Line 140—if the ant has crossed the screen, update the variable bop and move the position of the ant back to the start.

Line 145—four ants have crossed the screen; decrease the amount of fruit left, re-set the variables and GOTO 81.

Line 150 prints the scores.

Line 155—if there is no fruit left, GOTO 4030.

Line 160 returns to start of loop.

Lines 200–220 print the foot going down and check to see if it has hit a butterfly or an ant. If a butterfly, update bop—this will lose you a fruit when back in the main loop. If an ant, score either two or four for accuracy.

Lines 1000–1030 print the game heading.

Lines 2000–2030 print the end of game message, BEEP, and re-RUN the program.

Lines 3000–3096—the second title page routine.

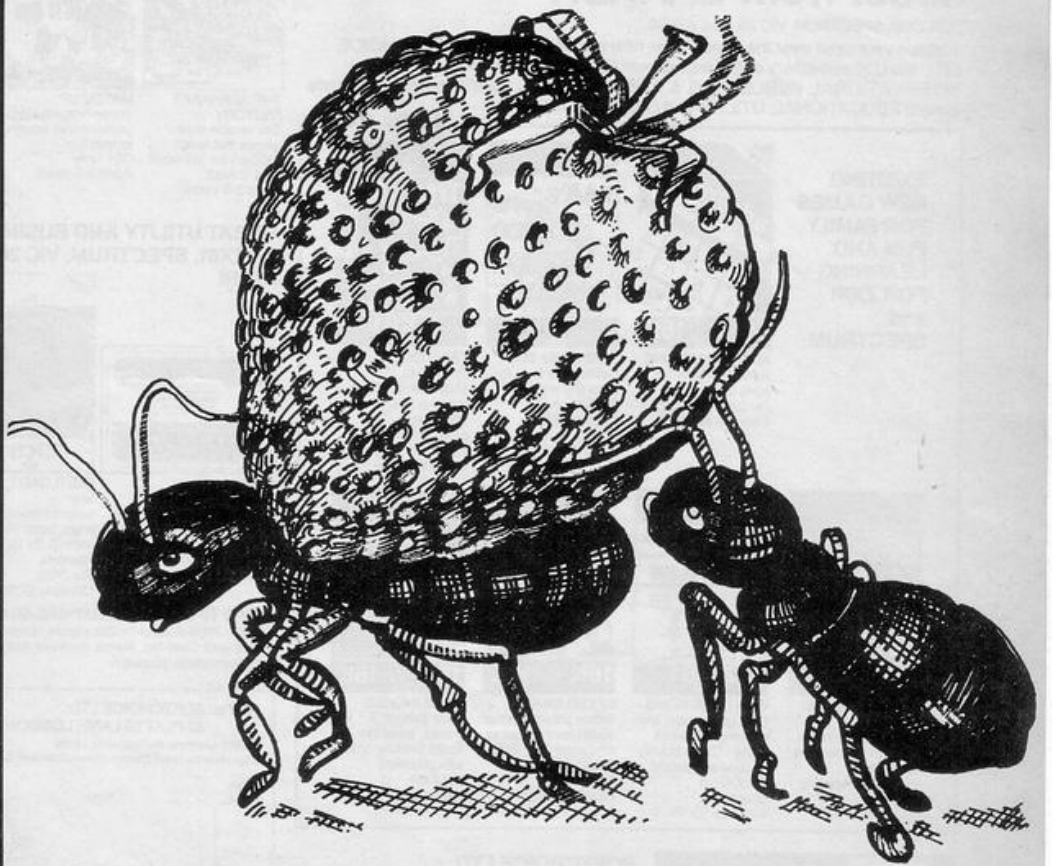
Lines 4000–4010 and 4015–4020—these routines clear the old fruit and put in lines 4030–4040 the new, depending on the level.

If you want to speed the game you will have to do a fair amount of reprogramming. The simplest method is to remove some of the BEEPs, particularly in line 120. To speed it further you will need to take lines 7 to 80 and put them at the end of the program, replacing them by a single call to the routine.

```
   1 REM "Ant Raid !"
   5 REM AB EF IJ M  O RS
   6 REM CD GH KL N PQ
   7 LET a=10: LET ant=0: LET sc
=0: LET fr=3: LET bop=0
   8 LET a$="AB": LET b$="CD": L
ET c$="EF": LET d$="GH": LET e$=
"IJ": LET f$="KL": LET g$="RS"

   9 CLS : LET m$="    Ant Raid
   ": FOR q=19 TO 1 STEP -2: PRI
NT  AT q,8; INK 0; PAPER 7; BRIG
HT 1; FLASH 1;m$: BEEP .01,q+10:
 BEEP .01,q+13: BEEP .01,q+16: N
EXT q: LET q$=" Beware The Butte
rfly!!! ": FOR c=1 TO  LEN q$: L
ET r$="": LET r$=r$+q$(c): PRINT
AT 10,c+2; INK 6; PAPER 2; BRI
'GHT 1; FLASH 1;r$: BEEP .01,c: B
EEP .01,c+3: BEEP .01,c+6: NEXT
c: BRIGHT 0
  10 FOR f=0 TO 18: FOR n=0 TO 7
: READ x: POKE  USR  CHR$ (144+f
)+n,x: NEXT n: NEXT f
  20 DATA 0,0,0,0,1,3,3,3,0,96,1
44,128,128,192,192,192,7,7,15,31
,29,24,13,7,224,224,240,248,248,
248,240,224,30,15,7,3,3,1,1,1,0,
128,224,240,248,252,252,252,1,1,
1,3,3,7,15,30,252,252,252,248,24
0,224,128,0
  30 DATA 6,1,6,1,15,17,44,45,32
,64,176,64,240,136,52,180,49,16,
27,11,8,7,3,1,140,8,104,112,16,9
6,64,128,0,0,3,227,236,82,137,0,
0,0,192,199,55,74,145,0,153,153,
153,153,153,153,153,153,0,1,3,43
,85,234,255,127,126,36,36,194,19
9,255,255,254,36,50,105,125,62,
53,25,17,36,76,150,190,124,248,
25 ,136
  40 DATA 8,92,145,238,77,172,15
2,136
  50 GO SUB 3000
  60 GO SUB 1000
  70 PRINT  AT 21,0; INK 4;"(32*
ig8)"
  80 IF fr=3 THEN  PRINT  AT 19,
29; INK 4;a$; AT 20,29;b$
  81 IF fr=2 THEN  GO SUB 4000

  82 IF fr=1 THEN  GO SUB 4015

  90 LET a=a+( INKEY$ ="O" AND a
<26)-( INKEY$ ="9" AND a>0): PRI
NT  AT 2,a; INK 1;" PQ "
 100 IF  INKEY$ ="1" THEN  GO SU
B 200
 120 PRINT  AT 20,ant; INK 0;" M
": BEEP .001,50: BEEP .001,40: B
EEP .001,30
```

RAID

```
 130 LET ant=ant+1
 140 IF ant=28 THEN  LET bop=bop
+1: LET ant=0: PRINT ; AT 20,31;
 INK 0;"N"; AT 20,28;" "
 145 IF bop=4 THEN  LET fr=fr-1:
 BEEP .25,30: BEEP .75,0: LET bo
p=0: PRINT  AT 20,ant;" ": LET a
nt=0: PRINT  AT 20,31;" ": FOR p
=2 TO 16: PRINT  AT p,0; INK 0;"
                                "
: BEEP .01,p+10: NEXT p: NEXT n:
 GO TO 81
 150 INK 1: PRINT  AT 0,8;sc: PR
INT  AT 0,29;fr
 155 IF fr=0 THEN  GO TO 4030
 160 GO TO 90
 200 FOR f=2 TO 14: PRINT  AT f+
1,a+1; INK 1;"PQ"; AT f,a+1;" O"
: BEEP .001,f+20: BEEP .001,f+22
: BEEP .001,f+24: NEXT f: IF  AT
TR (f+1,a+1)=43 OR  ATTR (f+1,a+
2)=43 THEN  LET bop=4: IF bop=4
THEN  GO TO 145
 201 FOR z=15 TO 18: PRINT  AT z
+1,a+1; INK 1;"PQ"; AT z,a+1;" O
": BEEP .001,z+20: BEEP .001,z+2
2: BEEP .001,z+24: NEXT z
 205 IF z+1=20 AND a+1=ant THEN
 LET sc=sc+2: PRINT  AT 20,ant;
INK 0;"v"; AT 20,ant; OVER 1;"x"
: FOR i=0 TO 4: BEEP .01,55: BEE
P .01,53: BEEP .01,51: NEXT i: L
ET ant=0
 206 IF z+1=20 AND a+2=ant THEN
 LET sc=sc+2: PRINT  AT 20,ant;
INK 0;"x"; AT 20,ant; OVER 1;"v"
: FOR i=0 TO 4: BEEP .01,55: BEE
P .01,53: BEEP .01,51: NEXT i: L
ET ant=0
 210 FOR f=20 TO 3 STEP -1: PRIN
T  AT f,a+1;"  "; AT f-1,a+1; IN
K 1;"PQ": BEEP .001,f+20: BEEP .
001,f+22: BEEP .001,f+24: NEXT f

 211 PRINT  AT 16, INT ( RND *10
)+2;"  "
 215 PRINT  AT 16,a+1; INK 3;g$

 220 RETURN
1000 BORDER 5: PAPER 5: INK 5: C
LS
1010 PRINT  INK 1;"N Score=";sc;
" (g6:ig8)ANT RAID(ig8:g6) Fruit
=";fr;" M"
1030 FLASH 0: RETURN
2000 PRINT  AT 10,7; INK 3; FLAS
H 1; PAPER 7;" Picnic Abandoned
"
2010 FOR n=50 TO 0 STEP -1: BEEP
 .1,n: BEEP .1,n+2: BEEP .1,n+4:
 NEXT n
2020 FOR v=50 TO 30 STEP -1: BEE
P .001,v+6: BEEP .001,v+3: BEEP
.001,v: NEXT v
2030 RUN
3000 PAPER 4: INK 0: CLS
3010 PRINT " IJ N    A N T  R A
I D    M IJ "
3020 PRINT " KL  RS   by G.Ramsd
en   RS  KL "
3040 PRINT "  RSRSRSRSRSRSRSRSRS
RSRSRSRSRS  "
3050 PRINT  INK 7;";"    You wer
e having a lovely      picnic...
until the ants came."
3060 PRINT ; INK 7;"   They wil
l try to steal your   fruit,it t
akes four ants to     steal one
of your three fruits."
3070 PRINT ; INK 7;"   You must
 stamp on the little  perisher o
r your picnic will be ruined"
3075 PRINT ' INK 7;"     ~9~...l
eft";'';"     ~0~...right";'';"
    ~1~...stamp"
3076 INK 7: PLOT 165,16: DRAW 0,
40: DRAW 0,-20,-4: DRAW 53,-20:
DRAW -5,40: DRAW -5,-20: DRAW -5
,20: DRAW -5,-40: DRAW -8,40: DR
AW -8,-40
3080 FOR g=0 TO 5: FOR l=0 TO 7:
 BEEP .1,l+40: BORDER l
3081 IF  INKEY$  <> "" THEN  RET
URN
3082 NEXT l
3085 FOR k=7 TO 0 STEP -1: BEEP
.1,k+40: BORDER k
3090 IF  INKEY$  <> "" THEN  RET
URN
3095 NEXT k: NEXT g
3096 CLS : RETURN
4000 FOR x=28 TO 1 STEP -1: PRIN
T  AT 18,x; INK 4;"AB "; AT 19,x
;"CD "; AT 20,x-1; INK 0;"N N ":
 BEEP .01,x: BEEP .01,x-2: BEEP
.01,x-4: NEXT x: PRINT  AT 18,0;
"   "; AT 19,0;"   "
4001 PRINT  AT 19,29; INK 6;c$;
AT 20,29;d$
4002 LET fr=2
4010 RETURN
4015 FOR x=28 TO 1 STEP -1: PRIN
T  AT 18,x; INK 6;"EF "; AT 19,x
;"GH "; AT 20,x-1; INK 0;"N N ":
 BEEP .01,x: BEEP .01,x-2: BEEP
.01,x-4: NEXT x: PRINT  AT 18,0;
"   "; AT 19,0;"   "
4016 PRINT  AT 19,29; INK 2;e$;
AT 20,29;f$
4020 RETURN
4030 FOR x=28 TO 1 STEP -1: PRIN
T  AT 18,x; INK 2;"IJ "; AT 19,x
;"KL "; AT 20,x-1; INK 0;"N N ":
 BEEP .01,x: BEEP .01,x-2: BEEP
.01,x-4: NEXT x: PRINT  AT 18,0;
"   "; AT 19,0;"   "
4040 GO TO 2000
```



MACHINE CODE PROGRAMMERS

There's a price on your head!

And Marjacq can get it for you.

Marjacq is an agency representing writers in the world of books, film, TV, video, radio, cable — and now computers. We know how to get you the rewards you deserve and they are big!

If you can do Z80, 6502, or 68000 machine coding, give us a ring right now.

We are MARJACQ SCRIPTS LIMITED,
32 Cumberland Mansions,
Nutford Place,
London W1H 5ZB

01-724 0565

A great line up of 17 NEW titles... direct from CANADA

FOR ZX81, SPECTRUM, VIC 20, C64, ATARI!

Just run your eyes over these new titles now available through "SOFTCHOICE LTD" the U.K. subsidiary of the well-known Canadian Software House INTERNATIONAL PUBLISHING & SOFTWARE INC. Purchase with confidence superb EDUCATIONAL, UTILITY and GAMES SOFTWARE!

EXCITING NEW GAMES FOR FAMILY FUN AND LEARNING FOR ZX81 and SPECTRUM

ADDING MACHINE
Additional facts for ages 5-9 yrs.
For Spectrum.
Cassette £6.95

TAKE AWAY ZOO
Subtraction facts for ages 5-9 yrs.
For Spectrum.
Cassette £6.95

TINY LOGO
The key to understanding and learning real computer programming!
For ZX81.
Cassette £5.95

SIGNALS & CODE
See and hear the letters and numbers in order! On demand, randomly, in messages, in score tests! For ZX81.
Cassette £4.95

WRATH OF KONG
Only great agility and cunning will outwit Kong - Climb quickly or Jane will perish!
For ZX81 & Spectrum.
Cassette £5.95

SPEED SNAKE
Slither around mazes. 10 different mazes to challenge your skill! Deadly!
For ZX81.
Cassette £4.95

MR MUNCHEE
Race through 3 mazes, avoid the Trolls! Exciting action with graphics!
For ZX81.
Cassette £4.95

SOFTCHOICE

SOFTCHOICE LTD.
52 PLATTS LANE, LONDON NW3 7NT.
TEL: (01) 431 2494. TELEX: 923753

CHILDRENS' & HOME EDUCATIONAL GAMES for the COMMODORE 64, ATARI 400/800
DISKS Only, at £14.95 each incl.

THE ALPHABET FACTORY
Two arcade-style games that teach children the alphabet!
C64 + Atari.
Ages 3-8 years.

MATCH UP
These high interest games make learning to read fun!
C64 only
Ages 3-8 years.

THE WORD BIRD
Three different games each designed to increase a child's reading vocabulary!
C64 only
Ages 6-12 years.

TIME ZONE
Two activity games that develop the needed language skills for successful reading!
C64 only
Ages 6-12 years.

BRIDGE
For all the family. Sharpen your skills with the computer's bidding!
VIC 20, C64, & ZX81.
Cassette £9.50

GREAT UTILITY AND BUSINESS SOFTWARE for ZX81, SPECTRUM, VIC 20, COMMODORE 64, ATARI

FASTWORD
Fast, versatile and complete word processing package by Dr Pearson.
For ZX81.
Cassette £7.50

FASTLOAD
any programme up to 6 times faster than normal! By Dr G. Pearson.
For ZX81.
Cassette £7.50

DIET
Gain control over your eating patterns. By Dr M. Minsky.
For ZX81 & Spectrum.
Cassette £5.95

CALC-PRO
A great tool for home or business! complete financial spreadsheet & runs statistics programs
VIC 20 Cassette £9.50
C64 Disk £14.95

GRAPH-IT
An easy to use tool to produce graphical displays.
For VIC 20.
Cassette £9.50

HOW TO ORDER. BY TELEPHONE (01) 431 2494
If you are a Access holder, please telephone and give your Card No., Name, Address and item required for immediate despatch.

BY POST. To purchase any of the items listed above, simply fill in the coupon below, write your Name, Address, enclose your cheque or P.O. made payable to: SOFTCHOICE LTD and post to us.

Post to: SOFTCHOICE LTD.
52 PLATTS LANE, LONDON NW3 7NT

Please send me the following items:
(Use separate sheet if space allocated not sufficient)

NO. REQ. | TITLE | TOTAL COST

I enclose my cheque/P.O. for £

I prefer to pay by ACCESS
(Delete which ever is not applicable)

Card No.

Signature

Name

Address

Please allow 7 to 14 days for delivery.
Card holders' address must be the same as coupon.

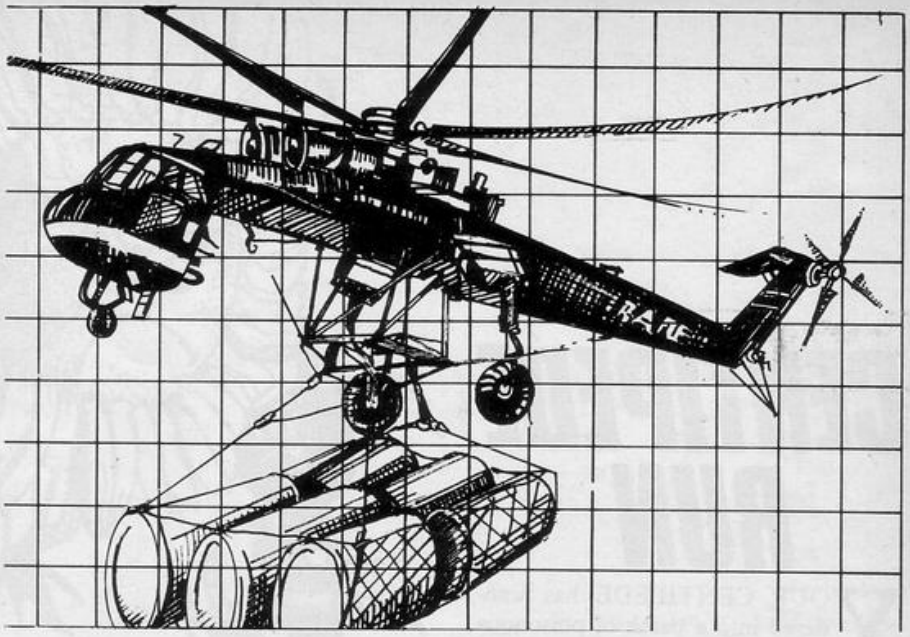
CENTIPEDE RUN

YOUR CENTIPEDE has wandered into a patch of poisonous plants and is in danger. Run quickly through the plants but make sure you avoid them as a collision will result in instant death.

Centipede Run was written for the 16K Spectrum by Norman O'Brien, aged 13, of Carlisle, Cumbria.

```
 10 POKE USR "a"+0,BIN 00111100
 20 POKE USR "a"+1,BIN 01111110
 30 POKE USR "a"+2,BIN 11111111
 40 POKE USR "a"+3,BIN 10011001
 50 POKE USR "a"+4,BIN 11111111
 60 POKE USR "a"+5,BIN 01111110
 70 POKE USR "a"+6,BIN 00111100
 80 POKE USR "a"+7,BIN 01000010
 90 LET hI=0: LET a=16: LET s=0
100 BORDER 1: PAPER 1: INK 6: C
LS
110 PRINT AT 0,9;"CENTIPEDE"; O
VER 1;AT 0,9;"_________"
130 PRINT AT 4,0;"YOUR CENTIPED
E HAS ACCIDENTLY   WANDERED INTO
 A PATCH OF        POISONOUS PLA
NTS.RUN QUICKLY    THROUGH THEM,
BUT DON'T HIT ONE  OR YOU WILL B
E INSTANTLY KILLED."
140 PRINT AT 12,0; INK 4; FLASH
 1;"CONTROLS:""""5=LEFT""""8=RIG
HT": PRINT  0; FLASH 1;"PRESS AN
Y KEY TO PLAY CENTIPEDE."
150 PAUSE 0: FOR F=0 TO 48 STEP
 .3: BEEP .01,F: NEXT F: CLS
160 PRINT AT 7,A; INK 4; BRIGHT
 1;"a"
170 PRINT AT 21,RND*31;"*";AT 2
1,RND*31;"*";AT 21,RND*31;"*";AT
 21,RND*31;"*";AT 21,RND*31;"*"
180 LET A=A+(INKEY$="8" AND A<3
1)-(INKEY$="5" AND A>0)
190 LET L=USR (3280)
200 IF SCREEN$ (7,A)="*" THEN
GO SUB 500
210 BEEP .001,20
220 LET S=S+.5
230 GO TO 160
500 FOR F=40 TO 0 STEP -.3: BEE
P .01,F: NEXT F: CLS : PRINT AT
0,9;"HI SCORE ";INT HI: PRINT AT
 5,10;"SCORE ";INT S;AT 10,5;"YO
U STUPID PERSON....!"
510 IF s>hi THEN  LET HI=S: PRI
NT AT 15,4; INK 2; PAPER 6; BRIG
HT 1; FLASH 1;"A NEW HIGH SCORE
OF...";INT HI
515 PRINT AT 21,0; INK 4; FLASH
 1; BRIGHT 1;"PRESS ANY KEY TO P
LAY CENTIPEDE.": LET f=0
516 BEEP .1,20: PRINT AT 7,f;
INK 4;"a";AT 7,f-5;" ": LET f=f
+1: IF f>30 THEN  LET f=0: FOR 9
=25 TO 30: BEEP .01,9: PRINT AT
7,9;" "; NEXT 9
518 IF INKEY$="" THEN  GO TO 51
6
519 IF INKEY$="" THEN  GO TO 51
6
520 FOR F=0 TO 21: LET L=USR (3
280): BEEP .05,F: NEXT F
530 FOR F=0 TO 10: NEXT F: BEEP
 1,22: LET S=0: LET a=16: RETURN
```

RESCUE



STEER your helicopter, using S and W. Rescue the man on the mountain by flying just above him, pick up as many fuel drums as possible, and avoid the poison clouds. Once you have the man you can land on screen two by pressing B. Reaching screen two without the man will result in loss of all your points.

