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POPULAR

Computing

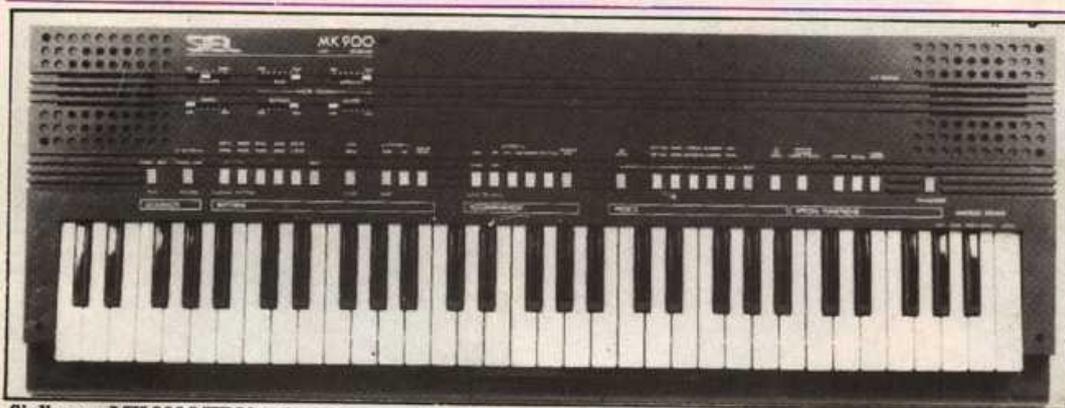
WEEKLY

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16-22 August 1984

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Vol 3 No 33



Siel's new MK 900 MIDI keyboard

MIDI for micros

MIDI, the communications standard that has transformed the synthesiser and electronic music keyboard industry, is making its first inroad into the computer market.

The MIDI standard enables musical instruments to commu-

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Atari prices slashed

ATARI will, as predicted, dramatically cut the prices of all its machines, software, and peripherals from September 1.

The 600 XL computer will retail for £99.99, a drop of £60 from the current price and the 800 XL will fall by over £50 from £249.00 to £199.99.

Software for both the VCS machines and computers will be reduced in price across the board to £9.99.

Peripherals prices will also fall; the 1020 printer will come down to £99.99 from £149.99; the 1050 disc drive will come down to £199.99 from £299.99; and the 1027 letter quality printer will come down to £249.99 from £299.99.

Rob Harding, Atari's marketing manager said, "The new retail price list, we believe,

reflects the true marketing prices for the products. It is by no means a 'flog-off' — we plan to continue marketing all Atari products."

The price cuts are a direct result of the company's take-over by former Commodore chief, Jack Tramiel: "With the new management there is a drive for Atari to become more competitive and aggressive in the UK."

Simon Westbrook, who has since the take-over been Atari Corporation UK's managing director, is now to continue in the post on a permanent basis. Previously Atari had announced that Commodore International executive David Harris would be joining Atari's UK branch as managing director.

First Star titles arrive

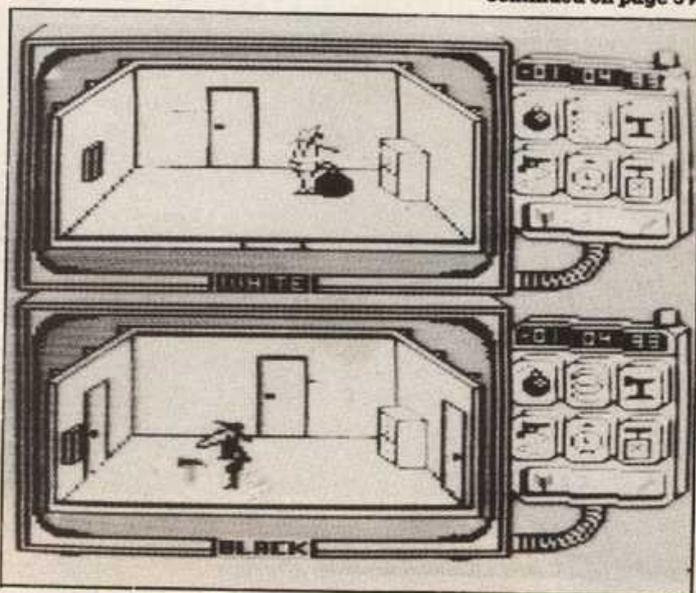
MORE American software will shortly be available, in the UK, this time from First Star of New York, originators of the *Spy vs Spy* game.

The company has reached agreements with a new UK company Statesoft, set up by John Fletcher, former sales manager of PSS, to sell its titles in Britain.

"The first two releases are *Astro Chase* and *Flip and Flop*, both for Commodore 64," explained John Fletcher.

Two more titles for the Commodore will follow in September, both of which have previously only been available on the Atari machines in the States. Statesoft now has the

continued on page 5 ▶



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If there is a growing disenchantment with home computers — as one much publicised recent market research document has suggested — it is because the rapidly increasing sophistication of the machines themselves is not being matched by the software they run. The programs are strong on technical quality but very weak on original ideas.

Recreational software began as a new toy. *Space Invaders* was a novelty. Since then it has developed to produce the *Manic Miner* type of game. No longer a toy. Instead a puzzle — just like those infuriating tangles of metal hoops that every year fall out of crackers, asking to be solved. But such puzzles only hold one's interest for a while.

When will the micro equivalent of the book evolve? The closest so far are adventure games. Certainly any subject which can be treated in a book or a film can be put into an adventure. But what do we have? Any more elves, trolls, warrior princes and, worst of all, princesses just waiting to be rescued, and I shall be throwing myself on to the nearest Sword of Darkness.

Where are software equivalents of the political satires? The biographies? The travelogues? The documentaries? The modern history books?

Where is the intelligence and subtlety? Where is the software that doesn't assume we are all gibbering trigger-happy idiots?

It's never been written because it's too much like hard work. It's much easier to just knock off another couple more *Miners*, *Atic Atacs*, or *Q-Berts*.

Software houses must savour their success while they can. Our collective intelligence is being insulted. And we are getting bored.

POPULAR Computing WEEKLY

Vol 3 No 33

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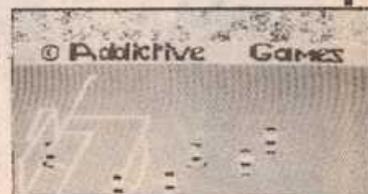
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>Futures...

The Dragon takes on Spectrum-like characteristics with a program to enable Basic programming with single key presses . . . how to down-load the QL's hi-res screen graphics on to a printer . . . and Star Game is *Jaws* for the BBC.

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ABC

55,090 copies sold every week (Jan-June 1984 ABC).

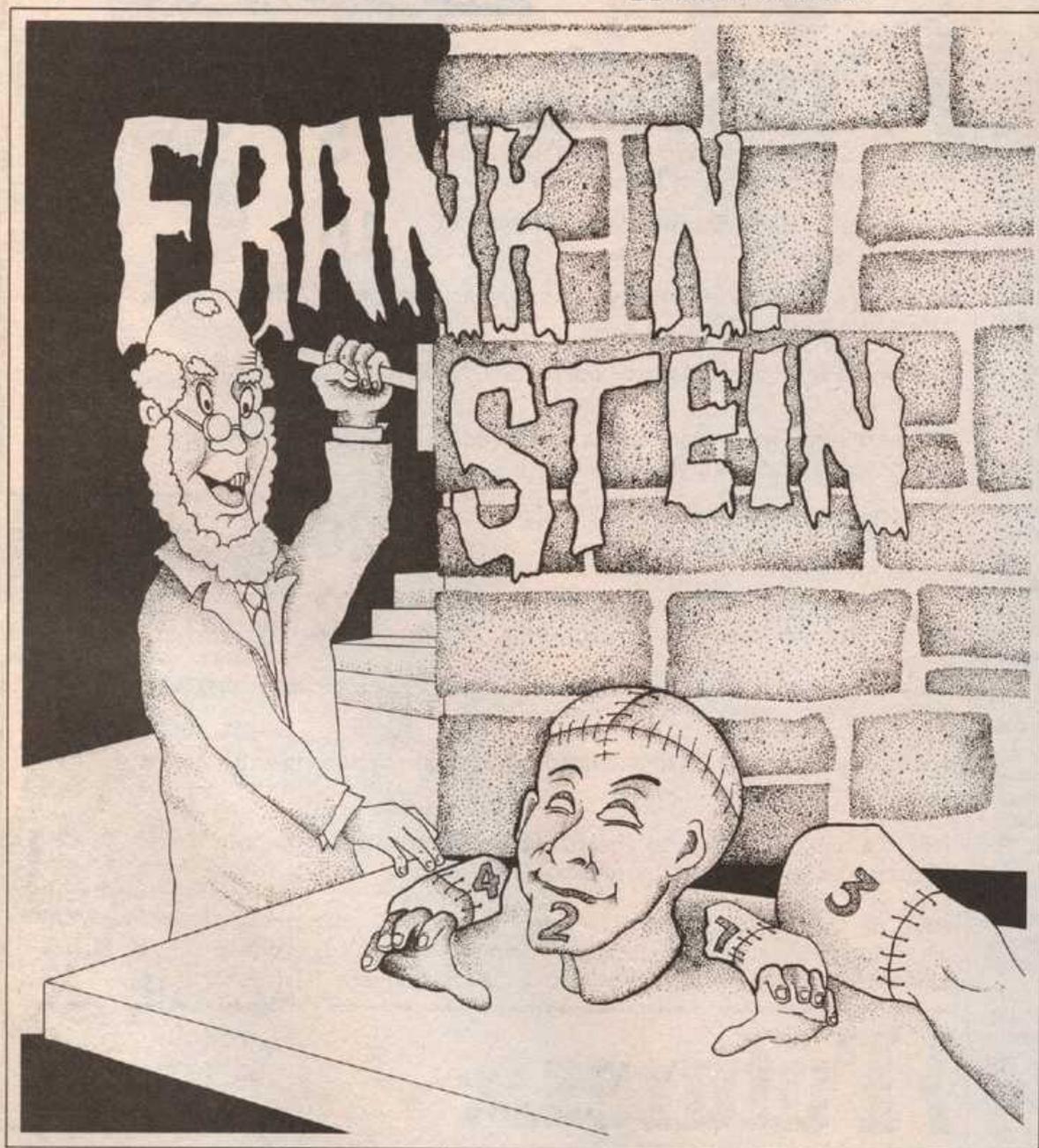
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Have you got what it takes to
build your very own monster?

FRANK N. STEIN

BY COLIN STEWART

NEW
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THE SETTING: Professor F.N. Stein's laboratory in his Castle in the Black Forest.

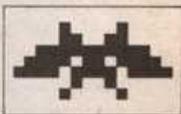
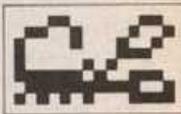
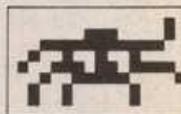
THE TIME: 1884

THE GAME: 50 Screens requiring timing, logic and planning to complete.

THE OPPOSITION: Too many to list here but featuring:- Snails, bats, ice (it makes you slip), firemen's poles, man eating pumpkins, spiders, slime (it slows you down), caterpillars, tanks, springs, light bulbs (they electrocute you), mice, lobsters, snakes, bumble bees, jack-in-the-box etc.

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Midi for home computers

◀ continued from page 1

nicate with each other, allowing for such things as one keyboard playing another or controlling a digital drum machine via, for example, a separate synthesiser.

Now home computers will be able to be connected into a MIDI network. Italian keyboard specialists Siel has developed an interface that enables Commodore 64 and Spectrum micros to be connected to a MIDI keyboard.

The connection allows the computer's memory to be used to store notes and be used as a sequence — playing back sequences of notes and chords which can then be used as an accompaniment for live playing or for complete computer control of the keyboard.

The interface also enables information to be sent from the music keyboard to the computer allowing, for example, automatic notation as the keys are played — instantaneous score writing.

Both the Commodore 64 and

Spectrum MIDI interfaces will be priced at £99. A BBC version of the interface will be available by the end of August.

Siel is also launching a low-cost portable MIDI standard music keyboard to accompany the microcomputer interfaces. Called the MK900 it is aimed specifically at home micro owners and is expected to retail at £449 (about half the usual price of a compatible keyboard).

Software currently available for the Siel keyboard and interface includes sequencers and a multi-track composer program.

More details from Siel, Suffolk House, Massetts Road, Horley, Surrey.

The Siel keyboard is just the first of a number of low-cost MIDI standard units. Casio for example, is expected to launch a 'cheap' MIDI keyboard later this year.

Yamaha's DX 5 MSX computer is offered with a sophisticated sound synthesiser add-on and mini-keyboard which also adopts MIDI standard.

Future of the Megagames

MEGAGAMES developed by Imagine Software are now in the hands of Imagine's liquidator.

When Imagine went into receivership, the ownership of the Megagames was in doubt. A contract between Imagine and Finchspeer, the company set up by three then Imagine directors, had been signed selling Finchspeer the copyright.

However, in law, any disposition of a company's assets taking place after a petition for winding up is presented can be set aside.

The liquidators for Imagine, Arthur Young, McLelland, Moores and Co., are currently holding talks with parties interested in acquiring the Megagames and continuing their development.

Since the Imagine collapse four former Imagine programmers have joined Software Projects. However Alan Maton, Software Projects' managing director said that Software Projects would not be working on

any ex-Imagine games, nor was it interested in adding the Megagames to its catalogue.

Most of Imagine's other programmers including its best known, Eugene Evans, are working with former directors Dave Lawson and Ian Hetherington. "We are currently writing software which will be ready for release in two to three weeks time," said Dave Lawson. "However, this is not games software, and probably not for the UK market either."

On the subject of the controversial Finchspeer contract, he added, "There was never any doubt that the Megagames were with Imagine's receivers, because the contract between the two companies was not honoured."

Sinclair 5th generation

SINCLAIR'S research team, based at the company's Meta-Lab in Cambridge, is working in conjunction with teams from British universities including

Discount software club

MAIL-ORDER booksellers, Book Club Associates, is to begin selling discount software through the post.

The company is setting up the Home Computer Club, which will offer computer books and software for three machines: Spectrum, Commodore 64 and BBC.

"The Home Computer Club will operate in much the same way as the Book Club does," said a Book Club spokesman. "Customers join by taking advantage of an introductory offer. They must specify which machine they are interested in, and from then, they will receive a Club catalogue every two months which deals exclusively with their machine."

Computer Club customers

will have to buy at least one title every two months, from about fifteen products in each magazine. They will get a statutory 25 per cent discount on each purchase — sometimes more."

Titles included in the Home Computer Club's introductory offer, due to appear at the end of this month, are *The Hobbit*, at £2.75 and *Hungry Horace*, at 75p, both from Melbourne House, and *White Knight MKII* at 75p from BBC Soft.

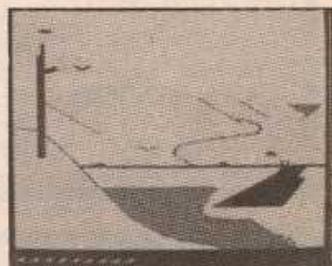
So far Book Club Associates has dealt almost exclusively with companies like Melbourne House which have a book publishing tradition. "Book publishers know that book clubs do not detract from sales at all," explained the spokesman.

Birds of Bourne

THE Royal Society for the Protection of Birds has teamed up with Bourne Educational Software to produce *Osprey!*, a game based on the struggle for survival of the endangered Scottish osprey population.

A 32-page booklet on the birds accompanies the program, which is the first of an educational/games series from BES called *Discovery*.

Versions for the BBC, Elec-



tron and Amstrad will be available in September at £9.95. Commodore 64 and Spectrum versions are to follow.

First Star

◀ continued from page 1

option to take up UK rights all First Star games, so it should not be long before *Spy vs Spy* makes its appearance in this country. "We will be converting the First Star titles for the Spectrum, possibly in time for Christmas," continued John.

Commodore sales boost

COMMODORE International has announced a large rise in both sales and profits for the year ending June 1984.

Profits went up by 57 per cent, from \$26.7m to \$33.1m and sales reached \$1.27bn, a rise of 86 per cent over the previous year's figure. The amount was boosted by sales of \$300.3m in the final quarter.

Southampton, Edinburgh and Imperial College, London on the development of a fifth generation computer.

The first Sinclair product to use the wafer-chip technology will — according to Sir Clive, be the 0.5M memory expansion unit for the QL.

Astro Chase author, Fernando Herrera



"We also intend to begin releasing our own programs shortly, which would then be sold in the US by First Star."

Astro Chase and *Flip and Flop* should be available within the next week, priced at £8.95 (cassette) and £11.95 (disc).



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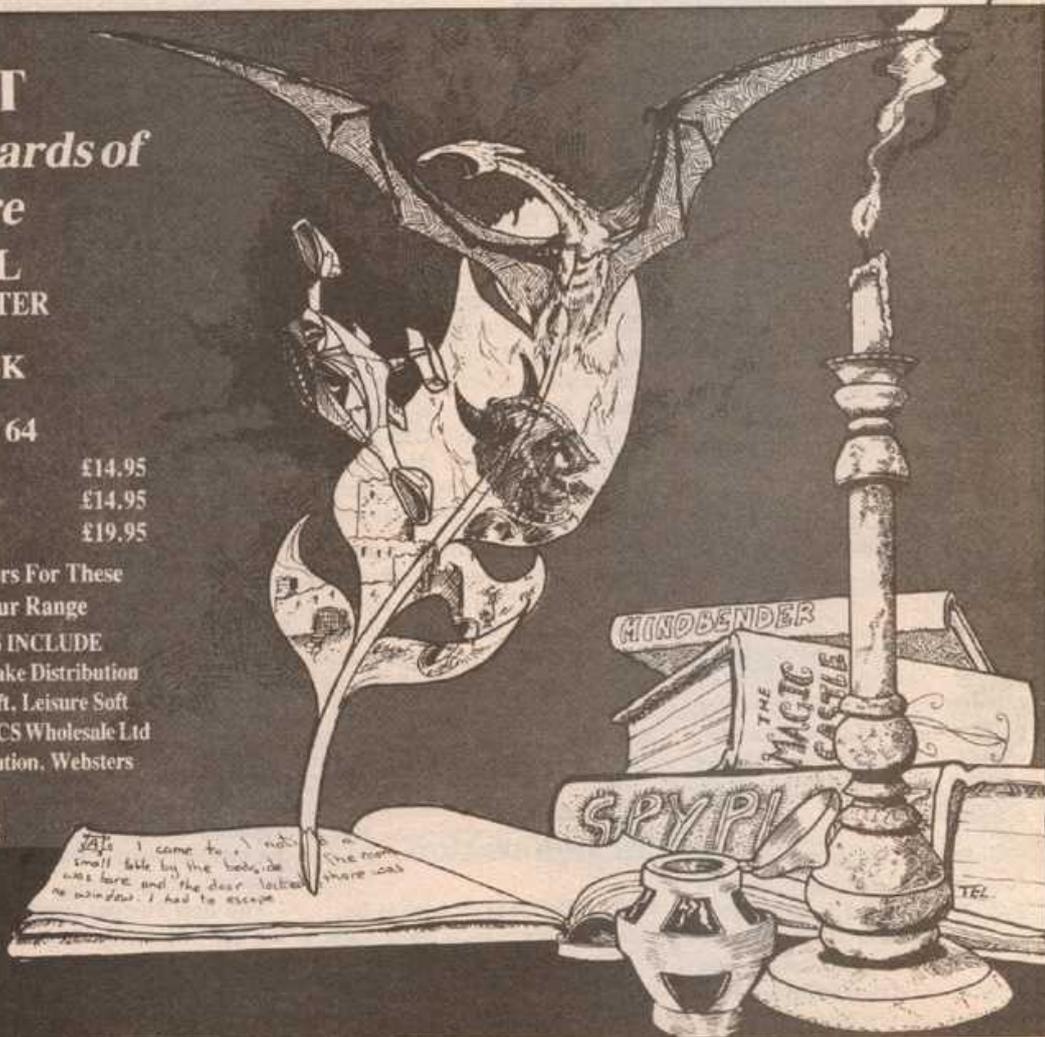
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Page the Amstrad?

I hope that undying loyalty to Sinclair will not spoil your good magazine. Week after week brings details of the QL's faults and shortcomings, but still a constant optimism that it will be 'everything we are looking for'.

My £229 has gone on the Amstrad as my Spectrum upgrade, and very impressive it seems too. I hope that it will receive the same respect and coverage as the QL, or isn't it serious enough because it doesn't say Sinclair on it?

How about an 'Amstrad Page' — or at least part of the QL's whole page?

A Piercy
c/o AMP
Avon House
360 Oxford St
London W1

I agree that the CPC 464 is well worth devoting space to in the magazine.

There is just one problem. Whereas QL owners appear to be a voluble lot, forever sending us programs they have written, Amstrad owners are so far keeping pretty 'stumm'. What about it?

Good clean smut

Following the letter, recently published in August 2 concerning our game *Gissa Kiss* (Code name *Smut*) under the heading 'No sex please... from Christopher Bryant, we feel we must reply, and make the following comments: prude, bore, straight, Mary Whitehouse supporter, party pooper and kill joy.

But seriously folks... Out there, in the big wide world, there are people yearning for good clean smut. Judging by the sales, from what is our smallest ad ever, all we can say is "Never in the field of human conflict has so much been done by so few for so many."

Mike Potter and
the infamous Mike O'Cain
Titan Programs
46 Market Place
Chippenham, Wilts

Three into one

May I make a prophecy. Take three completely independent developments, put them together, and see where their combination will take us.

One. The Psion Organiser pocket computer. It costs under £100 (price is most important), with its "solid state drives" (vital to my concept) — only a maximum of 32K (16×2) memory admittedly, but with paging techniques such as those used on the Amstrad such limits can be overcome.

Two. Large sized cheapa liquid crystal displays. These need more memory than the Organiser has got, but that could be got round.

Three. Beyond's *Lords of Midnight* adventure game. Here is the first true 'book'-type adventure/story program. Playing this is like being inside a book, being one of the characters — living their lives, but influencing the plot by your actions (which is more than you could ever do reading a book).

Let's put these together and what do we have?

Just imagine sitting in the garden, unconnected by plastic umbilical-cords to any source of power — holding a paperback book-sized micro with a 5×3 inch dot-addressable LCD screen, playing a game such as *Lords of Midnight*. Or, in another context, using this machine with its interchangeable Roms and Ram as an interactive or 'expert system' textbook.



"The nest and eggs are safe but some collector stole my software"

Anyone who has sat in front of a crawling VDU will not mind the loss of colour. They know the drawbacks of micro-gaming as it is today — the aching feeling behind the eyes which heralds a visit to the local optician. In all my years of reading books I have never before had these problems. Using an LCD in screen in the peace of a sun-filled garden produces nothing but a feeling of "this is how it should be".

My prophecy. Before long there will be a cheap machine that will marry the micro and the book. And not until using a micro is as easy and as straightforward as using a book in every way ie, hand-held, no-fuss, take anywhere, immediate use and take-up of place where left-off (book-mark facility) will the micro truly have come of age.

Will someone — perhaps Psion — make it soon? And make themselves a great deal of money?

