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POPULAR

# Computing

## WEEKLY

23-29 August 1984

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Vol 3 No 34

### Oric writ for Saatchi

ORIC Products International is now involved in a suit and counter-suit with its advertising agency, KMP, a wholly owned subsidiary of Saatchi and Saatchi.

KMP issued a writ against Oric for non-payment of £200,000 owed to the advertising agency. The money had been outstanding since April.

On the day before the case was due to be heard, Oric lodged a counter suit, claiming "wrongful advice" from KMP.

"Oric had been legally advised not to pay the debt, and so is putting through a counter suit," said an Oric spokesman.

"As far as we can tell, the object of the counter suit is to delay proceedings until Oric can get time to sort out a deal for payment," said Dick Richards, KMP's finance director.

"Oric has said that we didn't do what it was to pay us to do. But, according to instructions, approved advertising appeared on page 5

## Commodore's net in autumn launch

COMPUNET, Commodore's own networking system for owners of its 64 micro is now operational.

At present only a panel of user-group members have access to the system, which will be launched to the public on September 19.

The first Commodore modems should be delivered from next week and purchasers will each receive a free Compunet subscription form.

"Judging from our mailing list of people who have ordered modems, we expect to have about 1,000 subscribers to Compunet by October," said Commodore's Mike Horne.

"We plan to produce a minimum of 20,000 modems by Christmas.

Teleshopping, an estate agency service, full database

and free software will all be available initially on Compunet. The joint organisers of the system, Commodore and ADP Network Services, are in negotiation with a high street bank for a home banking facility.

"One of Compunet's stronger features will be the educational software provided," continued Mike. "At the moment, we have fifty good quality educational packages on the system — these will be updated by ten more each month.

"Software vendors have been particularly interested in Compunet because of the security of the programs. The Commodore modem effectively becomes a dongle with Compunet — down-loaded software can only be used when the same modem is connected to the computer."



### Stranglers quilled

FOUR-MAN rock group The Stranglers, who rose to prominence during the punk music explosion of 1976, are to release an adventure game with their new album *Aural Sculpture*.

The adventure will be included in the cassette version of the album, although not packaged with the record.

The game, *Aural Quest*, written for the 48K Spectrum using *The Quill* is based on the album's theme. Players must travel the world in search of pieces of the ear, which they must then fit together.

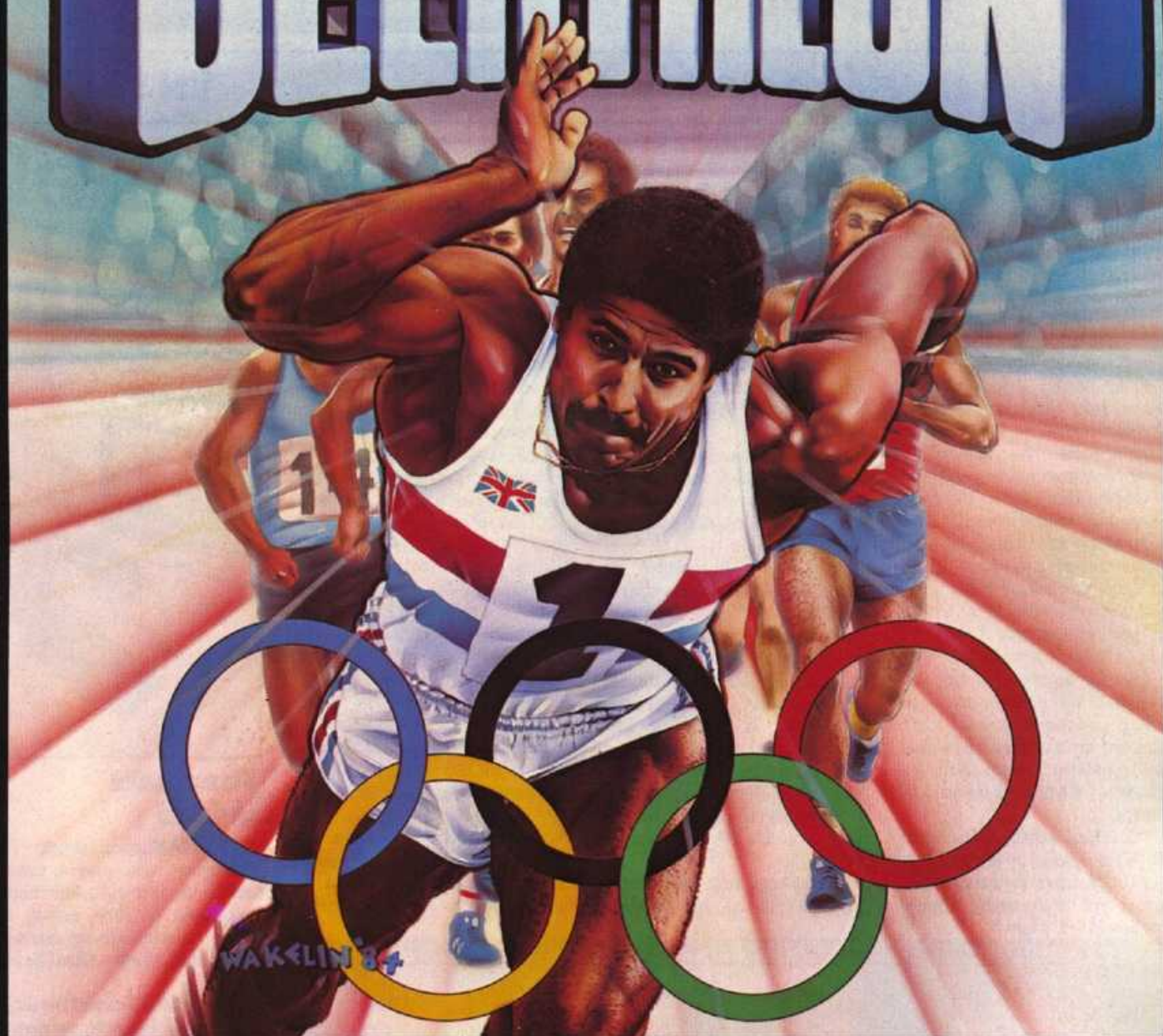


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# > View

**S**inclair has announced that it plans to set up its own chip manufacturing plant.

At present all the integrated circuit microprocessor and memory devices used in British micros are either made in the US or Japan.

Such a situation places our computer manufacturers at a significant disadvantage. It makes them vulnerable to changes in currency exchange rates and import duties with no control over the availability of the chips they use.

While Atari and Timex were being savagely beaten in the US market last year, Commodore sailed on to gain over 60 per cent of the market. One factor in Commodore's success is the fact that the company makes its own chips. In times of shortage Commodore will no doubt service its own needs before those of its competitors. Commodore also has a development advantage. It is able to work more closely than its rivals with its chip plant to develop the device it wants.

The key to future success in the computer market is higher and higher levels of integration — hence Sinclair's advanced wafer technology research group in Metalab. More and more semiconductor devices on a chip means smaller computers with fewer components which are cheaper to manufacture.

With chips like those Sinclair designed for the Microdrive and the flat-screen TV, both of which incorporate a very high degree of integration, Sinclair has proved its team can design innovative and competitive devices. Now Sinclair wants the facility to manufacture them itself.

And with the Japanese MSX manufacturers about to enter the home computer market as potentially the company's biggest rivals, it is very important that Sinclair gets a move on.

# POPULAR Computing WEEKLY

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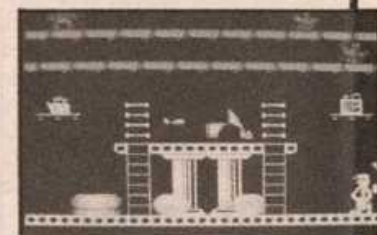
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ABC

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## CHART ACTION

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6 Mined-Out	- Electron -	£6.95
7 Gatecrasher*	- 48K Spec -	£6.95
8 Sting 64	- CBM 64 -	£7.95
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10 Dragonsbane	- 48K Spec -	£6.95
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12 Aquaplane	- CBM 64 -	£7.95
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14 Gatecrasher*	- Electron -	£6.95
15 Velnor's lair*	- Oric/Atmos -	£6.95
16 Mined Out*	- Oric/Atmos -	£6.95
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Ltd's terms of trade and  
conditions of sale, copies of  
which are available on request.



## Chip plant for Sinclair

SINCLAIR Research looks set to move into manufacturing for the first time with plans to build a semiconductor factory in the UK.

The plant is part of Sinclair's fifth generation project, announced by Sir Clive Sinclair two weeks ago.

The chips produced using advanced wafer-scale integration techniques will, however, not be for sale on the open market. Instead they will be used by Sinclair Research in new products based on the results of research now being carried out at the company's Metalab in Cambridge. A team at Metalab has been set up to research new semiconductor

wafer fabrication and thin-film techniques.

The company hopes that the factory will be completed by the time Sinclair's proposed share flotation takes place next year. One of the first devices planned to be built by the plant is the 0-5M Ram expansion for the QL.

●The company has also appointed a second distributor for the QL in addition to Prism — Terry Blood Distribution (Computers) — TBD — of Staffordshire, major distributors of records, tapes and videos.

## Rabbit debts top £200,000

A STORMY meeting of Rabbit Software creditors on August 10, appointed certified accountant Stuart Andrew Edgar as liquidator.

Edgar was nominated by Rabbit shareholders, the creditors putting forward no alternative nomination.

The total debts of Rabbit, which went into liquidation three weeks ago, amount to over £220,000. While the company has assets of just over £284,000 its realisable value is put at £182,700. The assets are now in the care of Rosan & Co, of Croydon, Surrey, acting for the sheriff of London.

## Sanyo MSX prices

SANYO has announced the price of its MSX micro, to be launched in this country in the Autumn.

The Sanyo MCP 100, at £299.95 will be £20 more expensive than its main MSX



creditors' meeting on Friday, August 24, will go into voluntary liquidation.

Along with Quicksilver, DK'Tronics and Kad, Fuller was one of the first companies to produce add-ons for the ZX81.

## Ocean goes for Gold

MUCH of the new software available this autumn will be imported from the US.

After Sierra and First Star comes US Gold, the company set up jointly by Ocean and Centre Soft.

The company has now signed deals with nine US companies, including Datasoft, Cosmi, Microprose, Bally Midway, Synapse, Access and Strategic Simulations to produce games for the Commodore 64 and Spectrum.

Over thirty titles are involved in the first batch of releases including games like *Caverns of Khafka* and *Slinky* from Cosmi, and *Zaxxon* from Synapse, which have previously only been available here on Atari.

Games with themes familiar to a UK audience include Datasoft's *Dallas Quest* and *Bruce Lee* titles and *Buck Rogers* and *Star Trek* from Bally Midway.

Some of the Commodore titles have already arrived — Cosmi's *Forbidden Forest*, Microprose's *Solo Flight* and Access' *Beachhead* — and the remainder will be released within the next month or so.

"The Spectrum versions will be following a month behind," said Ocean's David Ward. "Because we are doing the manufacturing in this country rather

rival, Toshiba's HX10.

It has 64K Ram, 32K Rom and 16K video Ram. The MCP100 has a Centronics parallel printer port and at the time of its launch, MJY-01 joysticks at £12.95 and a light pen and cartridge adaptor — the MLP-01 — at £89.95, will also be available.

## Houses shift out of Dragon

SOFTWARE houses which rose to prominence producing material for the Dragon are now — following Dragon's receivership — looking to other machines.

Software and Salamander have both announced Autumn releases, which are mainly conversions from the Dragon to other machines and neither has announced new Dragon titles.

Salamander, not in receiver-

than simply importing, we are able to sell at UK prices instead of the \$30 these games cost in the States."

**David Ward**  
managing  
director  
of Ocean



Most of the Commodore titles will be £9.95 and most Spectrum programs will be £7.95. Versions for the Amstrad and MSX machines are also under consideration.

Ocean and Centresoft have between them invested £800,000 in US Gold. Ocean will be mainly responsible for the technical work for the conversions with Centre Soft handling distribution.

ship as has been widely rumoured, will be converting the *Dan Dimond* trilogy for the Spectrum and 64, at around £13.00 for the three programs and *737 Flight Simulator* for MSX and the Oric Atmos at £9.95. Its multi-part adventure *Castle Baron*, which the company began work on eighteen months ago, is now to be written on the Commodore 64 rather than the Dragon and is now expected to be released in early 1985.

However, the company is also setting up a Software Discount Club specifically for Dragon owners who are having difficulty in obtaining Dragon software.

Any future releases we do for the Dragon may well be limited to club members by mail order," said Chris Holland of Salamander.

Shards will be releasing *The Pettigrew Chronicles* for the Commodore 64 and the Spectrum, a 'compilation' program of the best parts of *Pettigrew's Diary* and *Operation Safras*, according to managing director Steve Maltz. *Empire*, the strategy game, is to be converted for the 64, and *Galilee*, the sequel to *Jericho Road*, is being released for the Spectrum.

Shards looks unlikely to release any new games for the Dragon.

●It has now been confirmed (see PCW July 19) that Eurohard SA, of Caceres in the Extra Madura region of Spain, has bought the assets of Dragon Data. Manufacture of the Dragon 32 and 64 will begin in Spain as soon as possible. GEC will handle distribution here.

## BBCs for Ireland

ACORN Computer Group is to set up a manufacturing facility for the BBC B micro in the Republic of Ireland.

The company has appointed Lendac Data Systems of Dublin, already sole distributors of the BBC in Ireland, to begin manufacture in September. Production of 5,000 units is expected in the first year of operation.

## Oric writ

continued from page 1

red in approved media at an approved price."

The case should now be heard in September.

Oric has also denied that it may be pulling out of the UK market altogether, as has been suggested. "Oric is a UK company and we recognise that we need to maintain a healthy position here for the Atmos and future products," continued its spokesman.

However, 15 redundancies have been made at Oric in the UK, and 15 more staff taken on in Europe. The company has also been negotiating to set up a French manufacturing facility.

## Fuller crash

FULLER, the Spectrum peripherals manufacturer, has gone into receivership.

Two weeks ago, the company was declared insolvent at a board meeting, and after the





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## QDOS manual

Way back in January 1984, when the Sinclair QL was launched, there was much said about 'multi-tasking' and the amazing QL operating system — QDOS. Now, seven months after ordering the QL and two months after receiving the machine and its 'User Guide', I have taken delivery of the 'QDOS Manual' at a cost of £13, including postage and packing.

The document Sinclair Research calls the 'QDOS Manual' is, in fact, the missing pages from the QL Users' Guide detailing such mysteries as 'multi-tasking', system variables and QDOS system calls which the advanced programmer would find invaluable.

I ended up with my QDOS Manual by writing polite letters to Sinclair Research asking for the technical data "... I felt I had a right to be supplied with". This resulted in my getting a letter from the Customer Relations Department suggesting that I forward a cheque for £13. Try it — it might work for you. It arrived within a few days — honest!

Once you get your hands on one of the elusive documents, written by Tony Tebby, you will find it has some 150 pages and is written in a highly technical manner.

The first thing I noticed was a secret revealed which has been kept closely guarded by Sinclair: The QL was initially intended as a 32K/128K RAM configuration with an option to upgrade, similar to the Spectrum 16K/48K arrangement.

A brief introduction and overview of QDOS starts the manual, closely followed by details of changes to previous versions. My manual documents QDOS Version 1.03 — the earlier ones run through the release numbers 0.05, 0.06, 0.07, 0.08, 1.00, 1.01 and 1.02. In fact, you can find out which version of QDOS you have by looking through the Rom for a string in the format *n.nn*. My 'AH' version QL has version 1.02 QDOS.

The first half or so of the manual systematically describes each system call to QDOS (via the MC68008 Trap

instructions) detailing input parameters, output parameters, registers affected and possible error return situations. The subjects covered by these Traps are: job creation and deletion, job management, resident procedure control, display handling, Intel i8049 communication, serial port control, real-time clock control, memory allocation and file handling.

Other chapters are devoted to such subjects as device drivers, Rom drivers, interrupts, arithmetic handling, QL Microdrive format, interfacing to QL SuperBASIC, system variables and example assembly programs.

Details on QL Peripheral expansion are not available until "after the launch of the various devices".

As I said earlier, the manual is not exactly written with the complete beginner in mind — more the advanced programmer, or hobbyist.

With this said, I have to say the QDOS Manual is everything I wished. Let us not get romantic, though. It is quite obvious this extra information should have been supplied in the first place with the QL — not as an optional extra several months later. I hear that 'multi-tasking' is not implemented on QL versions FB, PM and AH. We will all have to wait for Sinclair to plug in the precious JM version, "within ten working days".

Then, your QDOS Manual will become a QL Bible.

Alan Turnbull  
Gale Green  
Stockport  
Cheshire



## A new bug

Ian Logan wants to hear about 'new' Spectrum bugs huh? OK, here's one.

```
1 DEF FN e(n,m)=n+m: DEF FN f()=FN e(29,FN e(17,8)): REM numbers chosen especially for HHGTTG fans.
PRINT FN f()
42
```

is the wrong answer. *FN e(n,m)* just calculates the sum of two numbers, *FN f()* should give the sum of 29 plus the sum of 17 and 8 ( $29+17+8=54$ ), but it doesn't. In fact, the computer has worked out  $17+17+8=42$ .

This is because, although the Spectrum uses a stack to keep track of the order of functions (ie, it must perform *FN e(17,8)* before *FN e(29...)* it holds the numbers it works with, its operands, in fixed locations. This means that the 29 and the 17 will occupy exactly the same areas of memory because they are both the first operand of an *FN e*. Since the 17 is interpreted after the 29, it just replaces it before the computer has had a chance to do anything with the 29.

So the computer ends up evaluating *FN e(17,17+8)*.

Julian Skidmore  
25 Cossall Road  
Trowell  
Notts

## Evil and sinister

Firstly, congratulations on the improvements to *Popular Computing Weekly*. It was always the leading magazine, but is now even better (perhaps with the exception of the unamusing advertisement from Automata).

Anyway I digress from the main point, which is to point out my extreme displeasure at receiving inside PCW this week a leaflet advertising a Dianetics publication. You cannot fail to have read a High Court Judge's recent comments about the Scientologists — the group behind Dianetics — whose activities parallel those of the Unification 'Church' (Moonies).

The Judge described Scientology as "Evil" and "Sinister", and by allowing Scientology a place in your publication, you may have unwittingly lined up some reader or readers for a

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The magazine will not be taking any more Scientology ads.

## Vic20 modulator

It was interesting to read Phil Roger's reply to P Whalley in *Peek & Poke* in the July 19 issue on the question of faulty Vic20 modulators.

A 'faulty' Vic modulator is often caused by users and not by the Black Box itself. Many people (quite possibly Mr Whalley not included) remove the modulator from the Vic by tugging at the cable between the modulator and the machine, and not by the recommended method of holding the actual connecting plug. Constant tugging wrenches the leads inside the connector out of position causing loss of sound, or picture, or both.

M J Davies  
The Waverley  
79 Rhosmaen Street  
Llandeilo  
Dyfed

## Stop bickering!

I would just like to point out to Mr Bathurst (August 9 issue), that, while the Commodore 64 has only 39K for Basic programming, it has another 19K which can be used either for machine code, or for storing graphic or sound detail.

I also object to letters like that of Mr Haighley (same issue), which, while it has a point to make — that magazines do not print enough for the Electron (I agree, but can't the Electron use BBC software?), the writer also decides to slip in a quick slagging-off of the Commodore 64.

Well, I own a TZQPA 3200042K computer with built-in speech synthesiser, instant retrieval disc drive, TV-resolution graphics, and it's better than all the other computers put together, so stop bickering!

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**I**n this program for the BBC B you are a diver trying to retrieve golden treasure chests from the sea-bed and put them in your blue boat.

If you touch any of the harmless red fish, they become frightened and a shark is alerted which chases you until you are safely inside the boat.

As you progress, the shark moves faster and the red fish get closer together. Naturally, you swim more slowly when carrying the heavy chests.