Rescue was written for the 48K Spectrum by C Wakelin and T Partlett of Tamworth, Staffordshire.

```
    1 CLS : PLOT  INK 3;0,40: DRA
W  INK 3; INK 0;255,0
   2 GO SUB 9000
   4 LET hs=0
   5 LET SC=0
   6 LET lives=2
   7 LET dead=0
   8 LET man=0
  10 PLOT 20,40: DRAW 30,20
  20 DRAW 40,30
  30 DRAW 5,10
  40 DRAW 12,0
  50 DRAW 5,-10
  60 DRAW 24,-15
  70 DRAW 25,-30
  80 DRAW 3,-5
  90 PAPER 5
 100 PRINT AT 17,0;"(160*198)"
 150 PRINT AT 3,6; INK 7;"ab";AT
 4,6; INK 7;"cd"
 160 PRINT AT 8,17; INK 7;"ab";A
T 9,17; INK 7;"cd"
 170 PRINT AT 6,19; INK 7;"ab";A
T 7,19; INK 7;"cd"
 180 PRINT AT 2,28; INK 7;"ab";A
T 3,28; INK 7;"cd"
 190 PRINT AT 1,2; INK 7;"ab";AT
 2,2; INK 7;"cd"
 200 PRINT AT 12,4; INK 7;"ab";A
T 13,4; INK 7;"cd"
 600 CIRCLE  INK 6;210,150,10
 610 PLOT  INK 6;200,150: DRAW
INK 6;20,0
 620 PLOT  INK 6;200,149: DRAW
INK 6;20,0: PLOT  INK 6;200,148:
 DRAW  INK 6;20,0
 630 PLOT  INK 6;201,148: DRAW
INK 6;18,0
 640 PLOT  INK 6;202,147: DRAW
INK 6;17,0
 650 PLOT  INK 6;203,146: DRAW
INK 6;15,0
 660 PLOT  INK 6;204,145: DRAW
INK 6;14,0
 670 PLOT  INK 6;205,144: DRAW
INK 6;13,0
 680 PRINT AT 8,12;"t"
 685 PRINT AT 6,13;"u";AT 2,16;"
u"
 690 PRINT AT 4,3;"u";AT 10,17;"
u"
 800 REM main game
 801 LET x=28: LET y=14
 810 PRINT AT y,x;" nm ";AT y-1,
x;"    "
 815 PRINT AT y+1,x;"     "
 816 PRINT AT 0,0;"SCORE=";SC
 820 LET x=x-1: BEEP .01,-5
 822 IF INKEY$="w" THEN  LET y=y
-1
 823 IF y<1 THEN  LET dead=1
 824 IF INKEY$="s" THEN  LET y=y
+1: IF y>15 THEN  LET dead=1
 825 IF x<1 THEN  GO TO 3000
 830 IF y=3 AND x=6 OR y=4 AND x
=6 THEN  LET dead=1
 840 IF y=6 AND x=19 OR y=7 AND
x=19 THEN  LET dead=1
 850 IF y=8 AND x=17 OR y=9 AND
x=17 THEN  LET dead=1
 860 IF y=2 AND x=28  OR y=3 AND
 x=28 THEN  LET dead=1
 870 IF y=1 AND x=2 OR y=2 AND x
=2 THEN  LET dead=1
 880 IF y=12 AND x=4 OR y=13 AND
 x=4 THEN  LET dead=1
 900 IF y=7 AND x=12 THEN  LET s
c=sc+10: LET man=1
 910 IF y=2 AND x=16 OR y=6 AND
x=13 OR y=4 AND x=3 OR y=10 AND
x=17 THEN  LET sc=sc+30
1000 IF dead=1 THEN  PRINT AT y,
x;"9h  ": LET lives=lives-1
1010 IF lives=0 THEN  GO TO 2000
1500 GO TO 810
2000 BEEP 1,3: BEEP .7,4: BEEP .
2,5: BEEP .3,4: BEEP .6,4: BEEP
.5,3: BEEP 1,3:
2490 PAUSE 0
2500 GO TO 1
3000 CLS : PLOT 0,40: DRAW  INK
4;255,0
3005 LET x=29
3010 PRINT AT 16,0;"(192*198)"
3015 PLOT 10,0: DRAW 0,175
3020 IF man=0 THEN  PRINT AT 0,0
;"YOU DON'T HAVE THE MAN GO AND
  GET HIM": PAUSE 100 : GO TO 1
3030 IF INKEY$="b" THEN  LET y=y
+1
3035 PRINT AT y,x;" nm ";AT y-1,
x;"    "
3040 IF x<2 THEN  LET dead=1
3045 LET x=x-1: BEEP .01,0: BEEP
 .01,-10
3050 IF y>14 THEN  GO TO 4000
3060 IF DEAD=1 THEN  PRINT AT y,
x;"  9h": GO TO 2000
3500 GO TO 3030
4000 LET SC=SC+100: CLS : GO TO
6
9000 POKE USR "a"+0,BIN 0
9010 POKE USR "a"+1,BIN 0
9020 POKE USR "a"+2,BIN 0
9030 POKE USR "a"+3,BIN 00000111
9040 POKE USR "a"+4,BIN 00001111
9050 POKE USR "a"+5,BIN 00011111
9060 POKE USR "a"+6,BIN 00111111
9070 POKE USR "a"+7,BIN 00111111
9080 POKE USR "b"+0,BIN 0
9090 POKE USR "b"+1,BIN 0
9100 POKE USR "b"+2,BIN 0
9110 POKE USR "b"+3,BIN 10000000
9120 POKE USR "b"+4,BIN 11000000
9130 POKE USR "b"+5,BIN 11111000
9140 POKE USR "b"+6,BIN 11111100
9150 POKE USR "b"+7,BIN 11111100
9160 POKE USR "c"+0,BIN 00111111
9170 POKE USR "c"+1,BIN 01111111
9180 POKE USR "c"+2,BIN 01111111
9190 POKE USR "c"+3,BIN 00111111
9200 POKE USR "c"+4,BIN 00011111
9210 POKE USR "c"+5,BIN 0
9230 POKE USR "c"+6,BIN 0
9240 POKE USR "c"+7,BIN 0
9250 POKE USR "d"+0,BIN 11111100
9260 POKE USR "d"+1,BIN 11111110
9270 POKE USR "d"+2,BIN 11111110
9280 POKE USR "d"+3,BIN 11111110
9290 POKE USR "d"+4,BIN 11111100
9300 POKE USR "d"+5,BIN 0
9310 POKE USR "d"+6,BIN 0
9320 POKE USR "d"+7,BIN 0
9400 POKE USR "n"+0,BIN 00111111
9410 POKE USR "n"+1,BIN 01010101
9420 POKE USR "n"+2,BIN 11111111
9430 POKE USR "n"+3,BIN 11111111
9440 POKE USR "n"+4,BIN 11111111
9450 POKE USR "n"+5,BIN 11111111
9460 POKE USR "n"+6,BIN 01111111
9470 POKE USR "n"+7,BIN 0
9500 POKE USR "m"+0,BIN 10000111
9510 POKE USR "m"+1,BIN 11111111
9520 POKE USR "m"+2,BIN 11111111
9530 POKE USR "m"+4,BIN 11111111
9540 POKE USR "m"+3,BIN 11111111
9550 POKE USR "m"+5,BIN 11111110
9560 POKE USR "m"+6,BIN 11111100
9570 POKE USR "m"+7,BIN 0
9600 POKE USR "9"+0,BIN 00000010
9610 POKE USR "9"+1,BIN 00111101
9620 POKE USR "9"+2,BIN 11001011
9630 POKE USR "9"+3,BIN 11010100
9640 POKE USR "9"+4,BIN 00100011
9650 POKE USR "9"+5,BIN 00101100
9660 POKE USR "9"+6,BIN 00010100
9670 POKE USR "9"+7,BIN 00000011
9700 POKE USR "h"+0,BIN 11111010
9710 POKE USR "h"+1,BIN 00010110
9720 POKE USR "h"+2,BIN 00100010
9730 POKE USR "h"+3,BIN 10100010
9740 POKE USR "h"+4,BIN 01011100
9750 POKE USR "h"+5,BIN 10010000
9760 POKE USR "h"+6,BIN 00110000
9770 POKE USR "h"+7,BIN 11000000
9800 POKE USR "t"+0,BIN 01011010
9810 POKE USR "t"+1,BIN 01011010
9820 POKE USR "t"+2,BIN 01111110
9830 POKE USR "t"+3,BIN 00111100
9840 POKE USR "t"+4,BIN 00111100
9850 POKE USR "t"+5,BIN 00111100
9860 POKE USR "t"+6,BIN 00100100
9870 POKE USR "t"+7,BIN 00100100
9900 POKE USR "u"+0,BIN 0
9910 POKE USR "u"+1,BIN 0
9920 POKE USR "u"+2,BIN 01100110
9930 POKE USR "u"+3,BIN 11111111
9940 POKE USR "u"+4,BIN 11111111
9945 POKE USR "u"+5,BIN 11111111
9950 POKE USR "u"+6,BIN 01100110
9960 POKE USR "u"+7,BIN 0
9999 RETURN
```

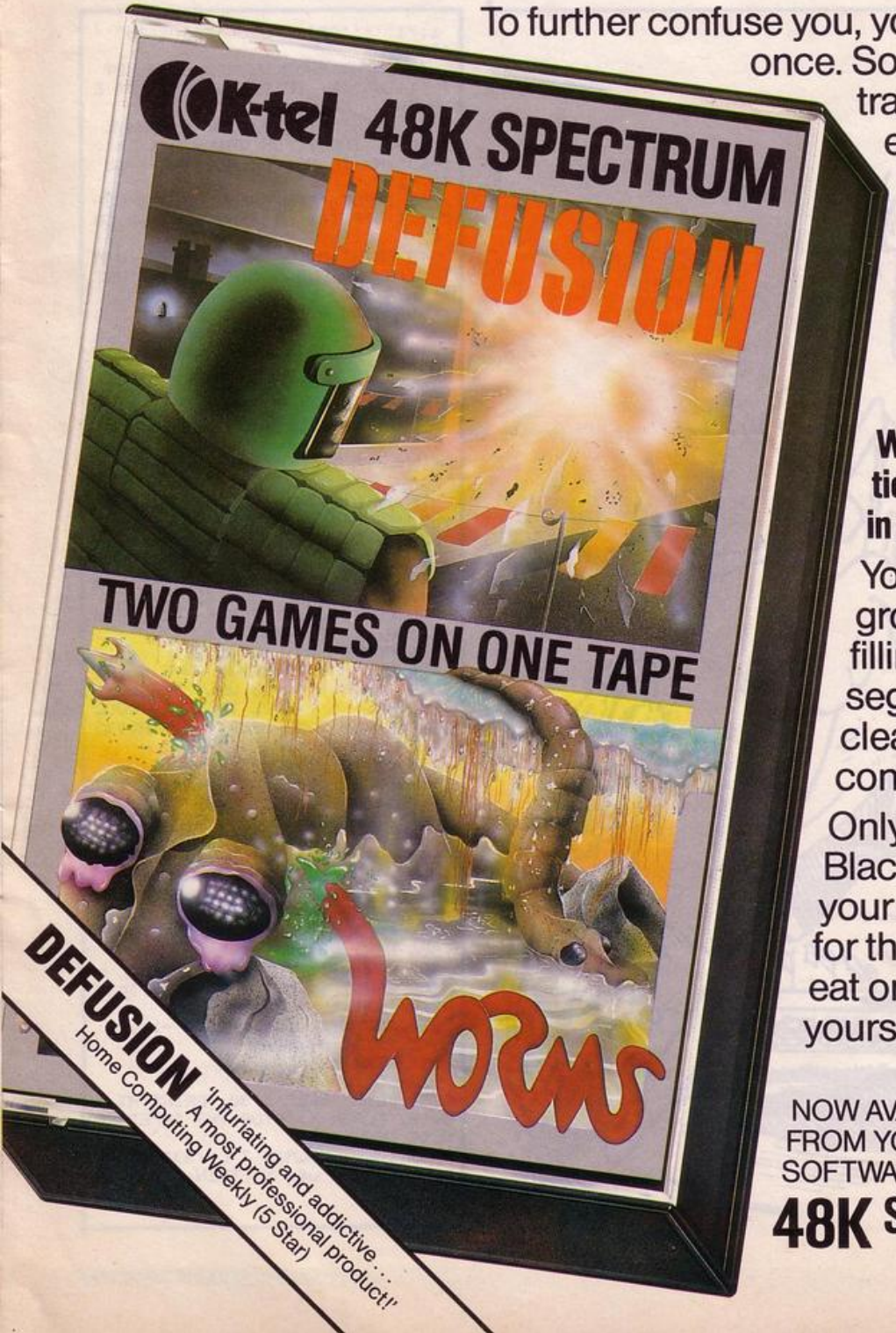
Two great games on one tape

DEFUSION

Time is running out . . . you are only seconds from an explosive experience.

A live bomb ticks menacingly as you try to get near enough to defuse it. Unfortunately your path is littered with Booby Traps. To say nothing of a very determined Hit Man, who follows your every move as you race to stop havoc and devastation.

To further confuse you, you may only use each path once. So take care you don't get trapped. In the direst emergency it is possible to make a new path, but that will take the one thing you haven't got . . . time!



What's slimy and nasty and ties itself . . . and you in knots?

You control the worm as it grows and grows, relentlessly filling the screen with its segments. Take care to keep clear of your own tail, as contact means certain doom.

Only by exactly locating the Black Segments can you cross your own path. But watch out for the Bluebottles. You must eat one to avoid crushing yourself to death . . .

NOW AVAILABLE FROM YOUR MAIN SOFTWARE RETAILER.

48K SPECTRUM

DOUBLESIDER

K-tel

RACE TRACK

```
  10 FOR a=1 TO 3: READ a$: FOR
b=0 TO 7: READ c: POKE USR a$+b,
c: NEXT b: NEXT a
  12 DATA "a",24,24,60,90,24,36,
36,66
  13 DATA "b",30,12,62,127,127,1
27,126,60
  14 DATA "c",56,56,146,254,16,1
24,68,198
  22 PRINT '"YOU HAVE £50 POUND
 TO BET ON  THREE RACES.YOU MA
Y BET ANYTHINGUPTO £20 ON EACH R
ACE."
  23 PRINT '"AS A BONUS,THE RUNN
ERS CHANGE  COLOUR AS THEY GO A
LONG . IF YOUCAN GUESS WHAT COLO
UR THE WINNERWILL BE AT THE END
YOU WIN £20  EXTRA ."
  24 PRINT ''"IF YOU WIN YOU GET
 DOUBLE THE  BET .IF YOU PICK
THE CORRECT  COLOUR YOU GET £20
 EXTRA";AT 21,10; FLASH 1;"HIT A
 KEY": PAUSE 0
  25 LET A=50: LET D=1
  26 PAPER 1: BORDER 1: INK 7: C
LS
  27 PRINT AT 0,0;"YOU HAVE £";A
;"  ": PRINT AT 2,0;"RACE ";D
  28 FOR C=4 TO 21 STEP 3
  29 PRINT AT C,0; INK 5;"------
------------------------": NEXT
 C
  30 DIM a(6)
  31 PRINT AT 3,0; INK 3; BRIGHT
 1;"1"''"2"''"3"''"4"''"5"''
''"6"
  40 INPUT "HOW MUCH DO YOU BET
? (1-20)";E: IF E<1 OR E>21 OR E
>A THEN  GO TO 40
  41 PRINT AT 0,0;"YOU NOW HAVE
£";A-E: INPUT "ON WHICH RUNNER (
1-6)";H: IF H>6 OR H<1 THEN  GO
TO 41
  42 INPUT "FINISHING COLOUR (2-
7)";I: IF I<2 OR I>7 THEN  GO TO
 42
  43 PRINT AT 0,19;"RUNNER ";H;A
T 1,19;"COLOUR ";I;AT 2,19;" BET
 £";E
  51 PRINT AT 2,0;"RACE ";D
 330 LET D=INT (RND*6+1)
 340 BEEP .02,RND*40: LET a(D)=a
(D)+1
 350 LET F=INT (RND*6+2): PRINT
AT 3*D,a(D); INK F;" a"
 360 IF a(d)<29 THEN  GO TO 330
 375 BEEP .5,-10: PRINT AT 21,0;
"WINNER ";D;": HIS COLOUR WAS ";
F
 376 IF D=H THEN  LET A=A+(E)
 377 IF F=I THEN  LET A=A+20
 378 IF D<>H THEN  LET A=A-E
 379 BRIGHT 1: IF A<1 THEN  PAUS
E 100: CLS : PRINT AT 10,9; FLAS
H 1;"YOUR SKINT": GO TO 9999
 380 LET D=D+1: IF D=4 THEN  PAU
SE 100: GO TO 400
 399 PAUSE 140: GO TO 26
 400 CLS : PRINT "YOU HAVE A TOT
AL OF £";A;''"YOU ONLY NEEDED £
";135-A;''"  MORE THEN YOU COUL
D HAVE WON SOME GOLD": IF A>135
 THEN  GO TO 500
 499 GO TO 9999
 500 PAUSE 200: FOR W=-10 TO 50
STEP .5
 501 BEEP .009,W
 502 NEXT W: BEEP 1,30
 503 CLS : PRINT "AS WELL AS THE
 MONEY YOU HAVE  ALSO WON SOME
GOLD"; INK 6;" bbbbbbbbbbbb"
 504 PAUSE 200: FOR x=1 TO 30
 505 PAUSE 4: PRINT AT 15,x;" c"
 506 NEXT x
 507 FOR v=15 TO 1 STEP -1
 508 PAUSE 4: PRINT AT V,31;"c";
AT V+1,31;" ": NEXT V
 510 FOR W=30 TO 19 STEP -1
 511 PRINT AT 1,W;"c "
 512 NEXT W
 513 GO TO 9999
9889 CLS : BEEP 2,30: PRINT AT 1
0,10; FLASH 1;"STOP THE TAPE": P
AUSE 200: RUN
9999 INPUT "AGAIN ? (y/n)";w$: I
F w$="y" OR w$="Y" THEN  GO TO 2
5
```

RACE TRACK was written for the 16K Spectrum by Lyndon Price, aged 14, of Cwmbran, Gwent. You have £50 to bet on the athlete you think will win a race. You also have a chance to win £20 extra by predicting the colour the winning athlete will be at the finishing line.

YES AND NO

ASK THE COMPUTER a question which is answerable with Yes or No and it will reply using one of a possible 25 answers it is storing. The answers to questions can often be amusing and seem appropriate.

