

POPULAR **Computing** WEEKLY

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Vol 3 No 45

CBM Mac rival

COMMODORE will now go ahead with its plans to launch a rival for Apple's Macintosh in mid-1985, despite a continuing legal battle with Atari over the ownership of the technology involved.

The Commodore machine is based on the Lorraine — a 256K, 32-bit 68000-based micro — developed by Amiga, a US

company which Commodore has been in the process of acquiring for some months. Commodore's purchase of Amiga was completed last week.

The future of the new Commodore machine had been in some doubt since Atari sued Amiga earlier in the year in a dispute over chips — used

in the Lorraine — developed by Amiga for Atari. Atari claimed that Amiga did not complete the contract and then offered the chips for sale to third parties.

Now there is confusion over how the sale of Amiga to Commodore will affect the law suit. Steven Greenberg of

continued on page 5

Atari plans up-market 800 XL micro

ATARI is to launch a new 128K version of its 800XL computer, as well as new 16- and 32-bit micros, in its renewed assault on the micro market.

"The 800XL, now selling at £169, will be the figurehead of



Simon Westbrook

the 8-bit range, and we will also be producing a 128K machine in this series," confirmed Simon Westbrook, Atari Corporation (UK)'s managing director.

"Then we will be introducing 16-bit and 32-bit machines, as talked about by Sam Tramiel earlier this year, which will involve much superior technology. Software for these will be both for business and domestic purposes." These up-market machines are expected to be 68000 processor based.

Atari is planning to offer a range of hard disc units with the more sophisticated machines, up to an IBM-compatible level. The company will also continue to support the lower, end of the market.

Advance — IBM takes action

COMPUTER giant IBM has taken action regarding the Advance 86a and B IBM-compatible micros.

Discussion between Ferranti, manufacturers of the Advance machines, and IBM have been going on for some time, regarding the Rom chips used in the Advance.

IBM claimed that the Ad-

vance Rom is a 90% direct copy of the Rom developed by IBM for its PC range. Now an agreement has been reached between the companies involved. A spokeswoman for IBM said, "IBM has concluded that a program in the Advance's Rom is an unauthorised copy of the basic input/output system on the IBM PC. Having been infor-

med of the infringement, Ferranti, Advance and W H Smith the distributors, have all agreed to cease infringements." It now seems likely Advance will alter the 86 micros' Rom chip.

At £1500, the Advance 86b undercuts the basic IBM-PC by nearly £1000, while the 86a sells for just £399. The Advance's 8086 processor runs up to 40% faster than the PC's 8088 chip.



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Last week one amateur Commodore 64 'hacker' succeeded where our government has so far failed. He lifted the exchange rate to \$50 to the pound.

Actually what he did was to use his modem to break into the *Financial Times*' reserved pages on the Prestel database and change the information displayed on the system as a joke. He also, while he was at it, gained access to the private mail Prestel area used by Prince Philip.

break in — apparently without too much difficulty — is considerably embarrassing for Prestel (and just when Prestel bashing seemed to be going out of style, too), especially as Prestel has recently embarked on a campaign to persuade big companies to take system space on which to store their own confidential business information.

Under this government's controversial Data Protection Act it is the responsibility of each database to ensure that its confidential information on individuals is kept as secure as possible. Anyone whose personal details are wrongfully disclosed can go to court to claim damages against the data provider. Taking action against the 'hacker' is not easy, however, under present law.

It must only be a question of time now before here are professional hackers — experts who, for a fee, undertake to pick open data files as directed and pull out financial data, police records or people's credit ratings and political allegiances.

There should be big fines imposed for such 'professional' hacking. And databases carrying private information on individuals should evolve systems to detect if an unauthorised access to the system has been made.

POPULAR Computing WEEKLY

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Data filing program for the Amstrad ... on-screen printing without control characters on the 64



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ABC

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Computer Trade Association Magazine of the Year

Here John did you know

Pyjamarama

is better than Jet Set Willy?

Who says so?

Computer and Video Games

It would be unfair to compare this game with Jet Set Willy but as people will inevitably do this, I'd like to say I think it is better. Here at C&VG we liked it so much that we are sticking it in our Hall of Fame.

Crash

Pyjamarama has some of the best animation and realistic graphics I have ever seen. Pyjamarama is unbeatable.



Personal Computer News

Pyjamarama has what is probably the most stunning graphics you are likely to see on a Spectrum. Pyjamarama is probably one of the best ever games released for the Spectrum.

Personal Computer Games

Game of the Month
It's not just the graphics, although these are outstanding. **The real point about Pyjamarama is that it's the first Arcade Adventure which is a real adventure.** Coupled with the games superb graphics and easy playability means that most people will fall in love with it straight away.

So now you know don't ya

Wally Week

Signed

Spectrum 48K
Commodore 64K
Amstrad CPC464

Mac rival

continued from page 1

Commodore US commented last week: "All the Atari lawsuit has done is prevent Amiga from licensing its chip technology to any third party — in its sale to Commodore it is not doing that, and the suit makes no difference."

"We will certainly be releasing a machine based on Amiga's micro under the Commodore name. A date has not been announced yet, but it will probably be some time in the second quarter of 1985."

Until Commodore's purchase of Amiga, Atari was hoping that its lawsuit would prevent Commodore from releasing the machine.

Rocky Horror Picture Show game from CRL

CRL, the company which has recently released games based on *War of the Worlds*, *Terrahawks* and *The Magic Roundabout*, is negotiating for a deal to base a computer game on *The Rocky Horror Show*.

"We still have to finalise the deal, but everything is going very smoothly," said CRL's managing director Clement Chambers. "We'll be basing the game around the strange environments in the stage show, with the emphasis on



Clement Chambers graphical presentation, rather than on the elements of dubious taste in the show itself.

"I'm hoping the game will be out in the middle of next year. We'll definitely be doing Commodore and Spectrum versions, and as many others machines as we can manage."

More news on page 8

Sinclair portable

SINCLAIR is developing a new portable computer, based on the Spectrum technology.

The machine, which could be available by mid-1985, will be fully software compatible with the existing Spectrum and Spectrum+.

Unlike other portable machines, however, the Spectrum

Portable will be battery operated, requiring no external power supply.

"This is one of the many projects in the pipeline, although no definite release date has yet been set," said a Sinclair spokesman.

Research into new types of high-performance batteries is now under way at Sinclair's Metalab development facility. The Metalab team worked with Polaroid on the battery for the Sinclair flat-screen tv and is currently working to design the power unit for the Sinclair Electric Vehicle project.

● Among the developments at Sinclair's Metalab is a solid state drive for the QL. This silicon version of the Winchester hard disc drive will run up to 100 times faster than a conventional device.

Low-cost modem

UNICOM has announced a full-feature modem costing only £60.

For the price, which includes postage and packing, Unicom is offering a modem, complete with leads, power supply and manuals, which connects to any micro with either an RS232 or RS432 interface. It features auto-answer, and auto-



Unicom's low cost modem. Details from Unicom, 20 Orange Street, London WC2

baudrate scan facilities, and operates at a variety of baud rates: 300/300, 1200/1200, 1200/75 and 75/1200. The device also allows one- or two-way simultaneous transmission (full and half-duplex).

Software is also available, on

Rom at £24, and disc at £12 to give access to a number of networks including Prestel, Micronet and Telecom Gold. It also provides an auto-dial and auto-redial facility, and enables the use of a printer to dump data sent and received.

Tangerine in troubles

TANGERINE, the company which spawned Tansoft and Oric Products International, has hit trouble.

Teknocron Circuits, an Isle of Wight company, has presented a winding-up petition against the company. The petition has caused some surprise, since Tangerine has been largely dormant since Oric and

Tansoft became separate entities, and Tandata was bought by Applied Petroleum.

"The petition concerns an argument which has been going on for the last three years," explained Oric managing director Barry Muncaster. "Teknocron made the circuit boards for Tangerine's Tantal Prestel adaptor. The money it says we owe them is around £4000 of outstanding interest."

continued on page 8 ►

Acorn micro music add-on

ACORN is to launch a music synthesiser add-on for the BBC B at the COMPEC show, beginning on November 13.

Manufactured by Hybrid Technology, the synthesiser plugs into the BBC and also connects with a hi-fi system. The user can write and program music on the micro, using a specially developed language, which can then be played back through the hi-fi speakers. The synthesiser can also be interfaced with a music keyboard.

Acorn is aiming the synthesiser at the professional market, and it is expected to sell for just under £200.

Other new Acorn products for the BBC set for launch at COMPEC include the languages *Logo* and *Pascal* — *Logo* on Rom at £69 and *Pascal* on both disc (6502 second processor needed) and Rom. A Winchester hard disc and the long-awaited 32016 second processor option for the BBC will also be announced.

For the Electron, the Plus 3 disc interface will be making its first appearance.

Prestel to hold inquiry

PRESTEL is conducting a top-level investigation into its security following a bizarre incident in which hackers broke into subscribers' files.

Personal identity codes of subscribers were printed on screen, much to the hackers' delight. They were then able to tamper with the *Financial Times* Stock Exchange news, so that at one point, the pound was displayed as being worth \$50 and break into the files of stockbrokers Hoare and Govett. They also perused the personal mail of Prince Philip — the Duke of Edinburgh is a Prestel subscriber.

"We are treating this very seriously indeed," said a British Telecom spokesman. "I can confirm that there was a severe lapse in Prestel security for a short while. Our immediate action was to change all the identity codes of our information providers, but we are carrying out a full investigation as to how it happened."

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Visions of the future

VISIONS Software has shed its marketing operations and is to concentrate solely on program development.

Marketing manager Mike Cowell has left the company and joined CSM (Consolidated Software Marketing) as sales and marketing director. CSM has now gained exclusive marketing rights to all Visions products.

"The amount of money Visions needed to market its own games was way beyond its means," explained Mike Co-

well. "Future releases written by Visions may or may not carry the Visions name — that has not yet been decided."

Of those future releases, the next titles to be launched will be four games for the BBC B — *Apple Pie*, *Sim*, *Ultron* and one as yet untitled *Q-Bert* style game. These should be available within a month at between £6 and £8.

Tangerine

◀ continued from page 5

"The action won't mean Tangerine will cease to exist — because it'll pay the money."

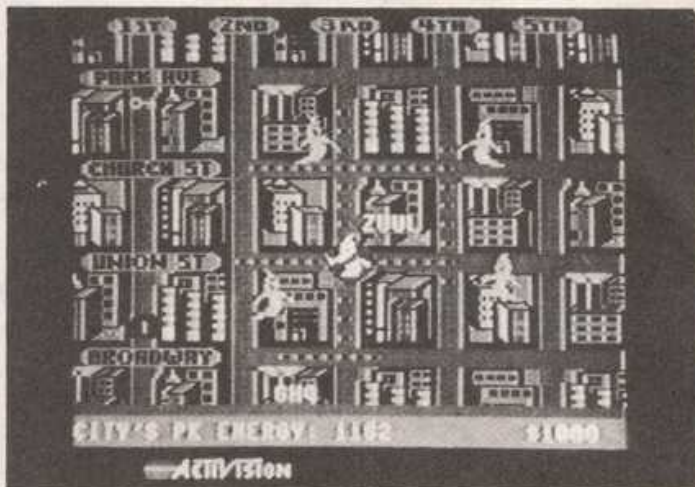
● Oric's legal action against its distributors Prism is also due to be heard in court this week (see *Popular Computing Weekly*, October 4). Oric is suing Prism for £4m made up of several smaller claims but has applied for summary judgment on claims totalling £320,000.

"We applied for summary judgment because the £320,000 claim is rock solid and beyond dispute. It concerns product that was taken and not paid for, and product which was not taken," Barry said.

Game of the film

GHOSTBUSTERS — The Computer Game is due out later this month, some three weeks before the film on which it is based goes on general release.

spirits. The aim is to find, capture and safely store the ghosts out of harm's way. Also making an appearance is the huge marshmallow man, a feature of the movie.



Produced for Activision by *Pitfall* author David Crane, the game plot follows the film fairly closely. The player takes the part of a "ghostbuster", striving to save New York from an invasion of ghosts and evil

Ghostbusters will be released initially for the Commodore 64 on disc (£19.99) and cassette (£10.99) and for the Spectrum (£9.99). BBC and MSX versions will follow.

ACT — company of the year

ACT, manufacturers of the Apricot range of business computers, has received the Business Enterprise Award as Company of the Year.

The Business Enterprise Award is sponsored principally by the Institute of Directors, and also by Barclays Bank, Lloyds Bank, the Sunday Telegraph and Henley — the Management College.

Exclusive competition

Win a ZX Spectrum +

Popular Computing Weekly, in association with Sinclair, offers the chance to win a Spectrum + — Sinclair's new Spectrum software compatible micro — worth £179.95 — complete with its six bundled software packs including *Tasword 2*, *Scrabble*, *Vu-3D*, *Make-a-Chip*, *Chess* and *Chequered Flag*.

All you have to do is look closely at Sinclair's current TV advert for the Spectrum + — being shown on Channel 4 and ITV until December — and name the eight Sinclair software programs which are shown on the screens during the advert.

If you think you know what the eight titles are, fill in the coupon below together with your name and address and send it off to us at: Sinclair Competition, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

Just in case more than one of you get the eight answers correct there is a tie-break. Read the idea for a new Sinclair game and think up a good title for it: 'You are invited to an isolated mansion as a potential heir to a vast fortune. To claim the fortune for yourself you must find and piece together the fragments of a portrait distributed around the cobweb festooned house'.

The best game title, with the correct eight titles from the TV ad will win the prize.

The judges decision will be final. Entries must reach us by midday on Friday, December 7.