## Lines

30 - 90 Set up envelope, variables, user-defined characters at graphics cursor (VOUS)

110 - 120 Draw sea-floor and surface using background fill (plot 77)  
150 - 170 Main loop moves diver, stopped by meeting non-background colour  
210 - 260 Clear screen for shark. Chase until non-background colour. Repeat or die  
ProcM Draw diver at B%, A%  
ProcS Draw shark; move closer to diver  
Proc I Check for key-press; change diver's co-ordinates; draw diver  
380 - 400 End game, high score, restart  
ProcFISH Clear screen window; draw flashing fish with random spacing  
ProcPICK Adjust screen and score when treasure picked up

ProcNEWP Draw new treasure and fish  
ProcSCORE Adjust score with fanfare  
ProcI Set faster flash rate

## Variables

B%, A% Diver's co-ordinate  
C%, D% Shark's co-ordinate  
I% Score  
F%, W%, X%  
Y%, Z% Control loop variables  
N% Speed of shark  
M% Speed of diver  
P% Position of treasure  
PC Flag for treasure





```

10REM *** JAWS ***
20REM *** By R.D.M.Hadden 1984 ***
30MODE2:HS=5:N$=""
40PROCINTRO
50REM *** INITIALISE ***
60B%=450:A%=990:M%=20:T%=-10:PC=0:N%=26:H=40:VDU5
70ENVELOPE1,128,0,-2,2,25,25,25,0,0,0,-126,126,0:ENVELOPE2,10,4,-8,0,4,1,1,0,
0,0,-126,126,0
80GCOL0,134:GCOL0,9:CLS:COLOUR130:COLOUR4
90VDU23,250,0,1,59,126,126,59,1,0,23,251,16,57,127,255,63,125,56,0,23,252,24,
24,74,60,24,24,36,36,23,253,0,112,248,248,248,248,248,248
100REM*** DRAW ***
110GCOL0,2:MOVE0,90:DRAW1279,90:FORF%=90TO0STEP-4:PLOT77,S%,F%:NEXT:COLOUR130:
VDU4:PRINTTAB(0,30)"Score"TAB(0,31)"HS-";N$:" ";HS:VDU5
120GCOL0,4:MOVE300,980:PRINT"\_/_":FORF%=976TO952STEP-4:PLOT77,400,F%:NEXT
130GCOL3,6:PROCIM
140REM*** MAIN PROG ***
150REPEAT
160PROC1
170UNTILPOINT(B%+32,A%-16)
180IFPOINT(B%+32,A%-16)=5 PROCICK:GOTO150
190IFPOINT(B%+32,A%-16)=2 PROCNEW:GOTO150
200REM*** SHARK ***
210COLOUR134:VDU4,28,0,23,19,3:CLS:VDU5,26:COLOUR130:MOVEB%,A%:VDU252
220N%=N%+2:C%=1250*(RND(2)-1):D%=200+RND(800):MOVEC%,D%:VDU251:SOUND2,2,20,-1
230REPEAT:PROC1:PROCS:UNTILPOINT(B%+32,A%-16):*FX21,6
240IFPOINT(B%+32,A%-16)<>2 GOTO380ELSEGCOL3,6:MOVEC%,D%:VDU251
250IFPC PROCFISH:GCOL3,6
260GOTO150
270REM ***DRAW MAN***
280DEFPROCIM:MOVEB%,A%:VDU252:ENDPROC
290REM*** SHARK ***
300DEFPROCS:MOVEC%,D%:VDU251:C%=C%-N%*(B%>C%)+N%*(B%<C%):D%=D%-N%*(A%>D%)+N%*(
A%<D%)+N%*(D%>950):MOVEC%,D%:VDU251:ENDPROC
310DEFPROC1:IFINKEY(-103) PROCIM:B%=B%+M%*(B%>M%):PROCIM
320IFINKEY(-104) PROCIM:B%=B%-M%*(B%<1220):PROCIM
330IFINKEY(-66) PROCIM:A%=A%-M%*(A%<990):PROCIM
340IFINKEY(-98) PROCIM:A%=A%+M%*(A%>109+M%):PROCIM
360ENDPROC
370REM *** END ***
380VDU4:PRINTTAB(0,25)"YOU HAVE BEEN EATEN.":*FX21,0
390IFT%>=HS PRINT"HIGH SCORE!":INPUT"Name ",N$:HS=T%
400IFGET$<>" " GOTO400ELSEGOTO60
410DEFPROCFISH:COLOUR134:VDU4,28,0,23,19,3:CLS:VDU5,26:COLOUR130
420FORY%=500TO700STEP200:X%=1300:Z%=Y%:REPEAT:FORW%=9TO14STEP5:GCOL0,W%:X%=X%-
RND(H)-45:Z%=Z%-25+RND(50):MOVEX%,Z%:VDU250:NEXT:UNTILX%<=0:NEXT:ENDPROC
430DEFPROCICK:MOVEB%,A%:VDU252:MOVEP%,122:GCOL0,6:VDU253:GCOL3,6:PC=0:MOVEB%,
A%:VDU252:SC%=5:PROCSCORE:M%=M%-10:ENDPROC
440DEFPROCNEW:IFPC ENDPROC ELSEPC=1:H=INT(H*.8):SC%=10:PROCSCORE:IFH=20 PROC1
450PROCFISH:GCOL0,3:P%=RND(800)+200:MOVEP%,122:VDU253:M%=M%+10:GCOL3,6:ENDPROC
460DEFPROCSCORE:T%=T%+SC%:VDU4:PRINTTAB(5,30)T%:VDU5:SOUND1,1,100,20:ENDPROC
470DEFPROC1:*FX9,20
480*FX10,20
490ENDPROC
500DEFPROCINTRO
510COLOUR134:CLS:COLOUR1:PRINTTAB(8,5)"JAWS"TAB(2)"By R.Hadden 1984":COLOUR4
:PRINTTAB(0,15)"A - up""Z - down""< - left""> - right""space - start"
520PRINTTAB(0,25)"Carry treasure to boat and avoid fish which warn maneating
shark when scared."
530IFGET ENDPROC

```



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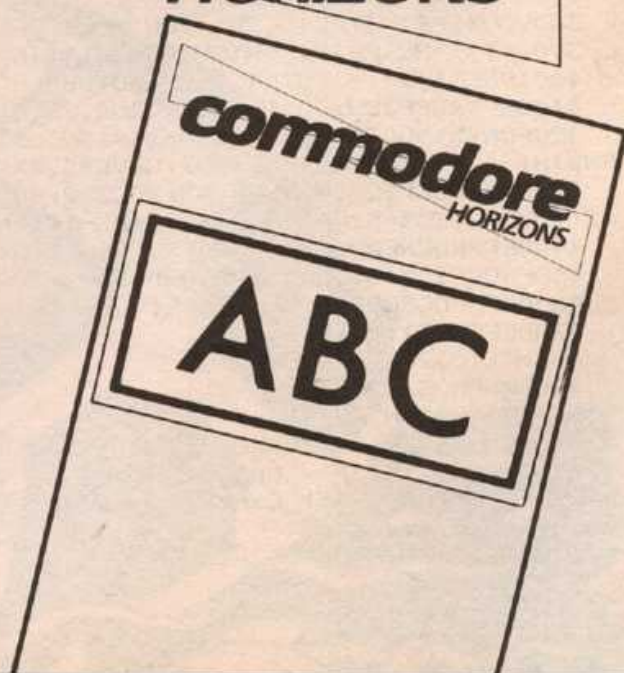
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## Software secret agent

Graham Taylor talks to software programmers' agent, Jacqui Lyons

**T**here was a time about a year ago when it seemed that the only teenage males not being signed to flamboyant Liverpool software houses were those too busy appearing on Top of the Pops.

For every one that made enough money to buy all the hi fi's, walkmen, compact discs, videos and bigger and better computers, he could ever require, there were countless others who received little or nothing and felt bitter and cheated.

It was a peculiar situation, a lack of managerial, organisational and, above all, legal experience on the part of everyone involved — particularly the programmers who, like so many teenybop stars before them, seldom understood what they were signing. Of course, this is the more generous explanation of what occurred, there is another: many of the people involved were crooks.

It really needed a professional person whose job it was to look after the programmers' interest.

One of the most successful of these software agents is Jacqui Lyons whose company Marjaq Scripts is jointly run with co-director George Markstein — best known for his work on *The Prisoner* and other TV programs.

"To begin with I had no idea about how to contact software programmers," said Jacqui. "I first tried a tentative ad in a

computer magazine — I got virtually no response from programmers at all, but I was inundated by publishers looking for computer book authors, so I knew it was an area worth pursuing.

"The small software houses where it's one man in his house selling games and paying royalties are and were, from last year, going out of business. The big companies are taking over and they need proper negotiated contracts, agreed time limits, specific programming requirements and the rest.

Equally the programmers find they are dealing with big international companies and they need support in getting the right deal."

Jacqui takes on people rather than products — a concept that some programmers have found surprising. "My work is not primarily concerned with introducing people to one another and organising contracts — I spend a lot of time getting the programs right. I tend to look after things like graphics and spelling which is usually quite appalling."

Programmers are often their own worst enemy. "They are sometimes very badly equipped for interaction with other humans — they are frequently very tongue-tied — you wouldn't believe the number of incomprehensible messages I get on my Ansa-

phone. Half the time I can ring them back to find out what they want because they forget to leave their names and addresses."

Jacqui has built a team of programmers "about 25 — I wouldn't want to deal with more than " — who do work to order. "We've been involved with companies such as Century, Mozaic, Cheetah and Island Logic who have been especially set up for computer software, but the more conventional publishers are getting involved too. I'm often talking to the same people I used to talk to when I was dealing solely in books."

The computer/book package where a computer game, often an adventure, contains themes from a well known book is obviously an area particularly appropriate to Jacqui's set-up.

I point out that the initial offerings in the book/software area have been lame to say the least. "That's true and it really reflects the fact that although the book companies were quick to spot the trend — they'd seen what happened with computer books after all — they didn't know how to go about it. For example, one company insisted that all the programs be written in Basic so that they would be easy to transfer from one machine to another — obviously the end result was just far too unsophisticated."

Jacqui and her team have been working on the first major software release from Century Communications — the recently set up software side of Century Publishing. To be called *Legend*, the program is a text adventure with arcade sequences. "It's based around a book and Century commissioned us to develop the gameplay."

After book publishers the next people to move into computer publishing are the independent TV companies. Aside from Thames' expected deal with DK 'Tronics to produce software based on some of its better known programs, other companies such as Granada are known to be keen.

"At the moment I think some of the TV people are in very much the same position as the book publishing houses were until recently — that is they don't really know what they want and have little idea about computers and what make a good game."

As much as anything else, the development of a role as sophisticated as that of Jacqui's reflects how the industry has changed over the past year. The distinction between the programmers and the promoters and marketers of the product is growing wider — the last few one-man bands are quietly going out of business.

As Jacqui says "now it's thousands invested, months of development, marketing strategies and the rest; it involves teams of programmers, proper contracts, and strict schedules. It also means discovering who has the rights to what and whether those rights include electronic media rights; in short it's getting very complicated."





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# Hardware Review

## Liberated

**Hardware Concept Keyboard Micro** Apple, BBC B, RML 380Z/480Z, Pet, Vic20, Spectrum **Price** A3 size (reviewed here): £113.85; A4 size: £79.35. Interfaces leads: £20.70 (Apple, BBC, RML); £24.15 (Pet, Vic20); £28.75 (Spectrum) **Supplier** Star Microterminals, 22 Hyde Street, Winchester, Hants.

**I** imagine a ZX81-type keyboard sixteen inches by twelve! A nightmare? No, it's the long-awaited liberation from type-writer tyranny.

The traditional keyboard has so far dominated micros. Despite the coming of joysticks, instrument interfaces and mice, most of us bash away on Qwerty boards.

They are useful but two groups of people find them extremely hard to use: very young children and handicapped people with poor physical co-ordination.

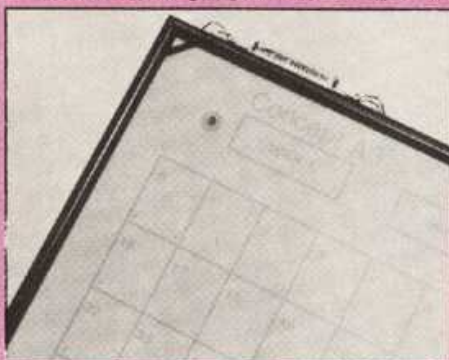
The Concept Keyboard is rather like a framed wall picture in size and dimensions — oblong about one inch high and solidly built. The top is a set of 128 touch-pad keys covered in a tough plastic skin plus some control keys.

This presents a flat surface on which you can place paper — known in the

jargon as an overlay. A few lines of *Basic* loaded in from the accompanying cassette tell your micro which key has been pressed. The manual shows easy ways to group blocks of keys and gives examples of creating look-up tables.

You can program the board to respond when drawings or symbols on the overlays are touched. Imagine various board games in which the computer knows where you plonk your playing-piece down. This is the joy and dilemma of the Concept Keyboard — it is only as good as your ideas for ways of using it. Enthusiastic teachers of infants and the handicapped will rapidly develop the simple examples supplied to prepare games and lessons that offer new interest to their classrooms.

*Starset* is a program to design the



overlays and it is supplied free with the A3-size boards in versions for the BBC B, RML 380Z/480Z and Spectrum machines. It helps you generate and adapt programs to read the keyboard. It is menu-driven, very simple to use and includes options for creating a new overlay, viewing a directory of layouts held on disc, editing a previous layout and converting a layout into the interface file.

When creating or amending an overlay, *Starset* draws a picture of the Concept Keyboard on screen. The arrow keys position a cursor on the key to be defined. The definition of the square can then be entered.

To enable a *Basic* program to be used with the Concept Keyboard, the layout must be converted into an interface file (it is not necessary to change the *Basic* program). An option exists to automatically convert the layout to the required format.

A number of educational programs are also supplied. These are aimed at infants and are designed to teach simple arithmetic, shape recognition, etc.

For primary teachers and the handicapped it will be a long-awaited blessing..

For ordinary users who are not word-processing, it offers an intriguing alternative to Qwerty arrangements.

Dave Watterson

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- All four languages can be used interactively with each other, and with the user.

### ROM EXPANSIONS

- MTX NewWord, a 32K word processing package
- Hisoft PASCAL, written specially for the MTX Series

### THE KEYBOARD

- Full size, 79-key, full-stroke professional quality keyboard incorporating:
  - Main Block with typewriter-style layout
  - A separate 12-key numeric/editor keypad
  - Eight programmable function keys (16 with shift)

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- 256 × 192 pixel resolution plus
- 32 × 24 Text in 16 foreground and background colours
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## A fair copy

**Program** *Dune Rider* **Micro** BBC **Price** £7.95 **Supplier** Micro Power, Northwood House, North Street, Leeds LS7 2AA.

One of the fundamental laws of home micros is that three months after the Commodore and Spectrum get a game the BBC will get a version of it (usually with less features).

Such is the case with *Dune*

*Rider* which is a version of *Moon Buggy*.

True to the original you have to trundle over the planet surface blasting backwards, forwards and upwards at the usual attacking aliens and jump over various rocks and pits which block your path.

If you liked the original then this is a fair copy — the graphics are quite small but you can blast away quite happily.

Ian Waltham



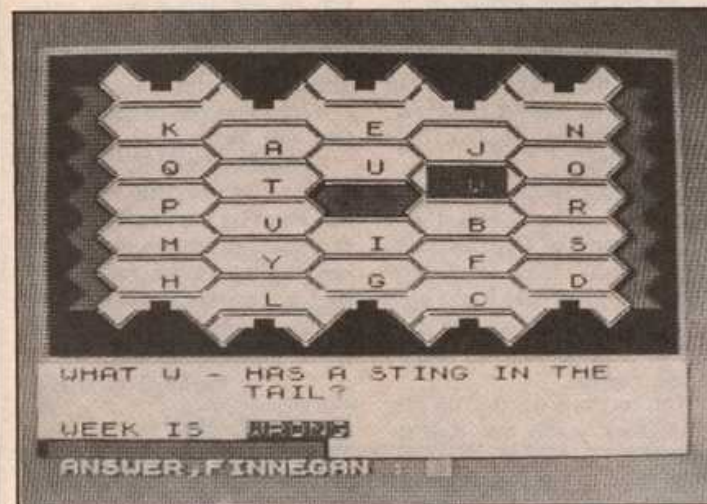
## A grade above

**Program** *Block-Buster* **Price** £5.95 **Micro** Spectrum **Supplier** Compusound, 32 Langley Close, Redditch, Worcs.

This program is a direct copy of the TV game of the same name and is well done. The hexagonal parts of the Block-Buster board are cleverly made up on the Spectrum's none-too-flexible display. Colour and sound are used to the full and the game works well; allowing either a two player game or a player v

any game like this will be in the questions asked, and fortunately there is a good selection of questions at varying levels of difficulty. (But don't believe the blurb on the box: level 1 questions are the hardest, not the easiest!) What does put this game a grade above others is that it allows for new questions to be loaded in from tape, thus catching out those who have played before. I can see an industry in question tapes developing, too, once people work out the structure of the array they are in.

Of all the games around for the Spectrum, this one must be more educational than most, and is at a level to attract those



computer game. The latter isn't easy, the computer often interrupting itself in the middle of a question to supply the answer. Unfair? No, because it's not very clever and as likely as not to get the answer wrong!

The strength or weakness of

who, like most of us, find that they get wiped off the board when playing the computer at *Scrabble*.

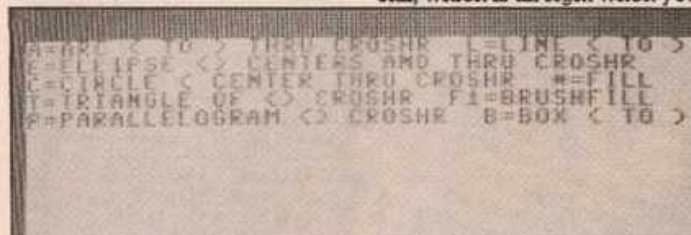
Simon Springett



## Curate's egg

**Program** *Paint Pic* **Price** £12.95 **Micro** Commodore 64 **Supplier** Kuma Computers Ltd, Unit 12, Horseshoe Park, Horseshoe Road, Pangbourne, Berks RG8 7JW.

This program is a multi-colour high resolution graphics utility from Kiwi-soft, a New Zealand software house, and it is very much like the proverbial curate's egg — good in parts.



The specification is excellent — it provides a complete set of commands for drawing, colouring and saving multi-colour hi-res pictures. For example, there are many predefined shapes available, commands to control the definition and use of complex textures, blocks of the picture can be manipulated, and there's a facility to help perspective dra-

wing. Additionally, there is a set of help screens if you forget any of the commands.

Unfortunately, this is where *Paint Pic* starts to be less impressive. The commands are pretty forgettable on the whole, only a few are at all useful. Furthermore, the help screens are very badly laid out; you have to scan through closely packed text to find the required information.

This would not be a problem if the manual was clear and concise. However, it isn't. It is written as a rather wordy tutorial, which is all right when you

first use the program but it subsequently becomes increasingly frustrating to use, because it is almost impossible to find anything quickly.

This is a great pity, because the facilities provided are very powerful, and an otherwise very good product is let down by poor presentation.

Richard Corfield



## Word checker

**Program** *Stylograph/Mail Merge/Spell Check* **Micro** Dragon 64 with disc drive **Price** £79.95 (OS9 disc is further £39.95) **Supplier** GEC/Dragon.

*Stylograph* is the Dragon OS9 package of wordprocessor, addressing and spelling-checker. Once the OS9 disc is booted, *Stylograph* can be loaded.

The word-processor supports all the usual functions — full screen editing of text, side-scroll to accommodate long lines, full left and right-formatted text, automatic paging with definable headers and footers to each page, centering of text, automatic paragraphing and so on.

All of the formatting commands are entered as the first item on a line and are preceded by a comma, and all are dynamic, that is, their ef-

fect is immediately visible. Typing *Ctrl - F* (holding down *Clear* and pressing *F*) will show the text as it will be printed — hiding the formatting commands.

On the same *Stylograph* disc is another program, called *Mail Merge*. This will take a number of disc files and print them out as one document — one file can even finish in mid-sentence as long as the next continues from there. *Mail Merge* can also take a file of data and print multiple copies of a document inserting data where required.

The third program of this disc is *Spell Check*. This will check a text file prepared by *Stylograph* against a dictionary held on disc. Any words not found are displayed and you have the option of ignoring them, changing them, adding them or adding them to a supplementary dictionary.

Brian Cadge





## Stranded

**Program** *Crusoe* **Price** £6.00  
**Micro** Spectrum **Supplier** Automata UK, 27 Highland Road, Portsmouth, Hants.

Here is an adventure program that could be a big hit in the next few months. *Crusoe* puts you on a desert island armed only with your wits and some hints on the cassette box. The game never takes itself seriously, and the setting is a refreshing change from the ghouls and ghosts

what is going on are displayed, and you then decide what *Crusoe* will do. The vocabulary is large and the replies witty. The game seemed to work as it should, though entering "6" had dire results, and I was never sure why. *Crusoe* is intelligent: He won't, for example, try to walk on water and then drown, rather he informs you that he needs to get his swimming gear on. The *HELP* function is minimal, and I never did discover just how I got untangled from the cactus... but it was edible, which is more than can be said for all the fruit I found.



that most programmers' imaginations are limited to.

You are shown a map with *Crusoe* himself and various dangers and objects marked out, and as you get to the edge of the screen the map moves along to show the next section of the island. Reports about

The game uses colour, graphics and sound well, offering good value and (given *Crusoe's* tough nature) many hours of sometimes frustrating fun. I'd recommend it!

Simon Sprigett



## Man or mouse?

**Program** *Bongo* **Price** £6.95  
**Micro** Commodore 64 **Supplier** Anirog Software, 29 West Hill, Dartford, Kent.

A popular theme for arcade games is collecting objects from a cave or chamber that you make your way around by means of platforms and ladders, while avoiding some kind of monster in the cave. *Bongo* from Anirog Software uses exactly this theme.

The story behind the game is that the king (of nowhere in particular) has promised his daughter's hand in marriage to any man who recovers some stolen diamonds. *Bongo*, the super mouse, decides to have a crack at the challenge. The diamonds have been hidden in

some underground caves which are protected by the inevitable monsters. The caves also contain the equally inevitable platforms, ladders and chutes. To marry the princess, *Bongo* must collect all the diamonds.

Whether the princess is very keen on having to marry a mouse (even if he is a super mouse) if *Bongo* ever succeeds in getting all the jewels is another matter. However, it may never come to that because the monsters are very effective in protecting the diamonds.

So, although not very original, the game is actually quite good fun, and is certainly quite challenging. But there are plenty of other games like this on the market, many of them better than this one.