Yes & No was written for the 16K Spectrum by W Mansell of Biggin Hill, Kent.

```
    1 GO SUB 1000
    5 INPUT a$
    6 PRINT  INK 6;a$
    7 GO TO INT ((RND*39)*10)+10
   10 PRINT "Yes,When I'm up a gu
m tree": GO TO 5
   20 PRINT "Yes,Of course!": GO
TO 5
   30 PRINT "Yes,But only Sometim
es": GO TO 5
   40 PRINT "Yes,Always": GO TO 5
   50 PRINT "No,Never": GO TO 5
   60 PRINT "How dare you!": GO T
O 5
   70 PRINT "You've got a cheak!!
!": GO TO 5
   80 PRINT "No": GO TO 5
   90 PRINT "Only in bed": GO TO
5
  100 PRINT "Yes,In the bath": GO
 TO 5
  110 PRINT "No,Of course not": G
O TO 5
  140 PRINT "Yes": GO TO 5
  150 PRINT "What do you mean": G
O TO 5
  160 PRINT "No,Certainly not!!":
 GO TO 5
  170 PRINT "Yes": GO TO 5
  180 PRINT "When I feel like it"
: GO TO 5
  190 PRINT "No": GO TO 5
  200 PRINT "Yes": GO TO 5
  210 PRINT "Yes": GO TO 5
  220 PRINT "No": GO TO 5
  230 PRINT "Not really": GO TO 5
  240 PRINT "How do I know?": GO
TO 5
  250 PRINT "I certainly hope so!
": GO TO 5
  260 PRINT "Only after eight": G
O TO 5
  270 PRINT "I don't know": GO TO
 5
  280 PRINT "No way!": GO TO 5
  290 PRINT "Pardon": GO TO 5
  300 PRINT "Not Today": GO TO 5
  310 PRINT "Not at the moment":
GO TO 5
  320 PRINT "Maybe tomorrow": GO
TO 5
  330 PRINT "You should be shot s
aying things like that!!": GO TO
 5
  340 GO TO 5
1000 INK 4: PAPER 0: BORDER 0: C
LS : PRINT TAB 12; INK 3;"YES&NO
"
1100 PRINT AT 6,3; INK 7;"This P
rogram  enables me(The ZxSpectru
m) to talk to you";AT 9,3; INK 4
;"All you have to do is ask me a
 question that is answerable by
yes or no and I will answer you
with over 25 different answers e
nabling me to talk to you!!!!"
1200  PRINT  INK 1;AT 18,2;"PRES
S ENTER TO START": PAUSE 0: CLS
: PRINT  INK 3;"PLEASE ASK ME SO
ME QUESTIONS": POKE 23609,50: RE
TURN
```

ONLY THE BEST BECOME A....

FIGHTER PILOT

48K SPECTRUM

BY D.K.MARSHALL

A SPECTACULAR FLIGHT SIMULATION OF THE WORLD'S MOST EXCITING JET FIGHTER WITH STUNNING 3D COCKPIT VIEW AND THE MOST REALISTIC 3D AIR-TO-AIR COMBAT EVER SEEN ON THE SPECTRUM!

The SUPREME SIMULATION... it leaves the rest at the runway threshold!

£7.95

inc. VAT & p. & p.
Joystick Compatible
(Kempston, AGF, Sinclair Interface 2, Protek etc.)*

OTHER AMAZING FEATURES

★ Landing and take off from 4 run ways plus steering on the ground.
★ Fully Aerobatic Performance
★ Airfield attack by the enemy
★ Cross winds, Turbulance and landing in fog.
★ 4 Pilot ratings, 8 Beacons, ground features and map
★ Artificial horizon, radar and flight computer.
★ ILS, Flaps, U/C and system failures
★ 100% machine code with complete instructions and pilot notes.

NIGHT GUNNER
£6.95
48K Spectrum
Joystick Compatible *

The air battle where only aces survive - with enemy fighters attacking from all directions, guns blazing, explosive ground attack sorties - and there's **still** the flight home.

FOOTBALL
£7.95
48K Spectrum

League Analysis - Easy to use Pools Prediction.
With 9 methods of team performance analysis - let your Spectrum guide you to your pools selection.

TAXI
£5.50
Any Spectrum

Become a Taxi Driver and test your skills - but beware the Reckless Drivers!
Fun for all the family

WIZARDS OF COMPUTER GAMES SOFTWARE

DIGITAL INTEGRATION

22 Ash Church Road
Ash, ALDERSHOT,
Hants. GU12 6LX

Please send me the following games for the Spectrum

Fighter Pilot 48K	£7.95	☐
Night Gunner 48K	£6.95	☐
Football 48K	£7.95	☐
Taxi (Any Spectrum)	£5.50	☐

VAT and p. & p. inclusive within UK
(Overseas inc. 55p. per cassette)

Lifetime Guarantee

I enclose a cheque/P.O. for _____ Total.
Cheques payable to Digital Integration

Name _____

Address _____

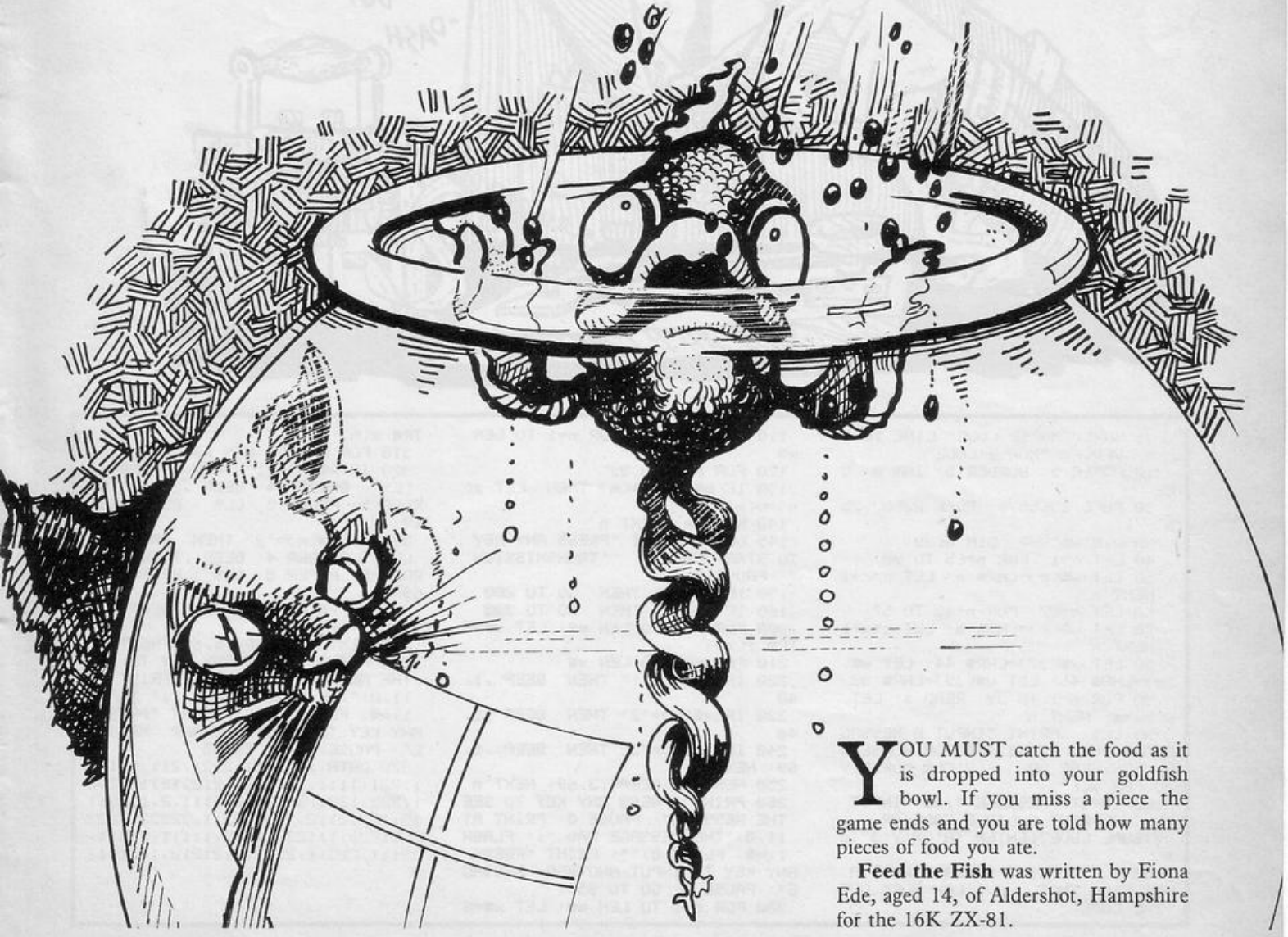
Please send to Digital Integration, Dept SP4
22 Ash Church Road, Aldershot, Hants. GU12 6LX.

Trade and Export enquiries welcome.

```
   1 REM "FISH"
   2 PRINT AT 13,0;"YOU ARE THE
FISH ""V"" AND YOU     HAVE TO CA
TCH THE FOOD ""*"" AS IT FALLS.
YOU MOVE LEFT WITH ""1""  AND RI
GHT WITH ""0"". GOOD LUCK."
   5 PRINT AT 20,5;"PRESS ANY KE
Y TO START"
   10 PRINT AT 9,8;"▚▚▚▚▚▚▚▚▚▚▚▚
"
   15 PRINT AT 10,8;"FEED THE FIS
H"
   20 PRINT AT 11,8;"▚▚▚▚▚▚▚▚▚▚▚▚
▚"
   25 PAUSE 4E4
   30 CLS
   35 PRINT AT 21,11;"▀▀▀▀▀▀▀▀▀";A
T 20,10;"▟          ▙";AT 19,9;"▟
          ▙";AT 18,8;"▟
  ▙";AT 17,7;"▟                ▙";
AT 16,6;"▟                    ▙";AT
15,5;"▟                      ▙";AT 1
   40 PRINT AT 13,5;"▟
       ▙";AT 12,5;"▟
        ▙";AT 11,5;"▟
         ▙";AT 9,6;"▟
  ▙";AT 8,5;"▟▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▙
";AT 10,5;"▟                  ▙"
   50 FOR A=12 TO 15
   60 PRINT AT A,6;"▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓
▓▓▓▓▓▓";AT 16,7;"▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓
";AT 17,8;"▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓";AT 18
,9;"▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓";AT 19,10;"▓▓▓▓▓▓
▓▓▓▓▓▓";AT 20,11;"▓▓▓▓▓▓▓▓▓▓▓▓▓▓"
```

```
  70 NEXT A
  80 LET G=13
  85 LET V=0
 100 LET Z=INT (RND*15+7)
 110 LET X=0
 120 PRINT AT X,Z;"*";AT X-1,Z;"
"
 125 PRINT AT 13,G;"▒V▒"
 130 IF INKEY$="1" THEN LET G=G-
1
 135 IF INKEY$="0" THEN LET G=G+
1
 140 LET X=X+1
 150 IF X=13 AND Z=G+1 THEN LET
V=V+1
 160 IF X=13 AND Z<>G+1 THEN GOT
O 200
 170 IF X=14 THEN PRINT AT X-1,Z
;"▒";AT X-2,Z;"▒"
 180 IF X=14 THEN GOTO 100
 190 GOTO 120
 200 PRINT AT 0,0;"YOU ATE ";V;"
PIECES OF FOOD."
 210 PRINT "DO YOU WANT ANOTHER
GO ?"
 220 PRINT "        (Y)   OR   (N)"
 230 IF INKEY$="Y" THEN GOTO 260
 240 IF INKEY$="N" THEN GOTO 270
 255 GOTO 230
 260 CLS
 265 RUN
 270 CLS
 275 PRINT AT 10,10;"BYEEE"
 280 STOP
```

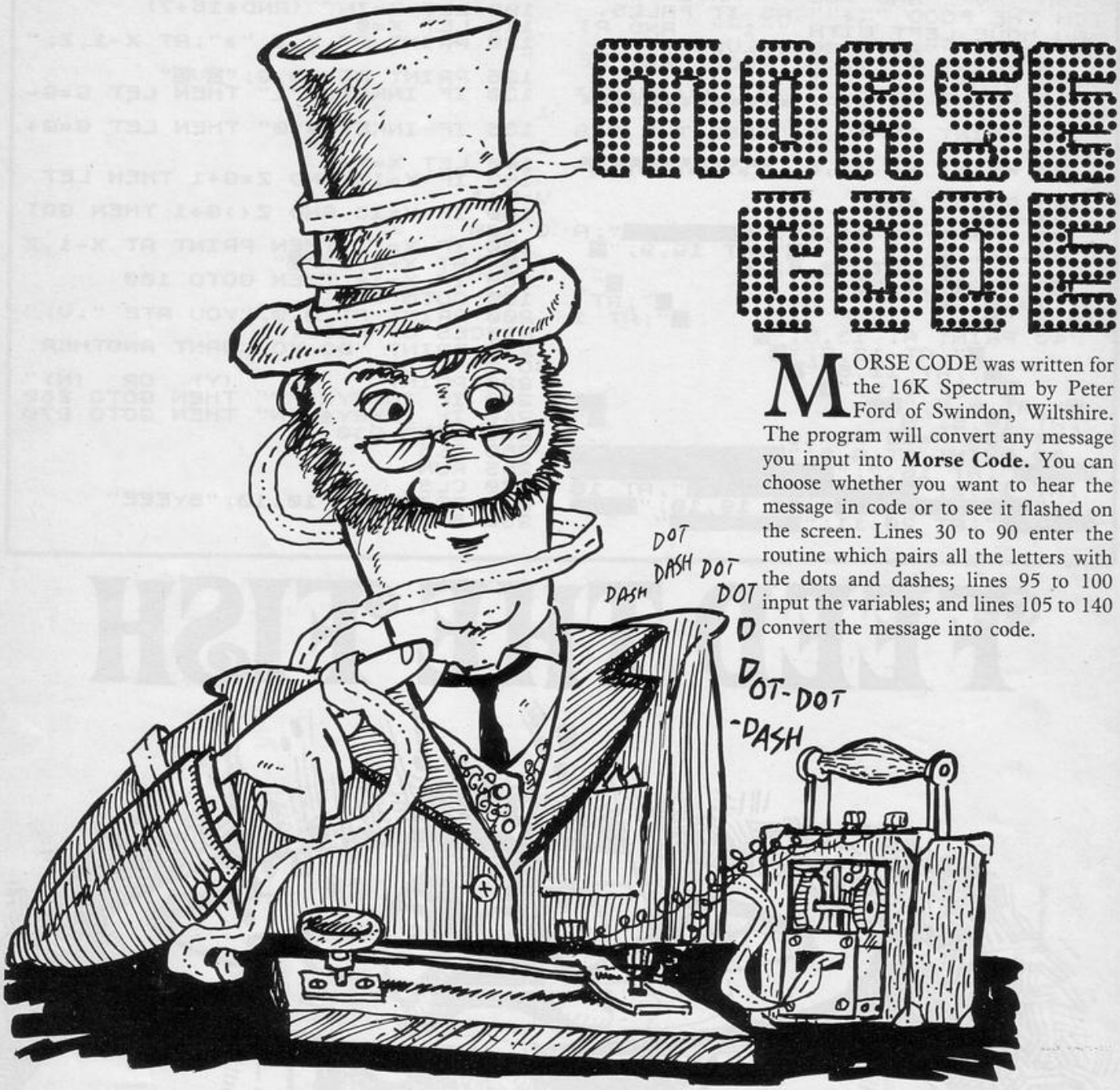
FEED THE FISH



YOU MUST catch the food as it is dropped into your goldfish bowl. If you miss a piece the game ends and you are told how many pieces of food you ate.

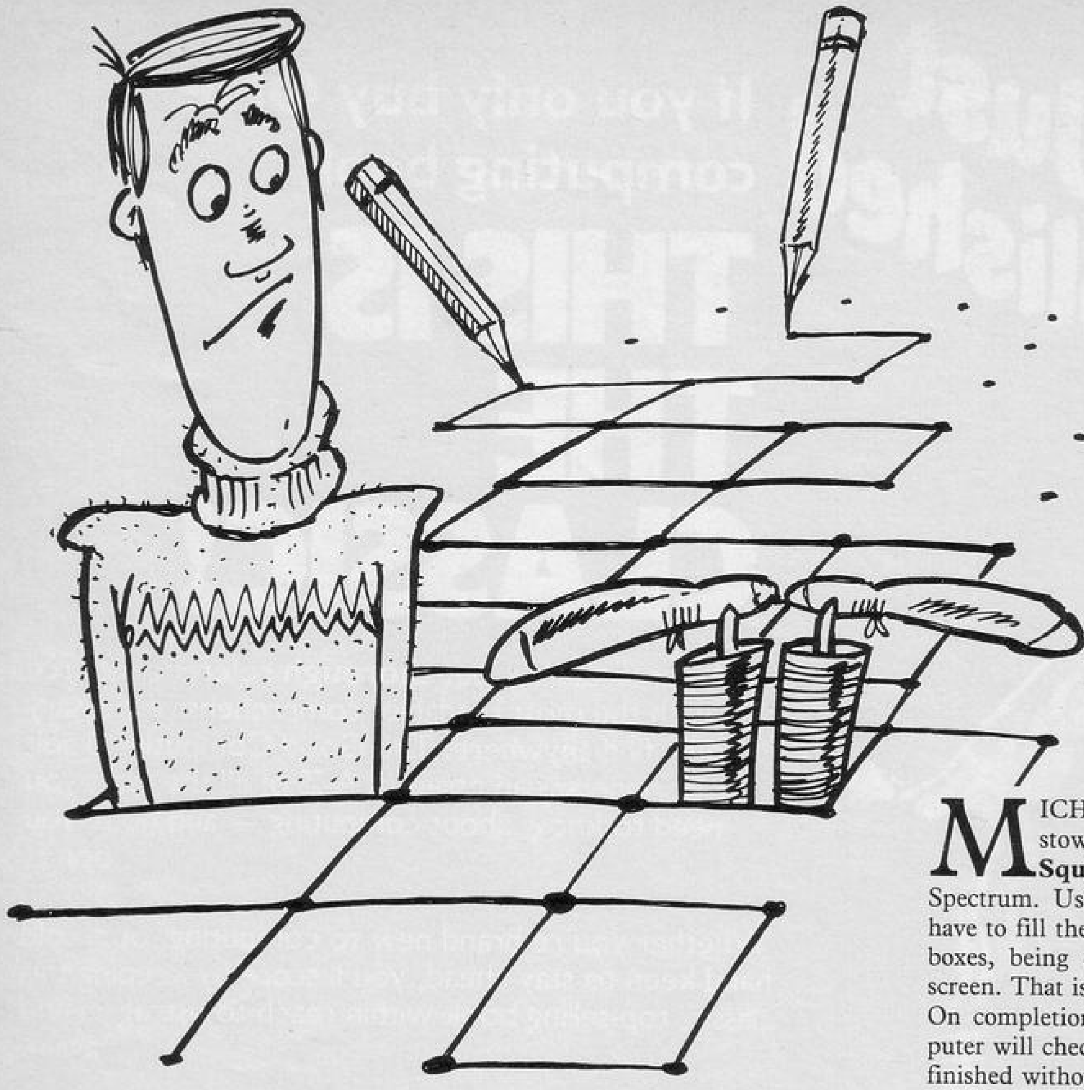
Feed the Fish was written by Fiona Ede, aged 14, of Aldershot, Hampshire for the 16K ZX-81.