D A Austin
18 Stafford Avenue
Clayton
Newcastle-under-Lyme
Staffs

The facts of life

I feel it is time the computer buying public were told a few of the facts of computer life.

The language used by machines such as The QL, and BBC is not Basic, but a Hybrid using functions filched from other languages. By no stretch of the imagination would I consider either machine suitable for a beginner, and yet the BBC appears among the limited choice offered to schools.

The purpose of these Hybrids, we are told, is to facilitate 'structured' programming, but a beginner is hardly likely to be a member of a programming team faced with debugging another's program. Structure can be helpful, but is not essential.

I would suggest that colour, sound, hi-res graphics, UDG, lower-case letters, Sprites, windows, and multi-tasking, do nothing whatever for computing, they are all concerned with the presentation of results

on the TV screen. If you feel the need for all or any of these, then by all means get a computer that provides them, but be prepared to own a more complex computer. All of these features require additional programming for their use, and some machines make it much more difficult than others. None of them make it easier!

You cannot get much more basic than a ZX81, and after four years of serious Basic programming, there is only one word I would add to ZX81 Basic, *Else*, and this can be simulated with a couple of Gotos. If Basic had been intended as a structured language, then Goto would have been left out.

I wish Alan Turnbull had been more lucid (or I less thick) on the QL page in the August 2 issue as I would have liked to have tried a ZX81 simulation of some of his ideas. As it is the following program will solve factorials, and seems to satisfy the criteria for recursion, ie to use the same bit of program repeatedly: 10 INPUT A 20 LET B = A 30 FOR N = 1 TO A - 2 40 LET BV = B * (A - N) 50 NEXT N 60 PRINT "FACTORIAL "; A; " = "; B.

I am surprised that Sir Clive should forsake the humble but powerful machine that started it all and made him a fortune. It's high time the ZX81 was reissued, with a decent keyboard, *Else*, and improved (medium resolution) graphics with at least 48K Rom.

W A George
10 Lonsdale Road
Stevenage
Herts SG1 5ES

Portuguese connection

I am a Portugese Spectrum owner, 18 years old, and I'd like to correspond with other Spectrum owners all over the world and exchange software — I have about 200 programs — and ideas.

Victor Jorge Esterao
Rua Jornal Correio
do Sul n°-33 1°d
8000 Faro
Portugal

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Alien Raid

Pit your wits and reflexes against a bizarre array of mutants in Julian Henschke's game for the 48K Spectrum

This is an arcade-style game for the 48K Spectrum, in which you must protect your central life-support command base from attack. Various weird and wonderful aliens are seeking to destroy the base, including octopi, streamers, swarmers, bombers and a large cast of mutants.

Any aliens which escape your fire range

will plant a time bomb at the base. Ten time bombs are enough to destroy the base.

The biggest danger is the Super Zapper, which may raid at any time with probable fatal consequences. Your only hope is to hit the computer-assisted auto-zap button (H) which will immediately destroy it.

Take care when typing in the data statements, as some machine code is included.

Variables

AY, AX	Aliens' y,x co-ordinates
SC	Current score
HI	Highest score
Bonus	Bonus awarded for completing all five waves
Land	Number of aliens landed
A	Current alien type
C	Number of aliens remaining in current wave



M	Aliens' random movement up/down	Program notes	700-795	Instructions
S	Score awarded for current alien	1-2	800-810	Alien landing routine
I	Ink colour of alien	100-200	900-999	Graphics/Machine code (key scan/print)
L	Executes machine code	400-440	1000-1060	Sets up screen
Peek 23300	Your X co-ordinate	450-455	1500-1530	Base destroyed/end routine
Peek 23301	Your Y co-ordinate	500-510	1700	Restart game
		600		

```

1 REM
2 LET HI=0: BRIGHT 1: INK 7:
POKE 23609,50: GO SUB 900: GO SU
B 500: GO SUB 600
100 LET L=USR 40000
105 PRINT AT AY,AX,CHR$ 32+CHR$
A: LET AX=AX+1: IF AX=24 THEN G
O SUB 500
110 IF INT (RAND*HI)=5 THEN PRINT
AT AY,AX,CHR$ 32: PRINT AT AY+1
,AX,CHR$ A: LET AY=AY+1: GO TO 1
00
111 IF INT (RAND*HI)=5 THEN PRINT
AT AY,AX,CHR$ 32: PRINT AT AY-1
,AX,CHR$ A: LET AY=AY-1: GO TO 3
00
145 IF INT (RAND*150)=50 THEN LE
T LE=0: GO SUB 450: LET LAND=LAN
D-1 AND LAND<0: LET SC=SC+500: P
RINT AT 3,1: INK 7: "SC": SC: AT
21,12: "LANDED": AT 21,19: LAND
150 IF INT (RAND*70)=25 THEN GO
SUB 1600

```

```

200 GO TO 100
400 REM
402 INK 3: PLOT OVER 1: PEEK 233
00+8+12,17: DRAW OVER 1:0,(21-F
EEK 23301)*8)-12: IF PEEK 23300=
1=INT AX AND PEEK 23301=INT AY T
HEN GO TO 415
405 PLOT OVER 1:PEEK 23300+8+12
,17: DRAW OVER 1:0,(21-PEEK 233
01)*8)-12
410 INK 1: GO TO 105
415 INK 3: PRINT AT AY,AX:
BEEP .1,-50: BEEP .1,-20: BEEP .
1,-10: LET C=C-1
417 IF C=0 AND A=148 THEN LET
BONUS=BONUS+1000: LET LAND=LAND-
3: PRINT AT 15,10: OVER 1:"BONUS
":BONUS: LET SC=SC+BONUS: RESTR
E 940: LET LE=2: GO SUB 450: PR
INT AT 15,10: OVER 1:"BONUS":BC
NUS

```

```

420 INK 7: PLOT OVER 1:PEEK 233
00+8+12,17: DRAW OVER 1:0,(21-F
EEK 23301)*8)-12: PRINT AT AY,AX
: BEEP .1,-50: BEEP .1,-20: BEEP .
1,-10: LET AX=0: LET AY=IN
T (RAND*3)+13: LET SC=SC+5: PRINT
AT 21,1:"SC": SC: AT 21,12: "LAN
DED": AT 21,22: "HI": HI
430 IF C=0 THEN READ A,C,M,S,I
440 INK 1: GO TO 105
450 FOR G=0 TO LE: FOR F=0 TO 5
0 STEP 5: BEEP .01 F: NEXT F: IF
INKEY$="C" OR INKEY$="c" THEN R
ETURN
455 FOR F=50 TO 0 STEP -3: BEEP
.01 F: NEXT F: NEXT G: RETURN
500 PAPER 1: BORDER 1: INK 6: C
LS: PRINT AT 10,5: PAPER 3: "W
ELCOME TO alien raid": AT 10,4: OVE
R 1:
15,7: FLASH 1: PAPER 4: INK 8:
Instructions(Y,NI): POKE 33817,2
36: INPUT "Y,N): LINE 24
501 IF $="Y" OR $="y" THEN GO
SUB 700
510 CLS: BORDER 1: PRINT AT 10
,5: FLASH 1: "OK Prepare for the
game": BEEP .1,20: PAUSE 0: RETU
RN
500 POKE 23300,15: POKE 23301,1
5: LET BONUS=0: LET AX=0: LET AY
=INT (RAND*5)+13: LET SC=0: LET L
AND=0: GO SUB 1000: RESTORE 910:
READ A,C,M,S,I: INK 1: RETURN

```

```

700 REM
705 CLS: INK 5: PRINT TAB 10, "
ALIEN RAID": OVER 1: AT 0,9:
710 PRINT AT 3,5: "The aim of AL
IEN RAID is to protect your
nuclear power station from
the five attacking aliens (": IN
K 4: "A": INK 5: "B": INK 2: "E":
: INK 3: "e": INK 7: "e")."

```

```

715 PRINT "Beware of the Supe
r Zapper which may strike at
any time! The only way to int
ercept it is to hit the emergenc
y button 'M'."
720 PRINT "If this fails or le
n of the aliens reach your b
ase a chain reaction will take
place hence destroying your bas
e!"
730 INK 5: PRINT 40: FLASH 1: AT
0,3: ("PRESS 'G' TO CONTINUE")
: LET LE=50: GO SUB 450: BEEP .
1,30: BEEP .1,20: CLS: PRINT TA
B 10:"ALIEN RAID": OVER 1: AT 1,
9:
740 PRINT AT 3,11: INK 6: PAPER
1:"SCORES": AT 3,2: OVER 1: TAB 1
0:"TAB 5: PAPER 1: I
NK 6:"OCTOPUSS: A = 50pts." TAB
5:"MUTANT A = 100pts." TAB 5:"S
TRAKER E = 150pts." TAB 5:"SWA
RMER A = 200pts." TAB 5:"BOMER
A = 250pts." TAB 5:"BAITER
A": FLASH 1: PAPER 2:"100pts."
750 PRINT AT 13,12: INK 4: "KEY
S": OVER 1: AT 13,11: "TA
B 8: "O" = UP" TAB 8: "K" =
DOWN" TAB 8: "A" = LEFT" TA
B 8: "S" = RIGHT" TAB 8: "P"
795 PAUSE 0: RETURN

```

```

800 REM
805 PRINT AT AY,AX: INK RAND*6+2
: FLASH 1: "": BEEP .1,-50: BEE
P .1,-20: BEEP .1,-40: LET AX=0:
LET AY=RAND*6+13: LET LAND=LAND+
1: PRINT AT 21,12: INK 7: "LANDED
": AT 21,19: LAND: IF LAND>=10
THEN GO TO 1500
810 RETURN

```

```

900 REM
905 RESTORE 910: PRINT AT 10,5:
FLASH 1: "Poking in machine code
": AT 15,10: "Please wait!"
910 RESTORE 910: FOR F=0 TO 7:
READ A: POKE USR "A"+F, A: NEXT F
: DATA 8,28,42,127,52,42,73,73
915 FOR F=0 TO 7: READ A: POKE
USR "B"+F, A: NEXT F: DATA 126,25
5,219,255,126,102,66,129
920 FOR F=0 TO 7: READ A: POKE
USR "C"+F, A: NEXT F: DATA 0,62,9
6,112,255,112,96,62,0
925 FOR F=0 TO 7: READ A: POKE
USR "D"+F, A: NEXT F: DATA 0,24,1
26,219,126,50,0,0
930 FOR F=0 TO 7: READ A: POKE
USR "E"+F, A: NEXT F: DATA 0,48,1
24,223,223,124,48,0
935 FOR F=0 TO 7: READ A: POKE
USR "F"+F, A: NEXT F: DATA 137,74
,0,3,192,0,82,143
938 RESTORE 936: FOR F=0 TO 7:
READ A: POKE USR "G"+F, A: NEXT F
: DATA 3,7,31,117,127,63,63,12
937 FOR F=0 TO 7: READ A: POKE
USR "H"+F, A: NEXT F: DATA 192,22
4,248,85,254,252,252,24
940 DATA 144,3,50,50,4,145,3,30
,100,1,148,3,23,150,2,147,3,15,2
,0,3,148,3,15,250,7
990 RESTORE 990: FOR I=40000 TO
40159: READ C: POKE F,C: NEXT I
: DATA 62,2,205,1,22,62,16,215,6
2,4,215,42,4,91,205,217,156,205
86,156,34,4,91,201,62,253,219,25
4,230,1,204,134,156,62,253,219,2
54,230,2,204,148,156,62,223,219,2
991 DATA 254,230,2,204,158,156
62,191,219,254,230,4,204,170,156
,62,223,219,254,230,1,204,182,15
6,201,62,0,189,200,205,200,156,4
5,205,217,156,201,62,21,109,200
,205,200,156,44,205,217,166,201,6
2,1,189,200,205,200,156,37,205
,217,156,201,62,19,100,200,205,20
0,156,36,205,217,156,201

```

```

992 DATA 229,62,1,50,66,92,33,5
6,92,54,146,33,67,92,54,1,225,20
1,62,22,215,124,215,125,215,62,9
2,215,62,32,215,62,32,215,201,62
,22,215,124,215,125,215,62,91,21
5,62,32,215,62,93,215,201
999 RETURN

```

```

1000 REM
1005 RESTORE 1010: PAPER 0: BORD
ER 0: INK 4: CLS: CIRCLE 20,150
: PLOT 0,150: FOR F=0 TO 16:
READ X,Y: DRAW X,Y: NEXT F
1010 DATA 20,30,5,-10,5,10,5,-10
,5,10,23,-30
1020 DATA 10,-10,20,50,30,-30,20
,-5,20,40,10,-10,10,0,10,20,30,-
50
1030 DATA 20,30,15,-20: INK 7: F
OR F=0 TO 10: PLOT RAND*30+30,AN
D*20+150: INK RAND*5+1: DRAW 4,0:
DRAW -2,0: DRAW 0,2: DRAW 0,-4:
BEEP .01 F*5: NEXT F
1040 INK 5: PLOT 255,48: FOR F=0
TO 18: READ X,Y: DRAW X,Y: NEXT
F: DATA -50,0,0,2,0,10,5,5,-5
,0,-10,5,0,5,20,-3,0,10,0,-3,0,5
,1,20,3,0
1050 DATA 5,0,3,10,3,0,3,-10,4,0
,0,-2: CIRCLE 248,65,5: PLOT 244
,56: DRAW 5,0: PLOT 243,53: DRAW
7,0: FOR F=0 TO 20: PLOT RAND+10
+220,RAND+10+75: BEEP .01 F*2: NE
XT F
1060 PRINT AT 20,0: INK 2: "

```

```

AT 0,0: INK 2: "
: INK 2: "AT 21,0": PRINT AT 21,0
: INK 2: "AT 21,11": "AT 21,21
: "AT 21,31: "AT 21,41: INK 7: AT 21,1
: "SC": SC: AT 21,15: "LANDED": LAN
D: AT 21,25: "HI": HI: FOR F=0 TO
10: BEEP .01 F*5: NEXT F: PAUSE
0: PAUSE 0: RETURN

```

```

1500 REM
1510 FOR F=0 TO 30: PLOT 220,50:
DRAW INK 2,RAND*30,RAND*40: PLOT
220,50: DRAW INK 2,RAND*30,RAND*4
0: BEEP .01,RAND*50: NEXT F
1515 INK 0: IF SC>HI THEN PRINT
AT 18,2: "WELL DONE COMMANDER YOU
HAVE SET A NEW HI SCORE"

```

```

1520 INK 7: PRINT AT 21,22: "HI:
": SC: AT 10,10: FLASH 1: "GAME OVER
": FOR F=0 TO 10: BEEP .001 F*5:
NEXT F: PRINT 80: TAB 5: "Press a
ny key to start": IF SC>HI THEN
LET HI=SC
1530 PAUSE 0: FOR F=0 TO 25: RAN
DOMIZE USR 3200: NEXT F: GO TO 1
700

```

```

1600 REM
1610 FOR F=0 TO 17: PRINT AT 15,
F: INK 4: "BEEP .001 F+10
: NEXT F: PLOT 160,50: OVER 1: F
OR F=0 TO 10: DRAW 3,3: DRAW 3,-
3: BEEP .01 F*5: IF INKEY$="h" O
R INKEY$="H" THEN LET F=F+1: GO
TO 1650
1620 NEXT F
1625 OVER 0: GO TO 1500
1630 PLOT INK 2:50,9: DRAW INK
2:50,40: PLOT INK 2:200,9: DRAW
INK 2:50,40: PRINT AT 15,15: FL
ASH 1: "BEEP .1,20: BEEP 1
,-50: BEEP .1,-10: PLOT INK 2,10
0,9: DRAW OVER 1: INK 2:50,40: P
LOT INK 2:200,9: DRAW INK 2:50,
40

```

```

1660 PLOT 160,50: LET F1=F-1: FO
R F=0 TO F1: DRAW INK 4,3,13: DR
AW 3,-3: BEEP .01 F*2: NEXT F: O
VER 0
1670 LET SC=SC+1000: PRINT AT 15
,18: "AT 21,1: INK 7: "SC": SC
1700 GO SUB 500: GO TO 10
Written by Julian Henschke ©1984

```

Last outpost of sanity

Christina Erskine dusts off her ZX81 and finds out what life is like down on Software Farm



Software Farm's Julian Chappell

Back in the distant mists of time — three years ago — the ZX81 was launched. Over one million sales later, although it now looks somewhat antiquated, and despite the hundreds of ZX81s that must be gathering dust in attics and under beds, there are those who have remained staunchly loyal to the Little Black Box.

Down on Software Farm, in Bristol, the launching of new machines and ever more colourful software has largely passed Julian Chappell by. To many, his decision to stay with ZX81 programming after the launch of the Spectrum must have seemed like commercial suicide; Julian is quietly convinced it has paid off.

"By the time the Spectrum was launched, we had four ZX81 games in our catalogue which were selling steadily," recalls Julian. "We knew we were in for a hard time when we took a stand at the next ZX Microfair — everyone was in a high state of expectation over the Spectrum, and our ZX81 stand was

entirely ignored. Our sales plummeted and the company was only just surviving."

Nor were Software Farm's products at that time particularly impressive. Four arcade game conversions, each two years old, having been constantly revised and up-dated since their release.

It seemed as though only an EEC subsidy could save Software Farm. "I thought long and hard about jumping on the Spectrum bandwagon. But with everyone else doing so, I felt it would be better to stick to the ZX81, and I hoped that if everyone deserted it then we'd have a clear run."

So how would you put your stamp on a market in which your share had risen dramatically because competitors had moved on...? No, Julian did none of these things. Software Farm didn't release another game for nine months.

However, when it finally did release the next game, *Forty Niner*, it represented something of a break-through for ZX81 pro-

grams, and kept Julian Chappell in business.

"I had been experimenting with the idea of using hi-res graphics on the ZX81 for some time. After I realised that we were going to have to do something innovative if we were to be able to stay with the machine, I reckoned we could take a chance with developing hi-res programs. Eventually the bank agreed to support me, and Software Farm more or less went into hiding to develop two hi-res programs."

The way in which the high resolution graphics — almost unheard of on the ZX81 — is created sounds deceptively simple. The 50byte-long hi-res routine which redefines the screen map is incorporated into the games program. The ZX81's processor interrupts are jammed, so that every 50th of a second when the ZX81 would normally redefine its screen picture from software in the Rom, it instead uses Julian's definition in Ram.

After the success of *Forty Niner*, the Farm's second hi-res game, *Rocket Man*, is due for release soon, and Julian sees no reason at all to stop producing for the ZX81 as long as it continues to sell.

The Farm has also recently established its own ZX81 club. The company is a natural target for ZX81 owners, frustrated because of diminished support for their machine, who want information about peripherals and software still available. The Software Farm club is now the only UK user group dedicated solely to the ZX81. It has already attracted over a hundred members, each paying £2 for the privilege of discounts on Software Farm's games, a membership card, and its problem-solving service. The club, Julian insists, is in no way a money-spinner. It is clear that he is touched by the many letters he receives from ZX81 owners who now feel neglected and forgotten.

"We are now talking about converting games for the 16K Spectrum so I suppose we've finally succumbed, albeit slowly," he says almost regretfully. Software Farm — in something of a radical departure — is also planning an artificial intelligence add-on for the Spectrum. Said Julian, rather optimistically, "It will give the computer a brain, and the accompanying programs will enable the Spectrum to do things no-one else has tried yet."

Julian still feels happy that the Software Farm stuck with the ZX81. "Look at all the software houses which are having difficulties making ends meet at the moment. *Forty Niner*, in all honesty, may have sold peanuts compared to big Spectrum games. But it has sold steadily — now about 10,000 units."

Julian puts this down to being selective, going for quality rather than quantity, and not expanding the business unless absolutely necessary. "As you can see, we haven't got flash offices, there aren't millions of members of staff, and I haven't rushed out to buy a new car."

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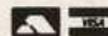
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Drawing the line

Hardware Trojan Light Pen Micro Spectrum 48K Price £17.95 Supplier Trojan Products, 166 Derlwyn, Dunvant, Swansea, W Glamorgan SA2 7PF.

Drawing on computers has been likened to knitting or weaving — the final laborious results must be pre-planned to precise *x/y* co-ordinates and manipulated remotely from the keyboard.

Not exactly conducive to the release of the creative spirit! Light pens supposedly change all that and more.

The Trojan Light Pen has the merit of simplicity and minimum cost. The outfit is neatly boxed and comprises the 'pen' itself, a PP3 battery, tape software and an instruction leaflet. A lead from the pen plugs into the ear socket of the Spectrum and a second wire plugs into the battery.

The pen is controlled by the software supplied cassette — Basic plus 14K of machine code — so that virtually all the usual Spectrum Basic commands are effected by touching different boxes displayed in a panel at the bottom of the TV screen with the pen. The commands are: *Box, Copy, Circle, Chr\$, Draw, Erase, Fill, Ink, Line,*

Move 1st cursor, New picture, Paper, Move 2nd cursor, Tape, Load/Save picture and Erase.

Box, Circle and Line are defined by the two *M* and *S* co-ordinate commands. Circles may be partially off the screen. Upper-case text can be included via the *Chr\$* command anywhere on the screen. The colours (tones of grey in monochrome) for *Ink, Paper* and *Fill* are also selected by a touch of the appropriate coloured box at the bottom of the screen.

The *Draw* command permits direct sketching on to the TV. A small flickering portion of the screen, beneath the pen, is instantly converted into a plotted pixel and line as the pen is moved.

To get a smooth line is not as easy as it looks as the pixels move across the screen seemingly uncontrollably. Practice and a firm hand are needed. Fortunately the *Erase* command will delete the last instruction to the screen if unacceptable results are produced.

Any area bounded by a line or the screen edge can be filled in any ink colour but one is still limited to one ink and one paper colour per character square on the Spectrum. Considerable care is needed to get worthwhile results.

As a bonus the light-pen software routines can be merged into your own pro-

grams for light pen use.

We are all used to touching the screen with our fingers to demonstrate a point. Substituting a light pen could dispense with the keyboard (when used for *Inkey\$*) in many educational programs and make the results much more interesting.

The Trojan light pen is well worth considering for budding computer artists and those exploring interactive computer control.

Maurice Gavin



FULL-TIME PROGRAMMER REQUIRED

Palace Software are looking for another full-time programmer to join the team. An extensive knowledge of 6502 machine code programming is required. The job would probably suit someone aged 18-25. Anyone who is afraid of hard work and occasional long hours to meet tight deadlines should not apply. Nor is it suitable for anyone who has ideas of vast salaries or driving a Lamborghini!

Those interested should phone Pete Stone on 01-278 0751.

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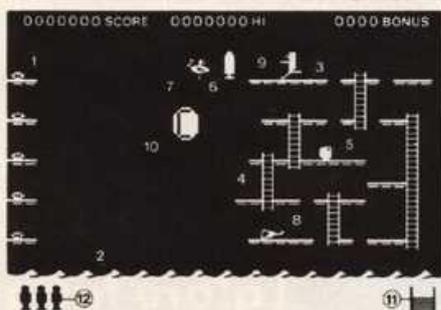
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| 4. Ladders | 8. Leg of Lamb | 12. Men Remaining |



Get rich quick by collecting Diamonds that are simply lying there waiting for you!

