

# POPULAR Computing WEEKLY

SPECIAL TAPE OFFER

35p 2-8 February 1984 Vol 3 No 5

## This Week

### Programming

R G Luxton explains how to create a program to keep file records on the ZX81. See page 18.

### Reviews

Brian Cadge looks at the latest Dragon software including *Shaft* from Dragon Data and *Ugh!* from Softek. Page 14.

### Commodore 64

Milos Versipellis presents a program to turn your computer into a synthesiser using the SID chip. See page 28.

### New Releases

Included in this week's selection are *How Long Have You Got* by Eastmead and *Megawarz* from Paramount Software. Page 56.

**★ STAR**  
Follow on BBC B  
See page 10  
**GAME ★**

## News Desk

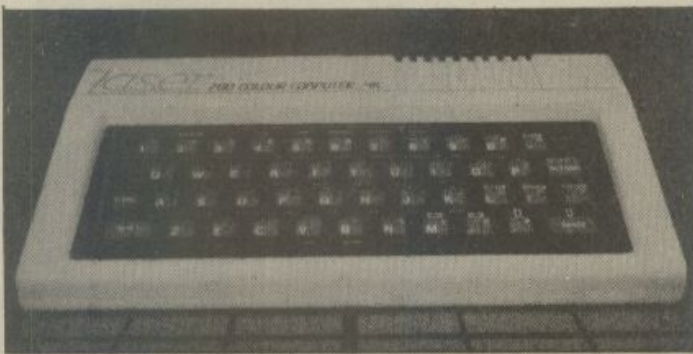
### Laser's future in doubt

THE future of the Laser 200 computer now looks uncertain, following the collapse of its UK distributor, Computers For All.

The company formally notified its dealers last Thursday that "due to financial difficulties" it had ceased trading.

The crash could prove fatal for the £69.95 Laser 200. The machine has not been adopted by any of the major high-street chains, and software for the machine is in very short supply.

The Laser 200 has had a  
**Continued on page 5**



### CBM micros in UK by the summer

COMMODORE is to sell its new range of microcomputers — the successors to the Commodore 64 — in the UK by the early summer.

The most sophisticated of the new machines will be priced well under £400 although the choice of models to be offered in Britain has still to be decided.

There is more to Commodore's new range than the two micros — the 264 and the V364 — previewed at the CES trade fair in Las Vegas last month.

These machines are just two options from a whole range of computers. Using a modular design Commodore can produce a new micro with a choice of three types of keyboard and anything from 16K to 64K Ram, in 8K steps.

The three-figure code numbers for the computers denote the keyboard type in the first number and memory capacity in the other two. For example, the Commodore 116 has a calculator-type keyboard and 16K Ram. The 264 has a professional keyboard and 64K Ram while the V364 has a built-in voice synthesis, a professional keyboard with separate numeric pad, and 64K Ram. All of the machines are built around the 7501 processor chip — an 8-bit development of the 6502 with built-in video processor.

Commodore has chosen a modular design because computer markets around the world are at different stages of development and Commo-

**Continued on page 5**

## Classified

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### AQUARIUS SEE PAGE 52

**VALHALLA**

## Classified

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**Continued on page 50**

**BRITAIN'S BEST-SELLING MICRO WEEKLY**



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### 48K SPECTRUM ANT ATTACK £6.95

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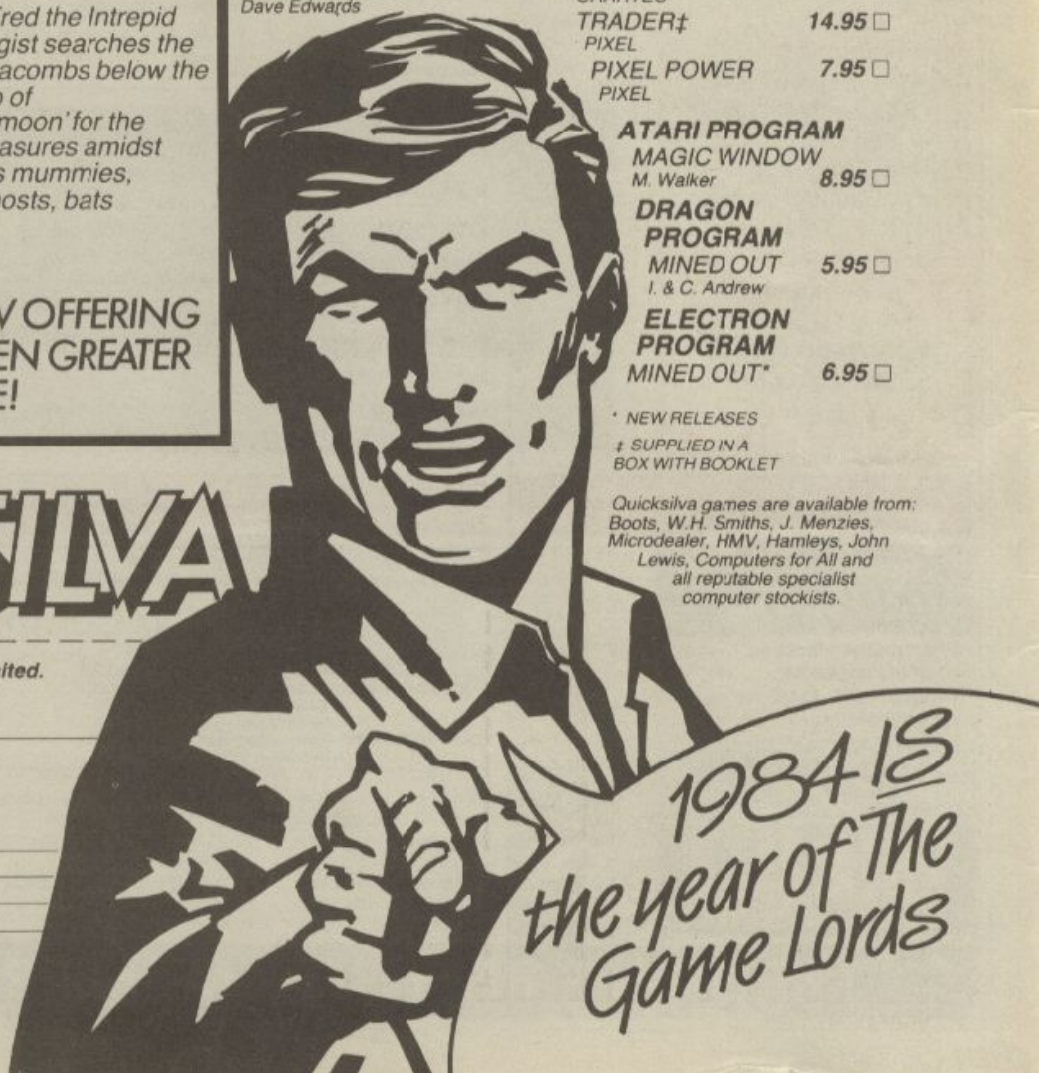
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### Accuracy

*Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

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## Editorial

THE announcement that Timex will neither manufacture Sinclair's QL computer nor market it in the US has led to speculation that the three-year association between the two companies may be nearing an end.

Yet the reason Timex will not manufacture the QL is a technical one. Timex's plant in Dundee would not have been suitable without considerable further investment in the site — a step Timex are unwilling to make.

As for the reason the QL will not be sold by Timex in the States, most observers point to Timex's poor handling of the previous American Sinclair machine, the 2068 version of the Spectrum. By dithering for almost a year Timex has denied the 2068 wide distribution and, by early December, only around 40,000 had been sold.

Timex proved to be too big an organisation to move quickly, and speed — as others like Atari and TI have found to their cost — is vital for a successful micro company.

But it is not Timex's performance which has been the main deciding influence on Sinclair choosing to sell the US QL itself. The reason for going it alone is simple: Sinclair is a far stronger company now than it was two years ago and — never shy of a challenge — it now wants to see if it can crack The Big One.

Unfortunately, Timex's record with the 2068 will not have helped Sinclair's job of selling the QL in America.

And Timex, without the QL, seems unlikely to be able to continue as a force in the micro world, except as an assembly facility.

## Next Thursday

You must guide your unarmed robot around the screen, avoiding the deadly red blocks — at the same time you are being followed by a red droid. Follow — next week's game for BBC model B by Andrew Pfahler.

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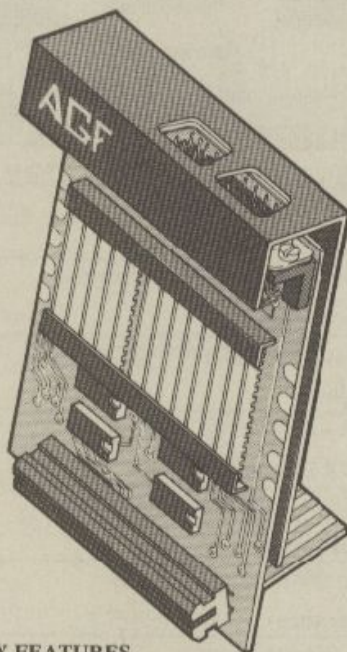
Programming is achieved by a two-digit code, which is looked up on the Programming Chart supplied, for each direction and firing button. These two numbers are then selected on a pair of leads which are clipped onto appropriately numbered strips on the interface.

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## Off the board for Scrabble

BOARD game makers Waddingtons and J W Spear have teamed up with a new company — Leisure Genius — to produce microcomputer versions of their famous titles.

This follows a first successful venture by Leisure Genius' associate company Little Genius last year — the top-selling program of P Spear's *Scrabble* for the Spectrum. That project was programmed by Psion and marketed by Sinclair. Now, Leisure Genius has established its own programming team to develop *Scrabble* for other computers. A Commodore 64 version will appear in March, to be fol-

lowed by a BBC Model B program.

In what appears to be a major change of policy, Waddingtons has also signed up with Leisure Genius. Waddingtons had previously seemed to view micros as a threat to its board game trade rather than as a new development in games.

Leisure Genius will sell a version of *Cluedo* for the Commodore 64 in March, to be followed by a Spectrum conversion in May.

The company is also to sell a micro title based on the Invicta game *Mastermind*.

All programs will sell for

between £7.95 and £14.95.

Says Peter Deutsch, managing director of Leisure Genius: "What we are doing is an extension of what Melbourne House has done with *The Hobbit*. We now have considerable experience of dealing with board game manufacturers and we see ourselves very much as an extension of those companies.

"We also hope these relationships will continue. For Waddingtons we are currently developing computer programs based on their new range of pre-school educational toys."

## Laser 200

Continued from page 1

chequered career. It is one of a number of machines — including the Comex 35 — designed and built by a Hong Kong-based company, Video Technology. It made its first appearance in an earlier guise as the Textet. Then Video Technology linked up with Leisure Zone to promote both machines to be distributed by Computers For All.

In the middle of last year Leisure Zone and Video Technology parted and Computers For All became sole distributor for the Laser 200 and Comex 35 computers.

Computers For All — the trading name of Moranbrook — was formed by Jeff Weinrich in 1980 and began by producing software for the ZX80. The company switched to retail distribution of computers, beginning with the Dragon, Oric and more recently the Tandy Model 10.

First deliveries of the Laser through Computers For All began in September 1983.

## Commodore

Continued from page 1

dore's many subsidiaries each have different requirements for a new machine.

It has apparently still not been decided which machines from the range will appear here in the early summer. Commodore UK is known to be keen on the 116 machine as a competitor for the Sinclair Spectrum. It also seems likely that the 264 will be sold in Britain.

## Single-board 6809 system for BBC

SOMEWHAT in advance of Acorn's own expected Z80 and 6502 second processors for the BBC micro comes a single-board 6809 system from Cambridge Microprocessor Systems.

The board can either sit inside the machine connecting via the tube interface or be connected using a Eurorack if expansion of the 6809 bus interface is required.

Once installed, the system allows disc software written for the Flex operating system to be run on the BBC — including a number of high-level languages like PL9, C, BCPL, Fort and Fortran.

The 6809 system includes a monitor Rom and a BBC Basic program on disc to link in the new processor card. The price for the board is £249

## Speech cartridge for the 64

COMMODORE is working on a Text/Speech cartridge for the Commodore 64.

The software Rom will plug into the Magic Voice sound synthesiser unit and convert text simply keyed-in to speech.

## IBM college scheme

IBM has announced a £400,000 scheme to provide colleges with microcomputers.

Ninety-two selected universities and polytechnics will each receive a free IBM PC machine under the plan.

and the Flex operating system costs another £130. Details from Cambridge Microprocessor Systems, 11 St Margaret's Road, Girton, Cambridge.

## Macintosh micro from Apple



APPLE has formally announced its new Macintosh computer.

It offers the same window graphics and 'mouse' cursor control as Apple's Lisa machine, but at around a third

of the price.

The Macintosh uses the 68000 processor, from the same family of chips as that used in the new Sinclair QL.

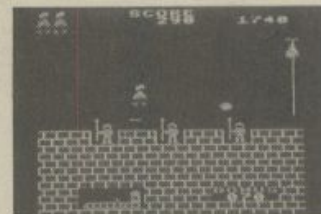
It has a built-in 9-inch black-and-white screen, single 3½-inch disc drive, 128K Ram, 64K Rom, built-in clock, and external disc, RS-232 and RS-422 interfaces.

The machine will sell in the US for between \$3,000 and \$3,500. It is expected to arrive over here in April, priced around £2,500.

## Century collapses

CENTURY Electronics, the only UK company designing arcade game machines, has gone into liquidation.

The company, based in Manchester, was the largest originator of coin-operated video games outside Japan and the US.



It was best known for the development of one of last year's most successful arcade titles — *Hunchback*. The game was also successfully licensed to two home computer software houses — Superior Software for the BBC version and Ocean for the Spectrum, Oric and Commodore 64 conversions.

Century was one of the first arcade game companies to licence its titles for home computers and its managing director David Jones campaigned vigorously against unauthorised home computer versions of coin-operated games.

## Phillips talk to Atari

WISSE Dekker, President of the Dutch electronics giant Philips, has confirmed that his company has been involved in talks with the troubled US microcomputer manufacturer Atari, concerning a number of possible joint ventures.

The preliminary discussions have dealt mainly with Atari's interests outside the US. Under consideration has been the possibility of a joint venture in Europe to expand Atari International and the idea of a research effort by the two companies to develop video-disc games using Philips' Laservision technology.

Both Dekker and Atari's chief executive James Morgan have denied rumours concerning a possible takeover of Atari International by Philips (see *Popular Computing Weekly*, December 15).

Over the last nine months Atari has produced a deficit of over \$500m.





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# LETTERS

## Ideal language

I write in response to Jeremy Ruston's outline of an ideal high-level language (PCW 12-18 January). The @ indirect operator he describes is in fact simply the Spectrum's Val function! The Spectrum does Val x\$ by looking at x\$ and using it as an indirect pointer to the variable or other expression whose name is written there. If the expression is a string you must of course use Val\$ provided by Sinclair for this purpose. The method can be applied to any depth.

My own ideal language would be a sort of hybrid of BBC and Spectrum Basic — it should have the huge array of structures provided on the BBC, but also the unique flexibility of the Spectrum's interpreter which manages to understand things you intuitively feel Basic ought to understand, like Goto variable, Gosub variable, and so on. Do any other readers have views on what they would consider an ideal language?

Iain D Stewart  
17 Torry Drive  
Alva  
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Scotland FK12 5NQ

## Pimania solved

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See you there, Mr Pi.

Yours,  
A Faithful Pimaniac

## Very average

I'm getting sick and fed up with your correspondence on high scores on Arcade-style games. I'm very average indeed at these games and I'm proud of it.

I mean what imaginative person wants to go through the repetitive motions of playing a game just to achieve 999,990.

Surely the game ceases to be a challenge at around the 100,000 mark. Personally I prefer adventures, it took me just over eight hours to complete the excellent Black Crystal — beat that, arcade junkies!!

Gareth P Jones  
6 Victor Road  
South Kirkby  
Pontefract  
W Yorks  
WF9 3DF

If any arcade junkies can beat that, perhaps they would just like to smile knowingly to themselves.

## Down under

In a recent issue of PCW Andy Wilson asked what a Bunyip was. Well, it's a creature of Australian Aboriginal folklore. The story is (roughly) this: the Bunyip lived with its mother at the bottom of a deep pool but was kidnapped by some Aborigines. I think its mother was something to do with water or rain. Anyway she got a bit upset and nasty and got her Bunyip back. I can't remember why, but now Aborigines treat some waters with respect.

Brian Langley  
34 Royal Sussex Crescent  
Eastbourne  
E Sussex

## Commodore tip

Here is a tip for Commodore 64 owners: Whilst it is true that you cannot enter more than two lines



"We'd better settle the matter before we begin manufacturing"

## A mirror image on screen

I've seen a program in a past issue of your magazine that copies a third of the screen of the Spectrum to the middle. The author of the program suggests that a routine like this could be used to produce a mirror image of the top third of the screen to the bottom third.

On writing such a routine, I decided that it was too slow to use usefully in a program. However, the following machine code routine provides an almost instant reflection of

the top eight lines to the bottom eight. This leaves eight lines in the middle as the routine uses the bottom two lines not normally available in Basic.

The routine is totally relocatable, making it suitable for both 16K and 48K Spectrums. To activate, type Randomise USR 'start address'.

David Channon  
5 Bowland Drive  
Walton Park  
Chesterfield

```
10 PRINT "WHERE DO YOU WISH TH  
E ROUTINE TO BE LOCATED."  
20 INPUT A  
30 FOR N=A TO (A+33)  
40 READ D: POKE N,D  
50 NEXT N  
60 DATA 33,0,64,17,224,87,6,64  
197,6,32,126,213,226,213,228,11  
225,209,35,19,16,244,197,8,64,  
227,16,253,193,193,16,231,201,0
```

of text from the keyboard, a program typed in on a Vic20 and saved on disc or tape and then loaded into the 64 will be accepted and will also Run (provided, of course, that Peek and Poke commands do not clash).

Richard Barton  
133 Stamford Road  
Dagenham  
Essex

than games than you realise.

J R Ryder  
Greenfields  
Greenfields Close  
Heath Green Lane  
Horley  
Surrey

Andy Pennell writes:  
The answer depends on which model of Spectrum you have. In models one and two there is a line marked Video on the PCB which you simply have to connect up to the edge connector with a blob of solder. Most model threes already have this connection made. Once done, simply hook up a lead from the edge connector to the monitor.

## Ace enthusiasts

In reply to John Noyce's letter regarding the Ace Users' Club, what I and many Ace users want is an independent club, where ideas and programs can be exchanged freely. We do not want a club that is just a front for a software house trying to boost its sales.

More power to Phil Murray — let's get the Ace Club for Enthusiasts on the road.

Derek Thomas  
32 Bathurst  
Orton Goldhay  
Peterborough  
Cambs

## Sadistic preview

I read with great interest Andy Pennell's preview of the Sinclair QL. As a Spectrum owner I was particularly interested in his comments concerning provision on the Spectrum for a colour composite monitor. How sadistic can you get!

You fed me the sprat and left the mackerel unhookable! Please put me out of my misery, document the undocumented and tell me what needs to be done to hook up my Spectrum to a colour composite monitor.

To change the subject I do agree with Steven Mason that you tend to concentrate too much on games and not enough on more serious software. I think there are more of us using our micros for things other



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# You've read the game... now play the book...

## MY SECRET FILE

Program by Phil Nathans

Based on the best-selling Puffin book by John Astrop

A personal database for your darkest thoughts.

Do you have secrets you wouldn't even confide to your closest friend? Let alone your family?

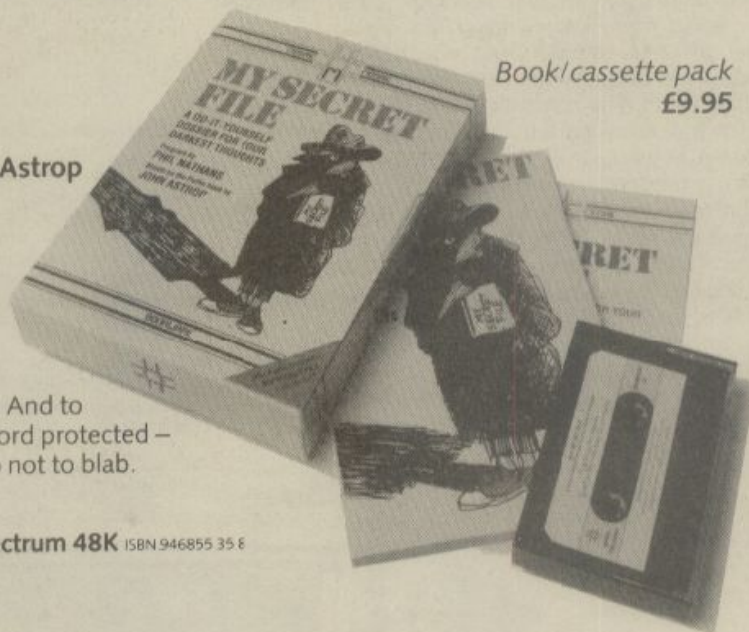
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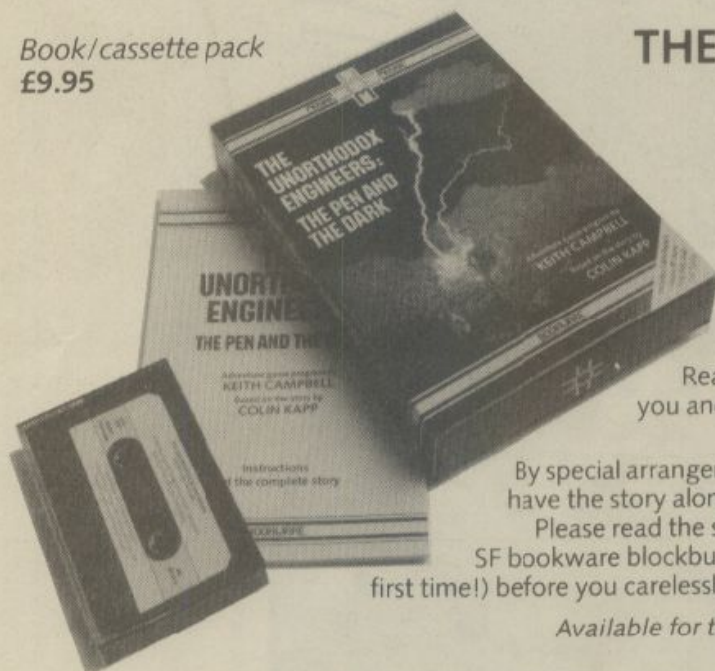
Trust no-one: file your friends before they file you.

Available for the: **Commodore 64** ISBN 946855 30 7 **Spectrum 48K** ISBN 946855 35 8  
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## THE UNORTHODOX ENGINEERS: THE PEN AND THE DARK

Adventure game program by Keith Campbell  
Based on the story by Colin Kapp

Colin Kapp created the classic SF stories about the Unorthodox Engineers – and now you can try to solve the mystery of the indestructible pillar of darkness and the riddle of contra-energy in this mind-bending text adventure game.

Reading Colin's story in this pack should help you. But once you and your micro are locked into the problem, not even Colin could get you out.

By special arrangement with an unspecified alien culture, Mosaic will let you have the story along with the program – so at least you're in with a chance.

Please read the story carefully . . . because we'd like to release our Spring SF bookware blockbuster (Harry Harrison's *Stainless Steel Rat* on micro for the first time!) before you carelessly unleash contra-energy across the universe. Thank you.

Available for the: **Spectrum 48K** ISBN 946855 15 3 **BBC Micro B** ISBN 946855 20 X

Available from good bookshops and computer stores.

Published by Mosaic Publishing Ltd

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BOOKWARE



# Bandit

A new game for 16/48K Spectrum by K Deakes

**B**andit is a fruit machine for both the 16K and 48K Spectrum which has all the features of the real thing, except, of course, actually paying out. It is written in two parts in order to fit it into the 16K machine, which would otherwise be difficult.

You begin with £1 and each go costs 10p. Apart from just spinning the reels, there are also random hold and nudge features indicated by relevant noises and flashing lights. The holds allow you to hold any of the reels on the following go by pressing keys 1, 2 or 3 as appropriate. Before a reel can be nudged, key N must be pressed to determine the number of nudges available. Then, by pressing keys 1, 2 or 3 again the reels are nudged until a win occurs or your quota has been used. There is also the option to cancel holds and remaining nudges. If required, instructions are displayed as necessary.