Richard Corfield



## Frustration

**Program** *Gems of Stradus Micro* Amstrad CPC 464 **Price** £7.95 **Supplier** Kuma Computers Unit 12, Horseshoe Park, Pangbourne, Berkshire.

*Gems of Stradus* follows the usual adventure format: overcome the hazards and find the treasure using the objects which you find lying around while in your travels.

This is a graphic adventure but since it is set in a maze all the pictures, which fill a quarter of the screen, look remarkably similar and are really only useful for spotting exits. The hazards, creatures and objects that you discover are all illustrated and are the best part of the graphics.

Moving is at first very confu-

sing because the cursor keys are used in a forward, back, left and right system — which results in rapid disorientation followed by frustration at getting lost so easily.

If you can master the movement, though, the adventure should be not insurmountably difficult to solve and therefore quite fun to play. If you do get stuck the *Help* facility gives clues that are as subtle as a brick!

More descriptive text would have improved the atmosphere and I would say that, unless you are really desperate for an adventure, I'd give this one a miss.

A maze is pretty boring compared to enchanted castles, sinister space ships and deserted mines.

Greg Pearson



## Self-taught

**Program** *The Complete Machine Code Tutor* **Price** £9.95  
**Micro** Commodore 64 **Supplier** New Generation Software Ltd, Bath, Avon.

Many home micro owners sooner or later become frustrated with the limitations of Basic, and turn to the possibilities of using machine code. However, the problem then arises of how to learn it.

One approach is to use a cassette based self-study course, and *The Complete Machine Code Tutor* from New Generation Software is one such course. It comes on two cassettes supplemented with a small manual.

The course is divided up into 24 lessons, each one descri-

bing a particular concept or group of instructions. Many lessons are followed by exercises containing some sample programs illustrating the content of the preceding lesson. The text is clear and concise, and the exercises are generally useful.

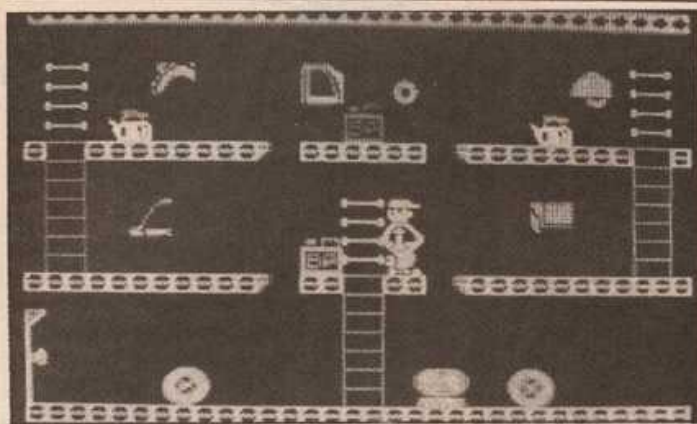
One very good feature is the 6502 simulator. This enables you to run the sample programs, or ones of your own, one instruction at a time, while displaying helpful comments and the contents of the registers and flags.

However, there is more to writing machine code than merely knowing what each instruction does, and this course does not go beyond the basics. As such it is a good introduction to machine code, but a good book would probably do just as well.

Richard Corfield







## Rolling tyres

**Program Automania Price** £5.95 **Micro Spectrum Supplier** Mikro-Gen, 1 Devonshire Cottages, London Road, Bracknell, Berks.

**A**rcade game fans roll up and buy this game: here are all the ingredients of a big success, with only a few small niggles to spoil the fun. The game took about five minutes to load from tape: a wasted five minutes in my case as it is incompatible with Interface 1 and the computer reset after loading. Switch off, unscrew Interface 1 and try again. This time, no problem.

Once the game is up and running, it rolls a selection of credits up the screen: study these carefully, some of the jokes are quite good. Sound is used well, and it's not their fault

that the Spectrum speaker is so feeble you can hardly hear it. (They allow you to turn it off, but you may not notice any difference!)

Colour is exploited to the full and the graphics are excellent: faintly reminiscent of *Jet Pac*. I had no instructions with my tape, so it took a while to work out what to do but after studying the demo mode it became clear that the aim is to assemble a car in the Automania workshop, all the while avoiding falling tools, etc.

Should be a winner, and well worth the money if you are a games player. It should be made compatible with Interface 1, though, or microdrive owners may be put off by the inconvenience of removing what is designed to be a semi-permanent attachment.

**Simon Springett**



## Mama mia

**Program Oh Mummy Micro** Amstrad CPC 464 **Price** £7.95 **Supplier** Amsoft, Brentwood House, 169 Kings Road, Brentwood, Essex.

**I**n *Oh Mummy* you play the role of an eminent archaeologist — dressed in flat cap, overalls and boots — leading a team of four in a quest to recover five royal mummies and as much treasure as possible from some Egyptian pyramids.

Everywhere you go — moving using either keyboard or joystick — you leave a trail of footprints. The passageways on the five levels of each pyramid are already clear and

all you have to do is excavate the 20 rooms on each floor by walking all round the room. Unfortunately there are two guardian mummies on each floor, one loose and one in an unknown room. These mummies chase you until you discover the key that allows you to move to the next floor. If you manage to dig up a magic scroll you can survive one mummy attack.

You can if you wish vary the speed and difficulty of play, as well as switch on or off the sound effects and background music.

In fact, this is not a bad arcade game, based loosely on *Armidar* with good cartoon-style graphics and sound.

**Greg Pearson**



## Cold comfort

**Program Pengo Micro BBC** **Price** £7.75 **Supplier** Watford Electronics, 33-35 Cardiff Road, Watford, Herts.

**P**engo is yet another version of that arcade game where you slide blocks of ice around whose title I can never remember. Ancient on the Spectrum and Commodore, it's even oldish on the BBC.

You are a penguin and the screen consists of you, square blocks of ice and a collection of blob monsters. Your only means of defeating the blob monsters is to slide the blocks

of ice towards them.

Pengo can only move a block of ice if it has a clear path, ie, doesn't have blocks next to it, so half the time your hapless bird has to 'melt' blocks to free a passage for them and thereby splatter the jelly things.

This is a good enough version of the game although on later screens all that happens is the number of monsters increase. Other features include a boundary which can send electric shocks and special cubes that do strange things as you put them in a line.

It's OK as a game but definitely too expensive.

**Ian Waltham**



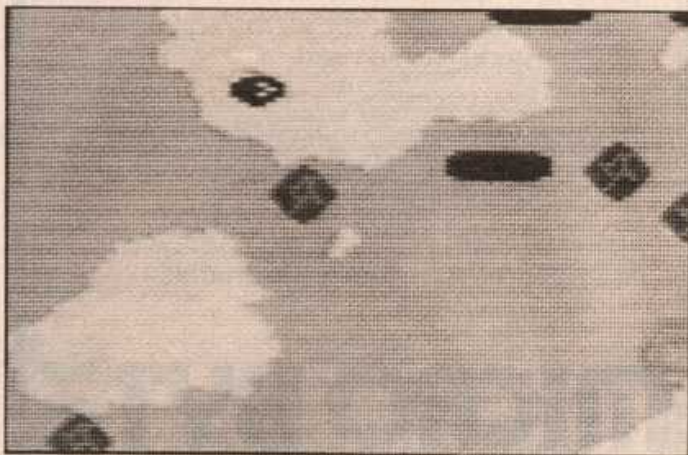
## Performing ant

**Program Turtle Jump Price** £6.99 **Micro Commodore 64** **Supplier** Romik Software, 272 Argyll Avenue, Slough, Berks.

**T**urtles have featured in a number of recent arcade games — *Turtle Jump*

You must get out of the treasure chest before the lid shuts or you will be trapped inside and lose one of your lives. You must also look out for the crocodiles, because when one appears all the turtles dive for cover, and if you are standing on one at the time you drown.

The game is well presented with nice graphics and title



from Romik Software is one of the latest. In this one you have to guide Ekim, a highly trained giant ant (oh really — whatever next), around a small group of islands by hitching a ride on the backs of passing turtles. The objective is to collect as much treasure from a chest full of gold as you can while the lid of the chest is open, and then return Ekim to his home on another of the islands.

screen and is really quite tricky. It is very difficult to land on the moving turtles and to stay on board as they float around. However, it soon becomes rather repetitive, and it is not really all that absorbing or exciting.

**Richard Corfield**





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## Quantum mechanics

**B Cornhill** shows how to get QL program listings on a ZX printer using a Spectrum and Interface 1

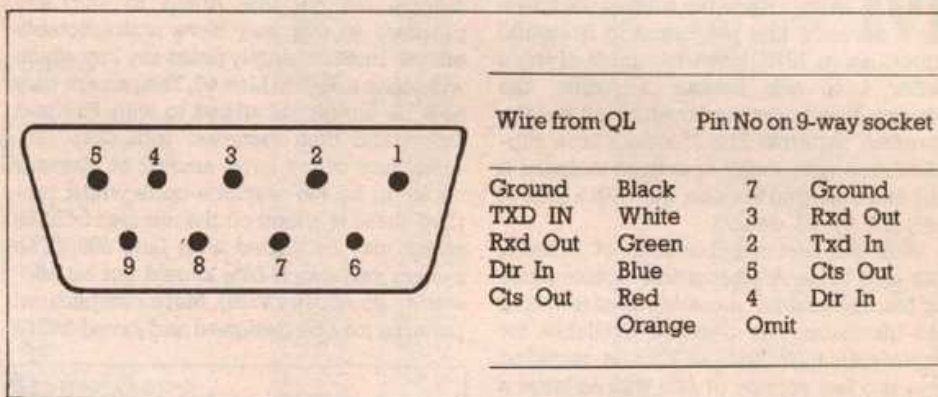
If like me you have up-graded to a QL from a Spectrum with Interface 1 and ZX Printer then this program may be of interest.

Using the Serial 1 port on the QL and the RS232 port on the Spectrum, it is possible to get listings of your QL programs printed out on the ZX Printer.

Firstly you will need to wire up a nine-way plug that fits into the Interface 1 socket to the 'printer-end' of Sinclair's QL printer cable. You will first have to take off the existing RS232 plug by carefully unsoldering the six wires. Then resolder the printer lead wires to the nine-way plug according to the diagram.

After you have made up the lead, plug the one end into the *Ser1* socket on the QL and the other into the RS232 socket on the Spectrum Interface 1.

Then enter the following program into the Spectrum and Run it (I used baud



600 for no particular reason).

```
10 FORMAT"r";600
20 OPEN#4;"r"
25 LET A$=INKEY$#4
26 IF CODE A$=10 THEN LET
    A$=CHR$13:GOTO 30
27 IF CODE A$< 32 THEN GOTO 25
```

```
30 LPRINT A$;
40 GOTO 25
```

Now Load the listing you want to print out into the QL, and enter the following on the

QL as direct commands:

```
BAUD 600
OPEN#6, SER1
LIST#6
```

Lo and behold, the ZX printer will spring into life and produce your QL listing.

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# Life, the universe and everything

A very sophisticated machine-code version of the classic game, *Life* by Richard Gain

Many versions of *Life* have been written since the rules of the game were first published in Scientific American in 1970. However, most of them suffer from one serious limitation; the playing area is far too small for all but the simplest patterns. The *Horizons* tape supplied free with every Spectrum includes a fast and colourful version, but with a grid of only 32 by 22 cells.

With the recent publication of *Wheels, Life and Other Mathematical Amusements* by Martin Gardner, a catalogue of new and old life-forms has become available for experimentation and all that is required now is a fast version of *Life* with as large a playing area as possible, hence the program below.

In case anyone has not come across the rules before, they are explained simply as follows:

- 1) Each cell on the grid has eight surrounding squares which determine the birth, survival or death of the cell in the next generation.
- 2) Any live cell with two or three live neighbours will survive to the next generation, otherwise it will die of isolation or overcrowding.
- 3) Any empty cell with exactly three live neighbours will become occupied in the next generation, ie, a birth.

This version runs on a grid of 160 x 160 cells each represented by one pixel. First type in the main program shown in Listing 1, then save onto tape with *Save "Life" LINE 100*. After verifying leave the tape in position and *New*. Now type in the Basic program in Listing 2 and *Run* it.

In response to the address prompts, enter the decimal bytes as shown until the program stops with the OK report. Next save the code on tape immediately following the Basic program, by typing *Save "Code" CODE 23296, 230*. Now rewind the tape and type *"Load"*. Playing the tape should now result in the playing of both parts of the program and the screen will then show a pattern on a white square which changes about once every second. Now just watch as some beautiful *Life* patterns emerge.

The Basic program consists of two main parts. Line 100 onwards is the initialisation routine and includes the pattern drawer beginning at Line 200. Any combination of *Plot* and *Draw* statements may be placed at Line 200, but these should always end with Line 500 *Goto 20*. This is the start of the main program loop.

Line 20 moves a copy of the screen pattern up to an area in high memory, simultaneously reordering the screen lines by using a version of the *Copy* routine in Rom. Line 40 is then repeatedly called to

calculate and redraw the subsequent generations. Do not use *Bread* to stop the program as this may have unpredictable effects. Instead, simply press any key which will cause a *Stop* in Line 40. The pattern may now be altered or added to with *Plot* and *Draw*, and then restarted with *Goto 20*.

Because of the large amount of memory taken up by the machine-code whilst running, there is a limit on the number of lines which may be added after Line 200. (The system variable *E-Line* should not be allowed to go above 24876). More complicated patterns may be designed and saved with a

drawing program like *Melbourne Draw*. Line 200 should then be simply *Load "SCREENS"*.

NB. The machine code resides in the printer buffer and any attempt to use the printer will erase it.

The assembly listing was produced on *Gens 3* from Hisoft's *Devpac* and includes calculated expressions. This is to allow any square array of side 8 to 160 (multiples of 8 only) to be set up by simply altering the value in line 180 before assembly. Smaller arrays give faster generation times, up to 5 or 6 per second for 64 x 64 cells.

## Listing 1

```
10 GO TO 110
20 RANDOMIZE USR 23325
30 PRINT AT 0,20; INVERSE 1;GE
N: LET GEN=GEN+1
40 RANDOMIZE USR 23330: IF INK
EY$>" THEN STOP
50 GO TO 30
100 LOAD "CODE
110 LET GEN=1
120 BORDER 0: CLS: PRINT "
      generation
OR n=2 TO 21: PRINT AT n,0;"
      ";AT n,26;"":NEXT n
200 PLOT 48,0: DRAW 159,159
210 PLOT 48,159: DRW 159,-159
500 GO TO 20
```

## Listing 2

```
100>FOR n=23296 TO 23296+230
110 INPUT (n),a
120 PRINT n,a
130 POKE n,a
140 NEXT n
```

23296	0	0	0	128	0
23301	0	0	0	0	0
23306	0	0	0	0	0
23311	0	0	0	128	128
23316	0	0	0	0	0
23321	0	0	0	0	2005
23326	174	130	2001	0	43
23331	33	2055	54	0	132
23336	17	0	96	1	132
23341	102	237	176	33	162
23346	96	17	6	202	6
23351	160	197	35	0	20
23356	197	6	0	26	7
23361	46	27	63	229	213
23366	17	162	0	203	0
23371	43	52	237	0	52
23376	35	52	35	52	25
23381	52	25	52	43	52
23386	43	52	209	225	35
23391	15	223	193	19	15
23396	215	35	235	1	12
23401	0	9	235	103	15
23406	201	33	6	202	17
23411	162	96	6	160	107
23416	19	6	20	197	209
23421	36	91	175	6	5
23426	79	25	111	121	162
23431	7	19	15	247	225
23436	119	35	193	15	34
23441	19	1	12	0	0
23446	193	15	202	205	10
23451	130	251	201	17	0
23456	200	6	192	33	0
23461	64	229	197	1	0
23466	0	237	175	193	5
23471	36	124	193	32	111
23476	10	125	193	248	2
23481	63	159	236	201	137
23486	103	16	209	192	3
23491	0	64	10	197	0
23496	0	0	229	197	0
23501	32	0	237	176	0
23506	225	35	124	230	0
23511	32	10	125	195	0
23516	111	63	159	230	0
23521	132	103	16	229	0
23526	0	0	0	0	0
23531	0	0	0	0	0
23536	0	0	0	0	0
23541	0	0	0	0	0



\*HISOFT GEN33 ASSEMBLER\*  
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Pass 1 errors: 00

```

      20 *C-      10 *D-
      30 ;A high-res fast
      40 ; life routine
      50
5B00      60      ORG 23296
5B00      70      DEFB 0,0,0,128,
0
5B05      80      DEFB 0,0,0,0,0
5B0A      90      DEFB 0,0,0,0,0
5B0F      100     DEFB 0,0,0,128,
128
5B14      110     DEFB 0,0,0,0,0
120
5B1D      130     ORG 23325
5B1D      140     CALL SWUP
5B20      150     RET
160
5B22      170     ORG 23330
00A0      180     EQU 160
000A      185     PART EQU SIDE/16
0A0A      190     CENT EQU SIDE*16+PA
RT
00A2      200     SIZE EQU SIDE+2
6684      210     GRID EQU SIZE*SIZE
0014      220     WIDE EQU SIDE/8
230
5B22      240     DI
5B23      250     LD HL,24575
5B26      260     LD (HL),0
5B28      270     LD DE,24576
5B2B      280     LD BC,GRID
5B2E      290     LDIR
5B30      300     LD HL,24576+5
IZE
5B33      310     LD DE,54288-C
ENT
5B36      320     LD B,SIDE
5B38      330     LINE PUSH BC
5B39      340     INC HL
5B3A      350     LD B,WIDE
5B3C      360     BYTE PUSH BC
5B3D      370     LD B,8
5B3F      380     LD A,(DE)
5B40      390     BIT RLCA
5B41      400     JR NC,EMPTY
5B43      410     CCF
5B44      420     PUSH HL
5B45      430     PUSH DE
5B46      440     LD DE,SIZE
5B49      450     SET 4,(HL)
5B4B      460     DEC HL
5B4C      470     INC (HL)
5B4D      480     SBC HL,DE
5B4F      490     INC (HL)
5B50      500     INC HL
5B51      510     INC (HL)
5B52      520     INC HL
5B53      530     INC (HL)
5B54      540     ADD HL,DE
5B55      550     INC (HL)
5B56      560     ADD HL,DE
5B57      570     INC (HL)
5B58      580     DEC HL
5B59      590     INC (HL)
5B5A      600     DEC HL
5B5B      610     INC (HL)
5B5C      620     POP DE
5B5D      630     POP HL
5B5E      640     EMPTY INC HL
5B5F      650     DJNZ BIT
5B61      660     POP BC
5B62      670     INC DE
5B63      680     DJNZ BYTE
5B65      690     INC HL
5B66      700     EX DE,HL
5B67      710     LD BC,32-WIDE
5B6A      720     ADD HL,BC
5B6B      730     EX DE,HL
5B6C      740     POP BC
5B6D      750     DJNZ LINE
760
5B6F      760     LD HL,54288-C
ENT
5B72      770     LD DE,24576+5
IZE
5B75      780     LD B,SIDE

```

```

5B77      790     LLINE PUSH BC
5B78      800     INC DE
5B79      810     LD B,WIDE
5B7B      820     BEYTE PUSH BC
5B7C      830     PUSH HL
5B7D      840     LD H,91
5B7F      850     XOR A
5B80      860     LD B,8
5B82      870     BBIT LD C,A
5B83      880     LD A,(DE)
5B84      890     LD L,A
5B85      900     LD A,C
5B86      910     OR (HL)
5B87      920     RLCA
5B88      930     INC DE
5B89      940     DJNZ BBIT
5B8B      950     POP HL
5B8C      960     LD (HL),A
5B8D      970     INC HL
5B8E      980     POP BC
5B8F      990     DJNZ BBYTE
5B91      1000    INC DE
5B92      1010    LD BC,32-WIDE
5B95      1020    ADD HL,BC
5B96      1030    POP BC
5B97      1040    DJNZ LLINE
5B99      1050    CALL SWDOWN
5B9C      1060    EI
5B9D      1070    RET
1080
5B9E      1090    SWUP LD DE,51200
5BA1      1100    LD B,192
5BA3      1110    LD HL,16384
5BA6      1120    LOOP PUSH HL
5BA7      1130    PUSH BC
5BA8      1140    LD BC,32
5BA9      1150    LDIR
5BAD      1160    POP BC
5BAE      1170    POP HL
5BAF      1180    INC H
5BB0      1190    LD A,H
5BB1      1200    AND 7
5BB3      1210    JR NZ,JUMP
5BB5      1220    LD A,L
5BB6      1230    ADD A,32
5BB8      1240    LD L,A
5BB9      1250    CCF
5BBA      1260    SBC A,A
5BBB      1270    AND 248
5BBD      1280    ADD A,H
5BBE      1290    LD H,A
5BBF      1300    JUMP DJNZ LOOP
5BC1      1310    RET
1320
5BC2      1330    SWDOWN LD DE,16384
5BC5      1340    LD B,192
5BC7      1350    LD HL,51200
5BCA      1360    LLOOP PUSH HL
5BCB      1370    PUSH BC
5BCC      1380    LD BC,32
5BCF      1390    LDIR
5BD1      1400    POP BC
5BD2      1410    POP HL
5BD3      1420    INC H
5BD4      1430    LD A,H
5BD5      1440    AND 7
5BD7      1450    JR NZ,JJUMP
5BD9      1460    LD A,L
5BDA      1470    ADD A,32
5BDC      1480    LD L,A
5BDD      1490    CCF
5BDE      1500    SBC A,A
5BDF      1510    AND 248
5BE1      1520    ADD A,H
5BE2      1530    LD H,A
5BE3      1540    JJUMP DJNZ LLOOP
5BE5      1550    RET

```

Pass 2 errors: 00

```

BBIT      5B62      BBYTE      5B7B
BIT        5B40      BYTE        5B3C
CENT       0A0A      EMPTY       5B5E
GRID       6684      JJUMP      5B63
JUMP       5B6F      LINE        5B38
LLINE      5B77      LLOOP       5B9A
LOOP       5BA6      PART        000A
SIDE       00A0      SIZE        00A2
SWDOWN     5BC2      SWUP        5B9E
WIDE       0014

```

Table used: 226 from 335



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time as a key A-Z. If so, the appropriate keyword is printed and this keyword is also loaded into the keyboard buffer. The program has one disadvantage and this is that when Editing Basic program lines the keywords have to be typed in normally.