Oh... I forgot to mention that there are one or two problems! There is an expanse of Shark infested water between you and the Diamonds and a strange breed of Bubble that seems hell bent on getting you in it! Somehow you must cross it...

You have a Rocket Pac to help you (a Vulture on higher levels) but you must rush around the platforms and ladders collecting cans of fuel (legs of lamb with the Vulture) and cursing that weird Bubble. Once you have enough fuel then it's Chocks Away!

Oh... but don't run out of fuel on the way - otherwise it's ... SPLASH!

The aim is to collect all the diamonds from the far left hand side of the screen, whilst avoiding the rampant Bubloid. These emerge from the sea and are hell-bent on returning to their watery habitat with you in tow. Sooner or later you are going to end up in the drink - The idea is to make it later!

By belting round the system of platforms and ladders, cleverly avoiding the Bubloid, you collect the fuel cans which appear in random positions, until you consider that your fuel gauge indicates sufficient in the tank. Now you can go and collect your rocket. With the rocket-pack strapped to your back you can fly across the expanse of sea to collect the diamonds... but don't run out of fuel or your rocket-pack will simply disappear and you will wind up in the drink!

There are six stages with six different platform layouts. On stages 1-3 the Bubloid, which floats in front of the platforms with uncanny ease, gets an ever increasing ability to home in on your position, making the task of staying alive more demanding with each stage. On stages 4-6 you once again start with the easiest Bubloid (which is a blessed relief!) but the fuel cans are replaced by legs of lamb which you must collect to feed your vulture, and once it has enough energy (or you think it has!) you must flap across the water on its back to collect the diamonds.

Extra men are awarded for every 10,000 points - but ONLY once you have collected all the diamonds and so completed each particular stage.

GOOD LUCK!

Available from all good computer shops
or send cheque/P.O. for £5.95 (inc P&P) to:

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Guess what?

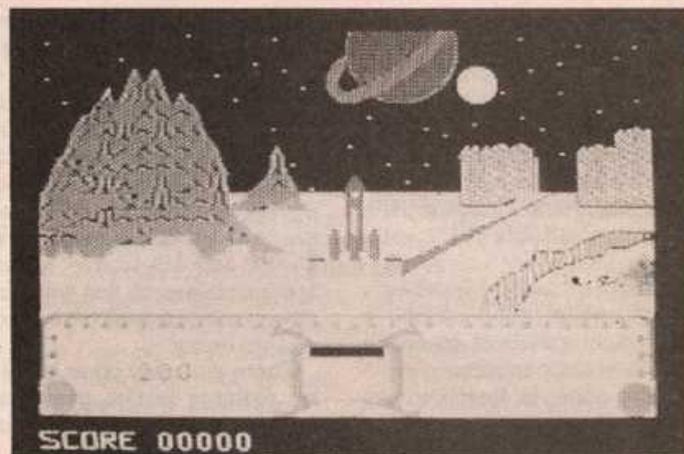
Program *Moons of Tantalus*
Price £6.45 **Micro** Spectrum
Supplier Cornhill Services, 2
Penrith Way, Aylesbury.

The whole of the software industry seems to have taken great pleasure in the past in categorising products according to genre. Hence the confusion that has meant many programs being haphazardly categorised as arcade/adventure when traditional arcade skills are mixed with the need for level headed adventure tactics. It also tends to suggest a certain degree of inherent quality — in the rich tradition of *Sabre Wulf*, *Atic Atak* etc. *Moons of Tantalus*

definitely falls into the 'AA' category but I don't think it deserves that special stamp of 'quality' the term ordinarily implies.

The action of the game consists of three screens of ludicrous simplicity, not so much the programming as the playing. First you move a lorry backwards and forwards between a fuel shed and launch pad. Secondly, you try to survive the ravages of alien hordes in open space, using a cockpit display to locate one of the four moons upon one of which lurks an alien base. When you find it you get part three in which, guess what? You blast it to bits.

After ten or twenty minutes play the necessary skills will be acquired and you'll win



every time. Of course, you can select a higher skill level which will involve a much greater number of attempts before you win. But one wonders if it is really worth the boredom and

suffering of playing the game over a long period of time.

Gordon Sneddon



Sour

Program *Jolly Roger* **Micro** Spectrum 48K **Price** £5.95 **Supplier** Video Vault, 140 High Street West, Glossop, Derbyshire.

This was a bit of a let down. *Jolly Roger* is a classic example of a potentially interesting graphic adventure (with arcade se-

quences) which has been spoilt by a mixture of ignorance and haste.

The object of the game is to land upon various assorted islands, stumble across doubloons, ammunition, food, scorpions and all those other fun things that would make Errol Flynn feel at home. From time to time you chance upon 'native' settlements, where a friendly native will emerge to offer information about the

whereabouts of the treasure.

But it's the presentation of the natives that worried me. Not only is it "Um ugg me give help" and similar, but you are positively encouraged to ruthlessly butcher any lone native upon whom you chance (they have doubloons hidden in their loin cloths). It left a sour taste in this mouth at least.

Gordon Sneddon



Fruit batty

Program *Mr Dig* **Price** £8.00 **Micro** Commodore 64 **Supplier** Microdeal, 41, Truro Rd, St. Austell, Cornwall.

Mr Dig consists of a number of standard arcade game features, plus a few new ones, put together to make an enjoyable and entertaining game.

Mr Dig is fond of cherries, and your aim is to guide him over bunches of cherries, while avoiding the various other characters in the game whose sole function is to stop him getting to the fruit. As well as cherries, there are some apples on the screen, not for picking, but for pelting the meanies, which not only gives them a nasty headache but also makes them disappear. *Mr Dig* can also dispose of his opponents by throwing his power orb at them (the mind boggles!). At the centre of the screen there is a treat, like an ice cream.

Although the elements of the game are quite simple, it is well presented and designed. The graphics are colourful and the title screen appealing — something many programmers neglect. The game makes an entertaining change from many others on the market and with ten levels of difficulty it should suit most people.

Richard Corfield



Being there

Program *The Waster* **Price** Micro Spectrum 48K **Supplier** Harddata, 230a Portway, Stratford, London E15.

The columns of *PCW* have frequently been filled with discussions of what characteristics make good adventure games. Personally, I find that no matter how well designed or logically stimulating a game may be, if it lacks atmosphere and a sense of involvement, then it is as nothing.

Harddata therefore should be congratulated for this text-only adventure as, spelling mistakes notwithstanding, *The Waster* conveys such an engaging sense of 'being there' that I played it over and over and over again.

To summarise the plot, one assumes the role of an extremely efficient CIA assassin

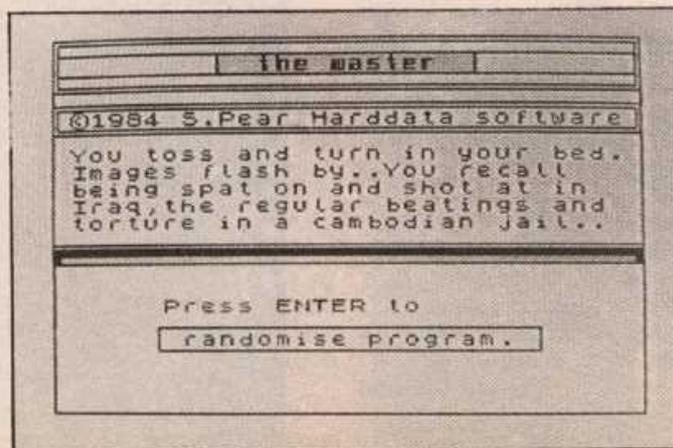
who must travel to Africa to eliminate the politically unsound leader of a certain state. The action takes place with a number of single-key commands which work in response to the most entertaining text that I have seen for some time.

Before you can embark on your journey you must first survive the nightmares of previous missions, moving from Ku

Klux Klan lynchings to international gun runners. Survive the night before an you 'qualify' for the mission.

And when your ex-wife empties your wallet of its \$95 and still wants more, be careful; she keeps a loaded shotgun by her side.

Gordon Sneddon



Highlights

Program *Football Manager*
Micro Commodore 64 **Price**
£7.95 **Supplier** Addictive
Games, 7a Richmond Hill,
Bournemouth BH2 6HE.

Some time ago I watched a friend of mine playing a really excellent game on his Sinclair Spectrum.

The game in question was *Football Manager* from Addic-



tive Games and it has just been converted for the C64.

In this game, you play the part of the manager of the football team of your choice. You start the game in the Fourth Division with a squad of twelve players, and it is your responsibility to guide your lads through both league and cup competitions. For each match you have to carefully select

your team by judging the best combination of skill and fitness, bearing in mind the strengths and weaknesses of your opponents. Having chosen your players, the match highlights are then displayed in very good animated 3D graphics. Other teams results are shown and full league tables are maintained so that you can always tell how well (or badly) you are doing.

There are many other excellent features in this game, in fact the attention to detail is

outstanding. For example, gates receipts, wage bills, players morale, strengths in attack, mid-field and defence are all taken into account. If your favourite team and players are not there, then you can even build your own.

Richard Corfield



Macabre

Program *The Evil Dead* **Price**
£6.99 **Micro** Commodore 64
Supplier Palace Software, 275
Pentonville Rd, London N1

IHave not seen the film on which *The Evil Dead* is based, so I do not know how faithful to the plot the game is, but it certainly sounds pretty macabre.

A party of friends go to the Tennessee woodlands to stay in a remote hut which has been unused for many years. Unfortunately, when they arrive they find that the hut is haunted by the spirit of the Evil Dead. In the game, you play the part of one of the group. He has to defend himself and his friends from the Evil Dead. If the spirit gets his friends, they turn into evil mu-

tants who try to attack him. He can defend himself with weapons which appear around the hut, such as an axe or a sword. If he kills a mutant, it turns into something else, like a pair of kicking legs or arms, which come after him again.

The plot is fairly chilling stuff, and the game is quite gripping as well. There is no let up in the action — just when you think you have got rid of all the nasties, another lot appear and come after you again. Fortunately, the graphics are not as gory as the plot, and the sound is standard arcade style. The intro music is suitably threatening though. Altogether, this is good arcade style action, distinguished by the horror movie plot.

Richard Corfield



Spellbound

Program *Can You Spell?* **Micro**
Oric/Atmos **Price** £3.95
Supplier Mellowsoft, 23 Dal-
ford Court, Hollinswood, Tel-
ford, Shropshire.

You have control of the a laser cannon. A strange object appears in the right-hand corner of your view-screen. You've seen it before... ah yes! Using your skill and judgement you position the laser and fire. Your aim may be true, but is it the right letter? The continual accompaniment of bells, whistles and clangs tell you that you hit the right target, and the letter 'c' falls from the sky.

Quickly you drive the lorry out of the factory, pick up the waiting letter and transport it back for enlargement. The giant letter is then stacked at the bottom of the screen, and it's back to the laser cannon for the next letter.

Finally you triumph, you can

spell 'cat', and you are just three years old.

Can You Spell? is an educational program by Mellowsoft for the Oric-1 and Atmos. The program is just one of eight cassettes for three to eight year-olds released by the company, all priced at £3.95. They are well thought out, make interesting use of graphics and sound, and are good value.

Can You Spell? is great fun, if a bit limited in the number of words and associated pictures.

What I liked about the program is the way it illustrates the principles of the subject, eg, when the letter is in the factory in order to enlarge the letter the corresponding key for that letter must be pressed.

Children will enjoy the repetitive graphics and sound and parents and teachers will like the way the child is encouraged to do more than just type in the answer.

Vic Fielder



Wicked

Program *Gisburn's Castle* **Micro**
BBC B **Price** £6.95 **Sup-
plier** Software Communica-
tions, Martech House, Pavense
Bay, East Sussex BN24 6EE.

The wicked Guy of Gisburn has captured Maid Marion and holds her in his castle. Armed only with

your trusty strongbow you have to rescue her.

It's an arcade game with adventure elements. You wander through forest and castle grounds picking up objects as you go, shooting at and being shot by the guards. Unfortunately you lose strength each time you are shot and if you're not careful you have to start again. This happened to me many times and it was a slow business building up a map of



the area. The objects appear at random so it is always necessary to cover a lot of ground without losing your strength. You can choose joystick or keyboard play and a level of skill.

I started off feeling very interested in this game, but my enthusiasm wore off with each repetition of 'shoot and avoid being shot'. But I do like the idea of mixing arcade and adventure themes in one game although I would prefer the balance to be on the adventure side. Great graphics though.

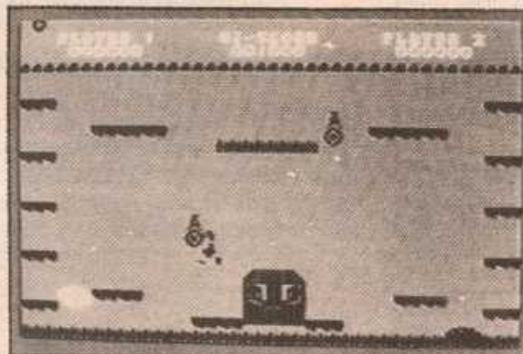
Jan Watterson



Inflammatory

Program Hercules Price £7.95
Micro Commodore 64
Supplier Interdisc 249-251, Kensal Road, London W10

One of the most frustrating things with many arcade games is having to start



at the same level over and over again each time you get zapped. Some games designers overcome this problem by allowing you to select the starting level of the game. In *Hercules* from Interdisc, a different approach is used — the game itself randomly selects the starting point for you, which makes the play a lot more interesting, if a bit disorientating at first.

The labours of Hercules are the theme of the game. The twelve labours are presented on fifty screens, each labour taking about four screens to complete. You randomly start at the beginning of any one of the first eleven labours. The

Way out

Program West Micro
Commodore 64 Price £9.95
(cassette) £12.95 (disc)
Supplier Talent Computer Systems, Freepost, Glasgow.

The scene is the Wild West in 1884. You are on the trail of a gang of notorious outlaws who have robbed a bank and hidden themselves and their loot in an abandoned mining town. You have to recover as much of the loot as you can, while avoiding or out-shooting the gang. Finally, you have to escape from the town which is deep in In-

diagonal territory in order to complete your mission.

twelfth can only be started after the first eleven have been completed. To complete each task, you must reach the goal of the labour via platforms and ropes, while avoiding mythical beasts, falling rocks and other hazards. To add to the difficulty the platforms have a nasty habit of disappearing or bursting into flames when you least expect it.

Many of the screens are very difficult — often you have to leap into space hopefully as many of the platforms are invisible until you actually land on them.

This is an unusual and interesting game, which requires a fair degree of skill to play. The random start feature is an excellent idea, which certainly adds to the enjoyment. It is a pity that the graphics are not a bit more lively to look at — they are the weak point of a game which is otherwise very good.

Richard Corfield



dian territory in order to complete your mission.

This is the 'screenplay' of *West*, a new adventure from Talent Computer Systems.

Although you can wander into the country outside the town, most of the action takes place around the derelict township itself. This consists of several streets and buildings laid out in quite a complicated plan. Each building usually has more than one room, so there are quite a few locations.

The game takes place in real time, so that other characters, like the robbers or the Indians, have to be dealt with fast or you may end up dead. However, you can be killed

thirty times before the game is stopped, so you can afford a few mistakes on the way.

Although this is a fairly standard text-based adventure, it has a reasonable vocabulary (of between 200 and 300 words). Unfortunately there is no glossary, so you just have to figure out the commands for yourself.

The most striking feature is the excellent hi-res picture of the town, which forms the title screen and appears at intervals during the game with different colour schemes depicting the different times of day.

Richard Corfield



Miner mole

Program Monty Mole Micro
Spectrum 48K Price £6.95
Supplier Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield.

You may have seen this one on ITV television news. Because Monty Mole is no ordinary multi-screen, *Manic Miner* inspired collect and dodge, superb graphics game. Monty Mole is political. The idea is that you move Monty Mole through a variety of tunnels and caverns (the mine) collecting various useful objects. His ultimate objective — the secret ballot.

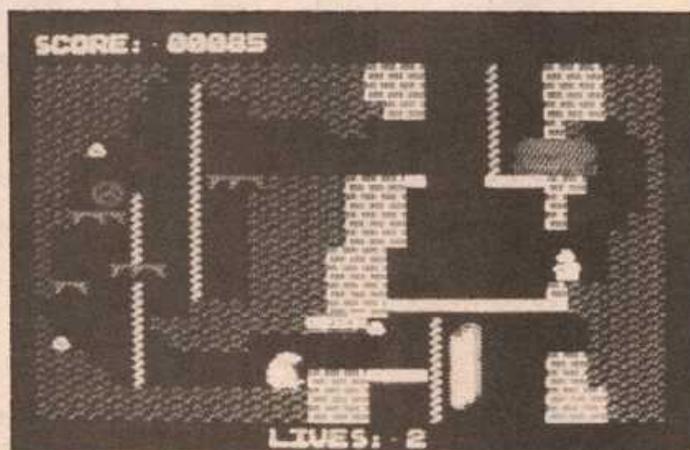
Monty has to avoid flying pickets and tins of hairspray (this seemingly oblique reference relates to the later sequences of the game where Monty confronts Arthur in his castle.

Right. Now that you have

had your political prejudices inspired or enraged by the news of the plot, on with the game itself. It is, in fact, superb. The graphics are of Ultimate quality and although it owes almost everything to *Manic Miner* — you collect things, avoid things, and the key to it all is knowing when to jump — the design of the game is so clever and the problems so fiendish that it has all the addictiveness of an original concept.

I spent quite a while declaring one part of the vast maze of interlocking patterns to be absolutely impassable before I realised in true *Manic Miner* fashion... well if I jump just as I enter the screen in the middle of the rope before the *Pacman* type thing grabs me I'll be OK. I did and was promptly squashed in a crusher machine.

Ian Waltham



The speaking Spectrum

David Laine explains how to build your own low-cost RS-232 output port

The software and hardware project described below allows the production quite cheaply of an RS232 output port operating from the Spectrum's *LList* and *LPrint* commands.

The system is 'blind' and the programs calling the interface *must* ensure that there is no data over-run.

Some knowledge of electronic construction and machine-code is assumed.

The RS232 serial signal is asynchronous signal. Characters are sent one bit at a time 'bit serially', the least significant bit is sent first; each character bit, '0' or '1', requires the same transmission time and all characters are preceded by a single mark or '1' bit and followed by one or more stop or '0' bit. The duration of each bit is 1/ baud-rate seconds; at 110 baud each bit lasts 9.09 milli-seconds.

You may need to tailor your version of the software routine in one or more of the following respects:

1) If your printer has no input buffer, the character which takes the longest to execute will probably be the *CR/LF* or carriage-return/line-feed. It will be necessary to follow the *CR/LF* character(s) by a short pause to allow for their completion or the number of stop bits after each character is sent should be increased from the mandatory 1 or 2 to perhaps 7 or 8; this will slow the overall character rate by half.

2) Your printer may demand a parity bit to be inserted after the mark stop (MS) bit and before the terminal stop bit(s) of each character.

3) You may need to alter the output baud

rate (this is the easy part). The *Wait* routine waits for one bit time and is set for 110 baud — this time should be accurate to within 4 per cent — for other baud rates use the values given: 75 baud — 164; 110 baud — 112; 135.5 baud — 91; 300 baud — 41; 600 baud — 20; 1200 baud — 103.

These values may need slight reduction at high baud rates but the basic timing is that of the Spectrum itself.

Hardware

Sinclair uses the Ear socket to output low-level signals for driving a cassette recorder. The circuit shown performs two functions — impedance matching to avoid wave-form distortion and amplification/level-shifting to give a suitable signal. Because RS232 signals go above and below earth the simplest (and safest) power supply is a 12 volt battery isolated from the earth. You must not use the spectrum power supply and should not use a car battery. Due to the high source impedance of the Spectrum you ought to use this interface only on its own, with the recorder disconnected.

Note, however, that the Spectrum earth is connected to the peripheral signal earth.

The operational amplifier used in the circuit is the very common 741. The input 10K resistor protects the Spectrum and the output 1k resistor allows the output to be shorted to earth without damage to the 741. All resistors are 1/4 or 1/8 watt rating.

Software

The software outputs bit four to port 254, the speaker/ear port of the Spectrum. After the code has been loaded a call of *Randomize*

Usr 64000 performs 2 functions:

- 1) It resets Ramtop to protect the code.
- 2) It changes the address in the *Chans* area, of the routine used by the Spectrum for *LList* and *LPrint* from 09F4h (2548 dec) to point to the new routine *Newp*. This address in the *Chans* area may change if you have microdrive.

Calls on *LList/LPrint* will all now be diverted via *Newp* which is entered for each output character/token in sequence. This character is to be found in the A register.

Note that because Ramtop has been reset you can now use *New* without damage.

Program notes

20-200 The initial set-up/protect routine
240-690 A contains the character-token to be printed. Graphics are omitted and tokens are selected for separate decoding at lines 330-570. The © symbol is treated as a make-believe token held at line 600. Remember that all tokens are terminated by having the MS bit set in their last byte in the Rom table at address 150)

700-1160 This outputs the bit stream in RS232 format, entry is with the byte in A. The Start mark is output at line 730 and the 8 (or 7) bits of A are output in sequence, least significant first, via the conditional calls on *Mark* and *Space* at lines 770 and 780.

880-1060 The *Mark* and *Space* routines which hold the output high or low for a one-bit period. What is actually output here is determined by the design of the interface.

1070-1150 The *Wait* for one bit period. Operates by the simple process of pre-setting HL and subtracting 1s until zero is reached.

This is a very simple interface. Have fun with it but do not expect too much, for instance you may have to start a message with a dummy character to ensure that the first text character is not lost, again you must find out exactly what control codes, if any, your peripheral requires for certain effects.