Listing 1 is the main program and should be typed in first and then Run to Save.

After *Verifying* it, stop the tape and type in listing 2. When Run, this program will *Save* the user defined graphics, arrays *a\$* and *c*, and screen, and these should be *Saved* on tape just after the main program. Finally, the program will *Save* itself as a precaution. Everything should now *Load* automatically.

## Notes:

### Listing 1

#### Lines:

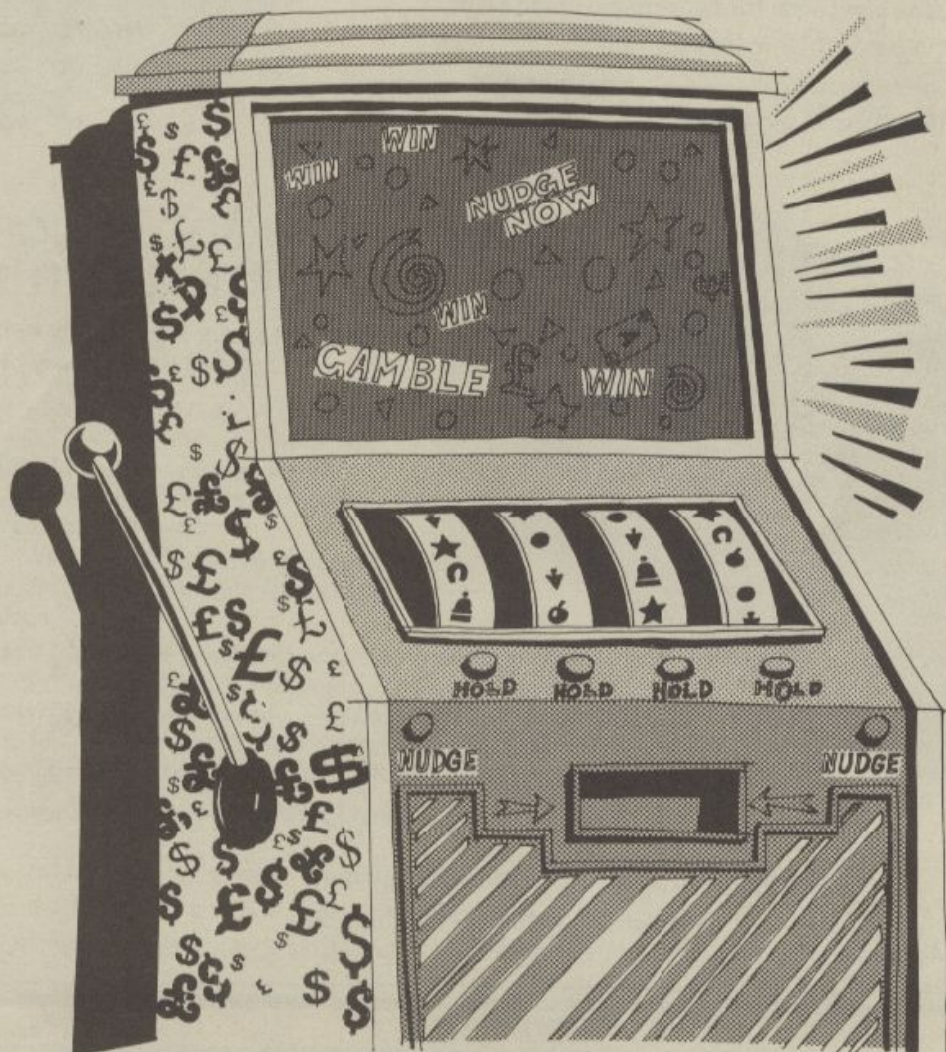
10 Saves the program to run automatically on loading  
40-110 Start the game and take it through the various subroutines  
500-540 A series of For-Next loops to 'rotate' the reels and to check which parts of the arrays (*a\$* and *c*) are in use  
700-880 Since SCREEN\$ cannot be used for distinguishing user defined graphics on the screen, the display file is PEEKed to check for a win  
900-1250 Nudge subroutine. Line 900 determines if there is to be a nudge. Lines 1000-1100 determine the number of nudges and lines 1120-1250 count the nudges used and

check which keys are pressed  
2000-2130 Hold subroutine, checking keys pressed and taking the appropriate action  
5000-6200 Win subroutine, working out the win and new credit total  
6300-6320 Play tune during win  
7000-7040 Reduce credits and check if there are any left  
8000-8030 End of game subroutine  
8040-8050 Clear instructions  
9000-9100 Load graphics, arrays and screen. Set up the variables and give the options of instructions. Poke 23658, 8 sets Caps Shift on

### Listing 2

#### Lines:

10-430 Draw Screen. This includes six user defined graphics in line 280 which are graphics ABC and DEF respectively. The graphics in lines 350-400 are part of the main graphics set shown below, and those in line 120 are alternating graphic 8s and shifted graphic 8s  
500-570 Define user graphics using one For-Next loop  
600-740 Set up arrays defining the reels. For graphics see below  
750-780 Save relevant parts of the program  
790 Saves the program itself





# GRAPHICS

## GRAPHICS

## KEYS

2 ..... A  
 3 ..... BC  
 4 ..... CD  
 5 ..... DE  
 6 ..... GH  
 7 ..... IE  
 8 ..... JK  
 9 ..... LM  
 0 ..... NO  
 1 ..... PQ  
 2 ..... RS  
 3 ..... TU

## BANDIT

WIN 20.20 CREDIT 100.00 WIN 20.20  
 NUDGE 1 2 3 4 5 6 7 8 9 10  
 WINS: 0 1 2 3 4 5 6 7 8 9  
 22.00 23.00 24.00 25.00 26.00 27.00 28.00 29.00 30.00  
 3 OF A 6 7 8 9 10  
 KIND 21.00 22.00 23.00 24.00 25.00 26.00 27.00 28.00 29.00 30.00  
 HOLD HOLD HOLD  
 NUDGE NUDGE NUDGE  
 START

© 1983 K.Deakes

## 1. MAIN PROGRAM

```

1 REM *****
2 REM *** BANDIT ***
3 REM *****
4 REM *** © 1983 K.Deakes ***
10 SAVE "BANDIT" LINE 9000
20 STOP
30 REM ***START***
40 PRINT AT 19,4; INK 2; "START"
FOR A=1 TO 3: LET R(A)=2*(INT
(RND*10)+1); NEXT A
45 IF Y=1 THEN PRINT AT 19,15;
INK 7; PAPER 1; "PRESS 2"
50 LET H=INT (RND*10); IF H=3
THEN GO TO HOLD
60 IF INKEY$="3" THEN GO SUB 8
840 GO TO 75
70 GO TO 60
75 PRINT AT 19,4; INK 5; PAPER
2; "START"
80 GO SUB SPIN
90 GO SUB CHECK
100 GO SUB NUDGE
110 GO TO 40
490 REM ***TURN REELS***
500 FOR A=1 TO 3: FOR G=2 TO R
A) STEP 2: FOR I=1+G TO 3+G
510 LET J(A)=D(A)+I; FOR B=20 T
O 60 STEP 20
520 IF J(A)>B AND J(A)<B+20 TH
EN LET J(A)=J(A)-B
525 NEXT B
530 PRINT AT 5+I-G,5;A+5; INK 0
(J(A)-3);A=J(A);A=1 TO 2)
540 NEXT I; NEXT G; LET D(A)=J
A)+22; NEXT A; RETURN
550 REM ***CHECK FOR WIN***
560 LET P1=16954; LET P2=P1+5;
LET P3=P2+5
710 IF PEEK P1<>PEEK P2 THEN GO
TO 750
720 IF PEEK P1=PEEK P2 AND PEEK
P2<>PEEK P3 THEN GO TO 750
740 IF PEEK P2=PEEK P3 THEN GO
TO 870
750 IF PEEK P1<>6 THEN GO TO 78
760 IF PEEK P1=6 AND PEEK P2<>6
THEN GO TO 8050
770 IF PEEK P2=6 THEN GO TO 507
780 FOR P=P1 TO P1+123 STEP 64
790 IF PEEK P=141 THEN GO TO 81
800 NEXT P; RETURN
810 FOR P=P1+5 TO P1+133 STEP 6
820 IF PEEK P=141 THEN GO TO 84

```

```

830 NEXT P; RETURN
840 FOR P=P1+10 TO P1+133 STEP
64
850 IF PEEK P=141 THEN GO TO 50
860 NEXT P; RETURN
870 IF ATTR (3,10)=ATTR (3,15)
AND ATTR (3,10)=ATTR (3,20) THEN
GO TO 5000
880 GO TO 750
890 REM ***NUDGE***
900 LET N=INT (RND*10); IF N=0
THEN GO SUB 1000
910 GO SUB 7000; RETURN
1000 PRINT AT 5,5; INK 1; PAPER
5; "FLASH 1; "NUDGE"; AT 5,22; "GAMB
LE"
1010 FOR A=0 TO 8 STEP 2: PRINT
AT A+6,7; INK 1; PAPER 5; FLASH
1;A;AT A+6,24;A+1; NEXT A
1040 FOR A=8 TO 20 STEP 6
1050 PRINT AT 17,A; INK 3; FLASH
1; "NUDGE"; NEXT A
1060 PRINT AT 16,5; INK 3; FLASH
1; "C"; AT 16,26; "C"
1070 FOR A=1 TO 3: LET R(A)=0; N
EXT A; IF Y=1 THEN PRINT AT 19,1
0; INK 7; PAPER 1; "PRESS N"
1080 LET N=INT (RND*10); IF N=0
THEN GO SUB 8040; GO TO 1220
1090 BEEP .2,6; IF INKEY$="N" TH
EN GO SUB 8040; GO TO 1120
1100 GO TO 1090
1120 IF N/2=INT (N/2) THEN PRINT
AT N+6,7; INK 1;N;AT N+6,24; PA
PER 5; FLASH 1;N+1
1130 IF N/2<>INT (N/2) THEN PRIN
T AT N+5,24; INK 1;N; IF N<>9 TH
EN PRINT AT N+7,7; INK 1; PAPER
5; FLASH 1;N+1
1135 IF Y=1 THEN PRINT AT 19,10;
INK 7; PAPER 1; "PRESS KEYS 1,2,
3 OR C"
1140 BEEP .2,0; LET B$=INKEY$
1150 IF B$="" OR B$(CHR$ 49 OR B
$)CHR$ 51 THEN GO TO 1210
1160 GO SUB 8040
1170 LET N=N-1; LET R(VAL (B$))=
2; GO SUB SPIN; LET R(VAL (B$))=
0
1180 GO SUB CHECK
1190 IF N=0 THEN GO TO 1220
1200 GO TO 1120
1210 IF B$="C" THEN GO SUB 8040;
GO TO 1220
1215 GO TO 1140
1220 LET N=0; PRINT AT 16,5; INK
5; PAPER 1; "C"; AT 16,26; "C"
1230 FOR A=8 TO 20 STEP 6: PRINT
AT 17,A; INK 3; PAPER 1; "NUDGE"
; NEXT A
1240 PRINT AT 5,5; PAPER 5; "
"; AT 5,22; "
"; AT 5,22; "
"
1250 FOR A=0 TO 8 STEP 2: PRINT
AT A+6,7; PAPER 5; " "; AT A+6,24;
" "; NEXT A; RETURN
1290 REM ***HOLD***
2000 IF e=1 THEN LET e=0; GO TO
60
2010 FOR A=9 TO 19 STEP 5: PRINT
AT 15,A; INK 3; FLASH 1; "HOLD";
NEXT A
2040 PRINT AT 16,5; INK 3; FLASH
1; "C"; AT 16,26; "C"
2050 BEEP .2,0; LET B$=INKEY$
2055 IF Y=1 THEN PRINT AT 19,10;
INK 7; PAPER 1; "PRESS 1,2,3,C O
R 5"
2060 IF B$="" OR B$(CHR$ 49 OR B
$)CHR$ 51 THEN GO TO 2090
2065 GO SUB 8040
2070 PRINT AT 15,VAL (B$)*5+4; I
NK 3; "HOLD"; LET R(VAL (B$))=0
2080 IF B$="C" THEN GO SUB 2110;
GO SUB 8040; GO TO 40
2090 IF B$="5" THEN GO SUB 2110;
GO SUB 8040; GO TO 75
2100 GO TO 2050
2110 FOR A=9 TO 19 STEP 5: PRINT
AT 15,A; INK 5; PAPER 1; "HOLD";
NEXT A
2130 PRINT AT 16,5; INK 5; PAPER
1; "C"; AT 16,26; "C"; RETURN
4990 REM ***PAYOUT***
5000 LET WIN=100; IF ATTR (3,10)
=58 THEN LET WIN=200
5020 GO SUB 6000; RETURN
5050 LET WIN=20; GO SUB 6000; RE
TURN
5070 LET WIN=40; GO SUB 6000; RE
TURN
6000 PRINT AT 2,5; INK 3; "WIN";A
T 2,20; "WIN"; AT 3,5; "E"; AT 3,22;
"2"
6020 LET N=0; LET CREDIT=CREDIT+
WIN
6030 IF WIN>=100 THEN PRINT AT 3

```



## BLASTERMIND

At first glance this might seem to be just another version of a very popular game. How wrong can you be!!! True, the start is simple enough. The Spectrum picks a code of numbers or colours with a selection of levels of difficulty — and invites you to do the same. You then take it in turns to guess each others code from the clue supplied after each guess. An extremely well written, fast and very clearly displayed game, with almost inevitable defeat.

This was exactly as intended but unfortunately *something went wrong*. During the programming strange complimentary messages began to appear on the screen. At first they were so few they were not taken too seriously, but soon they could no longer be ignored. Somehow the Spectrum had been given a personality — a rather devious, supercilious, dislikeable, hateful, horrible mind.

✱ Side B contains a version of the game compatible with the excellent Currah µSpeech unit — even worse!! ✱

SPECTRUM 48k £5.95



## THE QUEST OF MERRAVID

VIC 20 (16k) £7.95  
or Commodore 64 £7.95

A really challenging and enjoyable adventure, written by a confirmed adventure addict who grew tired of the ease with which he solved other adventures himself. Will accept and act on sentences containing up to nine words.

The adventurer becomes Merravid, charged with the task of finding, taking and then returning the magic Firestone of the Dwarves. However, overcoming the many novel and original hazards is no easy matter. Careful and imaginative thought is required if progress is to be made and the Firestone tracked down to the lair of the Dragon of Thargon. Even then the Dragon has to be defeated and the stone retrieved. A compulsive, extremely enjoyable and very user friendly adventure.



## HARRIER ATTACK

Pure machine code, super-fast, action-packed, highly addictive arcade-style game requiring great skill. The harrier takes-off from an aircraft-carrier and flies over seaborne defenses to attack enemy installations on a nearby island. The harrier may fly faster, slower, higher or lower, and has bombs and cannon fire with which to protect itself and make its own attack. If it flies too high it is detected by enemy jet-fighters (which it may counter-attack) — so it needs to hug the mountainous terrain which also varies with every new game. But the island is heavily defended by anti-aircraft rockets and tanks, which again the harrier may counter-attack or try to fly through. A tally is kept of fuel, speed, altitude, ammunition, plus player score and high score. Finally the harrier must make its bomb-run over the enemy base before returning past more hostile shipping to its own carrier.

any ORIC - 1 £6.95  
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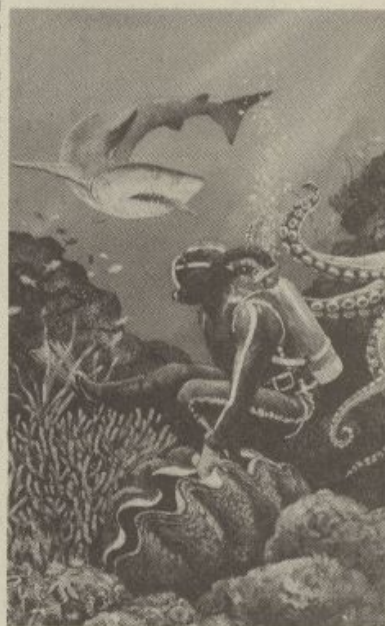


DURELL SOFTWARE

## SCUBA DIVE

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Pure machine code with super cartoon graphics. You are in control of a diver who must swim down through jellyfish, sharks, barracuda and a host of other under-sea nasties to locate the entrance of a submarine cave. He must then follow its twisting and branching passages which change with every new game, to locate the magical giant oysters with their fabulous treasure of enormous pearls. Many of the passages lead to dead-ends, while some are filled with horrible underwater monsters. Each dive has to be timed carefully so that there is enough oxygen left for the return journey, which is further frustrated by the diver's boat shifting anchor and threatening to decapitate him with its propellor. This game which features three divers, player score, high score, hall of fame and sound effects, presents perhaps the ultimate epic arcade adventure.



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## Enter the Dragon

**Brian Cadge picks his way through a New Year selection of Dragon software**

At the recent Christmas fair at Wembley, a lot of new Dragon software was on display, not least from Dragon Data themselves who have recently released new titles in new style packaging. Most of these titles have been licensed from US software houses which write for the Tandy Coco, and the two featured here are no exception.

*Shaft* is a game originally written by Prickly Pear Software which includes high resolution colour graphics and a little sound. The game begins by requesting skill level to be entered via the joystick — there are only two levels and these don't differ a lot. The title display is only black and white, but is a very impressive use of mode 4 graphics.

On to the game itself. Across the screen are eight lifts, moving up and down at various speeds. Your job is to negotiate the lifts, avoiding all but the last one which is yellow and which moves you up to the next floor. The sound effects are a bit half-hearted, but the graphics (mode 3) are not bad, especially the player's cowboy (why he is a cowboy is not made clear). If you do manage to reach the top right-hand corner of the screen, a parachute opens to

maze game! Escaping from your cell on the alien ship, you roam the many corridors collecting laser guns, etc, hoping ultimately to find the way out. Joysticks cannot be used, as all commands are entered via the keyboard as in *Open, Take, Search*, etc. The main problem I had was that I couldn't pick up anything — typing *Take Lasergun* when one is hanging on the wall resulted in nothing happening! Maybe I am missing something, which is not surprising as the manual is not exactly detailed.

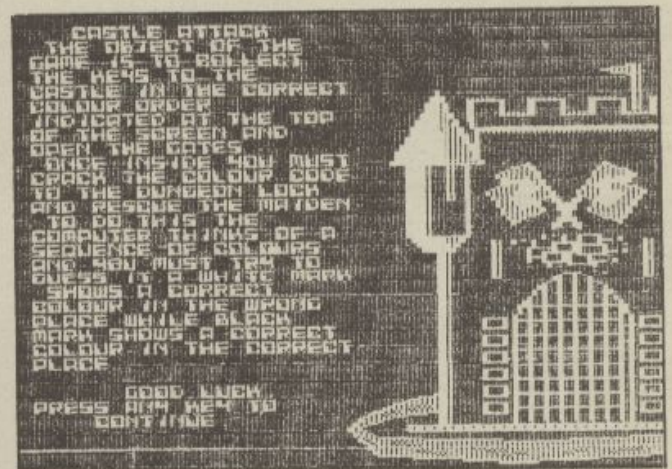
The sound effects are quite good, but as in *Shaft*, the graphics could have been better, and they are nowhere near as smooth as *Escape*, the 3D maze game from Microdeal.

Dragon Data's new packaging is in giant 7" x 9" plastic

shapes instead of colours. After such a good start to the game, it was disappointing to find this as the finale. If he fails to find the correct combination in time, the princess gets the knife, if he succeeds the game restarts.

*Castle Attack* seems to have been hastily finished off, a bit more sound, a better end to the game and an option for joysticks would make this very good game into an excellent one. In any case, at the reasonable price of £6.50, this piece of software is still a worthwhile buy.

*Super-Spy* is a "modern history simulation" in the Cheshire Cat educational series. It contains two double-sided cassettes neatly packed with an instruction



bring you back to the bottom to start all over again.

Although *Shaft* is quite an original game and enjoyable at the beginning, the novelty soon wears off when you realise that getting to the top depends more on the random arrangement of lifts than on the player's skill. The graphics could be a little less fuzzy and so could the sound.

The second game featured here from Dragon Data is *Cimeeon Moon*. The back of the box enthuses: "A real time sci-fi adventure set in deepest space — fantastic 3D graphics and surrealistic sound effects create this weird and wonderful experience."

Well, you'll have to use your imagination a bit to go that far as this is yet another 3D

boxes with full colour inlays, manuals and space for two cassettes and a disc. This is certainly impressive, especially when the games are still only £8 each, but remember it is the software not the packing that counts!

*Castle Attack* from M & D Systems is another arcade game using hi-res colour graphics, but very little sound. The

program is a hybrid of Basic and machine code which seems to run at quite an acceptable speed.

Side one of the tape contains only instructions and title screens, while side two contains the game itself. The graphics are quite outstanding, my only grumble is that the keyboard has to be used with no option for joysticks. The object of this game is to guide our hero round the castle walls, collecting three coloured keys in the correct order, and avoiding the barrels being tossed at him from the battlements and the arrows from the windows.

Once all three keys are collected, you enter the castle to rescue the princess. To do this, our hero is confronted by yet another version of *Mastermind*, using

card. The front of the box has the familiar red Dragon logo with the usual wording and looks more like a Dragon Data program than bona fide Dragon ones do!

Part one of the software starts with an assault course in black and white graphics in which you must duck and jump over various obstacles to get on to the next section of the program where facts about wartime Britain are thrown at you, followed by ten questions for the 11-year-old to answer. Get five right and you go on to the parachute game. This particular game section has got to be the most boring and monotonous of its type I have ever seen. If you stick it out, a code letter is given to help you later on in your secret mission. The programs continue in a similar vein from here on.

By now you will have realised that these programs attempt to educate youngsters while keeping them interested with games in between the facts. Unfortunately, the games are of a very low standard indeed and would have trouble keeping a five-year-old amused, let alone an average 11-year-old.

*Super-Spy* is a good idea which could have been rather better. In its present form, the average parent will not want to pay out £20 for it.

For those users who love playing maddening word puzzles in newspapers, where a number of words are hidden in a word grid, there is *Searchword* from Temptation Software. The program allows



words from three to 12 letters to be entered and will then produce a word grid for you to play on. The words can be saved and loaded from cassette and there is also an option to list the concealed words if you forget them.

Not perhaps a game that will appeal to everyone, but if you like doing word puzzles, this program should be of interest to you.

The only way of classifying the next game is to call it a sort of strategy/simulation, for *UXB* from Virgin Games is a very original idea. Essentially, the idea is to defuse an old wartime bomb. There is a choice of six tools from 12 to take along, these include hammer, spanners, pliers, screwdrivers etc. The game consists of a number of set stages, most involving choosing which action to do next with what tools. Making one wrong move causes the bomb to explode. A nice feature of the game is that if you do get killed, you can restart the game from that point.

High resolution colour graphics are used to display the bomb and its circuits from all angles as the game progresses. Graphics also form part of the action in two sections of the defusing cycle, together with the arrow keys to move detonator out.

Typing *Help* will sometimes give you a clue as to what to do next and *Tools* will list what you have with you. The game is written in Basic with some machine code routines from various magazines (including *PCW*) for handling the text, sound and autorunning the program.

Mastering the game is really a matter of patience, trial and error. Of course, once you have found the correct method of defusing the bomb (which took me about two hours to find) the game loses all of its appeal as there is no random element in the program.

Unfortunately, there are a number of bugs in the program. For example, if one chooses to use the same tool twice, the program counts it as two tools. The restart option doesn't always work correctly, there is a simple way to cheat on the first graphic section and on the minefield you can walk straight through mines. Finally, as the program uses nearly all the memory, it occasionally crashes with an *Out of Memory* error.