Name

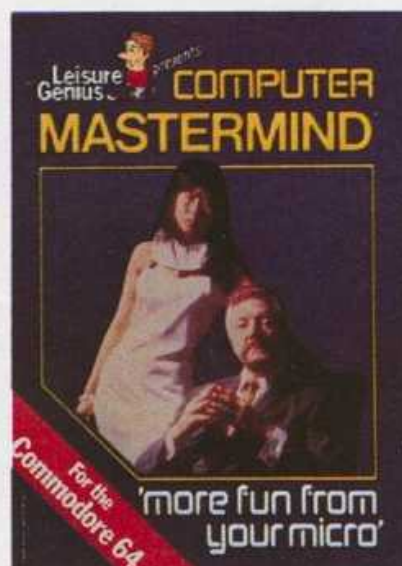
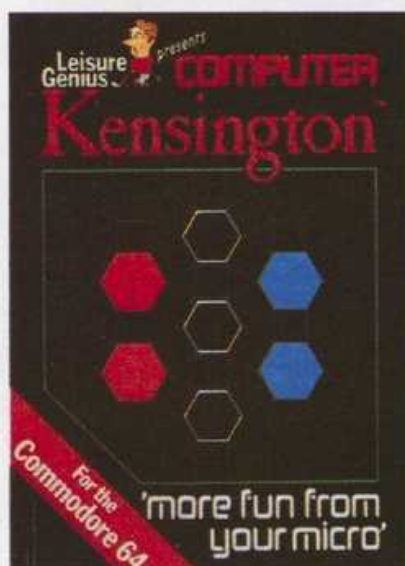
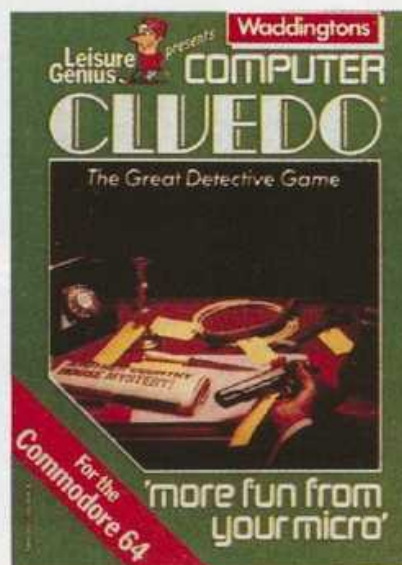
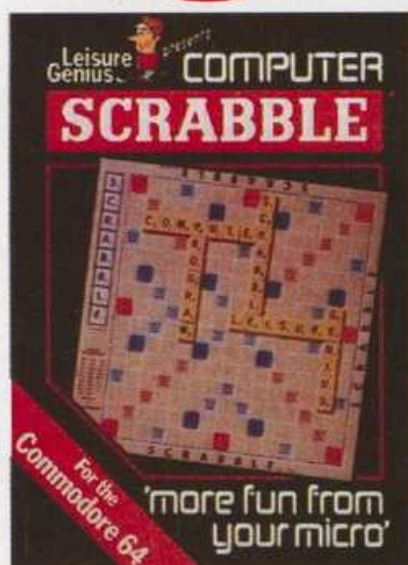
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My title for the 'heir to the fortune' game is



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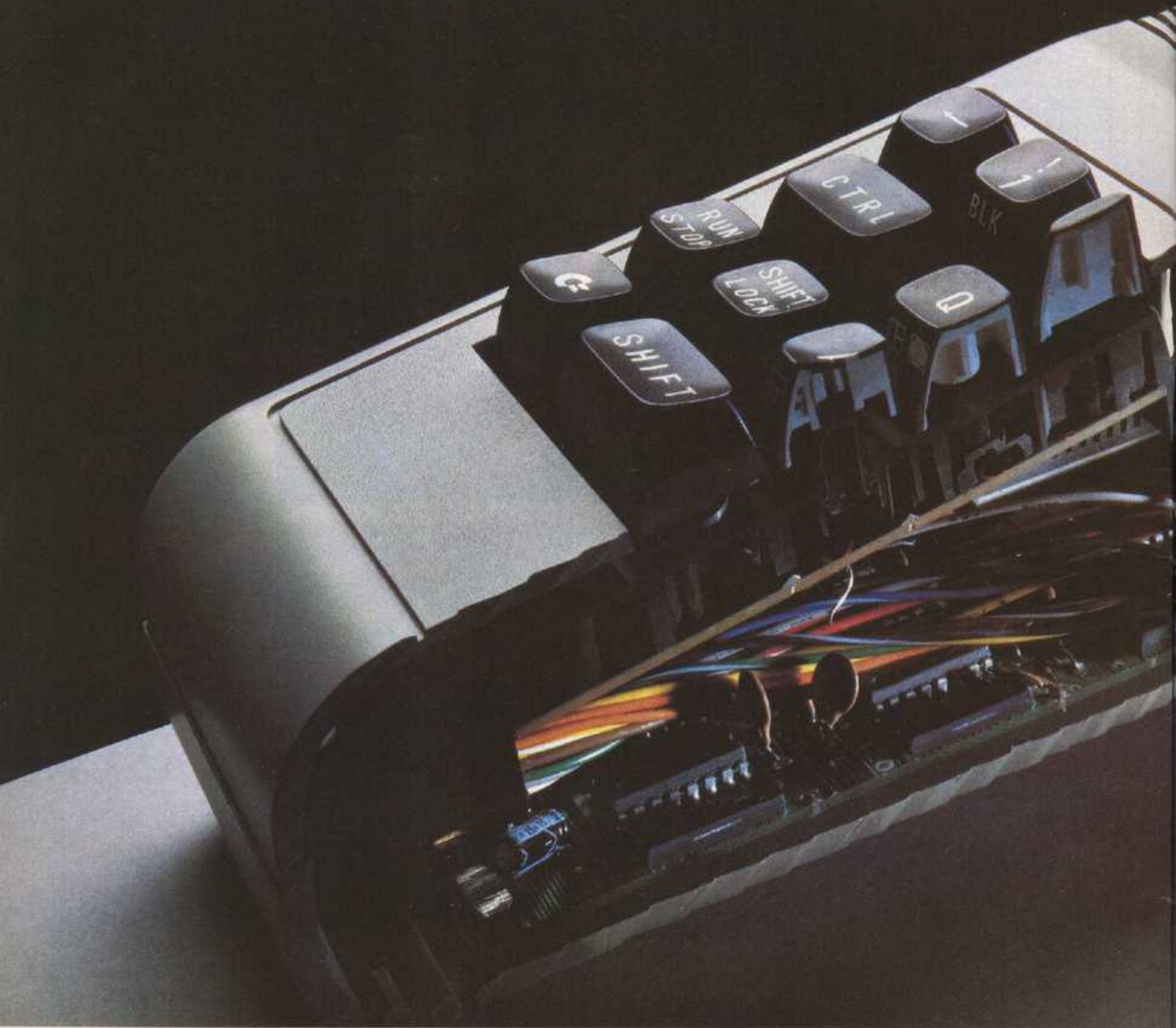
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Are you only using

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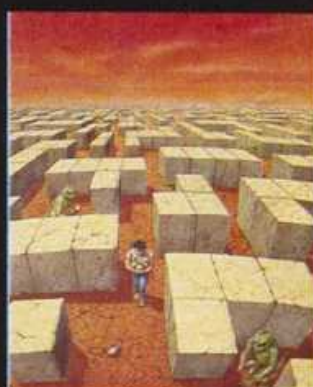
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No such animal

Your correspondent John Mawhood (*Letters*, October 25 issue) has indeed spotted a documentation bug: although I'd like to point out there is no such animal as 'The Amstrad'.

Dec\$ is not mentioned in the main user guide, and should have been omitted from the technical manual for the Basic, and will be in future editions.

As for the comment: "...ought to be publicised because Amsoft have not officially acknowledged it..." What do you want, low-flying aircraft towing banners?

Late delivery of *Amsword* is a considerable nuisance — but exemplifies several cases where software houses anticipated "just transferring" programs from lesser hardware to the CPC464, but ended up by producing a labour of love inspired to far greater things than originally intended by the power of the hardware and OS.

Mr Mawhood will be receiving a beta copy of *Amsword* today, and he may then appreciate why it isn't a simple clone of the Spectrum product. It is a wolf in sheep's clothing, sir — unlike other products which prompt thoughts of mutton dressed as lamb...

And as for having the Spectrum + dangled in front of us — well, really. And the funny thing is that my spies tell me that many programs using the cursor keys on the original Spectrum seem to be exhibiting some trouble coping with the Plus — even though the Rom is reputedly identical. Nice one!

William Poel
Amssoft
Brentwood House
169 Kings Road
Brentwood
Essex

Delete alternative

Here's a quick Amstrad CPC464 bug. If you type in 10 Rem and then hit Tab you end up with the line: 10 Rem →.

If this is run you get error messages 'syntax error in 32511' and 'line does not exist in 32511'.

However, things get curiously. Enter Line 10 → and you get a message 'Line 10 does not exist', so it appears the arrow is ignored.

Now try a small program of ten Rem statements. If the first one contains an arrow it deletes all subsequent lines if it is Run. Goto has no effect.

This then becomes an effective alternative to Delete. If you wish to delete the whole program after, say, Line 10000 you can achieve this with 9995 Rem →, followed by Run 9995. Interesting, eh!

D R Halliwell
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Right-hook comparison

Perhaps someone can enlighten me? How is it that some writers and reviewers say that the MSX standard is the best thing that ever happened to the Z80, while others claim that it is 'substandard' (sub what standard? To the best of my knowledge there ain't been one up to now).

Some of the most vitriolic statements seem to come from the Spectrum diehards, coming out of the blue corner swinging with a right and a left, and following through with a right-hook comparison. Which machine really does fare better?

Sound MSX: 3 voices, 8 octaves, programmable using a macro music sub-language. Spectrum: 1 squeak.

Keyboard MSX: Full-travel, typewriter style. Spectrum: Squelch sensitive, travel-sick.

Cursor keys MSX: Well placed, easy to use cluster. Spectrum: Errmm...Now...which



key, oh sorry!

Editor MSX: Full-screen, cursor-controlled. Spectrum: Single line, back to those cursed cursor keys.

Colour attribute problems MSX: Two colours per eight pixels (horizontal). Spectrum (and C64 for that matter): Two colours per 64 pixels (chunky, man!).

Joystick ports MSX: Two D-ports. Spectrum: What joystick port?

Sprites MSX: Thirty-two. Spectrum: ...if you buy *White Lightning*... (Commodore 64: Eight, but who can control them?)

Real-Time Interrupts MSX: Eight. Spectrum: None.

Need I go on? If MSX is sub-standard, what does that make the Spectrum? If MSX is out-of-date because of the Z80 chip it is based on, what is the Spectrum based on, a 32 bit wonder! It is not.

All I'm saying chaps is that the Japanese have made a good job of their standard. Their machines are easy to use, well made, well laid-out, and use a more than passable version of Basic (OK so the Enterprise's Basic is better, but I think that this venerable machine must have been got-at by those nasty Klingons).

And the Japanese companies have done what we should have done two years ago — they got together! We the punters are the winners, or we will be if we take little notice of the misinformation which is circulating in certain periodicals.

Mr D A Austin
15 Stafford Avenue
Clayton
Newcastle-U-Lyme
Staffs ST5 3BN

What you have not mentioned in your evaluation of the MSX system is that, whereas the Spectrum is £129 and the Commodore 64 is £199, the majority of the MSX machines cost over £275, and they all have considerably less memory available to Basic than either the Spectrum or C64.

Search in vain

Melbourne House say in the booklet which accompanies their excellent ad-

venture game *Sherlock* 'you will find yourself in strange situations'.

They were right. I had been searching in vain for some time for Major Percival Foulkes when, on returning to Baker Street, I found him in a hansom cab in my hall! I have since tried to remove him and the cab from the hall without success.

A small bug, in an otherwise first-class game.

P Cowley
148 Widney Lane
Solihull
W Midlands

More practice

Jeff Naylor's review of the Spectrum+ in the October 25 issue refers to a 'bug' in the new welcome tape. The keyboard tutor program will tell you that you need more practice even when you score 100% if you have spent insufficient time in any section. At least four correct keystrokes are required to get a pass mark.

As you are allowed to leave any section at any time, we decided that 'you need more practice' was an appropriate message for those who leave a section precipitously. Regard it as a bug if you will, but it is a deliberate one.

Incidentally, both the welcome tape and the new manual were designed for a much younger user than the original Spectrum items. Sinclair have thought that most Spectrum users, who are in the eight to 15 age group, may have found the original manual heavy going. After all, Sinclair did not envisage the Spectrum being used primarily for entertainment when it first appeared. It was thought in the beginning that it would be used by small businesses and in education.

Goldstar Software were specifically required to replace the original items with brighter, more easily understood, and friendlier productions, omitting the more esoteric technicalities, and maybe even some of the less esoteric ones.

Iolo Davidson
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1-2 Henrietta Street
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Rid the land of ferocious dragons armed with only a sturdy bow, in this arcade game by Richard Snowden for the QL

Many years ago, when dragons roamed the forests, a typical day's work may have involved ridding the land of herds of ferocious dragons. But this is no easy task, as the dragons are devious, and powerful and will soon defeat

you if you lack concentration.

Here, the QL becomes your own personal hunting trainer to tune up your reflexes. A direct hit is required to destroy a dragon, but plan your attacks well, as you have only six arrows. Once this stock is depleted, you

must venture across the river and enter the castle to re-stock.