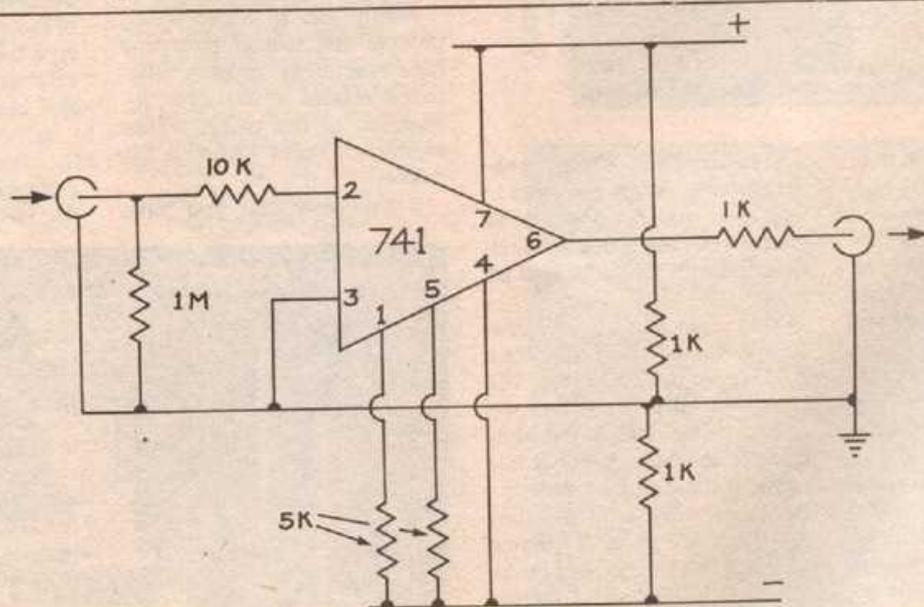


Figure 1 Interface circuit diagram. NB the 12 volt supply must be totally independent of the Spectrum — only the earth is common

ORG 64000		0580 CRITE LD HL,CTXT	
0020 INIT: PUSH AF		0590 JR TOKEN	
0030 PUSH DE		0600 CTXT DEFM "COPYRIGHT"	
0040 PUSH HL		0610 ; "All token decodes end with MS bit set"	
0050 ; "Reset RAMTOP"		0620 DEFB 128	
0060 LD DE,INIT-2		0630 ; "SPACE inserted at end of TOKEN"	
0070 LD HL,23730		0640 BYTSP LD A," "	
0080 LD (HL),E		0650 BYTE1 CALL BYTEX	
0090 INC HL		0660 BYTE2 POP HL	
0100 LD (HL),D		0670 POP AF	
0110 ; "Set NEWP to be the new output routine"		0680 RET	
0120 LD HL,(23631)		0690 ; "Character output routine"	
0130 LD DE,15		0700 BYTEX PUSH AF	
0140 ADD HL,DE		0710 PUSH BC	
0150 LD DE,NEWP		0720 ; "Output the initial MARK"	
0160 LD (HL),E		730 CALL MARK	
0170 INC HL			
0180 LD (HL),D		0740 ; "Change 8 to 7 for 7 bit characters"	
0190 POP HL		0750 LD B,8	
0200 POP DE		0760 NXB BIT 0,A	
0210 POP AF		0770 CALL NZ,SPACE	
0220 RET		0780 CALL Z,MARK	
0230 ; "MICRO RS232 PORT COPYRIGHT D.N.LAINE 1984"		0790 WT SRL A	
0240 NEWP PUSH AF		0800 DJNZ NXB	
0250 PUSH HL		0810 CALL SPACE	
0260 CP 127		0820 ; "Add more SPACES to reduce character rate"	
0270 JR C,BYTE1		0830 CALL SPACE	
0280 ; "Deal specially with COPYRIGHT symbol"		0840 POP BC	
0290 JR Z,CRITE		0850 POP AF	
0300 CP 165		0860 RET	
0310 ; "Omit graphics symbol"		0870 ; "output MARK routine"	
0320 JR C,BYTE2		0880 MARK PUSH AF	
0330 SUB 165		0890 PUSH BC	
0340 ; "A contains the token sequence number"		0900 LD A,0	
0350 ; "150 is head address of TOKEN decode table"		0910 OUT (254),A	
0360 ; "now find the right part"		0920 CALL WAIT	
0370 LD HL,150		0930 POP BC	
0380 TL0 JR Z,TSPCE		0940 POP AF	
0390 TL1 BIT 7,(HL)		0950 RET	
0400 INC HL		0960 ; "output SPACE routine"	
0410 JR Z,TL1		0970 SPACE PUSH AF	
0420 TL2 DEC A		0980 PUSH BC	
0430 JR TL0		0990 ; "16 is bit 4 for OUTPUT"	
0440 ; "SPACE inserted at start of TOKEN"		1000 LD A,16	
0450 TSPCE LD A," "		1010 OUT (254),A	
0460 CALL BYTEX		1020 CALL WAIT	
0470 ; "Print the token"		1030 POP BC	
0480 TOKEN LD A,(HL)		1040 POP AF	
0490 AND 127		1050 RET	
0500 CALL BYTEX		1060 ; "WAIT for 1 bit period: 1128=110 baud 4k"	
0510 LD A,(HL)		1070 WAIT PUSH BC	
0520 BIT 7,A		1080 PUSH HL	
0530 ; "was last character as MS bit is set"		1090 LD HL,1128	
0540 JR NZ,BYTSP		1100 LD BC,1	
0550 INC HL		1110 WZ SBC HL,BC	
0560 ; "collect next TOKEN byte"		1120 JR NZ,WZ	
0570 JR TOKEN		1130 POP HL	
		1140 POP BC	
		1150 RET	
		1160 END	

BYTE VALUES COPYRIGHT D.N.Laine 1984

ADDRESS	values	check
64000	245	213
64005	249	033
64010	035	114
64015	017	015
64020	029	250
64025	225	209
64030	229	254
64035	040	038
64040	054	214
64045	000	040
64050	035	040
64055	246	062
64060	250	126
64065	098	250
64070	032	018
64075	033	080
64080	067	079
64085	073	071
64090	062	032
64095	225	241
64100	205	126
64105	203	071
64110	204	126
64115	016	244
64120	205	138
64125	201	245
64130	211	254
64135	193	241
64140	062	016
64145	150	250
64150	197	229
64155	001	001
64160	032	252
		225
		017
		092
		079
		025
		035
		114
		245
		057
		056
		165
		033
		126
		024
		098
		205
		127
		203
		127
		242
		237
		082
		128
		250
		197
		008
		250
		138
		241
		063
		250
		193
		200
		250
		197
		205
		201
		004
		066
		201
		066
		201
		035
		0903

Window of opportunity

Adrian Warman concludes his two-part Commodore 64 windowing feature

This week we publish the second part of the assembly language listing for the 'windowing' program. The accom-

panying program notes are, I hope, fairly comprehensive and should be self-explanatory.

Also included is a list of labels used by the assembly language listing.

For the benefit of those without an assembler, there is also a Basic loader program.

The short demonstration program will enable you to see how the windowing technique works in practice.

- 2100-2160 All the window dimension data has now been found. The transfer process can now begin. First find the position of the window on the screen. Then add the current position of the character storage map (given by the system variable *Hibase*). This address is placed into *SRC*, since the data will come from this position.
- 2170 Transfers the window from *SRC* to *VEC*, using the sub-routine *Copy*.
- 2180-2240 Reloads the position of the window, and adds a correction factor for the colour nybble store; then copies into the store using *Copy* again.
- 2250-2390 In order to reload the stored data, it is necessary to keep a record of the window data. This is stored after the actual screen data so that it can be accessed first during reload. Finally, the free location pointer *VEC* is updated, then the job is then completed.
- 2430-2490 Reloads a stored window. First checks that there is actually some window data stored. This is done by testing the current value of *VEC*. If *VEC* still points to \$A000 then there is no data present and the command will be ignored.
- 2500-2520 If data is present, it switches out the Basic Roms to access the window.
- 2530-2590 Moves *Vec* to point to start of dimension data storage.
- 2600-2670 Reloads the dimension data back into *XORIG*, *XSIZE*, etc.
- 2680-2750 Finds the relative position of window on the screen. It calculates where this is in the colour nybble memory. *Src* is then used to place the data back into position by the *Get* sub-routine.
- 2760-2820 Repeats the process for the character data back into the current character map (using *Hibase* again).
- 2830-2860 Switches the Basic Roms back again, and returns to Basic.
- 2900-2920 Copies each row of the window until reaching the bottom of the window.
- 2930-2970 Traverses the current row until reaching the last column of the window. Note that the first column of the window is treated as being column 0 because the actual column number is added into the calculations by sub-routine *Posn*.
- 2980-3020 Transfers the data byte, and updates the storage vector *Vec*.
- 3030-3020 Moves to the next column and repeats the transfer.
- 3050-3100 Detects the end of the current row, and repeats until reaching the bottom of the window; then exits the routine.
- 3180-3210 Preserves the contents of *Temp*, since it may still be required by the 'up-date' routine.
- 3220-3210 Transfers and up-dates *Temp* to *Src*; also reloads the stored *Temp* value from the stack. This manipulation of data is necessary, because the data must be reloaded 'backwards' ie bottom corner first.
- 3400-3420 Loads *X* with the row count. If there are no more rows to reload, it exits the routine.
- 3430-3510 Makes the *Src* point to the start of the previous row — because the routine is reloading 'backwards'.
- 3520-3540 Sets *Y* to column count. While there are still columns to do on this row, it gets the data back to the screen stores.
- 3550-3600 Makes *Vec* point to the data byte. Gets the byte and places it back in position.
- 3610-3620 Moves to the next column.
- 3630-3660 Moves to the next row. If there are no more rows, exits routine.

2100 C0BD 2039C0	JSR POSN	2490 C0D3 60	RTS
2110 C090 A5BB	LDA TEMP	2500 C0D4 A501	LDA \$01
2120 C092 85FB	STA SRC	2510 C0D6 29FE	AND \$X11111111
2130 C094 A5BC	LDA TEMPHI	2520 C0D8 8501	STA \$01
2140 C096 1B	CLC	2530 C0DA A5FD	LDA VEC
2150 C097 6DBB02	ADC #02BB	2540 C0DC 3B	SEC
2160 C09A 85FC	STA SRCHI	2550 C0DD E904	SBC #04
2170 C09C 201CC1	JSR CDPY	2560 C0DF 85FD	STA VEC
2180 C09F A5BB	LDA TEMP	2570 C0E1 A5FE	LDA VECHI
2190 C0A1 85FB	STA SRC	2580 C0E3 E900	SBC #00
2200 C0A3 A5BC	LDA TEMPHI	2590 C0E5 85FE	STA VECHI
2210 C0A5 1B	CLC	2600 C0E7 A200	LDX #00
2220 C0A6 69DB	ADC #5DB	2610 C0E9 A000	LDY #00
2230 C0A8 85FC	STA SRCHI	2620 C0EB B1FD	LDA (VEC),Y
2240 C0AA 201CC1	JSR CDPY	2630 C0ED 95F7	STA XORIG,X
2250 C0AD A200	LDX #00	2640 C0EF CB	INX
2260 C0AF A000	LDY #00	2650 C0F0 EB	CPY #04
2270 C0B1 85F7	LDA XORIG,X	2660 C0F1 C004	BNE RELOAD
2280 C0B3 91FD	STA (VEC),Y	2670 C0F3 D0F6	JSR POSN
2290 C0B5 EB	INX	2680 C0F5 2039C0	LDA TEMP
2300 C0B6 CB	INX	2690 C0FB A5BB	STA SRC
2310 C0B7 E004	CPX #04	2700 C0FA 85FB	LDA TEMPHI
2320 C0B9 D0F6	BNE KEEPON	2710 C0FC A5BC	CLC
2330 C0BB A5FD	LDA VEC	2720 C0FE 1B	ADC #04
2340 C0BD 1B	CLC	2730 C0FF 69DB	STA VEC
2350 C0BE 6904	ADC #04	2740 C101 85FC	BCC STOREOUT
2360 C0C0 85FD	STA VEC	2750 C103 204AC1	INC VEC
2370 C0C2 9002	BCC STOREOUT	2760 C106 A5BB	LDA TEMP
2380 C0C4 E6FE	INC VEC	2770 C108 85FB	STA SRC
2390 C0C6 60	STOREOUT	2780 C10A A5BC	LDA TEMPHI
2400 C0C7	RTS	2790 C10C 1B	CLC
2410 C0C7	! RELOAD STORED WINDOW.	2800 C10D 6DBB02	ADC #02BB
2420 C0C7	!	2810 C110 85FC	STA SRCHI
2430 C0C7 A9A0	UPDATE	2820 C112 204AC1	JSR GET
2440 C0C9 C5FE	LDA #A0	2830 C115 A501	LDA \$01
2450 C0CB D007	CHP VEC	2840 C117 0901	ORA \$X00000001
2460 C0CD A900	BNE DOUN	2850 C119 8501	STA \$01
2470 C0CF C5FD	LDA #00	2860 C11B 60	RTS
2480 C0D1 D001	CHP VEC	2870 C11C	
	BNE DOUN		
	! IS DATA PRESENT?		

```

2890 C11C      ! COPY SCREEN TO STORE.
2890 C11C      !
2900 C11C      COPY      LDX #900
2910 C11E E4FA COUTER   CPX YSIZE      ! ROW COUNT.
2920 C120 B027      BCS CENDOUTER
2930 C122 B602      STX CALC
2940 C124 A200      LDX #900
2950 C126 A000      LDY #900      ! COLUMN COUNT.
2960 C128 C4FB      CINNER   CPY XSIZE
2970 C12A B00D      BCS CENDINNER
2980 C12C B1FB      LDA (SRC),Y      ! STORE DATUM.
2990 C12E B1FD      STA (VEC,X)
3000 C130 E6FD      INC VEC      ! UPDATE STORE VECTOR.
3010 C132 D002      BNE CNDUPDATE
3020 C134 E6FE      INC VEC1
3030 C136 CB        CNDUPDATE INY      ! CONTINUE COLUMNS.
3040 C137 D0EF      BNE CINNER
3050 C139 A928      CENDINNER LDA #928      ! FIND NEXT ROW.
3060 C13B 18        CLC
3070 C13C 63FB      ADC SRC
3080 C13E 85FB      STA SRC
3090 C140 9002      BCC CCARRY
3100 C142 E6FC      INC SRCHI
3110 C144 A602      CCARRY   LDX CALC      ! CONTINUE ROWS.
3120 C146 EB        INX
3130 C147 D005      BNE COUTER
3140 C149 60        CENDOUTER RTS
3150 C14A          !
3160 C14A          ! COPY STORE TO SCREEN.
3170 C14A          !
3180 C14A A5BC      GET      LDA TEMP1
3190 C14C 4B        PHA
3200 C14D A5BB      LDA TEMP
3210 C14F 4B        PHA
3220 C150 A4FA      LDY YSIZE
3230 C152 2023C0    JSR MULY
3240 C155 C6BB      DEC TEMP
3250 C157 A9FF      LDA #9FF
3260 C159 C5BB      CMP TEMP
3270 C15B D002      BNE NOTHI
3280 C15D C6BC      DEC TEMP1
3290 C15F A5BB      LDA TEMP
3300 C161 18        CLC
3310 C162 65FB      ADC SRC
3320 C164 85FB      STA SRC
3330 C166 A5BC      LDA TEMP1
3340 C168 65FC      ADC SRCHI
3350 C16A 85FC      STA SRCHI
3360 C16C 68        PLA
3370 C16D 85BB      STA TEMP
3380 C16F 68        PLA
3390 C170 85BC      STA TEMP1
3400 C172 A200      LDX #900
3410 C174 E4FA      CPX YSIZE
3420 C176 B02B      BCS CENDOUTER
3430 C178 B602      STX CALC
3440 C17A A200      LDX #900
3450 C17C A5FB      LDA SRC
3460 C17E 38        SEC
3470 C17F E928      SBC #928
3480 C181 85FB      STA SRC
3490 C183 A5FC      LDA SRCHI
3500 C185 E900      SBC #900
3510 C187 85FC      STA SRCHI
3520 C189 A4FB      LDY XSIZE
3530 C18B C001      CPY #01
3540 C18D 900F      BCC CENDINNER
3550 C18F A5FD      LDA VEC
3560 C191 D002      BNE DECLO
3570 C193 C6FE      DEC VEC1
3580 C195 C6FD      DEC VEC
3590 C197 A1FD      LDA (VEC,X)
3600 C199 91FB      STA (SRC),Y
3610 C19B 8B        DEY
3620 C19C D0F1      BNE GINNER
3630 C19E A602      GENDINNER LDX CALC
3640 C1A0 EB        INX
3650 C1A1 D0D1      BNE GOUTER
3660 C1A3 60        GENDOUTER RTS

```

Labels

C05B BADVAL	0002 CALC	C144 CCARRY	C139 CENDINNER
C149 CENDOUTER	C128 CINNER	C136 CNDUPDATE	C11C COPY
C11E COUTER	C195 DECLO	C0D4 D0UP	C19E GENDINNER
C1A3 GENDOUTER	C14A GET	C0A4 GETVAL	C18F GINNER
C174 GOUTER	C000 INIT	C0B1 KEEPON	C023 MULY
C029 NEXT	C15F NOTHI	C039 POSN	C049 POSNOUT
C0EB RELOAD	C009 SCRIN	C030 SKIP	C0FB SRC
C0FC SRCHI	C01A START	C003 STOR	C05B STORE
C0C6 STREDUT	C0B7 STRSCRN	C00B TEMP	C08C TEMP1
C0C7 UPDATE	C006 UPDT	C0FD VEC	C0FE VEC1
C0F7 XOR16	C0FB XSIZE	C0F9 YOR16	C0FA YSIZE

Basic loader program

```

1000 REM BASIC SCREEN SAVER PROGRAM.
1010 :
1020 REM BY A. WARMAN.
1030 :
1040 DATUM=0
1050 SUM=0
1060 :
1070 PRINT "LOADING DATA."
1080 :
1090 FOR LOC=49152 TO 49571
1100 READ DATUM
1110 SUM=SUM+DATUM
1120 POKE LOC,DATUM
1130 NEXT LOC
1140 :
1150 IF SUM<>59595 THEN PRINT "SUM ERROR."
1160 STOP
1170 :
1180 :
1190 DATA 76, 26,192, 76, 91,192, 76,199,192,169, 0,133,247,133,249,169
1200 DATA 40,133,248,169, 25,133,250, 76,135,192,169, 0,133,253,169,160
1210 DATA 133,254, 96,132, 2,169, 0,162, 8, 70, 2,144, 3, 24,105, 40
1220 DATA 106,102,139,202,208,243,133,140, 96,164,249, 32, 35,192,165,139
1230 DATA 24,101,247,133,139,144, 2,230,140, 96, 32,253,174, 32,138,173
1240 DATA 32,247,183,201, 0,208, 1, 96, 76, 72,178, 32, 74,192,192, 40
1250 DATA 176,246,132,247, 32, 74,192,132,248,152, 24,101,247,201, 41,176
1260 DATA 231, 32, 74,192,192, 25,176,224,132,249, 32, 74,192,132,250,152
1270 DATA 24,101,249,201, 26,176,209,165,254,201,184,176,203, 32, 57,192
1280 DATA 165,139,133,251,165,140, 24,109,136, 2,133,252, 32, 28,193,165
1290 DATA 139,133,251,165,140, 24,105,216,133,252, 32, 28,193,162, 0,160
1300 DATA 0,181,247,145,253,232,200,224, 4,208,246,165,253, 24,105, 4
1310 DATA 133,253,144, 2,230,254, 96,169,160,197,254,208, 7,169, 0,197
1320 DATA 253,208, 1, 96,165, 1, 41,254,133, 1,165,253, 56,233, 4,133
1330 DATA 253,165,254,233, 0,133,254,162, 0,160, 0,177,253,149,247,200
1340 DATA 232,192, 4,208,246, 32, 57,192,165,139,133,251,165,140, 24,105
1350 DATA 216,133,252, 32, 74,193,165,139,133,251,165,140, 24,109,136, 2
1360 DATA 133,252, 32, 74,193,165, 1, 9, 1,133, 1, 96,162, 0,228,250
1370 DATA 176, 39,134, 2,162, 0,160, 0,196,248,176, 13,177,251,129,253
1380 DATA 230,253,208, 2,230,254,200,208,239,169, 40, 24,101,251,133,251
1390 DATA 144, 2,230,252,166, 2,232,208,213, 96,165,140, 72,165,139, 72
1400 DATA 164,250, 32, 35,192,198,139,169,255,197,139,208, 2,198,140,165
1410 DATA 139, 24,101,251,133,251,165,140,101,252,133,252,104,133,139,104
1420 DATA 133,140,162, 0,228,250,176, 43,134, 2,162, 0,165,251, 56,233
1430 DATA 40,133,251,165,252,233, 0,133,252,164,248,192, 1,144, 15,165
1440 DATA 253,208, 2,198,254,198,253,161,253,145,251,136,208,241,166, 2
1450 DATA 232,208,209, 96
READY.

```

Demonstration program

```

1000 SYS 49152
1010 PRINT CHR$(147);
      CHR$(13);CHR$(13)
1020 FOR COL=0 TO 15
1030 POKE 646,COL
1040 FOR NUM=1 TO 12
1050 PRINT NUM;
1060 NEXT NUM
1070 PRINT
1080 NEXT COL
1090 PRINT"PRESS ANY
      KEY TO STORE."
1100 GET IN$
1110 IF IN$="" THEN
      GOTO 1100
1120 SYS 49161
1130 PRINT CHR$(147);
      "PRESS ANY KEY
      TO RETRIEVE."
1140 GET IN$
1150 IF IN$="" THEN
      GOTO 1140
1160 SYS 49158

```

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Of sound mind

In the final part of their series, Jason Orbaum and Geoffrey Campbell look at Dragon sound routines

This week we look at sound generation from machine code. The relevant chip in the Dragon is called (by those in the know) an analog multiplexer and controls from whence the sound is to come. The three locations in this chip that are of interest to us are *Sel1*, *Sel2* and *BDA* which are, respectively, locations 65281, 65283, and 65315. By configuring these chips in various ways we can select the sound source we require according to the table in Fig 1. All are normally set at zero as can be concluded from the Figure.

The Bit in each of these chips that is important is Bit 3 ie, the bit worth 8 in decimal. The sound generation that we require is 6-bit D/A. We must therefore

set *Bda*. To disable the interrupt (and prevent irritating clicks at high frequencies) we clear the top bit of *Sel2*.

Now, to generate sound we store a value (0-255) in location 65312. The value determines the volume of the click that is produced through the speaker. As sound is a wave motion, the pitch is determined by

Fig 1

SEL1	SEL2	BDA	Sound source selected.
0	0	1	6 BitD/A
1	0	1	Cassette
0	1	0	Cartridge (extension chip)
0	0	0	Silence

the number of these clicks produced per second, or the frequency. In the routine provided, the X register holds the length of a pause between clicks, and the Y register holds the total number of clicks. It is therefore quite easy, with a bit of experimentation, to produce a note of the right pitch and duration. It should be pointed out that as the pitch rises, more clicks are needed (ie the contents of the Y register increase) to produce a note of the same duration.

In our earlier program, *Blitz*, there are several different sound routines, all of which are variations on the method outlined above. *Zap* starts with a high-pitched note, which decreases in pitch over a fraction of a second. *Bang* is a white-noise generator, which fades in volume. White-noise is a sound with a random, constantly varying pitch and volume. You should be able to work out how *Hum* works, as it is a variation on *Beep*.

```

2711 *
2711 * BEEP. LOAD X WITH PITCH, BASIC LOADER PROGRAM.
2711 * Y WITH DURATION, AND B WITH
2711 * VOLUME.
2711 *
2711 3402 BEEP PSHS A 0 REM BEEP
2713 B6FF23 LDA 65315 5 CLEAR 200, 10000
2716 8A08 ORA #8 :CS=0
2718 B7FF23 STA 65315 10 FOR N=10001 TO 10061
271B B6FF03 LDA 65283 20 READ A$
271E 84FE ANDA #254 30 A=VAL("&H"+A$)
2720 B7FF03 STA 65283 40 POKE N,A
2723 F7FF20 LOOP STB 65312 50 CS=CS+A
2726 8D1C BSR DELAY 60 NEXT N
2728 7FFF20 CLR 65312 70 IF CS<> 7161 THEN
272B 8D17 BSR DELAY SOUND 1,1:PRINT"DATA
272D 313F LEAY -1,Y ERROR." :END
272F 26F2 BNE LOOP 80 PRINT"ALL CORRECT"
2731 B6FF23 LDA 65315 :SOUND 200,1:END
2734 84F7 ANDA #247
2736 B7FF23 STA 65315 90 DATA 34,2,B6,FF,23,
2739 B6FF03 LDA 65283 8A,8,B7,FF,23,B6,FF
273C 8A01 ORA #1 ,3,84,FE,B7,FF,3,F7,FF
273E B7FF03 STA 65283 100 DATA 20,8D,1C,7F,FF,
2741 3502 PULS A 20,8D,17,31,3F,26,F2,
2743 39 RTS B6,FF,23,84,F7,B7,
2744 3410 DELAY PSHS X FF,23
2746 301F DLOOP LEAX -1,X
2748 26FC BNE DLOOP 110 DATA B6,FF,3,8A,1,B7,
274A 3510 PULS X FF,3,35,2,39,34,10,
274C 39 RTS 30,1F,26,FC,35,10,39
274D DATA 39,0

```

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After the program is loaded any of the routines — for example printing a microdrive directory or formatting a blank cartridge — can be carried out using only a couple of simple key-presses.