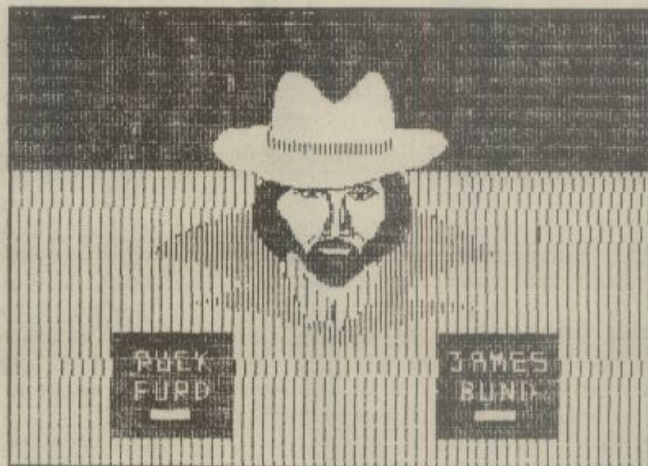
With this number of bugs you will probably not be too keen on *UXB*, but don't be put off. The program makes a refreshingly original change from run-of-the-mill adventures or arcade games, and a 32K program with good graphics and sound for £7 is worth a second look at least.

Finally, in this review, are two games from Softek. *Monsters* is yet another version of *Space Panic*, also available on the Dragon in versions called *Bonka* and *Cuthbert goes Digging*. In case you aren't familiar with this game, it involves guiding a small figure up and down ladders, bashing holes in the floor for the baddies to fall through before they get you. Also, you are running out of air all the time. In this version of the game, you do not need to bash the robot on the head to make him fall, as in the original arcade game.

*Monsters* is a good version of this classic game, which uses the keyboard only, as does *Bonka*, and is similarly priced to the other versions mentioned.

So, it is really a matter of taste and whether or not you want to use joysticks, as to which you choose.

As has become traditional, I have left by far the best game until last. *Ugh*, also from Softek, is certainly one of the best arcade games to be released for the Dragon.



*Ugh* is a caveman, whom you control via joystick or keyboard, who knows that with the coming of the ice age he must stock his cave with food. Stealing eggs from the pterodactyl's nest at the top of the mountain seemed a good idea, until ptery arrives dropping boulders on poor *Ugh*. To top it all, along plods Rex, a giant tyrannosaurus to aid ptery by chasing and jumping on *Ugh*.

Armed with only a spear, which *Ugh* drops when he gets a egg, he must climb the mountain to the nest, get an egg and get it back to his cave, avoiding ptery and Rex, and if possible killing them for bonus points.

A bonus *Ugh* is awarded for every 5,000 points on the first screen and every 10,000 on the screen. At 10,000 points you move on to the next screen, which is a harder route up the mountain. Each screen contains 16 integral skill levels. A demo game is available on loading to give you the idea and show you all three screens.

The graphics in this game, which are in mode 3, show just what can be done with a lot of effort by the programmer and the animation is rivalled by no other game that I've seen. The sound is also a string part of this piece of software. For originality and graphics, *Ugh* surely beats Microdeal's *The King*, but lacks as many different screens. At £7, this is the best game for the Dragon in a long time and with the option of joystick or keyboard, and the ability to be easily transferred to disc, it is a must for every user's game collection.

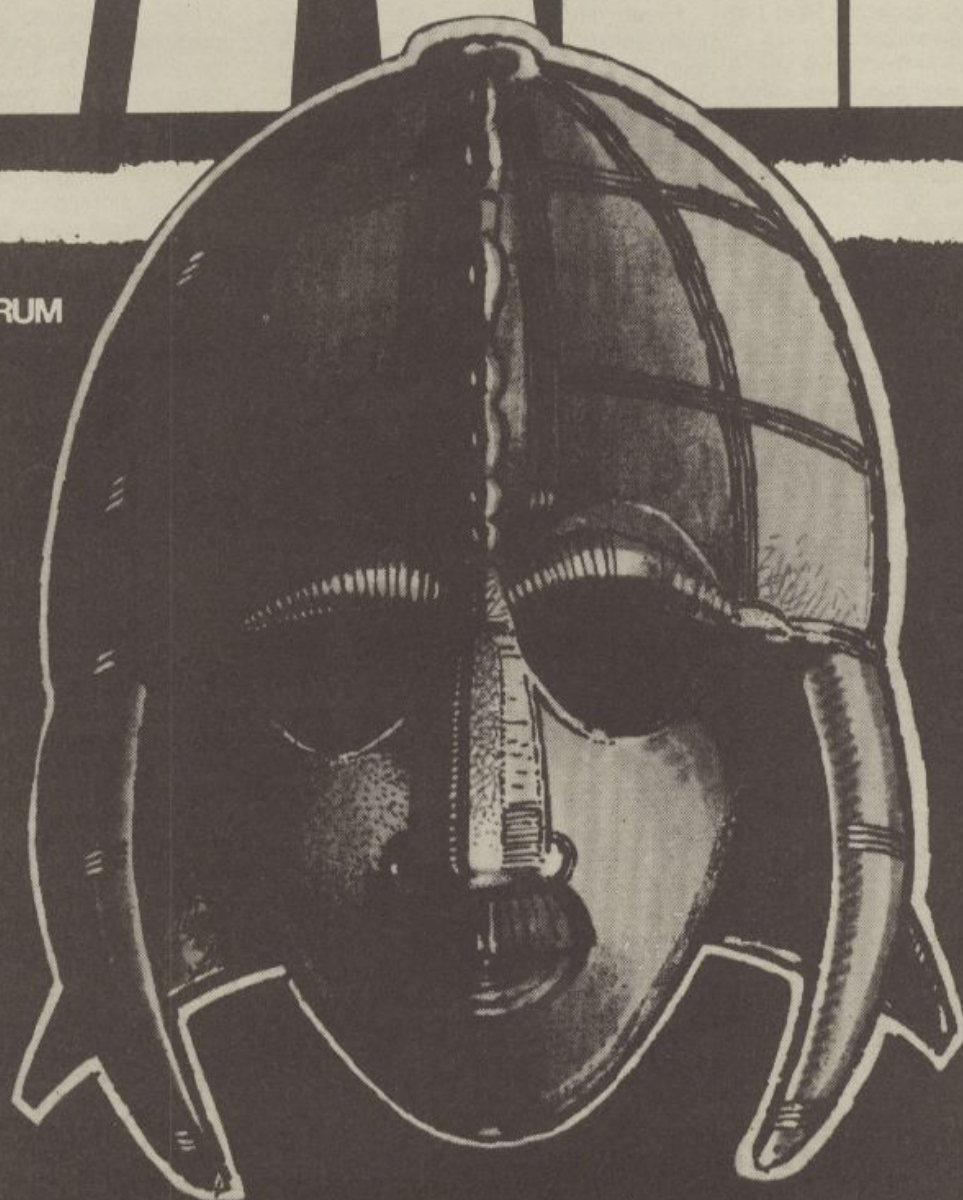
Looking at this batch of software, it is evident that the general standards are still rising, slowly but surely. It is particularly good to see Dragon Data making an effort to get in on the software market once again.

Supplier	Program	Price	Value (1-10)
Dragon Data	<i>Shift</i>	£7.95	6
Kenfig Industrial Estate Margam Port Talbot W Glamorgan	<i>Cimeean Moon</i>	£7.95	6
M & D Systems 39 Sheridan Road Frimley Surrey GU16 5DU	<i>Castle Attack</i>	£6.50	7
Ampalsoft PO Box 19 Knutsford Cheshire WA16 0HE	<i>Super-Spy</i>	£19.95	5
Temptation Software 58 Poland Street London	<i>Searchword</i>		7
Virgin Games 61-63 Portobello Road London W11	<i>UXB</i>	£6.95	7
Softek 329 Croxted Road London SE24	<i>Monsters</i>	£6.95	7
	<i>Ugh</i>	£6.95	10



# WALKER

48K SPECTRUM





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POP. W. 5



## Search and find

Ron Luxton demonstrates how to store and list recorded programs

After the honeymoon period with my ZX81, I quickly found that I needed an orderly way of listing my increasing number of recorded programs, or I would have to spend hours searching through a motley collection of tapes each time I needed one.

The answer for me has been to use one side of a C10 or C12 cassette for each program, recording each one two or three times, and to store the tapes in the special stackable drawer units made for the purpose. These are often advertised at reasonable prices and can be added to as required.

Another way is to store programs on longer tapes — C60 or C90 — recording each program two or three times in succession. This is cheaper, but does require a recorder with a tape counter to make searching along the tapes a practical

proposition.

Program List for the ZX81 (16K) is designed for use with either method of storage and provides an opportunity to search for your programs either by number or by name. It has the added facility of obtaining a print-out, via the ZX printer, of a complete list in either numerical or alphabetical order should you require one.

It will allow you to list and search for your programs under three main headings, Games, Utility, and Programming, and a "Special Instructions" entry to enable a single character code to be entered against programs for whatever purpose you want — to identify those programs in machine code, confidential files, or perhaps merely to identify your favourites.

Program List A is intended for users of single tapes for each program, while Pro-

gram List B is for use where many programs are recorded, one after another, on longer tapes. The second program is a list of the line changes to convert Program List A to Program List B.

Program List B additionally allows entries for the number of each tape and the position on the tape of each program. It will search for and list these numbers, and both programs will list all entries with the same name, such as Bank Account, but will separately identify Bank Account 1 from the rest if this is called for.

The program in Basic makes plentiful use of Inkey\$ for rapid access and only the alphabetical order call, which puts the entries through a sort, takes any appreciable time. To limit this to 60 seconds or so, it will search through only the first three letters and three digits of the number of each line (line 1300). This may mean that Analysis appears above Anagram for example, but is a small price to pay for a rapid sort. Some of the multiple instructions lines are long — lines 580, 630 and 1090 — and care should be taken to enter

```

10 REM "PROGRAM LIST"
20 REM =====
30 REM SET UP FILE
40 REM =====
50 GOTO 530
60 DIM A$(100,32)
70 FAST
80 LET A=0
90 FAST
95 IF A>100 THEN GOTO 635
110 LET A=A+1
140 FAST
150 CLS
160 SCROLL
170 PRINT "PROGRAM NUMBER";TAB
16;A
180 LET P$=STR$ A
190 LET P$=" "+P$ AND VAL P$(<
=9)+( " "+P$ AND VAL P$>10 AND V
AL P$(<=99)+(P$ AND VAL P$>100)
200 SCROLL
210 PRINT "PROGRAM NAME?"
220 INPUT N$
230 IF LEN N$>24 THEN GOTO 970
240 IF N$="" THEN GOTO 180
250 IF N$="" THEN LET N$=""
260 IF N$="END" THEN GOTO 530
270 SCROLL
280 PRINT N$
290 SCROLL
300 PRINT "PROGRAM CATEGORY KEY
?
310 INPUT C$
320 PRINT AT 21,22;C$
330 SCROLL
340 PRINT "SPECIAL INSTRUCTIONS
KEY?"
350 INPUT X$
360 PRINT AT 20,16;X$
370 LET A$(A)(1 TO LEN N$)=N$
380 LET A$(A)(LEN N$+1 TO 23)="
.....
400 LET A$(A)(26 TO 28)=P$
410 LET A$(A)(30)=C$
420 LET A$(A)(31)=X$
430 CLS
440 SCROLL
450 PRINT A$(A)
460 SCROLL
470 SCROLL
480 PRINT "IS THIS O.K. (Y/N)?"
483 IF A=100 THEN GOTO 635
490 SLOW
500 IF INKEY$<>"Y" AND INKEY$<>
"N" THEN GOTO 500
510 GOTO (90 AND INKEY$="Y")+(1
40 AND INKEY$="N")
520 REM =====
530 REM MENU
540 REM =====
550 FAST
560 CLS
570 PRINT AT 0,4,"PROGRAM LIST"
,AT 0,18;"MENU";
580 PRINT AT 2,2;"A TO SET UP F
ILE",AT 3,2;"B THIS CLEARS PROGR
AMS ENTRIES",AT 4,2;"C INSTRUCT

```

```

IONS",AT 5,2;"D CALL - PROGRAM N
UMBER",AT 6,2;"E CALL - PROGRAM
NAME",AT 7,2;"F CALL - PROGRAM C
ATEGORY",AT 8,2;"G CALL - SPECIA
L INSTRUCTIONS",AT 9,2;"H TO MAK
E FURTHER ENTRIES",AT 10,2;"I TO
LIST IN.....",AT 11,2;"J NUMBE
R ORDER",AT 12,2;"K ALPHABETICAL
ORDER",AT 13,2;"L TO SAVE PROGR
AM"
590 PRINT AT 19,6;"SELECT A L
ETTER ";
600 SLOW
610 IF INKEY$="" THEN GOTO 610
620 LET Q$=INKEY$
630 GOTO (60 AND INKEY$="A")+(1
050 AND INKEY$="B")+(660 AND INK
EY$="C")+(660 AND INKEY$="D")+(6
60 AND INKEY$="E")+(660 AND INK
EY$="F")+(140 AND INKEY$="G")+(16
10 AND INKEY$="H")+(1030 AND INK
EY$="I")+(1770 AND INKEY$="J")
635 CLS
638 PRINT AT 10,0;"FILE FULL FOR
LE FULL FILE FULL"
640 STOP
650 REM =====
660 REM SEARCH ROUTINES
670 REM =====
680 FAST
690 CLS
700 PRINT "ENTER DETAILS"
710 INPUT Z$
720 CLS
730 LET Y=LEN Z$
750 IF Y=1 THEN LET Z$=" "+Z$
760 IF Y=2 THEN LET Z$=" "+Z$
770 GOTO (780 AND Q$="C")+(820
AND Q$="D")+(860 AND Q$="E")+(91
0 AND Q$="F")
780 LET U=VAL Z$
785 IF U+1>A THEN PRINT "NO ENT
RY FOR THIS NUMBER"
787 IF U+1>A THEN GOTO 1700
790 PRINT A$(U)
810 GOTO 1700
820 LET X=0
825 FOR B=1 TO A
830 IF Z$=A$(B)(1 TO (1+Y)-1) T
HEN PRINT A$(B)
835 IF Z$=A$(B)(1 TO (1+Y)-1) T
HEN LET X=X+1
840 NEXT B
842 IF X>=1 THEN GOTO 1700
843 PRINT "NO ENTRY UNDER THAT
NAME"
850 GOTO 1700
860 LET Z$=Z$(3)
865 GOSUB 1860
867 GOTO (870 AND Q$="S")+(892
AND Q$="P")
870 FOR B=1 TO A
880 IF Z$=A$(B)(30) THEN PRINT
A$(B)
885 NEXT B
890 GOTO 1700
892 FOR B=1 TO A
894 IF Z$=A$(B)(30) THEN LPRINT
A$(B)
896 NEXT B

```



them exactly as written.

Before typing out the program, decide how many titles you will finally want to store as this cannot be altered later, although the full number of entries does not have to be entered at once and you can add to the list at any time. About 150 titles should fit comfortably within 16K. More may be squeezed in, but the alphabetical sort soon runs out of memory beyond this number.

Line 60 should read: "Dim A\$(number

of entries, 32)" and lines 95 and 483 should read: "IF A + (number of entries) Then Goto 635".

When the program has been entered, debugged and runs satisfactorily, Save it against accidental crashes, enter Run, and follow the instructions.

The program complete with your lists can be Saved and will automatically go to the menu on loading. Remember, however, that Run or Clear must not be used from now on or all the entries will be lost. If

you need to restart the program, enter Goto 530.

If you need to change any of the entries later without affecting the rest of the list, you should enter as a direct command, the following: "LET A\$(number of entry to be changed) = new program name, full stops, numbers, letter, code" etc, with the spacing exactly as lines appear in the rest of the program, press Newline, and the new line will replace the old. If you get the spacing wrong, then just try it again. ■

```

900 IF Q$="P" THEN GOTO 530
910 LET Z$=Z$(3)
915 GOSUB 1860
917 GOTO (920 AND Q$="S")+ (942
AND Q$="P")
920 FOR B=1 TO A
930 IF Z$=A$(B) (31) THEN PRINT
A$(B)
935 NEXT B
940 GOTO 1700
942 FOR B=1 TO A
944 IF Z$=A$(B) (31) THEN LPRINT
A$(B)
946 NEXT B
948 IF Q$="P" THEN GOTO 530
950 GOTO 1700
960 REM =====
970 REM CHECK LEN N$ ROUTINE
980 REM =====
990 SCROLL
1000 SCROLL
1010 PRINT "SORRY, 24 LETTERS ONL
Y. TRY AGAIN"
1020 SCROLL
1030 GOTO 220
1040 REM =====
1050 REM INSTRUCTIONS
1060 REM =====
1070 FAST
1080 CLS
1090 PRINT "INSTRUCTIONS", "----
-----"
1100 "ENTER TITLES AS RE
QUESTED."
1110 "ENTER PROGRAM CATE
GORY AS: -"
1120 "U" = UTILITY, "G" = GA
MES, "E" = TO LEAVE ENTRY LIST, EN
TER "END" = TO LEAVE TITLE E
NTRY, ENTER TWO SPACES, "USE
ONE CHARACTER ONLY FOR "SPECIAL
INSTRUCTIONS CODE."
1130 "ENTER" (OR GOTO 530) TO "RETURN T
O MENU."
1140 GOTO 1700
1150 GOSUB 1860
1160 REM =====
1170 REM PRINT OUT AFTER SORT
1180 REM =====
1190 FOR I=1 TO P-1
1200 LET W=VAL E$(I+1) (4 TO 6)
1210 IF Q$="S" THEN PRINT H$(W)
1220 IF Q$="P" THEN LPRINT A$(W)
1230 NEXT I
1240 IF Q$="P" THEN GOTO 530
1250 GOTO 1700
1260 REM =====
1270 REM SHELL-METZNER SORT
1280 REM =====
1290 FAST
1300 LET B=A
1310 DIM D$(B) (P,6)
1320 DIM E$(B) (P,6)
1330 FOR I=1 TO P
1340 LET D$(I)=A$(I) (1 TO 3)+A$(
I) (26 TO 28)
1350 NEXT I
1360 FOR I=1 TO P
1370 LET E$(I)=D$(I)
1380 NEXT I
1390 IF 2+H>N THEN GOTO 1420
1400 LET H=H+1
1410 GOTO 1390
1420 LET F=2+H-1
1430 LET F=INT (F/2)
1440 IF F=0 THEN GOTO 1110
1450 LET D=N-F
1460 LET B=1
1470 LET H=B
1480 LET E=H+F
1490 IF E$(H)>E$(E) THEN GOTO 15
GO
1500 LET B=B+1
1510 IF B>D THEN GOTO 1430
1520 GOTO 1470
1530 LET S=S+1
1540 LET U=E$(H)
1550 LET E$(H)=E$(E)
1560 LET E$(E)=U
1570 LET H=H-F

```

```

1580 IF H<1 THEN GOTO 1500
1590 GOTO 1480
1600 REM =====
1610 REM NUMBER ORDER PRINT-OUT
1620 REM =====
1630 FAST
1640 GOSUB 1860
1650 FOR B=1 TO A
1660 IF Q$="S" THEN PRINT A$(B)
1670 IF Q$="P" THEN LPRINT A$(B)
1680 NEXT B
1690 IF Q$="P" THEN GOTO 530
1700 REM =====
1710 REM ***RETURN TO MENU***
1720 REM =====
1730 POKE 16416,0
1740 PRINT AT 23,0;"KEY ""H"" FO
R MENU"
1750 POKE 16416,2
1760 SLOW
1770 IF INKEY$("<")="H" THEN GOTO 17
20
1780 FAST
1790 GOTO 530
1800 REM =====
1810 REM SAVE ROUTINE
1820 REM =====
1830 CLS
1840 PRINT "START RECORDER AND P
RESS ""S""
1850 SLOW
1860 IF INKEY$("<")="S" THEN GOTO 18
10
1870 SAVE "PROGRAM LIST"
1880 GOTO 530
1890 REM =====
1900 REM SCREEN OR PRINTER S/R
1910 REM =====
1920 CLS
1930 PRINT "SCREEN OR PRINTER?"
1940 SLOW
1950 LET Q$=INKEY$
1960 IF Q$("<")="S" AND Q$("<")="P" THEN
GOTO 1910
1970 FAST
1980 CLS
1990 RETURN

```

FOR "PROGRAM LIST (S)" -  
(FOR LISTING A NUMBER OF  
PROGRAMS ON LONGER  
TAPES), DELETE THESE LINES  
FROM LISTING FOR "PROGRAM  
LIST (A)" - (FOR LISTING  
INDIVIDUAL TAPES): -

230	340	350	360	380	400
410	420	580	630	770	850
860	894	910	915	920	930
944	950	1010	1090	1300	

AND ENTER THE FOLLOWING

LINES: -

```

332 PRINT "SPECIAL INSTRUCTIONS
?"
334 INPUT I$
336 PRINT AT 21,27,I$
338 SCROLL
340 PRINT "TAPE NUMBER?"
342 INPUT T$
344 LET T$=( " "+T$ AND VAL T$<
=9)+(" "+T$ AND VAL T$>=10 AND V
AL T$>=99)+(T$ AND VAL T$>=100)
346 PRINT AT 21,16,T$
351 SCROLL
353 PRINT "POSITION ON TAPE?"
355 INPUT X$
357 LET X$=( " "+X$ AND VAL X$<
=9)+(" "+X$ AND VAL X$>=10 AND V
AL X$>=99)+(X$ AND VAL X$>=100)
363 PRINT AT 21,16,X$
365 SCROLL
375 LET A$(A) (LEN N$+1 TO 17)=""
380 LET A$(A) (19 TO 21)=P$
385 LET A$(A) (23)=C$
387 LET A$(A) (24)=I$
390 LET A$(A) (25 TO 27)=T$
395 LET A$(A) (28)="/"
410 LET A$(A) (29 TO 31)=X$

```

Continued on page 21



# TURN YOUR PROGRAMME UPSIDE DOWN

Now you can add another dimension to your games.  
Swap direction, swap functions, confuse your friends.  
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Stonechip's Programmable Joystick Interface.