MORSE CODE



MORSE CODE was written for the 16K Spectrum by Peter Ford of Swindon, Wiltshire. The program will convert any message you input into **Morse Code.** You can choose whether you want to hear the message in code or to see it flashed on the screen. Lines 30 to 90 enter the routine which pairs all the letters with the dots and dashes; lines 95 to 100 input the variables; and lines 105 to 140 convert the message into code.

```
  1 SAVE "MORSE CODE" LINE 10
  2 VERIFY "MORSE CODE"
 10 PAPER 5: BORDER 5: INK 0: C
LS
 20 POKE 23658,8: POKE 23609,25
5
 30 DIM w$(39): DIM w(39)
 40 LET c=1: FOR n=65 TO 90
 50 LET w$(c)=CHR$ n: LET c=c+1
 NEXT n
 60 LET c=27: FOR n=48 TO 57
 70 LET w$(c)=CHR$ n: LET c=c+1
 NEXT n
 80 LET w$(37)=CHR$ 44: LET w$(
38)=CHR$ 46: LET w$(39)=CHR$ 32
 90 FOR n=1 TO 39: READ a: LET
w(n)=a: NEXT n
 95 CLS : PRINT "INPUT A MESSAG
E AND THEN STATE  'A'FOR MORSE Y
OU CAN HEAR OR    'V'FOR MORSE Y
OU CAN SEE"
 100 INPUT "MESSAGE ";m$: INPUT
"DO YOU WANT AUDIBLE CODE OR
 VISUAL CODE?(ENTER 'A'OR'V')";c
$
 105 CLS   PRINT "PLEASE WAIT A
WHILE SO THAT     I CAN WORK OUT
 THE CODE"
 110 DIM z(100): FOR n=1 TO LEN
m$
 120 FOR m=1 TO 39
 130 IF m$(n)=w$(m) THEN  LET z(
n)=w(m)
 140 NEXT m: NEXT n
 145 CLS : PRINT "PRESS ANY KEY
TO START THE      'TRANSMISSION'
": PAUSE 0
 150 IF c$="A" THEN  GO TO 200
 160 IF c$="V" THEN  GO TO 300
 200 FOR n=1 TO LEN m$: LET x$=$
TR$ z(n)
 210 FOR m=1 TO LEN x$
 220 IF x$(m)="1" THEN  BEEP .1,
40
 230 IF x$(m)="2" THEN  BEEP .3,
40
 240 IF x$(m)="3" THEN  BEEP .6,
69: NEXT n
 250 NEXT m: BEEP .3,69: NEXT n
 260 PRINT "PRESS ANY KEY TO SEE
 THE MESSAGE": PAUSE 0: PRINT AT
 11,0;"THE MESSAGE WAS ";' FLASH
 1;m$; FLASH 0;"": PRINT "PRESS
ANY KEY TO INPUT ANOTHER  MESSAG
E": PAUSE 0: GO TO 95
 300 FOR n=1 TO LEN m$: LET x$=$
TR$ z(n)
 310 FOR m=1 TO LEN x$
 320 IF x$(m)="1" THEN  PAPER 4:
 CLS : BORDER 4: BEEP .25,69: BO
RDER 5: PAPER 5: CLS : BEEP .25,
69
 330 IF x$(m)="2" THEN  PAPER 4:
 CLS : BORDER 4: BEEP .75,69: BO
RDER 5: PAPER 5: CLS : BEEP .25,
69
 340 IF x$(m)="3" THEN  BEEP 1,6
9: NEXT n
 350 NEXT m: BEEP .5,69: NEXT n
 360 PRINT "PRESS ANY KEY TO SEE
 THE MESSAGE": PAUSE 0: PRINT AT
 11,0;"THE MESSAGE WAS ";' FLASH
 1;m$; FLASH 0;"": PRINT "PRESS
ANY KEY TO INPUT ANOTHER  MESSAG
E": PAUSE 0: GO TO 95
 370 DATA 12,2111,2121,211,1,112
1,221,1111,11,1222,212,1211,22,2
1,222,1221,2212,121,111,2,112,11
12,122,2112,2122,2211,22222,1222
2,11222,11122,11112,11111,21111,
22111,22211,22221,121212,111111,
3
```



MICHAEL WARD of Padstow, Cornwall wrote **The Square Game** for the 16K Spectrum. Using the cursor keys you have to fill the bigger box with smaller boxes, being careful not to leave the screen. That is not so easy as it sounds. On completion, press 1 and the computer will check to make sure you have finished without cheating.

THE SQUARE GAME

```
   1 CLS
   3 PRINT AT 10,10;"████████████
                     ████████████
                     ████████████
                     ████████████
                     ████████████
                     ████████████
                     ████████████
                     ████████████
                     ████████████
                     ████████████
                     ████████████"
   5 PRINT AT 21,0; FLASH 1;"PRE
SS ANY KEY TO CONTINUE         "
   6 PAUSE 0: CLS
   7 PRINT AT 10,0;"SIMPLY  USE
THE CURSOR KEYS AND FILL IN THE
BOX!! IT'S NOT AS   EASY AS IT S
OUNDS.FILL AWAY!!!!!"
   8 PRINT AT 21,0; FLASH 1;"PRE
SS ANY KEY TO PLAY             "
   9 PAUSE 0: CLS
  10 PRINT AT 2,0;"██████████████
█████████████████████"
  15 PRINT AT 0,10;"SUPER SQUARE
"
  20 FOR n=1 TO 20
  30 PRINT AT n,0;"█"
  40 NEXT n
  50 FOR n=1 TO 20
  60 PRINT AT n,31;"█"
  70 NEXT n
  80 PRINT AT 21,0;"██████████████
█████████████████████"
 150 LET x=10
 160 LET y=15
 165 PRINT )0;AT 0,0; FLASH 1; I
NK 4;"WHEN COMPLETED PRESS NUMBE
R ONE!"
 170 PRINT AT x,y; INK 2; PAPER
1; BRIGHT 1;"█"
 190 IF INKEY$="5" THEN  LET y=y
-1
 200 IF INKEY$="8" THEN  LET y=y
+1
 210 IF INKEY$="6" THEN  LET x=x
+1
 220 IF INKEY$="7" THEN  LET x=x
-1
 225 IF INKEY$="1" THEN  GO TO 4
00
 230 IF y>=31 THEN  GO TO 300
 240 IF y<=0 THEN  GO TO 300
 250 IF x>=21 THEN  GO TO 300
 260 IF x<=2 THEN  GO TO 300
 270 GO TO 170
 300 CLS
 310 PRINT AT 10,8; INK 4; FLASH
 1; BRIGHT 1;"OUT OF SCREEN"
 320 PRINT AT 12,0;"DO YOU WANT
ANOTHER GO? Y/N"
 330 INPUT A
 340 IF A=Y THEN  GO TO 1
 350 IF A=N THEN  STOP
 400 PRINT AT 21,12; FLASH 1;"CH
ECKING"
 410 FOR H=3 TO 20
 415 FOR M=1 TO 30
 420 IF ATTR (H,M)<>74 THEN  PRI
NT AT 21,12;"CONTINUE": GO TO 17
0
 430 NEXT M: NEXT H
1000 CLS
1010 PRINT AT 5,10; INK 5; FLASH
 1; BRIGHT 1;"WELL DONE"
1015 PRINT AT 7,0;"YOU HAVE FILL
ED THE BOX WITH    SQUARES!! VER
Y GOOD!NOW DO IT   AGAIN. BET YO
U CAN'T!!!!!HA!HA! "
1020 PRINT AT 12,0; INK 3;"DO YO
U WANT ANOTHER GO?  Y/N     "
1030 INPUT A
1040 IF A=Y THEN  GO TO 1
1050 IF A=N THEN  STOP
```

Second Edition Just Published

If you only buy ONE computing book

THIS IS THE CLASSIC!

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

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

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

Here's another fact you'll find fascinating: it will only cost you £2.95!

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

Please send me _____ copy(ies) of The Good Computing Book for Beginners by Dennis Jarrett at £2.95 each plus 50p post and packing. I enclose a cheque for _____ / Please debit my credit card account Visa/Access/Diners/Amex number _____

Signature _____

Name _____ (please print clearly)

Address _____

Send to: ECC PUBLICATIONS LIMITED
196–200 Balls Pond Road
London N1 4AQ

SPIDER

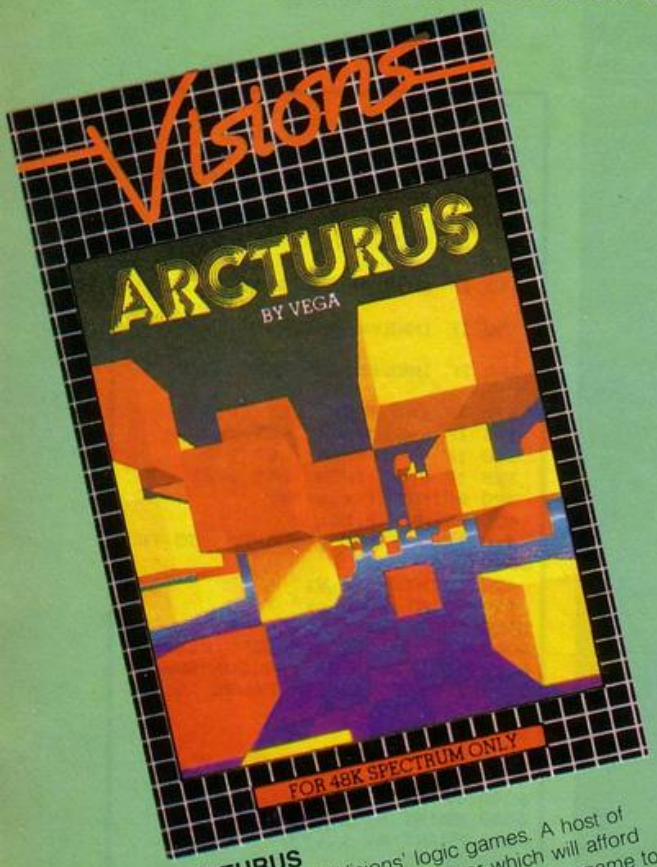
YOU PLAY the part of a spider and have to trap as many flies as you can in the time allowed. The flies are trapped in the web and you must use the cursor keys to catch them. **Spider** was written for the 16K Spectrum by A Culling of Barton Turf, Norwich.

The user-defined graphic in lines 30 and 390 is a graphic A and in lines 45 and 6050 it is a graphic B.

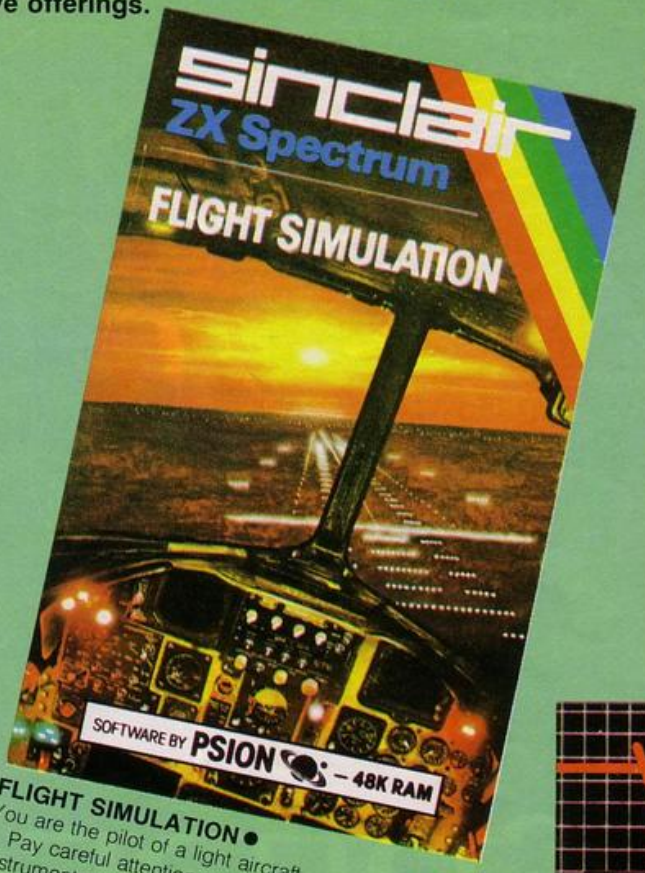
```
  10 GO SUB 9000
  15 BORDER 4
  20 PRINT AT 5,7; FLASH 1;"HOW
MANY FLYS CAN ": PRINT AT 7,7; F
LASH 1;"YOUR SPIDER CATCH ?"
  25 PRINT AT 14,7;"use keys 5,6
,7&8": PRINT AT 15,7;"to move yo
ur spider"
  30 PRINT AT 0,1;"
"
  35 PRINT AT 21,1;"
"
  40 FOR a=0 TO 21
  45 PRINT AT a,0;"": PRINT AT
a,31;""
  50 NEXT a
  55 PAUSE 250
  60 LET hs=0
  65 LET u=0
  70 CLS
  75 LET s=-1
  80 LET t=500
  85 PRINT AT 21,29;hs
  90 PRINT AT 21,17;"HIGH SCORE=
"
 100 PRINT AT 21,1;"TIME"
 110 PLOT 0,0: DRAW 0,175: DRAW
255,0: DRAW 0,-175: DRAW -255,0:
 DRAW 0,8: DRAW 255,0: DRAW 0,15
9: DRAW -255,0
 120 PLOT 255,100: DRAW -60,-92:
 PLOT 255,115: DRAW -125,-107: P
LOT 255,130: DRAW -235,-122: PLO
T 255,143: DRAW -255,-79: PLOT 2
55,155: DRAW -255,-35
 130 PLOT 210,167: DRAW 2,-16: D
RAW 3,-16: DRAW 5,-14: DRAW 8,-1
0: DRAW 16,-14: DRAW 10,-8
 140 PLOT 145,167: DRAW 3,-24: D
RAW 8,-28: DRAW 14,-28: DRAW 18,
-24: DRAW 27,-20: DRAW 40,-24
 150 PLOT 64,167: DRAW 3,-36: DR
AW 8,-40: DRAW 20,-43: DRAW 32,-
40
 190 LET x=3: LET y=29
 200 LET b=INT (RND*19)+1
 210 LET c=INT (RND*29)+1
 220 LET z=INT (RND*4)+1
 230 IF z=1 THEN  LET b=b+1
 240 IF z=2 THEN  LET b=b-1
 250 IF z=3 THEN  LET c=c+1
 260 IF z=4 THEN  LET c=c-1
 270 IF b=0 THEN  LET b=1
 280 IF b=21 THEN  LET b=20
 290 IF c=-1 THEN  LET c=0
 300 IF c=32 THEN  LET c=31
 310 PRINT AT b,c;""
 315 PRINT AT 21,6;t;"  ": LET t
=t-1
 320 IF t=-1 THEN  GO TO 7000
 330 IF INKEY$="7" THEN  LET x=x
-1
 340 IF INKEY$="6" THEN  LET x=x
+1
 350 IF INKEY$="5" THEN  LET y=y
-1
 360 IF INKEY$="8" THEN  LET y=y
+1
 370 IF x=0 THEN  LET x=1
 375 IF x=21 THEN  LET x=20
 380 IF y=-1 THEN  LET y=0
 385 IF y=32 THEN  LET y=31
 390 PRINT AT x,y;""
 400 BEEP .02,50
 410 IF x=b AND y=c THEN  GO TO
6000
 420 PRINT AT x,y;" "
 430 PRINT AT b,c;" "
5000 GO TO 220
6000 FOR j=1 TO 4: BEEP .02,20:
BEEP .02,40: BEEP .02,20: BEEP .
02,40: BEEP .02,20: PAUSE 15: NE
XT j
6010 LET s=s+2
6020 LET u=u+1
6030 IF u>hs THEN  LET hs=u
6040 IF u=15 THEN  GO TO 8000
6050 PRINT AT 0,s;""
6060 PRINT AT x,y;" "
6070 GO TO 110
7000 BEEP 2,10
7010 CLS
7020 IF u>=hs THEN  PRINT AT 2,7
; FLASH 1;"HIGHEST SCORE"
7030 PRINT AT 5,7;"YOU SCORED
 FLYS"
7040 PRINT AT 10,7;"HIGH SCORE="
7050 PRINT AT 5,18;u
7060 PRINT AT 10,19;hs
7070 PRINT AT 15,2;"press any ke
y for another go"
7080 PAUSE 0: PAUSE 0: PAUSE 0
7090 GO TO 65
8000 BEEP 2,10
8010 CLS
8020 PRINT AT 5,8; FLASH 1;"CONG
RATULATIONS"
8030 PRINT AT 7,3;"YOU SCORED MA
XIMUM POINTS"
8040 PRINT AT 15,7; FLASH 1;"HIG
H SCORE="
8050 PRINT AT 15,19; FLASH 1;u
8060 PRINT AT 18,2;"press any ke
y for another go"
8070 PAUSE 0: PAUSE 0: PAUSE 0
8080 GO TO 65
9000 FOR k=1 TO 2: FOR n=0 TO 7:
 READ a: POKE USR (CHR$ (143+k))
+n,a: NEXT n: NEXT k
9010 DATA BIN 10011001,BIN 01000
010,BIN 10111101,BIN 01111110,BI
N 01111110,BIN 10100101,BIN 0100
0010,BIN 10000001
9020 DATA BIN 10000000,BIN 01100
000,BIN 00010000,BIN 11110110,BI
N 11111110,BIN 00111001,BIN 0101
0100,BIN 10010010
9030 RETURN
```

PLAY THE

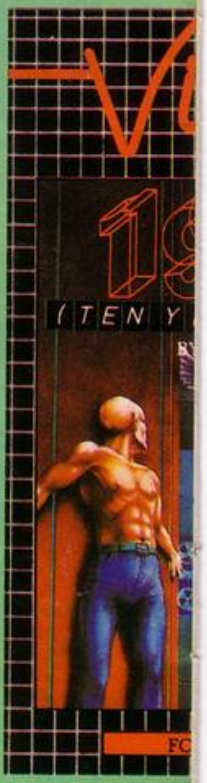
Here's a sure-fire way of making certain 1984 is packed full of fun for you and your friends. We've searched for brilliant new program sources throughout the U.K. and North America to find an exciting collection of new games—and business programs—many of which cannot be bought by mail order from any other source! These are our latest exclusive offerings.



ARCTURUS
This is the first of Visions' logic games. A host of features are offered to the player which will afford many hours of entertainment. Not an easy game to put down and at the higher levels seemingly impossible to beat. For the Spectrum 48K.
Cassette price: £6.95
Ref. No: 2-55



FLIGHT SIMULATION ●
You are the pilot of a light aircraft.
Pay careful attention to the many cockpit instruments to take off, bank, dive and climb. Touch a button, your display is a navigational chart: work out your flight path, choose a runway, prepare to land!
Full-colour high-resolution graphics. Written by Psion for a 48K RAM Spectrum.
Cassette price: £7.95.
Ref. No: 2-54



FREE BLANK C15 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?

GREAT VALUE! TREMENDOUS SELECTION! PLUS A FREE OFFER EVERY TIME!

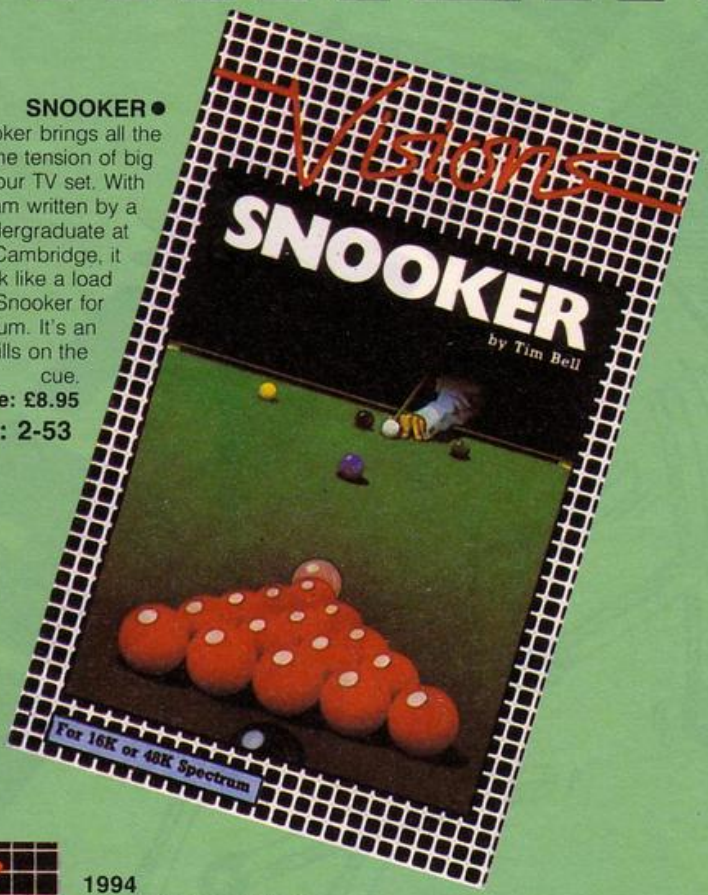
Fill in the order form right away — we're guaranteeing fast delivery, quality and satisfaction (after all, we want you to come back for more!)

The Software Workshop, Yew Tree, Selborne, Hants GU34 3JP

G
Order with
not entire
your pur
days and

WINNERS

SNOOKER ●
Visions Snooker brings all the excitement and all the tension of big time tournaments to your TV set. With an advanced program written by a 19 year old undergraduate at Queens College Cambridge, it makes Pot Black look like a load of old balls. Visions Snooker for the 16K ZX Spectrum. It's an exciting test of your skills on the cue.
Cassette price: £8.95
Ref. No: 2-53



1994
The game has eight screens which get progressively more difficult. The object of the game is to take Smiffy from Screen 1 to Screen 8 and to get to and from each screen you must pick up the key which lies within the screen that will open the exit door. The hazards include stepping onto and off, up and down lifts going over droids and avoiding plasma bolts that are constantly being fired at you. For the Spectrum 48K.
Cassette price: £9.95
Ref. No: 2-56

And here's a further selection of the latest games, the best value software for your Spectrum

Spectrum Software

2-13 **Sentinel**
Guard you mother ship against alien attacks. 48K RAM **£4.95**

2-14 **Meteor Storm**
Spectrum version of the ever-popular arcade game. 16K or 48K RAM **£4.95**

2-15 **Star Trek**
Popular space program brought to life by excellent graphics. 48K RAM **£4.95**

2-21 **Frogger**
Manoeuvre the frog across the road avoiding heavy traffic. 48K RAM **£5.95**

2-23 **Arcadia**
The expert's version of the popular invaders' game. 16K or 48K RAM **£5.95**

2-24 **Golf**
The finest of golf handicap games. 48K RAM **£5.95**

2-26 **Derby Day**
This favourite has to be a winner. 48K RAM **£5.95**

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 replacement.