Type in the program Run and save a copy of it before it is Run. Then Run the program

and after a few seconds the message Which Key will appear on the screen. Enter a letter from A to Z and then type in the keyword you want for that key. When all of the letter keys have been defined, type \* in response to Which Key. The message New The Basic Program will appear on the screen and you should then type New followed by CSA-VEM"SINGLEKEY", 32400, 32650, 32400.

To use the defined keywords in future, type Clear 100, 32399 and load in the machine code. You will then need to type Exec and the single key entry will be ready for use.

The list of possible keywords is shown in Listing 2.

Listing 1

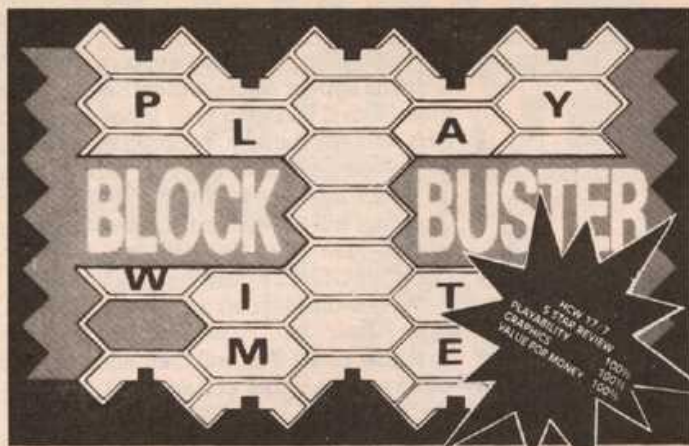
```
SINGLE KEY ENTRY
10 CLEAR900,32399
20 DIM A$(150),A(150):FDRA=1 TO 150:A$(A)="":NEXT
30 DATA 134,126,183,1,106,142,126,156,191,1,107,57,52,34,129,65
40 DATA 37,6,129,90,34,2,32,3,53,34,57,183,126,249,182,255
50 DATA 0,132,64,129,0,38,241,247,126,250,16,158,136,49,63,16
60 DATA 159,136,48,31,52,16,182,126,249,72,183,126,249,246,126,249
70 DATA 142,126,121,58,16,174,132,53,16,166,160,129,127,34,14,167
80 DATA 128,124,126,250,52,48,189,181,74,53,48,32,236,128,128,189
90 DATA 181,74,167,128,246,126,250,32,175,0,0
100 FOR A=32400 TO 32506
110 READ B
120 POKE A,B
130 NEXT A
140 Z=0
150 X=1
160 FDRA=32819 TO 33089
170 Y=PEEK(A):IFY>127 THEN FL=A-Z:GOTO360
180 Z=Z+1:MID$(A$(X),Z,1)=CHR$(Y)
190 NEXT
200 FDRA=33226 TO 33359
210 Y=PEEK(A):IFY>127 THEN FL=A-Z:GOTO380
220 Z=Z+1:MID$(A$(X),Z,1)=CHR$(Y)
230 NEXT
240
250
260
270 CLS:INPUT"WHICH KEY ":K$:K=ASC(K$)
280 IF K$="" THEN EXEC 32400:PRINT"NEW THE BASIC PROGRAM":STOP
290 IF K<65 OR K>90 THEN SOUND1,1:GOTO270
300 K=K*2:K=32377+K
310 INPUT"WHICH KEYWORD ":L$:M=LEN(L$)
320 FOR L=1 TO 101
330 IF MID$(A$(L),1,M)=L$ THEN 350
340 NEXT:PRINT"NO SUCH KEYWORD":GOTO 270
350 Y=A(L):GOSUB 390:GOTO270
360
370 MID$(A$(X),Z+1,1)=CHR$(Y-128):A(X)=FL:X=X+1:Z=0:GOTO190
380 MID$(A$(X),Z+1,1)=CHR$(Y-128):A(X)=FL:X=X+1:Z=0:GOTO230
390
400 W$=HEX$(Y):IFLEN(W$)=3 THEN W$="0"+W$
410 H=VAL("&H"+LEFT$(W$,2))
420 I=VAL("&H"+RIGHT$(W$,2))
430 POKE K,H:POKE K+1,I
440 RETURN
```

Listing 2 LIST OF KEYWORDS

FOR	GO	REM	ELSE
IF	DATA	PRINT	INPUT
END	NEXT	DIM	READ
RUN	RESTORE	RETURN	STOP
CONT	LIST	CLEAR	NEW
CLOAD	CSAVE	OPEN	CLOSE
SET	RESET	CLS	MOTOR
AUDIO	EXEC	SKIPF	DEL
TRON	TROFF	LINE	PCLS
PRESET	SCREEN	PCLEAR	COLOR
PAINT	GET	PUT	DRAW
PHODE	PLAY	DLOAD	RENUM
TO	SUB	FN	THEN
SGN	INT	ABS	POS
SQR	LOG	EXP	SIN
TAN	ATN	PEEK	LEN
VAL	ASC	CHR\$	EOF
FIX	HEX\$	LEFT\$	RIGHT\$
POINT	INKEY\$	MEM	VARPTR
			RND
			COS
			STR\$
			JOYSTK
			MID\$
			INSTR



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## Commodore à la carte

A machine-code routine giving a neat on-screen menu facility from  
**Adrian Warman**

**T**he program gives the Commodore 64 a powerful menu selection program which can be incorporated into any program where at some point it is required for the user to choose from a number of different options.

The program will be printed over two weeks and this first installment will be continued next week.

Often screen menus show the different options each with a code number — eg, 1, 2, 3 — and you select which option you want by keying in the relevant code.

Rather than that, the program listed below displays a 'selection cursor' highlighting one item on the menu. The cursor can be moved around the items in the menu until the desired option is highlighted with the cursor. A single key-press will then return control back to the main program in which this utility has been incorporated — together with information of which item has been selected.

Three listings are included — an assembly-language version, a Basic Loader version for those without an assembler and a short demonstration program showing the menu facility in use. This week we print the first half of the program notes and assembly language listing. The Basic Loader and demonstration program will be printed next week.

### Program Operation

To start the program, either type in the assembly-language listing or load and run the Basic Loader program. This will place the machine code program into the area of memory from \$C000 to \$C111.

However, the menu routine will not be

initialised until the command `SYS 49152` performed, this will modify the `Usr` vector so that the `Usr()` function can be used to perform the menu selection.

Once the routine is initialised, its operation can be invoked by using a command of the form:

```
item=Usr (dummy), retain, wrap, skip, xstart
xend,ystart,yend
```

For details of each of the parameters, see the Program Description section below. The easiest way to see how it works is to look at the similar format command at Line 150 of the demonstration program.

Once the menu selection process is started, the selection cursor can be moved through the menu using the `F1` and `F7` function keys. To select the currently highlighted item, press the `Return` key. This will exit the routine. The value returned from `Usr` is the item number of the highlighted menu item. Note that the top element in the menu is always referred to as item number 1, and the second element is always item 2, and so on, regardless of the number of blank lines between each menu item. All keys apart from `F1`, `F7` and `Return` are ignored.

### Program Description

As described above, the command to invoke the Menu Selection process is:

```
Item=Usr(dummy),retain,wrap,skip,xstart,
xend,ystart,yend
```

All the parameters above are values which are used to select the tasks performed in operating the menu selection routine.

**Item.** When the selection process has finished, the chosen menu item number

will be returned, and can be placed into item.

**Dummy.** This is any number or numeric variable. It will not be used by the routine.

**Retain.** Once the selection has been made, the programmer may wish to keep the highlight, or else remove it. If `retain` is 0, the highlight will be removed when the selection is made. If `retain` is 1, the highlight will remain after selection is made. Any other value of `retain` is illegal, and will produce an error message.

**Wrap.** As the selection cursor is moved up and down the menu (see below), the cursor will reach either the top or bottom of the list. If `wrap` is 1, then the cursor will wrap-around; in other words, when the cursor reaches the top, any further attempt to move the cursor up-wards will result in the cursor moving to the bottom, and vice-versa. If `wrap` is 0, then the cursor cannot wrap-around. Any other value for 'wrap' is illegal, and will produce an error message.

**Skip.** A spacing may be required between each menu item, in order to make the menu easier to read. `Skip` is used to indicate how many lines to move by, when transversing the menu. A value of 0 for `skip` is illegal, as is any value greater than 5. This upper limit could be changed if desired.

**Xstart.** The menu is assumed to be a column of items, starting at the column with the number given as `xstart`. The leftmost column has value 0, and the rightmost has value 39. Any value outside this range is illegal.

**Xend.** This value gives the column number of the end of the highlight area. Again, this is in the range of 0 to 39 inclusive, but the value must be greater than `xstart`.

The highlight effect is visible by the characters being reversed. However, if no characters are present, then no highlight

```
00001 0000      *=$C000
00002 C000      ;
00003 C000      ;menu selection program.
00004 C000      ;
00005 C000      ;by a.warman.
00006 C000      ;
00007 C000      ;
00008 C000      ;define rom routines and system locations.
00009 C000      ;
00010 C000      hibase=$0288
00011 C000      tstcom=$aeFD
00012 C000      getbyt=$b79e
00013 C000      error=$a437
00014 C000      getin=$ffe4
00015 C000      usr=$0311
00016 C000      ;
00017 C000      ;define storage locations.
00018 C000      ;
00019 C000      retain=$008b
00020 C000      wrap=$008c
00021 C000      skip=$008d
00022 C000      row=$008e
00023 C000      xstart=$00fb
00024 C000      xend=$00fc
00025 C000      ystart=$00fd
```



can appear. The effect is best demonstrated by trying the example Basic demonstration program.

For the column numbers, if *xstart* is, say, 10, and *xend* is, say 18, then if the cursor is on a valid menu item row, and some characters are present in columns 10 to 15 inclusive, then they will be highlighted.

*Ystart*. This is the row number on the screen of the top-most item of the menu. The value must be in the range of 0 to 24.

*Yend*. This is the lower row of the menu. Again, it must be in the range 0 to 24 but *yend* must be greater than *ystart*.

It is very important that there is a correspondence between the *y* values and the *skip* value. Consider the following example:

item = *Usr* (0),1,1,2,10,20,1,9

which sets up the following effects. When the item is selected, the highlight will remain. As the cursor is moved around, it can wraparound. Finally, there is one blank line between each menu item. The highlight can only appear in columns 10 to

20 inclusive. There should be menu items on rows 1,3,5,7, and 9; since these are the only rows that can be highlighted. Note that there is a 'skip' value of two, which is one blank line between each highlighted line.

## How the Program works

Please refer to the Assembly-code listing while following the description.

10-15. The various Rom routines and system variable locations used by the program.

19-31. The storage locations for use by the program. In order to make the routine as fast as possible all addresses are in 'zero-page'. Since there are insufficient locations assigned to the user, some of the random number seed locations have been used as well.

36-40. This is the code which alters the *Usr* vector to perform the menu selection program.

44. Any parameter value which is out of range must cause an error message. This is a jump to the error routine, placed here so that branches can be made from within the program.

48-50. Calculates the value for *retain*. The *A* register is loaded with the smallest value which

is greater than the maximum for this parameter. Since *retain* can only have the values 0 and 1, the next largest number is 2. Hence *A* is loaded with 2. A sub-routine call is made to *getval*, which will get the next value in the command. If this value is illegal (by comparison with the *A* register), then an error will be produced. Otherwise, the value found will be returned in the *X* register, and with the *A* value unchanged. The value in *X* is kept as the *retain* command.

51-52. Finds the value for *wrap*.

53-57. Finds the value for *skip*. The maximum value is 5, hence *A* is loaded with the value 6. On return, a check is made to see if the value is 0 (which is illegal), and if so, an error is produced.

58-61. Finds the value for *xstart*. This cannot exceed 39. The value found is also placed into *posn*, which is used to calculate the position in memory of the menu.

62-69. Finds the value of *xend*. This has *xstart* subtracted from it to check that *xend* is larger than *xstart*, and also to find the width of the menu.

The continuation of the assembly language listing and the Basic Loader and demonstration programs will be printed in the concluding installment of this short series next week.

```

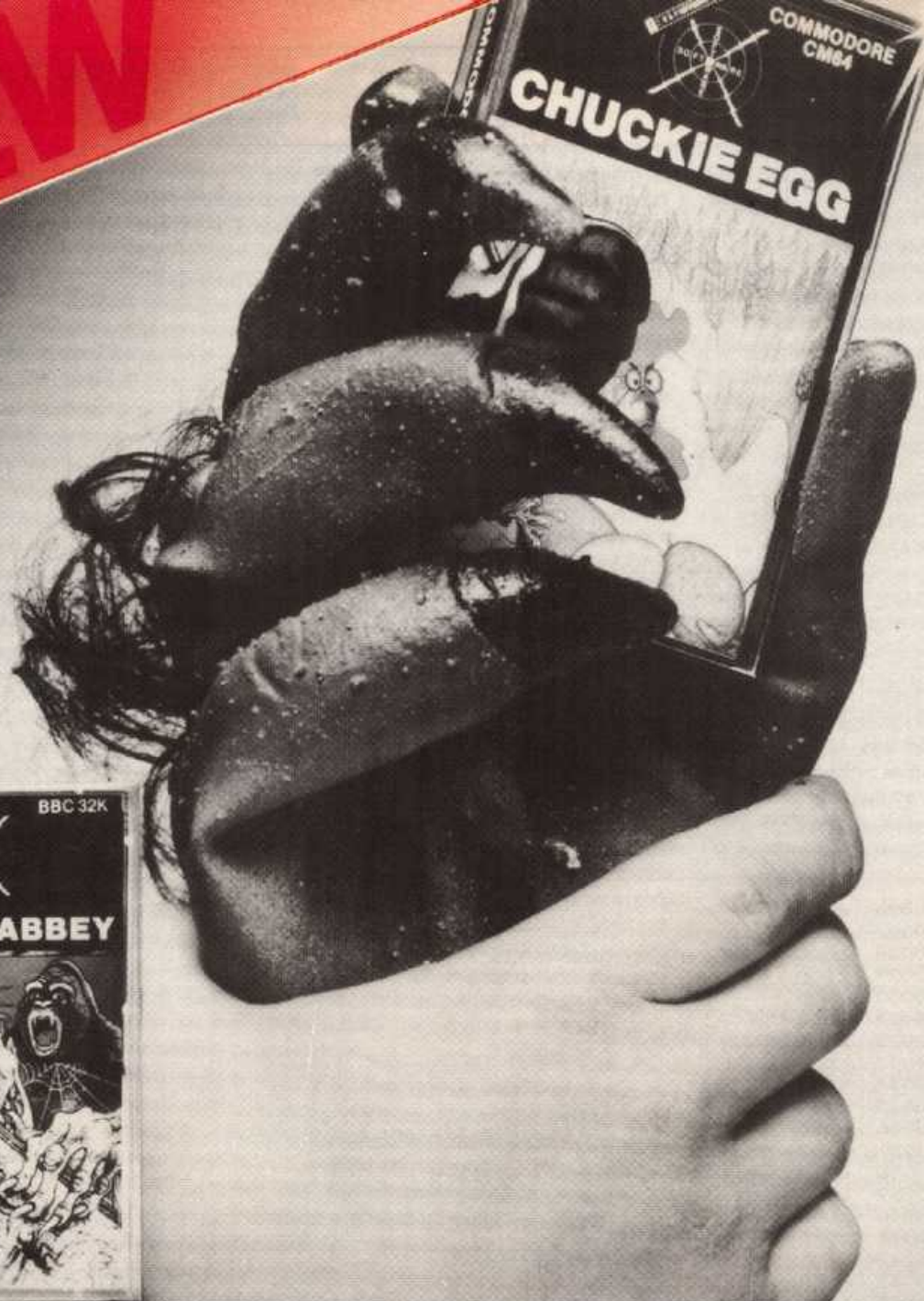
00026 c000          yend=$00fe
00027 c000          from=$0014
00028 c000          posn=$033c
00029 c000          width=$033e
00030 c000          temp=$033f
00031 c000          key=temp
00032 c000          ;
00033 c000          ;
00034 c000          ;initialise program.
00035 c000          ;
00036 c000 a9 0e      init   lda #<start
00037 c002 8d 11 03   sta    usr
00038 c005 a9 c0      lda    #>start
00039 c007 8d 12 03   sta    usr+1
00040 c00a 60        rts
00041 c00b          ;
00042 c00b          ;error jump.
00043 c00b          ;
00044 c00b 4c ee c0   badnum jmp badval
00045 c00e          ;
00046 c00e          ;program area.
00047 c00e          ;
00048 c00e a9 02      start  lda #$02
00049 c010 20 f3 c0   jsr    getval
00050 c013 86 8b      stx    retain
00051 c015 20 f3 c0   jsr    getval
00052 c018 86 8c      stx    wrap
00053 c01a a9 06      lda    #$06
00054 c01c 20 f3 c0   jsr    getval
00055 c01f 86 8d      stx    skip
00056 c021 e0 00      cpx    #$00
00057 c023 f0 e6      beq    badnum
00058 c025 a9 28      lda    #$28
00059 c027 20 f3 c0   jsr    getval
00060 c02a 86 fb      stx    xstart
00061 c02c 8e 3c 03   stx    posn
00062 c02f 20 f3 c0   jsr    getval
00063 c032 86 fc      stx    xend
00064 c034 8a        txa
00065 c035 38        sec
00066 c036 e5 fb      sbc    xstart
00067 c038 8d 3e 03   sta    width
00068 c03b f0 ce      beq    badnum
00069 c03d 30 cc      bmi    badnum

;find parameters.
;retain highlight?
;wrap around ends?
;what is skip?
;is skip ok?
;what is xstart?
;prepare part of calculation.
;what is xend?
;is xend valid?
;calculate width of menu column.

```



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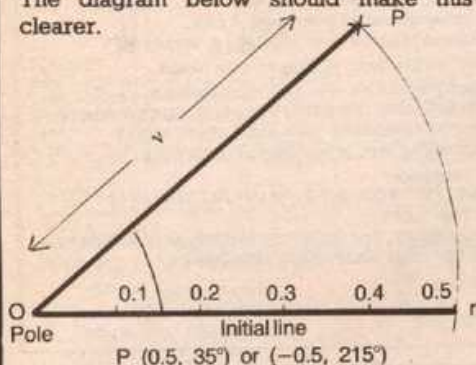
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## Playing it cool

Robert Crook fixes a point using polar co-ordinates

The position of a point in a plane is often determined by Cartesian positioning, giving its co-ordinates ( $x, y$ ) relative to two fixed axes (the  $x$  axis and the  $y$  axis). It is sometimes useful to fix the position of a point by polar co-ordinates where a fixed line is chosen as the initial line and we fix a point by saying that its co-ordinates are ( $r, \theta$ ). Here  $r$  represents the distance between the fixed pole of the line and the point  $P$  on the line. The angle,  $\theta$ , represents the angle between the line extending from the pole to the point  $P$ , and the initial line. The diagram below should make this clearer.



The task of plotting polar co-ordinates is often very time-consuming and small mistakes can often creep in and ruin results. This program, written for the BBC Model B, allows you to input any equation and then goes on to show the polar graph. You do not need to be a mathematician to appreciate some of the colourful patterns produced.

To use the program you must enter your equation using the letter  $A$  to represent Angle. You must also enter the angle increments (the smaller the more accurate) and the range of degrees you wish to examine.

### An example calculation

Plot the polar graph of  $r^2 = 5^2 \cos(2^*A)$ . If any mistakes are going to be made it will be at this stage. Although the equation seems to be complete and ready for input, it will not at present give the expected results. In nearly all cases you will use  $A$  to represent degrees not radians and so to get the correct graph you must enter the word **Rad** in the equation.

ie,  $r^2 = 5^2 \cos \text{RAD}(2^*A)$

Of course, if you intend  $A$  to represent radians then the word **Rad** should be omitted.

The equation must be entered in the form  $r...$  so the correct equation will be:

$r = \text{SQR}(5^2 \cos \text{RAD}(2^*A))$

Here is what you would enter:

Equation  $r = \text{SQR}(5^2 \cos \text{RAD}(2^*A))$

Increments Any number which will give suitable results.