Use the cursor keys to move, and the *ALT* key to fire. To enter the castle, stand just in front of the castle door and step inside when it opens.




```

10 REMARK Dragon Slayer
20 REMARK *SnowSoft*
30 REMARK Richard Snowdon
120 moveset
130 readchars
140 castle 280,166
150 door 280,166,5
160 lake
170 init
180 play
190 STOP
200 DEFINE PROCEDURE castle(x,y)
210 WINDOW #1,465,210,32,2:WINDOW #0,465,46,32,210:BEEP
220 FOR i=0 TO 2:BORDER #1,0,0:SCALE #1,256,0,0:INK
#1,7:PAPER #1,0:CLS #1:OVER #1,0
230 MODE 8
240 LINE x,y:INK 2:FILL 1:LINE_R 50,0 TO 0,40 TO -50,0 TO 0,-40
250 INK 2,3:FILL 1:LINE_R 0,40 TO 10,5 TO 50,0 TO -10,-5
260 INK 2,0:FILL 1:LINE_R 10,5 TO 10,5 TO 0,-40 TO -10,-5 TO 0,40
270 INK 0:FILL 1:LINE x,y
280 LINE_R 3,10 TO 0,20 TO 3,5 TO 0,-20 TO -6,0
290 FILL 1:LINE x+38,y:LINE_R 3,10 TO 0,20
TO 3,5 TO 0,-20 TO -6,0
300 INK 3:FILL 1:LINE x,y:LINE_R 0,40 TO 5,10 TO 5,-10 TO -10,0
310 INK 3,0:FILL 1:LINE_R 5,10 TO 10,5 TO 5,-10 TO -10,-5 TO -5,10
320 INK 3:FILL 1:LINE x+38,y:LINE_R 0,40 TO 5,10 TO 5,-10 TO -10,0
330 INK 3,0:FILL 1:LINE_R 5,10 TO 10,5 TO 5,-10 TO -10,-5 TO -5,10
340 FILL 0:OVER -1:CSIZE 3,1:CSIZE #0,0,1:OVER #0,1
350 FOR i=10 TO 0 STEP -2:INK #0,1+5*(i/10):CURSOR #0,
i,(10-i):PRINT #0,"OL Dragon Slayer"
360 OVER #0,0:END DEFINE
370 DEFINE PROCEDURE door(x,y,colour)
380 LINE x+25,y:OVER 0:INK colour:FILL 1
390 LINE_R -10,0 TO 0,30 TO 10,5 TO 10,-5 TO 0,-30 TO -10,0:OVER -1
400 END DEFINE
410 DEFINE PROCEDURE init
420 x=20:y=150:dirn=33:fx=330:fy=50:lives=4:dras=1
430 dx=270:dy=80:po=37:fire=0:arr=6:inc=0
440 END DEFINE
450 DEFINE PROCEDURE play
460 knight x,y:dra dx,dy,po:arrow
fx,fy:arrowsleft:livesleft:drasleft
470 REPEAT loop
480 k:=KEYROW(1)
490 IF k1882:IF x>8 THEN knight x,y:x=x+8:dirn=33:knight x,y
500 IF k18816:IF x<420 THEN knight x,y:x=x-8:dirn=33:knight x,y
510 IF k1884:IF y>8 THEN knight x,y:y=y+8:knight x,y
520 IF k188128:IF y<180 THEN knight x,y:y=y-8:knight x,y
530 IF KEYROW(7)884:IF arr=0:IF NOT fire THEN fire=1:
fx=x:fy=y:fp=10*(dirn=33)-10*(dirn=35):in
c=dirn=33:arr=arr+1:arrowsleft:arrow fx,fy:BEEP 0,10,-2,100,-2,100
540 IF fire:IF fx<10 OR fx>420 THEN fire=0:arrow fx,fy:fx=330:fy
=50:BEEP:ELSE arrow fx,fy:fx=fx
+fp:arrow fx,fy
550 IF fx<dx:50:IF fx>dx:IF fy>dy:10:IF fy<dy:10 THEN bump
dx,dy,4:drasleft
560 IF arr=0:IF y<8:IF x>326 AND x<334:IF y>40 THEN door
280,166,0
570 IF arr=0:IF y<72:IF y>60:IF x>326 AND x<334 THEN arr=6:
knight x,y:x=20:y=150:door 280,166
580 knight x,y:arrowsleft:FOR s=255 TO 10 STEP -1:BEEP 16000,s,
-255,500,-255,500
590 r=dot(x,y)
600 IF r THEN bump x,y,1:livesleft
610 IF fire:IF dy>y-10:IF dy<y+10 THEN dra dx,dy,po:dy=(dy+2)*
(dy<170):dra dx,dy,po
620 IF RND(40)<5 THEN
630 IF fire THEN arrow fx,fy
640 breath dx,dy:dra dx,dy,po
650 IF dx<x THEN po=37:dx=dx-8
660 IF dx>x THEN po=42:dx=dx+8*(dx<366)
670 IF dy>y:IF dy>18 THEN dy=dy-8:IF dot(dx+
(po=42)*40,dy) THEN dy=80
680 IF dy<y THEN dy=dy+8:IF dot(dx+(po=42)*40,dy) THEN dy=130
690 dra dx,dy,po
700 END IF
710 END REPEAT loop
720 END DEFINE
730 DEFINE PROCEDURE arrow(x,y)
740 INK 3:CURSOR x,y:PRINT CHR$(188+inc)
750 END DEFINE
760 DEFINE PROCEDURE arrowsleft:AT #0,0,20:PRINT #0,"Arrows:
":FOR i=1 TO arr:PRINT #0,CHR$(189)
770 CLS #0,4:END DEFINE
780 DEFINE PROCEDURE breath(dx,dy)
790 LOCAL w,p
800 BEEP 16000,255,-200,20,-200,20,9,0
810 IF po=37:p=RND(40):p=p*(p<bx):w=bx-p:ELSE p=bx+50:w=RND
(320 TO 440)-p:IF w<p THEN w=440-p
820 IF by>20:IF by<72:IF bx<320:IF po<37
THEN w=300-p:w=w*(p<290)
830 BLOCK w,40,p,by-10,2,0
840 IF x>p:IF x<p+w:IF y>by-30:IF y<by+30
THEN bump x,y,2:livesleft

```

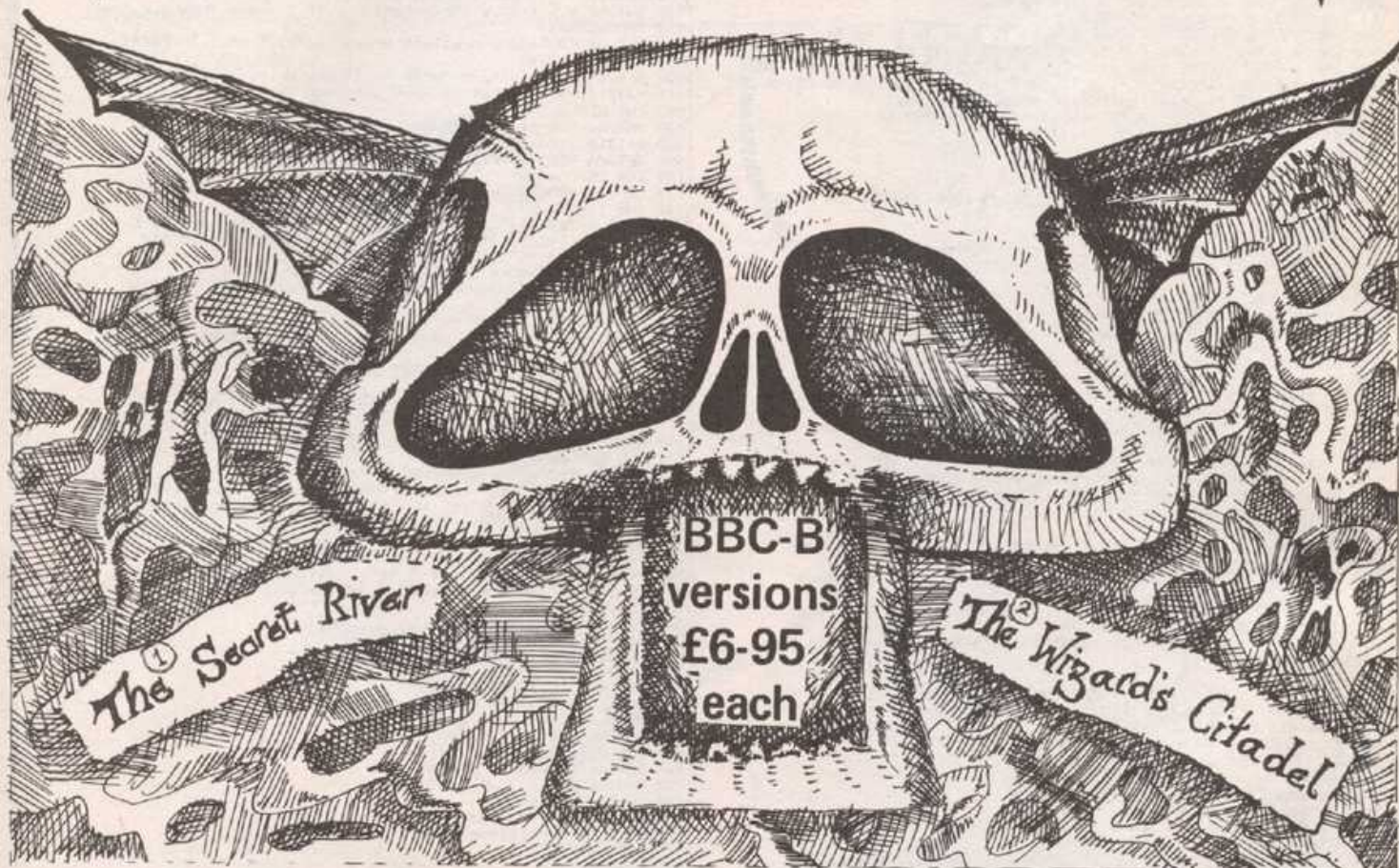
```

850 BLOCK w,40,p,by-10,2,0
860 IF fire THEN BEEP 0,10,-2,100,-2,100
870 END DEFINE
880 DEFINE PROCEDURE dra(x,y,d)
890 INK 4
900 CURSOR x,y:PRINT CHR$(d):CURSOR x+10,y:PRINT CHR$(d+1)
:CURSOR x+20,y:PRINT CHR$(d+2):CURSOR
x+30,y:PRINT CHR$(d+3)
910 END DEFINE
920 DEFINE PROCEDURE bump(cx,cy,colour)
930 LOCAL p,r,f
940 BEEP 0,2,50,50,50,50,7,7:INK colour
950 LINE cx/440*420,(190-cy)/190*256:FILL 0
960 FOR p=1 TO 2
970 FOR r=1 TO 50 STEP 5:CIRCLE_R 0,0,r
980 FOR f=50 TO 1 STEP -5:CIRCLE_R 0,0,r
990 NEXT f:BEEP
1000 END DEFINE
1010 DEFINE PROCEDURE livesleft:lives=lives-1:AT #0,1,16:PRINT #0,
"Lives:":FOR i=1 TO lives:PRI
NT #0,CHR$(134):NEXT i:PRINT #0,"
1020 knight x,y:x=20:y=150:knight x,y:IF lives=0 THEN gameover
1030 END DEFINE
1040 DEFINE PROCEDURE drasleft:dras=dras+1:AT #0,1,26:PRINT
#0,"Dragons:":dras
1050 dra dx,dy,po:dx=270:dy=80:po=37:dra dx,dy,po:fire=0:arrow fx,
fy:fx=330:fy=50:IF dras=10 THEN gameover
1060 END DEFINE
1070 DEFINE FUNCTION dot(dx,dy)
1080 p=131072+(dx<32)*2530612+(dy<2)*128
1090 RETURN PEEK(p)+PEEK(p+1)+PEEK(p+2560)+PEEK(p+2561)
1100 END DEFINE
1110 DEFINE PROCEDURE lake
1120 INK 1:FILL 1
1130 LINE 0,160 TO 52,150 TO 43,130 TO 0,130 TO 0,150:FILL 1
1140 LINE 75,145 TO 390,110 TO 390,80 TO 64,125 TO 75,150
1150 END DEFINE
1160 DEFINE PROCEDURE screen
1170 OVER -1:CSIZE 0,0:BEEP 0,255,-60,100,-25,100
1180 FOR t=1 TO 2
1190 FOR p=10 TO 0 STEP -1
1200 AT p,p+1:FOR x=p TO 36-p:INK (x MOD 7)+1:PRINT CHR$(41);
1210 FOR y=p TO 19-p:AT y,37-p:INK ((y+3) MOD 6)+1:PRINT CHR$(41)
1220 FOR x=37-p TO p STEP -1:AT 20-p,x:INK
(x MOD 7)+1:PRINT CHR$(41);
1230 FOR y=20-p TO p STEP -1:AT y,p:INK ((y
+3) MOD 6)+1:PRINT CHR$(41)
1240 NEXT p:BEEP 0,0,-200,200,-200,200:NEXT t:BEEP
1250 END DEFINE
1260 DEFINE PROCEDURE gameover
1270 AT #0,0,0:CSIZE #0,1,1:CLS #0:BEEP 0,255,-60,-70,-25,100
1280 IF dras=10 THEN PRINT #0,"The Knight won":PAUSE 50:PRINT
#0," this time":ELSE PRINT #0,"Th
e Dragon won":PAUSE 50:PRINT #0," as per usual"
1290 PAUSE 50:CSIZE #0,3,1
1300 PRINT #0,"Another game (Y/N) ":i:=INKEY$(8000)
1310 IF i$="Y" THEN RUN 140:ELSE screen:STOP
1320 END DEFINE
1330 DEFINE PROCEDURE moveset
1340 set=167722
1350 oldbase=PEEK_L(set)
1360 newbase=RESPR(875)
1370 FOR m=0 TO 375 STEP 4
1380 POKE_L newbase+m,PEEK_L(oldbase+m)
1390 NEXT m
1400 POKE_L set,newbase
1410 END DEFINE
1420 DEFINE PROCEDURE readchars
1430 RESTORE
1440 numberofchars=13
1450 FOR char=1 TO numberofchars
1460 READ c:charbase=newbase+10*(c-32)*9
1470 FOR dat=1 TO 9
1480 READ d:POKE charbase+dat,d
1490 NEXT dat
1500 NEXT char
1510 END DEFINE
1520 REMARK characters in mode 8 need size 3 when defining.
1530 DATA 33,24,24,16,52,92,20,24,35,72
1540 DATA 34,24,24,16,52,92,52,24,40,68
1550 DATA 35,48,48,16,88,116,88,56,72,36
1560 DATA 36,48,48,16,88,116,88,48,40,68
1570 DATA 37,0,16,96,16,104,4,4,0,0
1580 DATA 38,0,0,4,24,48,64,64,40,12
1590 DATA 39,0,40,84,0,0,0,0,0,124
1600 DATA 40,0,0,68,44,60,56,32,32,64
1610 DATA 41,124,68,94,94,94,84,84,68,124
1620 DATA 42,0,0,68,72,104,120,120,8,4
1630 DATA 43,0,40,84,0,0,0,0,0,124
1640 DATA 44,0,0,112,0,4,4,0,40,64
1650 DATA 45,0,16,12,16,28,96,64,0,0
1660 DEFINE PROCEDURE knight(x,y)
1670 INK 7:CURSOR x,y:PRINT CHR$(dirn*x/8 MOD 2)
1680 END DEFINE

```


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Quest for discs

Christina Erskine talks to Paul Bygrave from Quest

The idea of the Sinclair QL as a small business machine has been given a shot of extra credibility with the recent launch of a wide range of business-style add-ons for the machine from Quest International Computer Technology.

The Quest QL Executive series (Newsdesk, November 1 issue) includes five floppy disk drives ranging in price from £249 to £599 — single 200K, 400K and 800K and dual 400 and 800K models — a 7.5Mb Winchester hard disc drive at £995, four memory expansion boards from 64K to 512K, microdrive and disc versions of CP/M (£49.50 and £79.50), and Tally, a comprehensive accounts package.