A while back when I was using my Sinclair Spectrum I decided that it would be a good idea to define numeric variables such and set them equal to the respective starting line numbers of a *Gosub* routines within a program that executed such 'procedures' — the idea being to call such procedures or *Gosub* routines as required.

Then along came the QL with its *DEFine PROCEDURE* command, an answer to all my problems.

Wouldn't it be nice, I thought, if I could just type *D1* for a directory listing of microdrive 1 instead of the long-winded command necessary.

See for yourself what the results of such thinking by typing in the listing below. It may not be the best solution but I find *User Procedures* very useful. It would be easy to extend the program to include additional procedures.

Points you should be aware of include:

1) I have an early version of the QL where the co-ordinates of the *At* command are reversed. If your machine is without the dongle swap these values round for each *At* command.

2) Beware of using procedures or variables with the same name as those in *User Procedures*. Errors may be abundant.

3) Type *Help* if you find yourself in difficulties, this will display the Help Screen.

4) Occasionally the *Save* procedures do not work first time around. If this occurs use the *Retry* command. I am told this is not a problem on the most recent versions of the QL.

5) The *Clear* command tends to sort out problems if your machine is acting up. Use

it when all else fails.

6) The program is called 'boot' and as such may be loaded in the same manner as the packages supplied with the QL.

7) The £ sign in the listing should be typed in as *at* sign.

8) *User Procedures* starts at line 29999. No program should be loaded subsequently which use these line numbers greater than 29999.

The following is a list of key-presses and their functions.

Press	Routine
<i>L1</i>	Loads from mdv1
<i>L2</i>	Loads from mdv2
<i>D1</i>	Directory of mdv1
<i>D2</i>	Directory of mdv2
<i>S1</i>	Saves program to mdv1
<i>S2</i>	Saves program to mdv2
<i>DEL1</i>	Delete from mdv1
<i>DEL2</i>	Delete from mdv2
<i>SPROC</i>	Save current user procedures
<i>DPROC</i>	Deletes current program from memory
<i>DTE</i>	Sets clock
<i>R</i>	Run program
<i>L</i>	List program
<i>F2</i>	Format mdv2
<i>C1</i>	Copy from mdv1 to mdv2

```

29999 INTRO
30000 REMark *****
30005 DEFine PROCEDURE INTRO
30010 MODE 4
30015 SCREEN1
30020 BLOCK 511,95,0,160,4
30025 CSIZE 3,1
30030 AT 9,1
30035 PRINT "W E L C O M E"
30040 AT 14,3
30045 PRINT "T D"
30050 AT 12,5
30055 PRINT "U S E R"
30060 AT 6,7
30065 PRINT "P R O C E D U R E S"
30070 CSIZE 0,0
30075 INK 0
30080 PAPER 4
30085 AT 28,17
30090 PRINT "THE SYSTEM CLOCK IS SET AS"
30095 AT 31,19
30100 PRINT DATE#
30105 AT 26,21
30110 PRINT "Press 'SPACE' to change date or"
30115 AT 26,22
30120 PRINT "Press any other key to continue"
30125 AT 36,24
30130 PRINT "VERSION 1.01"
30135 IF INKEY#="" THEN GO TO 30095
30140 IF KEYROW(1)=64 THEN DTE
30145 HELP
30150 END DEFine INTRO
30155 REMark *****
30160 DEFine PROCEDURE DTE
30165 SCREEN2
30170 PRINT "CHANGE DATE"
30175 PRINT
30180 INPUT "YEAR (YYYY) = ";YEAR
30185 INPUT "MONTH (MM) = ";MONTH
30190 INPUT "DAY (DD) = ";DAY
30195 INPUT "HOURS (HH) = ";HOURS
30200 INPUT "MINUTES (mm) = ";MINUTES
30205 PRINT "ONCE THE VALUE FOR SECONDS IS INPUT THEN THE SYSTEM
CLOCK WILL BE SET"
30210 INPUT "SECONDS (ss) = ";SECONDS
30215 SDATE YEAR,MONTH,DAY,HOURS,MINUTES,SECONDS
30220 PRINT
30225 PRINT "THE SYSTEM CLOCK IS SET AS"
30230 AT 0,11
30235 PRINT DATE#
30240 PRINT
30245 PRINT "Press any key to continue"
30250 IF INKEY#="" THEN GO TO 30230
30255 HELP
30260 REMark *****
30265 DEFine PROCEDURE ENTER
30270 CLS
30275 PRINT "ENTER FILE NAME ";
30280 END DEFine ENTER
30285 REMark *****
30290 DEFine PROCEDURE L1
30295 LOCAL X#
30300 ENTER
30305 PRINT "TO BE LOADED FROM MDV1_"
30310 INPUT X#
30315 MERGE "MDV1_"&X#
30320 RUN
30325 END DEFine L1
30330 REMark *****
30335 DEFine PROCEDURE L2
30340 LOCAL X#
30345 ENTER
30350 PRINT "TO BE LOADED FROM MDV2_"
30355 INPUT X#
30360 MERGE "MDV2_"&X#
30365 RUN
30370 END DEFine L2
30375 REMark *****
30380 DEFine PROCEDURE D1
30385 CLS
30390 PRINT "DIRECTORY MDV1_"
30395 DIR MDV1_
30400 END DEFine D1
30405 REMark *****
30410 DEFine PROCEDURE D2
30415 CLS
30420 PRINT "DIRECTORY MDV2_"
30425 DIR MDV2_
30430 END DEFine D2
30435 REMark *****
30440 DEFine PROCEDURE S1
30445 LOCAL X#
30450 ENTER
30455 PRINT "TO BE SAVED TO MDV1_"
30460 INPUT X#
30465 SAVE "MDV1_"&X#, TO 29999
30470 HELP
30475 END DEFine S1
30480 REMark *****
30485 DEFine PROCEDURE S2
30490 LOCAL X#
30495 ENTER
30500 PRINT "TO BE SAVED TO MDV2_"
30505 INPUT X#
30510 SAVE "MDV2_"&X#, TO 29999
30515 HELP
30520 END DEFine S2
30525 REMark *****
30530 DEFine PROCEDURE DEL1
30535 LOCAL X#
30540 ENTER
30545 PRINT "TO BE DELETED FROM MDV1_"
30550 INPUT X#
30555 DELETE "MDV1_"&X#

```

```

30560 HELP
30565 END DEFINE DEL1
30570 REMark *****
30575 DEFINE PROCEDURE DEL2
30580 LOCAL X#
30585 ENTER
30590 PRINT "TO BE DELETED FROM MDV2_"
30595 INPUT X#
30600 DELETE "MDV2_"&X#
30605 HELP
30610 END DEFINE DEL2
30615 REMark *****
30620 DEFINE PROCEDURE SPR0C
30625 CLS
30630 PRINT "SAVING CURRENT PROCEDURES..."
30635 DELETE mdv1_boot
30640 SAVE mdv1_boot
30645 HELP
30650 END DEFINE SPR0C
30655 REMark *****
30660 DEFINE PROCEDURE DPR0G
30665 CLS
30670 PRINT "DELETING CURRENT PROGRAM..."
30675 LRUN mdv1_boot
30680 END DEFINE DPR0G
30685 REMark *****
30690 DEFINE PROCEDURE R
30695 RUN
30700 END DEFINE R
30705 REMark *****
30710 DEFINE PROCEDURE L
30715 LIST
30720 END DEFINE L
30725 REMark *****
30730 DEFINE PROCEDURE F2
30735 LOCAL X#
30740 CLS
30745 PRINT "FORMAT MDV2_"
30750 PRINT "ENTER MICRODRIVE FORMAT NAME"
30755 INPUT X#
30760 FORMAT "MDV2_"&X#
30765 HELP
30770 END DEFINE F2
30775 REMark *****
30780 DEFINE PROCEDURE HELP
30785 SCREEN2
30790 PRINT "HELP"
30795 PRINT "INTRO      Introduces user procedures and option to
set clock"

30800 PRINT "L1      LOAD from mdv1_"
30805 PRINT "L2      LOAD from mdv2_"
30810 PRINT "D1      DIRectory of mdv1_"
30815 PRINT "D2      DIRectory of mdv2_"
30820 PRINT "S1      SAVe to mdv1_"
30825 PRINT "S2      SAVe to mdv2_"
30830 PRINT "DEL1     DELETE from mdv1_"
30835 PRINT "DEL2     DELETE from mdv2_"
30840 PRINT "SPROC    SAVE current user procedures"
30845 PRINT "DPROG    DELETE current program from memory"
30850 PRINT "DTE      Sets clock"
30855 PRINT "R        RUN program"
30860 PRINT "L        LIST program"
30865 PRINT "F2       FORMAT mdv2_"
30870 PRINT "C1       COPY from mdv1_ to mdv2_"
30875 PRINT "HELP     Displays this screen"
30880 PRINT "Choose desired option"
30885 END DEFINE HELP
30890 REMark *****
30895 DEFINE PROCEDURE C1
30900 ENTER
30905 PRINT "TO BE COPIED FROM MDV1_ TO MDV2_"
30910 INPUT X#
30915 COPY "MDV1_"&X# TO "MDV2_"&X#
30920 HELP
30925 END DEFINE C1
30930 REMark *****
30935 DEFINE PROCEDURE SCREEN1
30940 WINDOW £1,512,256,0,0
30945 PAPER 2
30950 INK 7
30955 CLS
30960 END DEFINE SCREEN1
30965 REMark *****
30970 DEFINE PROCEDURE SCREEN2
30975 SCREEN1
30980 WINDOW £0,452,32,30,224
30985 WINDOW £1,452,208,30,16
30990 WINDOW £2,452,208,30,16
30995 PAPER £0,2
31000 INK £0,7
31005 CLS £0
31010 PAPER £2,0
31015 INK £2,4
31020 CLS £2
31025 CLS
31030 END DEFINE SCREEN2
31035 REMark *****

```

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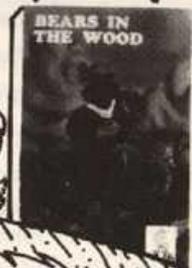
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Command performance

Charis Charalambous attempts to unravel the complexities of the BBC's envelope-shaping sound commands

While the BBC has a very powerful enveloping facility, it is unfortunately complicated and difficult to master. This program makes enveloping much easier and simpler.

It will enable you to alter any parameter on Envelopes 1 to 4, together with any parameter on any channel at any time. Use of sound will not affect the program.

It will accept any correct variable, and if you type in something 'wild', the program will tell you the allowed range on the current variable.

It will run on both the Model A and Model B (O/S 1.0 and 1.2).

Program notes

290 Defprocset sets keys F0-F9 to produce

ascii, 193 and also sets initial envelopes

560 Deffnok (A,B,X) checks that x is between A and B

590 Defprocchoose accepts response from keyboard

1510 Defprocwr (1,11) outputs on screen the allowed range for the current parameter within the allowed boundaries of L to LL

1570 Defprocupdate updates the current envelope on screen

1750 Defprocsound updates the current envelope parameters

1830 Defprocso (h%) plays sound channel h%

1880 Defprocso-off switches off all sounds

```

10REM*****
20REM BBC(B) O.S 1.2
30REM ENVELOPE DEFINER
40REM Charis Charalambous..(c)
50REM ADDRESS:
60REM Byzinou 16,
70REM 40 Eklisies,
80REM Thessaloniki,
90REM GREECE.
100REM*****

110TV255,1
120MODE1
130PROCSET
140PROCINSTR
150PROCDISPLAY
160PROCUPDATE(Z%)
170PROCUPDATE_SOUND
180PROCCHOOSE
190*****

200DEFPROCDISPLAY
210COLOUR2:PRINTTAB(2,1)"ENVELOPE
DEFINER--Charis(11/2/84)"
220COLOUR3
230 FOR FX=0 TO 5*6 STEP6:PRINTTAB(FX,4)"( )
"TAB(FX,2)"( )":NEXT
240FOR FZ=2*6 TO 3*6 STEP6:PRINTTAB(FZ,8)"
( )":NEXT
250FOR F=0 TO 3:PRINTTAB(0,12+3*F)"Channel ";F:
FOR J=0 TO 3:PRINTTAB(12+J*6,12
+3*F)"[ J]:NEXT,
260PRINTTAB(0,4)"[ J]"
270ENDPROC
280*****

290DEFPROCSET
300DIM EX(72)
310AZ=2:YZ=5:ZX=0
320FX4,1
330K.0 !!A
340K.1 !!B
350K.2 !!C
360K.3 !!D
370K.4 !!E
380K.5 !!F
390K.6 !!G
400K.7 !!H
410K.8 !!I
420K.9 !!J
430VDU23,8202,0,0,0;
440VDU23,255,24,60,126,255,24,24,24,24
450VDU19,1,2,0;
460FX21,0
470FORF=1TO72:READ EX(F):NEXT
480DATA1,1,4,-4,4,10,20,10,127,0,0,-5,126,126,0,
-4,100,6,1,3,100,6,2,2,100,6,3,1,100,6
490DATA2,8,1,-1,1,1,1,1,121,-10,-5,-2,90,90
500DATA3,1,-26,-36,-45,255,255,255,127,0,0,-127,126,0
510DATA4,7,2,1,1,1,1,1,121,-10,-5,-2,120,120
520FOR Z%=31 TO 59 STEP14:PROCSOUND:NEXT
530Z%=1:PROCSOUND
540 ENDPROC
550*****

560DEFPROCDEFNOK(A,B,X)
570 IF B>=X AND A<=X =TRUE ELSE=FALSE
580*****

590DEFPROCCHOOSE
600COLOUR3
610PRINTTAB(AZ,YZ)CHR#255
620AS=GET$:DX=ASC(A$)
630IF DX=193 PROCSD(0)
640IF DX=194 PROCSD(1)
650IF DX=195 PROCSD(2)
660IF DX=196 PROCSD(3)
670IF DX=197 PROCSD_OFF
680PRINTTAB(AZ-1,YZ)SPC(3)
690IF DX=202 AZ=2:YZ=5
700AZ=AZ+6*(INKEY(-26)-INKEY(-122))
710YZ=YZ+(2-(YZ)=13)*(INKEY(-58)-INKEY(-42))
720IF AZ=32:AZ=32 ELSE IF AZ<=2 AZ=2
730IF YZ=11 YZ=13 AND INKEY(-42)
740IF YZ>22 YZ=22
750IF YZ=10 YZ=9
760IF YZ<=5 YZ=5
770IF YZ=9 AND AZ<=14 AZ=14 ELSE IF YZ=9 AND AZ=20 AZ=20
780IF YZ>9 AND AZ<=20 AZ=20
790 JJ=1+(AZ DIV 6)-6*(YZ=7)
800 IF YZ=9 JJ=11+AZ DIV6
810IF YZ>12 JJ=9+AZ DIV 6+((YZ-10) DIV 3)*4
820 IF FNOK(48,57,ASC(A$)) OR A$="" :PROCGET:COLOUR3
830GOTO600
840*****

850DEFPROCSET
860IF JJ<15 AND JJ>30 TEMP=EX(JJ+Z%-1) ELSE TEMP=EX(JJ)
870 PRINTTAB(AZ-1,YZ-1)SPC(4)
880COLOUR1
890IF A$<>"" :PRINTTAB(AZ-1,YZ-1)VAL(A$)
ELSE PRINTTAB(AZ-1,YZ-1)(A$)
900 B$=A$
910X$=GET$
920IF ASC(X$)=13 AND LEN(B$)=1 AND B$="" :GOTO940 ELSE IF
ASC(X$)=13 PROCVALUE VAL(B$):ENDPROC
930B$=B$+X$
940IF LEN(B$)=5 B$=LEFT$(B$,3)+RIGHT$(B$,1)
950PRINTTAB(AZ-1,YZ-1)VAL(B$)
960GOTO 910
970*****

980DEFPROCVALUE(NO)
990DN JJ GOSUB1080,1100,1120,1140,1160,1180,1200,1220,
1240,1260,1280,1300,1320,1340,1390,1370,1380,1390,
1430,1400,1410,1420,1470,1430,1440,1450,1360,1460,
1470 1480
1000ENDPROC
1010*****

1020 If you are..runing out of patience
1030 ommit the whole testing routine !
1040 DELETelines 1090_1490 and 1500_1540
1050 also add 790 IF JJ>1 JJ=1
1060 and 990 GOSUB 1080
1070*****

1080IF FNOK(1,4,NO) PROCUPDATE(NO):RETURN
1090PROCWR(1,4):RETURN
1100IF FNOK(0,255,NO) EX(Z%+1)=NO:RETURN
1110PROCWR(0,255):RETURN
1120IF FNOK(-128,127,NO)EX(Z%+2)=NO:RETURN
1130PROCWR(-128,127):RETURN
1140IF FNOK(-128,127,NO)EX(Z%+3)=NO:RETURN
1150PROCWR(-128,127):RETURN
1160IF FNOK(-128,127,NO)EX(Z%+4)=NO:RETURN
1170PROCWR(-128,127):RETURN
1180IF FNOK(0,255,NO)EX(Z%+5)=NO:RETURN
1190PROCWR(0,255):RETURN
1200IF FNOK(0,255,NO)EX(Z%+6)=NO:RETURN
1210PROCWR(0,255):RETURN
1220IF FNOK(0,255,NO)EX(Z%+7)=NO:RETURN
1230PROCWR(0,255):RETURN

```

```

1240IF FNOK(-127,127,NO)EX(ZX+B)=NO:RETURN
1250PROCWR(-127,127):RETURN
1260IF FNOK(-127,127,NO)EX(ZX+9)=NO:RETURN
1270PROCWR(-127,127):RETURN
1280IF FNOK(-127,0,NO)EX(ZX+10)=NO:RETURN
1290PROCWR(-127,0):RETURN
1300IF FNOK(-127,0,NO)EX(ZX+11)=NO:RETURN
1310PROCWR(-127,0):RETURN
1320IF FNOK(0,126,NO)EX(ZX+12)=NO:RETURN
1330PROCWR(0,126):RETURN
1340IF FNOK(0,126,NO)EX(ZX+13)=NO:RETURN
1350PROCWR(0,126):RETURN
1360
1370IF FNOK(-15,16,NO)EX(22)=NO:RETURN ELSE
PROCWR(-15,16):RETURN
1380IF FNOK(0,7,NO)EX(17)=NO:RETURN ELSE
PROCWR(0,7):RETURN
1390IF FNOK(0,255,NO)EX(18)=NO:RETURN ELSE PROCWR
(0,255):RETURN
1400IF FNOK(-15,16,NO)EX(20)=NO:RETURN ELSE PROCWR
(-15,16):RETURN
1410IF FNOK(0,255,NO)EX(21)=NO:RETURN ELSE PROCWR
(0,255):RETURN
1420IF FNOK(0,255,NO)EX(22)=NO:RETURN ELSE
PROCWR(0,255):RETURN
1430IF FNOK(-15,16,NO)EX(24)=NO:RETURN ELSE PROCWR
(-15,16):RETURN
1440IF FNOK(0,255,NO)EX(25)=NO:RETURN ELSE
PROCWR(0,255):RETURN
1450IF FNOK(0,255,NO)EX(26)=NO:RETURN ELSE
PROCWR(0,255):RETURN
1460IF FNOK(-15,16,NO)EX(28)=NO:RETURN ELSE
PROCWR(-15,16):RETURN
1470IF FNOK(0,255,NO)EX(29)=NO:RETURN ELSE
PROCWR(0,255):RETURN
1480IF FNOK(0,255,NO)EX(30)=NO:RETURN ELSE
PROCWR(0,255):RETURN
1490ENDPROC
1500*****
1510DEFPROCWR(L,LL)
1520IF JJ<15 AND JJ>30 EX(JJ+ZX-1)=TEMP ELSE EX(JJ)=TEMP

```

```

1530COLOUR3
1540PRINTTAB(10,10)"Allowed range:";L;" to ";LL;
PROCSPACE:PROCCLEAR:COLOUR1:PRINTTAB(AZ-1,YZ-1)SPC4TAB
(AZ-1,YZ-1)EX(JJ+ZX-1)
1550ENDPROC

1560*****
1570DEFPROCUPDATE(Z):X=Z:IF Z=1 Z=0:ZX=1 ELSE IF Z=2 Z=30:
ZX=31 ELSE IF Z=3 Z=4 4:ZX=45 ELSE Z=58:ZX=59
1580EX(ZZ)=X:COLOUR1
1590FOR F=0 TO 30 STEP6:PRINTTAB(F+1,4)SPC(4)TAB(F+1,6)SPC
(4)TAB(F+1,4)EX((F+6)DIV6+Z)TAB(F+1,6)EX(6+(F+6)DIV6+Z)
1600NEXT
1610PRINTTAB(13,8)SPC(4)TAB(19,8)SPC(4)
1620PRINTTAB(13,8)EX(13+Z)TAB(19,8)EX(14+Z)
1630ENDPROC

1640*****
1650DEFPROCUPDATE_SOUND:COLOUR1
1660FOR F=14 TO 32 STEP6:FOR G=12 TO 21 STEP3:PRINTTAB(F-1,
G)SPC4;TAB(F-1,6)EX(16+(F-20)DIV 6+4*(G-12)DIV3):NEXT,
1670ENDPROC

1680*****
1690DEFPROCSPACE
1700PRINTTAB(8,25)"Please press space/bar"
1710 REPEAT T=GET:UNTILT=32
1720 PROCCLEAR
1730ENDPROC

1740*****
1750DEFPROCSOUND
1760ENVELOPEEX(ZX),EX(ZX+1),EX(ZX+2),EX(ZX+3),EX(ZX+4),EX
(ZX+5),EX(ZX+6),EX(ZX+7),EX(ZX+8),EX(ZX+9),EX(ZX+10),
EX(ZX+11),EX(ZX+12),EX(ZX+13)
1770ENDPROC
1780*****

```

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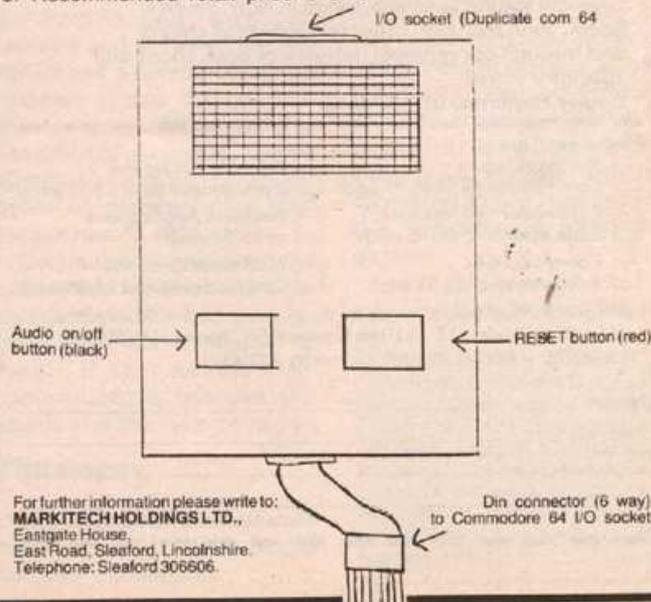
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Tank Attack

on Dragon 32

In this game for the Dragon 32 the object is to destroy as many tanks as possible in two and a half minutes. You have at your disposal a high-powered field-gun controlled by the cursor keys. The space bar is used to fire the gun at the tank crossing the battlefield.