Roots Y (We have used a SQR)

Root=(1/? ) 2 (We used SQR.SQR( $r$ )= $r^{1/2}$ )

In the last equation you will see that I have put  $3/2$  in the root column. The program asks for the root to be entered as a fraction, so if the root was  $(1/(1.5))$  — as it was in this case — then it must be entered as  $3/2$ . The fraction must be in its lowest terms. Because

### Some example equations to try

Equation ( $r=...$ )	Increments	Roots	End angle	Description
$5^* \cos \text{RAD} S$	2	None	360	Circle
$\text{SQR}(5^2 \cos \text{RAD}(2^*A))$	5	2	360	$\infty$
$0.5^*(1+0.5^* \cos \text{RAD}(A))$	2	None	360	Limacon without loop
$5^* \text{RADA}/100$	2	None	360	Archimedean spiral
$100^5/\text{RADA}$	2	None	360	Reciprocal spiral
$\text{SQR}(5^2 \text{RADA}/100)$	2	2	720	Parabolic spiral
$\text{SQR}(100^5/2 \text{RADA})$	2	2	720	Lituus
$\cos \text{RAD}(9^*A)$	2	None	360	9 petals
$\cos \text{RAD}(2^*A)$	2	None	360	4 petals
$\sin \text{RADA}^* \cos \text{RADA}$	2	None	360	4 petals
$12/(5-4^* \cos \text{RADA})$	5	None	360	ellipse
$(51.5^* \cos \text{RAD}(1.5^*A))/(1/1.5)$	2	$3/2$	720	'Flower head'

which is represented by  $(1/2)$

End angle 360

The computer will now go on to display the graph which in this case is called Bernoulli's Lemniscate ( $\infty$  in shape).

of the way I have used error trapping within the program, if you **Escape** into it you will be unable to re-run the program. To overcome this set up a user-definable key as follow:

\*Key 9 Print 0/0[M Run]M

To re-run merely press this key.

```

10REM *****
20REM* Polar Co-ordinates *
30REM* By *
40REM* R.Crook (C) 1984 *
50REM*****
60ON ERROR GOTO 280
70X=0:Y=0
80MODE 7
90VDU 23:820210:0:0:
100PRINTTAB(5,5):CHR$(131):CHR$(141):"POLAR CO-ORDINATES":PRINTTAB(5,6)
110INPUT TAB(5,10)"Equation:r="E$
120INPUT TAB(5,12)"Increment",I
130INPUT TAB(5,14)"Any roots operating ",T$
140IF T$="Y" OR T$="y" THEN INPUT TAB(5,16)"Root=(1/? )
    (As a fraction) "R$:PROCDenom
150IF T$="Y" AND T$="y" THEN R$="0"
160R=EVAL(R$)
170INPUT TAB(5,18)"End angle "F
180IF F/I<0 THEN CLS:GOTO 120
190IF R/2=INT(R/2) AND R(I)<0 THEN G=1 ELSE G=0
200C=0:C=0:A=0:H=0:DIM X(F/I+2),Y(F/I+2),AX(F/I+2),AY(F/I+2)
210X(C)=COS(RAD A)*EVAL(E$)
220Y(C)=SIN(RAD A)*EVAL(E$)
230IF G=1 THEN CO=CO+1:AX(CO)=-X(C):AY(CO)=-Y(C)
240IF ABS(X(C))>H THEN H=ABS(X(C)):AN=A:S=0
250IF ABS(Y(C))>H THEN H=ABS(Y(C)):AN=A:S=1
260IF ABS(X(C))>H THEN H=ABS(X(C)):AN=A:S=1
270C=C+1
280IF ERR=17 OR ERR=25 THEN CLS:REPORT:END
290A=A+I
300IF A(F/I) THEN 210
310TP=C
320PROCscale
330MODE1:GCOL 0,3
340COLOUR2:PRINTTAB(0,31)"r=":E$
350PROCdraw
360FX15,0
370T=GET:RUN
380END
390DEFPROCscale
400IF S=0 THEN SX=500*COS(RAD AN)/H ELSE SX=500*SIN(RAD AN)/H
410SC=H/5
420ENDPROC
430DEFPROCdraw
440R=500
450REPEAT
460ANGLE=0
470MOVE540+R*COS(RAD ANGLE),512+R*SIN(RAD ANGLE)
480REPEAT
490ANGLE=ANGLE+20
500DRAW 640+R*COS(RAD ANGLE),512+R*SIN(RAD ANGLE)
510UNTIL ANGLE=360
520R=R-100
530UNTIL R=0

```

continued over the page



```

540VDU 29,640:5121
550PROCPlot("X","Y")
560PROCPlot("AX","AY")
570VDU 5
580GCOL 0,3
590X=0
600REPEAT
610MOVE X,0
620PRINTX/100:SC
630X=X+100
640UNTIL X=600
650GCOL 0,2
660MOVE 510,0:PRINT"r"
670ENDPROC
680DEFPROCPlot(A#,B#)
690MOVE0,0
700C=0:X=0
710REPEAT
720GCOL 0,2+X
730X=NOT X
740PLOT 69, SX+EVAL(A#+"("+STR#C+"")
    ", SX+EVAL(B#+"("+STR#C+"")")
750C=C+1
760PLOT 69, SX+EVAL(A#+"("+STR#C+"")
    ", SX+EVAL(B#+"("+STR#C+"")")
770PLOT 65,0,0
780UNTIL C=TP
790ENDPROC
800DEFPROCDenom
810L=LEN(R#)
820A=1:K=1
830IF MID$(R#,A,1)="/" THEN K=A-1
840A=A+1
850IF A(L+1) THEN B30
860R#=MID$(R#,1,K)
870ENDPROC

```

In case you were wondering what had happened to the end of Charis Charalambous' sound enveloping program printed last week — we ran out of space — so here it is!

```

1790 DEFPROCLEAR
1800PRINTTAB(0,10)SPC39;TAB(0,25)SPC39
1810ENDPROC
1820*****
1830DEFPROCSDO(H%):PROCSOUND
1840P%=4*H%
1850SOUNDH%,EX(16+P%),EX(17+P%),EX(18+P%)
1860ENDPROC
1870*****
1880DEFPROCSDO_OFF:#FX15
1890ENDPROC
1900DEFPROCINSTR
1910VDU19,1,11;0;19,0,2;0;19,3,0;0;:COLOUR3:CLS
1920PRINT""This is an envelope definer, making
    use of the BBC's envelope abilities."
1930PRINT"You are displayed with the current
    envelope's & sound's parameters."
1940PRINT"Use the cursor keys for moving the
    arrow (";:COLOUR2:PRINT;CHR# 255;:COLOUR3:
    PRINT;") around."
1950PRINT"The first parameter is the env. number
    and you can change whatever you like."
1960PRINT"The program tests for invalid entries
    so experiment with any number you want."
1970PRINT"The fuction keys do the following...."
1980FOR F=0 TO 3:COLOUR2:PRINT"f";F;:COLOUR3:PRINT;
    STRING$(10,".");"SOUND'S CHANNEL ";F;:NEXT
1990COLOUR2:PRINT"f4";:COLOUR3:PRINT;STRING$(10,".")
    ;"Stop's all sound"
2000COLOUR2:PRINT"f9";:COLOUR3:PRINT;STRING$(10,".")
    ;"Moves you TOP_LEFT"
2010COLOUR1:PRINTTAB(5,30)"PLEASE PRESS SPACE/BAR";
    REPEAT:UNTILGET=32:VDU20:CLS:ENDPROC

```



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# Open Forum

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed.

## Radio alphabet

### on Spectrum

Radio Alphabet is a short listing that converts the message typed in into the standard radio alphabet. This is used by

aircraft, ships etc because the words produced cannot be mistaken as letters might be (for example 'f' and 's' often sound alike on radio).

When using the program, substitute asterisks (\*) for spaces. Messages should be no longer than 300 characters, although this can be changed by altering Line 20. The

program is especially useful if you are trying to learn the radio alphabet. There are some slight variations on the alphabet, such as India which is commonly known as Indigo, but this is the world standard version.

#### Program notes

Line 5 Pokes caps lock on  
Lines 10-20 Define arrays.  
Lines 40-60 Scan input for spaces and end of message  
Lines 70-120 Read from data statement and print words  
Line 130 Jump back to input routine.  
Line 140 Single data statement containing all words in alphabet.

```
1 REM RADIO ALPHABET
2 REM ALAN PERSSSE 1984
5 POKE 23658,8
10 DIM X$(9)
20 DIM Y$(300)
30 INPUT "ENTER MESSAGE>"; LIN
40 FOR Z=1 TO LEN Y$
50 IF Y$(Z)="*" THEN LET X$=""
60 IF Y$(Z)=" " THEN GO TO 30
70 FOR W=1 TO (CODE Y$(Z)-64)
80 READ X$: NEXT W
90 RESTORE
100 PRINT X$( TO )
120 NEXT Z
130 GO TO 30
140 DATA "ALFA", "BRAVO", "CHARLI",
"DELTA", "ECHO", "FOXTROT", "GOLF",
"HOTEL", "INDIA", "JULIET", "KIL",
"LI", "MIKE", "NOVEMBER", "OSC",
"PAPA", "QUEBEC", "ROMEO", "SIE",
"RRA", "TANGO", "UNIFORM", "VICTOR",
"WHISKEY", "X-RAY", "YANKEE", "ZULU"
```

Radio alphabet  
by Alan Persse

## Arcade Avenue



### Panic time

Ultimate games week. First off let's deal with the letters I have had about *Sabre Wulf*. Gerald Dawson of Kenilworth has finished the game with a score of 100,820 even though he was not "playing for points". He tips us that the four medallions pieces are found in any of the 25 dead end clearings and, of the incredible 256 locations, 71 need not be entered at all.

Guy Fothergill of Leicester has completed the game with 68% and 76,965 points and has mapped 251 of the rooms.

Many thanks to Michael Smith of London who as well as

sending in a score of 220,110 and 89% has offered many useful hints:

- 1) Look out for red rocket shaped objects (statuettes) as these give you extra lives. The program only allows me nine extra lives - this is a bug
- 2) Keep fight button pressed whilst moving as monsters appear in your path.
- 3) Use the orchids as much as possible except the white.
- 4) Do not stay too long on the same screen or the fireball appears - move on to a new screen and then return and it will have gone.
- 5) The medallion pieces look like flashing parts of a jig-saw puzzle.
- 6) If in trouble move between two screens near an orchid bud until it blooms - the blue flower is best as it doubles your speed and makes you invincible.

Paul Holden of Bolton, whose

best score is 49%, warns that the flames and the *Sabre Wulf* are both invincible and fatal if touched. He explains that yellow orchids stop you but clear all hazards on the screen, red orchids either slow you down or make the keys work in reverse, although they do make you invincible, white orchids return you back to a normal state.

On to *Atic Atac*. Thanks to Steven Stoner of Southampton who has scored 99% (as has his mum whilst his seven year-old brother has scored 89%) for the following tips:

- 1) Always keep your finger on the fire button as this will save you in times of panic.
- 2) Open as many coloured doors as possible as this increases the percentage. They will remain open.
- 3) You must assemble the parts of the AGG key in the correct order in your scroll before

passing through the main door.  
4) The cross makes Dracula back, off, the bag of money lures the hunchback away from the door and the spanner will destroy Frankenstein.  
5) Although the keys and the AGG parts do appear with some randomness the same locations occur fairly often - so note them down."

Steven is keen to know if 100% is possible of is it an unobtainable goal to keep people playing. So please write in and let me know if anyone has done it.

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.



## Areas

on Vic20

The program calculates the approximate area under the graph of a function defined by the user. This will be a useful check for many problems in mathematics and physics.

The function is defined in Line 100, and in listing provided is the square root of X. The

program can thus be modified for other functions by altering the definition of function.

Once the required function has been declared the program can be run. The computer asks for the lower and upper limits which correspond to the X-coordinates between which the area is to be worked out. The upper limit must always be greater than the lower limit, if not the user is asked to input new values.

After the successful input of the limit the

program calculates an approximate value for the function defined, using Simpson's rule. This is then printed out.

### Variables

Function A contains the equation of the graph.

LL = lower limit

UL = upper limit

NS = number of strips

H = strip width

SM = area under the graph

X = x co-ordinate

Y = y co-ordinate

C = counter

```

2 REM AREA APPROXIMATION
3 REM COPYRIGHT
5 REM ***CALCULATE AREA***
10 PRINT " "
90 REM ***FUNCTION***
92 REM
95 REM
100 DEF FNA(X)=SQR(X)
200 INPUT "LOWER LIMIT ";LL
210 INPUT "UPPER LIMIT ";UL
220 IF UL<LL THEN PRINT "UPPER LIMIT MUST BE GREATER THAN LOWER LIMIT!";
GOTO200
230 PRINT "PLEASE WAIT,          CALCULATING AREA."
250 NS=1000
300 H=(UL-LL)/NS
350 SM=0:X=LL
400 FOR C=1 TO (NS-2) STEP 2
500 LET SM=SM+(4*FNA(C*H+X)*H/3)
600 LET SM=SM+(2*FNA((C+1)*H+X)*H/3)
700 NEXT
800 SM=SM+(FNA(LL)*H/3)+(FNA(UL)*H/3)
900 SM=INT((SM*10)+0.5)/10
1000 PRINT "THE AREA IS";SM
    
```

Areas

by I Shambrook

## Microradio

GW6JJN



### Roving radio

A new company called Crystron is marketing a 'Black Box' — its name, not mine — which is designed to help companies keep in touch with their employees on the road. The Black Box is basically an interface with converts information received over the air into RS232C format suitable for a portable terminal rather like the Tandy Model 100. It works from a car battery so that the company employee can sit in his or her car with a two-way radio, the Black Box

and the portable terminal, and communicate with the company's central computer.

Operating on ultra-high frequency (UHF) the range is about a hundred miles or so. The company computer will act as a base station Black Box and be able to 'talk' to the car. The purpose seems to help field sales people work out quotations and be aware of stock, etc, as well as to place orders directly. With a price tag of £1500 per mobile unit and around £4000 for the base unit it's a bit beyond me but I'm sure someone will find a use for it.

If you worry about losing your software on tape or disc during a major fire, Inmac, the computer consumables people, have the answer for you in the shape of their data-safe. It has been tested to 1090°C in a special oven and the software survived. So for

£450 pounds or so you can sleep peacefully in the knowledge that if your home and all its contents are burned to a crisp, your favourite computer game will make it.

Many of you write to me about the radio-frequency interference (RFI) that your computer clock gives out causing havoc to radio transmission and reception, usually when using a radio teletype system. There is no completely satisfactory answer to this, although much can be done to alleviate the problem by using various screening devices from metal foil to biscuit tins.

I was reminded of the problem recently when reading a press release from a company called Grid System Inc. It would appear the the Ministry of Defence have a similar problem in that data transmissions from Embassies and the

like must not give out RFI in case someone may be listening who can make some sense of it all.

The Ministry set a standard as regards RFI screening which is met by the Grid 1107 portable computer. With 512K Ram and 38K of bubble memory, it comes in two versions: shielded and unshielded. The unshielded version is £5,195 and the shielded version is £10,500. What price radio interference now, you might well ask...

Ray Berry GW6JJN

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.



## Tandy convert

on Dragon

This is a program to convert any Tandy Basic program into Dragon Basic. It is a short machine-code routine loaded in as

Basic data statements. To use the program simply load in the routine and load in the Tandy Basic program. Then type Exec 32600.

```
0 PRINT"decodeBASICprogramsFROMtandy":PRINT
1 REM 1983 COFFINET ETIENNE 1984 COLINA JULIAN
2 CLEAR200,32599:FOR A=32600 TO 32720:READC:POKEA,C:NEXT A
3 PRINT"CLOAD decode & [RUN] REMEMBER:[EXEC32600]
  ":PRINT:PRINT"CLO AD TANDY PROGRAM & EXEC32600 THEN RUN NEW
  PROGRAM FOR DRAGON & CSAVE ITSEL. ALL IS O.K. !!! "
4 DATA 190,0,25,48,4,188,0,27,44,62,230,128,193,0,39,243,
  193,255,39,22
5 DATA 193,141,35,237,16,142,127,161,16,140,127,181,39,227,
  225,164,35,28,49,34,3 2,242,230,128,193,130,35,213,16,142,127,
  181,16,140,127,209,39,203,225,164,35,4,4 9,34,32,242,235,33,
  231,31,32,189,57
6 DATA 150,1,163,2,166,23,180,24,184,241,185,223,186,212,203,
  239,204,242,205,0,1 31,30,132,0,133,3,141,6,147,8,148,247,150,
  244,151,240,152,252,153,237,154,233,15 5,234,156,249,161,255
```

**Tandy convert**  
by Julian Conlina

## Baud Walk



### PSS – certainly

**N**ews comes first this week about two new bulletin board services that have sprung up lately. The first one is at Nottingham and supports 1200/75 baud modems using standard terminal software. Telephone number is 062 289 783 - and it's open 24 hours a day too.

The second service I have heard of is to be operated by BASUG, the UK Apple Users Group. This will be a multi-baud rate board (300/300 1200/75) and the telephone number is 0268 778956. This should be a good service as BASUG has plenty of experience, information and public domain software to offer.

I've also heard about a new

cassette magazine that is being specially written for Spectrum users who have a modem (in most cases these will be owners of the VTX 5000) and really want to get into communications. Apparently the author is an avid hacker who regularly uses services like Prestel, Compuserve (the American version of Prestel) and the like.

On to some more serious communicating, I thought I should look at PSS; it's the Band Walk equivalent of American Express in that you need a healthy bank balance, but it does very nicely thank you!

PSS is BT's data network which allows you access to databases and services not only in the UK, but all around the world. A number of service operators offer PSS connection to their system as it has a number of local call points in — the UK — thus avoiding STD calls.

Users of PSS have to take out a subscription to the service - but the advantage is in the long distance connections. For example, a 30-minute call to

London on STD costs around £2.47 — using PSS it's. The more you use PSS — within reason — the quicker you will recover that subscription charge, at least that's the idea.

In fact, PSS is not dependent on distance for tariff charges in the UK — and this only partially applies to international access to — but depends on the amount of data you send along the wires. UK calls can cost as little as 2p a minute and a typical connection to the States around 12p per minute.

Full details about PSS can be obtained from BT Marketing on 01-920 0661, or better still, try your local librarian. Who may be able to give you good advice and recommend reading a database directory. On my reckoning, the States has at least around 1000 databases - some commercial and private, but other public, plus, or course, bulletin boards.

PSS differs from the normal telephone network in that it is tailor-made for digital communications - in other words for micro communications. In fact, BT appears to be about to offer

more digital services next year that could well offer a cheaper alternative to PSS. Apparently a 300/300 network will be tested next year and it will be cheaper than the normal telephone network.

If you have access to a PSS account try the following numbers for overseas databases but remember the cost.

Source # 01 01 703 734 7500  
Compuserve 01 01 313 769 6800  
Telenet # 01 01 703 442 1363  
Tymnet # 010 01 408 446 7000  
Uninet # 01 01 913 341 9161

If you are feeling really adventurous, why not get an information pack from Compuserve. Write to Compuserve Inc, 5000 Arlington Boulevard, Columbus, Ohio 43292, USA.

**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



## Across the pond

There's a well-used saying which is especially rampant in the computer world, that what is currently popular in the United States will one day be imported to Britain. The common feeling is there is usually a delay of several months before we see the best selling software from America. This is not to say that the software from across the Atlantic is necessarily better — programs such as *Lords of Midnight*, *Valhalla* and *The Hobbit* would be received with ecstasy over there; but it is true to say that there are many adventures there that, thanks to the widespread use of the disc drives, are such more complex than is the norm in Britain.

Assuming, however, that with the popularity of the CBM64, Apple and Atari, we can expect to see American adventures in the next few months, let's see what is brewing over there.

Available now, on disk and cassette for the Commodore system, and soon for the Atari, Apple and IBM-PC/PC Jr. (the latter system is looked on very much as a home computer in the States), is *Dallas Quest*, from Datasoft, the company that bought you *Zaxxon*, among other great arcade games.

The lifelike scenes draw the player into the sumptuous Texas mansion of Southfork and then into the steamy jungles of South America to rub elbows with, and outsmart, crafty J R Ewing. In the game, you take the part of a world-famous detective, who in solving the challenge of each scene, must find the map which reveals the whereabouts of a South African oil-field.

"Interactive Fiction" is the latest buzzword in America for adventures, and Spinnaker Software, authors of such education-orientated software, have taken advantage of the name and come up with several programs adapted from classic novels.

It's a route that others have taken (as in *The Hobbit*, the best-known that we have here), but Spinnaker's adventures are aiming for a wider audience, with titles such as *Swiss Family Robinson*, *Wizard of Oz*, *Guilliver's Travels* and *Below the Root* (based on the Green Sky Trilogy). The adventures allow the use of full sentences and support full graphics. Most are of the traditional variety, with puzzles to be solved; but *Below the Root* is more of a Monster-Bash, with the player moving around a graphic landscape as in *Ring of Darkness*.

The target audience of this range of games seems to be rather young, and it would seem to be a good series with which to learn about adventures. Other titles in the series, to be released later this year, are *Wind in the Willows* and *Treasure Island*.