Quest's main field of interest, until now, has been in operating systems and Winchester discs for micros in the IBM/Sirius/Apricot range, making their move 'down' to the QL all the more interesting. Very much like Sinclair, Quest operates solely on a research and development basis — all manufacturing is sub-contracted.

Paul Bygrave, Quest's technical director, explained why the QL had caught the company's attention: "Initially we were interested because the QL used the Motorola 68000 processor — we had been aware of the chip's development in the US for some time and its possibilities. The QL's specification made it look like a good machine, and good for items such as Winchesters to run on. We also had the experience to do memory expansions — we felt there was room for an alternative operating system to QDOS, and gradually we progressed to a complete set of packages. Judging from Sinclair's record, we felt the machine would

be a volume seller.

"To me, the QL looks like a starter machine with considerable business potential. Perhaps it has been treated with some caution so far because it's not easy to define its market — we're hoping our range will help define one end of it."

Paul joined Quest in March 1984. Previously he and Ralph Warren, now Quest's general manager, headed a company named Raw Computers. Raw was sold to Quest Automation and re-emerged as Quest International Computer Technology, part of the Quest group.

The decision to implement Digital Research's CP/M-68K operating system on QL arose from a feeling that CP/M — apart from its large established software base — was more suited to business applications than QDOS.

Quest is currently working on a few refinements to the Executive series for the near future; one such is a utility to enable data file transfer from QDOS to CP/M: "We want our CP/M system on the QL to be able to co-exist with QDOS — to enable people to go directly from the QL to the type of machine they have in the office," Paul continued. "One sector of the market we do envisage using our system on the QL is people working on business at home. They will be able to take their data on disc from the QL and feed it straight into their office micro."

Other work in progress includes the facility to allow the floppy disc drives to run 3½ inch and 8inch discs — at the moment they run 5¼ inch only. "We chose

5¼ inch to start with because it's the one most people are familiar with — and although we will release a controller board for 8inch, I don't really see it as a heavy-weight market."

Quest has been working on the Executive Series since the QL's launch, and have had Sinclair's full support throughout since, as one Sinclair executive put it, Sinclair has neither the time nor inclination to manufacture QL peripherals itself.

"Sinclair provided all the necessary documentation, and notified us immediately when the new SuperBasic versions came out. We also worked closely with Psion on our Tally software packages — we wanted the Tally accounts programs to integrate fully with Psion's bundled software. As a result, you can take data from Tally, load Easel, and have your data represented in graphic form without any re-input needed."

Paul is quick to stress that in bringing out a range of floppy disc drives, Quest is not suggesting any inadequacy on the part of the QL's in-built microdrives. "I think the microdrives serve a definite purpose, and the Psion packages are very good indeed, but some people will find they simply need the extra space and speed that conventional discs can offer."

"Obviously we're aware of the arguments against microdrives, and, yes, we did have some problems with them, but with our range, people can build up slowly to the level they want."

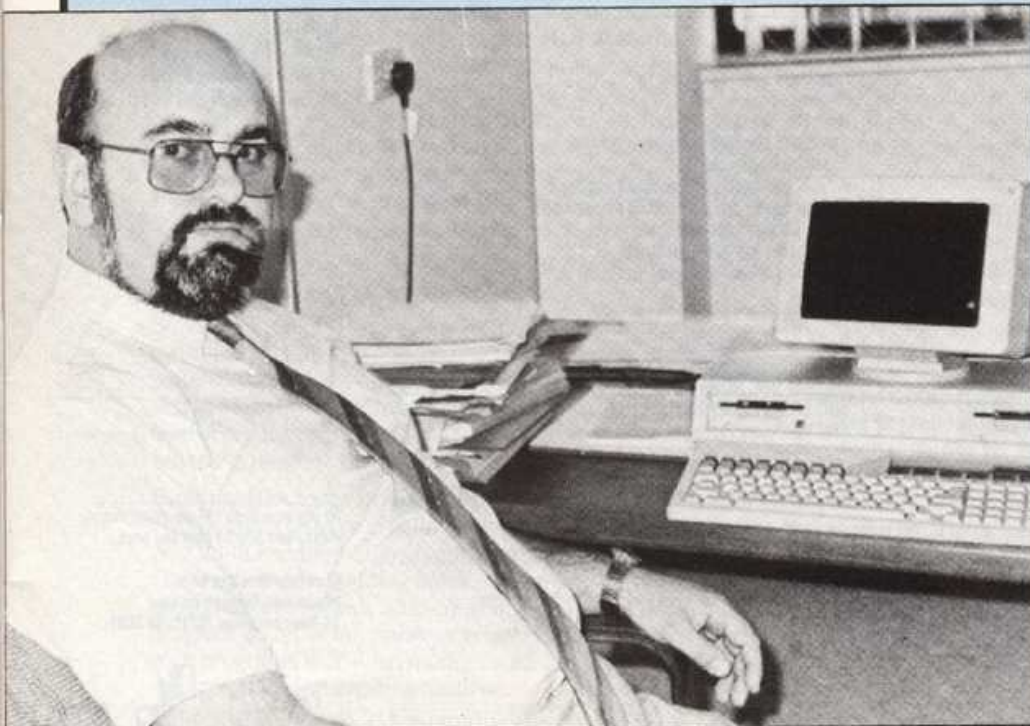
Quest's Executive series will also be made available in its entirety in the US when the QL is launched there early next year. "I can see the QL being very successful in the States — they'll see the machine as very much a home micro, but at a fantastic price — much cheaper than an Apple, for example. I also don't think the Americans will be quite so critical of microdrives, surprisingly enough. I think they'll see them as an exciting novelty — which may not be so good for our floppy discs!"

In the long-term, Quest is looking at possibilities for networking and multi-user multi-tasking on the QL. "We have an option on Digital Research's concurrent disc operating system, which is a system emulating MS-DOS for multi-tasking, but this is really looking quite far into the future."

"It takes a very long time to test the system — the writing doesn't take nearly so long, but I can't see anything happening before the second half of next year."

Meanwhile, Quest is still working on its Firefly Winchester disc range for the 'heavyweight' micros — adding the Apricot F1 to the list of machines to carry Firefly and looking at its possibilities on the IBM AT.

The QL Executive series, however, will form the major focus point of Quest's stand at Compec, the business computer exhibition at Olympia later this month when the series will go on show for the first time to the public.



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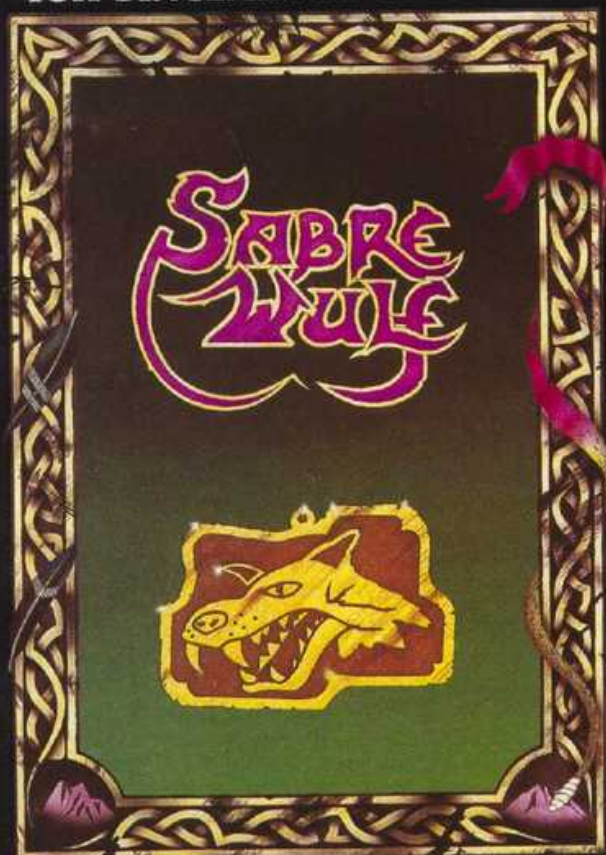
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48K SINCLAIR ZX SPECTRUM

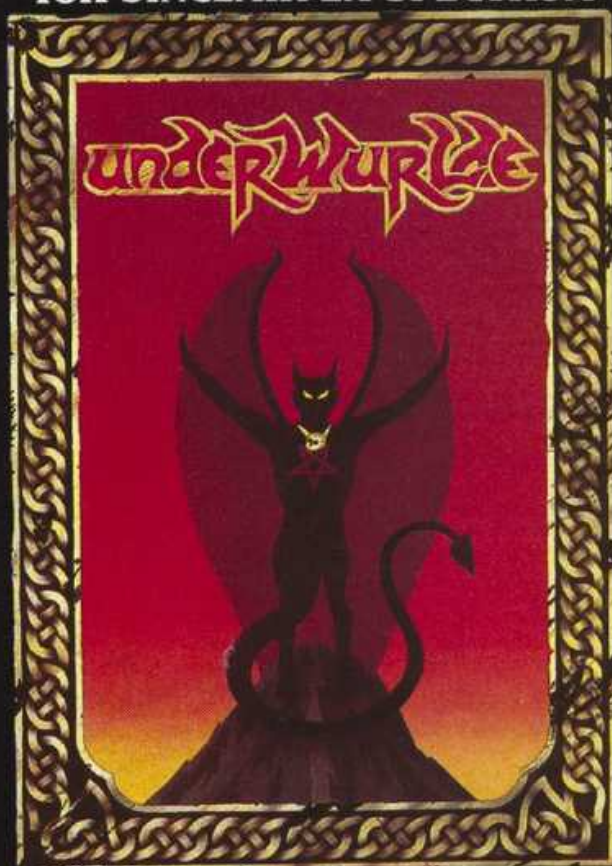


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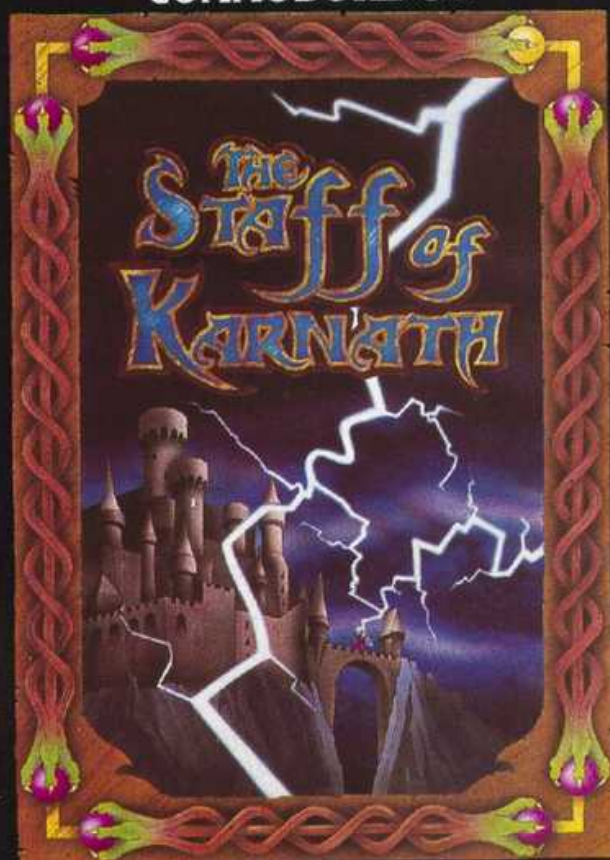
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COMMODORE 64



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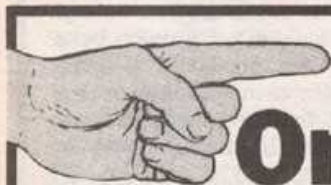


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Demo mode

Program *Kensington* **Price** £12.95 **Micro** Commodore 64 **Supplier** Leisure Genius, 3 Montague Row, London W1H 1AB.

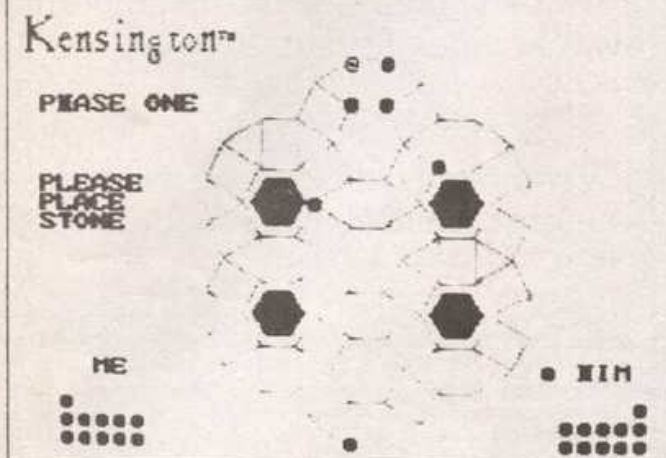
Kensington forms part of Leisure Genius's series of micro versions of well-known board games.

Kensington can be used in a number of different modes. The most useful of which enables a solo player to pit his wits against the program, which can play at three skill levels — novice, intermediate

the screen in place of a real one — which seems fairly pointless. Alternatively, both players can be played by the computer giving a demo mode.

There are several other options, for example, you can control the speed at which the computer makes its moves, ranging from too fast to follow, to paralytically slow. You can also watch the program trying out its moves before it selects the best one.

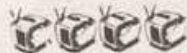
This is a good presentation of an already enjoyable board game, and makes for a handy way for one person to enjoy a game of *Kensington*. The only complaint is that it would have



and expert. At the expert level, it proves quite a formidable opponent. The program can also be used by two players using the board displayed on

been nice to have been able to use a joystick for control.

Richard Corfield



Overlay

Program *Grasp* **Micro** Amstrad CPC 464 **Price** £8.50 **Supplier** Camel Micros, 33a Commercial Road, Weymouth, Dorset.

Grasp is a graph drawing package which will produce variations about three main types of graph: bar, line and pie.

Before you can draw a graph, it is necessary to have the correct data. This data is stored in four 100 element files and can easily be edited. If you want to draw a line graph you must enter the x-axis data into one file and the y-axis data into another. This can be done using the editor, or, if the data is linked by a mathematical for-

mula, simply by entering the equation.

A graph of your data is drawn by pressing a single key depending on the graph format to be used. Other junctions allow graphs to be overlaid on the screen, tests to be added, and display to be dumped to a printer.

To define your own graph format you have to specify the type, colour, size, position, scaling etc. If you require it, auto scaling can be used.

Overall, *Grasp* is a very good program with extensive facilities which are clearly described in the comprehensive manual. With practice, complex graph formats can be described.