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 _____

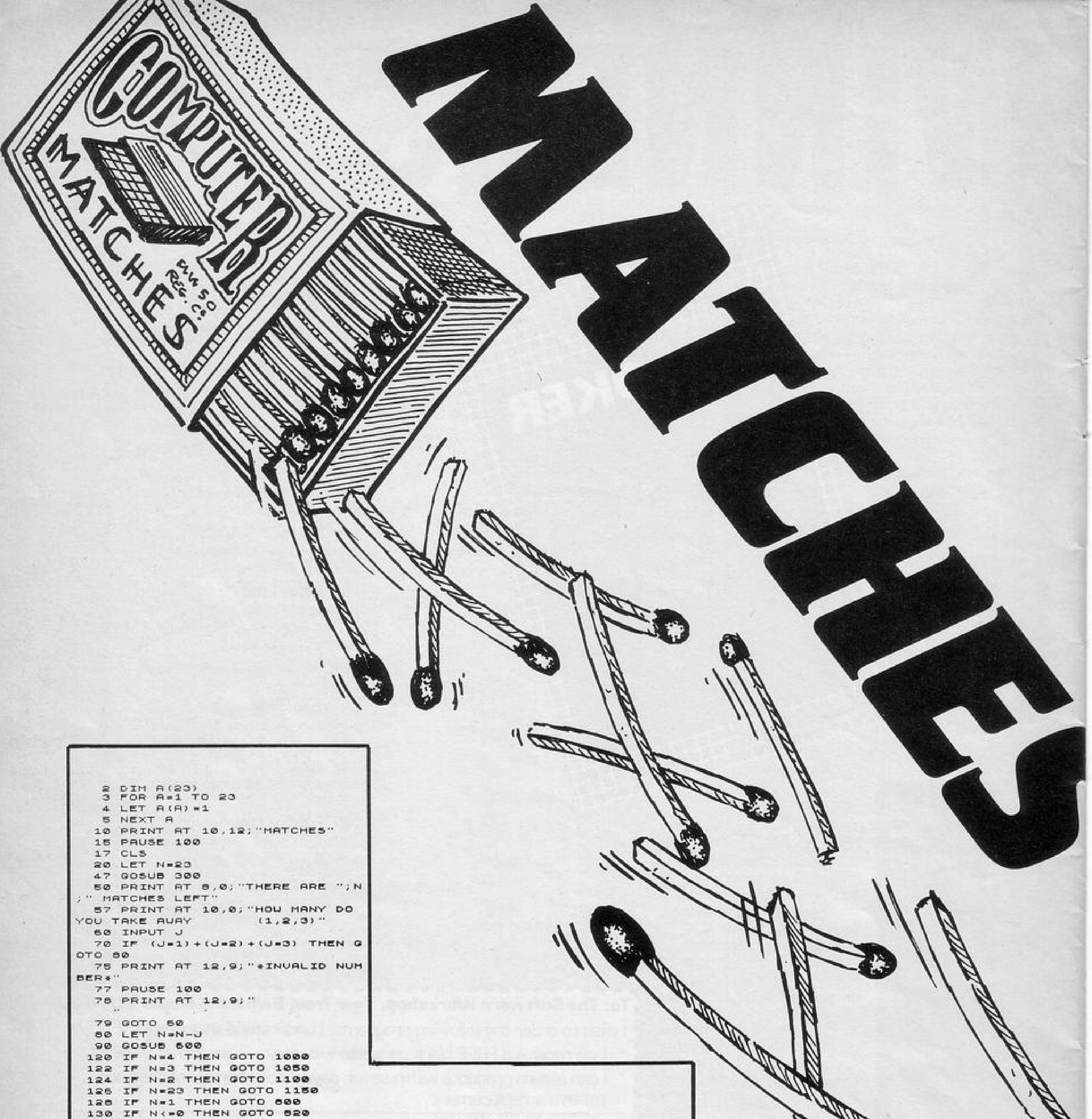
Address _____

_____

(Allow 28 days MAXIMUM FOR DELIVERY)

UARANTEE
complete confidence. If you are
y satisfied with the quality of
chase return it to us within 7
we will provide a replacement.

MATCHES



```
   2 DIM A(23)
   3 FOR A=1 TO 23
   4 LET A(A)=1
   5 NEXT A
  10 PRINT AT 10,12;"MATCHES"
  15 PAUSE 100
  17 CLS
  20 LET N=23
  47 GOSUB 300
  50 PRINT AT 8,0;"THERE ARE ";N
;" MATCHES LEFT"
  57 PRINT AT 10,0;"HOW MANY DO
YOU TAKE AWAY          (1,2,3)"
  60 INPUT J
  70 IF (J=1)+(J=2)+(J=3) THEN G
OTO 80
  75 PRINT AT 12,9;"*INVALID NUM
BER*"
  77 PAUSE 100
  78 PRINT AT 12,9;"
    "
  79 GOTO 60
  80 LET N=N-J
  90 GOSUB 600
 120 IF N=4 THEN GOTO 1000
 122 IF N=3 THEN GOTO 1050
 124 IF N=2 THEN GOTO 1100
 126 IF N=23 THEN GOTO 1150
 128 IF N=1 THEN GOTO 800
 130 IF N<=0 THEN GOTO 820
 132 LET Z=4-J
 150 PRINT AT 6,0;"ZX81 REMOVE "
;Z;" MATCHES"
 155 PAUSE 100
 160 LET N=N-Z
 170 LET J=Z
 180 GOSUB 600
 190 IF N=1 THEN GOTO 820
 200 GOTO 50
 300 FAST
 305 PRINT "THE PLAYER STUCK WIT
H          THE LAST MATCH LOSES
"
 310 PRINT AT 14,0;"▛▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀
▀▀▀▀▀▀▀▜"
 320 FOR F=15 TO 21
 330 PRINT AT F,0;"▌";AT F,24;"▐
"
 340 NEXT F
 350 PRINT AT 21,0;"▙▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄
▄▄▄▄▄▄▄▟"
 490 FAST
 495 LET X=2
 500 FOR U=1 TO 23
 510 FOR Y=3 TO 12
 520 PLOT X,Y
 525 NEXT Y
 530 LET X=X+2
 540 NEXT U
 545 SLOW
 550 GOTO 120
 560 RETURN
 600 FOR Z=1 TO J
 605 LET X=2
 610 FOR G=1 TO 23
 615 IF A(G)=0 THEN GOTO 650
 620 FOR Y=3 TO 12
 621 UNPLOT X,Y
 622 NEXT Y
 625 LET A(G)=0
 626 GOTO 690
 650 LET X=X+2
 655 NEXT G
 690 NEXT Z
 700 RETURN
 800 PRINT AT 17,2;"YOU WON"
 810 STOP
 820 PRINT AT 17,2;"YOU LOST"
 821 PRINT AT 17,2;"YOU LOST"
 830 STOP
1000 LET Z=3
1010 GOTO 150
1050 LET Z=1
1060 GOTO 150
1100 LET Z=1
1110 GOTO 150
1150 LET Z=2
1160 GOTO 150
1200 SAVE "MATCHE█"
1210 RUN
```

MATCHES is a game of strategy between you and the computer. The computer goes first and chooses whether to take one, two or three matches out of the 23 on the table. It is then your turn and you can take up to three matches. The object is for you to make the computer take the last match, which is not very easy.

Matches was written for the 16K ZX-81 by Mike Hsieh of Singapore.

SWAG

```
  10 GOTO 40
  20 SAVE "SWAG"
  60 DIM N$(10,10)
  70 DIM L(10)
  80 FOR A=1 TO 22
  90 PRINT "
                                                  "
 100 NEXT A
 130 PRINT AT 7,3;"
                                                  "
 140 PRINT TAB 3;"
                                                  "
 150 PRINT TAB 3;"
                                                  "
 160 PRINT TAB 3;"
                                                  "
 170 PRINT TAB 3;"
                                                  "
 180 PRINT AT 21,1;"PRESS ONE OF
 THE FOLLOWING KEYS"
 190 IF INKEY$="" THEN GOTO 190
 200 CLS
 210 PRINT TAB 7;"INSTRUCTIONS"
 220 PRINT
 230 PRINT "THE OBJECT OF THE GA
ME IS CATCH AS MANY FALLING ""
" AS YOU CAN."
 240 PRINT "YOU HAVE A MAXIMUM O
F 12 ""  "" IN A GAME.YOUR SCORE
 WILL BE DISP-LAYED DURING THE G
AME,AND WHEN THE 12 ""  "" HAVE
 FALLEN A BONUS WILL BE ADDED."
 250 PRINT "IF YOU GET MORE THAN
 10 OF THE ""  "" YOU WILL PLAY
AGAIN"
 260 PRINT "YOU ARE THE ""  ""
IN THE MIDDLE OF THE SCREEN"
 270 PRINT AT 21,2;"PRESS ANY KE
Y TO PLAY GAME"
 280 IF INKEY$="" THEN GOTO 280
 290 CLS
 300 LET S=0
 310 CLS
 320 LET B=13
 330 LET U=0
 340 LET X=10
 350 FOR M=1 TO 12
 360 LET A=INT (RND*29)+1
 370 PRINT AT 0,2;"SWAG=£";S
 380 LET B=B-1
 390 PRINT AT 0,20;"BAGS=";B;"  "

 400 PRINT AT 1,0;"
                                                  "
 410 PRINT AT 2,0;"
                                                  "
 420 PRINT AT 3,0;"
                                                  "
 430 PRINT AT 4,0;"
                                                  "
 440 FOR Y=4 TO 20
 450 PRINT AT Y,A;""
 460 LET X=X+(INKEY$="8" AND X<3
1)-(INKEY$="5" AND X>0)
 470 PRINT AT 21,X;"  "
 480 PRINT AT Y,A;" "
 490 NEXT Y
 500 PRINT AT 21,A;""
 510 IF A<>X+2 THEN GOTO 570
 520 LET S=S+10
 530 LET U=U+1
 540 IF U>10 THEN GOTO 310
 550 PRINT AT 0,2;"SWAG=£";S
 560 GOTO 580
 570 PRINT AT 21,A;" "
 580 NEXT M
 590 LET S=S+(S*10)
 600 PRINT AT 0,2;"SWAG=£";S
 610 PRINT AT 0,20;"BAGS=0 "
 620 PRINT AT 21,0;"PRESS ANY KE
Y TO SEE HIGH SCORES"
 630 IF INKEY$="" THEN GOTO 630
 640 CLS
 650 FOR J=1 TO 10
 660 IF S>=L(J) THEN GOSUB 860
 670 IF S>=L(J) THEN GOTO 790
 680 NEXT J
 690 CLS
 700 PRINT "HALL OF FAME-TOP TEN
 PLAYERS"
 710 PRINT
 720 FOR J=1 TO 10
 730 PRINT J;TAB 3;L(J);TAB 10;"
 ";N$(J)
 740 NEXT J
 750 PRINT AT 21,0;"PRESS ANY KE
Y TO PLAY AGAIN"
 760 IF INKEY$="" THEN GOTO 760
 770 CLS
 780 GOTO 300
 790 CLS
 800 PRINT "PLEASE ENTER YOUR NA
ME"
 810 PRINT "NO LONGER THAN 10 LE
TTERS"
 820 INPUT N$(J)
 830 IF LEN N$(J)>10 THEN GOTO 7
90
 840 LET L(J)=S
 850 GOTO 690
 860 FOR P=9 TO J STEP -1
 870 LET L(P+1)=L(P)
 880 LET N$(P+1)=N$(P)
 890 NEXT P
 900 RETURN
```

CATCH as many of the money bags which fall from the wall as you can, using keys 5 and 8. If you catch all 12 successfully you will receive a bonus. The top 10 scores are listed in the hall of fame.

Swag was written for the 16K ZX-81 by Christopher Marley of Bradford, W. Yorks.

JUNGLE OF DEATH

YOU ARE FACED with seven perilous jungle scenes, each being slightly more complex than the previous one. The object is to avoid all the hazards of the jungle, such as animal pits and obstructing trees, and to reach the exit on each scene.

The Jungle of Death was written for the 16K ZX-81 by Richard Morgan of Stourbridge, West Midlands.

```
   5 LET U=PEEK 16396+256*PEEK 1
6397
   7 LET SC=0
   8 GOSUB 5000
  10 FOR H=1 TO 7
  11 CLS
  12 GOSUB 9000
  13 LET T$="[illegible]"
  14 LET T=31
  25 LET Z=(U+50)
  26 IF PEEK Z=118 THEN STOP
  30 POKE Z,CODE "Y"
  35 LET I$=INKEY$
  40 LET Z=Z+(I$="8")-(I$="5")+(
33*(I$="6"))-(33*(I$="7"))
  45 IF PEEK Z<>0 AND PEEK Z<>CO
DE "Y" THEN GOTO 8000
  50 LET T=T-.2
  54 GOSUB 900
  55 PRINT AT 23,0;T$( TO T)+" "
  60 IF T<1 THEN GOTO 8000
  65 GOTO 30
  70 NEXT H
 100 REM SUCCESS
 110 PRINT
" OOO    O   O
 O   O  O  O
 O   O  O O      YOU MADE IT AT LAS
 O   O  OO         I AM SURPRISED
 O   O  O O
  OOO   O  O"
 120 PRINT ,,"YOU SCORED "; (INT
SC)
 130 STOP
 900 REM SHELL
 905 LET X=U+(RND*700)
 910 IF PEEK X<>0 THEN RETURN
 920 POKE X,23
 930 RETURN
5000 REM INSTRUCTIONS
5005 PRINT TAB 8;"THE JUNGLE OF
DEATH"
5010 PRINT ,,"    YOU SHALL BE FA
CED WITH 7    JUNGLE SCENES,EACH
 BEING MORE   COMPLEXT THAN THE
LAST.            THE OBJECT IS T
O REACH THE   EXIT ON EACH SCENE
."
5020 PRINT "    AS YOU TRY TO ESC
APE THERE   WILL BE A CONSTANT B
OMBARDMENT  OF SHELLS (*).THE GA
ME ENDS IF  YOU HIT A TREE OR FA
LL INTO A   BOMB CRATER."
5023 PRINT "(SCORE=10*REMAINING
TIME.)"
5025 PRINT ,,"USE THE CURSOR KEY
S TO MOVE"
5035 PRINT ,,,,TAB 11;"GOOD LUCK
",,,"PRESS ANY KEY TO START."
5050 IF INKEY$<>"" THEN GOTO 505
0
5055 IF INKEY$="" THEN GOTO 5055
5060 CLS
5070 RETURN
8000 REM CHECK FOR DEATH/EXIT
8003 LET O=PEEK Z
8005 IF O>165 THEN LET SC=SC+(10
*T)
8010 IF O>165 THEN GOTO 70
8020 LET A$=" ;?/*><,+-$"
8030 FOR N=1 TO (LEN A$)
8035 POKE Z,CODE A$(N)
8040 NEXT N
8050 PRINT AT 11,11;" GAME OVER
"
8100 GOTO 120
9000 REM ARMPRINTS
9005 LET A$="[illegible]"
9010 PRINT A$+A$
9015 FOR N=1 TO 20
9030 PRINT AT N,0;"■";AT N,31;"■
"
9035 NEXT N
9050 PRINT A$+A$
9060 FOR N=1 TO (H*7)
9070 LET A=INT (RND*25)+3
9080 LET B=INT (RND*17)+1
9090 PRINT AT B,A;"■";AT B+1,A-1
;"[illegible]";AT B+2,A-2;"[illegible]";AT B+3
,A;"■"
9100 NEXT N
9101 PRINT AT 21,12;"EXIT";AT 20
,12;"  "
9103 PRINT AT 1,15;"
    "
9105 POKE 16418,0
9110 RETURN
9990 REM SAVE ROUTINE
9995 SAVE "JUNGL■"
9998 RUN
```

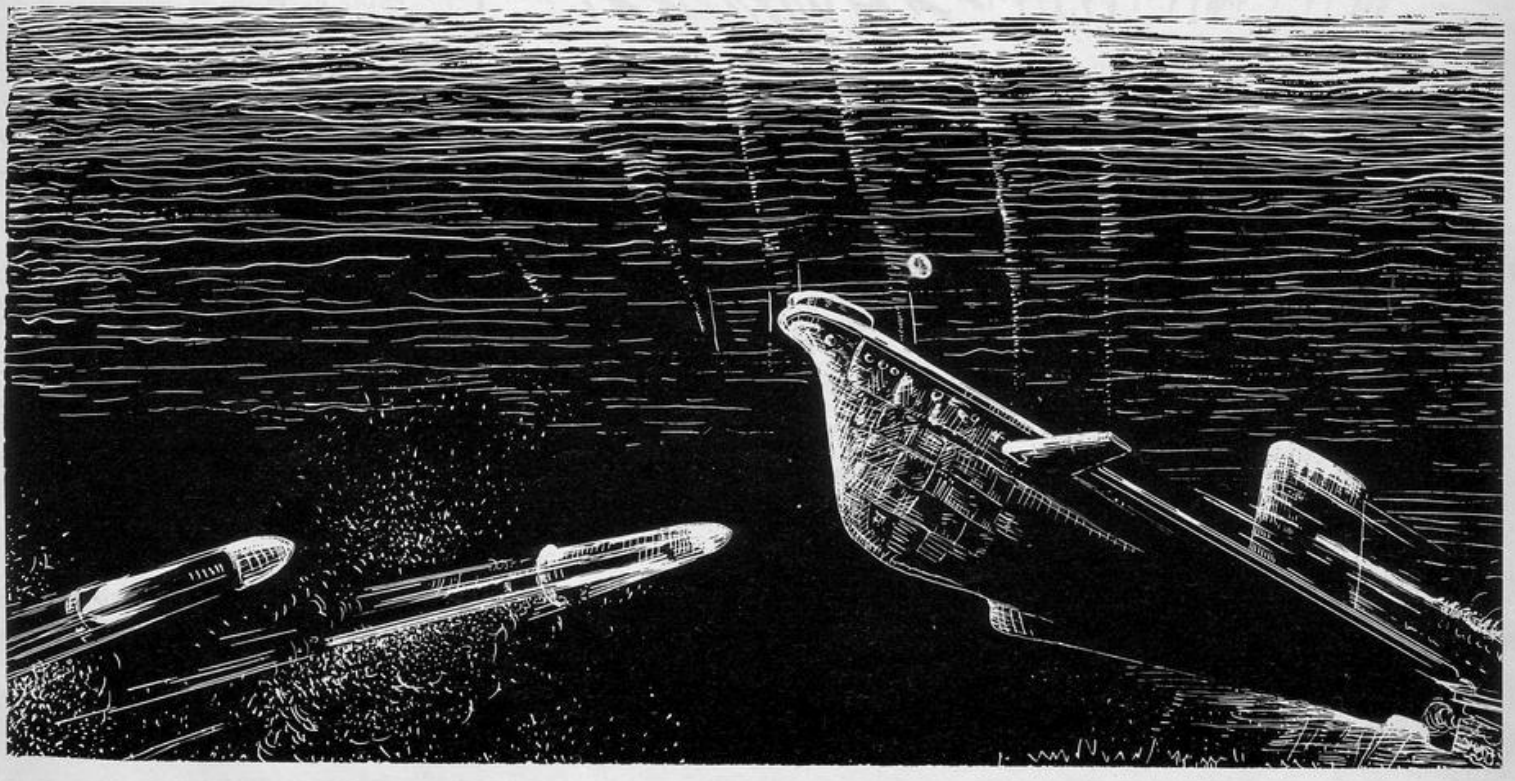
DEPTH CHARGE

FIRE DEPTH CHARGES at submarines and torpedos which move along the bottom of the screen. You receive five points for hitting a submarine at either end and 10 points for a midships strike. Torpedos are worth 15 points and you have 12 shots per game.

The Torpedos move at constant speed, whereas the submarines move at random and at a slower speed. Use key 0 to fire a depth charge.

Depth Charge was written for the 16K ZX-81 by Graham Stock of Worcester Park, Surrey.