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# PROGRAMMING

```

483 IF A=100 THEN GOTO 635
520 PRINT AT 2,2;"A TO SET UP F
FILE" AT 3,2;"B TO CLEAR PREVIOUS
ENTRIES" AT 4,2;"C INSTRUCT
IONS" AT 5,2;"D CALL - PROGRAM N
UMBER" AT 6,2;"E CALL - PROGRAM
NAME" AT 7,2;"F CALL - PROGRAM C
ATEGORY" AT 8,2;"G CALL - TAPE N
UMBER" AT 9,2;"H CALL - TAPE POS
ITION" AT 10,2;"I CALL - SPECIAL
INSTRUCTIONS" AT 11,2;"J TO MA
KE FURTHER ENTRIES" AT 12,2;"K N
UMBER ORDER" AT 13,2;"L ALPHABETICA
L ORDER" AT 14,2;"M TO SAVE PROG
RAM"
630 GOTO (60 AND INKEY$="A")+(1
050 AND INKEY$="B")+(660 AND INK
EY$="C")+(660 AND INKEY$="D")+(6
60 AND INKEY$="E")+(660 AND INKE
Y$="F")+(660 AND INKEY$="G")+(66
0 AND INKEY$="H")+(140 AND INKEY
$="I")+(1610 AND INKEY$="J")+(12
30 AND INKEY$="K")+(1770 AND INK
EY$="L")
770 GOTO (780 AND Q$="C")+(820
AND Q$="D")+(860 AND Q$="E")+(91
0 AND Q$="F")+(950 AND Q$="G")+(
949 AND Q$="H")
849 LET Z$=Z$(3)
850 GOSUB 1860
851 GOTO (852 AND Q$="S")+(856
AND Q$="P")
852 FOR B=1 TO A
853 IF Z$=A$(B) (24) THEN PRINT
A$(B)
854 NEXT B
855 GOTO 1700
856 FOR B=1 TO A
857 IF Z$=A$(B) (24) THEN LPRINT
A$(B)
858 NEXT B
859 IF Q$="P" THEN GOTO 530
860 IF Z$=A$(B) (23) THEN PRINT
A$(B)
864 IF Z$=A$(B) (23) THEN LPRINT
A$(B)
910 GOSUB 1860
920 LET X=0
925 FOR B=1 TO A
930 IF Z$=A$(B) (25 TO 27) THEN
PRINT A$(B)
932 IF Z$=A$(B) (25 TO 27) THEN
LET X=X+1
937 IF X>=1 THEN GOTO 1700
938 PRINT "NO ENTRY UNDER THAT
NUMBER"
944 IF Z$=A$(B) (25 TO 27) THEN
LPRINT A$(B)
950 LET X=0
951 FOR B=1 TO A
952 IF Z$=A$(B) (29 TO 31) THEN
PRINT A$(B)
953 IF Z$=A$(B) (29 TO 31) THEN
LET X=X+1
955 NEXT B
956 IF X>=1 THEN GOTO 1700
957 PRINT "NO ENTRY UNDER THAT
NUMBER"
958 GOTO 1700
1010 PRINT "SORRY, 17 LETTERS ONL
Y, TRY AGAIN"
1090 PRINT "INSTRUCTIONS", "----
-----"
1100 "ENTER TITLES AS RE
QUESTED."
1110 "ENTER PROGRAM CATEGOR
Y AS: "
1120 "U" = UTILITY, "G" = GAME
1130 "S" = ENTER TAPE NUMBER AND PO
SITION, "ON TAPE AS MAXIMUM OF T
HREE" "DIGITS EACH." "USE ONE
CHARACTER ONLY FOR" "SPECIAL IN
STRUCTIONS CODE." "TO LEAVE EN
TRY LIST, ENTER "END" " "TO LEAV
E TITLE EMPTY, " "ENTER TWO SPACE
S, " "ENTER "M" (OR GOTO 530)
1140 "TO RETURN TO MENU."
1300 LET Q$(I)=A$(I) (1 TO 3)+A$(
I) (19 TO 21)

```

## Program List A

### NUMERICAL

DEC LOADER.....	1	P*
HEX LOADER.....	2	P*
LONDON BRIDGE.....	3	G\$
ABOVE RAMTOP.....	4	P*
MEMORY TEST.....	5	U\$
EYEBALL.....	6	U\$
COMPILER.....	7	P*
LABEL MAKER.....	8	U
CHOMPER.....	9	G
PATIENCE.....	10	G*
HOUSEHOLD EXPENSES.....	11	U\$
BUSINESS EXPENSES.....	12	U\$
CAR EXPENSES.....	13	U\$
GRAND PRIX.....	14	G
MORTGAGE.....	15	U\$
CONVERSIONS.....	16	U

### ALPHABETICAL

ABOVE RAMTOP.....	4	P
BUSINESS EXPENSES.....	12	U\$
CAR EXPENSES.....	13	U\$
CHOMPER.....	9	G
COMPILER.....	7	P*
CONVERSIONS.....	16	U
DEC LOADER.....	1	P*
EYEBALL.....	6	U\$
GRAND PRIX.....	14	G
HEX LOADER.....	2	P*
HOUSEHOLD EXPENSES.....	11	U\$
LABEL MAKER.....	8	U
LONDON BRIDGE.....	3	G\$
MEMORY TEST.....	5	U\$
MORTGAGE.....	15	U\$
PATIENCE.....	10	G*

### GAMES

LONDON BRIDGE.....	3	G\$
EYEBALL.....	6	G\$
CHOMPER.....	9	G
PATIENCE.....	10	G*
GRAND PRIX.....	14	G

### UTILITY

MEMORY TEST.....	5	U\$
LABEL MAKER.....	8	U\$
HOUSEHOLD EXPENSES.....	11	U\$
BUSINESS EXPENSES.....	12	U\$
CAR EXPENSES.....	13	U\$
MORTGAGE.....	15	U\$
CONVERSIONS.....	16	U

### PROGRAMMING

DEC LOADER.....	1	P*
HEX LOADER.....	2	P*
ABOVE RAMTOP.....	4	P*
COMPILER.....	7	P*

### PROGRAM LIST MENU

```

A TO SET UP FILE
B THIS CLEARS PREVIOUS ENTRIES
C INSTRUCTIONS
D CALL - PROGRAM NUMBER
E CALL - PROGRAM NAME
F CALL - PROGRAM CATEGORY
G CALL - SPECIAL INSTRUCTIONS
H TO MAKE FURTHER ENTRIES
I TO LIST IN.....
J NUMBER ORDER
K ALPHABETICAL ORDER
L TO SAVE PROGRAM

```

### SELECT A LETTER

## Program List B

### NUMERICAL

DEC LOADER.....	1	P*	1/ 1
HEX LOADER.....	2	P*	1/ 2
LONDON BRIDGE.....	3	G\$	1/1225
ABOVE RAMTOP.....	4	P*	1/275
MEMORY TEST.....	5	U\$	1/322
EYEBALL.....	6	U\$	2/ 21
COMPILER.....	7	P*	2/ 69
LABEL MAKER.....	8	U	2/105
CHOMPER.....	9	G	2/432
PATIENCE.....	10	G*	3/ 14
HOUSEHOLD EXPENSES.....	11	U\$	3/ 56
BUSINESS EXPENSES.....	12	U\$	3/144
CAR EXPENSES.....	13	U\$	4/ 11
GRAND PRIX.....	14	G	4/102
MORTGAGE.....	15	U\$	4/233
CONVERSION.....	16	U	5/ 10

### TAPE NUMBER

CAR EXPENSES.....	13	U\$	4/ 11
GRAND PRIX.....	14	G	4/102
MORTGAGE.....	15	U\$	4/233

### PROGRAM LIST MENU

```

A TO SET UP FILE
B THIS CLEARS PREVIOUS ENTRIES
C INSTRUCTIONS
D CALL - PROGRAM NUMBER
E CALL - PROGRAM NAME
F CALL - PROGRAM CATEGORY
G CALL - TAPE NUMBER
H CALL - TAPE POSITION
I CALL - SPECIAL INSTRUCTIONS
J TO MAKE FURTHER ENTRIES
K TO LIST IN.....
L NUMBER ORDER
M ALPHABETICAL ORDER
N TO SAVE PROGRAM

```

### SELECT A LETTER



# Addressed and labelled

*John Bradshaw presents a word-processing program for editing and printing letters and articles*

I have found this program very useful for entering, editing and printing letters, notes for lectures, orders of church worship and sermon outlines. At the time when *WP* was written my only printer was the ZX; hence the number 32 (ie, the number of characters per line permitted by the printer) will be found in the program. I imagine that if 32 were replaced by 65 or 80, the program could be used by the better printer.

Text is inserted in the form of Data blocks at the end of the program. Since each block is accessible (by Listing) and cannot be affected by alterations to other blocks, editing and manipulation of the blocks is simple and safe! Hence, it is possible to delete, alter, expand and move blocks freely.

However, the price to be paid for entering text as Data is that the Spectrum will accept only about 450 characters per Data entry. So a paragraph on the ZX printer is limited to about 15 lines. On the other hand it is possible to do some things that are not possible even on some expensive machine-code, disk-based systems. For example, if the names and addresses to which a circular letter is to be sent are kept on tape as little blocks of data (ie, as 'mini-programs' within a reserved set of line numbers), each destination can be Merged with (WP + the letter), and the program will then print out a correctly addressed letter.

Moreover, since, as will be seen later, any data items can be selected for printing

on their own, having inserted the address on the letter, an 'address label' can then be printed for the envelope before proceeding to the next destinee.

The normal mode for entering text is one that uses 'word-wrap' and right-justification. This is the default mode — ie, unless the user gives other instructions, *WP* will print proportionately-spaced, justified block of text. A data entry which consists of # followed by a space will be printed without proportional spacing. An entry which begins with @ followed by a space is printed at Tab @, and an entry beginning with c followed by a space will be centred.

The main sections of the program are prefaced by REM statements, to which the following notes refer:

## Advice

When Run is Entered advice is given on the screen on how to enter text at Line 2000 ff. This is followed by examples.

## Main Menu

The user chooses the TAB value, single or double spacing, and whether to View or Print. Additionally, the user may select up to 26 blocks of data to be printed in any order. The user can also instruct the computer to number the blocks on the screen or on the print-out.

## Proportional Spacing

Paragraphs are scanned line-by-line. The ends of words are tagged and spaces are inserted after them, progressively, until a line of 32 'characters' is formed. This line is then printed. A limiting device ensures that two or three words are not unduly expanded to fill the line. The Subroutine (Lines 1230 to 1410) is slow, so that lines with proportional spacing are printed at about one per second. Clearly this is where machine-code would help. On the other hand, the fact that the whole program is in Basic enables the user to adapt it according to his or her need.

## Menu

When the text has been viewed or printed, the variables are saved and the user can make alterations; eg, from single to double-line spacing, etc.

I shall be happy to answer questions about *WP* or to provide copies of it on tape at £2 including postage: any proceeds will go to charity. Write to me at 2 Netherwood Close, Solihull, W. Midlands.

I usually Merge *WP* with my program *Relist* which renumbers the text (ie, the Data blocks) in tens and/or my program *Delete* which deletes *WP* itself, leaving only the text to be Saved. I shall be glad to know how to improve *WP*, especially by using machine code for Lines 1320 to 1410. I forgot to say that one edits in exactly the same way as when writing programs. ■

```
10 REM WPT
20 REM 36/500
30 POKE 23609,50
35 REM **ADVICE FOR USER**
40 PRINT "ENTER TEXT AS DATA AT
T LINES 2000, 2010 ... LIKE THIS
"
50 PRINT " (N.B. Where single
quotes are shown below, they
represent double quotes, that is
P with SYMBOL-SHIFT)."
60 PRINT "2000 DATA '# To J
Smith'"
70 PRINT "When the program
is run this will appear as:
"
80 PRINT "To J Smith"
80 PRINT "Similarly, 2010 DA
TA '@ From A Brown' appears as
From A Brown
"
90 PRINT "i.e., it is set
in by the TAB number chosen belo
w."
100 PRINT "2020 DATA 'c HEADI
NG'"
110 PRINT "This will be centr
ed, like this:
"
120 PRINT "HEADING"
130 PRINT "2030 DATA 'Unmark
ed text is proportionately s
paced so that both margins are
justified, as in this present p
aragraph.'"
140 PRINT "WHEN TEXT HAS BEEN
ENTERED, ALTER THE REM STATEMENT
```

```
IN LINE 20 TO RECORD THE NUMBER
OF DATA ENTRIES & SOME NUMBER E
THER THAN THE NUMBER OF CHARACT
ERS IN THE LONGEST PARAGRAPH."
110 INPUT "PROCEED (Y/N) ? ";
2$
115 REM **MAIN MENU**
120 IF 2$="Y" THEN CLS : PAUSE
50
130 INPUT "TABULATION: Number of
spaces ";h$
140 INPUT "SELECT Y/D ";s$
150 INPUT "SINGLE OR DOUBLE SPA
CING S/d ";w$
160 INPUT "NUMBER DATA OR NOT (
Y/N) ";n$
170 INPUT "NUMBER OF DATA ITEMS
";i$
180 INPUT "LENGTH. ( ) length of
longest DATA ENTRY ";l$
190 INPUT "VIEW (V) OR COPY (C)
";j$
200 CLS : IF s$="N" THEN GO TO
470
205 REM **SELECTS TEXT FOR VIEW
OR PRINT**
210 INPUT "ENTER DATA ITEMS SEL
ECTED, then ENTER 0. ";aa: IF aa
=0 THEN GO TO 470
220 INPUT ab: IF ab=0 THEN GO T
O 470
230 INPUT ac: IF ac=0 THEN GO T
O 470
240 INPUT ad: IF ad=0 THEN GO T
O 470
250 INPUT ae: IF ae=0 THEN GO T
```



```

0 470
0 280 INPUT af: IF af=0 THEN GO T
0 470
0 270 INPUT ag: IF ag=0 THEN GO T
0 470
0 280 INPUT ah: IF ah=0 THEN GO T
0 470
0 290 INPUT ai: IF ai=0 THEN GO T
0 470
0 300 INPUT aj: IF aj=0 THEN GO T
0 470
0 310 INPUT ak: IF ak=0 THEN GO T
0 470
0 320 INPUT al: IF al=0 THEN GO T
0 470
0 330 INPUT am: IF am=0 THEN GO
0 470
0 340 INPUT an: IF an=0 THEN GO
0 470
0 350 INPUT ao: IF ao=0 THEN GO T
0 470
0 360 INPUT ap: IF ap=0 THEN GO T
0 470
0 370 INPUT aq: IF aq=0 THEN GO T
0 470
0 380 INPUT ar: IF ar=0 THEN GO T
0 470
0 390 INPUT as: IF as=0 THEN GO T
0 470
0 400 INPUT at: IF at=0 THEN GO T
0 470
0 410 INPUT au: IF au=0 THEN GO T
0 470
0 420 INPUT av: IF av=0 THEN GO T
0 470
0 430 INPUT aw: IF aw=0 THEN GO T
0 470
0 440 INPUT ax: IF ax=0 THEN GO T
0 470
0 450 INPUT ay: IF ay=0 THEN GO T
0 470
0 460 INPUT az: IF az=0 THEN GO T
0 470
475 REM **READING TEXT**
470 DIM v$(x,y)
480 FOR n=1 TO x
490 READ v$(n)
500 IF v$="g" THEN NEXT n
510 IF v$="n" THEN GO TO 790
525 REM **PRINTING SINGLE LINES
OR ADDRESSES**
530 LET n=aa: GO SUB 780
535 LET n=ab: GO SUB 790
540 LET n=ac: GO SUB 780
550 LET n=ad: GO SUB 780
560 LET n=ae: GO SUB 780
570 LET n=af: GO SUB 780
580 LET n=ag: GO SUB 780
590 LET n=ah: GO SUB 780
600 LET n=ai: GO SUB 780
610 LET n=aj: GO SUB 780
620 LET n=ak: GO SUB 780
630 LET n=al: GO SUB 780
640 LET n=am: GO SUB 780
650 LET n=an: GO SUB 780
660 LET n=ao: GO SUB 780
670 LET n=ap: GO SUB 780
680 LET n=aq: GO SUB 780
690 LET n=ar: GO SUB 780
700 LET n=as: GO SUB 780
710 LET n=at: GO SUB 780
720 LET n=au: GO SUB 780
730 LET n=av: GO SUB 780
740 LET n=aw: GO SUB 780
750 LET n=ax: GO SUB 780
760 LET n=ay: GO SUB 780
770 LET n=az: GO SUB 780
780 IF n=0 THEN GO TO 1570
790 IF j$="v" AND v$(n,1)="a" A
TO 34-h: THEN PRINT TAB 5;v$(n,3
TO 34-h): GO TO 1540
800 IF j$="v" AND v$(n,1)="a" A
TO 34-h: THEN PRINT TAB 5;v$(n,3
TO 34-h): PRINT n: GO TO 1540
810 IF j$="c" AND v$(n,1)="a" A
TO 34-h: THEN LPRINT "TAB 5;v$1
TO 34-h): GO TO 1540
820 IF j$="c" AND v$(n,1)="a" A
TO 34-h: THEN LPRINT TAB 5;v$(n,3
TO 34-h): LPRINT n: GO TO 1540
830 IF j$="v" AND v$(n,1)="a" A
TO 34-h: THEN PRINT TAB 5;v$(n,3
TO 34-h): GO TO 1540
840 IF j$="v" AND v$(n,1)="a" A
TO 34-h: THEN PRINT TAB 5;v$(n,3
TO 34-h): PRINT n: GO TO 1540
850 IF j$="c" AND v$(n,1)="a" A
TO 34-h: THEN LPRINT "TAB 5;v$1
TO 34-h): GO TO 1540

```

```

860 IF J$="c" AND V$(n,1)="#*#*#*
AND nn=1 THEN LPRINT TAB 0;V$(n,3
TO 32); LPRINT n; GO TO 1540
865 REM **FINDS ENDS OF WORDS**
870 LET L=0
880 LET V$(n,1 TO 4)=V$(n,L+1 TO
4)
890 DIM q(10)
900 LET k=0: LET z=0: LET m=1:
LET p=1: LET q=1
910 LET t=32
920 FOR p=1 TO t
930 IF V$(n,p)=CHR$ 32 THEN LET
q(m)=p-1: LET m=m+1
940 IF m=8 THEN GO TO 960
950 NEXT p
960 LET L=0: LET a$="": LET b$
="": LET c$="": LET d$="": LET e$
="": LET f$="": LET g$="": LET h$
="": LET i$=" "
970 IF V$(n,1)<>" " THEN LET L=1: a$=
V$(n,1 TO q(1))
980 LET m=1
990 IF q(m)=0 THEN LET z=m: GO
TO 1150
1000 IF q(m)<>0 THEN LET b$=V$(n
/(q(m)+2) TO q(m+1))
1010 LET m=2: IF q(m)=0 THEN LET
z=m: GO TO 1150
1020 IF q(m)<>0 THEN LET c$=V$(n
/(q(m)+2) TO q(m+1))
1030 LET m=3: IF q(m)=0 THEN LET
z=m: GO TO 1150
1040 IF q(m)<>0 THEN LET d$=V$(n
/(q(m)+2) TO q(m+1))
1050 LET m=4: IF q(m)=0 THEN LET
z=m: GO TO 1150
1060 IF q(m)<>0 THEN LET e$=V$(n
/(q(m)+2) TO q(m+1))
1070 LET m=5: IF q(m)=0 THEN LET
z=m: GO TO 1150
1080 IF q(m)<>0 THEN LET f$=V$(n
/(q(m)+2) TO q(m+1))
1090 LET m=6: IF q(m)=0 THEN LET
z=m: GO TO 1150
1100 IF q(m)<>0 THEN LET g$=V$(n
/(q(m)+2) TO q(m+1))
1110 LET m=7: IF q(m)=0 THEN LET
z=m: GO TO 1150
1120 IF q(m)<>0 THEN LET h$=V$(n
/(q(m)+2) TO q(m+1))
1130 LET m=8: IF q(m)=0 THEN LET
z=m: GO TO 1150
1140 IF q(m)<>0 THEN LET i$=V$(n
/(q(m)+2) TO q(m+1))
1150 LET z$=a$+b$+c$+d$+e$+f$+g$
+h$+i$
1160 LET L=LEN z$+z-1
1165 REM **LIMITS PROPORTIONAL
SPACING**
1170 IF a$<"c" AND b$=" " AND c$
=" " AND d$=" " AND e$=" " AND f$="
" AND g$=" " AND i$=" " THEN GO TO
1420
1180 IF a$<"c" AND c$=" " AND d$
=" " AND e$=" " AND f$=" " AND g$="
" AND i$=" " THEN LET a$=a$+" "
GO TO 1420
1190 IF z=4 AND L<25 THEN LET a$
=" "
1200 LET u$=CHR$ 32
1210 LET k=LEN (a$+b$+c$+d$+e$+f$
+g$+h$+i$)
1220 IF k=32 THEN GO TO 1420
1231 REM **CENTERING**
1220 IF J$="v" AND a$="c" AND nn
=0 THEN PRINT TAB 16-INT (k/2);b$
+CHR$ 32+c$+CHR$ 32+d$+CHR$ 32+
e$+CHR$ 32+f$+CHR$ 32+g$+CHR$ 32
+h$+CHR$ 32+CHR$ 32+i$; GO TO 1540
1224 IF J$="v" AND a$="c" AND nn
=1 THEN PRINT TAB 16-INT (k/2);b$
+CHR$ 32+c$+CHR$ 32+d$+CHR$ 32+
e$+CHR$ 32+f$+CHR$ 32+g$+CHR$ 32
+h$+CHR$ 32+CHR$ 32+i$; PRINT n;
GO TO 1540
1226 IF J$="c" AND a$="c" AND nn
=0 THEN LPRINT TAB 16-INT (k/2);
b$+CHR$ 32+c$+CHR$ 32+d$+CHR$ 32
+e$+CHR$ 32+f$+CHR$ 32+g$+CHR$ 32
+h$+CHR$ 32+CHR$ 32+i$; GO TO 1540
1228 IF J$="c" AND a$="c" AND nn
=1 THEN LPRINT TAB 16-INT (k/2);
b$+CHR$ 32+c$+CHR$ 32+d$+CHR$ 32
+e$+CHR$ 32+f$+CHR$ 32+g$+CHR$ 32
+h$+CHR$ 32+CHR$ 32+i$; LPRINT
n; GO TO 1540

```

Continued on page 25





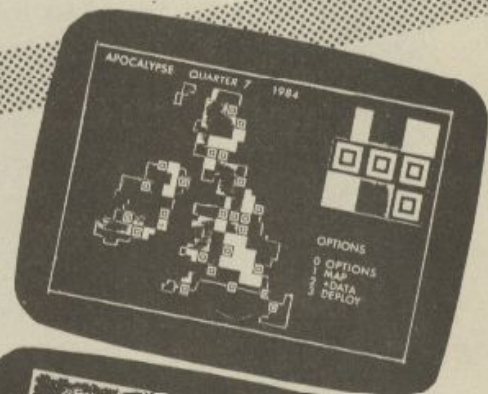
# BE THE WAR LORD

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```

1229 REM **PROPORTIONAL
    SPACING**
1230 IF K<32 AND A$(K)="" AND Q(2)
    <>0 THEN LET A$=A$+U$: LET K=K+1
1240 IF K=32 THEN GO TO 1420
1250 IF K<32 AND Q(3)<>0 THEN LE
    T B$=B$+U$: LET K=K+1
1260 IF K=32 THEN GO TO 1420
1270 IF K<32 AND Q(4)<>0 THEN LE
    T C$=C$+U$: LET K=K+1
1280 IF K=32 THEN GO TO 1420
1290 IF K<32 AND Q(5)<>0 THEN LE
    T D$=D$+U$: LET K=K+1
1300 IF K=32 THEN GO TO 1420
1310 IF K<32 AND Q(6)<>0 THEN LE
    T E$=E$+U$: LET K=K+1
1320 IF K=32 THEN GO TO 1420
1330 IF K<32 AND Q(7)<>0 THEN LE
    T F$=F$+U$: LET K=K+1
1340 IF K=32 THEN GO TO 1420
1350 IF K<32 AND Q(8)<>0 THEN LE
    T G$=G$+U$: LET K=K+1
1360 IF K=32 THEN GO TO 1420
1370 IF K<32 AND Q(9)<>0 THEN LE
    T H$=H$+U$: LET K=K+1
1380 IF K=32 THEN GO TO 1420
1390 IF K<32 AND Q(10)<>0 THEN LE
    T I$=I$+U$: LET K=K+1
1400 IF K=32 THEN GO TO 1420
1410 IF K<>0 AND K<32 THEN GO TO
    1200
1415 REM **PRINTING PARAGRAPHS**
1420 IF J$="V" THEN PRINT A$+B$+
    C$+D$+E$+F$+G$+H$+I$
1430 IF J$="C" THEN LPRINT A$+B$+
    C$+D$+E$+F$+G$+H$+I$
1435 REM **DOUBLE SPACING**
1440 IF J$="V" AND W$="d" THEN P
    RINT ""
1450 IF J$="C" AND W$="d" THEN L
    PRINT ""
1460 IF K<>0 THEN GO TO 880
1465 REM **SPACES BETWEEN
    PARAGRAPHS**
1470 IF J$="V" AND W$="s" THEN P
    RINT ""

```

```

1480 IF J$="V" AND W$="d" THEN P
    RINT ""
1490 IF J$="C" AND W$="s" THEN L
    PRINT ""
1500 IF J$="C" AND W$="d" THEN L
    PRINT ""
1505 REM **NUMBERING**
1510 IF J$="V" AND NN=1 THEN PRI
    NT N
1520 IF J$="C" AND NN=1 THEN LPR
    INT N
1530 IF K<>0 THEN GO TO 880
1540 IF S$="a" THEN NEXT N
1550 IF S$="y" THEN RETURN
1560 RESTORE 420
1565 REM **MENU: NEXT STEPS**
1570 PRINT ""
1580 PRINT TAB 0;"VIEW/COPY";TAB
    24;"GOTO 190"
1590 PRINT TAB 0;"LENGTH";TAB 24
    ;"GOTO 180"
1600 PRINT TAB 0;"DATA";TAB 24;"
    GOTO 170"
1610 PRINT TAB 0;"NUMBER";TAB 24
    ;"GOTO 160"
1620 PRINT TAB 0;"SINGLE/DOUBLE
    SPACING";TAB 24;"GOTO 150"
1630 PRINT TAB 0;"SELECT DATA IT
    EMS";TAB 24;"GOTO 140"
1640 PRINT TAB 0;"TABULATION";TA
    B 24;"GOTO 130"
1645 REM **VIEW AND/OR ADD TO
    LAST DATA ITEM**
1650 INPUT "VIEW LAST DATA ENTRY
    (Y/N)";I$
1660 IF I$="Y" THEN PRINT ""
1670 IF I$="Y" THEN LIST 1980+10
    *
2000 DATA "e e Netherwood Close"
2010 DATA "4 To Joe Bloggs"
2020 DATA "I want to write this
    note to test the re-numbered WP
    program."
2030 DATA "c CENTRE HEADING"
2040 DATA "c *****"
2050 DATA "# END"

```

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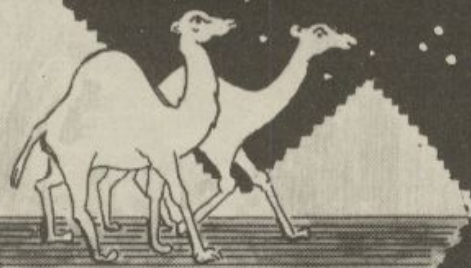
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## Curved slope

*Milos Versipellis presents an envelope shaping program for the Commodore 64*

This program for the Commodore 64 allows the user to explore the SID chip's envelope shaping capability. It is written *top-down* style to isolate sub-routines for use in other programs. The many lines with just a colon are to add readability, they are not necessary to the

working of the program.

Four variables define the shape of the program by setting the *slope* of a curve. The numbers are coded logarithmically, so that a slope of two is twice a slope of one. This is necessary since human senses measure all input logarithmically. Since it

is the slope that is being set in coded form, a zero will still produce a slope.

As a clue to your experiments, the coded numbers 0 to 15 can be thought of as the length of time a particular phase lasts, so that you can hear the envelope effects. Perhaps you would like to try the following — they are given in order — Attack, Decay, Sustain, Release:

10, 10, 10, 0 HARPIke sound  
10, 15, 0, 0 HARPSICHORDlike sound  
15, 0, 10, 15 A Great AMEN  
12, 2, 13, 9 A lesser Amen  
12, 7, 7, 10 Typical envelope natural  
8, 4, 2, 1 BANJOLike sound