Greg Pearson



Key press

Program *Zedis* **Micro** Amstrad CPC 464 **Price** £6.95 **Supplier** Pride Utilities, 7 Charlton Heights, Charlton, Luton LU4 9UF.

Zedis is a machine code editor and disassembler for the Amstrad CPC 464. It uses the 80 column display, 40 columns being used for the disassembly, the rest showing the options available and your previous commands.

The commands are limited to those that change the start address of the disassembly, insert a character string or hex digits into memory, move a block of memory, or search memory for a specified 16 bit

word.

The disassembly is displayed as a series of pages, each consisting of 24 lines forward or 80 bytes back. The disassembly on the screen can be copied to a printer by pressing the Copy key. This means printing a lot of code requires an equal finger numbing amount of key pressing.

As the program is written in Basic, it can't be relocated in memory, and use with another Basic routine will require merging of the programs.

If you only require a very simple disassembler/editor then *Zedis* may be sufficient, more than that and it probably won't be good enough.

Greg Pearson



Dumb-bell

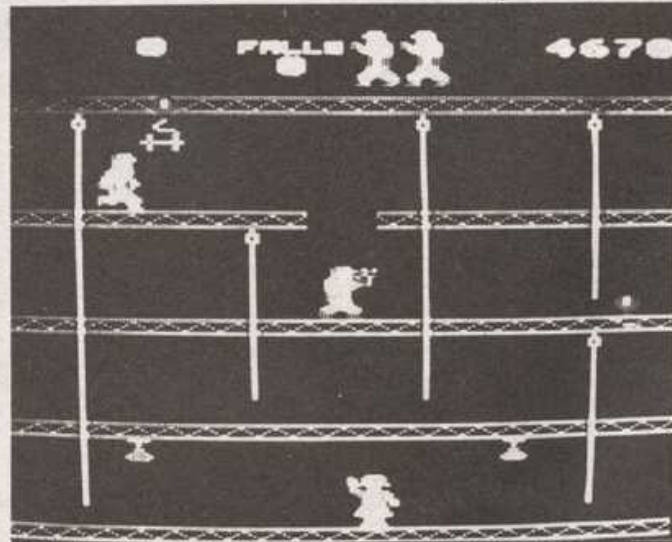
Program *Boxer* **Price** £9.95 **Micro** BBC B **Supplier** Acornsoft Limited, 4a Market Hill, Cambridge CB2 3NJ.

Fast moving action is required to win the heart of the blonde heroine. The scenario is that he-man you and your micro-macho rival are in a gym vying for the attention of a girl by catching the balloons she keeps releasing from the

As if that weren't tough enough, you also have to avoid boxing gloves, hammers and dumb-bells that come flying across the screen — not to mention odd things your rival drops on you.

You can punch hammers and gloves if you are fast enough but have to jump dumb-bells. You get points for balloons caught, items punched or jumped. But your opponent gains points if balloons get past you to the top and he is also steadily scoring points himself!

Action is by keys or joysticks



floor. You can catch them only when they lodge in the rafters or beams at various levels. This means you must shin up and down ropes, run to and fro, jump to the balloons — and avoid moving ones as they knock you over.

with fast, smooth animation but curiously little sound. By no means the most original or compelling arcade game based on an overworked 'sense' theme.

Dave Watterson



Slow trace

Program Assembler and Debugger Micro 48K Spectrum
Price £9.95 Supplier Roybot.

The market for Spectrum Assemblers has become a tough one, and programs have to compete in the areas of testing facilities and



special features. Roybot's program scores well on both these counts, and makes up for a slightly non standard line entry and label procedure.

The instructions are entered as Basic Rem lines: not an approach I would prefer, but easy to get used to. Labels are not used as such, instead you refer to the line number of the routine to Call or Jump to. This rules out using a meaningful name for a label, and is something that many programmers will miss. However, the program is easy to use, and

different subroutines can be merged together allowing the build up of a library of different subroutines.

The best part of this program is its test facilities. It allows single step or slow trace, showing all registers, plus various memory locations. Also included is a fast trace and the use of 'Non Stop Calls', a sort of Express Coach of machine code to use with bits of the program you are sure work properly. The program also maintains a history of the last ten instructions to be executed, allowing some insight into how you got in that endless loop! Also provided are breakpoint, direct entry of instructions, and many more, all easy to use.

The only literature provided is the small cassette box insert, but as the program is menu driven this is not an important omission. Roybot's Assembler won't be everyone's best buy, but is good enough for most home machine code programmers.

Along with a suitable introductory book, it will give a low cost way in to this more advanced programming language.

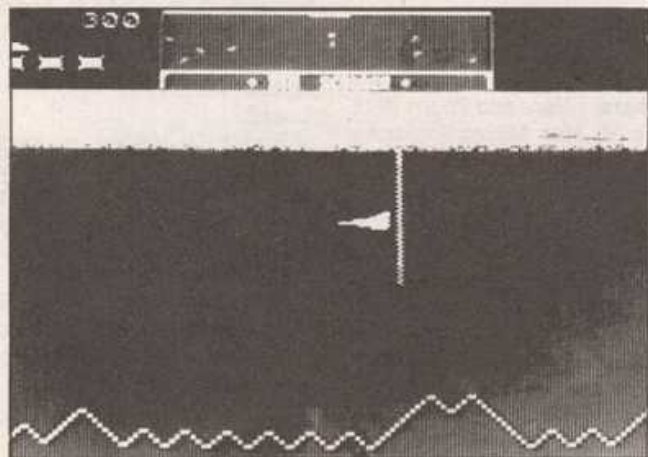
Simon Springett



Frenzied

Program Scuba Attack Micro
Spectrum Price £6.95 Supplier
 Century Software, Portland House, 12-13 Greek Street, London W1.

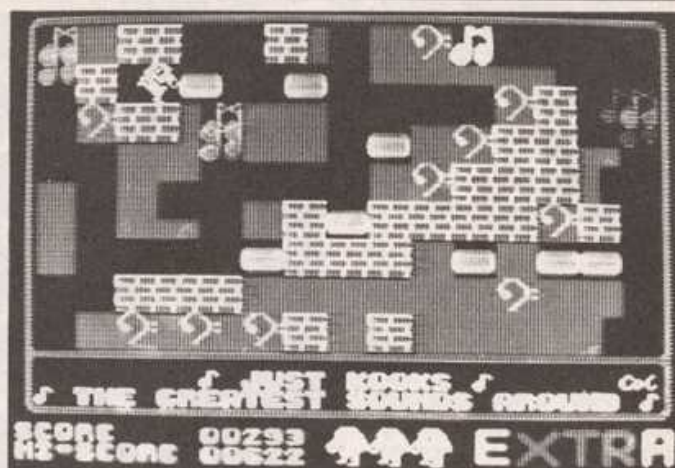
It can't be easy thinking of new shoot-'em-ups, but this one contains enough that is



novel to make it interesting for those with itchy trigger fingers.

Actually fingers are its major failing — six controls are needed and almost all at the same time. Play can become a tangle of digits.

Meanwhile, on the screen, your submarine defends divers from 'frenzied jellyfish' (frenzied jellyfish — is this for real?). Your laser fires forwards and three sonic bombs can destroy



Big bug

Program Pi-in-ere Micro
Spectrum Price £6.00 Supplier
 Automata UK, 27 Highland Road, Portsmouth, Hants.

Arade freaks watch out for this program in the series featuring Burt, the large nosed cult-figure from Automata.

In this game he is inserted into a computer's innards to search out various bugs, and eventually the elusive (well, I didn't find it) Big Bug.

The graphics are very cleverly done — particularly the way the central character turns — and the game uses colour and sound well. The snag is that, even with a joystick (all the usual options are available),

the response is far from quick: the little creature takes so long to turn round that the bugs are on him before he can get around to moving away. The game feels impossible at first but you will quickly develop strategies to clear each of the 61 screens — that is if you haven't found anything more interesting to do, like listening to *Today in Parliament*.

You see, the truth is that I found this game boring. The sound track on the cassette flip side is quite fun, but totally unsurprising. And I feel the same about the game — it works very neatly but the ideas have all been used many times before.

Simon Springett



Minimal

Program The Horselord Price
 £12.95 **Micro BBC B Supplier**
 Century Publishing Co. Ltd., Portland House, 12-13 Greek Street, London W1V 5LE.

Century bring us a combination novel and arcade game package built round Peter Morwood's sword-and-sorcery book *The Horselord*. The novel is not striking but quite fun with all the standard features of young man making good in a world where all seems set against him. The game is designed by Jonathan Griffiths of *Snapper* and *Rocket Raid* fame. I wish it were even as good as the book.

In fact the action is based on a four page section of the 250 page book. The hero, Aldric, takes part in an obstacle

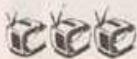
everything in the area; a long range scan completes your equipment.

This results in a fast-moving game — not highly sophisticated in sound or graphics but both are passable — I particularly liked the wobbling whirl of the aforementioned jellyfish.

One hitch is that fresh attackers sometimes appear too close to the submarine, destroying it instantly — survival calls for quick reactions at the best of times.

While there is still a market for a basic run-and-shoot game this could sell steadily, though at the moment it is overpriced. A twin-fire programmable joystick would improve the play considerably.

John Minson



course for horse soldiers. Like a joust it has dummy swords and dyes to indicate strikes rather than blood. The scenario is that as a messenger he must beat the opponents and deliver vital news to the castle. In the book something unexpected happens ... but not in the game.

You see the plan view of a course like the @ symbol. Riding up to an obstacle the screen changes to give you a closer view. It may be a water jump or more often an ambushing enemy to be destroyed. You may swing at opponents with sword or let loose one of the arrows in your stock. It takes five strikes or one arrow to down an enemy swordsman. You play against the clock.

You can use joystick or keys but your actions are limited to turning left or right, accelerating and jump/strike or fire arrow. The movements are fast but jerky, the graphics chunky, the sound minimal.

In short it is boring and a poor way to spend £12.95

Dave Watterson

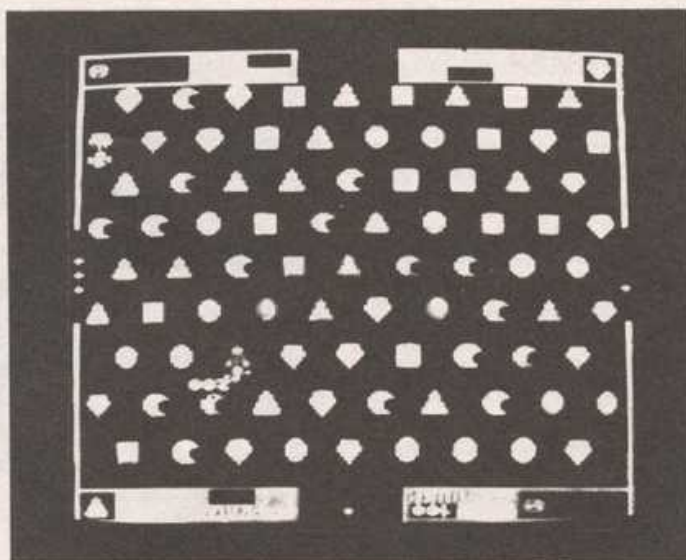


Unnamed

Program Shuttle Shock Micro
Spectrum **Price £2.99 Supplier**
Software Supersavers, Bear
Brand Complex, Allerton Road,
Woolton, Liverpool.

For this, their bargain priced label, Software Projects have stripped packaging to a basic minimum. Gone too are fancy loading screens and elaborate graphics. Indeed *Shuttle Shock* resembles a primitive *Manic Miner*.

Your character (unnamed —



Mean streak

Program Drogna Price £9.95
Micro BBC B Supplier Acornsoft Limited, 4a Market Hill,
Cambridge CB2 3NJ.

Based on part of TV's 'Adventure Game' *Drogna* offers the fascination of a game where the rules change as you play.

I said this was stripped down) walks left, right or teleports at 45° around a series of platforms. Lifts provide some help but accurately judging the teleport leaps is most important.

Inevitably, deadly beasts roam the place on set courses, so timing is vital if you're to reach the exit to the next screen. There is also continuous, infuriating music (although it can be turned off) and the traditional humorous screen titles.

As with all games of this type, the fun lies in seeing what comes next, the addictiveness in

What's more it is one of those rare micro games for two people. Strategy, lateral thinking and a mean streak all make a contribution to the winner's skill.

You play on a screen composed of five different shapes each of which may appear in five different colours. You are given a base shape and colour which allows you to move onto any colour in your base shape,

that you only learn what to do by playing.

However, I did notice one point in Screen Two, which is rather too harsh in taking a life.

The game looks bargain-priced but performs well and is a clever, not too difficult addition to the platform-maze game family that should suit newcomers. Recommended at the price.

John Minson



Directions

Program Here and There With The Mr Men Micro Spectrum
48K **Price £7.95 Supplier** Mirrorsoft, Holborn Circus, London EC1.

Mr Reviewer has an educational program featuring his friends, the Mr Men. It contains four games to teach four to eight year olds directions. Whoopee!

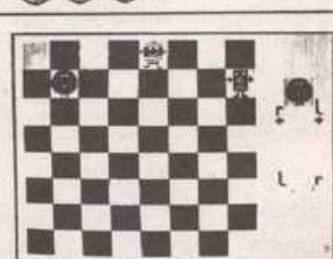
Mr Reviewer's mental age is five. Also, Mr Reviewer could

or onto any shape in your base colour. Think about it! The fun really starts when you learn that on each turn the base shape and colour may change! This system means a colour TV or monitor is essential.

The purpose of your action is to steal diamonds from two stores and transport them to your lair. But your larcenous opponent may steal your gems — even the topmost one in your lair ... and you can do the same to him or her. Strategy is involved in planning your routes, deciding where to park the loot temporarily if you can't move where you want, and in attacking your opponent so as to make them dissolve into the walls and re-materialise at their lair. The first to win 900 points worth of diamonds wins.

Play is by keys or joystick and as fast as you expect from Acornsoft, though the sound effects are limited. As a game it rates far below *Elite* but should entertain younger members of the household and has the advantage of allowing two to play at once.