Arthur C. Clarke

"Suddenly, quietly, inexplicably, a huge new asteroid appears in the Solar System. After lengthy observations, the impossible explanation becomes the only one: the asteroid is actually a spaceship. Mankind must attempt a rendezvous". If this sounds familiar, it's not surprising, as it is the plot of a new adventure based on Arthur C. Clarke's *Rendezvous with Rama*. But read on:

As luck would have it, the only spaceship close enough is your own — the *Endeavour*. You must explore the asteroid and, if you are lucky, return to Earth. Trillium is a name that Spinnaker Software has adopted for a series of adventures based on well-known Science Fiction titles. Clarke's classic is the first, and others will follow from Robert Heinlein, Alan "Alien" Dean Foster, Ray Bradbury, Michael Crichton, Phillip Jose Farmer, Alfred Bester and others.

These adventures will be available for the

usual mix of Commodore 64, Apple and Atari machines, but the interesting thing about them is that they have been written with full co-operation of the authors — so the story-lines will be pretty good.

A new release from Infocom is always worth waiting for, and their new adventure, *Seastalker*, is no exception. This one has you undersea, and the mission is to rescue Aquadome, "the world's first undersea research station", from destruction.

Infocom calls this a beginner's adventure, aimed at younger player. In fact, one of the authors, Jim Lawrence, has written many of the Nancy Drew and Hardy Boys mysteries.

*Seastalker* comes with the usual brilliant Infocom packaging, which in this includes a unique Help Decoder, which can be used to reveal one clue at a time.

*Quest of the Space Beagle*, as befits its subject, is a huge program, covering four disc sides — it's the sequel to the even bigger *Jupiter Mission 1999*, which filled a staggering eight sides. As you might guess, your role in both the programs is to, yup, save the universe again, but the authors have really gone to town and created a sprawling, complex adventure which includes stunning graphics, arcade sequences and plenty of strategic planning. It's from Avalon Hill for the Atari.

For the Commodore 64 is *Ripper!*, a role-playing adventure game that puts you in the shoes of the detective responsible for tracking down old Jack. If your IBM-PC is lying idle, how about treating it to *Diplomacy*? Not strictly adventure, I know, but I think this is the first version available for a computer.

Also for the IBM only, but soon for the Apple, is a very interesting-looking program from Sierra on-Line who brought you *Frogger*, *B C's Quest for Tires*, *Dark Crystal*, *Cranston Manor* and the *Ultima* series. It's a graphic adventure, which includes many animated sequences and joystick control.

The Americans seem, to me, to be quite a long way behind us when it comes to graphic adventures — a program like *Valhalla*, for instance, now that it is available on the CBM64, should become a huge hit in the States, where complex sentence recognition and input is only just making an appearance in graphic adventure.

Still, it promises to be a busy time over the next few months for us adventurers, and I think we are going to reap a lot of benefit from all the research that programmers have done with arcade games.

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



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## Squiggles

David Steventon of Tipton, West Midlands writes:

**Q** Our family owns a ZX Spectrum and we have almost mastered the art of programming in Sinclair Basic. When I say almost I may be exaggerating, but there is one thing that gets on my nerves: The number of characters used in the extended mode which we hardly ever use — such as the tiny little squiggles and many others. I would like to know if there is any way that we can use any of these hindrances to extend the 21 graphics characters available? I'm sure many other Spectrum owners would like to be able to put more graphics into their programs and so would I. I am in the middle of a program and I used 18 graphics just making a man dive to the floor.

**A** Page 173 of the Spectrum manual describes (among others) a system variable called *Char\$*. The description of this variable states that you can define your own character set in Ram and make the Spectrum use it by making *Char\$* point to it. This can be achieved by copying the character set into Ram and you can then change any character you wish (even the little squiggles) to whatever you like.

## Unpredictable

R Bain of Sherwood, Nottingham writes:br

**Q** When I poke address 53272 on my CBM 64 in the range 0-255 and then Peek the same address, only in

some cases is the Peek value the same as the Poke.

ie Poke 53272,0:Print Peek (53272) gives value 1.

Poke 53272,1:Print Peek (53272) gives value 1.

Poke 53272,2:Print Peek (53272) gives value 3.

Only odd numbers are returned, can you tell me the reason why this should be?

**A** Address 53272 is used by the Vic memory control register (mentioned on page 104 of the *Commodore Programmers Reference Guide*). This address is used in conjunction with address 53265 to set up a high resolution bit-map in memory eg. Poke44,64:Poke16384,0:New Poke 53265,Peek(53265) Or 32 :Rem turns on bit-map mode Poke 53272,(Peek(53272) And 240) Or 8.

These instructions set the start of Basic memory at 16385, and use locations 8192 to 16383 to store the high resolution bit-map. As to why the value changes, I would think that as this location on its own is used by the screen refresh routine (amongst others) and that its value is probably quite unpredictable.

## Going off

P Reynolds of Euxton, Lancs writes:

**Q** I am writing to you to see if you could solve a problem of mine. I have had a 16K ZX81 for over a year and have just purchased an AGF interface. Now, suddenly the computer goes off, but when I take the Rampack off it is all right. Please could you tell me what to do.

**A** It looks as though your Rampack has developed a fault. It may be just coincidence that it occurred at the same time as your purchase of the interface, or it may be that in fitting the interface you unwittingly damaged the connectors on the Rampack. As you are out of your guarantee period, your only solution is to get your Rampack repaired. A firm near you, PV Tubes, 104 Abbey Street, Accrington, Lancs, will be glad to estimate for a repair on your machine. I have had a number

of letters from readers who have had excellent service from this company, whose prices are also very reasonable. They can be telephoned on (0254) 32611.

## Gone dud

R B Charles of Glasgow writes:

**Q** I want to replace a Z80A CPU as the one in my Spectrum has gone dud. Will a Z80A CPU from any dealer do the job, as I have been told that I would need to get a special Z80A CPU?

**A** It would be as well to purchase components designed to work within the Spectrum. R A Electronics supply Spectrum Z80A CPUs at £3.00 (including postage and packing). Their address is 30 Kimberley Road, Lowestoft, Suffolk.

## Nonsense

Richard Smith of Birmingham writes:

**Q** Having bought the much recommended book *Spectrum Machine Language for the Absolute Beginner* published by Melbourne House, I first read through it and found it very useful. But then I decided to type in their Ezcode machine code monitor. This was when the trouble started. The program did not work. The problem occurred at Line 2090 and gave a *Nonsense in Basic* error. Finding the program impossible to debug, I wrote to Melbourne House. They sent me back a duplicated sheet with about five mistakes on it. Therefore I typed in the program again without these errors. Again all I got back was the same error.

If I wrote to Melbourne House again I feel that all I

would receive would be the same duplicated sheet. What else can I do?

**A** Line 2090 in my copy of the book reads: 2090 IF K=5 OR VAL K\$=ZE OR VAL K\$=LN THEN GO TO MR

I have deliberately typed all the variable names in upper case because it seems to me that you may have confused the lower case L in LN with a 1. This would result in a Nonsense in Basic message being produced for that line.

If this is the cause of your problem then you will have to check through the rest of the program to make sure that you have not been misled elsewhere.

Failing that, if you could get your version of the program listed (as you typed it in) I will be glad to investigate the problem further for you.

## Monochrome

Peter Mutitsch of Glasgow writes:

**Q** I have a problem with my Issue 2 Spectrum, in that the colour on my Sanyo portable colour TV isn't. Originally when I got the TV, the display was black and white, so I adjusted the computer internally to get the proper colours. Unfortunately the TV was not properly on channel, so that if I changed channels then changed back again the picture went back to black and white. Shortly after this I returned the TV but the colour still is not right.

**A** Issue 1 and 2 Spectrums are notorious in this respect I am afraid. The Issue 3 machines are very much better in this area. There is not a lot I can suggest for you to do. I presume that since returning your TV you have tried re-adjusting the computer internally with no success. Apart from that there is not really anything you can do.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem Peek it to Phil Rogers and every week he will Poke back as many answers as he can. The address is *Peek & Poke*, PCW, 12-13 Little Newport Street, London WC2R 3LD



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**CBM/PET** 32K 4000 series computer with 3022 printer, C2N cassette unit plus all leads, software books etc. Excellent condition. Bargain! £395 ono the lot! Could deliver. (0244) 675717.

**VIC 20** software for sale. All originals + books. Including Myriad, Bonzo + Night-Crawler. Tapes from £2 to £4 also listing service phone for details. Tel: 01 303 9277 after 5pm. Also some CBM 64 games.

**VIC 20** 16K Ram pack. Spectrum books; games. Tandy 200 inc 1 Electronics lab will sell separate or swap for anything to do with Spectrum or Tandy model 1. Tel: 53248 Worcester.

**CBM 64** + C2N + 1520 printer, extras inc: £350 s/w worth over £700 sell for £350 or might swap for Spectrum with D/K keyboard and lots of accessories. Write 107 Stockfield Rd. Chadderton. Oldham.

**C2N COMMODORE** cassette unit for Vic 20, etc. £20. Intro to basic 1 for Vic 20, unopened £5 Chess The Turk for Spectrum £4 Ring 01 904 5849 after 4.15 pm weekdays.

**COMMODORE CBM 64** plus recorder C2N Joystick and £100 worth of software 6 months guarantee cost £360 new accept £250 ono. Phone (0523) Mansfield 862911 reasonable swaps considered.

**VIC20** + C2N 16K switchable 2 cartridges. 50 original games. Lots of mags. Swap for 48K Spectrum, CBM 64

or Atari 600. Tel: Langley Mill 718257. **VIC 20** cassette deck switchable 38, 16K rampack cartridge + one £150. Worth of s/w. Cost £320. Sell £200 ono. Tel: Uxbridge 32820 (eves).

**VIC 20**, starter pack, 16K ram pack, money manager, Home Office (30 games) 5 book, joystick. Sell £150. Tel: 01 551 4162 x290. John.

**CBM 64** + C2N cassette, manuals, boxed as new, unwanted gift. £190. Tel: 01 393 7855.

**16K VIC 20** + cassette deck + 3K ram pack + Joystick + 3 Rom games. + many tapes £120 ono. Market Weighton 0696 60504.

**VIC 20** + disk drive, cassette, mother-board extra 3K, machine code, cartridge, RS232 connection, lots of software. Tel: 07073 35737 Les.

**VIC 20** cartridges inc: Gorf, Radar, Rat Race, Chess. Cassettes inc: Whacky Waiters, Arcadia, Gridrunner, Terminator, Scramble. £40 + p/p Tel: 055 586 757 Crossford.

**VIC 20** + C2N cassette unit + 8K Ram + 3K Super Expander + 2 games cartridges + many cassette games + 3 program books. All boxed £150.00. Tel: 01 539 2955.

**VIC 20** 16K + tape deck + super expander + 4 cartridges, 17 original s/w titles, with Joystick, £440 cost. sell for £190. Or swap for CBM 64. Tel: 0744 28963.

**VIC 20** — tape deck, switchable 16, 3, 8K inc: Jet pack, box of 50 mags. £185. Tel: 01 802 8864.

**CBM 64** + C2N recorder, s/w books etc. 6 months old £190. Tel: Parkstreet, (St Albans) 72809 evens.

**VIC 20**, 16K Ram, plus over 35 games. Cost over £300. New sell for £100. Tel: Stevenage 354425 or consider swap for printer or 1541 disk drive plus cash adjustment.

## Dragons for sale

**DRAGON 32 PERFECT** working order with lots of software. All leads P.S.U. and manual included. Boxed. Offers over £110 or swap for Dragon Disc Drive. Phone Romsey (0794) 23041 (eves.)

**DRAGON 32, JOYSTICK** + s/w £160 ono. Tel: Clevedon 874514.

**DRAGON 32** + 2 joysticks inc: Quicks-hot + £470. s/w. £160 or swap for Spectrum + s/w. Tel: Risca 612445.

**DRAGON 32, INC:** tape recorder, tape leads, books and over £500 worth of original s/w. The lot for £195. P. Perris, 88 Poplar Crescent, Shipley, West Yorks BD18 2HH.

**DRAGON 32 FOR SALE** including cassette, 2 books, mags, 2 sets joysticks, original software worth £130. Genuine reason for sale. £100 ono. Write or call — Mr. M. O'Donnell, 5 Worthington Close, Runcorn, Cheshire.

**SWAP DRAGON** games cartridges for utility cartridges will swap two for one where necessary or will include lightpen phone 01 8221 1710 after 5pm.

**EXCHANGE INFO** and programs for

Dragon 32/64 Write T. Hopson 3 Wantage Woodside Telford Salop TF75PA. **DRAGON 32 COMPUTER** for sale 8 month guarantee £80 of software dust cover. Two joysticks all for £110 Phone 9822468 after six.

**DRAGON 32** + Black white TV cassette recorder oodles software Quick Shot joystick books magazines £155 ono Tel: Evenings 0223 871339.

**FOR SALE — DRAGON 32** with cassette, £140 best s/w, 2 books, 2 sets joysticks, magazines. Excellent condition worth £380 + sell for £100 ono. Genuine reason for sale. Write or call, Mr. M. O'Donnell, 5 Worthington Close, Runcorn, Cheshire.

**DRAGON 32 WITH** joysticks, Aldream cartridge printer cable and over £150 of original software. Sell for £180 or swap for BBC. Phone East Kilbride (03552) 28380.

**DRAGON 32 + TAPE** recorder. All leads, Manual 12 games, mags cost £340. Offers. Phone for further details: S.T.D. 0387 82 385.

**SWAP DRAGON 32**, 2 joysticks, cartridge and cassette software, magazines etc for similar 48K Spectrum outfit. Will consider extra payment if microdrives/and/or replacement keyboard also available. Tel: 0536 711288.

**DRAGON 64**. Six months guarantee. Perfect condition. £125 ono. Trojan Lightpen, Sanyo recorder, software, five books and all Dragon Users. £140. Or £150 the lot! Tel: Nigel Leeds (05332) 672534.

**DRAGON SOFTWARE** DASM/Demon cartridge Assembler Monitor £15.00 Sprint Basic Compiler £8.00 Rainbow Writer Screen Enhancer £8.00 Telephone John 061 792 1122 after 7pm.

**DRAGON 64** still boxed, £180 or with extras e.g. dustcover books, cartridge, magazines, games and utilities £220 the lot. Will separate items. Phone for details. Kidderminster (0562) 743968 (evenings).

## ZX81s for sale

**16KZX81** + 5 S/W tapes swap for spectrum hardware write to: A. Mahmoore 31 Webbex House Nath Street Barking.

**ZX81** + 16K S/W + dictator for £45 00 Tel 0762 42603.

**ZX81** Ram Pack 16K, made by Memotech, very good conditions, boxed, still working: Sell £20.00, Tel: F. Karim 937 5764.

**ZX81** 16K, RAM, 9 cassettes, boxed, £45 Tel: 01850 — 2759 after 6 p.m.

**ZX81** 16K Dean keyboard recorder large collection of software and books £75 ono phone 673 3491 after 7pm.

**48K SPECTRUM** + fuller keyboard £100 microdrive + I/I 1 £60 ZX Printer £30 recorder £15 L Print interface £10 Valhalla, Auto monopoli, football manager, pascal, depvac speeds HT.

Tasmodem beta basic superchess utilities, books, offers. 0924-25797.

**1KZX81** 16K Ram fuller keyboard 15 games including glaxians, defender

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printronic T.V. game with 10 games QL ord form, calendar, program 41 listing including caterpillar, 2 grand prix grandstand soccer game over £10 worth of mags Bargain price £500 Mr E. Mitchell, 52 Bycroft Road Southall, Middx UB1 2XQ.

**ZX81**, 16K Ram approx ten games and six magazines all leads power pack and owners manual include cost the new approx £60 will accept £30 o.n.o. 36 Norfolk close Redcar, Cleveland.

**ZXK8** 1K £25 S/W all original psst, zoom, cookie, the Hobbit, colossal adventure Black crystal and organes master £22 for the Cot Tel 0274 08995.

**16K** 2x81 S/W Inc: 4 g'g flight simulates, Crazy Kong, Football, manager, very good conditions. All original tapes, Tel: 01 251 0539. or will swap.

**ZX81** Printed — Power Cable — 3 reels of Printed paper — £130 ono. Tel: 01 888 — 4923 — Mr Allaman.

**ZX81** S/W, Pixel Trader JRS fast loader system, carnell compendium, (6 programs) Sinclair History + Inventions, books, understanding ZX81 ROM, ZX81 Pocket Book, £12 ono. Tel: Dave, Stevenage 69447.

**ZX81** S/W £10 00 games Inc: Back gammon 3D defender 30 grand prix, flight simulator, through the wall + scramble. All original games. Tel: (0792) 288235.

## Acorns for sale

**BBC 'B'** 1.2 Eprom monitor + toolkit. Books, games etc: £325 ono. Tel: 01 229 0350. Tues-Thurs 9-5.

**BBC 'B'** 1.2 OS. Some s/w, leads £330. Steve (eves) Tel: 01 736 2542.

**BBC B** with Acorn DFS, joystick, cassette player and software including Flight Simulator, Planetoid, Snapper, Philosopher, Quest. Good condition £420 Tel: 01-736 9504 eves. Ask for Richard.

**KENDA DMFS/DOS** for BBC. Double density. No user RAM taken up. CP/M filenames. No limit to number of files. Recover erased files and lots more. £80 ring Rajiv 01-204 1908.

**BBC B** Salamander 737 Flight Simulation £5.00 Program Power Galactic Commander £3.00 Acornsoft Arcade action £5.00. Buy all three for only £10.00 Spectrum 16K Quest's Black Hole" £4.00 originals only. Wiltchampton 840 354 w-e only.

**FOR SALE SOFTWARE** for BBC Model B 14 different programs. 5 program power. Chess, Croaker, Killer Gorilla, Alien Swirl, World Geography, Quicksilver Music Processor. Trench. Offers, Phone Barnsley 764481 after 6pm.

**OVER £300** of original s/w for BBC + Electron micro. All kinds at 8 3rd prize. 0255 814523.

**BBC MODEL B** 1 month old. £340. Inc: joystick + games. Tel: Wallisall 683365.

**FORD CLASSIC** vintage collectors car G.C. Swap for CBM 64 or BBC with peripherals. Mr Cox Tel: 0952 51628 after 6pm.

**ACORN ELECTRON** Leads box 5 months guaranteed signpoint quick joystick 1 6 books s games cassett recorder magazines elbug electron uses all for £300 ono Tel: Leon on 870 — 1884.

**BBC-B S/W**: Space arena leads for centipede, Atlantis, galax defence. £3 each write to W.L. Tang, 6 North Farm Road, Lancing West Sussex, BN15 9BS. All S/W original.

**BBCSoftware** for sale all originals mysterious adventure, philos quest snowball Arcadians Arcade Action £4 each French cocats test £5 must go! Phone 0788 812940.

**BBC B 12 O/S, Leads, S/W + + Data base.** offers one £300 tel: Steve 01 — 738 2542.

**ACORN ELECTRON** Interface quickshot joystick + cassettes recorder £100. S/W subscription, books, manuals, dirt cover, offers Tel 742 1446.

**TEAC DOUBLE** sided 40 track disk drive. With cables for BBC — £150 ono. Tel: 0302 840 768 eves.

**ACORN ELECTRON** software to swap. Pedro, Felix, Moonbase Alpha, Moonraider, Swoop, Adventure, Lt Bertron, Chess, Snooker, Pengwyn, Killer Gorilla, T.K.V., Chuckie Egg. Write to P. Jess 58 Legacurry Road, Lisburn, Co. Down, N.I.

## Ataris for sale

**ATARI 800** — 810 disk drive, joysticks, books, mags. Over 1000 worth of s/w. Exchange for Apple or sell separately for £750 ono. Tel: Blackpool 852650.

**ATARI 48K**, complete with new tan tan 1010. About 4 months old. Point Master joystick + books. £185. Tel: 0285 67174 evenings.

**ATARI 400 48K** with keyboard, tape recorder, 2 pointmaster joysticks, lightpen, paddles, Defender, Star Raiders, Centipede. Basic cart. 4 learner tapes, game tape, 8 learner books + menus, mags etc. £500. Tel: Upminster 27275.

**ATARI 400 16K** with assembler and Star Raider cartridges cassette and operating system plus Dere Atari manuals plus games £130 ono. or swap for 48K Spectrum + software. Tel: Gosport 520412.

**ATARI 800XL 64K**, 4 months old. £200. Astro chase, Ghost Hunter, Claim Jumper, Action Quest cassettes £13 each. Gorf Wizard of Wol discs £17 each. Tel: 05436 72055.

**ATARI** software for sale. All original Dig Dug cartridges £15. Canyon Climber cassette £5. Lone Raider cassette £8. Tel: Mark on 0450 76856.

**ATARI 400** with 2 joysticks and program recorder. Seven cartridges including Star Raiders, Dig-Dug, Pole Position, Chess, Zaxxon, Scram and many others on cassette. Cost £350. Want only £90. Tel: Wokingham (0734) 78563.

**ATARI VCS** for sale. 10 games inc. Enduro, Pitfall, Pacman and The Empire Strikes Back. Cost £350, will sell for £115 ono. Tel: Mark, Fareham 281137.

**ATARI 600XL** + 54K memory module, + cassette. Lots of Atari s/w + manual. All as new £250. Tel: Oxted 7498 evenings.

**ATARI 800XL** £160 or exchange for 850 interface, printer cable and £80. Tel: Farnham Common 4052.

**ATARI VCS** Combat, Star Raiders, Astroids, Air Sea Battle £80. Tel: 949 7464.

**ATARI 800XL 64K**, 1050 disk drive, with dos 3 master disk 2. 1010 cassette recorder 850 interface. All new, guaranteed. S/w £700. (originals). Complete unit £650. Tel: 864 5613.