```

0 :
1 REM#####
2 :
3 REM THE ROYAL MAIL
4 :
5 REM ENVELOPE SHAPING EXPERIMENT
6 :
7 REM BY MILOSC VERSIPELLIS
8 :
9 REM#####
10 :
20 GOSUB 9000 :REM INITIALISE
30 GOSUB 8000 :REM GET NYBBLES
40 GOSUB 7000 :REM PLAY NOTE WITH AISR
50 GOTO 20
90 :
4000 :
4001 REM CHECK NYBBLE LIMITS
4002 :
4100 A=INT(A)
4110 FL=0
4120 IF A < 0 OR A > 15 THEN FL=1:PRINT
4990 RETURN
6000 :
6001 REM END - SHUT OFF VOLUME AND NOTES
6002 :
6010 :
6020 FOR I=0 TO 24
6030 :POKE $1+I,0
6040 NEXT
6990 RETURN
7000 :
7001 REM PLAY NOTE
7002 :
7003 REM VOLUME AND ATTACK/DECAY
7007 :
7010 GOSUB 6000 :REM SWITCH OFF SOUND
7020 POKE $1+24,15:REM INITIALISE SOUND
7030 POKE $2+5,ATT OR (DEC*16)
7040 POKE $2+5,ATT OR (DEC*16)
7050 POKE $3+5,ATT OR (DEC*16)
7051 :
7060 REM SUSTAIN/RELEASE
7061 :
7070 POKE $1+6,SUS OR (REL*16)
7080 POKE $2+6,SUS OR (REL*16)
7090 POKE $3+6,SUS OR (REL*16)
7091 :
7100 REM SET FIXED CHORD
7101 :
7110 POKE $1+1,17
7120 POKE $1,37
7130 POKE $2+1,21
7140 POKE $2,154
7150 POKE $3+1,25
7160 POKE $3,177
7161 :
7170 REM SET TRIANGULAR WAVEFORM
7171 :
7180 POKE $1+4,17
7190 POKE $2+4,17
7200 POKE $3+4,17
7201 :
7990 RETURN
8000 :
8001 REM GET NYBBLE VALUES
8002 :
8030 PRINT HEADER$
8100 PRINT" SELECT ENVELOPE "
8110 PRINT
8120 :
8200 INPUT"ATTACK NUMBER (0 - 15) ":A
8210 GOSUB 4000
8220 IF FL THEN 8200
8230 ATT=A
8240 PRINT
8260 :
8300 INPUT"DECAY NUMBER (0 - 15) ":A
8310 GOSUB 4000
8320 IF FL THEN 8300
8330 DEC=A
8340 PRINT
8360 :
8400 INPUT"SUSTAIN NUMBER (0 - 15) ":A
8410 GOSUB 4000
8420 IF FL THEN 8400
8430 SUS=A
8440 PRINT
8460 :
8500 INPUT"RELEASE NUMBER (0 - 15) ":A
8510 GOSUB 4000
8520 IF FL THEN 8500
8530 REL=A
8540 PRINT
8560 :
8990 RETURN
9000 :REM STARTING VARIABLES SET UP
9002 :
9010 S1=54272
9020 S2=81+7
9030 S3=82+7
9031 :
9040 REM DEFAULT VALUES
9041 :
9050 ATT=0
9060 DEC=0
9070 SUS=0
9090 REL=0
9100 HEADER$="*****ENVELOPE SHAPING EXPERIMENT*****"
9990 RETURN
10100 REM $1,$2,$3 ARE THE ADDRESSES OF
10110 REM THE VOICE REGISTERS ON THE
10120 REM COMMODORE 64 SID CHIP.
10200 :
10210 REM ATT DEC SUS REL ARE SHORT FOR
10220 REM ATTACK, DECAY, SUSTAIN AND
10230 REM RELEASE WHICH ARE THE MAIN
10240 REM COMPONENTS OF ENVELOPES.
10300 :
10310 REM THE NYBBLES MUST BE CHECKED
10320 REM TO ENSURE THEY ARE BETWEEN
10330 REM THE VALUES ZERO AND FIFTEEN
10340 REM BECAUSE THEY CONTROL VOLUME
10350 REM WHICH HAS A MAXIMUM VALUE OF
10360 REM FIFTEEN. NOTE THE USE OF THE
10370 REM FL OR FLAG VARIABLE HERE.
11000 #####
11001 :
11002 :
11003 REM FOR THE COMMODORE 64 COMPUTER
11004 :
11005 #####

```



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# SPACE SHUTTLE



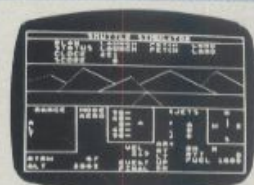
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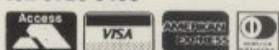
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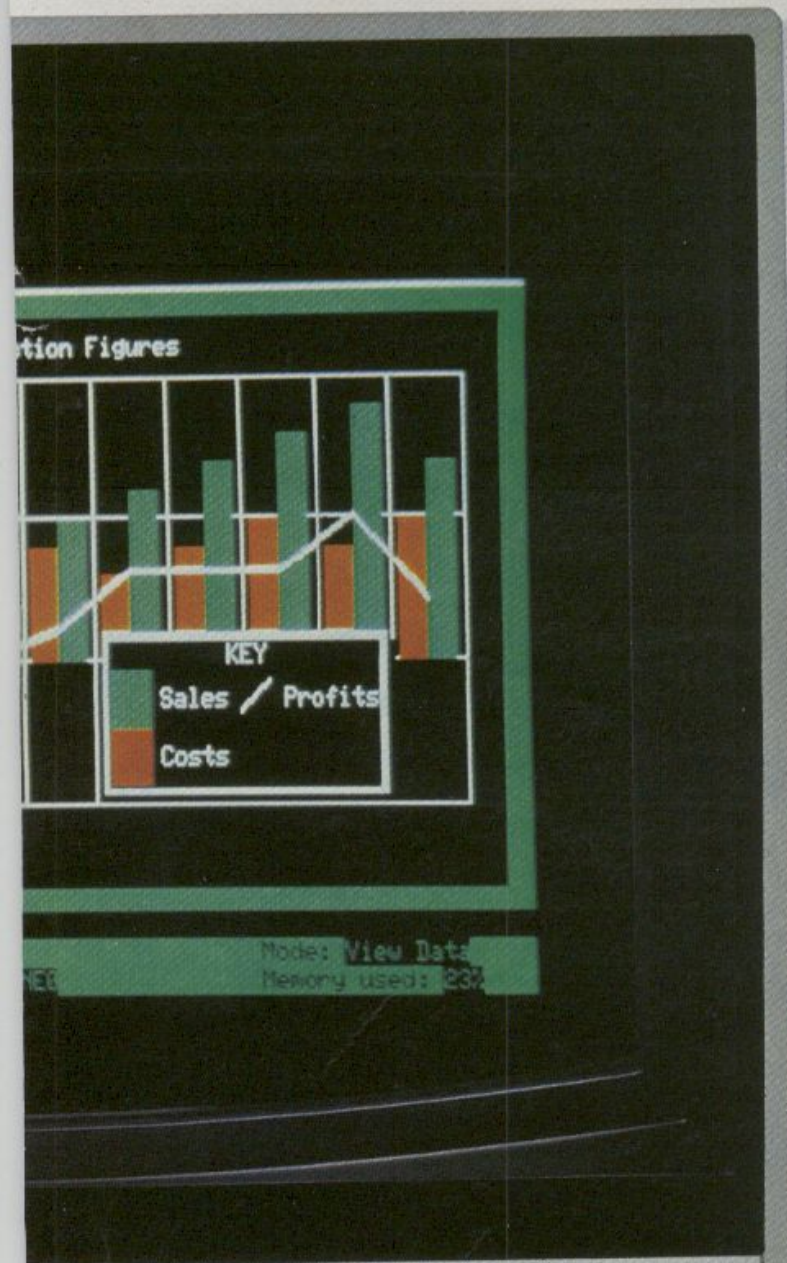


**John Menzies**



# New-Sinclair QL

## There's no comparison chart, b



The Sinclair QL is a new computer.

Not just a new Sinclair computer, but a totally new sort of computer – nothing like it exists anywhere.

It's not just a bit better than this, or a bit cheaper than that – it's a computer that's very hard to compare with anything. Just check the features below – and if you don't agree, take up the challenge at the end of the advertisement.

If you do agree, there's only one course of action you can take... get yourself a Sinclair QL at the earliest possible moment.

### The Sinclair QL has 128K RAM. Big deal?

Several micros offer 128K RAM, or more, as standard. The 'What Micro?' table for December 1983 lists over 50 of them – but 40 of the 50 micros listed cost over £2,500!

The Sinclair QL offers you 128K RAM for under £400, and an option to expand to 640K. That's a lot of bytes to the pound!

### The Sinclair QL has a 32-bit processor. Who else?

Under £2,700, nobody. Even the new generation of business computers, such as the IBM PC, are only now beginning to use 16-bit processors.

At prices like this, the Motorola 68000 family – widely regarded as the most powerful microprocessors available – will remain a luxury.

Yet with the Sinclair QL, the 32-bit Motorola 68008 is available for less than £400.

You can also be sure that the QL will not become outdated. 32-bit architecture is future-proof.

32-bit processor architecture, 128K RAM, and QDOS combine to give the QL the performance of a mini-computer for the price of a micro.

### Exclusive: new QDOS operating system

No competition! QDOS sets a new standard in operating systems for the 68000 family of processors, and may well become the industry standard.

QDOS is a single-user, multi-tasking, time-sliced system using Sinclair's new SuperBASIC as a command language.

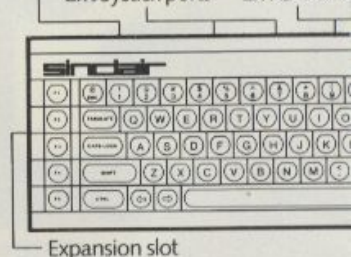
One of its most significant features is its very powerful multi-tasking capability – the ability to run several programs individually and simultaneously. It can also display the results simultaneously in different portions of the screen. These are features not normally available on computers costing less than £7,000.

### Eleven input/output ports

QL ROM Cartridge slot

2x Joystick ports

2x RS-232-C

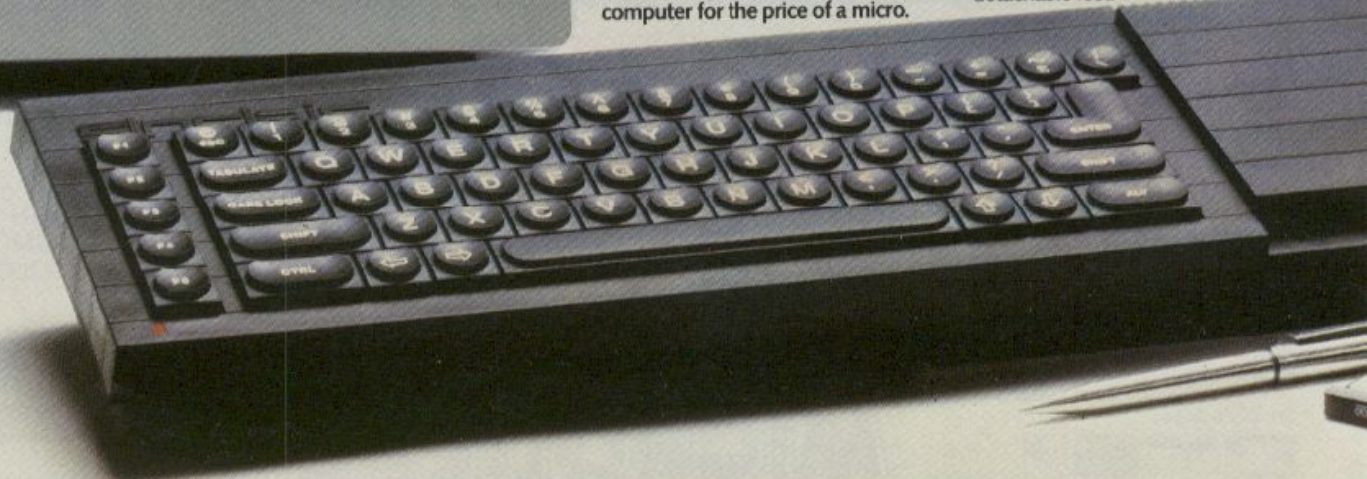


### New professional keyboard

The QL keyboard is designed for fast input of data and programs.

It is a full-size QWERTY keyboard, with 65 keys, including a space bar; left and right-hand shift keys; five function keys; and four separate cursor-control keys – key action is positive and precise.

A membrane beneath the keyboard protects the machine from dust (and coffee!), and for users who find an angled keyboard more comfortable, the computer can be raised slightly at the back by small detachable feet.





# £399

# because there's no comparison!

## Advanced new friendly language – Sinclair SuperBASIC

The new Sinclair SuperBASIC combines the familiarity of BASIC with a number of major developments which allow the QL's full power to be exploited.

Unlike conventional BASIC, its procedure facility allows code to be written in clearly-defined blocks; extendability allows new procedures to be added which will work in exactly the same way as the command procedures built into the ROM; and its constant execution speed means that SuperBASIC does not get slower as programs get larger.

## Included – superb professional software

The suite of four programs is written by Psion specially for the QL and incorporates many major developments. All programs use full colour, and data is transportable from one to another. (For example, figures can be transferred from spreadsheet to graphics for an instant visual presentation.)

### Word-processing



Certain to set a new standard of excellence, QL Quill uses the power of the QL to show on the screen exactly what you key in, and to print out exactly what you see on the screen.

A beginner can be using QL Quill for word-processing within minutes.

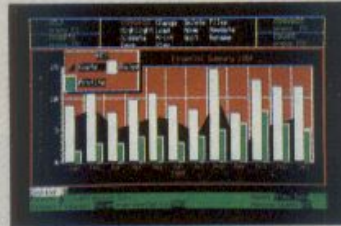
QL Quill brings you all the facilities of a very advanced word-processing package.

### Spreadsheet



QL Abacus makes simultaneous calculations and 'what if' model-construction easier than they've ever been. Sample applications are provided, including budget-planning and cash-flow analysis. QL Abacus allows you to refer to rows, columns and cells by names, not just letters and numbers. Function keys can be assigned to change a variable and carry out a complete 'what if' calculation with a single key-stroke.

### Business graphics



QL Easel is a high-resolution colour program so easy to use you probably won't refer to the manual! It handles anything from lines, shaded curves or histograms to overlapping or stacked bars or pie charts. QL Easel does not require you to format your display before entering data; it handles design and scaling automatically or under your control. Text can be added and altered as simply as data.

### Database management



QL Archive is a very powerful filing system which sets new standards, using a language even simpler than BASIC. It combines ease of use for simple applications – such as card indices – with huge power as a multi-file data processor.

An easy-to-use labelling facility means that you don't have to ask for your file by its full name – a few letters are enough.

## New – the Sinclair QLUB

The QLUB is the QL Users Bureau. Membership is open to all QL owners. For an annual subscription of £35, QLUB members receive one free update to each of the four programs supplied with the QL, and six bi-monthly newsletters. Sinclair has also made exclusive arrangements for QLUB members to obtain software assistance on QL Quill, Abacus, Archive or Easel by writing to Psion.

## The Sinclair QL challenge

If you're seriously considering any other computer, post the coupon for a blow-by-blow comparison. We'll take a published comparison chart for the machine you're considering (not one we've created ourselves) and give you the Sinclair QL figures, detail by detail.

## Take action today!

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– complete the coupon and send it to the FREEPOST address below. For credit card holders it may be possible to extend your credit limit. Full details will be sent when we acknowledge your order.

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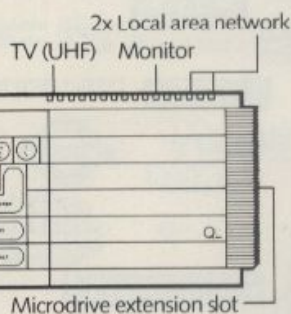
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### For more information

Phone Camberley (0276) 686100, or use the coupon to get a QL brochure.

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## Two 100K microdrives built in

The Microdrives for the Sinclair QL are identical in principle to the popular and proven ZX Microdrives, but give increased capacity (at least 100K bytes each) and a faster data-transfer rate. Typical access speed is 3.5 seconds, and loading is at up to 15K bytes per second. The Sinclair QL has two built-in Microdrives. If required, a further six units can be connected.

Four blank cartridges are supplied with the machine.

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# Access to files

Brian Cadge looks at direct access on disc drives in the first of a two-part series

Now that the Dragon disc drives are finally available in quantity, more and more users who have paid out nearly £300 for this metal box will be asking themselves "Is it just a fast cassette recorder?" Although one of the main advantages of a disc drive is its speed, the other major benefit is not so immediately obvious — the capability for sophisticated file handling.

Cassette tapes have the disadvantage of being serial access only — that is, record 2 can only be read after record 1 and so on. But a disc drive is capable of 'random access', that is, reading any record you wish at 'random'. The file handling commands added with the DDS cartridge are easy to use and lend themselves to direct access filing, although there is no provision for true random access from Basic as on some other drives.

The program presented here illustrates the use of direct access files and should be of use to any disc drive owners who want to keep names and addresses or catalogue their programs, etc. To try and make

it as easy to follow as possible, the program is designed as a series of modules — easily spotted by the Rem lines. Line 60 defines the important function which will simulate direct access files. The Dragon disc drives allow a file to be created as it is written to, but this is only suitable for serial data. For our purposes, the disc space must already have been reserved for the file in advance — similar to a Dim statement — and this is done by the first module. Notice in line 310 that by the use of the Free function it is possible to avoid a possible error by checking that the disc space exists before attempting to Create the file in line 330.

To read an entry from the file, the user-defined function is used, with the argument being the record number that we wish to read. The length of the record, L, must also be stated as well as the name of the file, F\$, see line 510. This program also allows you to enter a 'search string', the program then searches through the whole file and prints any possible match that it finds — the Instr function is very

useful here.

Not only can we read from any record directly, we can also, of course, write to any record and this is done by the module starting at line 800. The same format is used for the Fwrite command in line 880 as is used for the Fread command.

Another very useful feature of the DOS Basic is error trapping. The program is fully error trapped. Any errors not found by the individual modules are handled by the error routine starting at line 1010 — the Error Goto command in line 70 points to this. The most common errors, for example caused by the user not inserting a disc properly, are explained in full. Others have their code number and line number displayed. After an error has occurred, control is passed back to the main menu.

By not having any data in Ram, except when required, the files can be as big as disc space will allow, up to 165K. This program is only an example of file handling on the Dragon, it is written in such a way as to be easily expanded. I leave it up to you to customise it and add your own modules as you like; for example, a printer dump of the files contents.

Next week, we take a more technical look at Dragon's disc drives, including a memory map for the DOS and some DOS Rom routines of interest to the machine code programmer.

```

10 'GENERAL PURPOSE FILE PROGRAM
20 'REQUIRES DRAGONDOS 1.0
30 '
40 CLEAR500
50 FLAG=0
60 DEF FNR(R)=(R-1)*L+20
70 ERROR GOTO 1010
80 CLS
90 PRINT"OPTIONS AVAILABLE ARE:"
100 PRINT
110 PRINT" 1: CREATE A NEW FILE"
120 PRINT" 2: EXAMINE ENTRIES IN FILE"
130 PRINT" 3: DELETE ENTRIES FROM FILE"
140 PRINT" 4: ADD AN ENTRY TO FILE"
150 PRINT" 5: CHANGE CURRENT FILE IN USE"
160 PRINT
170 IF FLAG=0 THEN PRINT"NO FILENAME -
    SELECT 1 OR 5." ELSE PRINT"FILE IN
    USE IS "F$
180 PRINT
190 BEEP:PRINT@453,"ENTER OPTION NUMBER":
200 INPUT OP$:OP=VAL(OP$):IF OP<1 OR OP
    >5 OR OP>INT(OP) THEN 190
210 IF FLAG=0 AND (OP<>1 AND OP<>5) THEN
    190
220 ON OP GOTO 230,400,670,800,920
230 '*****
240 'CREATE A NEW FILE
250 '*****
260 CLS:PRINT"CREATE A NEW FILE.":PRINT
270 INPUT "NUMBER OF RECORDS":N
280 IF N<1 THEN 270
290 INPUT "LENGTH OF EACH RECORD":L
300 IF L<1 THEN 290
310 IF (FREE1)+1024<((20+L*N) THEN BEEP:
    PRINT"NOT ENOUGH DISK SPACE!"