Lines 210 and 700 can be deleted if your machine doesn't run the double-speed Pokes. The number of kills is indicated by crosses at the top of the screen, one for each tank destroyed.

(Note: — If you run in slow speed the time limit will obviously be longer.)

Program notes

- 30-200 Game instructions
- 210 Double speed poke
- 220-270 Set up screen
- 300-340 Draw and get tank
- 380-440 Draw background and gun position
- 490-510 Move tank
- 520-530 Display gun
- 540-570 Check cursor keys
- 630 Check space bar for hit
- 690 Update score at random first place of tank
- 710-810 End of game routine

```

10 REM      TANK ATTACK
20 REM MARTIN, J. LLOYD (C) 1984
30 CLS0
40 PRINT#42, "tank" ICHR$(128) I "attack" I
50 PRINT#96, "the" ICHR$(128) I "object" ICHR$(128) I "of" ICHR$(128) I "the" ICHR$(128) I "e
ame" ICHR$(128) I "is" ICHR$(128) I "to" I
60 PRINT#130, "destroy" ICHR$(128) I "as" ICHR$(128) I "many" ICHR$(128) I "tanks" ICHR$(12
8) I "as" ICHR$(128) I "is" I
70 PRINT#162, "possible" ICHR$(128) I "within" ICHR$(128) I "the" ICHR$(128) I "time" ICHR
(128) I "of" I
80 PRINT#196, "two" ICHR$(128) I "and" ICHR$(128) I "a" ICHR$(128) I "half" ICHR$(128) I "min
utes" I
90 PRINT#258, "use" ICHR$(128) I "the" ICHR$(128) I "cursor" ICHR$(128) I "keys" ICHR$(128)
I "to" ICHR$(128) I "move" I
100 PRINT#290, "the" ICHR$(128) I "barrel" ICHR$(128) I "of" ICHR$(128) I "the" ICHR$(128) I
"field" ICHR$(128) I "gun" I
110 PRINT#322, "and" ICHR$(128) I "the" ICHR$(128) I "space" ICHR$(128) I "bar" ICHR$(128) I
"to" ICHR$(128) I "fire" ICHR$(128) I "a" I
120 PRINT#356, "shell" ICHR$(128) I "at" ICHR$(128) I "the" ICHR$(128) I "tanks" I
130 PRINT#418, "press" ICHR$(128) I "any" ICHR$(128) I "key" ICHR$(128) I "to" ICHR$(128) I
start" ICHR$(128) I "game" I
140 FOR C=1 TO 7
150 B=C
160 FOR A=0 TO 63:SET(A,0,B):SET(A,31,B):B=B+1:IF B=63 THEN B=1:NEXT A ELSE NEXT
A
170 FOR A=0 TO 31:SET(0,A,B):SET(63,A,B):B=B+1:IF B=63 THEN B=1:NEXT A ELSE NEXT
A
180 IF INKEY$="" THEN 190 ELSE GOTO 210
190 NEXT C
200 GOTO 140
210 POKE 65495,0
220 PHODE 3,1
230 SCREEN1,0
240 V=70
250 T=8
260 L=8
270 PCLS
280 DIM Z(60)
290 DIM Y(60)
300 DRAW"BM20,10:55E3R3U3RAD1R5L5D2R3F3L15D2R3U1D1R3U1D1R3U1D1R3U1D1R4U2"
310 PAINT(23,9),2,4
320 GET(B,0)-(40,15),Z,G
330 PCLS
340 GET(B,0)-(40,15),Y,G
350 PCLS
360 CIRCLE(126,96),200
370 LINE(0,70)-(255,70),PBET
380 DRAW"BM0,70:E20F10E20F5E10F20E5F5E10F10E5F15E5F5E10F10E20F10E20"
390 PAINT(10,10),3,4
400 PAINT(126,67),2,4
410 DRAW"BM21,192:U20R47D20:"
420 PAINT(31,100),4,4
430 DRAW"BM153,192:U20R47D20:"
    
```

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GW6JJN



Computer games

With the Los Angeles Olympics fresh in our minds, it is interesting to look at the computer communications that were involved in providing information of all kinds to the press, contestants and to the audience.

The games were held close to Silicon Valley so it is not

Hi-tech

surprising that the hi-tech industries provided the most comprehensive data and information service ever seen at

such an event.

The LA Olympic Authorities had an Electronic Messaging System (EMS) installed. Several companies contributed to this undertaking, not least the American giant AT & T.

The Olympic games were held over 28 sports sites which, with various support facilities, covered about 5,000 square miles of Southern California. It was the function of EMS to link all this together and to provide certified results for each event, histories of athletes taking part, electronic

Instant results

mail and instant communication between terminals (nearly 200 of them) as well as providing facilities for meals, arranging buses, etc. The several thousand journalists covering the games were able to get instant results with such information as past medal holders, past records for each event and biographies of players. This includes the television

broadcasters who had access to the real-time and 'elapsed-time' clocks used in timing events. So you don't need to have an encyclopaedic memory to be a journalist after all.

The EMS system allowed communication between terminals within the system, access to the outside world via the Pacific Bell telephone network and between the terminals and a central computer complex where the information is stored. This complex consisted of a dozen 32-bit machines each with 12 Megabytes of memory plus 9000 Megabytes on disc.

Communication through the system was by lines with a capacity of 56,000 bits per second, and not a modem in sight. If that seems fast, communication between terminals and the main computer

Fibre-optic

complex was by fibre-optic cable at an incredible 90 million bits per second.

Along with all this was a back-up system capable of taking over the network and the lot had to run for a fortnight non-stop with the whole world watching.

The technology didn't end there, of course. The system had to be linked in real time to geostationary satellites transmitting data and pictures live into other computer networks and television systems all over the world. The achievement was certainly incredible — almost as exciting as the games themselves. Perhaps what we witnessed in Los Angeles was the ultimate in computer games.

Ray Berry GW6 JJN

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share, or topics that you would like to see covered, write to: Ray Berry, Microradio, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

Colour utility

on Vic20

This program is for the unexpanded machine. It enables the user to try out different coloured screens without working out the value to be Poked into 36879. Run the program, and using the number given in the Rem statements, answer the questions and the Vic will give you your screen combination.

Program notes

- Line 10-30: Get number of border colour
- Line 40: Input screen colour number
- Line 50: Colour screen appropriately
- Line 100: Numbers for the colours

```

10 PRINT "TYPE BORDER COLOUR: ";
   POKE 198, 0: POKE 204, 0
20 GET#1: BC=VAL(C#): IF BC<1 OR BC>8
   THEN 40
30 PRINT BC: BC=BC-1
40 INPUT "TYPE SCREEN COLOUR: ";
   SC: SC=VAL(C#): SC=SC-1
50 POKE 36879, (BC*16)+SC*8
100 REM BLACK 1
110 REM WHITE 2
120 REM RED 3
130 REM CYAN 4
140 REM PURPLE 5
150 REM GREEN 6
160 REM BLUE 7
170 REM YELLOW 8
180 REM ORANGE 9
190 REM LT ORANGE 10
200 REM PINK 11
210 REM LT CYAN 12
220 REM LT PURPLE 13
230 REM LT GREEN 14
240 REM LT BLUE 15
250 REM LT YELLOW 16
    
```

```

440 PRINT(165, 180), 4, 4
450 DRAW "BM10, 10: C2: R5: U3: L5: U3: R7: C3: R2: S5: D5: R7: C3: R2: C2: U5: R5: D5: L5: R7: C3: R2: C2: U5: R3: D3: L3: R1: F3: R2: C3: R2: C2: R4: L4: U3: R4: L4: U3: R4: C4"
460 GOSUB 690
470 TIMER=0
480 E=100: F=110: G=120: H=112: I=192: J=162
490 PUT(A, B)-(C, D), Z, PSET
500 A=A+7: C=C+7
510 IF RND(2)=1 THEN B=B-RND(2): D=D+15 ELSE IF RND(2)=2 THEN B=B+RND(2): D=D+15
520 LINE(E, I)-(F, J), PSET
530 LINE(G, I)-(H, J), PSET
540 IF PEEK(344)=223 THEN LINE(E, I)-(F, J): PRESET: LINE(G, I)-(H, J): PRESET: F=F+5: H=H+5
550 IF PEEK(343)=223 THEN LINE(E, I)-(F, J): PRESET: LINE(G, I)-(H, J): PRESET: F=F-5: H=H-5
560 IF PEEK(341)=223 THEN LINE(E, I)-(F, J): PRESET: LINE(G, I)-(H, J): PRESET: J=J-2
570 IF PEEK(342)=223 THEN LINE(E, I)-(F, J): PRESET: LINE(G, I)-(H, J): PRESET: J=J+2
580 IF C=250 THEN PUT(A, B)-(C, D), Y, PSET: D=B: GOSUB 690
590 IF J=160 THEN J=J+2
600 IF J=180 THEN J=J-2
610 IF F=81 THEN F=F+5: H=H+5
620 IF F=149 THEN F=F-5: H=H-5
630 IF PEEK(345)=223 THEN D=J-142: N=D+4: P=109-H: M=1: CIRCLE(H-P-10, N), 4, 4: PAINT(H-P-10, N), 2, 4: IF H-P-10 A+4 AND H-P-10 C-4 AND N D AND N D THEN A=A+3: C=C-2: D=D+3: C=C-2: PUT(A, B)-(C, D), Z, PSET: FOR K=1 TO 250: NEXT K: PUT(A, B)-(C, D), Y, PSET: D=B: V=V+8: GOSUB 690
640 IF M=1 THEN CIRCLE(H-P-10, N), 4, 4: PAINT(H-P-10, N), 1, 1: M=0
650 IF B=72 THEN B=B+3: D=D+3
660 IF TIMER=7527 THEN SOUND 210, 5: FOR D=1 TO 50: NEXT D: SOUND 210, 5: DRAW "BM70, 120: C2: U5: L3: R6: C1: R2: C2: R6: L3: D5: L3: R6: C1: R2: C2: U5: R5: D5: R2: C1: R2: C2: U5: R5: D5: L5: R7: C1: R2: C2: U5: R5: D5: R2: C1: R5: C2: U5: L3: R6": FOR D=1 TO 3500: NEXT D: GOTO 700
670 GOTO 690
680 PLAY "T255: I03: A0G0": L=L+1
690 A=B: B=RND(128): IF B(72 OR B)140 OR B=0 THEN 690 ELSE C=40: D=B+15: IF M=1 THEN CIRCLE(V, T), 3, 2: IF V=245 THEN T=T+6: V=70: RETURN ELSE RETURN ELSE RETURN
700 POKE 55494, 0
710 A$="" : AS=INKEY$
720 CLS: PRINT 9194, "number"; CHR$(128); "of"; CHR$(128); "tanks"; CHR$(128); "destroyed"; CHR$(128); "in"; CHR$(128); "minutes"; PRINT 9194+34, "two"; CHR$(128); "and"; CHR$(128); "a"; CHR$(128); "half"; CHR$(128); "minutes":
730 PRINT 9300, L
740 FOR D=1 TO 2500: NEXT D
750 CLS
760 PRINT 9194, "press"; CHR$(128); "any"; CHR$(128); "key"; CHR$(128); "to"; CHR$(128); "play"; CHR$(128); "again":
770 FOR D=1 TO 100: NEXT D
780 PRINT 9194, "PRESS ANY KEY TO PLAY AGAIN":
790 FOR D=1 TO 100: NEXT D
800 IF INKEY$="" THEN 810 ELSE RUN
810 GOTO 760
    
```

Tank Attack
by Martin J Lloyd



Hacker's dream

Jet Set Willy is becoming not only the favourite of games players but also a computer hacker's dream.

I can't begin to count the number of 'extra lives' programs that arrive in the mail.

Another program I received is designed to change the titles of the various screens. We have published one such listing for JSW and I would like to know from readers whether you want the same for *Manic Miner* — if so the first listing, already received — will be printed. I also get a lot of routines that overcome the colour-code loading sequence but with the current sensitivity

about piracy I don't intend to encourage people in print to overcome this protection device. For those who have genuinely lost their colour card or are colour blind first write to Software Projects and if they don't offer any help then perhaps we'll think again.

Anyway, thanks in the meantime to Christopher Kenworthy of Preston, TJ Vernon of Reading, Andy Beatie of Radstock, Robert Lewis of Richmond, NJ Fuller of Eastbourne, Jerry Brown of Ponteland, R Ley of Plymouth and Simon Dales of Poole.

David Hookham of Barwell says that Willy can be sent to many rooms in the mansion by loading the game, typing *Writetyp* and pressing 9 plus a combination of keys 1-6. You must be careful where to position Willy so as not to end up somewhere lethal. Start from the left of the stairs on the landing. This is one way to get to the objects beneath the conservatory roof!

P Oakey and P Collins offer

Poke 38488,40 which turns Willy into a flying pig in most rooms.

Michael Poyner of Tewkesbury warns against loading the game with Interface 1 connected because the game freezes. This is not a bug — it is due to the large size of the program.

Kevin Young of Dundee offers these tips — clear the priest's hole first because it is the hardest screen; there is an invisible object in the hall on the top level and an object is added to your score when you pass left into the swimming pool. He has finished the game by collecting 83 objects at 8.47am after removing the bug that prevents access to the right of A Bit of a Tree. We published the necessary *Pokes* a few weeks ago. Robert Lewis says that this screen is best completed by going to the Banyan Tree then "get on the hump one from the furthest from the left and jump right, then jump and go up."

Finally on this subject — congratulations to Helen Gray,

aged 10²/₃ rds, from Upminster for finding 59 of the rooms. I would love to see a copy of your map. (There is only one room left to find.)

I promised to say how I got on with *Manic Designer* — well this is a very useful utility for recreating the positions of the conveyor belts, crumbling platforms, etc, on *Manic Miner*. Although easy to use it is slow and hard work producing screens that are challenging as well as being possible to complete. My sympathies go out to Matthew Smith — *Manic Miner's* author — who must have put a great deal of effort into the original to produce screens that are very playable.

Tony Kendle

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments, from playing tips on difficult games or programs you'd particularly like to praise (or blame!) then write to: Tony Kendle, Arcade Avenue, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

Open Forum

Clear Screen

on ZX Spectrum

This machine-code routine is designed to aid ZX Spectrum users by cutting out the CLS command needed for universal colouring. To use the routine you must:

- 1) Poke your specified attributes into 32607 (Refer to page 116 of the manual.)
- 2) Call the machine code by using the command `Let 1 Usr k`.

This program works by finding the start of the attribute file then fills in the corresponding square with your number.

An important note is that the program should not be *Newed* as it is not held in an area unaffected by the command.

```
9000 LET K=PEEK 23730+256*PEEK 2
3731
9010 FOR G=K TO K+17: READ A: PO
KE G,A: NEXT G
9020 DATA 33,0,66,6,3,52,0,54,40
,35,61,32,256,120,5,32,243,201
9030 STOP
```

Clear Screen
by David Parkinson

Memory

on BBC

This short program for any BBC will display the memory contents between two specified addresses. Unlike some similar programs this one displays 32 characters per line as well as the address — making it easier to see errors. Addresses can be entered in decimal or in hex form (if in hex precede with '&').

```
>LIST
10 REM M A Colson 22.1.1984
20 MODE 7
30 ON ERROR GOTO 250
40 INPUT "Start Address ? "S#
50 S#=EVAL(S#)
60 INPUT "End Address ? "E#
70 E#=EVAL(E#)
80 FOR A=S TO E STEP 32
90 UDU 129
100 IF A<&1000 PRINT ;"0";
110 IF A<&100 PRINT ;"0";
120 IF A<&10 PRINT ;"0";
130 PRINT ;~A;" ";CHR$(131);
140 FOR B=0 TO 31
150 C=A*2+B
160 C#=CHR$(C#)
170 IF C<32 OR C>126 PRINT " ";
180 IF C>31 AND C<127 PRINT C#;
190 NEXT
200 PRINT
210 NEXT
220 PRINT
230 GOTO 40
240
250 IF ERR=17 RUN
260 REPORT:PRINT "
at line ";ERL
```

Memory
by M A Colson

Strobe

on ZX81

This is a simple short sub-routine which could be included in a utility or educational program. It could also be used as a bit of fun in a darkened room. It uses the fast and slow speed modes of the ZX81 to simulate a stroboscope.

You can change the flash rate by inputting a number at the start.

Program notes
10 - 30 Frequency
60 - 130 Stop start screen.

```
5 REM STROBE (c) S.A.WEIR Jan '84
10 PRINT "INPUT FREQUENCY"
20 INPUT A
30 PRINT A
40 FOR D=1 TO 200
50 NEXT D
60 PRINT
70 PRINT "***HOPE YOU'RE
80 FAST
90 PAUSE 240
100 FOR F=1 TO 100000
110 PAUSE (100)/(A*1000)
120 PRINT F
130 SLOW
140 SCROLL
150 FAST
160 NEXT F
```

Strobe
by S A Weir

Baud Walk



Telesoftware

There are a number of developments taking place in the software industry that could point to much more software being available electronically — and that's where data communications and the humble modem step in.

Scenario 1: You are reading a magazine at 10pm at night and a particular software product catches your eye. Instead of the advertisement directing you to a shop it directs you to a telephone number. Hook up your modem, and with a few keystrokes you are able to

download the program into your micro and run it. The system automatically debits either your charge card or telephone account.

Scenario 2: You are reading the same magazine which contains an exhaustive listing of a handy utility. Instead of spending hours typing in the listing — only to find you've made a keyboard error — you simply ring up the magazine's own bulletin board or database services and download the software.

It was this vision of the future of software which originally sparked off the concept of Micronet 800, the telesoft service on UK Prestel and which this year, has seen the announcement of Compunet by Commodore.

I will cover telesoftware in a later column but essentially it is simply a file transfer proto-

col which enables data to be transmitted along the telephone lines to a microcomputer with error correction built in. The receiving micro has specially designed terminal software which unpacks the data (which may be encrypted for piracy protection) and loads it into the micro's Ram or offers the Save option. Telesoftware programs, usually public domain offerings, abound on bulletin boards in the UK which also allow users to upload back to the board, hence the predominance of 300/300 baud ports instead of the 1200/75 working.

Micronet 800 currently offers programs for downloading from a number of leading companies for the Spectrum and BBC micro computers (although there are some notable exceptions) and Commodore I am sure will support Compunet both with

its own software and by encouraging other houses to provide programs.

Whether telesoftware ever takes off as a true commercial proposition is still difficult to estimate — however the more modems there are in circulation the more attractive your favourite software house is going to find the prospect.

Why not write and tell me what you think of the software available so far on Micronet.

Robin Wilkinson

Baud Walk is a new weekly column with news on networking, databases, reviews of modems and software and points of contact for information.

Any readers with experience of networking are asked to send their experiences or news of services to Robin Wilkinson, *Baud Walk Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

He can also be contacted on Prestel mailbox 019993727.

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Tony Bridge's Adventure Corner



Kick the telly

A couple of weeks ago, I mentioned *The Curse of the Seven Faces*, a new adventure from Classic Computing. If your appetite was whetted by my description of it, you will be pleased to know that the program will shortly be released by Artic and will be in the shops soon. Co-author Alan McDonald is now converting the adventure to run on the Enterprise, as well as working on Amstrad adventures. If you Amstrad owners want to write to him with ideas, you'll find his address in the *Corner* of July 19.

The Grand Elf was obviously stuck in a dungeon that week, having lost the address of John Copland, the author of an excellent adventure, *Treasure of Meathos*. For your copy, write to him at 70 green Lane, Dronfield Sheffield S18 6LN.

Now for some help: first, for Wayne Coleman, who has finished *Mountains of Ket*, the first of the Ket trilogy from Incentive Software. It certainly is advantageous to score 100% in this program, Wayne, and I hope you kept a note of that code word — do the same with the next two parts, and you are in line for a video recorder, that being the prize for completing the trilogy!

Speaking of Artic, as we were, the early adventures from this company are still causing problems for people. Like Mr W Gibbons, who is playing *Espionage Island*. To get past the tank, Mr Gibbons, refer to the list of words at the end of the corner, and 10,10,3,24,16,29,5...31,24, and then 10,10,7,32...31,9. Tony Coxon can't see into

the dark corner — actually, Tony, you don't really need to see into the corner, but 26,8 and then 28,12. To get downstream, just 14! Karl Bennet and Rupert Woodman are stumped by the crevasse. To get over, fellas, 25,4, and to get across the Swamp, look at the clue — doesn't it say something about SEWing?

Ship of Doom was always a mystery to me — I could never melt the ice over the woman, or smash the glass covering the key (or was it the other way round...?) — but despite all that, or maybe because of it, it was (is still, I should say) an addictive and aggravating adventure. Several players are trying to unlock the door; just 29,22...31,9. Incidentally, for those of you just starting on this game, the way to power up the sonic screwdriver is to 29,39,31,40.

Planet of Death was the very first Artic adventure — I remember buying it for my ZX81 at the second ZX MicroFair, way back in (I think) 1981. It kept me up late for months afterwards, and, judging by the letters I've had, it still holds its power over Spectrum owners. To get the rope from the tree, 13,19...41,17. For those who, like Gavin Barry, are wondering what to do with the buttons in the lift, try this: 42,30,15,1.

Many people are having trouble with the force-field in the cavern — it can be rather a sticky problem (it's meant to be, after all!). The accepted way through is to (37,20) × 2, and then 27. If you land up in jail, just kick the bars to escape. There are several red herrings in this adventure, one of which is the gold coin, to be found in the lake. Although you can indeed bribe the guard with this, in order to escape the jail, it is not necessary, and in fact will not help you solve the adventure. After escaping the jail, 38,21 — which will return you to the cavern. The mirror is not a red herring, as it will be needed to reflect the force-field. Incidentally, although the maze in *Planet of Death* was the first one of its kind I had come across, it is actually pretty easily solved — just go through the cardinal points of the compass to escape and find the ice cavern.