**ATARI 600 XL**, cassette deck, wooden case, joysticks, games, £140. Tel: 01-399 2669.

**ATARI S/W** for sale. All originals cartridges, alnette disks, fantastic Prices — Tel: Mark (0225) 742777.

**ATARI 600 XL**, galaxians cartridge joystick 2 basic books, £100 ono. Tel Chester 679 329.

**ATARI 400** basic H manual, 6 months £75 tel 01 359 1177.

**ATARI 800 XL** and 1010 recorder over £300 worth of S/W 2 joysticks, books H manuals all 6 months old please ring 01 — 668 7072 First offer around 1375 secures.

**ATARI 400 32K**. Qwerty keyboard Basic cartridge, manuals, games inc. Pole Position plus joysticks and recorder sell for £136 ono. Tel: Peter 851-9929.

**ATARI 800, 48K & 410** Program Recorder with dust covers, manual, magazines & 4 books & various software £150 ono Waford (0923) 26838 (evenings & weekends).

**ATARI DISK** + cassette s/w for sale, Le Shamus, Preppie, Poolyarn, Savage Island etc all original. Reasonable offers please! Tel: 051 677 8642.

**ATARI 800 48K** + 10-10 recorder + joystick, basic cartridge + manuals + books. Also some s/w. All boxed, not 1 year old. £24.00 ono. Tel: 0842 4431.

**ATARI 600X2** computer complete with data recorder and joystick as new. Unused. Offers, or exchange considered. Liphook 0428 722975.

**ATARI 600XL** 16K with tape recorder 4 original cassettes 3 cartridges inc Donkey Kong Pole Position and Defender Atari joystick 1 book manuals still boxed £200 East Peckham 871735 worth £310.

**ATARI V.C.S.**, 23 cartridges, joysticks, paddles, boxed, v.g.c. £370 ono. Tel: Saddleworth 2518. Sat. mornings only. (ask for Martin).

**ATARI VCS** and joystick and paddles. Plus £250 of games v.g.c. cartridges top-sellers like Pole Position, Super Cobra, Tutankhamen offers? Tel: Dorking 887619.

**ATARI 800** plus recorder plus twin disk drives plus Star Gemini printer all immaculate. £650 ono quick sale needed. Phone Basildon (0268) 285406 evenings weekends.

**ATARI VCS** with 3 joysticks, paddles etc and seven tapes inc. Defender, MS-Packman Missile Command, Adventure, Haunted House, ET, Combat. Worth £230. Sell for £70 Tel: 041 632 0592.

**ATARI 400 48K** with keyboard, 4 cartridges, tapes, joysticks, manuals etc. £480 Tel: Upminster 27275.

**ATARI 600XL** under guarantee till January £100, still in box Phone Wrexham 753238.

**ATARI CARTRIDGES** for sale Berserk £10. Tennis £10. Space Invaders £10. Ski-ing £10 Combat £10 Outlaw £10. Atari VCS no joysticks or paddles £15 swap everything for 16K Spectrum, Tel: Skipton [number deleted]

**ATARI VCS** inc 10 cartridges e.g. Pacman Indy 500 etc... have knocked off £20 because of no console box. Sell for £129 ono Tel: 044822523 from 5pm-10pm.

**ATARI VCS** plus £200 s/w (top games) also Super Charger + 2 games all v.g.c. with 2 joysticks, paddles and power adapter, offers? Tel: Dorking 837619 Guy.

## Tandys for sale

**TANDY C/C 32K** with dual discs and printer £800 inc. Word processor + D Basic. Tel: 0525 714488.

**TANDY GCP-115** colour graphics printer/plotter + dragon computer lead. Cost £168. Sell for £105. Tel: 01 360 3443.

**TANDY PC2** + 8K Ram + printer + s/w manuals, leads, books, £200.00. Ring (0244) 677677 ex 64 (Bill).

**VIDEO GENIE** 16K Ram with integral cassette recorder. All manuals + leads included. Will sell for any reasonable offer. Also some software. eg Chess. James Ledingham 57 Lilyhill Terrace, Meadowbank, Edinburgh, EH8 7DR.

**FOR SALE** Tandy CGP 115 colour, graphics printer + Dragon lead. Cost £167. Sell for £105. Tel: 01 360 3443.

**PRINTER-PLOTTER**, Tandy CGP-115, four colours 40 or 80 CPL, serial or parallel interface to suit most computers, complete with spare paper. £85. Tel: 061 439 7929 (Stockport).

**TANDY TRS 80 MC10** colour, 16K Ram pack + P4SS load boxed — unused — valve £120 — sell £70 ono Postage paid Tel: 0482 865333.

**PRINTER, TANDY CGP-115**, 40-80 characters in 4 colours. Also does graphics. Boxed with manual as new £95 Tel: 0325 312417.

**TANDY CGP-115** colour printer/plotter with Centronics lead (for BBC) worth £180 will accept £100 or ono condition as new.

**TANDY TRS-80** model 1 level 2 business computer all leads included. Much software. Also includes high resolution hardware modification. Ideal for small business. £150 ono. Phone 021 779 6877.

**TANDY GP115** colour graphics printer and BBC lead. Cost £160 sell for £110 Tel: (0533) 897268.

## For sale

**T199/4A** computer with 2 wire remote control + 2 s/w cassette recorder cable + 2 cassettes for T1 Basic £99. Tel 01 278 0572 after 5pm.

**VARIOUS COMPUTER** magazines eg. Your Computer, Popular Computing, Crash. 1/2 price. Jet Set Willy + Kong (new) £40 ono. Other Spectrum s/w (originals) 1/2 price. 5-6 pm (0298) 6437.

**MAGAZINES** all weeklies, most monthlies hundreds of back issues. Tel: 0259 60840 after 6pm.

**SHARP MZ 700** with printer plotter and cassette builtin, s/w, spare parts and rolls for plotter. Only 2 months old and boxed £250 ono. Or may consider swap. Tel: 01 863 0198.

**SHARP MZ80A**, dust cover, expansion interface + printer interface module, disc drive interface module, twin double sided-double density disc drive. Disc Basic + s/w. £750 ono. Tel: 01985 1509.

**MICRODRIVE £40** — Currah Speed Unit £20. Kempston joystick Interface £7. Or £60 the lot. Tel: 0442 66641 (lan).

**SHARP M2 700/11** £250 only. Tel: 01-806 8068.

**TRS 80 MODEL 100** portable British Modern. Like new. Offers over £350. Tel: 01-879 3238. Mr Clarke.

**MAGAZINES** + dated cassette interface. Tel: 051-733 0090. (after 4pm) Richard.

**SINCLAIR QL** Kridge 3 model. AH Super Basic £400. Tel: Kings Langley 66780.

**TRIGGER COMMAND** joystick and Spectrum DK Tronics light pen £7 each or swap for other Spectrum hardware. Tel: Nick 0203 346 848 after 6pm.

**ZX PRINTER** for sale. Very good condition. S/w titles to swap or sell: Tel: Andrew 08823 245.

**KEMPSTON JOYSTICK** + interface and s/w. Sell or swap. Tel: David 08823 254.

**TI 99/4A, JOYSTICKS**, Basic Tutor, connect four, £60 Oxford (0865) 69346 after 6pm.

**LYNX 48K** £160 or swap for other non ZX81 computer includes leads, software, mags, Lynx computing book, power pack etc. A bargain. Phone Alan on Coventry (0203) 466035 evenings.

**FOR SALE:-** Seikosha GP80A Dot Matrix Printer in mint condition, with approx. 1000 sheets of Fanfold paper, 2-3 ribbons and friction feed £75. Contact Richard Alderton, Phone Sheffield 20571.

**MZ80A SHARP** computer, built in monitor and cassette, 48K. Basic and Forth language tapes, many games dust



cover. As new. £200 for quick sale delivery by arrangement phone Rotherham (0709) 540336.

**SPECTRUM, CBM 64, BBC** software for sale. Wide range including Stalag 164 £3.50. Stonkers for Spec 48 £3.00, Arcadia £3.00. BBC Killer Gorilla £4.25 and many more. Call (0204) 699737 after 5pm.

**FOR SALE SIX 5 1/4"** single sided floppy disks and one 5 1/4" double sided disk £3 each or £21 for the lot phone Mark on 603 9467 after six.

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**BARGAIN! T1994A** with leads + joysticks also Parsac — Connect Four Tomb Stone City — Zero Zap Modules Teach Yourself Basic — UFO — Hunchback cassettes + four books £80 the lot Tel: Burton (0283) 48975.

**TI-99/4A FOR SALE.** Including Parsac cartridge, Basic tutor cassette, joysticks, 3 books and complete with all necessary leads and manuals. Yet only £70. Tel: Barnes 01-741 7824.

**LYNX 48K PLUS APPROX** £100 software only £110 ono tel: 735 4861 x 69 (day) 656 2897 (eve & weekend).

**HISOFT PASCAL 4T** compiler for 48k Spectrum with 75-page manual and Turtle graphics package. Sell for £10 (cost £25). Mr S. Littley, 42-12 John Coates Hall, Bishops Rise, Hatfield, Herts AL10 9BT.

**FOR SALE. PROTEK** joystick interface, interface 2 with Cookie cartridge and Quickshot joystick + over £50 of s/w will sell for £50 ono. Phone High Wycombe 26472 between 4pm and 4.30pm. Ask for Paul.

**SPECTRUM** software. Mini processor filing system, disassembler, bank account handler, £2.50 each. Personalised software for small businesses. Prepared in about two weeks £28. Phone Brian on Bolton (0204) 389498.

**AS NEW ZX** printer with three Rolls, to highest bid over £25. As new Kempston Joystick interface to highest bid over £8.50. Write to: R.A. Kidd, 20 Buckfast Close, Ipswich, Suffolk.

**TRAFALGAR** speaking watch M306. Classical alarm, stopwatch, hourly chimE, clear speech, English and American voice modes. Costs £65. Sell £30. Tel: Hornchurch 71789 (Piyush).

**OVER FORTY** computer magazines £5.00. Also T199/4A Teach Yourself Basic (cassette) also Beginners Basic manual and Texas program book. Texas items £10 the lot. Tel: 061 795 9824. North Manchester area.

**TECHNICS HI-FI.** SU 8077 amplifier (70W/Ch/Rms) 8077 tuner, M45 cassette (d/drive, 2 motor), Dual 505 V table, £1000 new. Perfect. Wanted — dual disk drive or t/text adaptor, W.H.Y. (for BBC B) or sell £450 ono. Write: F. Newall, 6 Beech Range, Levenshulme, Manchester M19 2EU.

## Wanted

**WANTED. SPECTRUM, VIC 20** or 64. In any condition, e.g. smashed or zapped. But must be cheap. The Laurels, Swaffham Road, Wendling, Dereham, Norfolk. NR19 2LZ Tel: 036287 327.

**SONY CC7 VIDEO** swap for Spectrum compatible printer DMP or Daisy Wheel, with interface Tel: 0733 237381 (Peterborough) evenings.

**SWAP ACORN** Atom fully expanded internally with built in word processor and assembler + s/w and all accessories for any other computer. Sell £75 ono S. Woolley 43 Jetson Street Gorton Manchester

**SWAP MY SPECTRUM 48K** + cas-

sette + Joy Interface + £50 of software. Still Boxed Six months old. For CBM-64 + cassette, manuals, SOFTWARE IF ANY. 958-7390 ask for Jonathan.

**WANTED EPSOM RX80** or similar and interface, and microdrive for £267 s/w £100. Mags and light pen, console etc. My total offer worth over £450 Great offer! Phone 0445 582900.

**SWAP 20 GAMES/utility** programs for AGF programmable joystick interface or 10 games for Kempston interface also wanted Sinclair printer paper swap for games (0703) 844956.

**WANTED CBM 64, C2N,** swap for Spectrum 48k q Cambridge interface + joystick + data recorder + £150 of software. Any condition considered Tel: Bld (0274) 635068 any time after 6pm. **SWAP TAMIYA** Toyota 4x4 off road jeep with rechargeable batteries and chargers, foru channel transmitter, mags, all boxed in excellent condition worth £300. For 48k Spectrum in excellent condition plus s/w Tel: (0325) 718387

**WANTED DISK** Drive for Atari 400. Paul Hardman 01-777 2605.

**T100/4A SWAP** video Chess + best of 99er. For mini memory module Tel: 01-643 2310.

**DRAGON 32 Q S/W (originals)** dust cover boxed new. Swap for CBM 64 or Spectrum 48K. Tel: H. Patel. Coventry 75511 ext 2112 day Coventry 24917 eves.

**WANTED 48K SPECTRUM.** No tape recorder needed. Tel: Dunstable 630230 (Bobby).

**WANTED WORKING/BROKEN** Spectrum for experiments will pay reasonable price. Tel: 01-539 5402 after 6pm (London Area).

**WANTED CBM 64** with cassette and disk drive. Tel: 025 761 3445 after 4pm.

**SWAP CITRON CXGTI 2400,** taxed and MOT, Reg 1978. Tinted windows — electric. G. condition. Deliver anywhere for computer — any model — any model + s/w. Tel: Workington 0900-65614. Keith.

**WANTED T199/4A** mini memory disk drive editor assembler, Ring 02357-68689. Neolest Hetford.

**WANTED FOR ATARI 400.** Basic cartridge + manuals. Also will swap ETPCS Cartridge for any Atari 400 Cartridge. Phone Castle Town 689.

**WANTED ZX PRINTER** + Interface. Reasonable Price considered. Or 289-7365 Rob.

**WANTED MODEM** for BBC B must have 300 board as well as Prestel. Tel: Bradford 832981 after 6pm W. Yorkshire.

**WANTED 48K Spectrum** — will pay up to £80.00. Tel: 0923 38091 after 4pm. **AARRGGHH!! URGENTLY** wanted: 48K Sinclair Spectrum (model 3 or later). Must include manuals and leads and must be VIGC (Boxed). Price around £45 (No software). Phone Now: 0558 822509 (Mike).

**SPECTRUM SOFTWARE** Tasprint, stop secrets, buy or swap for my other utilities.

**WANTED BBC Model B** in good condition books and accessories welcomed write to Edward Sia Garnett House Leazes Terrace Newcastle NE1 4LA.

**TIME FOR A CHANGE?** Swap my VIC-20 and C2N recorder intro-Basic software Spectrum cover worth £130 for your Spectrum 48K and software Meadowside Ave Tong Fold Bolton Lancs.

**WANTED PRINTER** Seikosha GP100A for Spectrum. Full details to Mr. Peak. Redditch 61729.

**SWAP 30 COMPUTER** magazines, 2 arcade games (Splat, & Meteor Storm) and a camping sack for a programmable joystick interface and an Atari joystick. 0582 599576.

**SWAP BONTempi** Junior organ plus Invader From Space with Adaptor for ZX printer with six rolls of paper. Phone Neath 57697.

**TEXAS INSTRUMENTS 59/Printer** PC 100C, printer utility pakette, used magnetic cards. Phone Jeff. 0558 822509. **TRS80 MODEL I** level II Tel: 0276 25391 anytime.

**WANTED WORKING** Teletype or similar cheap printer for £50. Contact J. Chapman 8 Weir Road, Rochdale, Lincs. Tel: 0706 524228.

**WANTED 16K ROM** pack for ZX81 £5.00 Leeds (0532) 463018.

**SWAP DRAGON 32** for 48K Spectrum 8 game free (originals). Tel: Gateshead 776091.

**SWAP SPECTRUM s/w.** All originals — John after 6pm. Tel: 01-476 8884.

**SWAP SPECTRUM s/w** Sabre Wolf. G.hh, Underworld. Tel: James 01 476 9447 after 12pm.

**WANTED SPECTRUM s/w** for Exchange. Also 48K Spectrum Pay £60 and CBM64 Pay £130. Tel: 05827 69152.

**SPECTRUM 48K** for sale or swap for Sharp MZ80K. Inc: CDs Fuller keyboard, DK Tronics Programmable Interface with joystick. Over 10 original games £210 ono. Tel: 01 551 2736. **DRAGON SOFTWARE** to swap titles including Skramble Chess Lunar. R. P. etc. Tel (0256) 50956 (Kevin) after 5pm not on Mondays.

**SWAP DURST** colour enlarger 605 + accessories worth £800 for any computer considered. Tel: 903 3178.

**SWAP VIC-20** Pirate Cove adventure cartridge for your "The Count" adventure cartridge. No copies, must be boxed. In mint condition. Phone: Luton (0582) 505840. And ask for Clive 5.00 — 8.00.

**SWAP: SPECTRUM 48K** + cassette recorder + many 48K + 16K games and magazines, for Commodore 64 + C2N cassette recorder. Can't sell, must swap. Telephone Steve on Coventry (0203) 418809. After 5pm please.

**WANTED SOFTEK 'IS'** compiler — swap for 3 originals — choice of 30 including alchemist, Zip Zap, Manic Miner, Luna Crabs, Starclash, Space Wars, Pssst!, Tranz Am + more also software to swap or sell. Phone Martin (06065) 3882 4-6pm (originals).

**SWAP OR SELL** lots of VIC 20 games. All are originals. For details ring 051 644 6028 after 6pm or weekends.

**SWAP HARRIER C. BX** FM C.B. rig with accessories and books for VIC-20 starter pack or W.H.Y. (rig has switchable Rodger Bleep fitted) also Xtal filter fitted. Please tel: 051 644 6028.

**SWAP T199/4A,** perfect condition, as bought, plus cassette lead, software, and books, for VIC-20 or 16K Spectrum, preferably Tyneside area. Best offer secures. Phone Ian on (0632) 553158 after five.

**WANTED: ZX SPECTRUM 16/48K.** Anything considered. Will pay reasonable price or part exchange for BBC software. Latest titles. Including Overdrive, Battletank, Spitfire Command + others. Tel Frome (0373) 61552. Jonathan.

**DISK DRIVE** for Atari 800. Tel: 01 954 5275.

# Diary

Event	Dates	Venue	Admission	Organisers
Electron and BBC Micro User Show	Aug 31-Sept 1 10.00am-8.00pm Sept 2 10.00am-4.00pm	UMIST Manchester	£2.00 adults £1.00 children	Database Publications 061-456 8383
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 31857
Walthamsoft 84	Sept 8 10.00am-5.00pm	Main Exhibition Hall, Waltham Forest Technical College, Forest Rd, London E17	£1.00	Londex Exhibitions and Promotions 01-654 5039
ZX Microfair	Sept 8 10.00am-8.00pm	Alexandra Palace, London N22	£1.00 adults 50p children (in advance)	ZX Microfairs 01-801 9172
Personal Computer World Show	Sept 19-22 10.00am-7.00pm Sept 23 10.00am-8pm	Olympia 2, Hammermith Rd, London W8	£3.50	Montbuid Ltd 01-496 1951



## Twentieth

*Son of Bigger* is a spin-off from *Bigger* which in turn was heavily inspired by *Manic Miner*. Matthew Smith could never have suggested what he was going to start.

However, *Son of Bigger* happens to be a particularly fine form of this style of game.

The idea is to left-right-and-jump your way around a secret headquarters, collecting gold-end keys. There's a lot to explore, things to climb, conveyors, slides and disolving floors. Various lunatic things happen in the different rooms (twelve in all) and, as ever, it's a matter of figuring out when and where to jump.

Alligata have thoughtfully provided a layout showing the entire game area so you can see what you are missing as you get killed in the first screen for the twentieth time.

In fact, if this didn't draw quite so much from *Miner/ Jetset Willy* I'd really rate it very highly indeed.

**Program** *Son of Bigger*  
**Price** £7.95  
**Micro** Commodore 64  
**Supplier** Alligata  
178 West Street  
Sheffield  
S1 4ET

## Nursery crime

Adventure games are commonly the province of a certain kind of teenage or young adult — generally the same people who like science fiction and often as not ancient progressive rock bands like Genesis.

But *My First Adventure* is not for them.

Jolly Rodgers software has decided, rather sensibly that the younger kids could be persuaded to enjoy adventures too, hence the rather yukishly titled *My First Adventure*.

The only concession to this game being for young kids is the fact that the spelling is guaranteed correct and the problems are not quite so nightmarish as in some of the more brain-damaging traditional

adventures. That apart, it has the usual verb noun entry and I found it pretty difficult — for example, you keep meeting all these nursery rhyme characters but I never did find out what on earth you're supposed to do with them. However, I can tell you that 'Kill Little Boy Blue' doesn't work, neither does 'Get Little Miss Muffet'.



There are graphics for many of the locations which are as good as anything you'll see in most other games and the whole game does, indeed, seem to be correctly spelt. For an adventure game, this must be a record.

**Program** *My First Adventure*  
**Price** £5.95  
**Micro** Commodore 64  
**Supplier** Jolly Rogers  
19 Castleton Avenue  
Barnehurst  
Bexleyheath  
Kent DA7 6QT

## Gaseous

Wye Valley software have come up with a sort of occult equivalent of *Jetpac* for the Commodore 64.

It's called *Merlin* and is pretty entertaining. You move the individual of the title around the screen, avoiding vast numbers of ghosts, ghouls, and other Hammer Horror type things. *Merlin* moves about either on a cloud or his broomstick needs a new exhaust since he appears to be sitting on something gaseous.

In *Jetpac* you had to collect bits of spacecraft and assemble them to make your escape, here you must collect the ingredients for the caldron (to

nasty to go into any detail except to say they include a frog's leg) dropping them in one by one.