    'WAIT5
000:GOTO70
320 LINE INPUT "FILENAME:":F$
330 CREATE F$,20+L*N
340 N=0
350 FWRITE F$,FROM 0,N
360 FWRITE F$,FROM 10,L
370 BEEP:PRINT"FILE "F$" CREATED"
    'FLAG=255
380 PRINT"DISK SPACE USED ="L OF(F$+".
    DAT")
390 WAIT 5000:GOTO70
400 '*****
410 'EXAMINE AN ENTRY
420 '*****
430 CLS
440 INPUT "EXAMINE ALL ENTRIES (Y/N)":A$
450 IF A$="Y" THEN 620
460 CLS
470 PRINT "ENTER RECORD NUMBER OR SEARCH
    STRING:"
480 LINE INPUT S$
490 R=VAL(S$)
500 IF R=0 THEN 570
510 FLREAD F$,FROM FNR(R),FOR L:A$
520 CLS
530 PRINT"RECORD NUMBER":R
540 PRINT
550 PRINTA$
560 PRINT"PRESS ANY KEY":EXEC41194
    'GOTO70
570 FOR I=1 TO N
580 FLREAD F$,FROM FNR(I),FOR L:A$
590 IF INSTR(1,A$,S$)<>0 THEN PRINT"
    RECORD NUMBER":I:PRINTA$:PRINT:BEEP

```





```

600 NEXT I
610 GOTO 560
620 CLS
630 FOR I=1 TO N
640 FLREAD F$,FROM FNR(I),FOR L: A$:PRINT
    I: A$
650 NEXT I
660 GOTO 560
670 '*****
680 'DELETE AN ENTRY FROM FILE
690 '*****
700 CLS
710 BEEP: INPUT "RECORD NUMBER TO BE
    DELETED": R
720 FLREAD F$,FROM FNR(R),FOR L: A$
730 PRINT: PRINT "DELETE: " : PRINT A$
740 INPUT "DELETE (Y/N)": Z$
750 IF Z$ <> "Y" THEN BEEP: PRINT "ABANDONED
    " : WAIT 5000: GOTO 70
760 FWRITE F$,FROM FNR(R),FOR L: " "
770 IF R=N THEN N=N-1: FWRITE F$,FROM 0: N
780 GOTO 70
790 '*****
800 'ADD ENTRY TO FILE
810 '*****
820 CLS
830 INPUT "RECORD NUMBER": R
840 IF R<1 THEN 840
850 PRINT: PRINT "ENTER TEXT: "
860 PRINT: LINE INPUT A$
870 FWRITE F$,FROM FNR(R),FOR L: A$
880 IF R>N THEN N=R: FWRITE F$,FROM 0: N
890 INPUT "ADD ANOTHER (Y/N)": A$
900 IF A$="Y" THEN 800 ELSE 70
910 '*****
920 'CHANGE CURRENT FILE
930 '*****
940 CLS
950 LINE INPUT "FILENAME": F$
960 FREAD F$,FROM 0: N
970 FREAD F$,FROM 10: L
980 FLAG=255
990 GOTO 70
1000 '*****
1010 'ERROR TRAPPING ROUTINE
1020 '*****
1030 SOUND 1,1
1040 IF ERR=128 THEN PRINT "DISK ERROR"
    ELSE PRINT "ERROR IN BASIC"
1050 PRINT "ERROR" ERR, "AT LINE": ERL
1060 PRINT
1070 IF ERR=128 THEN PRINT "DISK NOT
    READY, PLEASE ENSURE THAT DISK
    IS IN PLACE AND THE HATCH IS
    CLOSED."
1080 IF ERR=160 THEN PRINT "YOU HAVE TRIED
    TO ACCESS A FILE THAT DOES NOT EXIST."
1090 IF ERR=154 THEN PRINT "YOU HAVE TRIED
    TO ACCESS A DATA RECORD THAT DOES
    NOT EXIST."
1100 IF ERR=162 THEN PRINT "THERE ARE TOO
    MANY FILES OPEN": CLOSE
1110 WAIT 5000: GOTO 70
1120

```



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# Keyed up

**Michael Durrant** explains how to get 40 function keys on the BBC with 1.2 Rom

This program enables you to set up the function keys on the BBC B such that you can get not the usual 10 but 40 different functions.

1.2 Rom (and so will not work on machines with the old Rom) and using function keys in conjunction with different keys. The combinations are as follows:

- 1) Function keys on their own
- 2) Function keys with Shift

- 3) Function keys with Control
- 4) Function keys with Control and Shift

The important thing to note is that the additional 30 character definitions will survive not only a Break but also a hard — reset (Ctrl—Break). This means that once this program has been run and the characters defined, another program can be entered (in Mode 4 say) and the keys can be used to insert the definitions as one character, instead of the Print Chr\$ (224); etc, with the Vdu definitions at the beginning.

This facility is made possible by the new

```

10 MODE7
20 PROCOFF
30 PRINTTAB(5,5);CHR$(141);CHR$(130);CHR$(157);CHR$(132);"
  FUNCTION KEYS SET U ";CHR$(156)
40 PRINTTAB(5,6);CHR$(141);CHR$(130);CHR$(157);CHR$(132);"
  FUNCTION KEYS SET U ";CHR$(156)
50 VDU28,0,24,39,8
60 PRINTTAB(3);" NORMAL FN:"
80 PRINTTAB(4);"0. .UNUSED"
90 PRINTTAB(4);"1. .UNUSED"
100 PRINTTAB(4);"2. .LIST["
110 PRINTTAB(4);"3. .RUN["
120 PRINTTAB(4);"4. .*FX12,4["
  *FX11,35["
130 PRINTTAB(4);"5. .PRINTTAB("
140 PRINTTAB(4);"6. .=INKEY("
150 PRINTTAB(4);"7. .*KEY"
160 PRINTTAB(4);"8. .UNUSED"
170 PRINTTAB(4);"9. .UNUSED"
180 PRINTTAB(4);"10 .OLD[" LIST"
190 *KEY2"LIST:M"
200 *KEY3"RUN:M"
210 *KEY4"*FX12,4:M*FX11,35:M"
220 *KEY5"PRINTTAB("
230 *KEY6"=INKEY("
240 *KEY7"*KEY"
250 *KEY10"OLD:MLIST"
260 PRINTTAB(5,14);CHR$(130);"PRESS
  ANY KEY FOR NEXT PAGE"
270 PRINTTAB(5,15);CHR$(148);STRING
  $(27,"")
280 A$=GET$
290 CLS
300 PRINTTAB(3);" SHIFT FN:"
310 PRINTTAB(3);CHR$(145);"
320PRINTTAB(4);"0. .NO EFFECT"
330PRINTTAB(4);"1. .RED ";CHR$(134);"
  THESE KEYS ARE USED"
340PRINTTAB(4);"2. .GREEN ";CHR$(134);"
  IN MODE SEVEN"
350PRINTTAB(4);"3. .YELLOW";CHR$(134);"
  AND WHEN PRESSED"
360PRINTTAB(4);"4. .BLUE ";CHR$(134);"
  WITH A SHIFT KEY"
370PRINTTAB(4);"5. .MAGENTA";CHR$(134);"
  GIVE COLOURS"
380PRINTTAB(4);"6. .CYAN";CHR$(134);"
  (134);" (USEFUL IN"
390PRINTTAB(4);"7. .WHITE ";CHR$(134);"
  IN PRINT STATEMENTS)"
400PRINTTAB(4);"8. .FLASH"
410PRINTTAB(4);"9. .STEADY"
420 PRINTTAB(5,14);CHR$(130);"PRESS
  ANY KEY FOR NEXT PAGE"
430 PRINTTAB(5,15);CHR$(148);STRING
  $(27,"")
440 A$=GET$
450 MODE1
460 PROCOFF
470 COLOUR1:PRINT""TAB(3);"
  CNTRL FN:"
480 COLOUR2:PRINTTAB(3);"*****"
490 COLOUR3
500 *FX227,224
510VDU23,224,129,66,36,24,24,36,
  66,129
520VDU23,225,255,255,255,255,255,
  255,255,255
530VDU23,226,0,60,126,126,126,126,
  60,0
540VDU23,227,255,129,129,129,129,
  129,129,255
550VDU23,228,0,0,60,36,36,60,0,0
560VDU23,229,126,195,219,215,215,
  219,195,126
570VDU23,230,170,85,170,85,170,85,
  170,85
580VDU23,231,85,170,85,170,85,170,
  85,170
590VDU23,232,0,0,0,24,24,0,0,0
600VDU23,233,24,24,24,24,24,24,24,
  24
610 PRINT
620 PRINTTAB(9);"0. ";CHR$(224)
630PRINTTAB(9);"1. ";CHR$(225)
640PRINTTAB(9);"2. ";CHR$(226)
650PRINTTAB(9);"3. ";CHR$(227)
660PRINTTAB(9);"4. ";COLOUR1:PRINT
  FOR MODES 0 TO 6";COLOUR3:PRINT
670PRINTTAB(9);"5. ";CHR$(229)
680PRINTTAB(9);"6. ";CHR$(230)
690PRINTTAB(9);"7. ";CHR$(231)
700PRINTTAB(9);"8. ";CHR$(232)
710PRINTTAB(9);"9. ";CHR$(233)
720 COLOUR2

```



```

730 COLOUR2:PRINTTAB(8)"PRESS ANY
    KEY FOR NEXT PAGE"
740 COLOUR1:PRINTTAB(7);STRING$(
    (29,"*"))
750 A$=GET$
760 CLS
770COLOUR2:PRINTTAB(3);" SHIFT
    & CNTRL FN:"
780COLOUR1:PRINTTAB(3);"*****
    *****"
790 COLOUR2
800 *FX228,234
810VDU23,234,255,255,255,255,0,0,0,0
820VDU23,235,0,0,0,0,255,255,255,255
830VDU23,236,240,240,240,240,240,
    240,240,240
840VDU23,237,15,15,15,15,15,15,15,15
850 VDU23,238,240,240,240,240,0,0,
    0,0
860 VDU23,239,15,15,15,15,0,0,0,0,
    15,15,15,15
870VDU23,240,0,0,0,0,240,240,240,
    240
880VDU23,241,0,0,0,0,15,15,15,15
890VDU23,242,1,3,7,15,31,63,127,254
900VDU23,243,128,192,224,240,248,
    252,254,255
910 FORN=OTD9
    
```

```

920 PRINTTAB(4);N;". ";:COLOUR2:
    PRINTCHR$(129);:COLOUR1:PRINT
    CHR$(234+N);:COLOUR2:PRINTCHR$(
    (129)';:COLOUR2:NEXT
930 PRINTTAB(17,10);"THE RED
    CHARACTERS"
940 PRINTTAB(17,11);"ARE THE
    CHARACERS"
950 PRINTTAB(17,12);"DEFINED AND
    THE"
960 PRINTTAB(17,13);"YELLOW BLOCKS"
970 PRINTTAB(17,14);"EMPHASIZE
    THEIR"
980 PRINTTAB(17,15);"POSITION ON A"
990 PRINTTAB(17,16);"CHARACTER CELL
1000 COLOUR1:PRINTTAB(18,19);" FOR
    MODES 0 TO 6"
1010 PRINT
1020 COLOUR2:PRINTTAB(8)"PRESS ANY
    KEY TO FINISH"
1030 COLOUR1:PRINTTAB(6);STRING$(
    (27,"*"))
1040 A$=GET$
1050 COLOUR3
1060 END
1070 DEFFROCOFF
1080 VDU23,1,1;0;0;0;
1090 ENDPROC
    
```



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**Open Forum** is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the *Program of the Week* double our new fee of £6 for each program published.

## Maze 'n' Chase

on Spectrum

Maze 'n' Chase is an addictive maze chase-type program with a difference. You are the small man beginning at the bottom of the screen. You must move around the maze, eating the dots and scoring points (use cursor control keys to move, arrows

show direction of movement). However, you must avoid the small invader that inhabits the maze, who moves towards you with deadly intent. Every spade you run into enables you to dig one hole in the maze (press key 0 to dig). Only the invader can fall down the holes you dig, and when he does you must race to the scene and fill in the hole (press key P to fill); this must be done before the invader has time to climb out.

Whenever an invader is buried, you will have several seconds before a new and identical invader appears. There are four spades in each maze. When you have cleared the maze of dots and spades, you will move on to a new and different maze. You have four lives. You score one point for each dot eaten, 10 points each spade picked up and 30 points for each invader buried.

### Program notes

The program uses the `Attr` and `Screen$` function extensively throughout to detect what is where in the maze. The main purpose of lines 104-240 is to control the movement of the invader. The invader will keep within the maze walls and will actually chase you. If the invader gets near you he will accelerate. User-defined graphics are used and are set up in lines 1000-1020. The maze is constructed in lines 5-50.

**PROGRAM OF THE WEEK**

```

1 REM A-MAZE-'N' CHASE
  by J. Southgate.
2 GO SUB 1000
3 LET h=0: LET li=4: LET sc=0
: LET y=0: LET p=0: LET o=1
5 FOR i=1 TO 19 STEP 2: BEEP
: 01,60-i*2: PRINT AT i,0: INK 0;
:.....
: NEXT i
10 FOR n=2 TO 19 STEP 2: PRINT
AT n,0: INK 6;.....
20 PRINT AT n,AND#28+1; " ": IF
AND#2 THEN GO TO 20
30 NEXT n
35 PRINT AT 1,2: INK 4; "I"; AT
5,28: INK 4; "I"; AT 15,2: INK 4;
5,28: AT 19,28: INK 4; "I"
40 FOR n=0 TO 20: PRINT AT n,0
: INK 6; "■"; AT n,30: INK 6; "■";
NEXT n
50 FOR n=0 TO 30: PRINT AT 0,n
: INK 6; "■"; AT 20,n: INK 6; "■";
NEXT n
60 LET w=0: LET y=0: LET o=1:
LET l=19: LET c=12: LET a=2: LET
b=5
65 PRINT AT l,c: INK 1; "X": IF
INKEY$="" THEN GO TO 65
70 PRINT AT 21,2: "SCORE="; sc; A
T 21,14: "LIVES="; li; AT 21,25: "I="
: p: NEXT n
71 PRINT AT l,c: " "
72 IF INKEY$="0" THEN GO SUB 5
00
75 LET e$=INKEY$: IF e$>"4" AN
D e$<"9" THEN LET m$=e$
80 LET l=(l+(m$="6") AND ATTR
(l+1,c)<>62)-(m$="7" AND ATTR (l
-1,c)<>62)
90 LET c=c+(m$="8") AND ATTR
(l,c+1)<>62)-(m$="5" AND ATTR (l
,c-1)<>62)
92 IF ATTR (l,c)=60 THEN LET s
c=sc+10: LET p=p+1: LET w=w+1: B
EEP .5,20: IF w>=287 THEN LET sc
=sc+50: FOR n=0 TO 20: PRINT AT
n,0; " ": BEEP .1,n*2: NEXT n: GO
TO 5
95 IF SCREEN$ (l,c)="." THEN L
ET sc=sc+1: LET w=w+1: BEEP .001
:30: IF w>=287 THEN LET sc=sc+50
: FOR n=0 TO 20: PRINT AT n,0; " ":
BEEP .1,n*2: NEXT n: GO TO 5
100 PRINT AT l,c: INK 1; "X"
102 IF y=1 AND l=a AND (c=b-1 O
R c=b+1) AND INKEY$="p" THEN BEE
P .01,20: PRINT AT a+1,b: INK 6;
"■": BEEP .5,20: BEEP .5,-20: LE
T sc=sc+30: LET a=1: LET b=5
104 IF h=1 THEN PRINT AT a,b; " "
: LET h=0: GO TO 106
106 PRINT AT a,b; " "
108 IF y=1 THEN BEEP .01,-20: L
ET x=x+1: IF x=30 THEN LET y=0:
PRINT AT a+1,b: INK 6; "■"
109 IF y=1 THEN GO TO 70
110 IF a=l THEN GO TO 200
120 LET a=a+(a<l AND (ATTR (a+1
,b)<>62))-(a>l AND (ATTR (a-1,b)
<>62))
125 IF o=1 AND ATTR (a,b+1)<>62
THEN LET b=b+1
128 IF o=-1 AND ATTR (a,b-1)<>6
2 THEN LET b=b-1
129 IF ATTR (a,b+o)=62 THEN LET
o=o*-1
130 IF ATTR (a,b+o)=60 THEN LET
o=o*-1
135 IF SCREEN$ (a,b)="." THEN L
ET h=1
140 PRINT AT a,b: INK 2; "X": GO
TO 70
210 IF b>c THEN LET b=b-1
220 IF b<c THEN LET b=b+1
225 IF ATTR (a,b)=57 THEN FOR i
=65 TO 90: PRINT AT a,b; CHR$ i:
BEEP .01,1-40: NEXT i: PRINT AT
a,b; "X": BEEP .5,-30: PRINT AT a
,b; "X": LET li=li-1: LET l=19: L
ET c=5: LET a=1: LET b=5: IF li=
0 THEN GO TO 700
228 IF ATTR (a+1,b)=59 THEN GO
SUB 600
229 IF SCREEN$ (a,b)="." THEN L
ET h=1
230 PRINT AT a,b: INK 2; "X"
240 GO TO 70
500 IF p=0 OR ATTR (l+1,c)<>62
OR m$="6" THEN RETURN
510 PRINT AT l+1,c: INK 3; "■":
BEEP .1,-30: BEEP .1,-20: BEEP .
1,-10: LET p=p-1: RETURN
600 LET y=1: LET x=1: BEEP .01,
20: PRINT AT a+1,b; " " OVER 1: C
HR$ 8; "X": BEEP .2,-10: BEEP .01
:20: GO TO 70
700 PRINT AT 8,10: INK 2: INK 2
: PAPER 6; "GAME OVER": BEEP 1,30
: INPUT : INK 7: PAPER 0; "PRESS
ENTER TO PLAY AGAIN"; y$: RUN
1000 FOR v=144 TO 146: FOR n=0 T
O 7
1010 READ r: POKE USR CHR$ v+n,r
: NEXT n: NEXT v
1020 DATA 24,36,66,165,66,36,90,
129,60,36,24,126,153,36,36,102,1
26,16,16,16,16,124,124,56
1030 RETURN

```

Maze 'n' Chase  
by James Southgate



# OPEN FORUM

## Music

### on BBC

This machine code routine makes keying in programs more pleasant, giving you a beep of varying pitch each time you press a key.

The *Osrch* vector is altered to point to this routine. At the end of the routine a jump is made to &DFA5, which is the normal contents of the vector at &210.

The pitch of the note is determined by multiplying the ASCII code of the letter you press by three. An *Osword* routine is used to make the sound.

Instructions on how to change the various parameters of the sound are given in the program. Lines 310-340 determine whether the code is less than 32; ie, a control code. If it is a control code then a sound is not emitted. Lines 460-500 are responsible for making the sound.

```

90 *KEY10 OLDIM?&210=0: ?&211=&0D:IM
100 ?&210=0: ?&211=&0D: ?&70=2: ?&71=0
    : ?&72=&F6: ?&73=&FF: ?&74=0: ?&75=0
    : ?&76=4: ?&7 7=0
110
120 REM ***** TO CHANGE THE
    AMPLITUDE OF THE SOUND USE
    ' ?&72=amplitude' *****
140 REM ***** TO SWITCH SOUND OFF
    USE HARD BREAK OR ?&210=&A5:
    ?&211=&DF *****
160 REM ***** TO CHANGE SOUND
    CHANNEL USE ' ?&70=channel' *****
180 REM ***** TO CHANGE THE
    DURATION OF THE SOUND USE ?&76=
    duration. %TWENTIETHS OF A
    SECOND) *****
220 FOR PASS=0 TO 3 STEP 3
230 P%=&D00
240 EOPT PASS
250 STA &80
260 PHA
270 TYA
280 PHA
290 TXA
300 PHA
310 LDA &80
320 SEC
330 SBC #31
340 BCS GTEQUAL
350 PLA
360 TAX
370 PLA
380 TAY
390 PLA
400 JMP &DFA5
410 .GTEQUAL
420 STA &81
430 ASL A
440 CLC
450 ADC &81
460 STA &74
470 LDA #7
480 LDX #&70
490 LDY #0
500 JSR &FFF1
510 PLA
520 TAX
530 PLA
540 TAY
550 PLA
560 JMP &DFA5
570 J
580 NEXT

```

Music  
by Robert Turner

## Wordgame

### on Dragon 32

The program produces a trackword-type game, with a set time-limit.

#### Program notes

10 Initialise arrays etc  
20-50 Select or reject instructions  
60-90 Select own word  
100-120 Select word from array

130-170 Scramble word  
180-250 Prepare board  
260-330 Run/re-run game  
340-360 Prepared words  
380-490 Print instructions  
500- Accept user's word

```

10 DIMW$(30),U$(9),S$(9):B$=STRING$(7,128)
20 CLS:PRINT"DO YOU WANT INSTRUCTIONS (Y/N)"
30 A$=INKEY$
40 IF A$="" THEN S=RND(30):GOTO 30
50 IF A$="Y" THEN GOSUB 380
60 CLS
70 PRINT"USE MY NINE-LETTER WORD (Y/N)"
80 A$=INKEY$:IF A$="" THEN 80
90 IF A$="N" THEN GOSUB500:GOTO130
100 FOR N=1 TO 30:READW$(N):NEXT
110 X$=W$(S)
120 FOR N=1 TO9:U$(N)=MID$(X$,N,1):NEXT
130 FOR N= 1 TO 9:S$(N)="" :NEXT
140 FOR N=1 TO 9
150 S=RND(9)
160 IF S$(S)="" THEN S$(S)=U$(N) ELSE 150
170 NEXT N
180 CLS6
190 FOR X=170 TO 362 STEP 32

```



```

200 PRINT@X,B$;
210 NEXT X
220 PRINT@203,S$(1);PRINT@205,S$(2);PRINT@207,S$(3);
230 PRINT@267,S$(4);PRINT@269,S$(5);PRINT@271,S$(6);
240 PRINT@331,S$(7);PRINT@333,S$(8);PRINT@335,S$(9);
250 PRINT@416,"";
260 TIMER=0
270 IF TIMER/50 <120 THEN270
280 SOUND 150,10
290 PRINT@416,"YOUR TIME IS UP ";CHR$(223);
300 PRINT@448,"ANOTHER GAME (Y/N)?";
310 A$=INKEY$;IF A$="" THEN310
320 IF A$<>"Y" THEN END
330 RESTORE:GOTO20
340 DATA AUBERGINE,ACCORDION,MELODRAMA,ARTICHOKE,TRIBUTARY,BACKWATER,
    APPETISER,CHIPOLATA,LOLLIPOPS,BLACKJACK
350 DATA PRIVATEER,NORWEGIAN,SOVEREIGN,AFTERWARD,SEPTEMBER,PIECEMEAL,
    YESTERDAY,ANCHOVIES,BRIMSTONE,TARANTULA
360 DATA BUTTERCUP,DANDELION,SACRAMENT,EPISCOPAL,CATHEDRAL,MANGANESE,
    INOCULATE,EPIDERMIS,HEARTBURN,ADRENALIN
370 END
380 CLS
390 PRINT"THE IDEA OF THE GAME IS TO"
400 PRINT"FORM WORDS BY COMBINING ADJACENTLETTERS. ";
410 PRINT"LETTERS CAN BE ADJACENT";
420 PRINT"HORIZONTALLY,VERTICALLY, "
430 PRINT"OR DIAGONALLY."
440 PRINT"EACH LETTER CAN BE USED ONLY"
450 PRINT"ONCE IN EACH WORD"
460 PRINT:PRINT:PRINT
470 PRINT"PRESS ANY KEY TO CONTINUE"
480 A$=INKEY$;IF A$="" THEN 480
490 RETURN
500 PRINT"WHAT'S YOUR WORD";
510 INPUTWO$
520 IF LEN(WO$)<>9 THENPRINT:PRINT"NINE LETTERS PLEASE!";FOR T= 1 TO
    1000:NEXT T:GOTO500
530 FOR N= 1 TO 9:U$(N)=MID$(WO$,N,1):NEXT N
540 RETURN

```

Wordgame  
by D Lee

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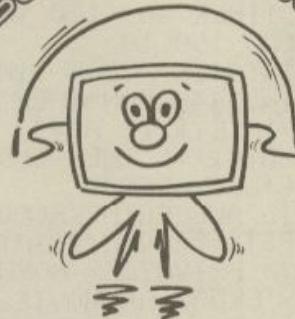
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# SPRITES FOR THE DRAGON

Merlin's Sprite Magic offers a whole host of new features for the Dragon

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Animation is easily implemented with DRWG function which swaps the drawings being used for sprites and they needn't even be the same size.

Some of the commands are exceptionally powerful... MOVEn moves a single sprite, MOVEn,n moves a block of sprites, MOVEM moves all the sprites. All the MOVE commands observe the individual direction, screen-edge, joystick and keyboard instructions for the various sprites. The REPORT function reports how many have crashed. The HIT function reports crashed sprite numbers.

Sprites are non-destructive i.e. they do not leave a "trail". They're fast and they're efficient and they're easy to use.

The Dragon now has its very own BEEP command. This one, however, offers a range of 16 pre-programmed gunshots, explosions, sirens, laser sounds and the like. You can also program your own... BEEP (six parameters) lets you generate the kind of noises you have heard on other high quality software.

Keyboard handling has had some attention too... optional auto-repeat, INKEY function returns ASCII code, KEY function does the same, but waits for a keypress. CLEAR key clears hi-res screen and homes the print cursor.

We have also included a couple of routines to provide text on the hi-res screen... in all 5 PMODES with enhanced cursor controls providing relative as well as absolute positioning, PAGE command, HOLD command (to fix headers or graphics), COLOUR command changes text foreground and background colours etc. The hi-res screen is used just like the Basic text screen, including editing. You can also re-define the character set using the friendly new command CHR(n)=eight row values.

Sprite Magic requires absolutely no knowledge of machine code. The comprehensive manual describes the new Basic commands in full, with lots of examples. As well as the documented demonstration program, the cassette includes Character and Sound Generators, Mate in two (yes you can!), Shooting Gallery and Breakout. Price £17.25 all inclusive.



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# OPEN FORUM

## Letter Puzzle

on Vic20

This program draws a five by five grid with the letters a to x. You then move the letters

and try to get them into order. The instructions tell you the order in detail. You move the letters with the keys:

W = Up  
A = Left  
D = Right  
X = Down

— or use a joystick. The puzzle is like *Magic Squares* which are small plastic squares in which you move bits around to make words or pictures. The Rem statements are self-explanatory and so you should be able to follow how the program works easily.