Dave Watterson



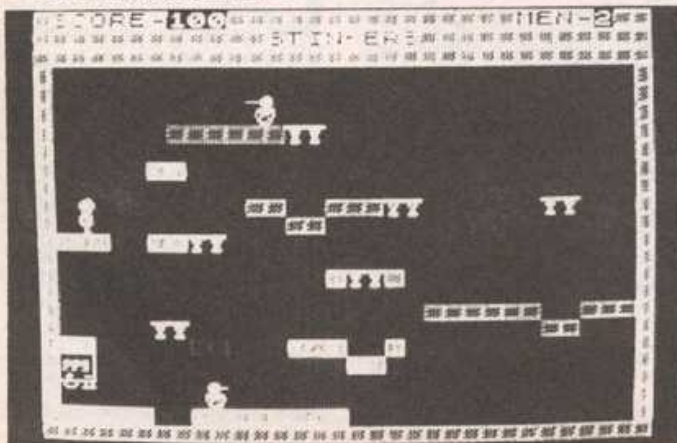
never tell his left from his right. But there you go. Here he has to guide things from his own and the Mr Men's point of view.

The first jigsaw game is a bit boring, but making Mr Tickle tickle Mr Grumpy is much more fun. Then a big worm has to be sent up a tree to knock apples into Mr Lazy's mouth. Finally four Mr Men gang up against Mr Tickle on a chess board.

Roger Hargreaves' cartoons transfer well to the micro, as those nice Mr Men at Mirrorsoft have shown before. A colour television is advised for these games though.

Mr Reviewer thinks that this program should suit the age-group suggested, but youngsters will need guidance.

John Minson



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
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Communicator

Hardware Touchmaster Pad (plus Multiprint program) Micros Spectrum, Commodore 64, Vic 20, BBC, Dragon 32 and 64 Price £149.95 Supplier Touchmaster, Kenfig Industrial Estate, Margam, nr Port Talbot.

For those of you who are not able to type, or who dislike doing so, there are many alternative ways in which you can communicate with a computer.

Joysticks, light-pens, touch-screens and mice are some of the more common ways of keeping your fingers away from the keyboard.

Now, Touchmaster, the company which has sprung out of the collapsed Dragon Data, provides yet another way.

It has produced what it claims is 'a revolutionary' touch-sensitive pad that sits next to the computer. This device (from which the company takes its name) consists of a wedge-shaped plastic case about 15in long and 12in deep, rising from half an inch in height at the front to about two inches high at the back.

Most of the upper surface of the Touchmaster is taken up by an A4-size rubber pad, which forms the communication surface itself.

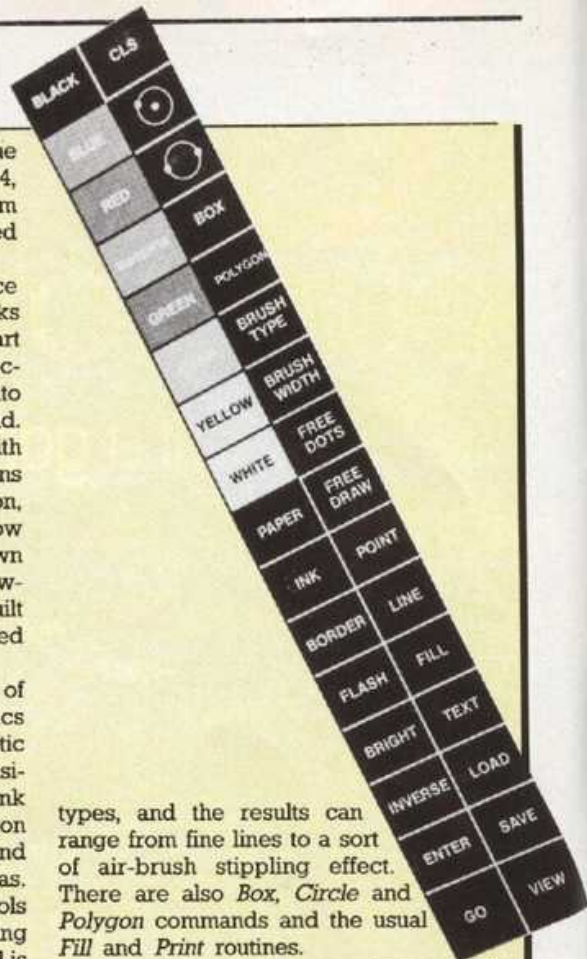
This pad has a touch resolution of 256 x 256 points, and information about which points have been touched — using a stylus like a ball-point pen which is supplied with the package — can be transmitted in serial or parallel form to the host computer via a Din connection at the back. The company so far, is producing versions for the BBC, Spectrum, C64, Vic 20 and Dragon 32 and 64. Versions for the Amstrad and MSX are also under development. Micros that alrea-

dy possess a suitable interface, such as the BBC, need only a cable; those like the C64, the Vic20, the Dragon and the Spectrum need an extra interface (which is included in the price).

The Spectrum version has the interface contained in a black plastic box that looks just like a Dragon games cartridge. Apart from the standard connector to the Spectrum, there is a ribbon cable that plugs into the parallel port on the Touchmaster pad. The power comes from a power supply with an integral mains plug and the connections are shown clearly in the documentation, which also includes short routines to allow the Touchmaster to be used in your own programs. The proof of the pudding however, lies in using some of the purpose-built software for the device — the so-called 'Touchware'.

Included in the pack is a copy of *Multipaint*, a fairly complex graphics package. As with all Touchware, a plastic overlay is included that fits over the sensitive pad on the Touchmaster. This is blank on most of the surface except for a section about an inch wide down the right-hand edge that is divided into 40 small areas. Pressing these with the stylus controls colour, brush type and width, drawing mode and so on, while the rest of the pad is used as the drawing area.

The software on the Spectrum loads in about two minutes to display a blue screen with a small information area along the base to remind you of the ink/paper colour, drawing mode, etc. A large cross acts as the drawing cursor, and once the brush type and width have been selected, drawing can commence. It takes some time to get used to the fact that your hand is moving in one place, while the results are appearing somewhere else, but once you get over that conceptual hurdle, the effects can be quite good. There are brush widths from one pixel up to 32, as well as five different stroke



types, and the results can range from fine lines to a sort of air-brush stippling effect. There are also *Box*, *Circle* and *Polygon* commands and the usual *Fill* and *Print* routines.

The pad is easy to use and seems only limited by your own graphic ability and of course, the Spectrum's restrictions on colours in the same character square, which produces chunky edges if you aren't careful. My only complaint with the Touchmaster in use lies in finding where you are on the screen, as there is no record of your progress on the pad.

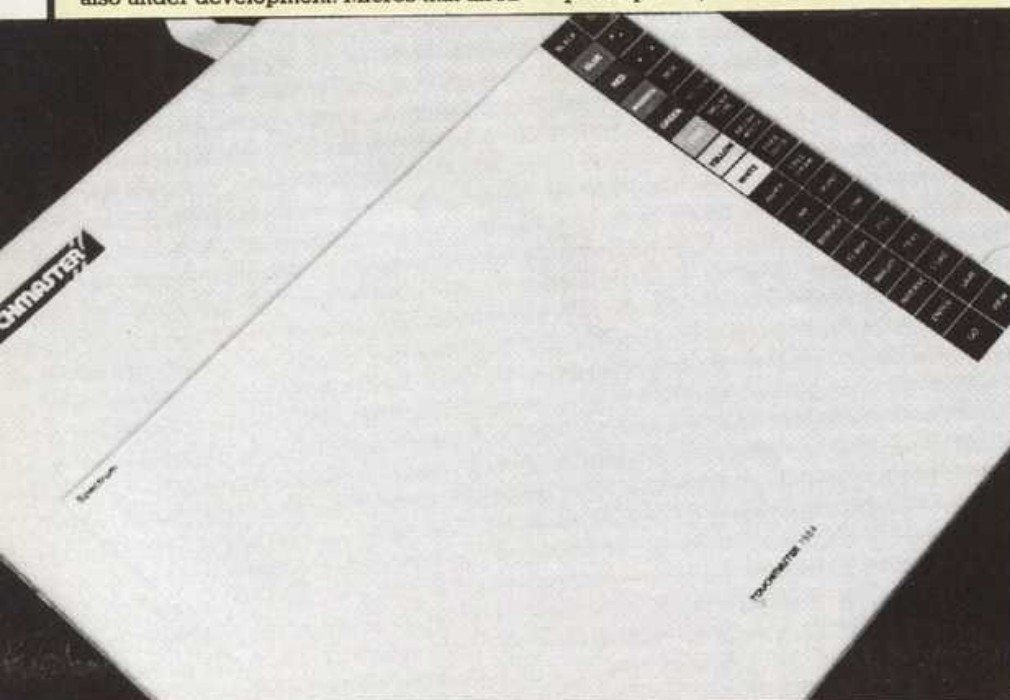
The BBC version of the pad will clearly produce better detail, and if a QL model were to be produced we could look forward to something approaching the electronic paint-box system used by TV companies.

There is also now, a range of software titles available for the Touchmaster pad, including board games, adventures and learning packages. The scope for a device like the Touchmaster in early education or with the handicapped must be enormous, as software can be written that does not involve reading or complex muscular skills, merely the recognition of shapes or colours and the ability to touch the pad.

My overall impressions are very favourable, and the Touchmaster would be a very useful peripheral for any computer. However, I don't think it will sell particularly well as long as it keeps its present price. If it cost £60, it would be expensive but worth having. At £145, it is considerably more than you would have to pay for a Spectrum, an Atmos, a Dragon or a Vic 20 or C16.

Much as I like the concept, at the moment you'd get better value from a light-pen, and you'd also know where you were on the screen.

John Scriven



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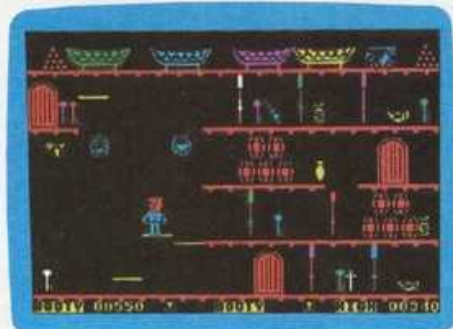
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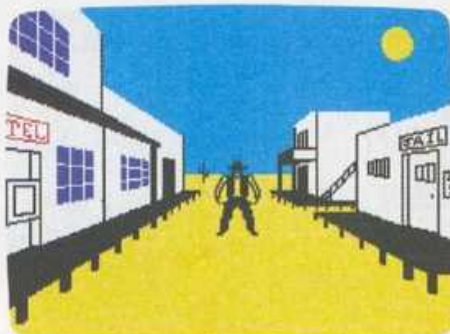
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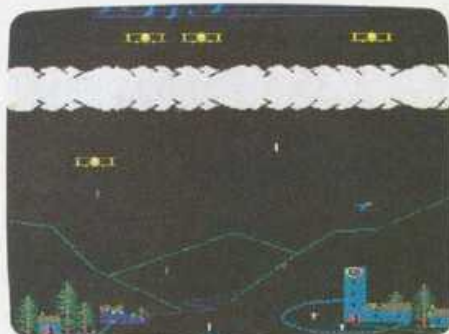
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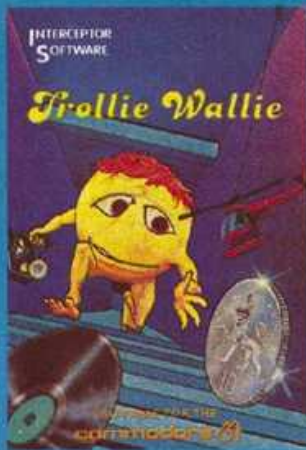
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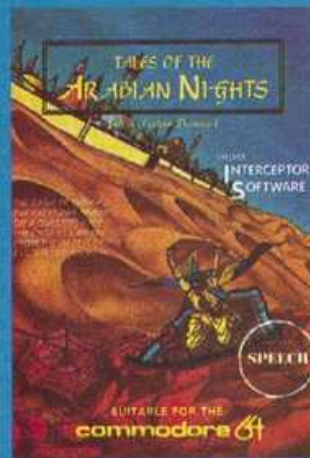


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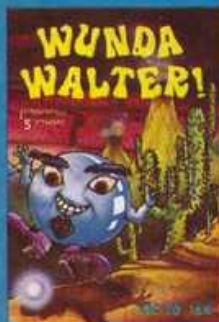
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Hardware Review

Elegant

Hardware Spectrum On-off power switch Micro Spectrum Price £4.95
Supplier TEC, 24 Victoria Road, Bromsgrove, Worcs.

Peripheral manufacturers have made a good living out of the Spectrum's budget-conscious design. Supplementary keyboards, joystick interfaces and sound boxes by the dozen are available, and it's only with the introduction of the Spectrum Plus and Sinclair's own interfaces that business seems likely to die down.

Meanwhile, TEC's Spectrum Switch remedies an abiding problem, by allowing you to switch off or reset your old-style Spectrum without pulling out the mains connector and risking wear on the socket.

The Switch costs £4.95, is designed with breathtaking elegance and simplicity, and adheres to the back of the Spectrum with stick-on self-adhesive pad. It clips over the power socket, and has a follow-on socket on the back.

It's unlikely to fit on any add-on keyboard, but some of these have built-in reset switches anyway.



The switch itself seems sturdy and reliable, and if you don't have the ability or patience to solder together your own reset switch, you would do well to request Santa to leave one of these in the toe of your stocking.

Chris Jenkins

In storage

Hardware Microdrive storage box Price £5.95 Micro Spectrum & QL
Supplier Transform Ltd, Swatlands, Lucks Lane, Paddock Wood, Kent

No, contrary to first impressions, this is not a box to store microdrives themselves, but a neat holder for the actual cartridges, used on the Spectrum and the QL.

It consists of a black plastic box with internal divisions for holding up to 20 cartridges, and a hinged lid to cover them all. Inside there is also a small gap that can be used for anything, such as the sticky labels supplied with the cartridges, or up to four more cartridges.

When your bank manager lets you buy more than 20 cartridges, you can get an additional box, as they cleverly interlock with one another. The cost is reasonable, being not much more than a single cartridge.

The world (well, me mainly) has been crying out for a method of storing the little blighters, and Transform have come up with a neat and cheap way of doing it.

Andrew Pennell

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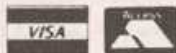
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Sinclair speaks

Let your Spectrum do the talking with John de Rivaz

This program was developed so that CB users could get their Spectrums to say repetitive messages. The messages are listed in statement lines 390 to 430.

After you have found a blank channel, press *!* and enter the channel number. Then tune your CB to channel 14 and hold the microphone near your Spectrum's speech speaker and press *One* and the microphone key. The Spectrum will say

'One four for a copy.'