And now to *Golden Apple*, the last of the first series of Artic adventures. I haven't had so many questions about this one (has it sold as well as the others?), but to get you started, you will need to smell the flowers at the start, in order to find the keys. Several adventurers have wondered what use the

parrot is, at a later stage of the game — as far as I know, nothing can be done with it, but it will tell you something useful, that can be used at the computer (2B or not 2B). Where my memory has slipped here, I'm indebted to Ron Smith for excellent maps and hints.

Finally, a telling-off from Pete Ashmore of Gosport. He writes: "You have a lot to answer for! Here I am, a 57-year-old professional idiot, who bought a ZX81 to 'try my hand'. This was in February 1983, at the same time as I began reading *PCW*. I fitted a DK'tronics keyboard — very good — put the power unit and 16K Rampack inside, and fitted a bigger heat-sink. Everything is working fine, but then I made my biggest mistake, which was start reading articles by that 'swine' Tony Bridge. I thought, 'I wouldn't mind trying one of these adventures', and bought *Pimania*. It's entirely your fault that I have changed from a calm peaceful man into a raving maniac, ready to kick the telly, stamp on the ZX and turn to drink [no problem there, Pete, I do it every Saturday night!]"

Many people have written to me about *Pimania*, though none so eloquently as Pete Ashmore — the lure of the golden sundial (the deadline for which, I believe, has just passed again for this year) has meant that the adventure has been bought by many, but obviously not solved by a single person, as yet.

Pete is having trouble getting through the green door. It's difficult to tell you exactly what to do here, as everything depends so much on what you have with you — suffice to say, that only certain combinations of objects will work, and I'm afraid that it is up to you to experiment. To give you a start, though, try taking the telescope and the deaf aid (you'll get both of these gifts from the Pi-Man after giving him some food; and this also requires a certain combination to be used, so it is going to take a lot of trial-and-error). I hope to return to this crazy adventure.

Code words: 1 ONE; 2 ROCK; 3 REMOVE; 4 STICK; 5 PLASTIC; 6 THE; 7 SHINE; 8 CORNER; 9 HOLE; 10 SWITCH; 1 LOCK; 12 STRING; 13 GET; 14 FLOAT; 15 TWO; 16 AND; 17 ROPE; 18 USE; 19 FLINT; 20 LASER; 21 UP; 22 KEY; 23 WITH; 24 LIGHT; 25 DROP; 26 FEEL; 27 DANCE; 28 PULL; 29 INSERT; 30 THREE; 31 INTO; 32 TORCH; 33 HERING; 34 TAKE; 35 YOU; 36 BREAK; 37 FIRE; 38 GO; 39 BATTERY; 40 ROD; 41 CUT; 42 PRESS;

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Light pen

Jason Birch of Rochdale, Lancs writes:

Q I own a Vic 20 and I am thinking of buying a light pen. There are two kinds of light pen, normal ones and ones that use pixel pads. Please could you tell me a) which type you recommend? b) how much would one cost? and c) what can I use it for?

A It's funny, but light pens seem to be the latest thing at the moment yet I can remember programming an IBM mainframe computer to accept a light-pen generated input back in 1971.

I suggest you go for a standard light pen, such as the one from Stack. It costs £25 and is fully compatible with the Vic.

With a light pen you can write programs that allow words and images to be moved about the screen, or trigger off a series of actions by touching a keyword on the screen with the pen. A small number of light-pen compatible software packages and games are also available, some produced by Stack.

New angle

Cpl J Weaver of RAF Gutersloh, BFPO 47 writes:

Q Is there a way of emulating the BBC's command *Old* on the Spectrum, so that a previously *Newed* program can be retrieved? Also, can you explain how to fit a reset switch on a Spectrum so that the dreaded never-ending loop can be exited from without losing the program

A The Spectrum *New* command clears memory from address 3FFF (hex) up to Ramtop. This means that any Basic statements held in the machine are lost for ever. Machine-code routines, as they reside above Ramtop are unaffected, as are UDG's.

You can see that for Basic programs there is no way of *Olding* them once *New* has been executed.

There are number of ways of fitting a reset switch to a Spectrum, the easiest of which is to wire the power supply into a light switch (for example, from a table lamp) and wire the switch into the Spectrum power socket. However, there are reset switches available on the market at the moment, and one which I find personally very attractive is a component of the new joystick interface from AGF (the Protocol 4 interface).

Business

Aaron Byers of Lenzie, Glasgow writes:

Q I am a keen games player (I have a Vic) and am hoping to introduce my dad to business software (on a small scale). Could you please advise me on which computer would best suit my needs from the following: MSX, Plus/4 and Amstrad.

A It seems to me that you are looking for a dual-purpose machine — games and business. To achieve this you will need a machine with a capability for disc handling, and good printer controls. All three types of machine you mention would be able of providing your father with the business software that he would probably require. As yet neither the Plus/4 or MSX machines are available in the shops and certainly to begin with neither will have the variety of games that you might want. On the other hand the Amstrad may soon have a large amount of games software on it — but so far there is no disc unit on sale.

If I had to pick one, I would probably pick the Amstrad, but I would want to see if the disc drive and CPM software is launched in the Autumn.

No point

L Privett of Ilford, Essex writes:

Q Please could you tell me if there is an equivalent Spectrum *Peek* instruction to the *Point* command, as a program I am writing will not compile into machine code. The *Point* command is not accepted by the compiler, but the *Peek* command is.

A Unfortunately not. The Spectrum's screen display is laid out in memory in such a way as to make that extremely difficult.

You will need to convert the X and Y pixel co-ordinates into screen display file addresses, and then test for the bit you want.

As you can imagine this is quite a complex business. I don't know whether your compiler allows machine-code routines to be called, but if it does what you have to do is to put the X and Y pixel co-ordinates on to the calculator stack (Y co-ordinate on top), and then call the *Point* subroutine at Rom address 22CBH. If the pixel is on, a 1 will be on top of the calculator stack; a 0 will be there if it is off.

Video, video

S Keating of Leyton writes:

Q I have a Sinclair Spectrum and I found how to record my programs on a VCR. However, I've only done this once as I'm not sure if it might damage either my computer or my recorder. Do the output signals from the Spectrum cause damage to the video? Or vice-versa? Or not at all?

A There is nothing wrong with using a VCR to record computer programs. No adverse effects will be produced on either the computer or the video by using them in this

way.

The only problem you might get is if you are doing a lot of rewinding, such as when you *Save/Verify*. This could cause minor problems with the fast rewind mechanism on the VCR. However this is a remote possibility only.

Break dance

Ian Brennan of London writes:

Q I am writing a Basic program on the Spectrum, which also has a machine-code routine for printing large letters. My problem is security. I can't stop my program from being broken into, except for *Poke* 23613,0, which redirects the error return, causing a crash if *Break* is attempted. As crashing the program every time is not the ideal solution, I was wondering if you could help me.

A You have the answer to your problem at your fingertips. What you should do is place a *Return* instruction (machine code) at the end of your machine-code routine, and make the *Err Sp* system variable point to its address. This will have the effect of ignoring *Break*.

CBM calling

A Murray of Manchester writes:

Q I own a Commodore 64 and I have heard of modems for the Spectrum, BBC etc. Could you tell me if there are any modems for my machine?

A There are indeed a number of modems available for the CBM 64. All would be too many to mention here, but I'll list just a few: Tandata TM110, OEL Telemod 2 and OCS Interpod — all of which costs around £100.

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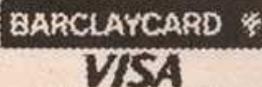
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FOR SALE DOZENS of original Spectrum s/w. inc (Jet Set Willy, Under Jet Man, Sabre Wolf, Omestron). From £1.50 01-348 7378. Ask for Pod.

48K SPECTRUM Boxed + manuals, Kempston and Protex Interface + joystick, £40 of s/w. £100 + mags + Optional Guarantee. £250 ono Tel: 061 747 4149.

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ORIGINAL SPECTRUM software for sale at very competitive prices, all in superb condition. Send an SAE without delay to: J. Earle, 138 Cavendish Ave, Harrow, Middx.

SPECTRUM LIGHT PEN (Trojan) £10.00 software, all originals. Chequered Fiat, Lunar Jetman, Snooker, Blind Alley. £10.00 the lot. Also plug in modules for Speak and Spell £4.00 each. 06286 62843.

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48K SPECTRUM and cassette recorder wanted. Must be in very good condition. Pay £110 cash — no dealers need apply — contact John Weller, 49, Haylett Gardens Surbiton Crescent, Kingston, Surrey. KT1 2ER.

Dragons for sale

DRAGON 32, 3 joysticks, lightpen, user magazines, software games & utilities. Dust cover. Less than year old. Only £160. Also for sale, Tandy CGP-115. £105 together for £255. Tel: 01 360 3443.

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DRAGON 32 under guarantee. £600 worth of business and games software including payroll and Basic tutorial. Plus Joysticks, books, cover and club membership. Sell for £270 ono. Tel: (0302) 721071.

DRAGON 32 with two joysticks, lightpen, manuals and £180 of software. Sell all for £180. Tel: Medway 404437.

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DRAGON SOFTWARE Android Attack, Pimania, Cave Fighter, Galactic Ambush, Champs, Deadwood, Orb, Space Monopoly, Roman Empire. Worth £70. Swap for speech synthesis module or phone with offers to (0664) 67761.

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DRAGON 32K for sale plus software books and magazine £140 ono or swap for Spectrum 48K. Tel: Abingdon 835609.

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DRAGON 32 original software for sale or swap. Microdeal, Salamander, etc. Write for details to: Mavis 35, Leng Road, Newton Heath, Manchester M106NX.

DRAGON 32 plus telewriter edit 2 graphdrawer programs, and books. no

games. Good working condition plus tape recorder. Buyer collects for cash £120. Waltham Cross 29932.

DRAGON 32 with all accessories boxed as new £115 plus £110 worth games software (mainly Microdeal) £60. Tel: Sheffield 883552.

DRAGON 32 with over £500 of software, books, etc. A Bargain at £200.00. No offers and must collect. Tel: 0274 585972. After 6pm Mon-Sat Sunday. All day ask for Paul.

DRAGON 32 software, 5 cassettes and 1 chess cartridge and 2 books total value of £60. sale for £35 or swap for Spectrum Joystick plus interface and software of same value. Tel: 01 366 5944.

Commodores for sale

VIC 21, C2N machine code monitor, 16 games, Joystick, manuals, listings and dust cover. Cost £280 want £110. Tel: Welwyn 4814.

VIC 20 + 6 cartridges, magazines, 4 tapes + joystick. £80. Tel: 061 436 2362.

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CBM 64 plus cassette, Joystick £30 software both still under guarantee. Excellent condition. A must at £200. Write to Eran Elliott 50 Brynawel, Brynmawr, Gwent, South Wales.

COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD or telephone 01-437 4343.

All software offered through computer swap must be in original condition and for private sale only.

It cannot be swapped.

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Please write your copy in capital letters on the lines below.

Name.....

Address.....

Telephone.....

VIC 20 + C2N cass, 32K switch rampack, £100 worth software including Jet Pac, Arcadia, Avenger, etc, Introduction to Basic Part 1, and program book. Excellent condition worth £300. Will sell for £225 ono. Tel: 01 517 3522 6pm.

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VIC 20, 8K ram pack, C2N cassette unit, Joystick, with software, still with box and package. £150 ono. Tel: New Milton 618200.

VIC 20 starter pack five months old. Plus 16K Joystick, Super Expander, software. Cost £250 accept £130. Buyer must collect. Phone Exeter 34316.

VIC 20, starter pack, 2 cartridges 5 books £90 ono. Tel: Me Ali 01 735 6459.

CBM 64, C2N cassette unit, 1520 printer plotter, Joystick, 5 books, s/w dust cover £300. Tel: Durham (0385) 881 069.

VIC 20 + C2N cassette + 16K Ram + 3K Super Expander + Joystick + dust cover + s/w + mags (£100). All boxed as new £170 ono. Tel: 061 707 3445 eves.

CBM 64 s/w to sell or swap. All original latest American titles. Over 400 titles. Glasgow 041 557 1533 after 6pm.

CBM 64 + C2N cassettes, Atari Joystick + £100 worth of s/ware. £230.00 01 853 3051.

CBM 64, 3 months old, perfect condition. C2N recorder. Quickshot Joystick, manuals, leads, books, mags + 20 games, all original one cartridge. Worth over £450. Sell for £340. Tel: 0525 220 274.

For sale

UNUSED KEMPSTON joystick for sale (unwanted gift). Suitable for most computers. Cost £14, bargain at £9. Send cheque or P/O to J. Earle, 138 Cavendish Ave, Harrow, Middx. HA1 3RQ.

FOR SALE: TRS-80 quick printer with manual, £100 ono. Also TRS-80 CGP-115 colour plotter, £100 ono., both brand new condition. Tel: 0966-3341 after 7pm.

FOR SALE: ZX Spectrum Digital Tracker. Boxed as new. Used 4 times. £35 L. Cawley 2 Darras Rd, Gorton, Manchester M18 7PA.

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ACE TELCOM viewdata decoder Prestel Special Modem offers around £100 Tel: 01-683 0963 evenings.

SHARP, M2 700, data recorder, various s/w, inc over 20 games (original) £195. Or swap with CBM 64. Tel: Scunthorpe 865124.

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LYNX 48K + extra's £100. Tel: Belper 4080 (Derbyshire).

TANGERINE MICRON 16K CMOS RAM 10K basic Xbug assembler disassembler toolkit various software including Adventure Space Invaders Labrith etc. £40 the lot Tel: 0793 813250.

Wanted

SWAP Quickshot joystick plus interface plus Currah micro speech plus software originals, Valhalla, H.U.R.G., 3D Lunatuck and Blade Alley for Prism VTX5000 modem and manual etc. Tel: Coatbridge 35595 evenings.

SWAP Texas parsec module for Adventure and Pirate or Statistics cartridge. Write to: J. C. Crees, 106 Tollgate Drive, Stanway, Colchester CO3 5PR.

WILL pay up to £150 for working BBC 'B' or £50 for broken BBC. Also wanted CBM 1541 disk drive and any printer for Commodore 64. Tel: (01) 987591, Ireland.

SWAP ZX Spectrum 48K with joystick and interface with software (Spectrum well under guarantee) for Commodore 64 with or without software. Must be under guarantee. Tel: Douglas on 01-907 1204.

WANTED. Monitor or autostart ROM and graphics ROM for Apple II and/or graphics ROM Hex dump. Eprom copies OK with circuit mods. B. P. Smith, 9 Mead Lane, Farnham, Surrey GN9 7OY.

SWAP 48K Spectrum (under guarantee) with leads, manuals, amplifiers, tons of mags, books, etc. for Commodore 64 (with or without software). Quick swap needed. Tel: Birmingham 021 3579452 after 5pm

DURST colour enlarger 605 + accessories worth £605 swap for computer. Any considered. Tel: 903 3178.

SWAP portable Sanyo stereo music centre for interface I or D. M. Tronics keyboard. Tel: 01-593 6288 after 4pm.

SWAP 86 computer mags. 60 PC news, 6 PCW, 4 PCN, 16 SU. For 1K ZX80. Tel: Blackpool (0253) 724899 (will collect in Lancs area).

SWAP Currah microspeak, 10 month guarantee for ZX printer + paper. Tel: 0472 602445.

TEXAS 99/4a wanted logo2, tiwriter typing tutor, multiplan, peripheral expansion box, cards, editor assembler, mini-memory, speech synthesiser, extended basic, Pascal, Forth, Donkey Kong. Tel: 021-742 1969.

ADVENTURE HELPLINE

Espionage Island on Spectrum. Help me to get across the sinking swamp. John Cowley, 43 Chynace Drive, Newquay, Cornwall TR7 2AA.

The Count on Vic20. How do I enter the dark window under the bedroom, and get out of the dark pit in the dungeon? Stephen Potter 27 Stratford Road, Breadsall, Derby.

Fantasia Diamond on Spectrum. I cannot progress having reached the river which I cannot cross. Rupert Drummond-Hay, The Old Hall, New Road, Burton Lazars, Melton Mowbray, Leics.

Pharaoh's Tomb on Spectrum. How do you get into the tunnel which is in the ice room? Mr J Gillingham, 152 Newman Road, Exeter, Devon.

Mountains of Ket on Spectrum. How do I get past the skull in the south? John Douglas, 245 Stewart Royd, Commercial St, Heckmondwike, W Yorks.

Colossal Adventure on Atari 800.

I cannot get past the maze just after the crystal bridge. Neill Penney, 15 Chilterns Hill Road, Beaconsfield, Bucks.

Quest for the Holy Grail on Spectrum. How do I get the pin

out of the Holy Grenade? Alan Vaughan, 82 Cranwell Road, Liverpool.

Twin Kingdom Valley on Electron. How do I get past the witch in the desert king's castle? James Morris, 53 Gays Road, Bristol.

Arrow of Death part 1 on Commodore 64. 1) How do I get the arrowhead from the serpent? 2) How do I get the ladder from the giant building? 3) What are the tree stumps and the cauldron for? Paul Duxbury, Walford, Basings-toke Rd, Spencers Wood, Reading, Berks.

Snow ball on Spectrum. How do you reach the trapdoor after getting out of the coffin, and how do you kill the nightingale? Jason Hutchinson, 6A Mill Hill Avenue, Pontefract, West Yorks.

Planet of Death on Spectrum. How do I get out of the prison cells and how do I operate the lift? Simon Timmons, 311 Blackpool Road, Carleton, Poulton-le-Fylde, Lancs.

The Hobbit on Spectrum. When I get to Laketown with the treasure I cannot get Bard to shoot the dragon. Darren Adlington, 475 Whippendell Rd, Watford, Herts.

The Knights Quest on Spectrum. How do you go east — from inside the cleft or up the rocky mountain? Gareth Blajney, 47 Allt-yr-yn Ave, Newport, Gwent.

Diary

Event	Dates	Venue	Admission	Organisers
End Official Acorn User Exhibition	Aug 16 (trade day) Aug 16-18 10.00am-6.00pm Aug 19 10.00am-5.00pm	Olympia 2 Hammersmith Rd, London W6	£3.00 adults £2.00 children (on door)	Small Enterprises 01-930 1613
Electron and BBC Micro User Show	Aug 31-Sept 1 10.00am-6.00pm Sept 2 10.00am-4.00pm	UMIST Manchester	£2.00 adults £1.00 children	Database Publications 061-456 6383
Games Day 84	Sept 1 10.30am-6.00pm Sept 2 10.00am-5.00pm	Royal Horticultural Society's New Hall, Greycoat St, London SW1	£1.25	Games Workshop 01-965 3713
Hampshire Computer Fair	Sept 6 11.00am-9.00pm Sept 7 10.00am-5.00pm	Guildhall, Southampton	Trade - free Public - £2.00	Testwood Exhibitions 0703 31557
Walthamsoft 84	Sept 8 10.00am-5.00pm	Main Exhibition Hall, Waltham Forest Technical College, Forest Rd, London E17	£1.00	London Exhibitions and Promotions 01-584 5039
ZX Microfair	Sept 8 10.00am-6.00pm	Alexandra Palace, London N22	£1.00 adults 80p children (in advance)	ZX Microfairs 01-801 9172
Personal Computer World Show	Sept 19-22 10.00am-7.00pm Sept 23 10.00am-5pm	Olympia 2, Hammersmith Rd, London W6	£3.50	Montbuid Ltd 01-486 1951

Elvish

Setting up a Spectrum-orientated games software house and releasing new material now, in the height of the hot, slow summer is to open the throttle right out and dive your Zero of private enterprise kamikazi-style straight in to the flight deck of the aircraft-carrier of capitalism. Or something like that.

Nevertheless, Gamma software have done just this.

Of its three recently released programs I looked at *Orc Slayer*, an adventure in the classic tradition. By this I mean that you have to visit over 120 locations looking for a magic runesword with which to kill a baddie who has killed your family. This involves visiting a lot of places with funny names like Azonti and the Maze of Desperation (we've got a Neil Armstrong Way near where I live). In any event I'm sure it contains enough *Lord of the Rings* rip-offs to keep adventure fans scurrying about and chattering in elvish about swords of power for ages.



It isn't fair to review adventures when you've had only a few minutes to look at them, so I'll say that the puzzles and places I came across were more intriguing than most other text adventures I've seen recently.

Program *Orc Slayer*
Price £5.50
Micro Spectrum
Supplier Gamma Software
 12 Milverton Road
 London NW6 7AS.



Near Miss

Alcatraz Harry is the first Spectrum game from Mastertronic after its recent claims that the new games at £1.99 were going to be as good as anything usually put out at £5.95.

Making claims like that is rather like tying yourself to the rails and asking critics to drive their train over you. Mastertronic want *Alcatraz Harry* to be great value at full price, with no excuses. Is it? I think it's probably a near miss — not quite good enough to beat the full price games completely out of sight (although I've certainly seen far worse games put out by large companies for five or six pounds) but excellent value at £1.99.

Although the game is described as 'a unique blend of arcade, strategy and adventure, in point of fact it is primarily a memory game with strategy overtones. The idea is to escape from a prison camp. This involves three stages — getting the equipment, negotiating a mine field and stealing a car.

The camp is presented graphically in a sort of simple hi-res 3D, and you move your little sprite-type person (which walks as though completely drunk) over a number of screens looking for the equipment. To begin with your are shown a layout of the camp and are told where the secret files are located and you must remember these, as well as other details discovered as you look around the screen, to avoid being captured.

Pick of the week

Off the rails

One of the cleverest and graphically most impressive games I've yet seen for the Commodore 64 is *Loco* from Alligata. The idea is to move a beautifully animated steam train along the track switching lines to dodge bombs, explosive handcarts, airships and planes whilst collecting flags and trying to make it to the next level.

Your defenses include lethal smoke from the funnel (all that carbon monoxide I'd guess) and an in-built radio scanner that tells you what's coming down the rails at you with just enough time (hopefully) to switch tracks and avoid the obstacles.

It has the now almost mandatory three-voice continuous soundtrack — on this occasion it's a medley of Jean Michael Jarré bits and pieces (hope you've okayed that one, Alligata) described as 'toe tapping' on the box. I haven't heard music described as 'toe tap-

ping' for years. Next they'll be describing it as 'groovy' or 'really swinging'.

Actually *Loco* is a superb game, simple, ingenious, with wonderful graphics. It deserves to sell in vast quantities. One of the musts on the C64 for this year I think.



Program *Loco*
Price £7.95
Micro Commodore 64
Supplier Alligata
 1 Orange Street
 Sheffield S14 2W

Later sections have you reasoning out where mines are located from a simple colour code — the graphics are quite nice although simple and the game itself has a straightforward appeal.

It's really this simplicity that would make me wonder about it's chances if it was sold for £5.95.

Nevertheless if you have £1.99 to spare next time you're in Tesco or Asda or countless other retail chains (impulse buying you see) you should grab this one.

Program *Alcatraz Harry*
Price £1.99
Micro Spectrum
Supplier Mastertronic
 48 George Street
 London W1

Business style

Despite all the troubles, there are still companies supporting the Dragon 32.

After all, whatever its faults, the Dragon is perfectly ca-

pable of running business-style software where high-speed graphics are not important.

One such program is *Instant Graph Plotter* from R&P International. As the name suggests it is a sophisticated graph plotting program capable of drawing several graphs at once and accommodating a range of scales.