```

10 POKE 36879,8
12 POKE 36878,15
13 POKE 36864,12
20 REM
22 REM ***** INITIALISE *****
25 REM
27 DIM P(30),C(30),T(24)
30 FOR I=1 TO 25
35 READ P(I):NEXT
50 REM ***** DATA FOR POSITIONS *****
55 REM
60 DATA 7774,7777,7780,7783,7786
62 DATA 7840,7843,7846,7849,7852
64 DATA 7906,7909,7912,7915,7918
66 DATA 7972,7975,7978,7981,7984
68 DATA 8038,8041,8044,8047,8050
70 REM ** PUT CHARS IN RANDOM **
71 C(25)=32
72 FOR I=1 TO 24
75 X=INT(RND(1)*24)+1
77 IF T(X)<>0 THEN 75
80 C(I)=X:T(X)=1:NEXT I
100 REM
102 REM ***** INSTRUCTIONS *****
105 REM
110 PRINT"***** LETTER PUZZLE"
115 PRINT"*****"
120 PRINT"***** MOVE THE LETTERS AND PUT THEM INTO ORDER"
125 PRINT"***** USE THE KEYS:-"
130 PRINT"***** W"
132 PRINT"***** I"
134 PRINT"***** A-S-D"
136 PRINT"***** I"
138 PRINT"***** X"
140 PRINT"***** OR USE THE JOYSTICK"
150 PRINT"***** PRESS ANY KEY"
155 GETA$:IFA$=""THEN155
160 PRINT"***** LETTER PUZZLE"
162 PRINT"*****"
170 GOSUB 500:REM * GRID *
175 FOR I=1 TO 24
180 POKE P(I),I:NEXT
185 PRINT"***** GET THE LETTER INTO THIS ORDER."
190 PRINT"***** PRESS ANY KEY"
195 GETA$:IFA$=""THEN195
200 REM
202 REM ***** SET UP PUZZLE *****
205 REM
210 PRINT"***** LETTER PUZZLE"
215 PRINT"*****"
220 GOSUB 500:REM * GRID *
230 FOR I=1 TO 25
235 POKE P(I),C(I)
237 POKE P(I)+30720,4
240 NEXT I
250 TI$="000000"
260 P=25:TR=0
300 REM
303 REM ***** PLAY *****
305 REM
307 POKE 36864,8
312 REM ** JOY STICK **
313 M=0
314 J=PEEK(37137)
316 IF J=110 THEN M=-1
318 IF J=122 THEN M=-5
320 IF J=118 THEN M=5
322 POKE 37154,127
324 IF PEEK(37152)=119 THEN M=1
330 POKE 37154,255
332 REM ** KEYBOARD **
333 REM-LARGE PETE-
334 J=PEEK(197)
336 IF J=09 THEN M=-5
338 IF J=17 THEN M=-1
340 IF J=18 THEN M=1
342 IF J=26 THEN M=5
352 IF M=0 THEN 380
355 P1=P+M
357 IF P1<26 AND P1>0 THEN 360
358 POKE36875,230
359 FORR=1TO400:NEXT:POKE36875,0:GOTO 390
360 IF M=1 AND P/5=INT(P/5)THEN 365
361 IF M=-1 AND P/5-.2=INT(P/5)THEN 365
362 IF M=-1 AND P=21 THEN 365
363 GOTO 370
365 POKE 36875,220
366 FORR=1TO400:NEXT
367 POKE 36875,0:GOTO380
370 POKE P(P),PEEK(P(P))
372 POKE P(P),PEEK(P(P))
375 POKE P(P1),32
376 POKE 36876,200
377 FORR=1TO200:NEXT
378 POKE36876,0
379 P=P1:TR=TR+1
380 REM
382 REM ***** CHECK FOR WIN *****
383 REM
384 FOR I=1 TO 24
385 IF PEEK(P(I))<>ITHEN 390
387 NEXT:GOTO 700
390 PRINT"***** TIME: ";TI$
395 PRINT"***** MOVES: ";TR
400 GOTO 300
500 REM
502 REM ***** DRAW GRID *****
505 REM
510 PRINT"*****"
520 FOR I=1 TO 4
530 PRINT"***** | | | | |"
535 PRINT"***** | | | | |"
540 PRINT"***** | | | | |"
545 NEXT I
550 PRINT"***** | | | | |"
555 PRINT"***** | | | | |"
560 RETURN
700 REM
702 REM ***** WIN *****
703 REM
705 PRINT"***** WELL DONE YOU MADE IT!"
710 FOR I=1 TO 10
720 POKE 36875,0:POKE36876,128
730 FORR=1TO300:NEXT
740 POKE 36876,0:POKE36875,128
750 FORR=1TO300:NEXT
760 NEXT I
765 POKE 36875,0
770 PRINT"***** ANOTHER GO(Y OR N)"
780 GETA$:IFA$=""THEN780
790 IFA$="Y"THEN RUN
800 PRINT"*****:POKE36879,27
810 POKE 36864,12

```

Letter Puzzle  
by A Blackham



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## Input

### on Spectrum

The purpose of this piece is to provide an alternative to using the *Input* statement when entering numerical data into Spectrum. The *Input* statement has three major faults: first, the value entered is removed from the screen once the *Enter* key has been hit. The second is that using *Input* stops you from using the bottom two lines of the screen for display purposes. Third, and most importantly, *Input* is not 'user friendly' for numeric data. If we hit a non-numeric key by accident (and we all

do this from time to time), then the program will crash with an error code 2.

Program 1, which uses *Inkey\$* instead of *Input*, has been written as a subroutine which can be used with other programs. An input prompt is printed (line 3010) and the auto repeat is cancelled (line 3020). The subroutine now waits for a key to be hit and the result is stored in location B\$. Lines 3050 to 3100 test the *Code* of the last key hit to ascertain whether or not that key is valid for numeric data.

Program 2 is an illustration of a main program using this subroutine, the data that we enter being stored in an array X. As the subroutine stores the numeric data

as a string, we must use the *Val* function if we wish to use X as our array.

Also it is convenient to initiate an auto-scroll (lines 60 and 160) in case we wish to store more than 20 numbers. The *Print* statement following the *Gosubs* are necessary because the subroutine does not force the computer to move to the next line. Program 3 illustrates how the subroutine can be used when entering pairs of numbers — in a regression program, for example. I have found this subroutine to be especially useful when I have written programs where the output is in the form of a table, but one entry per line of the table is an input.

#### Program 1

```
3000 LET A$="": LET D=0
3010 PRINT FLASH 1;">"; FLASH 0;
CHR$ 8;
3020 IF INKEY$<>"" THEN GO TO 303
3030 IF INKEY$="" THEN GO TO 303
3040 LET B$=INKEY$: LET Z=CODE B
3050 REM CHECK FOR VALID ENTRY
3060 IF Z>47 AND Z<58 THEN GO TO
3130
3070 IF Z=13 AND A$<>"" THEN GO
TO 3230
3080 IF Z=46 AND D=0 THEN GO TO
3120
3090 IF Z=12 THEN GO TO 3170
3100 GO TO 3020
3110 REM ENTRY ACCEPTED
3120 LET D=1
3130 LET A$=A$+B$
3140 PRINT B$;
3150 BEEP .1,15
3160 GO TO 3010
3170 REM DELETE LAST ENTRY
3180 IF A$="" THEN GO TO 3020
3190 IF A$(LEN A$)="" THEN LET
D=0
3200 LET A$=A$(1 TO LEN A$-1)
3210 PRINT " "; CHR$ 8; CHR$ 8;
3220 GO TO 3010
3230 REM ENTER PRESSED
3240 IF A$="" THEN GO TO 3020
3250 PRINT " "; BEEP .1,10
3260 RETURN
```

#### Program 2

```
10 DATA "1st","2nd","3rd"
20 PRINT "HOW MANY ENTRIES? ";
30 GO SUB 3000: LET N=VAL A$
40 PRINT
50 DIM X(N)
60 PRINT
70 POKE 23692,255
80 FOR I=1 TO 3
90 READ A$
100 PRINT A$;" NUMBER = ";
110 GO SUB 3000: LET X(I)=VAL A
$
120 PRINT
130 NEXT I
140 FOR I=4 TO N
150 PRINT I;"th NUMBER = ";
160 GO SUB 3000: LET X(I)=VAL A
$
170 PRINT
180 NEXT I
190 STOP
```

#### Program 3