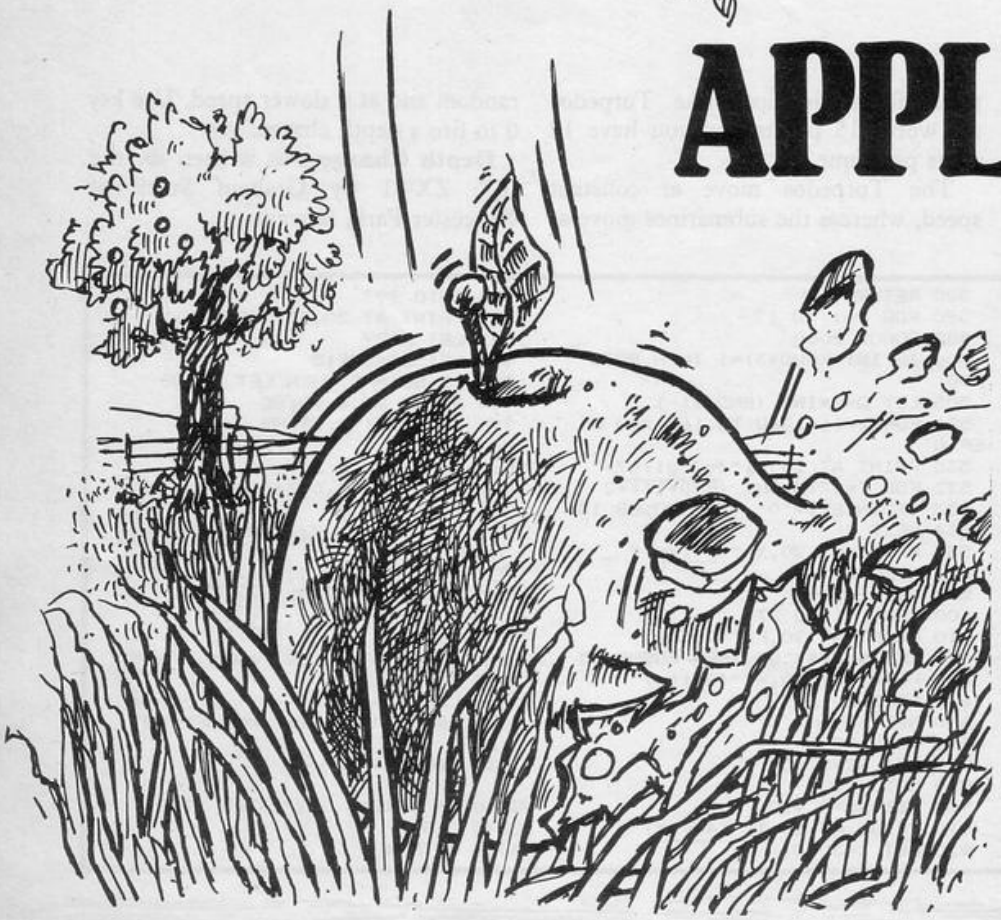
```
   3 LET HS=0
   4 LET SC=0
   7 PRINT AT 0,2;"SCORE = ";SC
   8 PRINT AT 0,17;"HI-SCORE = "
;HS
  10 GOTO 390
  18 PRINT AT 6,15;"*"
  19 PRINT AT 6,15;" "
  40 FOR A=5 TO 1 STEP -1
  70 PRINT AT A,21-A;"*"
  75 PRINT AT A,21-A;" "
  80 NEXT A
  82 FOR A=2 TO 7
  83 PRINT AT A,20;"*";AT A,20;"
 "
  85 NEXT A
  87 FOR A=8 TO 19
  89 PRINT AT A,20;";AT A,20;"
(isp)"
  90 NEXT A
 100 LET F=13
 110 PRINT AT 20,20;
 120 LET Z=PEEK (PEEK 16398+PEEK
 16399*256)
 130 IF Z<>128 THEN GOTO (Z=3)*8
00+900*(Z=1)+990*(Z=137)
 147 PRINT ";AT 20,20;"(isp)"
 300 RETURN
 390 FOR P=1 TO 12
 402 GOSUB 2000
 500 IF INT (RND*3)=1 THEN GOTO
600
 505 LET Q=2*INT (RND*2)-1
 520 FOR X=16-12*Q TO 16+12*Q ST
EP Q
 530 PRINT AT 20,X;"(g7:g1:g7)"
 532 FOR F=1 TO INT (RND*11)+2
 533 IF INKEY$="0" THEN GOSUB 15
 534 NEXT F
 535 PRINT AT 20,X;"(3*isp)"
 540 NEXT X
 590 GOTO 650
 600 FOR K=1 TO 27
 610 PRINT AT 20,K;"(2*gg)"
 620 IF INKEY$="0" THEN GOSUB 15
 630 PRINT AT 20,K;"(2*isp)"
 640 NEXT K
 650 NEXT P
 660 GOTO 3000
 800 LET SC=SC+5
 810 GOTO 910
 900 LET SC=SC+10
 910 PRINT AT 20,X;"(4*isp)"
 920 LET X=30*Q
 930 GOTO 993
 990 PRINT AT 20,15;"(8*isp)"
 991 LET K=29
 992 LET SC=SC+15
 993 IF SC>=HS THEN LET HS=SC
 994 PRINT AT 0,10;SC
 995 PRINT AT 0,28;HS
 997 RETURN
2000 FOR F=8 TO 21
2002 PRINT AT F,0;"(32*isp)"
2003 NEXT F
2010 PRINT AT 7,7;"(ga:3*gd:2*ga
:3*gd:ga)"
2020 PRINT AT 6,11;"(gd:ga)"
2030 PRINT AT 5,12;"(ga)"
2040 PRINT AT 4,12;"(g3)"
2060 RETURN
3000 PRINT AT 20,11;"game over"
3005 PAUSE 250
3010 CLS
3020 PRINT AT 11,8;"ANOTHER GO?
(Y/N)"
3030 PAUSE 40000

3040 IF INKEY$<>"Y" THEN STOP
3045 CLS
3050 GOTO 4
```



YOU HAVE to collect sufficient apples to make some **Apple Jack.** As the apples fall from the tree you have to catch them safely in your basket. You lose one of three lives if an apple hits the ground, as it will be too badly-bruised to make the Apple Jack.

Apple Jack was written for the 16K ZX-81 by G Walker of Uxbridge, Middlesex.

APPLE JACK



```
 10 POKE 16418,0
 20 LET HI=0
 30 FAST
 40 FOR Z=3 TO 19
 50 PRINT AT Z,0;"(4*isp)"
 60 NEXT Z
 70 FOR Z=0 TO 31
 80 FOR X=1 TO INT (RND*3)+4
 90 PRINT AT X,Z;"(gh)"
100 NEXT X
110 NEXT Z
120 PRINT AT 20,0;"(32*g7)"
130 PRINT AT 22,0;"(32*g6)"
140 SLOW
150 GOTO 650
160 LET SC=0
170 LET LI=3
180 PRINT AT 21,0;"SCORE: 0  "
190 PRINT AT 21,11;"LIVES:"
200 LET A$="( (gh) )"
210 PRINT AT 21,17;A$;AT 21,22;
A$;AT 21,27;A$
220 LET A=19
230 LET B=15
240 LET AP=INT (RND*22)+6
250 LET B$="(gh)"
260 FOR Z=4 TO 18
270 PRINT AT Z,AP;
280 LET C$=CHR$ PEEK (PEEK 1639
8+256*PEEK 16399)
290 IF C$<>"(gh)" THEN LET B$="
0"
300 PRINT AT A,B;A$;AT Z,AP;B$;
AT Z,AP;C$
310 LET B=B+(INKEY$="8" AND B<2
7)-(INKEY$="5" AND B>4)
320 NEXT Z
330 IF B+2=AP THEN LET SC=SC+1
340 IF B+2<>AP THEN GOSUB 370
350 PRINT AT 21,7;SC
360 GOTO 240
370 LET LI=LI-1
380 LET DE=LI*5+18
390 PRINT AT 21,DE;"    "
400 IF LI<>0 THEN RETURN
410 LET E$="OUT OF LIVES "
420 LET C=1
430 FOR Z=30 TO 18 STEP -1
440 PRINT AT 21,Z;E$(1 TO C)
450 IF Z>18 THEN LET C=C+1
460 NEXT Z
470 PRINT AT 8,5;"HI SCORE :";H
I
480 PRINT AT 10,5;"YOUR SCORE :
";SC
490 IF SC>HI THEN PRINT AT 12,5
;"YOU HAVE BEATEN HI SCORE"
500 IF SC=HI THEN PRINT AT 12,5
;"YOU EQUALLED HI SCORE"
510 IF SC<HI THEN PRINT AT 12,5
;"YOU DID NOT REACH HI SCORE"
520 IF SC>HI THEN LET HI=SC
530 PRINT AT 14,5;"DO YOU WISH
ANOTHER GAME ?";AT 16,14;"(Y OR
N)"
540 LET Z$=INKEY$
550 IF Z$<>"Y" AND Z$<>"N" THEN
GOTO 540
560 IF Z$="Y" THEN GOTO 610
570 PRINT AT 21,0;"
                  "
580 PRINT AT 21,12;"GOOD BYE";A
T 21,12;"good bye"
590 IF INKEY$<>"Y" THEN GOTO 58
0
600 PRINT AT 21,12;"          "
610 FOR Z=7 TO 19
620 PRINT AT Z,5;"
          "
630 NEXT Z
640 GOTO 160
650 PRINT AT 7,12;"APPLE JACK"
660 PRINT AT 9,5;"YOU MUST COLL
ECT THE APPLES"
670 PRINT AT 10,5;"WHICH FALL F
ROM THE TREE SO"
680 PRINT AT 11,5;"THAT APPLE J
ACK CAN BE MADE"
690 PRINT AT 13,5;"THEY MUST NO
T HIT THE FLOOR"
700 PRINT AT 14,5;"AS THEY WILL
BE USELESS FOR"
710 PRINT AT 15,5;"MAKING APPLE
JACK"
720 PRINT AT 21,0;"CONTROLS:
(5)LEFT      (8)RIGHT"
730 PRINT AT 17,5;"YOU ARE ((gh
)) AND THE APPLES"
740 PRINT AT 18,5;"MUST LAND IN
THE CENTRE."
750 PRINT AT 0,7;"PRESS (P) TO
START"
760 IF INKEY$<>"P" THEN GOTO 76
0
770 PRINT AT 0,7;"   APPLE JACK
"
780 GOTO 610
790 CLS
800 PRINT AT 8,10;"APPLE JACK"
810 PRINT AT 10,0;"THE COMPUTER
WILL ENTER FAST"
820 PRINT "MODE FOR FOUR SECOND
S WHILE THE"
830 PRINT "SCREEN LAYOUT FOR TH
E GAME IS"
840 PRINT "PRINTED"
850 PRINT AT 15,7;"PRESS (P) TO
START"
860 IF INKEY$<>"P" THEN GOTO 86
0
870 CLS
880 GOTO 10
890 LET U$="APPLE JACK"
900 SAVE U$
910 GOTO 800
```

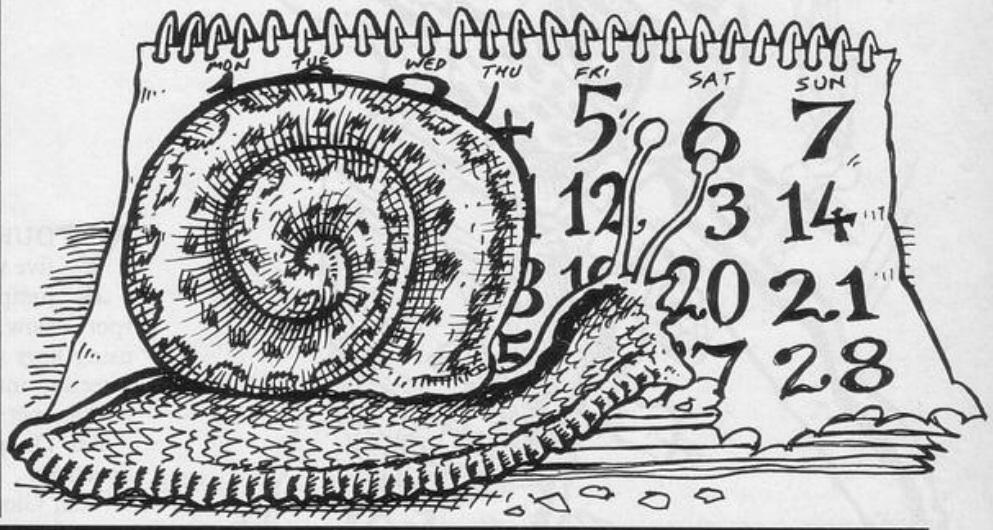
CALENDAR

```
  1 PRINT "ABCDE"
  2~PRINT "KKKFF"
 10 PRINT "IMPUT YEAR, MONTH AN
D DAY"
 20 INPUT A$
 25 LET B$=A$
 30 INPUT B
 40 INPUT C
 50 LET A=VAL A$(3 TO 4)
 60 LET A=A+INT (A/4)+C
 70 IF INT (VAL A$/100)=17 THEN
 LET A=A+4
 80 IF INT (VAL A$/100)=18 THEN
 LET A=A+2
 90 IF VAL A$/4=INT (VAL A$/4)
AND B<=2 THEN LET A=A-1
100 LET A$="144025036146"
110 LET A=A+VAL A$(B)
120 LET A=A/7
130 LET A=A-INT A
140 LET A=A*7
150 LET A$="SATSUNMUNTUEWEDTHUF
RI"
160 PRINT AT 1,0;A$(1+A*3 TO 1+
A*3+2);" ";C;" ";B;" ";B$
161 PRINT AT 10,0;"N/L TO RUN"
165 INPUT Z$
167 CLS
170 RUN
```

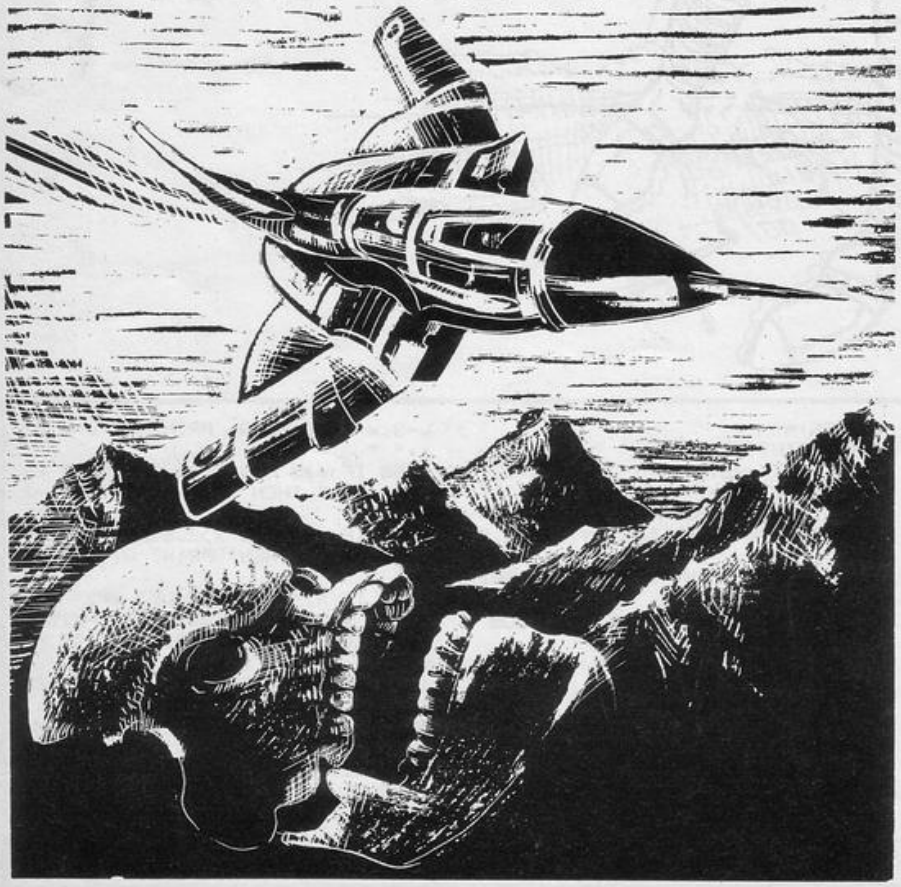
USING this program you can find on which day a certain date lies.

Input the year, month and date and the computer will tell you the day of the week on which that particular date fell.

Calendar was written for the 1K ZX-81 by Colin Robinson, aged 15, of Clackmannanshire, Scotland.



VALLEY OF DEATH



FLY YOUR AIRCRAFT through the **Valley of Death,** steering clear of the walls. You can weave in and out but if you crash you lose one of three lives. You must score 500 to reach the end. Written for the 1K ZX-81 by Matthew Everett, aged 10, of Kidderminster, Worcs.

```
  1 REM "VALLEY"
  5 LET P=3
 10 LET S=0
 20 LET X=12
 30 LET Y=8
 40 PRINT AT 13,X;"U"
 50 PRINT AT 13,Y;"■";AT 13,Y+8
;"■"
 60 LET X=X+(INKEY$="8" AND X<3
2)-(INKEY$="5" AND X>0)
 70 IF X=Y OR X=Y+8 THEN LET P=
P-1
 75 IF P=0 THEN GOTO 200
 80 LET S=S+1
 90 LET L=INT (RND*2)
100 LET Y=Y+(L=0 AND Y<23)-(L=1
AND Y>0)
110 SCROLL
120 IF S=499 THEN GOTO 140
130 GOTO 40
140 PRINT "YOU MADE IT"
150 PAUSE 200
160 CLS
170 GOTO 5
200 PRINT "CRASH, SCORE=";S
210 GOTO 150
```

AIR

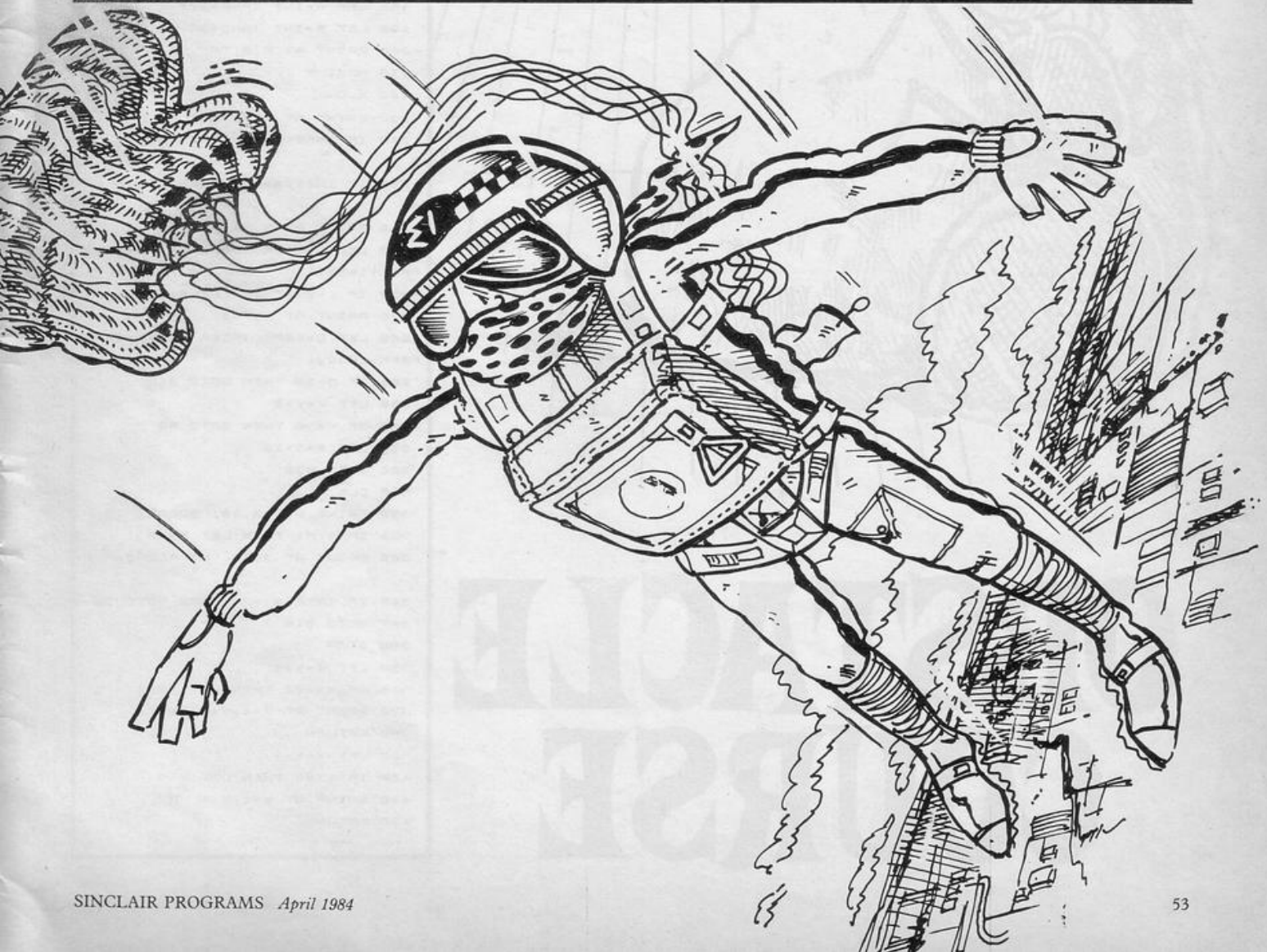
YOUR AEROPLANE contains five women, each of whom must jump to safety on the landing spot below. Guide each parachutist, using keys O and P, and taking wind direction into account, to land as close to that spot as possible.