Every so often a parachute drops down and can neutralise the spells you've collected so far if you don't watch out and zap it quickly. Four screens is probably not enough and I'm surprised more weren't included — not memory restrictions surely? Still I found it fast and snappy and you probably will too.

**Program** *Merlin*  
**Price** £6.90  
**Micro** Commodore 64  
**Supplier** Wye Valley Software  
Parton House  
Kinnersley  
Herefordshire.

Pick of the week

## Edge-on 3D

You may have seen a rather impressive looking ad, for a couple of games for the Commodore 64 recently — the games are *Flip & Flop* and *Astro Chase* and the company is Statesoft.

*Flip & Flop* proved to be an absolutely wonderful *Q-Bert* where you bounce around a lattice of squares changing their colour as you go whilst being chased by a variety of stange animals.

In *Flip Flop* you are, alternately, a kangaroo and a monkey — the kangaroo bounces over a number of lattice platforms changing the colour of certain marked squares it can move from one level to the next only where there is a ladder. It's easy to take one bounce too many and go hurtling into space.

The monkey is on the 'under-side' of the platform, swinging from one to the other, again watch out for that one swing too many. The ruin of many of us.

The 3D logic of what's where in 3D and which direction to press the joystick proved more than enough for me, but later levels have you chased by a zoo keeper and what looks like an iron grate.

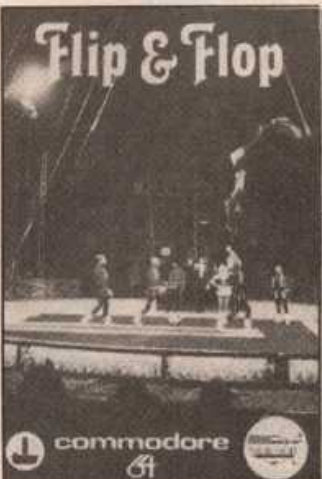
What really makes the game

Superior Software consider *Wallaby* to be one of the best programs they have ever released.

I think that Spectrum owners would probably greet it with a yawn but it ranks well alongside other BBC arcade games and has a certain amount of humour to redeem it as well.

*Wallaby* is a platform and ladders game, vaguely similar to *Donkey Kong* in that you have to climb to the top, in this case to rescue a stolen Wallaby, avoid various thing being chucked at you by a group of monkeys and collect fruits for bonus points.

is the impressiveness of the graphics — the edge-on 3D lattice of squares seemingly suspended in space is the kind of thing you can find in the better science fiction films; ie genuine other-worldliness. It



is only the constant frustration of leaping into infinite space that prevents me from naming this the best Commodore game of oh, well, yonks and yonks anyway.

**Program** *Flip & Flop*  
**Price** £8.99  
**Micro** Commodore 64  
**Supplier** Statesoft



You, I hasten to add, are a grown-up Wallaby (which looks, for all the world, like a Kangaroo so far as I can see). This means that you can bounce over some of the obstacles and, in true Tom and Jerry tradition, biff monkeys and obstacles alike with a swift uppercut from the paw.



It's good fun, even if there is a sense of déjà vu about it all. I did enjoy the wallaby's bounce complete with boiiong noise.

**Program** Wallaby  
**Price** £7.95  
**Micro** BBC  
**Supplier** Superior Software  
Regent House  
Skinner Lane  
Leeds LS7 1AX

## Pool perm

The pools prediction program *Spectadraw* has been around in some form or another for a good long while now, but the latest highly advanced, souped-up and permuted version complete with Currah speech compatability and proper instruction manual has arrived.

Quite simply, the program uses a large database of information on the past scores of teams to predict what will happen in the future. It will predict the teams most likely and least likely to draw and, if you wish, generate ten 8 from 10 full cover lines which can be copied straight on to the pools coupon using a *Spectasort* perm generation program incorporated in the main program.

The manufacturer's say that using the program ups your

likelihood of winning by 20 to 30 per cent. What this means, in practice, is a fair likelihood of a series of small wins rather than much chance of a massive payout.

The program has been adapted for use with microdrive so that data can be easily saved — the reason for this being that you can develop the database as you go along adding more and more results and theoretically at least, making it more reliable.

**Program** Spectadraw 3  
**Price** £9.95  
**Micro** Spectrum  
**Supplier** Spectadraw  
1 Cowleaze  
Chinnor  
Oxford OX9 4TD

## Bluff

I have waited for a long time for someone to bring out a version of poker for the computer. The mysterious Jungian collective consciousness has struck again and several versions have appeared all at once, for a variety of machines.

One, simply called *Poker*, is for the Spectrum. This one plays pretty much the standard game — dealing, few rounds of betting on what you've got followed by a change of cards to develop that hand and more betting.

You play against four other players all of whom are controlled by the computer. They raise the stakes of fold or bluff like real players although obviously with a computer involved the challenge is to make

them behave sensibly.

Over a couple of hands I found them pretty convincing. Two complaints — you appear to be limited in how much the computer will let you bet and if by some judicious and brave bluffing you get everyone else to fold there is no chance to see their cards (I know you're not supposed to but I should at least be an option) — ie, to determine whether you would have won on cards, or better still, that it was your sheer bravado that did it.

Nevertheless, perhaps because I like poker, I shall be playing this more than most of the other games released recently. The definitive computer poker that really induces the tension and anxiety of the real thing has yet to be produced though.

**Program** Poker  
**Price** £5.99  
**Micro** Spectrum  
**Supplier** De Barron  
Software  
Bowie Hillock  
Fyvie  
Aberdeenshire

## Shuffling

Atlantis are a new company marketing games for £1.99 — the 'pocket money' price initiated by Mastertronic. The first release I've seen from the company is *Eights* — a computer implementation of the popular card game.

The idea of the game is to get rid of all the cards in your hand — the two players must follow the 'lead' of the previous card and many only discard a card of the same suit or the same value. The eight is treated as a special card and can be used to change the suit to whatever you want, either to make it difficult for your opponent to go and/or easier for you to continue discarding cards. If you can't go you must pick up a new card.

In this computer version the computer plays very well and I hardly ever beat it on its simplest level of play, proving, since the cards are shuffled randomly for each new game, that it isn't a matter of luck. The game is thoughtfully designed, entering your card choice is very sensible and logical — J followed by C equals Jack of

## EIGHTS



ATLANTIS

Clubs. Trouble has been taken, too, in the form of redesigned character sets — shuffling noise and so on. In short, this is wonderful value for money, and if you like playing card games on computers, a must.

**Program** Eights  
**Price** £1.99  
**Micro** Spectrum  
**Supplier** Atlantis Software  
19 Prebend Street  
London N1 8PF

## Pie fight

There's no doubt about it, a lot of companies are dropping their prices. Comsoft, a BBC and Electron house, has its price at £4.95, around £2 to £3 cheaper than the BBC norm.

*Custard Pie Fight* is an absurdly simple idea.

The game simply consists of two figures facing one another trying to throw dodges pies — you play either against a friend or computer. That's all there is to it, but the simple pleasures of splatting someone in the face entertain for quite a while. Good for several laughs.

**Program** Custard Pie Fight  
**Price** £4.95  
**Micro** BBC  
**Supplier** Comsoft  
7 Roman Drive  
Leeds  
West Yorkshire  
LS8 2DR

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.





Vic20	
1 (-) Snooker	(Visions)
2 (7) Sub Hunt	(Mastertronic)
3 (-) Phantom Attack	(Mastertronic)
4 (-) Undermine	(Mastertronic)
5 (-) Vegas Jackpot	(Mastertronic)
6 (10) 3D Maze	(Mastertronic)
7 (8) Bewitched	(Mastertronic)
8 (-) Scrambler	(Mastertronic)
9 (-) Choo-o-bloc	(Paramount)
10 (-) Gridrunner	(Llamasoft)
(6) Wizard & the Princess	(Melbourne House)

Two titles tied for 10th position  
(Figures compiled by Boots/Websters)

Commodore 64	
1 (-) BMX Racers	(Mastertronic)
2 (-) Space Walk	(Mastertronic)
3 (2) Beach Head	(Centrosoft)
4 (4) Hektik	(Mastertronic)
5 (-) Hunchback	(Ocean)
(10) Manic Miner	(Software Projects)
(-) Blagger	(Alligata)
8 (1) Squirm	(Mastertronic)
9 (-) Superfont	(English Software)
10 (5) Flight Path 737	(Anirog)

Three titles tied for 8th position  
(Figures compiled by Boots/Websters)

BBC B	
1 (1) Overdrive	(Superior)
2 (2) Fortress	(Pace)
3 (5) Micro Olympics	(Database)
4 (4) Aviator	(Acornsoft)
5 (3) Mr Wiz	(Superior)
6 (-) Ghoul	(Micro Power)
7 (-) Stock Car	(Micro Power)
8 (6) Star Striker	(Superior)
9 (-) JCB Digger	(Acornsoft)
10 (10) Snowball	(Level 9)

(Figures compiled by W H Smith and Son, London)

Dragon	
1 (3) Pedro	(Imagine)
2 (1) Hunchback	(Ocean)
3 (-) Hungry Horace	(Melbourne Hse)
4 (-) Buzzard Bait	(Microdeal)
5 (-) Cuthbert in Space	(Microdeal)
(-) Dungeon Raid	(Microdeal)
7 (10) Mr Dig	(Microdeal)
8 (-) Up Periscope	(Beyond)
9 (-) Ring of Darkness	(Wintersoft)
10 (2) Cuthbert in the Jungle	(Microdeal)

Two titles tied for 5th position  
(Figures compiled by Boots/Websters)

Books	
1 (8) Commodore 64 Programmers' Reference Guide	(Pitman)
2 (-) Creepy Computer Games	(Usborne)
3 (-) Beginners Micro Guide, Spectrum	(Granada)
4 (5) 80 Progs for Commodore 64	(Pan)
5 (-) Commodore 64 Graphics & Sound	(Granada)
6 (-) Teach yourself Computer Programming, Commodore	(Hodder)
7 (-) Adventure Games for Commodore	(Granada)
8 (-) Easy Programs for Commodore 64	(Shiva)
9 (1) Beginners Micro Guide BBC	(Granada)
10 (-) Battle Games	(Usborne)

(Figures compiled by Websters)

Spectrum	
1 (4) Jet Set Willy	(Software Projects)
2 (5) Jack and the Beanstalk	(Thor)
3 (1) Tornado Low Level	(Vortex)
4 (3) Zaxxon	(Starzone)
5 (-) Full Throttle	(Micromega)
6 (2) Blue Thunder	(Foundry Systems)
7 (-) Lords of Midnight	(Beyond)
8 (7) Star Trader	(Bug Byte)
9 (8) Chequered Flag	(Psion)
10 (6) Match Point	(Psion)

(Figures compiled by W H Smith and Son, London)

ZX81	
1 (1) Krypton Ordeal	(Novus)
2 (3) Planet Raider	(Novus)
3 (4) Walk the Plank	(Novus)
4 (1) Alien Rain	(CRL)
(-) Football Manager	(Addictive Games)
6 (5) Black Crystal	(Carnell)
7 (-) Hopper	(PSS)
(8) Flight Simulation	(Psion)
9 (-) Chess IE	(Psion)
10 (-) Asteroids	(Quicksilver)

Two titles tied for 4th position and 7th position  
(Figures compiled by Boots/Websters)

Atari	
1 (1) The Hulk	(Adventure International)
2 (2) Bruce Lee	(Datasoft)
3 (3) Encounter	(Novagen)
4 (6) Zaxxon	(Datasoft)
5 (-) Flak	(Synsoft)
6 (5) Captain Sticky's Gold	(English)
7 (-) Super Cobra	(Parker)
8 (10) Warlock	(Calisto)
9 (-) Saga 6	(Adventure International)
10 (-) Slinky	(US Gold)
5 32K Cassette + Cartridge + 48K disc	

(Figures compiled by Calisto Computers Birmingham 021 632 6458)

## Easy stuff

*Easy Programming for the Atari Micros* concerns itself with the generally boring area of 'How To Do Basic', but has a couple of important features.

Firstly, it's one of relatively few such books for the Atari machines that aren't expensive American imports. And secondly it is particularly well constructed.

It covers all the usual areas — the Basic commands, using sound, flow-charts, bug finding, different screen modes, etc, but takes more time to explain itself and lets you test that you really do understand what's been said to a greater degree than most other such books I've seen.

**Book** *Easy Programming for the Atari Micros*

**Price** £6.95

**Micro** Atari

**Supplier** Shiva

*The Hawthorns*

64 Welsh Row

Nantwich

Cheshire

CW5 5ES

## Conceptual

*Games Programming* sounds like another one of those awful books of listings I've moaned about before, but mercifully it isn't.

What we have here is a serious book about writing

games. It looks and reads like an academic tome. *Games Programming* discusses the concepts behind games design rather than how to create *Space Invaders*. For example, it deals with things like the kinds of maths useful in wargaming.

The book varies between strictly programming information and more abstract considerations on how the real world can be modelled by a computer. It's rather earnest difficult stuff, but fascinating as well.

**Book** *Games Programming*  
**Price** £7.50  
**Micro** General  
**Supplier** Cambridge University Press  
The Edinburgh Building  
Shaftesbury Road  
Cambridge  
CB2 2RU

## Ozone layer

Tim Hartnell, author of many good computer books and editor of many others has recently issued a book called *30 Dynamic Games for the Aquarius*. I blame aerosols eating away the ozone layer myself.

**Book** *30 Dynamic Games for the Aquarius*  
**Price** £2.95  
**Micro** Aquarius  
**Supplier** Interface Publications  
9-11 Kensington High St  
London W8 5NP

# This Week

Program	Type	Micro	Price	Supplier
Crawler	Arc	BBC	7.75	Watford
Drilla Killa	Arc	BBC	£6.90	Vampyre
Dune Rider	Arc	BBC	£7.95	Micro Power
Paranoid Pete	Arc	BBC	£5.50	Ubik
Pengo	Arc	BBC	£7.75	Watford
Bonsoft Pools				
Predict	Ut	BBC	£7.00	Bonsoft
Connect 4	S	Commodore 64	£1.99	Atlantis
Scrabble	S	Commodore 64	£12.95	Leisure Genius
Citadel of Chaos	Ad	Commodore 64	£5.50	Penguin
Forest of Doom	Ad	Commodore 64	£5.50	Penguin
Daley Thompson's Decathlon	S	Commodore 64	£7.90	Ocean
Strip Poker	S	Commodore 64	£9.95	US Gold
Turbo Saver	Ut	Commodore 64	£7.00	Arrow
Death Valley	Ad	Dragon	£6.50	Micro Data
Magic Midnight	Ad	Dragon	£7.50	Magic Midnight
Return of the Ring	Ad	Dragon	£9.95	Wintersoft
Zak'sson	Arc	Dragon	£6.95	Cable
Rat Race	S	Dragon	£7.50	Magic Midnight
Ghoul	Arc	Electron	£7.95	Micro Power
Felix in the Factory	Arc	Memotech	£6.95	Micro Power
Cashbook	Ut	MSX	£14.95	Micro Aid
Memo Calc	Ut	MSX	£14.95	Micro Aid

Payroll	UT	MSX	£29.95	Micro Aid
Prisoner of Village	Ad	Spectrum	£5.50	Spoof
The Lost Orb	Ad	Spectrum	£6.00	K W Computing
Paranoid Pete	Arc	Spectrum	£5.50	Ubik
Diseases of the Heart	Ed	Spectrum	£6.95	Medidata
Master Mariner	S	Spectrum	£1.99	Atlantis
Vagan Attack	S	Spectrum	£1.99	Atlantis
Coursewinner	Ut	Spectrum	£12.50	Selec
Poolswinner	Ut	Spectrum	£15.00	Selec
Space Art	Ut	Spectrum	£2.95	Eclipse
The Unitrust Program	Ut	Spectrum	£12.00	Michael Slatford
Sloopy's Christmas	Arc	T199/4A	£5.00	Gamesware

**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.





## Flatland

**I**t's only logical when you think about it. We are three-dimensional people, but our computer screens present two-dimensional pictures of a 2D world. So perhaps it's a nifty idea to study the way a 2D world would really work.

Oddly enough, there's quite a stack of literature on the subject, stretching back to the pre-computer age, as long ago as 1884.

That year saw the publication of Edwin Abbott's *Flatland: A Romance of Many Dimensions*, which started the idea of thinking flat. Abbot's *Flatland*, is literally flat: the inhabitants (whose internal structure is wisely not described) are 2D geometrical shapes lying on, or rather in, an infinite flat plane. Because there's no third dimension of "height" a mere line in this plane is an impenetrable barrier to your average Flatlander.

This sounds familiar. Flatland's geometry is more or less that of our old favourite *Pac-Man* — the chief difference being those "tunnels" at each side of the *Pac-Man* screen, where the flat space of the game sneaks round to join onto itself. A more thorough-going example is the curved space of *Asteroids*, which in cosmologists' jargon is "finite but un-bounded" since whenever you reach the "edge" you reappear on the other side.

Two authors wrote sort-of-sequels to *Flatland*, introducing the curved-space idea in different ways. Dionys Burger's *Sphereland* (1965) converts Flatland into the surface (only) of a sphere, so you can travel forever on the "plane" without reaching an edge. The idea of the book is to push

Einstein's view of our universe as curving through 4D space, so that to travel far enough out from Earth will take you clear round the curve of the universe and back.

The other view of 2D life comes from Charles Hinton's *An Episode of Flatland* (1907). Instead of making Flatland a 'map' viewed from above, as in *Pac-Man*, Hinton saw it from the side with a definite 'up' and 'down' (but, to compensate, no north or south). Just as in *Space Invaders*. Hinton's Flatlanders stand upright on the rim of the circle, their planet, towards whose centre they're pulled by gravity. 2D gravity, of course, obeys an inverse-linear instead of an inverse-square law. The flat, circular planet orbits a flat, circular sun in a flat universe...

The latest work on the subject is *The Planiverse* by A.K. Dewdney, a 1984 paperback (Picador £2.95) which tackles a 2D world in mind-boggling depth.

In 2D, a piece of string is a versatile tool. It can't be knotted without an extra dimension, but the Flatlanders (Dewdney even gives them a plausible biology!) can walk over deep gorges on it, in effortless tightrope-fashion; can hold it stretched overhead as a perfect umbrella; can carry water in a loop of it; or can loop the string around an area of light gas to create an instant, personal airship. There's no way to fall off a tightrope since there is no "sideways".

The book goes further. Conventional wheels don't work (the axle has to be central, and therefore inaccessible because it's totally enclosed by the wheel's rim), but rollers do. You can't nail two planks together: when the nail goes through the top one is to split it completely in two. Rainfall causes flash floods because the soil's impervious. And so on...

Very soon I expect to see a computer game simulating the weird possibilities and restrictions of a Flatland. Go North, you forgetfully type, and the computer replies: *North is an abstract metaphysical concept without real meaning in this universe, sire.*

It could leave you feeling pretty flat.

David Langford

## Pyramid building

### Puzzle No 121

When Wolfgang the woodcutter had a very large cube of wood surplus to requirements, he cut it into a number of identical smaller toy blocks for his young offspring. He was surprised to find, when at last he finished, that he had made exactly the right number of blocks for his child to build a square-based pyramid. He boasted of this fact proudly to the village school-teacher that night.

"You say that your son built a square pyramid," queried the teacher, — the type with a single block on the top tier, a two-by-two arrangement on the second from top tier and so on?"

"That is correct," said Wolfgang.

"And each of the blocks is exactly cubic, as was the original piece of wood?" Wolfgang nodded.

"It's impossible!" replied the schoolteacher.

They rushed off to the woodcutter's house to investigate the matter, and the solution was quickly found. In building the huge pyramid, just one of the small blocks had rolled into a corner where it had lain undetected.

How many blocks were there in all?

### Solution

The program places consecutive integers into a string and scans them for their individual digits. Each element of the dimensioned array *D*(10) is incremented by one to keep a tally of the total number of times each digit occurs (the zero's go into *D*(10)).

When *D*(1) is equal to *D*(2) + *D*(3) the results are printed:

```
10 DIM D (10) 20 LET N = 1 30 LET N$ = STR$(N)
40 FOR M = 2 TO LEN(N$) 50 LET T = VAL
(MID$(N$,M,1)) 60 IF T = 0 THEN LET T = 10 70
LET D(T) + 1 80 NEXT M 90 IF D(1) = D(2) + D(3)
THEN PRINT N 100 LET N = N + 1 110 GOTO 30
```

Note that the string *N\$* is scanned beginning at position 2 in Lines 40-80 as many micros reserve the first character for the positive or negative sign. This results in a number of possibilities, but the only odd one is when *N* = 115. (The next highest odd result (*N* = 1499) would also be too large for a 'slim' volume.

### Winner of Puzzle No 116

The winner is: Roland Langridge, Regent Street, Clifton, Bristol, who receives £10.

### Rules

If the puzzle can be sensibly solved using a computer then the winner will have included a listing of the program used to find the correct answer. The closing date for entries to Puzzle No 121 is September 8.

## The Hackers





PIMANIA-The Cult Adventure 48K Spec £10  
 CRUSOE M/C Adventure 48K Spec £6  
 OLYMPIANIA M/C Arcade 48K Spec £6  
 PIROMANIA M/C Arcade 48K Spec £6  
 PI-IN'ERE M/C Arcade 48K Spec £6  
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