```
10 PRINT "HOW MANY PAIRS? ";
20 GO SUB 3000: LET N=VAL A$
30 DIM X(N): DIM Y(N)
40 PRINT : PRINT
50 PRINT TAB 5;"X VALUE";TAB 2
0;"Y VALUE"
60 POKE 23692,255
70 FOR I=1 TO N
80 PRINT TAB 8;
90 GO SUB 3000: LET X(I)=VAL A
$
100 PRINT TAB 23;
110 GO SUB 3000: LET Y(I)=VAL F
$
120 PRINT
130 NEXT I
140 STOP
```

**Input**  
by Ronald Jones



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## Tony Bridge's Adventure Corner



### Beginners only

What would you recommend as a good Adventure for a beginner to start on? This is a question that I am often asked and, to be truthful, I cannot answer it!

There are, nowadays, several categories of Adventure — we can distinguish text Adventures, text with graphics, and graphics-only Adventures. We can further reduce any Adventure to one of two types if we concentrate on playing techniques.

Programs like *The Hobbit* or *Valhalla*, and most of the D&D-type combat Adventures, actually change with each playing, and the solution to the game at one playing need not necessarily be the solution at the next playing. Having silly Thorin wandering about, wittering on about Gold, or Mary bashing you over the head when you let loose a perfectly reasonable bit of strong language may prove a bit confusing to the beginner, who has enough to worry about (although I recently had a letter from an Adventurer of eight years old who completed *The Hobbit* in just a week or so!).

So, although the unpredictable elements in this kind of Adventure may appeal to some players, in general, the beginner will find that text Adventures are easier to play, with graphic Adventures being tackled later.

From America, Scott Adams and his company, Adventure International, have one of the most well-known catalogues of Adventures. These are available for all the American computers — Atari, Vic20, CBM 64, Apple — and have the added bonus of a Difficulty Rating system. Thus, *Pirate Adventure* is the easiest and would be a good place for the absolute beginner to start. The others range through Medium Difficulty to Advanced Adventurers Only Need Apply!

Probably the hardest is *Savage Island Part 2*, and I wouldn't recommend this one to a complete novice. Anyway, they're all pretty good value, and if you have an Atari or Apple, you can get to see a SAGA (Scott Adams Graphic Adventure) — they are rather expensive, and apart from the pretty pictures, are exactly the same as the text version.

The Scott Adams Adventures are now available for the Spectrum. Adventure International has finally woken up to the

fact that there are a million Sinclair owners, a large percentage of whom are just dying to get their hands on a Scott Adams Adventure — and none of them will be disappointed!

Of the other American text Adventures easily available over here, I must single out for mention the Infocom series. *Zark I, II* and *III* are the most famous, but the others, like *Suspended*, in which the player controls six robots which are his eyes, ears, and other senses, and *Witness* and *Deadline*, which contain complete dossiers of Police files, are equally as good. They're all very expensive — but they are state-of-the-art.

All this is pretty advanced stuff, however, and I only mention them as an example of what goodies you can look forward to!

Back on solid ground, and in the UK, we have many companies putting out Adventures which would make a good starting point for our budding Adventurer.

For the ZX81 and Spectrum, a good range of Adventures is available from Artic. There are four of them, with a fifth in preparation. With the exception, I believe, of the latter, they are all text (complete with the occasional odd spelling!). The scenarios and plots are excellent and invoke a good sense of atmosphere. But be warned — although they are a good introduction, they are not easy, and occasionally need rather lateral thinking (but that's what Adventuring is all about!).

Having been around for a number of years, they have obviously stood the test of time — three years is an eternity in the home computing market!

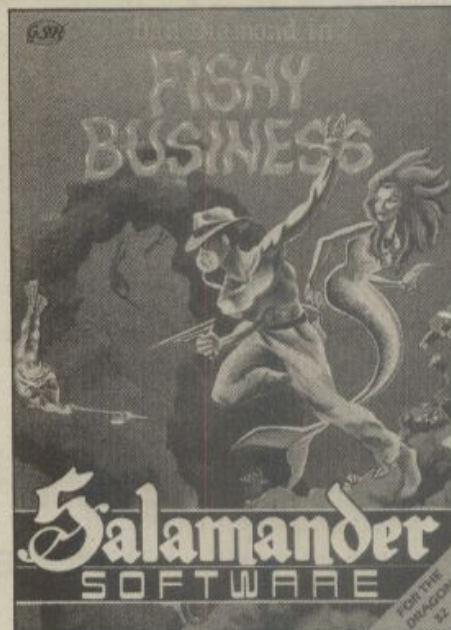
A large range of computers is catered for by Channel 8 Adventures. In the distant past, they were writing for the Nascom and Tandy TRS80, but in the last few months, the company has written versions of its 12 Adventures (and this number may increase by two or three in the next few weeks) for a much larger range of machines, which includes the BBC, Spectrum, Commodore and Atari computers.

The Adventures are text supported by nicely-drawn graphics, and the pictures, pretty though they are, can be toggled on or off as the player wishes. In fact, they have to be cleared from the screen if the player wishes to see what is at the current location.

They are all written by Brian Howarth, who obviously takes Scott Adams as a model, and his programs are a good training ground for the beginner.

Other worthwhile additions to the Spectrum owner's library are the Phipps Associates Adventures. Written by Mike Farley, they are, again, text Adventures, supported by graphics. Unfortunately, these are very slowly drawn, and the whole process can be very boring when repeated again and again. However, the Adventures themselves cannot be faulted, and *Knight's Quest* has become something of a classic Spectrum Adventure.

For the beginner, *Greedy Gulch* contains many of the common problems to be



found in Adventures, and is a good beginner's program.

The Spectrum, of course, is the machine with probably the biggest support from third-party software authors, and among their products are many good Adventures.

For the Dragon, Salamander has the Dan Diamond Trilogy. A pastiche of the Mike Hammer sort of detective novel, they follow the fortunes of the Private Eye from a graveyard in California in *Franklin's Tomb* to deep space in *Lost In Space*, to a watery alien world in *Fishy Business*. These Adventures are text only, although the beautifully produced accompanying manuals contain pictures of many of the locations, with clues embedded in them.

*Pettigrew's Diary*, from Shards Software, is a graphic Adventure, but suitable for beginners and certain to keep anyone hooked for many hours while travelling through the London Underground system among other locations.

Acornsoft, in their initial release of software for the BBC, included a couple of Adventures. *Castle Of Riddles* and *Philosopher's Quest* have been with us for a couple of years and still baffle people with dancing bears and rainbow-coloured rods. Third-party software is now coming through for the BBC machines.

For the Oric, you will find some good Adventures among the Tansoft catalogue — *Zodiac Adventure* being one of the better programs for beginners.

This list has been necessarily brief — in future weeks, I'll look at some in more detail, and add to the list.

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further, write to: Tony Bridge, Adventure Corner, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.



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## DOES IT EXIST?

*G Back of Bradbourne Road, St Johns, Sevenoaks, Kent, writes:*

**Q** Do you know anything about the Rom cartridge slot on the BBC micro? I know that it costs £55 to install and you get a speech chip, but what about the cartridge for the slot? Do they exist? My dealer cannot help.

**A** In short, no! Now that the Electron has at last seen the light of day, the Rom cartridge slot remains the great mystery of Acorn Computing. As far as I know all you can get for the £55 is the speech chip with its 175 word vocabulary. Apart from that, to my knowledge, there are no cartridges available from Acorn or anyone else.

Perhaps one of the reasons for this is that Acorn have released no specifications for the cartridge, the handbook that comes when the cartridge is added, is, to say the least, sketchy. I doubt that cartridges will become available in the near future, especially as the Electron does not have the cartridge slot.

## DISC TO CARTRIDGE

*Dr Manfred Dechmann of Herrenbergstrasse 1, Zurich, writes:*

**Q** How can I load programs on disc on to a cartridge or module. I need a few programs very often — five times a day — and so I want to save the loading time even from disc.

I have a C64 with 1541 disk station and Epsom RX80.

**A** If I understand your question correctly what you are asking is how to copy

disc programs to cartridge. The answer, I'm afraid, is with great difficulty. Unlike copying from tape to disc where the problems can be solved by playing around with the software memory locations, etc, a cartridge is a program "burnt into" an Eprom and mounted on a circuit board.

In some magazines from America I have seen devices that enable you to burn in your own Eproms, but they are very expensive. I doubt though this would solve your problem. If you are using the disc information daily for something like word processing or records, an Epsom has two major problems; firstly it cannot usually have programs longer than 32 K, sometimes 16K — probably not enough for your purposes — and, secondly, you cannot change the data information as with a disc — adding and erasing addresses, for example.

I'm afraid the only real way you have of speeding up access times is to see if your disc system cannot be improved in some way, but I doubt any difference would be very substantial.

## ZX PRINTER

*G. T. Swain of Fairmead Crescent, Edgeware, Middlesex, writes:*

**Q** I own a Sinclair ZX81 and I have a Spectrum on order. Can you recommend a printer that could be used with either machine. I already have a Sinclair printer, and to say the least it is not very good.

**A** Other than the Sinclair printer there are no printers that you can connect directly to your ZX81 or Spectrum (there is, though, a plain paper version of the Sinclair printer available that was originally designed for use with the Timex).

So any other printer you might choose will need to be interfaced. Almost all the available interfaces are Centronics, ie, they enable you to connect your Spectrum to Centronics printers — fortunately this is the vast majority. Suitable interfaces are made by Hilderbay, Kempston, Tasman and Morex (among others) and with them you

should find that virtually any cheap printer can be connected.

As to what you should buy, it really is up to you. How much money do you want to spend? Is it mainly for letters or listings? If you don't want to spend more than £200 and only need it for listings, then any dot matrix printer will do — an Epsom, for example. If it's for important letters, then you may need a Daisywheel costing more like £350.

I doubt that any other than Spectrum interfaces will work with the ZX81 — you will probably have to buy a special one for it, although you should be able to use the same printer.

## OVERHEATED VIC

*Matthew Smith of Elan Avenue, Stourport-on-Severn, writes:*

**Q** Not wishing to pay £200-plus for a Commodore printer, I was considering buying a smaller one. The one I have noticed is the Amber which is £70, but I would like to know if a dearer one would pay off?

The other problem that I have is overheating. After an hour my Vic gets very hot, and after about three hours it reduces my programs to gibberish. This means that I have to turn off and start again. I find that the slits at the back do little to help the problem. Is there a small cheap fan available that I could use to reduce the heat?

**A** People are always asking questions about printers — quite rightly since they can cost more than the computer itself. There are all sorts of problems with buying printers, but they are particularly highlighted with Commodore machines.

The problem is this — Commodore programs make much use of control characters — particularly for cursor move-

ment and colours, consequently listings are full of them. Since you were considering the Amber I would guess that your main requirement from a printer is to do program listings rather than word processing. The problem is that the Amber, and indeed all printers other than the Commodore ones, do not support the control characters. Thus, even assuming you manage to interface a printer to your Commodore so that it will print basic numbers and letters, it will still not print the control characters. I think you would be best advised to look for a second-hand Commodore printer — you should be able to find one for less than £200.

Your heat problem is very common and apart from taking care to save programs every couple of hours or so, there isn't much you can do. Commercial computers have inbuilt coolers, but it is hardly practical for you to open up your computer and put a fan in it.

## LYNX USER GROUP

*Ms G. Marsh of Kingston Road, Oxford, writes:*

**Q** I have recently bought myself a 96K Lynx computer, and while I'm pleased with it, I also find that there is very little published for it. I suppose that's what happens if you get a computer that is not a big seller. What I would actually like to know, is there a Lynx User group?

**A** The Lynx as you rightly imply is overshadowed by the likes of the BBC at one end, and the Spectrum at the other. It is a pity because it is fundamentally a good computer. However, all is not lost as there is a Lynx User group, namely NILUG (National Independent Lynx User Group). The address you want is NILUG, 53 Kingswood Avenue, Sanderstead, South Croydon, Surrey CR2 9DQ.

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**SWAP GAMES DESIGNER**, Chequered Flag, Penetrator and PacMan for ZX printer (good condition). Different software if required. Tel: Staines 57086 after 4.30 pm. (May sell software separately).

**SPECIAL GAMES** for 32K switchable Rampack. Also wanted, Commodore 64. Tel: 01-953 8643.

**BBC "B"** 1.2 Rom. Lots of programs and magazines, £300. Tel: 01-251 3769 after 6 pm.

**SHARP MZ80K** with software. Tel: 0244 47910 evenings.

**BBC 32K O.S. 1.2** for sale. Perfect condition, £270. Tel: 0905 60660 weekends.

**CRS80**, books, manuals, level one games pack and books. Offers. ZX microdrive order form. Tel: 021-742 1446 after 6 pm.

**BBC "B"** plus two joysticks and £200 software and magazines, boxed, including all leads, all for £380. Tel: Glasgow 771 1793 after 7 pm.

**EPSOM RX80 FP**, two weeks old, £300, under guarantee. Tel: Glasgow 771 1793.

## Wanted

**WANTED**. Vahalla or Hobbit for Spectrum. Will swap for Star Trek, Krazy Kong, Gulpman and Frogger. Tel: Peter 01-422 7583 evenings, before 8 pm.

**MICRODRIVE ORDER FORM (X2)** and software (3D Tunnel and others) to swap etc. Tel: Jon, 01-949 2053.

**MICROKET PEN PAL WANTED**. Using micronet mail box for exchanging information of hardware, software and general Spectrum news. Send me a message on account. Tel: 01-387 5477.

**ATARI CARTRIDGES** to swap. Centipede, Krazy Shootout, Assembler Editor, Video Easle. Swap Casiotone MT65 keyboard for Series 3 Spectrum. Tel: Jeremy, 01-363 1578 after 6 pm or weekend.

**SPECTRUM** and CBM 64 computer software wanted for immediate cash. Offer must be makers originals with cassette, slips intact. Prefer large collections in London area. Details please telephone 01-520 0904.

**WANTED**. Original Sinclair Spectrum keyboard, will buy or swap for fuller Spectrum keyboard or software. Tel: Wakefield (0924) 863658.

**SPECTRUM SOFTWARE SWAP**. Over 70 titles including Hobbit, Scrabble, Machine coder, Collectors Pack. Send your list for mine. Immediate reply. Eddie Earley, 65 Anner Road, Dublin 8, Ireland.

**WANTED**. CBM 64 user to swap programs. Tel: Mick, 01-828 2333, extension 249 (day).

**WANTED**. Spectrum 48K. Preferably north-west England. Tel: 051-426 6024 after 6 pm.

**A10 DISC DRIVE**, £200; £1,500 of software, £100. Will separate. Tel: Hackwood 8446.

**JUPITER ACE** plus leads and manual for £50 ono. Tel: Basildon (0268) 555468.

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**ZX MICRODRIVE** order form. Best offer secures. Tel: (Iver) 654398 after 7 pm.

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# NEW RELEASES

## SCALE DOWN

Although it's called *Logo-art*, this new program from Hobby Software has relatively little to do with the famous language used with Turtles and the like.

In fact *Logo-art* is an *Artists Designer*-type program, albeit one with a good many features.

For the Dragon 32, it allows you to draw in any *Pmode* and Save your creation to tape. Apart from the usual draw/erase line features there is a choice of scaling, ie, how far the line moves for each instruction, down to a single pixel point.

**Program** *Logo-art*  
**Price** £6.95  
**Micro** Dragon 32  
**Supplier** Hobby Software  
8 Elgar Avenue  
Chapel House Estate  
Newcastle upon Tyne  
NE5 1HZ

## OPENING TIME



*Pi-Eyed* is the latest in Automata's growing range of arcade games for the Spectrum. As ever it refrains from violence and concerns itself instead with the serious business of drinking — something dear to the Piman's heart (he must be a journalist).

The game is not likely to give Ultimate any sleepless nights, at least not technically, but it is good fun for all that.

Using the cursor keys you move the Piman along a road full of traffic (a bit like *Frogger* — Pigger perhaps?) to evade the traffic he can enter

one of the buildings that flash past — surprisingly, most of these seem to be pubs.

Once in a pub the Piman must drink all the pints on the table — this makes him drunk and difficult to control, consequently he falls over everyone; this loses points.

Other locations simply produce funny (fairly) messages and the aim of the game is really to last as long as you can.

**Program** *Pi-Eyed*  
**Price** £6  
**Micro** Spectrum 48K  
**Supplier** Automata  
27 Highland Road  
Portsmouth  
Hants PO4 9DA

## NOTATION

Vectors was one of those mathematical concepts that I never really mastered — maybe what I needed was *Vectors* by Salamander Software.

This package is a collection of 14 programs which cover most of the vector algebra required for 'A' level maths.

Subjects include Scalar multiplication, matrix notation, modulus, ratio theorem and many others.

The 14 programs develop logically on from one another and were written by a senior lecturer in mathematics.

The programs can be saved to disc should you have one and will work on both the BBC B and the Electron.

**Program** *Vectors*  
**Price** £24.95  
**Micro** BBC B/Electron  
**Supplier** Salamander  
17 Norfolk Road  
Brighton  
East Sussex  
BN1 3AA

## WIDE-EYED

Astronomy fans should get hours of wide-eyed entertainment from *The Cosmos* by Eclipse Software.

This program attempts to display the entire Cosmos on your 48K Spectrum from next door neighbours like the Virgo Cluster — a mere 2,000 light years away — to remote regions like the Hydra Cluster.

**Program** *The Cosmos*  
**Price** £5.95  
**Micro** Spectrum 48K  
**Supplier** Eclipse Software  
79 Ardrossan Gdns  
Worcester Park  
Surrey KT4 7AX

## AROUND SPACE



The galaxy is yours to explore in *Megawarz* a 'magical planetary trip' which takes you from Pluto to Mars battling it out with various aliens whose degree of vulnerability to your firepower is illustrated by their colour which changes periodically.

Your ship comes equipped with shields which have to be replenished from time to time by capturing astronauts who, for some reason, are hurtling through space towards you.

Movement is either by joystick or the keyboard and you can select the difficulty level and adapt the game to make it more or less difficult.

The first round ends when you have destroyed aliens in every corner of the galaxy and arrived back at the earth and then — guess what? It all starts again, faster and meaner.

**Program** *Megawarz*  
**Price** £7.50  
**Micro** Commodore 64  
**Supplier** Paramount Software  
67 Bishopton Lane  
Stockton-on-Tees  
TS18 1PU

## TIME LORDS

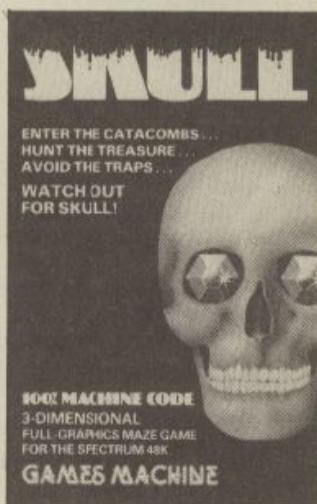
If unbelievably difficult text adventures appeal to you then you are bound to react with glee to the news that Level 9 has just issued its latest epic — *Lords of Time*.

Nine evil timelords are out to cause chaos throughout human history. Using a mysterious clock you must travel through nine different periods of time looking for the nine special objects which together will save eternity.

The adventure is being issued for seven different machines and is entirely in machine code. Responses are fast and, even more important, Level 9 have thought about a suitable response for when you haven't typed in the right thing, other than "I don't understand". Another winner.

**Program** *Lords of Time*  
**Price** £9.90  
**Micro** Most (32K+)  
**Supplier** Level 9 Computing  
229 Hughenden Road  
High Wycombe  
Bucks HP13 5PG

## BLOCKED MAZE



*Skull* is a machine code maze game for the Spectrum 48K. The only objective of the game is to stay alive as long as possible and accumulate as many points as possible. This is achieved by finding various treasures that are scattered about the maze.

Problems take the form of nasty skulls that will defend the treasure. You may also find that your way through the maze is suddenly blocked by a portcullis that can only be raised by a special key.

The 3-D views through the maze are very well done — in a similar way to *Transylvanian Tower* by Richard Shepherd — and also like that game you can elect to view a map of what's located where, but you



need to have a good memory as it dissolves within a couple of seconds. Very enjoyable with lots of tactical play possible.

**Program** *Skull*  
**Price** £6.95  
**Micro** Spectrum 48K  
**Supplier** Games Machine  
Bessemer Drive  
Stevenage  
Herts SG1 2DX

## SINGLE PIXEL

A very nice idea this; *Dataid* is a Dragon graphics program that comes not only with a manual but also a specially designed protractor and ruler.

The program itself is a fairly standard drawing program with fill and a choice of movement detail — from single pixel to 20 pixels. But the ruler and protractor look really useful in enabling accurate plotting on the high resolution screen.

The whole package is neatly put together and anything you create can be Saved for use in your programs. The price is reasonable too.

**Program** *Dataid*  
**Price** £10.95 (+£1.00)  
**Micro** Dragon 32  
**Supplier** Detail Utility Products  
32 Sleppe Crescent  
Brooklands Park  
Branksome  
Poole  
Dorset BH12 4DN

## EIGHT WAVES



More arcade action for the Oric 48K. *Starship* from Sector 7 Software would seem to have all the necessary require-

ments for the genre — eight waves of different aliens, machine code etc.

On this particular game you are required to defend earth (armed only with three gigantic battlecruisers) from a massed onslaught by the war fleet of the Cirellian Empire.

Apart from high score tables the game has an added feature not often seen on Oric games — it loads a pretty title screen for you to look at, whilst the Oric is taking its usual interminable time to load.

**Program** *Starship*  
**Price** £6.50  
**Micro** Oric 1 48K  
**Supplier** Sector 7 Software  
PO Box 8  
Newton Abbot  
Devon  
TQ12 1UE

## MORTGAGE

*Vic Money Manager* is one of Ivan Berg Software's growing range of utility packages for the Vic20 plus 8 or 16K.

The box contains two cassettes and a manual. The main program is *Money Manager* which is a fairly straightforward accounts program allowing you to keep records of bank statements, tax demands, etc, recording the main details with the relevant dates.

There are facilities to get a balance of your account and to credit regular income payments. You may also list standing orders and compare actual and estimated expenditures.

The second tape is *Money Calculator* which contains programs for mortgage and interest calculation.

**Program** *Vic Money Manager*  
**Price** £9.99  
**Micro** Vic20 (8K/16K)  
**Supplier** Commodore  
675 Ajax Avenue  
Slough Trading Estate  
Slough  
Berkshire SL1 4BG

## ENERGY LEVEL

*Krago Castle* is an adventure game with strategy overtones. Although a lot of the time you concern yourself with secret

passages and locked doors, whilst wondering what effect drinking the mysterious potion is going to have, you also have to maintain your energy for frequent bouts of combat with nasty monsters.

Although there are a couple of nice title screens, most of the action is text only — mainly Basic with machine code subroutines — a quick play suggested there were quite a few clever ideas in the game.

**Program** *Krago Castle*  
**Price** £6.00  
**Micro** Spectrum 48K  
**Supplier** Assassin Software  
10 Ash Road  
Leeds 6

## GRAPHICS AID



Print 'n' Plotter originally produced a range of practical aids for Spectrum program development in the form of large sheets of lined paper which mimicked the layout of the pixels on the Spectrum screen.

It has now issued a program that looks just as useful. *Paintbox* is basically a very sophisticated designed program. The potentially very impressive results are illustrated in both the adds and the helpful manual that comes with it.

The advantage of *Paintbox* is that like other similar programs it allows you 'etch a sketch' like facilities but it also gives you up to 84 user defined graphics with each design — especially useful for interesting type faces. If you've been looking for a Spectrum graphics aid, this seems like one of the best.

**Program** *Paintbox*

**Price** £7.50 (p+p 75p)  
**Micro** Spectrum 48K  
**Supplier** Print 'n' Plotter  
Products  
19 Borough High Street  
London SE1 9SE

## SUN TRAP



*Here Comes the Sun* is a graphics adventure from Alligata Software who have previously concentrated on BBC, Commodore and Dragon programs — this one is for the Spectrum.

The general plot sounds a little like *Artic's Ship of Doom* — you have to find your way to the retro rockets of a ship and activate them before you are dragged into the sun.

The program is supposed to be extremely difficult and will allow inputs other than *Take X* or *Drop Y* like *The Hobbit*.

Although hi-res, the graphics are fairly simple, but sound is used to good effect — one the hardened text adventurer will enjoy.

**Program** *Here Comes the Sun*  
**Price** £7.95  
**Micro** Spectrum 48K  
**Supplier** Alligata Software  
178 West Street  
Sheffield S1 4ET

New Releases is designed to let people know what software is coming on to the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: New Releases, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.



## Top 10

Atari	
1 (1) Zaxxon	(Datasoft)
2 (10) Spy's Demise	(Penguin)
3 (5) O' Riley's Mine	(Starcade)
4 (6) Meltdown	(Cosmi)
5 (1) Wingman	(Microprose)
6 (1) Zork III	(Infocom)
7 (1) Slinky	(Cosmi)
8 (1) Planet Fall	(Infocom)
9 (1) Cavern of Kafka	(Cosmi)
10 (4) Enchanter	(Infocom)

\$48K Cassette, £32K Disc, £32K Cassette.  
(Figures compiled by Callisto Computers,  
Birmingham 021-632 6458)

Spectrum	
1 (1) Chequered Flag	(Psion)*
2 (1) Atic Atac	(Ultimate)
3 (1) Death Chase	(Micromega)
4 (8) Lunar Jetman	(Ultimate)
5 (1) Manic Miner	(Bug-Byte)
6 (5) 3D Ant Attack	(Quicksilva)
7 (1) Flight Simulation	(Psion)
8 (1) Stonkers	(Imagine)
9 (7) The Alchemist	(Imagine)
10 (4) Kong	(Ocean)*

\*Requires 48K.  
(Figures compiled by W H Smith and Son,  
London)

BBC*	
1 (1) Killer Gorilla	(Program Power)
2 (2) Disc Doctor	(Computer Concepts)
3 (1) White Knight Mk 2	(BBC)
4 (1) Laser Command	(Program Power)
5 (3) Planetoid	(Acomsoft)
6 (1) Acomsoft Chess	(Acomsoft)
7 (5) Snapper	(Acomsoft)
8 (7) Wordspell	(Griffin)
9 (6) Sphinx Adventure	(Acomsoft)
10 (9) Feasability Experiment	(Digital Fantasia)

\*All Model B.  
(Figures compiled by Micro Management,  
Ipswich 0473 59181)

Books	
1 (4) Advanced User Guide for the BBC Micro, Bray	(Cambridge Micro Centre)
2 (5) Commodore 64 Programmer's Reference Guide, Commodore	(Commodore)
3 (6) Beyond Basic, Freeman	(BBC/NEC)
4 (3) Graphics on the BBC Micro, Cryer	(Prentice-Hall)
5 (1) BBC Micro Disk Companion, Latham	(Prentice-Hall)
6 (1) 30 Hour Basic, Spectrum edition, Prigmore	(BBC/NEC)
7 (7) Advanced Graphics with your ZX Spectrum, Angell and Jones	(Macmillan)
8 (1) Programming the M68000, King	(Addison-Wesley)
9 (1) 68000 Assembly Language Programming, Kane and Leventhal	(Osborne)
10 (9) Mastering Machine-code on Your ZX Spectrum, Baker	(Interface)

(Figures compiled by Watford Technical Books, Watford 0923 23324 Prestel 28844)  
(Last week's position in brackets)

## Top 10

ZX81	
1 (1) Asteroids	(Quicksilva)
2 (1) Defender	(Quicksilva)
3 (1) Invaders	(Quicksilva)
4 (1) Scramble	(Quicksilva)
5 (1) Centipede	(DK Tronics)
6 (1) Invaders	(Bug-Byte)
7 (3) Crazy Kong	(PSS)
8 (10) ZX DB Disassembler	(Bug-Byte)
9 (7) Hopper	(PSS)
10 (8) Froth	(Sinclair)

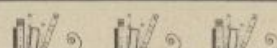
Dragon 32	
1 (1) Eightball	(Microdeal)
2 (1) Dragon Chess	(Oasis)
3 (1) SAS	(Peaksoft)
4 (1) Space Shuttle	(Microdeal)
5 (1) Dent Assault	(Microdeal)
6 (1) Cuthbert goes Digging	(Microdeal)
7 (4) Ugh!	(Softtek)
8 (1) Dream Bug	(Kensig)
9 (1) Intergalactic Force	(Microdeal)
10 (1) Tiger Grand Prix	(Tiger)

Commodore 64	
1 (1) International Football	(Commodore)
2 (1) Hungry Horace	(Melbourne House)
3 (1) Forbidden Forest	(Centresoft)
4 (1) Space Shuttle	(Microdeal)
5 (1) Cosmic Convoy	(Tasksoft)
6 (1) Hobbit	(Melbourne House)
7 (9) Frogger	(Interceptor Micros)
8 (1) Escape MCP	(Rabbit)
9 (1) Road Toad	(Audiogenic)
10 (1) Pooyan	(Centresoft)

Vic20	
1 (3) Wizard and the Princess	(Melbourne House)
2 (1) Snooker	(Visions)
3 (1) Amok	(Audiogenic)
4 (1) Computer Wars	(Thorn EMI)
5 (1) Four Gates of Freedom	(Phoenix)
6 (1) Arcadic	(Imagine)
7 (1) Sargon II Chess	(Commodore)
8 (1) Laser Zone	(Llamasoft)
9 (1) Supervaders/Bomber Run	(KTEL)
10 (1) Escape MCP	(Rabbit)

(Figures compiled by Boots/Websters)

## Book Ends



### POCKET SIZED

*Assembly Language for the Z80* is the latest in Pitman's Pocket Guide Series — neatly designed instruction books that actually will fit in a pocket.

Although not machine specific — and so it would probably need to be supplemented by more specific information should you actually wish to get down to some serious programming — it is nevertheless one of the most useful books on this subject I have seen.

The wonderful world of registers, stacks, unconditional jumps and relative addressing are described and explained in a fair amount of detail and the book, if that's the right description, seems excellent value for money.

Book	<i>Assembly Language for the Z80</i>
Price	£2.50
Micro	General (Z80 based)
Supplier	Pitman Publishing 128 Long Acre London WC2E 9AN

### DISC DRIVES

Whilst it is easy to see that general introductions to micros might sell well to all kinds of people, I am not sure there is an equivalent size of market for a general book on disc drives. Nevertheless *Disc Drives for Microcomputers* is just that.

This slim volume attempts to provide a general outline on how disc drives work and guidance on how to write programs that use them effectively. A number of programs are included in the book, although for many machines they will need some adaptation.

Book	<i>Disc Drives for Microcomputers</i>
Price	£7.95
Micro	General
Supplier	Sinclair Brown John Wiley & Sons Baffins Lane Chichester Sussex

## This Week

Program	Type	Micro	Price	Supplier
3D Spell	Ed	Spectrum	£5.95	Camel
Astro Fighters	Arc	Vic20	£6.95	Sumlock
Bombastic	Arc	Atari	£9.95	English
Brick Wars	Arc	Spectrum	£3.99	Paul Coyle
Bull Run	Arc	Spectrum	£5.95	Phipps Associates
Chopper	Arc	Vic20	£6.95	Sumlock
Cuthbert in the Mines		Dragon 32	£8.00	Microdeal
Dambuster	Arc	BBC B	£7.95	Alligata
Datapak	Ut	Vic20	£8.95	Sumlock
Destroyer	Arc	Vic20	£7.95	Sumlock
Dinky Digger	Arc	Spectrum	£6.95	Postern
Eagle Flight	Arc	Commodore 64	£7.95	Alligator
Execution	Ed	Spectrum	£2.50	Loophole
Fallout	Arc	Ace	£4.95	Plasma
Fireball	Arc	Dragon 32	£7.95	Abacus
Frogger	Arc	Ace	£4.95	Plasma
Games Tape	Arc	Ace	£4.95	Plasma
German Is Fun	Ed	Spectrum	£5.95	CDS
Graphics Rom	Ut	BBC B	£28.00	Computer Concepts
Grid Trap	Arc	Vic20	£7.95	Sumlock
Gun Fight	Arc	Vic20	£6.95	Sumlock
House of the Living Dead	S	Spectrum	£5.95	Phipps Associates
Invaders	Arc	Ace	£4.95	Plasma
Jumping Jack	Arc	Vic20	£7.95	Sumlock
Killer Knight	Arc	Spectrum	£5.95	Phipps Associates
Kriegspiel	S	Dragon 32	£6.95	Beyond
Loony Zoo	Arc	Spectrum	£5.95	Phipps Associates
Magic Meanies	Arc	Spectrum	£5.95	CDS
Manage	S	Spectrum	£6.00	CCS

Marathon	Arc	Commodore	£9.95	English
Maths Invaders	Ed	BBC Electron	£6.95	Stell
Mission 1	Ad	Spectrum	£6.00	CCS
Monkey Bizness	Arc	Spectrum	£5.95	Artic
Moonbuggy	Arc	Ace	£4.95	Plasma
Multiplan	Ut	Commodore 64	£99.95	Microsoft
Multitron	Arc	Vic20	£7.95	Sumlock
Oligopoly	S	Spectrum	£6.00	CCS
Pengwyn	Arc	Spectrum	£6.95	Postern
PI-balled	Arc	Spectrum	£6.00	Automata
Puzzle Pack	S	Vic20	£6.95	Sumlock
Q Man	Arc	BBC	£5.50	MRM
Robohunt	Arc	Ace	£4.95	Plasma
Scorpion	Arc	Vic20	£7.95	Sumlock
Siren City	Arc	Commodore 64	£7.00	Interceptor
Skramble	Arc	CMB64/Vic20	£7.95	Anirog
Space Rescue	Arc	Vic20	£6.95	Sumlock
Star Trader	S	BBC B	£7.95	FBC Systems
Starship Escape	Arc	Vic20	£9.95	Sumlock
Stockmarket	S	Spectrum	£6.00	CCS
Tankbattle	Arc	Ace	£4.95	Plasma
Tarot	S	Atari	£12.95	English
Timebomb	Arc	Spectrum	£5.95	CDS
Token of Ghail	Ad	Commodore 64	£7.00	Interceptor
Triad	Arc	Vic20	£7.95	Sumlock
Vortex Raider	Arc	Commodore 64	£7.00	Interceptor
Xanagrams	S	Spectrum/BBC B	£6.95	Postern

Key: Ad — adventure/Arc — arcade/Ed — education/  
S — strategy-simulation/Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to: This Week, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.



## Ziggurat



## Plug-compatible

Two computers with 16-bit microprocessors, both costing around £400 are due on the market in a short while — the Sinclair QL and the Advance 86a.

The two machines follow differing design philosophies, and the two approaches are very familiar to those whose experience extends to the world of main-frame computers. They are the "plough your own furrow" and the "plug-compatible" schools of thought.

For many years main-frame manufacturers have either decided to make their products compatible with IBM (plug-compatible products such as Amdahl), or decided to make their own way with products so distinctly excellent that they will be purchased in preference to IBM (eg. Honeywell or ICL).

With IBM becoming dominant in the upper reaches of the micro business market with its PC and now PCjr, the trend with low cost "professional" machines is set to follow the same path as the main-frames. Any manufacturer has to think very carefully about IBM before launching a new micro.

By choosing Motorola for the 16-bit chip, incorporating microdrives on-board, designing its own Basic and operating system, Sinclair Research seems to have chosen to be a Honeywell rather than an Amdahl.

Sinclair Research has been very successful in the past in producing highly novel, idiosyncratic products — trail-blazers in fact. It has been said that if Sinclair did not exist, then somebody would have had to invent him. What was meant was that Sinclair added a sense of the magical

to personal computing: though he had a good team, his personality was the driving force behind it.

In moving into a new sector of the market, and one which is already well supplied with machines, Sinclair Research is not in the same position of advantage it was with their small computers. A product has to be very good to sell to the serious user. However, at about £400 many "non-serious" users bought the BBC model B, and possibly that is the market for the QL, the upmarket personal user.

We know very little about the Advance, but we do know that it is a plug-compatible computer (ie, compatible with the IBM PC). The designers of the Advance took a design decision at the start to be plug-compatible with the IBM PC. In a similar way, in the world of mainframes, Amdahl and Hitachi design computers and peripherals so that IBM software and add-ons work without modification.

The way in which Amdahl and Hitachi sell their plug-compatible products is to make them cheaper, and faster, and anything else to give them an edge over IBM. Plug-compatible manufacturers are not trying to drive IBM out of business, because if IBM folded so probably would the plug-compatible manufacturers. IBM "look-alikes" are only viable if IBM is still the dominant computer manufacturer, because who wants to be a look-alike to a manufacturer whose products do not sell well?

The Advance is IBM PC compatible, is faster, and — according to somebody who has used a pre-production version — is a nice machine to use. The Advance uses the Intel 8086 chip (the IBM PC uses the 8088), and so is an advance (no humour intended) on the IBM in terms of technology.

With the QL and the Advance we have two very cheap 16-bit machines with two opposing views of the market and it should be very interesting to see how they fare.

Why is the IBM PC so popular (though it costs far more than, say, the Sirius)? The reason is simple. You can trust the IBM, they will not fold overnight, and when they enhance their machines they always ensure that old software will run on the new machines.

How many other personal computer manufacturers can say that?

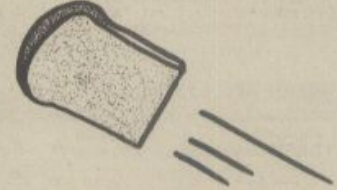
■ Boris Allan

## Puzzle

### Sale bargains

#### Puzzle No 92

Sue Sails went to the sales to buy a new electric toaster, and came back with many wondrous things — but not, I ought to add, the toaster!



It turned out that she had bought 25 items and had spent exactly £25 on the four types of goods listed.

Bath towels.....	two for £1
Tablecloths.....	£1 each
Saucepans.....	two for £5
Sets of cutlery.....	£5 each

How many of each had she bought?

#### Solution to Puzzle No 87

If the addition sum is examined, it is seen that if we assign values to the letters 'N' and 'S' we can immediately find out the value of 'A'. Once this is known, the value of 'T' can likewise be determined. This enables us to reconstruct the complete sum and check if any of the possible results match up.

```
10 FOR N = 0 TO 9 20 FOR S = 0 TO 9 30 IF N = S
THEN GOTO 160 40 LET X$ = STR$(N + 2 * S) 50
LET A + VAL (X$(LEN X$)) 60 IF A = S OR A = N
THEN GOTO 160 70 LET X$ = STR$((N * 10 + N) +
(N * 10 + S) + (N * 10 + S)) 80 IF LEN X$ < 2 THEN
LET X$ = "0" + X$ 90 LET T = VAL (X$(LEN X$ -
1)) 100 IF T = A OR T = N OR T = S THEN GOTO
160 110 LET ANN = A * 100 + N * 10 + N 120 LET
TANS + T * 1000 + A * 100 + N * 10 + S 130 LET
STANS = S * 10000 + TANS 140 LET SANTA = S *
10000 + A * 1000 + N * 100 + T * 10 + A 150 IF ANN
+ TANS + STANS + SANTA THEN PRINT S;A;N;T;A
160 NEXT S 170 NEXT N
```

From this the only solution is: S = 4, A = 5, N = 7 and T = 2, giving 577 + 2574 + 42574 = 45725.

#### Winner of Puzzle No 87

The winner is: G Loveridge, Usk Road, Pontypool, Gwent, who receives £10.





... but seriously,

# AUTOMATA

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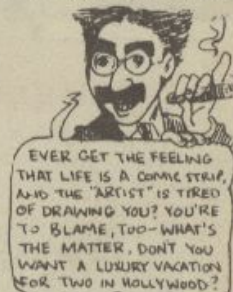
Well folks .... far be it from us to actually  
ADVERTISE anything on our glorious BACK PAGE,  
but in order to celebrate the PIMAN's return  
to the bosom of his happy family, (and to  
appease the AUTHORS of his new program)... we  
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SUPERB. The FREE MUSIC on the flipside is  
wonderfully offensive, (and the authors want  
their measly ROYALTIES!)

HI THERE YOU GUYS. THIS IS  
**UNCLE GROUCHO**

speaking. Just a reminder  
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ment where DREAMS COME TRUE  
contains the identity of a  
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The GENIUS who finds it  
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game on the market (only £6) and  
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