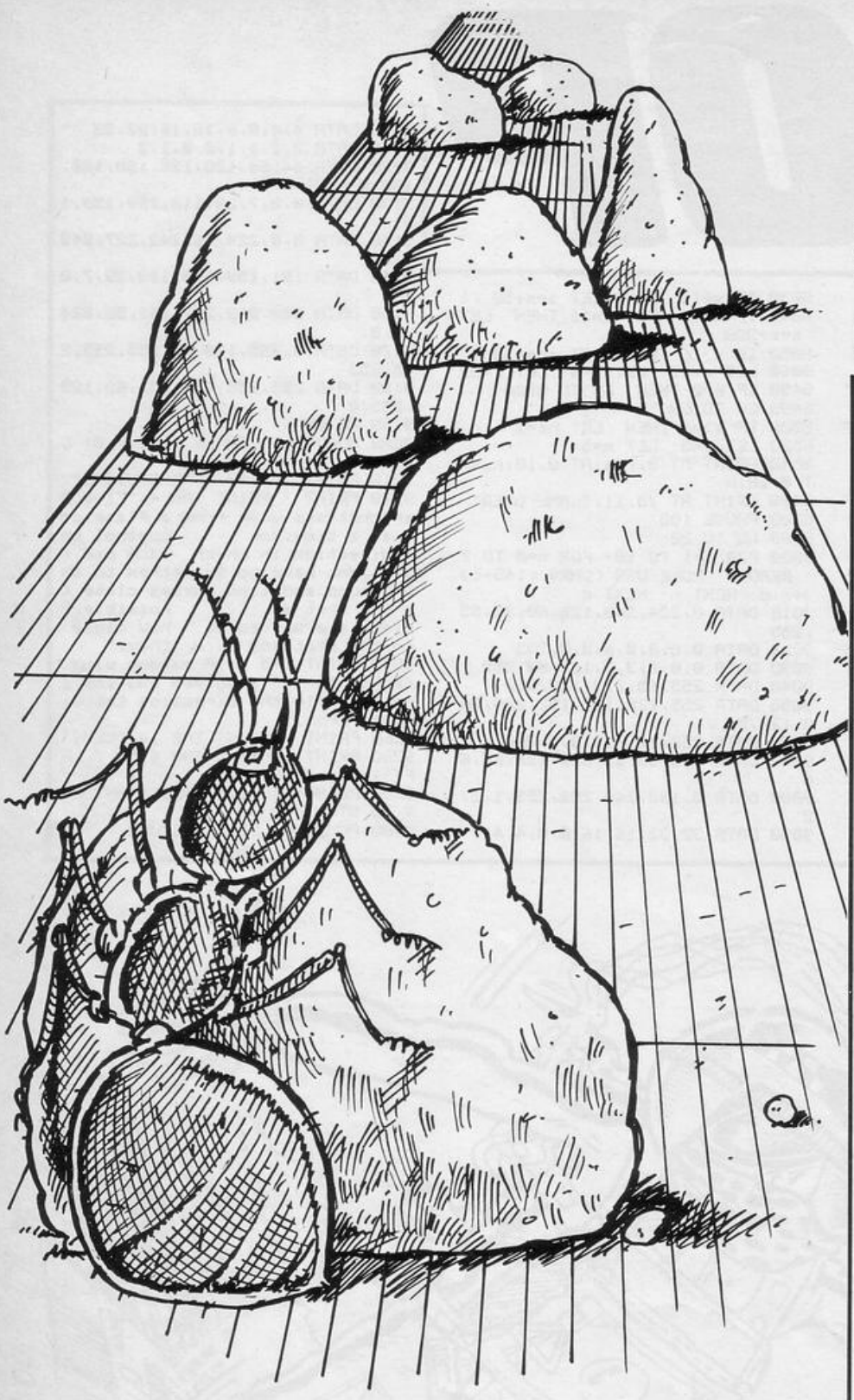
Air Drop was written for the 16K Spectrum by Simon Housden of Stroud, Gloucestershire.

```
  5 GO SUB 9000
 10 LET p=32: LET x=15: LET y=4
 LET s=0: LET hs=0: LET m=5
 20 BORDER 2: INK 1: PAPER 6: C
LS
 30 PRINT "DO YOU NEED INSTRUCT
IONS? (Y/N) "
 35 IF INKEY$="" THEN  GO TO 35
 40 IF INKEY$="y" THEN  GO SUB
9200
 99 CLS
100 FOR n=0 TO 31: PRINT AT 1,n
;"(198)";AT 21,n;"(198)": NEXT n
: FOR n=2 TO 20: PRINT AT n,0;"(
198)";AT n,31;"(198)": NEXT n
120 PRINT AT 0,1;"SCORE:";AT 0,
13;"HIGH:";AT 0,24;"MEN:"
140 PRINT AT 19,14;"m9n";AT 20,
14;"orp"
160 LET r=INT (RND*2)
1000 PRINT AT 0,7;s;AT 0,18;hs;A
T 0,28;m
1010 PRINT AT y,x-1;" ";AT y-1,x
-1;" ";AT y-2,x-1;" ";AT y,x+2;"
 ";AT y-1,x+2;" ";AT y-2,x+2;" "
1020 IF P=32 THEN  GO SUB 2000
1050 IF r=0 THEN  LET w=(RND*0.9
)
1060 IF r=1 THEN  LET w=-(RND*0.
9)
1100 IF INKEY$="p" THEN  GO SUB
3000
1110 IF INKEY$="o" THEN  GO SUB
4000
1200 PRINT AT y,x;"kl";AT y-1,x;
"ij";AT y-2,x;"gh"
1210 IF y>4.5 AND x>2 THEN  PRIN
T AT y-3,x-1;"   "
1222 IF y>4.5 AND x<29 THEN  PRI
NT AT y-3,x;"   "
1300 BEEP .005,w*10
1350 IF y>5 AND x>1.5 AND ATTR (
y-3,x-1)>7 THEN  PRINT AT y-3,x-
1;" "
1360 IF y>5 AND x<28 AND ATTR (y
-3,x+2)>7 THEN  PRINT AT y-3,x+2
;" "
1370 IF y>5 AND x>2.5 AND ATTR (
y-3,x-2)>7 THEN  PRINT AT y-3,x-
2;" "
1400 IF x>=28 THEN  LET x=2: PRI
NT AT y,28;"   (198)";AT y-1,28;
"   (198)";AT y-2,28;"   (198)";
AT y-3,28;"   (198)"
1410 IF x<2 THEN  LET x=28.5: PR
INT AT y,0;"(198)   ";AT y-1,0;"
(198)   ";AT y-2,0;"(198)   ";AT
 y-3,0;"(198)   "
1500 LET x=x+w
1800 IF y>18 THEN  GO TO 8000
1900 LET y=y+.2
1999 GO TO 1000
2000 LET p=p-1
```

DROP

```
2005 BEEP .006,10
2010 IF P<=30 AND P>=1 THEN  PRI
NT AT 2,P;"a";AT 3,P;"d"
2020 IF P<=29 AND P>=0 THEN  PRI
NT AT 2,P+1;"b";AT 3,P+1;"e"
2030 IF P<=28 AND P>=-1 THEN  PR
INT AT 2,P+2;"c";AT 3,P+2;"f"
2040 IF P<=27 AND P>=-2 THEN  PR
INT AT 2,P+3;" ";AT 3,P+3;" "
2050 IF P<-2 THEN  RETURN
2060 IF P=14 THEN  PRINT AT 4,P+
1;"kl"
2070 IF P=12 THEN  PRINT AT 2,P+
3;"gh";AT 3,P+3;"ij"
2100 GO TO 2000
3000 LET x=x+.5
3010 PRINT AT y,x-.5;" ";AT y-1,
x-.5;" ";AT y-2,x-.5;" "
3999 RETURN
4000 LET x=x-.5
4010 PRINT AT y,x+1.5;" ";AT y-1
,x+1.5;" ";AT y-2,x+1.5;" "
4999 RETURN
8000 LET m=m-1
8010 IF x>=13.5 AND x<=15 THEN
LET s=s+600: FOR n=30 TO -30 STE
P -1: BEEP .005,n: NEXT n: FOR n
=-30 TO 30: BEEP .009,n: NEXT n
8020 IF x<13.5 AND x>=13 THEN  L
ET s=s+300
8030 IF x<13 THEN  LET s=s+50
8040 IF x>15 AND x<=16 THEN  LET
 s=s+300
8050 IF x>16 THEN  LET s=s+50
8060 LET x=15: LET y=4: LET p=32
8450 IF m=0 THEN  GO TO 8500
8499 GO TO 99
8500 IF s>hs THEN  LET hs=s
8520 LET s=0: LET m=5
8540 PRINT AT 0,7;s;AT 0,18;hs;A
T 0,28;m
8600 PRINT AT 10,11;"GAME OVER"
8700 PAUSE 100
8999 GO TO 20
9000 FOR c=1 TO 18: FOR n=0 TO 7
: READ d: POKE USR (CHR$ (143+c)
)+n,d: NEXT n: NEXT c
9010 DATA 0,224,240,120,60,30,63
,255
9020 DATA 0,0,0,0,0,0,0,255
9030 DATA 0,0,0,3,7,111,63,255
9040 DATA 255,15,7,3,1,0,0,0
9050 DATA 255,128,192,192,224,24
0,120,56
9060 DATA 252,14,7,0,0,0,0,0
9070 DATA 0,3,15,63,255,128,64,6
4
9080 DATA 0,192,240,252,255,1,2,
2
9090 DATA 32,32,16,16,8,8,4,4
9100 DATA 4,4,8,8,16,16,32,32
9110 DATA 2,2,1,1,0,0,1,3
9120 DATA 64,64,128,128,128,128,
128,0
9130 DATA 0,0,7,28,113,199,159,1
91
9140 DATA 0,0,224,56,142,227,249
,253
9150 DATA 191,159,199,113,28,7,0
,0
9160 DATA 253,249,227,142,56,224
,0,0
9170 DATA 0,255,129,60,255,255,2
55,255
9180 DATA 255,255,255,255,60,129
,255,0
9199 RETURN
9200 BORDER 4: PAPER 6: INK 0: C
LS
9210 PRINT TAB 10;"PARACHUTING"
9220 PRINT : PRINT TAB 4;"Five P
arachutists jump from a Plane,on
e at a time.You       control th
e direction in which  each one f
alls.You have to guidethem to th
e ground and land themas close t
o the spot as         possible.P
oints are gained by   how close
to the spot you land  them."
9240 PRINT TAB 4;"A random wind
factor is      involved and you a
re not told the direction the wi
nd is from."
9260 PRINT : PRINT TAB 14;"KEYS"
9280 PRINT : PRINT TAB 6;"O...LE
FT , P...RIGHT"
9300 PRINT AT 21,5;"PRESS ANY KE
Y TO START"
9400 PAUSE 0: CLS : RETURN
```





OBSTACLE COURSE

COMPLETE the obstacle course using keys 6 and 7, avoiding the "A"s but hitting as many "*"s as possible. The obstacles multiply on completion of each screen and the score is given at the end of each game.

Obstacle Course was written for the 16K ZX-81 by D Lau of Burgess Hill, West Sussex.

```
 10 SLOW
 20 LET HI=0
 30 LET S=0
 40 LET T=20
 45 LET P=5
 50 FAST
 60 LET T=T+12
 65 LET P=P+5
 70 LET X=10
 80 LET Y=0
 90 FOR K=0 TO 21
100 PRINT AT K,0;"■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■"
110 NEXT K
120 FOR K=1 TO P
130 LET A=INT (RND*22)
140 LET B=INT (RND*28)+3
150 PRINT AT A,B;"*"
160 NEXT K
170 FOR K=1 TO T
180 LET A=INT (RND*22)
190 LET B=INT (RND*28)+3
200 PRINT AT A,B;"A"
210 NEXT K
220 SLOW
230 PRINT AT X,Y;"■>"
240 IF INKEY$="6" THEN GOSUB 36
0
250 IF INKEY$="7" THEN GOSUB 39
0
260 PRINT AT X,Y+2;
270 LET L=PEEK (PEEK 16398+256*
PEEK 16399)
275 IF L=23 THEN LET S=S+50
276 PRINT AT X,Y+2;
280 LET O=PEEK (PEEK 16398+256*
PEEK 16399)
281 IF O=38 THEN GOTO 310
285 LET Y=Y+1
287 IF Y=30 THEN GOTO 50
290 LET S=S+10
300 GOTO 230
310 CLS
320 PRINT AT 10,10;"SCORE:";S
330 IF S>HI THEN LET HI=S
340 PRINT AT 3,10;"HI SCORE=";H
I
345 IF INKEY$<>"" THEN GOTO 30
347 GOTO 345
350 STOP
360 LET X=X+1
365 IF X>=21 THEN LET X=21
370 PRINT AT X-1,Y+1;"■"
380 RETURN
390 LET X=X-1
400 IF X<=0 THEN LET X=0
410 PRINT AT X+1,Y+1;"■"
420 RETURN
```

Where to study computers

EACH MONTH from now, *Sinclair Programs* will publish a list of computer courses of interest to readers. Courses with priority in this section will be those aimed specifically at Spectrum, ZX-81, ZX-80 or QL users, courses in Basic, Z-80 machine code or Forth, and general introductions to computing.

If you run such a course please write to us with full details at 196-200 Balls Pond Road, London N1 4AQ. Details should include the name and duration of the course, where and when it will take place, price, any qualifications needed to begin the course, and the extent of access for the disabled.

The Prettygate Centre, Office and Activity Centre, The Philip Morant School, Rembrandt Way, Colchester CO3 4QS. Tel: Colchester 77458, runs a computer club on Tuesdays from 7.30 to 9.30pm which alternates with a tutor-led course. The standard course is of 12 hours and forms an introduction to Basic programming. Fees are 85 pence per hour; pensioners and under-18s pay half price and those in receipt of benefit pay 21 pence per hour.

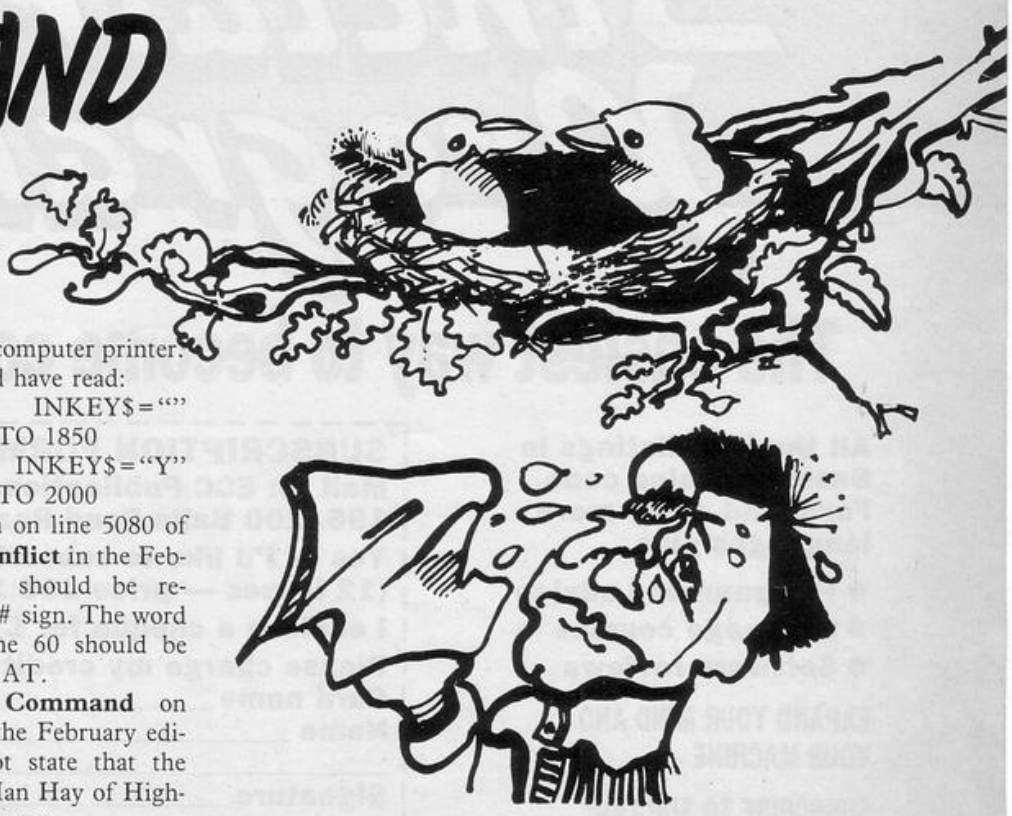
Network Enterprises Ltd (Tony Page or Judith Rose), 32 Great Marlborough Street, London W1. Tel: 01-437 1454, organises a range of one-evening specialist seminars, including introductions to computing, hardware courses, software courses, spreadsheet courses and word processors. Seminars are held at the American Club, 95 Piccadilly, London W1. They begin at 6.30pm, last approximately two-and-a-half hours, and cost £10.65 each.

Adult Education, Centre for Continuing Education, The City University, Northampton Square, London EC1V 0HB. Tel: 01-253 4399, extn. 3252 or 3268, runs a number of courses in computing and mathematics including An Introduction to Basic Programming which will consist of 10 weekly meetings beginning on Thursday, May 3. Times will be 6.30–8.30pm and the cost will be £25. History of Mathematics is a course for teachers which will run for 10 weeks from May 3. Meetings will be from 6–8pm and the course will cost £10.

City of London Polytechnic, Short Course Unit, 84 Moorgate, London EC2M 6SQ. Tel: 01-283 1030 runs a number of half-day and full-day courses in various aspects of new technology. Management Guide to Choosing a Computer will be a one-day course, held on April 3, which will review the various types of computer system available and provide practical advice and guidance on selection of software and hardware.

CTEC Ltd, 102–108 Clerkenwell Road, London EC1M 5SA. Tel: 01-251 4010 holds regular programming courses. Programming in Basic will run from March 26–30 and Wordstar Word Processing from March 28–30.

ERRORS AND MISHAPS



SEVERAL lines were omitted from **Panic** in the October edition of *Sinclair Programs*. They were:

562 IF A$="(i")" THEN GOTO 1000
563 IF E=12 THEN LET D=−1
564 IF E=3 THEN LET D=1
565 IF A$="(i*)" THEN LET S=S+INT (RND*30)
566 IF A$="(i*)" THEN GOTO 1000
569 PRINT AT A,B;A$

LINES 1870 and 1880 of **Abandoned House** in the January edition were scrambled by the computer printer. They should have read:

1870 IF INKEY$="" THEN GOTO 1850
1880 IF INKEY$="Y" THEN GOTO 2000

THE £ sign on line 5080 of **Cave Conflict** in the February issue should be replaced by a # sign. The word VAL on line 60 should be replaced by AT.

Missile Command on page 56 of the February edition did not state that the author was Ian Hay of Highbridge, Somerset.

SPECTRUM ORWIN SOFTWARE ZX-81

FOR 16K SPECTRUM
(will also run on 48K Spectrum)

CASSETTE A
GHOST GOBBLER Eat the ghosts before the ghosts eat you. Eat a star and you can chase the ghosts for a while.

ALIENKILL Control lasers, rockets and a force-field to stop the aliens from landing.
MOUSETRAP Trap the mouse in the corner but not anywhere else.
REVERSI A game of skill with simple rules but sophisticated tactics. Play against the computer.
LASER DEFENCE Control the laser sight to shoot down the alien ships. Machine code sound routines.

Ten programs for £6

TANK BATTLE For 2 players simultaneously or play against the computer. Each player has 2 rotate controls and move and fire controls. The tanks fire steerable missiles.
PHOEBUS A puzzle.
BLACKSPOT Gobble the stars and avoid running into black spots created by crossing your own path.
CUBE Manipulate a cube any size from 2×2×2 to 7×7×7.
MINEFIELD Collect the crowns while avoiding the mines and the electrified fence.

plus an extra . . .

GRAPHIC DEMO Did you know your Spectrum could do all this!?

EDUCATIONAL COMPENDIUM FOR 16K/48K SPECTRUM £6
All these programs on one cassette.

These programs were developed for use in a Junior School and have been in regular use there for some time. Older people also find them interesting and fun.