When another breaker (ie, CB user) answers, usually with 'Break a window' (ie, pick an empty channel), press *Three* and your microphone key, and the Spectrum will say 'Breaker for a copy go to', followed by your chosen channel number. You can press *Four* to get the Spectrum to 'Crank your handle' (ask your contact his CB name), and *Two* to give a count (used to test

a link). When you want to talk to your contact, *Five* gives a suitable message.

Program notes

- 10-120 Creates the speech strings, which are checksummed by the program. Data line 50 is "oh", "zero", "zero", etc.
- 130 Sets the port number to that of your speech unit, which should use the SP025 chip
- 150-180 Checksumming routine for the speech strings
- 190-240 Subroutine that says a string *XS*
- 250-340 Subroutine that says a channel number between 1 and 99 (the program won't input numbers over 40)
- 350-550 The main loop

```

10 CLS : PRINT "CB TALKER (C) RTL 7 JUNE 1984": PRINT : PRINT "Please wait, I'
m thinking."
20 REM CB Talker was made using RTL's Speechwriter, which accepts English Text
and converts it to allophone strings after asking the user some simple quest-
ions.
30 REM This program (and Speechwriter) is for all speech units using the
SP0256 chip.
40 DATA "R;/ (L^('L^(B(NK-O($",1090
50 DATA "DOOKY(R;/(1C(L27(L^(L$L([O&MC([+G+/(8&1(\$/($",2588
60 DATA "cKBMW'L^&8&N<-O&aY&1:($",1411
70 DATA ",K>/M&=&?>/9b$",899
80 DATA "$>4&8&[99-+N1K;4'&N<4-U1X($&ROQ&\D&->[&=U&1:&4&$Y/X($",3068
90 RESTORE 40: FOR n=1 TO 5: READ x$,TEST: GO SUB 150: IF a<>TEST THEN PRINT
"Error in data line ";30+n*10;".": STOP
100 NEXT n
110 RESTORE 40: READ a$,f,b$,f,c$,f,d$,f,e$
120 LET cn=1: REM Default channel number
130 LET PORT=159: REM Set this to your port number.
140 GO TO 370
150 REM SUBROUTINE TO TEST STRING
160 REM
170 LET A=0: FOR F=1 TO LEN X$: LET A=A+CODE X$(F): NEXT F
180 RETURN
190 REM SUBROUTINE TO SAY X$
200 REM
210 FOR N=1 TO LEN X$
220 IF IN PORT>127 THEN GO TO 220
230 OUT PORT,(CODE X$(N)-36)
240 NEXT N: RETURN
250 REM subroutine to say channel number
260 REM
270 LET n$=STR$ cn: IF LEN n$=1 THEN LET n$="0"+n$
280 FOR f=1 TO 2: LET n=VAL n$(f)
290 LET k=0: FOR j=0 TO n-1
300 LET k=k+1: IF b$(k)<>"(" THEN GO TO 300
310 NEXT j
320 LET x$=""
330 LET k=k+1: LET x$=x$+b$(k): IF b$(k)<>"(" THEN GO TO 330
340 GO SUB 210: NEXT f: RETURN
350 REM Main Loop
360 REM
370 CLS : PRINT "CB TALKER (C) RTL 7 JUNE 1984": PRINT
380 PRINT "Press to say"
390 PRINT "1. One Four for a copy"
400 PRINT "2. Zero to nine count"
410 PRINT "3. Breaker for a copy goto ";cn
420 PRINT "4. Crank your handle"
430 PRINT "5. I am a Spectrum Computer. I will now pass you to my
owner"
440 PRINT : PRINT "!" to set channel number"
450 LET x$=INKEY$: IF x$="" THEN GO TO 450
460 IF x$<>"!" THEN GO TO 490
470 INPUT "Channel Number ";cn: IF cn<1 OR cn>40 THEN GO TO 470
480 GO TO 370
490 IF x$<"1" OR x$>"5" THEN GO TO 450
500 IF x$="1" THEN LET x$=a$
510 IF x$="2" THEN LET x$=b$
520 IF x$="3" THEN LET x$=c$: GO SUB 210: GO SUB 250: GO TO 450
530 IF x$="4" THEN LET x$=d$
540 IF x$="5" THEN LET x$=e$
550 GO SUB 210: GO TO 450

```


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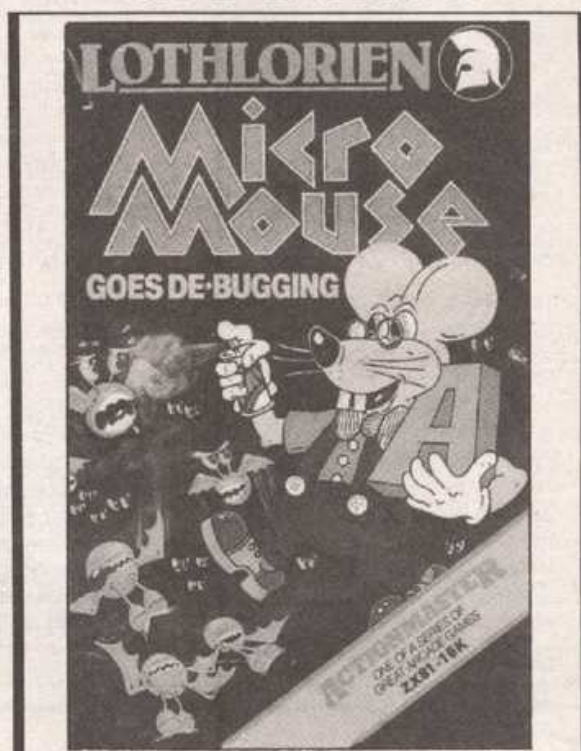
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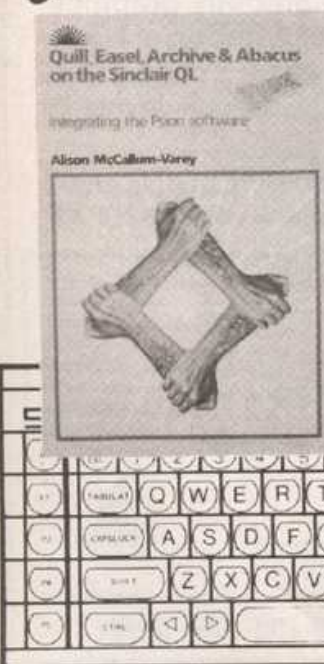
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Printing prettier

Take the strain out of listing with Pretty Prints by B G Merrick

SuperBasic is a powerful language designed for ease of programming. Hence it is perhaps surprising that no facility exists for indenting sections of a program when listed to show its structure, especially considering that this function is provided automatically in the database programming language provided in Archive.

This routine overcomes this deficiency by reading a program file from microdrive (or any other source) and copying it to another device (or back to the same file), formatting it by indenting all multi-line *REPEAT* loops, *FOR* loops, *SELECT* switches, *PROCEDURES*, *FUNCTIONS* and *IF* statements as it goes.

In order to use this program, first save the code to be formatted. Then load and run this program. The program prompts for a source and a destination file. The full name including the device should be entered, for example, 'mdv1-pretty' as this provides consistency with SuperBasic commands and allows a file to be formatted to a printer. However, if just *Enter* is pressed in response to the destination file prompt, and the file is on microdrive, this program will just copy the file to a temporary file as the source, delete the original file and use this as the destination file. At the end of the program the temporary file is deleted.

Main Routine

This initially prompts the user to determine the file names to use and if required copies the original file (*Source\$*) to a temporary file and deletes the old version.

After opening the files (Lines 240 and 250) the routine enters a loop which terminates when the end of the source file is reached. Within the loop the program reads a line at a time, calling *Num* to strip any leading spaces from the line, and print the line number to the destination file. The variable *Spc* holds the number of spaces to be placed between the line number and the first command of a line. The amount this is to be altered before and after printing the line is held in *Before* and *After* respectively. The procedure *Spaces* determines the values of these variables for the line. Line 340 ensures that an error will not occur if a program with incorrect syntax is passed through this program. Line 350 actually prints the line using *Fill\$* to provide a string of spaces.

On exit from the loop, the channels are closed and if used the temporary file is deleted.

Procedure Num

This routine consists of three parts. The first, Lines 460 to 490 simply removes any leading spaces from the line. The second,

Lines 500 to 550 gets the line number and prints this right justified in a space of 5 characters (Line 550).

The final part (Lines 560 to 600) is identical to the first part except that it removes spaces from after the line number.

Procedure Spaces

This section of the program compares the start of a program line with the statements listed in Lines 930 and 940 as data. If a match is found the *For* loop terminates with a value of 1 to 9 in *N*, representing the commands in the *Data* statements. If no match is found *N* contains the value 10, hence the dummy command '*' at the end of Line 940 preventing an error on the tenth *Read*.

Colon is then set to a truth value representing whether the line contains more than one statement by first testing for the presence of a colon and ensuring that this is not the end of the line.

This can then be used to determine whether or not a structure exists in its single or multi-line form.

The routine then switches on the value of *N* to determine the change in spacing for different statements. The only points to note here are that as a multi-line structure can start on the same line as an *ON=* or *=switch*, *Spaces* is called recursively, with the remainder of the line being passed as its parameter. A test for *Then* statement is made in the part that deals with *IF*.

Procedure Diff

This procedure simply updates the values of *Before* and *After* by adding its parameters to them.

```

100 REMARK PRETTY PRINT ROUTINE
110 REMARK BY B.G.MERRICK
120 REMARK (c)1984
130 REMARK
140 INPUT#0,"Source file
? ";Source$;"Destination file ? ";Dest$
150 IF (Dest$=' 'OR Dest$=Source$)AND Source$(1 TO 3)!="MDV"
160 Dest$=Source$
170 Source$=Source$&"_tmp"
180 COPY Dest$ TO Source$
190 DELETE Dest$
200 temp=1
210 ELSE
220 temp=0
230 END IF
240 OPEN_IN#3,Source$
250 OPEN_NEW#4, Dest$
260 Spc=1
270 REPEAT Loop
280 IF EOF(#3) THEN EXIT Loop
290 INPUT#3,line$
300 Num=line$
310 Before=0:After=0
320 Spaces=line$
330 Spc=Spc-Before
340 IF Spc<0:Spc=0
350 PRINT#4,FILL$( ' ',Spc):line$
360 Spc=Spc+After
370 END REPEAT Loop
380 CLOSE#3
390 CLOSE#4
400 IF temp THEN DELETE Source$
410 STOP
420 :
430 DEFINE PROCEDURE Num(a$)
440 LOCAL n$,i
450 n$="":i=1
460 REPEAT loop2
470 IF a$(i)<>' ' THEN EXIT loop2
480 i=i+1
490 END REPEAT loop2
500 REPEAT Loop3
510 IF a$(1)<'0'OR a$(1)>'9' THEN EXIT Loop3
520 n$=n$ & a$(1)
530 i=i+1
540 END REPEAT Loop3
550 PRINT#4,FILL$( ' ',5-LEN(n$)):n$;
560 REPEAT loop4
570 IF a$(i)<>' ' THEN EXIT loop4
580 i=i+1
590 END REPEAT loop4
600 a$=a$(i TO)
610 END DEFINE
620 :
630 DEFINE PROCEDURE Spaces(l$)
640 LOCAL N,Colon,thenin,Stmt$
650 RESTORE
660 FOR N=1 TO 10
670 READ Stmt$
680 IF 1$(1 TO LEN(Stmt$))=Stmt$ THEN EXIT N
690 END FOR N
700 Colon='':INSTR 1$
710 IF Colon=LEN(1$) THEN Colon=0
720 SELECT ON N
730 =1,2
740 Diff 1.1
750 IF Colon THEN Spaces 1$('':INSTR 1$+1 TO)
760 =3 TO 6
770 IF NOT Colon THEN Diff 0.2
780 =7
790 thenin='':INSTR 1$
800 IF thenin THEN thenin=LEN(1$)>thenin+4
810 IF NOT(Colon OR thenin) THEN Diff 0.2
820 =8:Diff 2.2
840 =9:Diff 2.0
850 END SELECT
860 END DEFINE
870 :
880 DEFINE PROCEDURE Diff(a,b)
890 Before=Before+a
900 After=After+b
910 END DEFINE
920 :
930 DATA '=', 'ON', 'REPEAT', 'FOR', 'DEFINE'
940 DATA 'SELECT', 'IF', 'ELSE', 'END', '*'

```


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Noises off

Try using these sound effects to give that professional touch to your programs, from **Mark Gornall**

This program demonstrates seven different sound effects using the **SID** chip. You may look upon them as an example of Commodore 64 sound or you may prefer to use them in your own programs, expanding and improving a particular sound to your own taste.

The program is menu driven, and lets you choose a particular sound or you can play all seven sounds one after the other. You can change the wave form being used, but it should be noted that some sounds may play better in one wave form than another. Here is a short description of each routine.

Sound One plays two notes in a *For/Next* loop, but one note is always much higher

than the other, giving the effect a rough musical scale. **Sound Two** uses ring modulation of voices one and three to produce a strange sound. **Sound Three** plays random notes, but the Sustain/Release is set to give a pleasant effect. **Sound Four** plays two notes in the chosen wave form and two notes of white noise all the way up the scale, using voices one and two. It sounds best in saw tooth wave form. **Sound Five** imitates multiple explosions using all three voices. It sounds best in white noise wave form. **Sound Six** plays two musical scales, one starting at the bottom, playing up, and one starting at the top, playing down, using voices one and two. **Sound Seven** is my

favourite. It plays a small echo using voice one and sounds great in all wave forms. You may like to try changing Line 228 to *ForI=OT040*.

I can never make up my mind which sounds best.