Data can be entered directly or mathematically manipulated using function keys for logarithmic, exponential or square function growth and decay. The manual includes extensive notes on altering the program (it's in Basic) to suit your own particular needs. Better still, the manufacturers will endeavour to explain how to change the program to your exact requirements if you write to them directly — sounds like an offer you can't refuse.

Program *Instant Graph Plotter*
Price £7.50
Micro Dragon 32
Supplier R&P International
 PO Box 129
 Wembley
 Middlesex HA0 2UG.

No comet

Watch the skies. With Halley's Comet rushing through the universe towards us the least we can do is give it the courtesy of looking at it, especially since if you miss it you are going to have to wait 76 years for another one to come round.

Should you decide to give it a peek, all the information you could possibly want in order to find it, as well as a heap of background material can be found on *Halley's Comet* by Eclipse Software. See the comet plotted on a starmap or pictured on local skylines, all in hi-res Spectrum graphics or get a plot of the 76 year orbit.

There are various other screens of information, all visually appealing. I agree with Eclipse when they say that you don't have to be an astronomer to find the program interesting.

Program *Halley's Comet*
Price £7.45
Micro Spectrum
Supplier Eclipse Software
 79 Ardossan Gdns
 Worcester Park
 Surrey, England

Astronomy: Spectrum 48k



Taking stock

A lot of people doubt that it's possible to use a home computer for serious business purposes — especially a Spectrum with its rubber keyboard.

Nevertheless companies still continue to produce such programs. More recently facilities like the ZX Microdrive and RS232 for printer connection

make business a slightly more serious proposition than it was — providing your requirements are not very great.

Simple Business Accounts is seriously intended for use by small businesses and is intended to provide a simple cash book for records of cash in hand, cheques, bank balance etc.

Receipts and expenditure can be organised under 30 headings and information can be protected by a password and either saved or sent to a printer. Flowchart say the program is simple to use and certainly it lacks the vast manuals of similar programs — this one has only eight pages.

Program *Simple Business Accounts*
Price £11.95
Micro Spectrum
Supplier Flowchart
 62 High Street
 Irthlingborough
 Northamptonshire
 NN9 5TN

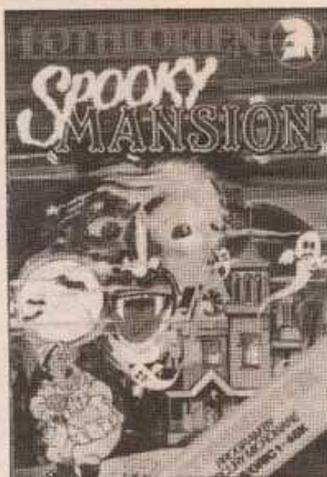
Our urn

Maybe it's the slow summer or just a fluke but all the recent releases from the traditionally wargames house Lothlorien have instead been arcade style titles (well, nearly all).

Spooky Mansion is a multi-screen arcade game for the Oric and Atmos. Aside from anything else it has the great virtue of being reliably recorded for a Fast Load, which means that whilst waiting for it to appear you only have time, say, to sip one cup of tea instead of drink an entire urn full.

The bad point about the game is that the name of the character you represent is Hugo First. (A word to software houses here: just because your 12 year-old programmer is a computing genius it doesn't mean you should let him/her write the cassette blurb. Take your lead from that redoubtable moral philosopher, Avoyd Attlecosts.)

Back to the game. There are seven screens, each with a different set of challenges of the 'collect things without anything bashing, bumping, biting, leaping or jumping on you' kind. You must climb, jump and swing with the best of them to



the final confrontation with Count Dracula.

It's all in machine-code and Lothlorien think that it may have the most number of screens of any Atmos game.

Program *Spooky Mansion*
Price £6.95
Micro Atmos/Oric
Supplier MC Lothlorien
 56A Park Lane
 Poynton
 Cheshire SK12 1RE

Starter for 20

Amazing as it may seem someone somewhere out there has just bought a Vic20 starter pack. Commodore are, I suspect, as amazed as I am that the Vic20 refuses to be killed off. These new owners must be looking for new software releases and Commodore have obliged. It is continuing to issue new programs for the Vic and the most interesting of the current batch is *Bomber Mission*.



sion, a sort of flight simulation program which requires 16K.

Though the controls have been kept fairly simple the game certainly is not — even if you manage to bomb the enemy target you still have to return and manage to land before your time runs out. The graphics are about as good as you could reasonably expect from the Vic and so if you have the machine you'll probably want this game.

Program *Bomber Mission*
Price £4.99
Micro Vic20
Supplier Commodore
 1 Hunters Road
 Weldon North
 Industrial Estate
 Corby
 Northants NN17 1QX

Customised

Random Access Mailing is a useful-looking program, particularly for those using *Wordwise* for serious business word processing.

The program enables you to use existing files and insert a different name and address from a series kept on another file. Customised mailshots — just like with real computers!

The system will enable you to develop files of names and addresses and print labels or letters, taking names and addresses from the file and printing them sequentially.

The program comes with a brief manual explaining the main features of the program with notes on using it in conjunction with *Wordwise*. It is not bargain at over thirty quid, though.

Program *Random Access Mailing*
Price £36.45
Micro BBC
Supplier Micro Aid
 25 Fore Street
 Praze Camborne
 Cornwall
 TR14 0JX

Compiled by Graham Taylor

New Releases is designed to let people know what software is coming on 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.

Spectrum

- 1 (-) Tornado Low level (Vortex)
 - 2 (9) Blue Thunder (Foundry Systems)
 - 3 (7) Zaxxon (Starzone)
 - 4 (2) Jet Set Willy (Software Projects)
 - 5 (5) Jack and the Beanstalk (Thor)
 - 6 (1) Match Point (Psion)
 - 7 (-) Star Trader (Bug Byte)
 - 8 (-) Chequered Flag (Psion)
 - 9 (8) Bytton (Beyond)
 - 10 (-) Les Flics (PSS)
- (Figures compiled by WH Smith and Son, London)

BBC

- 1 (4) Overdrive (Superior)
 - 2 (2) Fortress (Pace)
 - 3 (-) Mr Wiz (Superior)
 - 4 (1) Aviator (Acornsoft)
 - 5 (3) Micro Olympics (Acornsoft)
 - 6 (-) Star Striker (Superior)
 - 7 (-) Fresno (Program Power)
 - 8 (-) The Hobbit (Melbourne House)
 - 9 (-) Super Invaders (Acornsoft)
 - 10 (-) Snowball (Level 9)
- (Figures compiled by WH Smith and Son, London)

Commodore 64

- 1 (3) Squirm (Mastertronic)
 - 2 (7) Beachhead (Centresoft)
 - 3 (2) The Electron Game (Mastertronic)
 - 4 (1) Hektik (Mastertronic)
 - 5 (-) Flight Path 737 (Anirog)
 - 6 (-) Space Pilot (Anirog)
 - 7 (-) Bionic Granny (Mastertronic)
 - 8 (-) Munchmania (Mastertronic)
 - 9 (-) Sub Hump (Mastertronic)
 - 10 (-) Manic Miner (Software Projects)
- (Figures compiled by Boots/Websters)

Dragon 32

- 1 (2) Hunchback (Ocean)
 - 2 (9) Cuthbert in the Jungle (Microdeal)
 - 3 (-) Pedro (Imagine)
 - 4 (1) Chuckie Egg (A&F)
 - 5 (6) Dragon Chess (Oasis)
 - 6 (-) Bug Diver (Mastertronic)
 - 7 (-) Morocco Grand Prix (Microdeal)
 - 8 (-) Mystery of the Java Star (Shards)
 - 9 (-) Cave Fighter (Cablessoft)
 - 10 (8) Cuthbert goes Digging (Microdeal)
 - 10 (7) Mr Dig (Microdeal)
- Two titles tied for 10th position.
(Figures compiled by Boots/Websters)

Books

- 1 (2) Beginners Micro Guide BBC (Granada)
 - 2 (-) BBC Micro Book (Addison)
 - 3 (-) 40 Educational Programs for BBC (Granada)
 - 4 (-) 40 Educational Programs for Commodore 64 (Granada)
 - 5 (3) 80 Programs for the Commodore 64 (Pan)
 - 6 (-) Instant Arcade Games for the BBC (Pan)
 - 7 (-) BBC Micro in Education (Shiva)
 - 8 (-) CBM Programmes Reference Guide (Pitman)
 - 9 (-) Very Basic Basic Commodore (Century)
 - 10 (-) Step by Step Programming BBC (Dorling Kindersley)
- (Figures compiled by Websters)

ZX81

- 1 (2) Krypton Ordeal (Novus)
 - 1 (1) Alien Rain (CRL)
 - 3 (3) Planet Raider (Novus)
 - 4 (5) Walk the Plank (Novus)
 - 5 (4) Black Crystal (Carnell)
 - 6 (9) Espionage Island (Psion)
 - 7 (7) Chess IK (Psion)
 - 8 (8) Mothership (Psion)
 - 8 (-) Planet of Death (Psion)
 - 8 (-) Flight Simulation (Psion)
 - 8 (-) ZX Assembler (Bug Byte)
- Two titles tied for 1st position and four for 8th position.
(Figures compiled by Boots/Websters)

Vic20

- 1 (-) Duck Shoot (Mastertronic)
 - 2 (9) Sub Commander (Creative Sparks)
 - 3 (5) Tank Commander (Creative Sparks)
 - 4 (7) Tower of Evil (Creative Sparks)
 - 5 (3) Computer War (Creative Sparks)
 - 6 (4) Wizard and the Princess (Melbourne House)
 - 7 (-) Sub Hump (Mastertronic)
 - 8 (2) Bewitched (Imagine)
 - 9 (1) Flight Simulator (Craig Communications)
 - 10 (-) 3D Maze (Mastertronic)
- (Figures compiled by Boots/Websters)

Atari

- 1 (1) The Hulk (Adventure International)
 - 2 (5) Bruce Lee (Datasoft)
 - 3 (2) Encounter (Novagen)
 - 4 (7) A.C.E. (English)
 - 5 (9) Captain Sticky's Gold (English)
 - 6 (6) Zaxxon (Datasoft)
 - 7 (-) Proppia (Adventure International)
 - 8 (5) Planet Fall (Infocom)
 - 9 (4) Deadline (Infocom)
 - 10 (-) Warlock (Calisto)
- 32K Cassette, + 32K Disc, + 48K Disc.
(Figures compiled by Calisto Computers Birmingham 021 632 6458)

FUZZY LOGIC

Artificial Intelligence in Basic is yet another book on this subject.

Whilst there are a couple of programs you could type in, the book is primarily a conceptual consideration of what's involved in artificial intelligence, ie, what it is and isn't. Some of the topics in the book are basic to any discussion on AI — fuzzy logic, Eliza, language syntax.

But this book concerns itself more than most with the other side of the coin which is 'how do humans do it' — this proves most helpful in subsequently explaining the problems in implementing similar conceptual tasks on a computer.

The truth is, as soon as programs and programming, machines and machine-code go out the window, most computer book writers can't write — Mike James, the author of this book explains himself clearly and thoroughly and thus separates himself from the majority.

Book *Artificial Intelligence in Basic*
Price £6.95
Micro General
Supplier Newnes Technical Book
PO Box 63
Westbury House
Bury Street, Guildford
Surrey GU2 5BH.

INVADERS EXCLUDED

Perhaps prematurely — it remains to be seen — book publishers are going loopy over the QL.

Hutchinson have just released four titles with five more on the way.

Mostly, the books look like some effort has gone into them. One of them — *Advanced Programming with the Sinclair QL* — is aimed at those who have a 'working knowledge SuperBasic'. Presumably this must mean other authors of books on the QL since hardly anyone else has had much time with the QL.

The book looks good and not so much 'advanced' as 'not designed for complete beginners'. One thing is clear, the author definitely sees buyers of the book as being business or 'serious' users. All the programs are concerned with things like stock control, records, contract costs. No *Space Invaders* anywhere in sight.

This is one of only a few books released so far that people will still have a reason to buy in a year's time.

Book *Advanced Programming With the QL*
Price £6.95
Micro Sinclair QL
Supplier Hutchinson
17-21 Conway Street
London W1P 6JD

This Week

Program	Type	Micro	Price	Supplier
3D Monster Chase	Arc	Amstrad	£6.99	Romik
Alien Break In	Arc	Amstrad	£6.99	Romik
Atom Smasher	Arc	Amstrad	£5.99	Romik
Holdfast	S	Amstrad	£5.95	Kuma
Seroant's Lair	Ad	BBC	£4.95	Comsoft
Custard Pie Fight	Arc	BBC	£4.95	Comsoft
Wallaby	Arc	BBC	£7.95	Superior
Junior Quiz	Ed	BBC	£10.95	Kosmos
Fame Quest	Ad	Commodore 64	£7.95	Braingames
Electron Trail	S	Commodore 64	£7.95	Braingames
Astro Chase	Arc	Commodore 64	£6.99	Statesoft
Commodore 64 Pack	Arc	Commodore 64	£19.99	Beau Jolly
Flo Floo	Arc	Commodore 64	£8.99	Statesoft
The Double	S	Commodore 64	£2.99	Senator
Traffic	S	Commodore 64	£7.95	Quicksilva
Pilot - Plus/64	Ut	Commodore 64	£26.00	Sigma Press
The Graphics Editor	Ut	Commodore 64	£14.99	Romik
Serpent's Lair	Ad	Electron	£4.95	Comsoft
Alien Break In	Arc	Electron	£6.99	Romik
Atom Smasher	Arc	Electron	£6.99	Romik
Birds of Prey	Arc	Electron	£6.99	Romik
The Final Mission	Ad	Spectrum	£5.50	Quicksilva
Catcher	Arc	Spectrum	£5.99	Romik

Program	Type	Micro	Price	Supplier
Frank N Stein	Arc	Spectrum	£5.95	PSS
Games 84	Arc	Spectrum	£9.95	Quicksilva
Piromania	Arc	Spectrum	£6.00	Automata
Spectrum 4 Pack	Arc	Spectrum	£14.99	Beau Jolly
Spectrum 6 Pack	Arc	Spectrum	£19.99	Beau Jolly
Nobby's Numbers	Ed	Spectrum	£3.60	T Coulson
Eights	S	Spectrum	£1.99	Atlantis
Gate Crasher	S	Spectrum	£6.95	Quicksilva
Poker	S	Spectrum	£5.99	De Barron
Astronomer	Ut	Spectrum	£9.95	CP Software
Jet Set Willy	Ut	Spectrum	£4.00	P Rhodes
Spectadraw 3	Ut	Spectrum	£9.95	Spectadraw
Galaxia	Arc	Vic	£5.99	Romik

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.



Freeware

Copying is not just endemic in computing but in all aspects of life. And many people, and the organisations which employ them, are only too willing to live off the ideas of others.

It is wrong to copy software without the author's permission. But what about many of the games available which in turn are developed from the ideas of others — the *Frogger*, *Q-Bert* and *Pac-Man* rip-offs?

I believe that just as it is wrong to pirate software it is morally wrong to explicitly copy the ideas of others. It is only human to be influenced but there is a clear difference between explicit copying and just being influenced.

Similar questions of morality come into play in a new concept in software from the USA called 'freeware'. Freeware provides an intriguing alternative approach to the distribution of software.

At one time, in the early days of computing it was quite easy to write software as part-time occupation, advertise in magazines, and sell the software by post. Unfortunately the purchaser of such software — buying blind — was often taken for a ride.

As a response to the uncertainties of software by post, people began to purchase from shops, from producers whose names they knew. Now, the influence of the small software house has further diminished under the impact of the Megagames hype, with the purchaser quite often being taken for

a ride on price (and thus, one reason for the extensive copying of games).

'Freeware' tries to break that vicious circle of fewer software houses selling more expensive software, which encourages more copying, which ultimately ends up with fewer software houses producing even more expensive software.

With freeware you do not charge for your software, and you even encourage its copying. All you ask is that, if the user is satisfied with your product, s/he sends a fee — or donation — entitling them to software updates, manuals, and the like.

Freeware depends on a primitive morality in that if you are satisfied with a product you will feel inclined to assist the producer, and encourage the production of further good programs. The principal market for freeware in the USA is for the IBM PC, and many software writers are now distributing freeware.

Those who are producing good freeware are making a living, or a comfortable second income (the most famous is *PC Talk*). The initial outlay is negligible, distribution takes care of itself — people just copy — and the little person again has an advantage over the large organisation. And for the user freeware offers the advantage that it gets round the problem of buying blind.

The single most important characteristic of Freeware software is that if it has to be success, then it must offer outstanding value — in terms of its programming, and what the program can do.

Otherwise no-one would feel inclined to send any donations to the freeware house.

Think of all the copied programs in your possession. How many programs are sufficiently good that you feel you want to donate money to its producer? Probably not many.

Which proves, at least that the present system of software purchasing isn't perfect. And that it is worth thinking about alternatives.

Boris Allan

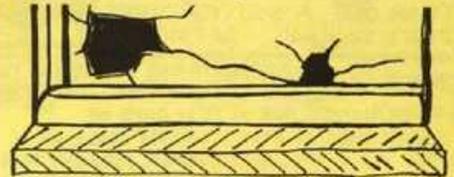
Broken up

Puzzle No 120

For Alphonse at the 'Ristorante Francaise' it had been a disaster.

First of all came his bill for the rates, and as if this wasn't enough, the gas oven promptly exploded whilst the speciality of the house was in preparation. Thus, the *Moules marinade a la Flambé* ended up with considerably more *flambé* than *moules*.

The result of this configuration was the arrival



of a gentleman from the gas board, and a number of broken windows caused as a consequence of the rapid departure of a number of *moules*.

Alphonse went to the till:

The rates bill cost him just half of what he had plus half a pound.

The gas repair cost just a third of the remainder plus one third of a pound.

The glazier's bill amounted to one quarter of what now remained plus one quarter of a pound.

The painter charged one fifth of what he had left plus one fifth of a pound.

Yet, curiously, each bill amounted to an exact number of pounds, and, as for poor Alphonse, to add insult to injury, the number of pounds that he had left at the end of the day was an exact multiple of 13!

Can you say what the days mishaps had cost? **Solution to Puzzle No 115**

The problem depends on finding the prime factors of 16000001. For the solution to the unambiguous there would need to be just three prime factors.

```
10 LET L = 16000001 20 FOR N = 3 TO SQR(L)
STEP 2 30 LET Z = L / N 40 IF Z = INT(Z) THEN
GOTO 100 50 NEXT N 60 STOP 100 PRINT N 110
LET L = Z 120 GOTO 50
```

This program reveals the three factors to be 109,229 and 641. From the information given we can find that there were 229 copies of *Hackit* produced each week, over a 109-week period, each copy costing £6.41.

Winner of Puzzle No 115

The winner is: Paul Clarke, Brent Moor Road, Bramhall, Stockport, Cheshire, who receives £10.

Rules

The closing date for entries to Puzzle No 120 is September 1.

The Hackers



AUTOMATA PRESENTS "PI" ... THE STORY OF PILAND'S BRAVE RESISTANCE AGAINST ALIEN VISITORS WHO ARE NOT QUITE WHAT THEY AT FIRST SEEM. THIS STORY WILL BE TOLD, NOT IN NINE HOURS OF MULTI-MILLION DOLLAR TELEVISION, BUT ON ONE HUMBLE BACK PAGE! THE PILOGUE ALL OVER PILAND'S COLOSSAL *CUPS AND SAUCERS HOVER OMNIPOTENTLY... FROM ONE, A SCUTTLE CRAFT FLIES TO LAND... (* BIG)



THIS IS LADY CLAIR, COMING TO YOU ON PIVISION! THE VISITORS ARE EMERGING FROM THE SCUTTLE-CRAFT... THEY'RE WEARING RED UNIFORMS, JACKBOOTS AND SUNGLASSES...



VERY, VERY THICK SUNGLASSES! OW! I THOUGHT YOU SAID IT WOULD BE BRIGHT!

OOP!

WHO YOU SHOVING, PILTOON? EERK!

THEIR REPRESENTATIVE ADDRESSES PILAND

IN EXCHANGE FOR A FEW CUPS OF SUGAR AND A HALF A DOZEN EGGS, WE'LL CURE ALL FORMS OF COMPUTER PIRACY! OUR NAMES WERE TOO DIFFICULT FOR IMPOVERISHED IMAGINATIONS TO INVENT, SO WE OF THE GIANT TEACUP WILL BE USING NAMES FAMILIAR TO YOU! I WILL BE KNOWN AS ERN!

HUH. I THOUGHT YOU GOT CUPS OF TEA OUT OF AN URN - NOT ERNS OUT OF A CUP OF TEA!



MEANWHILE, RASTAPIMAN EMERGES FROM A HIP RED STREET SUIT...

SHEE DOUGH SHUCKA GOAN BE JELS WHEN DAY GED RIFF DISH CRAZE COOSH MWAN! RAH!

HEY! WHY DISH CAT POASHDY BEELSH?!



EAMONN! YOU GODDY SOO JUSS LIKE MY!

WHAT! ARE YOU ONE OF US?

AH SHO NUFF AIN WUN OH DYEM!

YOU DON'T SOUND LIKE A BROKEN RADIO TO ME! COME ALONG TO THE MOTHER SHIP FOR REPROGRAMMING!



COOL IT, BRO! AH DEMAND TO RING MY SOYA!

DON'T YOU MEAN YOUR LAWYER?

NO, I'M A VEGETARIAN, MWAN!



BUT RASTAPIMAN MAKES HIS BID TO ESCAPE...

FIGH HONRAD AN FIFTY!

SIX HUNDRED!

SEVEN HONRAD!

GOING ONCE... GOING TWICE...



GONE!

NOW AH ISH GONE TO DO TO YOU WHAT DE BRATS DO TO DE PIMAN AT MICROFAIRS, MWAN ... BUT WAIT... DISH FACE IS SOFT...



AND BEHIND ALL *GOOD SOFTWARE... SALAMANDER!!

THEIR SECRET IS SOON OUT, AND PILAND STRIKES BACK, DEFACING THE ALIEN POSTERS.....



...DEFACING THE ALIENS...

AND ENGAGING IN BITTER COMBAT... THEIR ONLY WEAPON... THE CUSTARD PI - AGAINST THE ALIENS' HIGHLY DEVELOPED ARSENAL

IT'S USELESS - THEY'VE GOT PI-SHOOTERS!

FLIPPIN' ALIENS!



NOT UNTIL THE PI-FOLK THREATEN TO SWITCH TO THE OLYMPICS DO THE ALIENS TAKE FIGHT... BUT EVEN THEN, NOT BEFORE THEY KIDNAP THE PIMAN!

BUT WAIT! THE PIMAN IS DOZING BEFORE HIS OVERHEATED TELEVISION!



... SO WHO IS IT THE ALIENS HAVE TAKEN?

THE DEVIL MADE ME WEAR THIS SUIT!

EERK! THE WALKING PILLOW-CASE! ABANDON SCRIPT!

* NOT QUITE ALL... THIS IS AN AUTOMATA AD! 'AD??!

ALL CHARACTERS © AUTOMATA U.K. 1984

SPECIAL THANKS (FOR INSPIRATION) TO GREGORY MULLER (COURTESY)