TORTOISE GRAPHICS: an educational graphics language.
16K version commands include: forward, left and right through a specified angle, wipe, pen up and down, paper and ink colour, macro, edit.
48K version has extra commands including: backward, quit, cancel, printer and tape commands, auto, home, variables, loops.

TORTRAIL & TORTMAZE: 16K games using the forward, left and right commands. These are good for learning a feeling for distances and angles and are fun to play.
REVEAL: an addictive 16K word game. A piece of writing has had its letters rubbed out and you have to find out what they are. You buy letters or try to predict them. Included are 20 textfiles to be solved and a textmaker which will let you input your own text and store it on tape for someone else to solve.
EQUATION INVADERS: a 16K game to make simple equations more interesting.

CENTIPOID PLUS THREE for 48K SPECTRUM. £6

CENTIPOID (machine code).
Centipoid is a full-feature arcade game with mushrooms, spiders, webs, scorpions, gobblers, indestructible dead segments of centipoids that drop down on you, and, of course, the centipoids themselves.
You can choose your own control keys. It is playable from the keyboard or using any joystick interface which, like AGF Interface II, makes the joystick behave like keys on the keyboard.

Plus these games in Basic for the 48K Spectrum on the same cassette.

PANIC

HOUND

3D TIC TAC TOE
A 3D game of skill played against the computer.

CASSETTE 1: eleven programs (including 7 in machine code): React, Invaders, Phantom Aliens, Maze of Death, Planet Lander, Bouncing Letters, Bug Splat, I Ching, Codebreak, Robots, Basic Hangman.
for 1K ZX-81 £3.80

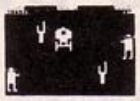
CASSETTE 2: ten games in Basic: Reversi, Awari, Laser Bases, Wordmaster, Rectangles, Crash, Roulette, Pontoon, Penny Shoot, Gun Command.
for 16K ZX-81 £5

CASSETTE 3: eight programs (including 1 in machine code): Starship Trojan, Startrek, Princess of Kraal, Battle, Cube, Kalabriasz, Secret Messages, Martian Cricket.
for 16K ZX-81 £5

CASSETTE 4 8 games for 16K ZX-81 £6

ZX-SCRAMBLE with 3 stages. (machine code) 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 ZX-81 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.

"quantity as well as quality"
Sinclair User, Oct '82

"if each game was on a separate tape and selling for £5 each I would still recommend them"
ZX Computing, Oct/Nov '82

"Easy to operate, graphically impressive and good value for money."
The Times, 11th Dec '82

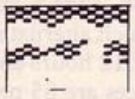
"Definitely good value for money at £6 . . . A smooth clear display and a relatively fast response from the keys. Graphics are as good as you will ever get on the 81."
What Micro? Nov '83

7 of the 8 games are in machine code, because this is much faster than Basic.
(Some of these games were previously available form J. Steadman).

CASSETTE 5 8 games for 16K ZX-81 £6

BYTE-MAN (machine code)
(previously available from Mindseye)

BREAKOUT (machine code)



PLANETOIDS (machine code)
Rotate, move, fire and hyperspace controls. Wide range of choice of speed and difficulty.

DODGEMS (machine code)
Dodge the computer's car while eating the dots.

DRAUGHTS (machine code)
Three skill levels.

MERCHANT (Basic)
Make your fortune on trading voyages in the Mediterranean and beyond.

SPACE RESCUE (machine code)
(previously available from Mindseye)

BLITZ (machine code)

"New polish on old favourites. . . . the quality of the software and the smooth action displays created on the screen make the programs worthwhile for anyone who has a ZX-81 and plays games using it. . . . It is pleasant to see that Orwin's kind of quality is available again."
Sinclair User, Sept '83

"Among the best reviewed was Cassette 5 from Orwin Software. For a mere £6, you get eight top-quality games . . . . All the games are of very high quality and would cost £4 or £5 if sold separately . . . Many of the other software houses could learn a lesson from these."
What Micro? Games supplement, Nov '83

7 of the 8 games are in machine code because it is much faster than Basic.

Member of the Computer Trade Association

Please make your cheques payable to ORWIN SOFTWARE and send your order to ORWIN SOFTWARE, Dept OSP, 26 Brownlow Road, London NW10 9QL

Send SAE for detailed catalogue

Trans cash 5054362

For orders placed at the Post Office

Sinclair Programs

The easiest way to become computer literate

All the best listings in Basic, machine code, Forth and many more languages plus

- **Programming advice**
- **Language courses**
- **Software reviews**

EXPAND YOUR MIND AND YOUR MACHINE

SUBSCRIBE TO SINCLAIR PROGRAMS TODAY

SUBSCRIPTION FORM
Mail to: ECC Publications Limited:
196–200 Balls Pond Road, London N1 4AQ
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 _____
N.B. This offer applies to U.K. subscribers only. Overseas rates available on request.

NO INTERFACE!!! SPECTRUM-STICK

ONLY **£9.95** INC VAT P&P

- OPERATES CURSOR KEYS DIRECT
- SIMPLY CLIPS ONTO CASE
- LEAVES REAR SOCKET FREE FOR ACCESSORIES
- NO WIRING
- 8 AXIS CONTROL
- ONE-HAND OPERATION
- ESSENTIAL FOR ALL FLIGHT SIMULATION GAMES
- IDEAL FOR PLOTTING & DRAWING
- TOUGH MARANYL NYLON MOVING PARTS

READ WHAT THE PRESS SAYS:

"An ingenious low-cost joystick" —*Popular Computing Weekly.*

"Robustly made and handles well" —*Personal Computer Games.*

"An ingenious device . . . found it to work well" —*ZX Computing.*

"The best-feel joystick . . . produces 8 directional movement with perfect accuracy . . . a worthwhile investment" —*Crash Micro Games Action.*

"Ingenious design . . .will help zap many an alien" —*Sinclair User.*

Now that most modern programs offer user-defined or cursor key choice, Spectum-Stick is being used more and more, even by owners of interface type joysticks who prefer the light one-handed control plus the freedom to plug in other accessories to the Spectrum rear sockets.

We cannot list all the programs suitable for Spectrum-Stick, but here are a few:

Atic Atac	Fighter Pilot	Nightflight	Knot in 3D
Apple Jam	Flight Simulation	Paratroopers	Vu 3D
Airliner	Froggy	Paint Box	Wheelie
Bedlam	Gold digger	Robot Panic	3D Desert Patrol
Bonkers	Gold Rush	Scuba Dive	3D Maze of Gold
Bubble Trouble	High Rise Harry	Splat	3D Tunnel
Caterpillar	Maze Death Race	Super Digger	3D Vortex
Chopper Rescue	Maziacs	Spectrapede	Last Sunset
Cybertanks	Mined Out	Harrier Attack	Corrodirs of Genon
Earth Defence	Missile Defence	Morris Meets Bikers	Etc. etc. etc.

CLIP-ON AND TURN-ON TO SPECTRUM-STICK

To: GRANT DESIGN LTD, BANK HOUSE, REEPHAM, NORFOLK NR10 4JJ
Please rush me a Spectrum-Stick Controller. I enclose Cheque/PO for £9.95. (Payable to Grant Design Ltd.) CREDIT CARD HOTLINE 0603 870852 (24 hour)
Please charge my Access ☐ Visa ☐ Credit Card Number

NAME.....

ADDRESS.....

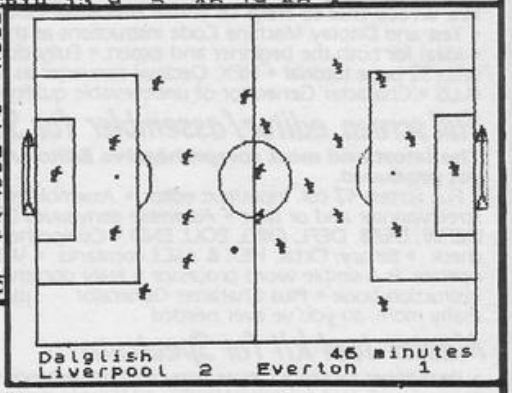
.....

.....Post Code.....

SUPER-LEAGUE ©

For use on 48K SPECTRUM

		W	D	L	F	A	Pts
1	Ipswich T.	16	6	5	41	20	54
2	Liverpool	16	5	6	61	31	53
3	Notts Cnty	13	9	5	46	19	48
4	Birming						
5	West Ha						
6	Southam						
7	Leicest						
8	Notts.						
9	Wolves						
10	Tottenh						
11	Sunderl						
12	Q.P.R.						
13	Watford						
14	Everton						
15	Norwich						
16	Coventr						
17	Aston V						
18	Man.Uni						
19	Luton T						
20	W.B.A.						
21	Arsenal						
22	Stoke C						



- Full 22-team League
- 42-match season
- Full 11-a-side match action
- Scale 90-minute game
- On-screen commentary showing current score, name of player in possession, time played
- Individual player skills
- League table and results on screen and printer
- Save season to date on tape

Be a top tactician and watch your team play in the safety of your home!

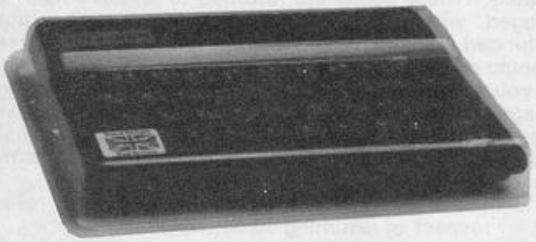
Also form any league of 22 teams and pick your own players!

£6.50 (inc. p. & p.)

Order direct from
CROSS SOFTWARE,
36 Langford Crescent,
Barnet, Herts, EN4 9EH

Also available from selected stores in the London area (including Virgin Megastore, Oxford Street)

DUST AND DIRT ARE ONE OF THE MAJOR CAUSES OF KEYBOARD FAILURE



PROTECT YOURS NOW WITH A GRAINGATE KEYBOARD COVER

Available for Spectrum, BBC, Dragon, Commodore 64 and VIC. Also ZX Printer Covers that keep your Printer dust and dirt free whilst you're using it – incorporates a special paper support for easy reading. All products available for the same amazingly low price of **£1.25** inc. p&p.

Save yourself £'sss.

The unbeatable Graingate Hi-Amp Beep Amplifier. Budget priced model adjusts from very low to 'turn that' down – all for the special Graingate price of **£6.99** inc. p&p.

For list of computer leads at factory prices (send sae) and ordering above products reply to:

GRAINGATE LTD
Unit 9, Bennerly Court, Blenheim Industrial Estate,
Bulwell, Nottingham NG6 8UT. Telephone: (0602) 756097

HIRE SPECTRUM SOFTWARE

FREE *FIRST TAPE HIRE 26 PAGE CATALOGUE NEWSLETTER*

OVER **250** *DIFFERENT ZX SPECTRUM PROGRAMMES AND OVER 2000 TAPES IN STOCK*

ANY TWO TAPES ONLY £2.20 (inc VAT & p&p) *FOR TWO WEEK'S HIRE*

LIFE MEMBERSHIP ONLY £6.00

MANY POPULAR TAPES ALSO FOR SALE AT DISCOUNT PRICES

JOIN NOW or send 30p stamps for catalogue

NATIONAL SOFTWARE LIBRARY

200 Mulgrave Road,
Cheam, Surrey SM2 6JT

I enclose cheque for £6.00 for LIFE MEMBERSHIP and I understand that my first tape hire will be FREE. If, within 28 days, I'm not delighted with your service you'll refund my membership fee.

Name _____

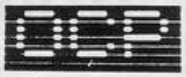
Address _____

_____

_____

SP4

All YOU NEED TO CRACK MACHINE CODE



For the Spectrum 16k & 48k

Test tools for Spectrum & ZX81/TS1000

The ultimate professional tutor and de-bug program. We wrote this to help us write Machine Code!!

• Test and Display Machine Code instructions as they're written • Ideal for both the beginner and expert • Fully documented with 32 page tutorial • HEX: Decimal converter as standard • PLUS • Character Generator of unbelievable quality!!

Full screen editor/assembler for Spectrum

The latest and most comprehensive Editor/Assembler yet produced.

• Full Screen 42 col. input/text editor • Assemble to screen/printer and or tape • Assemble derivatives DEFM, DEFS, DEFW, DEFB, DEFL, ORG, EQU, END • Comprehensive syntax check • Binary, Octal, HEX & ASCII constants • Will even operate as a simple word processor • Fully documented instruction book • Plus Character Generator . . . plus, many, many more, all you've ever needed

Master tool kit for Spectrum

• Re-number facility • Delete copy and move block function • String search and substitute facility • Variable dump • Cross reference • Trace function • Real time clock and alarm system.

POST TO: OXFORD COMPUTER PUBLISHING LTD., P.O. BOX 99, OXFORD

Please send ☐ **Machine Code Test Tool** ZX81
☐ **Machine Code Test Tool** Spectrum
☐ **Editor Assembler** ☐ **Tool Kit**

£9.95 each, any 2 or more **£9.25** (Postage free UK only). Overseas add £1 per program.

NAME .....

ADDRESS .....

Also available from most branches of W. H. Smith and other retailers. Also from Buffer Micro. Streatham.

ACCESS CARD NO. .....

EXPIRY DATE SPG4/84

APOLOGY

We apologise to all purchasers who experienced delays in receiving ZX81 software offered in our new year sale. The delays resulted from the unexpectedly high volume of orders. The backlog has now been cleared. Look out for our next special offer!

The Software Workshop,
Yew Tree, Selbourne,
Hants GU34 3JP

Reach an estimated readership of over 200,000 users per month for as little as £2.00*.

Or if you are starting your own small business advertise in the classified for only £10.00.

Yes all you have to do is fill in the coupon below including your name, address and/or telephone number and send to: Sinclair Programs, ECC Publications, 196–200 Balls Pond Road, London N1 4AQ.

Maximum 30 words.

Your advert will appear in the earliest possible edition.

Name .....

Address .....

..... Tel: .....

Have you included the fee of £2.00 or £10.00?

***for second hand sales only**

Conditions
The Advertisement Manager reserves the right to alter, reject or suspend an advertisement without assigning any reason. Advertisements are accepted subject to approval of copy and to the right of the Advertisement Manager to alter, reject or cancel any order without explanation. The Proprietors are not liable for any loss from any cause whatever, nor do they accept liability for printers' errors. The Advertisers shall indemnify the Publishers in respect of any claim, cost and expenses arising out of any libellous or malicious matter or untrue statement in any advertisement published for the advertisers, or any infringement of copyright, patent or design therein. The placing of any order will be deemed to be an acceptance of these conditions.

MAIL ORDER PROTECTION SCHEME

Advertisements in this magazine are required to conform to the British Code of Advertising Practice. In respect of mail order advertisements where money is sought in advance of the despatch of goods the Code requires the advertiser to despatch goods within 28 days, unless a longer period is stated. Where goods are returned to an advertiser, undamaged, within 7 days, the purchaser's money must be refunded, plus the cost of returning the goods. The reader should retain evidence of despatch.

If you order goods from mail order advertisements in this magazine and pay in advance of delivery you will be considered for compensation under the Scheme if the advertiser becomes insolvent or ceases to trade provided that:

(a) you have not received the goods, or a refund in respect of returning same, AND:

(b) you write to the Advertisement Manager of this magazine, stating the facts, not earlier than 28 days from the date of the order and NOT LATER THAN THREE MONTHS from the date on which the advertisement appeared.

THE SCHEME ONLY COVERS ADVANCE PAYMENT SENT IN DIRECT RESPONSE TO AN ADVERTISEMENT IN THIS MAGAZINE. IT DOES NOT COVER:—

(a) Classified advertising;

(b) payment made in response to catalogues, brochures, etc. received as a result of responding to such advertisements;

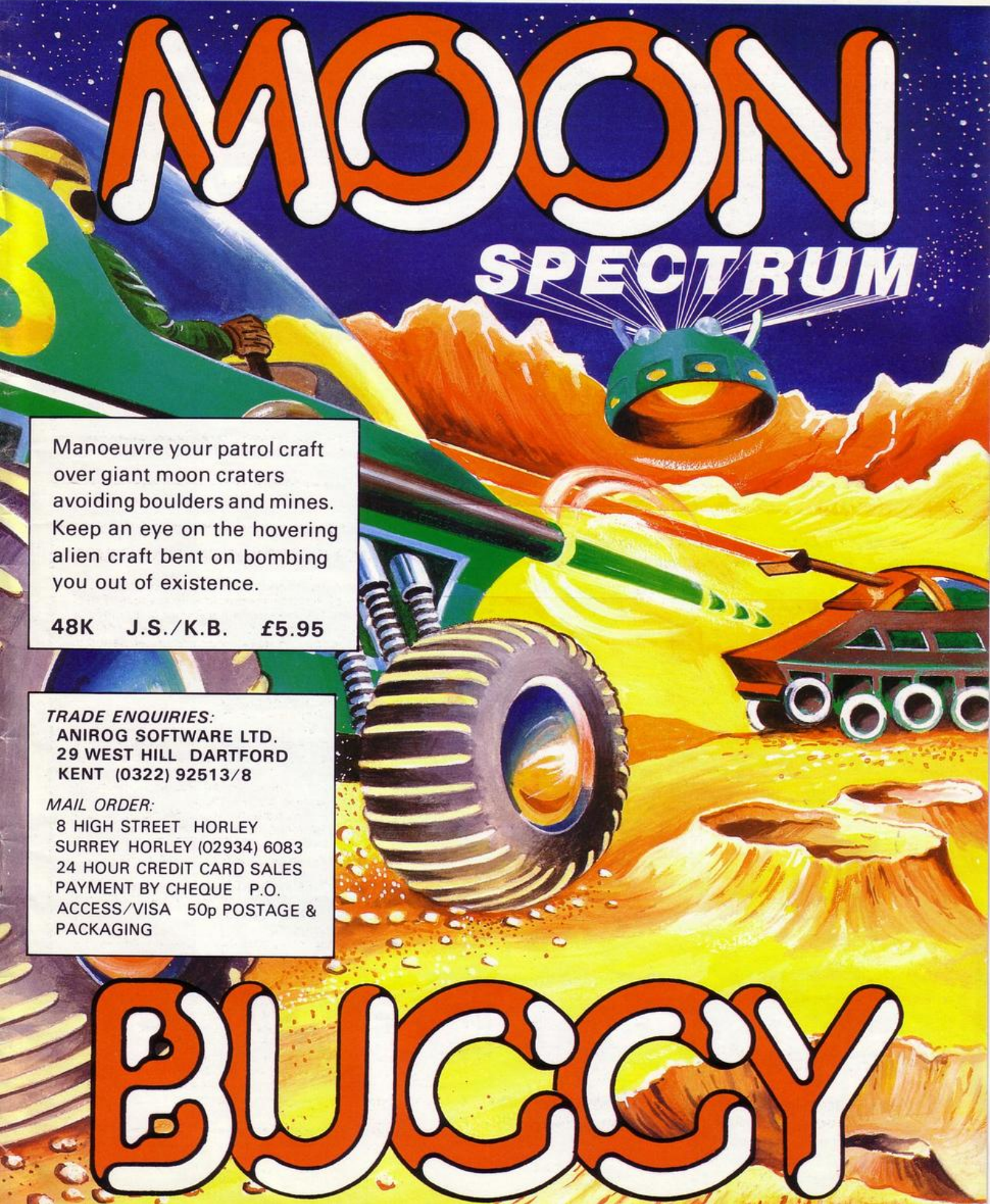
(c) advertisers offering services as opposed to goods,

(d) claims where payment is made with Access or Barclaycard and where the cost of the goods is over £30. In this case claims should be made to the Credit Card Company concerned.

Full details of the Scheme are available by sending a stamped and addressed envelope to Mail Order Protection Scheme, Periodical Publishers Association, Imperial House, Kingsway, London WC2B 6UN.

ANIROG

The Name For Quality And Innovation



Manoeuvre your patrol craft over giant moon craters avoiding boulders and mines. Keep an eye on the hovering alien craft bent on bombing you out of existence.

48K J.S./K.B. £5.95

TRADE ENQUIRIES:
ANIROG SOFTWARE LTD.
29 WEST HILL DARTFORD
KENT (0322) 92513/8

MAIL ORDER:
8 HIGH STREET HORLEY
SURREY HORLEY (02934) 6083
24 HOUR CREDIT CARD SALES
PAYMENT BY CHEQUE P.O.
ACCESS/VISA 50p POSTAGE & PACKAGING

It's no picnic!

But if you go down to the woods today, will you help Ted get his batteries?

Or will you get bovvered?

Or get the cocktail?

Will you ever reach the 8th round?

Come to that, will you ever work out the scoring system?

BEAR BOVVER

£6·95

For Sinclair Spectrum 48K

Available from:-
Artic Computing Ltd.
Main Street,
Brandesburton
Driffield
YO25 8RG
Tel: 0401 43553

Artic Computing Ltd