Program Notes

Line 2	Set up screen
Line 4	Initialise variables
Lines 6-28	Print menu, check key press
Lines 30-56	Change wave form
Lines 60-238	Sound routines
Line 244	Clear SID chip
Line 248	Set volume and pulse width
S	Voice 1
S1	Voice 2
S2	Voice 3
WV	Waveform
(CLR)	Shift Clr/Home
(CUD)	Cursor down
(CUL)	Cursor left

```

0 REM *** SOUND EFFECTS-MARK
6,1984 ***
2 POKES3280,11:POKES3281,11:POKE646,0
4 S=54272:S1=54279:S2=54286:WV=33
6 C=0:PRINT"[CLR]"TAB(12)
" SOUND EFFECTS"
8 PRINT"[CUD][CUD][CUD]1.
PLAY A SOUND"
10 PRINT"[CUD]2. PLAY ALL SOUNDS"
12 PRINT"[CUD]3. CHANGE WAVEFORM"
14 PRINT"[CUD]4. END"
16 POKE198,0
18 GETA$:IFA$=""THEN18
20 IFA$="1"THEN30
22 IFA$="2"THENC=1:GOTO60
24 IFA$="3"THEN36
26 IFA$="4"THENPRINT"[CLR]":END
28 GOTO18
30 INPUT"[CLR]ENTER SOUND (1-7)
.[CUL][CUL][CUL]";N
32 IFN<1ORN>7THEN30
34 ONNGOTO62,86,110,136,162,192,218
36 PRINT"[CLR]WAVE FORMS"
38 PRINT"[CUD][CUD]1. TRIANGLE"
40 PRINT"[CUD]2. SAW TOOTH"
42 PRINT"[CUD]3. PULSE"
44 PRINT"[CUD]4. WHITE NOISE"
46 GETA$:IFA$=""THEN46
48 IFA$="1"THENWV=17:GOTO6
50 IFA$="2"THENWV=33:GOTO6
52 IFA$="3"THENWV=65:GOTO6
54 IFA$="4"THENWV=129:GOTO6
56 GOTO46
58 :
60 REM **** SOUND 1 ****
62 GOSUB244
64 POKES+5,88:POKES+6,88
68 POKES+4,WV
70 FORI=OT0200STEP0.5
72 POKES+1,I:POKES+1,I+55
74 NEXTI
76 POKES+4,WV-1
78 IFC=1THEN86
80 GOTO6
82 :
84 REM **** SOUND 2 ****
86 GOSUB244
88 POKES+1,130
90 POKES+5,204
92 POKES+15,30
96 FORI=1TO300:POKES+4,21
98 POKES+4,WV
100 NEXTI
102 IFC=1THEN110
104 GOTO6
106 :
108 REM **** SOUND 3 ****
110 GOSUB244
112 POKES+5,9:POKES+6,5
114 FORI=1TO200
116 HF=INT(RND(1)*100)
118 LF=INT(RND(1)*100)
120 POKES+1,HF:POKES+1,LF
122 POKES+4,WV
124 POKES+4,WV-1
126 NEXTI
128 IFC=1THEN136
130 GOTO6
132 :
134 REM **** SOUND 4 ****
136 GOSUB244
138 POKES+5,8:POKES+6,204
140 POKES+15,8:POKES+16,204
142 FORI=1TO100
144 POKES+1,I:POKES+1,I
146 POKES+4,WV:POKES+4,129
148 FORJ=1TO5:NEXTJ
150 POKES+4,WV-1:POKES+4,128
152 NEXTJ
154 IFC=1THEN162
156 GOTO6
158 :
160 REM **** SOUND 5 ****
162 GOSUB244
164 POKES+5,255:POKES+6,204
166 POKES+15,64:POKES+16,234
168 POKES+5,0:POKES+6,204
170 POKES+1,2:POKES+24
172 POKES+1,8:POKES+97
174 POKES+2,167:POKES+2,15
176 POKES+4,WV
178 FORI=1TO3000:NEXT::POKES+4,WV
180 FORI=1TO2000:NEXT:POKES+4,WV
182 FORI=1TO2500:NEXT:POKES+4,WV-1
:POKES+4,WV-1:POKES+4,WV-1
184 IFC=1THEN192
186 GOTO6
188 :
190 REM **** SOUND 6 ****
192 GOSUB244
194 POKES+5,9:POKES+6,0
196 POKES+15,9:POKES+16,0
198 FORI=1TO150
200 POKES+1,I:POKES+1,I+1
202 POKES+1,151-I:POKES+1,152-I
204 POKES+4,WV:POKES+4,WV
206 POKES+4,WV-1:POKES+4,WV-1
208 NEXTI
210 IFC=1THEN218
212 GOTO6
214 :
216 REM **** SOUND 7 ****
218 GOSUB244
222 POKES+5,88:POKES+6,204
224 POKES+4,WV
226 FORJ=1TO15
228 FORI=40TO0STEP-1
230 POKES+1,I
232 NEXTI
234 POKES+4,WV-1
236 NEXTJ
238 GOTO6
240 :
242 REM *** CLR SOUND CHIP ***
244 FORI=OT024:POKES+1,0:NEXTI
246 REM *** SET VOL,PULSE WIDTH ***
248 POKES+24,15:POKES+3,8:POKES+2,0
250 RETURN

```


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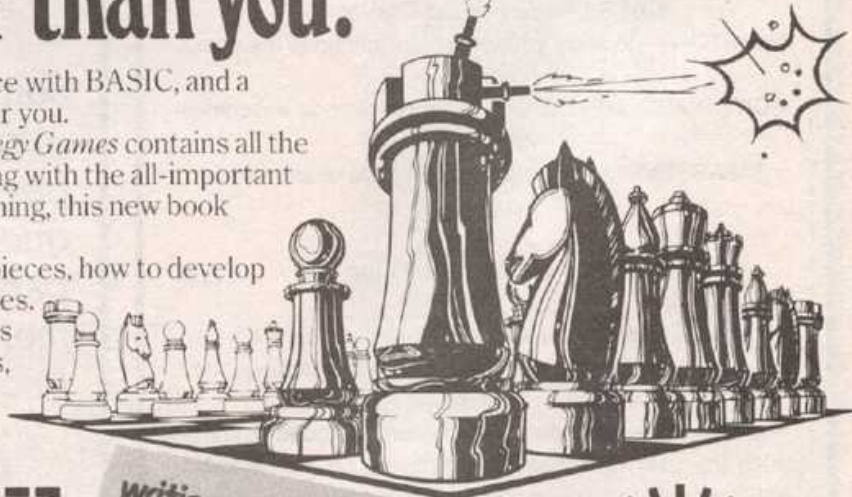


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When the program is executed, the user is confronted with a menu, and is asked to choose which service is required.

The program is well structured and easy to follow, with Rem statements detailing the workings of each procedure.

Program Notes

<i>Procinitialise</i>	Disables Escape and Break keys
<i>Procmenu</i>	Prints menu on screen
<i>Procscreen</i>	Draws border around menu
<i>Procsimple</i>	Calculates simple interest
<i>Proccompound</i>	Calculates compound interest
<i>Procdepreciation</i>	Calculates depreciation
<i>Procvat</i>	Calculates Vat
<i>Procrates</i>	Calculates local rates
<i>Procend</i>	Ends program
<i>Procagain</i>	Asks for another calculation

The program could be easily developed further to form part of a comprehensive domestic financial program.

```

10REM *****
20REM *** CALCULATOR ***
30REM *** BY NEIL MCGLYNN ***
40REM *** BBC BASIC ***
50REM *** 1984 ***
60REM *****
70REM The main loop of the program changes
the mode to a graphics mode and ca
lls three procedures.
80REPEAT
90MODE2
100PROCinitialise
110PROCmenu
120PROCagain
130UNTILagain$="N"
140END
150REM PROCinitialise sets the decimal
place to 2 places and disables the ESCA
PE and the BREAK keys.
160DEFPROCinitialise
170*F%229.2
180*KEY10OLD:MRUN:M
190%=&020200
200ENDPROC
210REM PROCmenu removes the cursor from the
menu and calls PROCscreen which dr
aws a border around the menu.
220DEFPROCmenu
230VDU23:8202:0:0:0:
240PRINTTAB(2,3):"CALCULATOR MENU"
250PRINTTAB(2,4):" "
260PRINTTAB(2,8):"SELECT NUMBER"
270PRINTTAB(0,11):" 1 SIMPLE INTEREST"
280PRINTTAB(0,14):" 2 COMPOUND INTEREST"
290PRINTTAB(0,17):" 3 DEPRECIATION"
300PRINTTAB(0,20):" 4 VAT"
310PRINTTAB(0,23):" 5 LOCAL RATES"
320PRINTTAB(0,26):" 6 END PROGRAM"
330PROCscreen
340REPEAT
350answer=GET-48
360UNTILanswer<7 AND answer>0
370IFanswer=1THENPROCsimple
380IFanswer=2THENPROCcompound
390IFanswer=3THENPROCdepreciation
400IFanswer=4THENPROCvat
410IFanswer=5THENPROCrates
420IFanswer=6THENPROCend
430ENDPROC
440REM PROCscreen draws a border
around the menu.
450DEFPROCscreen
460GCOL0,1
470DRAW1279,0
480DRAW1279,1023
490DRAW0,1023
500DRAW0,0

```

```

510ENDPROC
520REM All procedures called from the menu
have the commands VDU22,7 and CHR$1
41. VDU22,7 changes the mode to the teletext
mode(MODE 7)and CHR$141 prints the
character in double height.
530REM PROCsimple calculates
Simple Interest.
540DEFPROCsimple
550VDU22,7
560PRINTCHR$141:"          SIMPLE INTEREST"
570PRINTCHR$141:"          SIMPLE INTEREST"
580PRINT
590PRINT
600PRINT
610INPUT"INPUT PRINCIPAL          "principal
620PRINT
630INPUT"INPUT INTEREST RATE      "rate
640PRINT
650INPUT"INPUT NUMBER OF YEARS   "years
660interest=(rate/100)*principal*years
670amount=principal+interest
680CLS
690PRINTCHR$141:"          SIMPLE INTEREST"
700PRINTCHR$141:"          SIMPLE INTEREST"
710PRINTTAB(3,7):"PRINCIPAL
= "principal
720PRINTTAB(3,9):"INTEREST
RATE = ":rate:"%"
730PRINTTAB(3,11):"YEARS
= "years
740PRINTTAB(3,13):"INTEREST
= "interest
750PRINTTAB(3,15):"AMOUNT
= "amount
760PRINTTAB(3,23):"ANY KEY TO RETURN"
770next$=GET$
780ENDPROC
790REM PROCcompound calculates
Compound Interest.
800DEFPROCcompound
810VDU22,7
820PRINTCHR$141:"          COMPOUND INTEREST"
830PRINTCHR$141:"          COMPOUND INTEREST"
840PRINT
850PRINT
860PRINT
870INPUT"INPUT PRINCIPAL          "principal
880PRINT
890INPUT"INPUT NUMBER OF YEARS   "years
900PRINT
910INPUT"INPUT INTEREST RATE      "rate
920amount=principal
930FORtime=1TOyears
940amount=amount+(amount*(rate/100))

```



```

950NEXTtime
960interest=amount-principal
970CLS
980PRINTCHR#141:"
COMPOUND INTEREST"
990PRINTCHR#141:"
COMPOUND INTEREST"
1000PRINTTAB(3,7):"PRINCIPAL
= "principal
1010PRINTTAB(3,9):"YEARS      = "years
1020PRINTTAB(3,11):"INTEREST RATE =
":rate:"%"
1030PRINTTAB(3,13):"AMOUNT      = "amount
1040PRINTTAB(3,15):"INTEREST
= "interest
1050PRINTTAB(3,23):"ANY KEY TO RETURN"
1060next$=GET$
1070ENDPROC
1080REM PROCdepreciation calculates the
number of years it takes an article to be
worthless and worth half its original value.
1090DEFPROCdepreciation
1100REPEAT
1110VDU22,7
1120PRINTCHR#141:"          DEPRECIATION"
1130PRINTCHR#141:"          DEPRECIATION"
1140PRINT
1150PRINT
1160PRINT
1170INPUT"INPUT VALUE OF ARTICLE "sum
1180PRINT
1190INPUT"INPUT % DEPRECIATION    "percent
1200UNTILsum>0ANDpercent>0
1210variable=sum
1220variable2=sum
1230years=0
1240years2=0
1250REPEAT
1260variable=variable-((percent/100)
*variable)
1270years=years+1
1280UNTILvariable<1
1290REPEAT
1300variable2=variable2-((percent/100)
*variable2)
1310years2=years2+1
1320UNTILvariable2<sum/2
1330CLS
1340PRINTCHR#141:"          DEPRECIATION"
1350PRINTCHR#141:"          DEPRECIATION"
1360PRINTTAB(3,5):"ORIGINAL VALUE = "sum
1370PRINTTAB(3,7):"% DEPRECIATION
= "percent:"%"
1380PRINTTAB(3,9):"NUMBER OF YEARS
FOR ARTICLE'S
VALUE TO BE WORTHLESS      = "y
ears:" YEARS"
1390PRINTTAB(3,14):"NUMBER OF YEARS
FOR ARTICLE'S
VALUE TO BE HALVED        = "
years2:" YEARS"
1400PRINTTAB(3,23):"ANY KEY TO RETURN"
1410next$=GET$
1420ENDPROC

1430REM PROCvat calculates the VAT to be
1440DEFPROCvat
1450VDU22,7
1460PRINTCHR#141:"          VAT"
1470PRINTCHR#141:"          VAT"
1480PRINT
1490PRINT
1500PRINT
paid on an article.
1510INPUT"INPUT THE VALUE OF VAT      "vat
1520PRINT
1530INPUT"INPUT THE VALUE OF
THE ARTICLE "article
1540output=article*(vat/100)
1550CLS
1560PRINTCHR#141:"          VAT"
1570PRINTCHR#141:"          VAT"
1580PRINTTAB(3,7):" VAT
= ":vat:"%"
1590PRINTTAB(3,9):" ARTICLE PRICE
= ":article
1600PRINTTAB(3,11):" THE VAT ON
THE ARTICLE = ":output
1610PRINTTAB(4,23):"ANY KEY TO RETURN"
1620next$=GET$
1630ENDPROC
1640REM PROCrates calculates the
Local Rates to be paid.
1650DEFPROCrates
1660VDU22,7
1670PRINTCHR#141:"          LOCAL RATES"
1680PRINTCHR#141:"          LOCAL RATES"
1690PRINT
1700PRINT
1710INPUT"INPUT RATEABLE VALUE      "rateable
1720PRINT
1730INPUT"INPUT RATE PER              "pound
1740rate=rateable*pound
1750CLS
1760PRINTCHR#141:"          LOCAL RATES"
1770PRINTCHR#141:"          LOCAL RATES"
1780PRINTTAB(3,7):"RATEABLE VALUE =
"rateable
1790PRINTTAB(3,9):"RATE PER POUND = "pound
1800PRINTTAB(3,11):"YOU WILL HAVE
1810PRINTTAB(3,23):"ANY KEY TO RETURN"
1820next$=GET$
1830ENDPROC
1840REM PROCend ends the program.
1850DEFPROCend
1860CLS
1870END
1880ENDPROC
1890REM PROCagain asks the user if he/she
would like another calculation to be
1900DEFPROCagain
1910VDU22,7
1920CLS
1930PRINTTAB(3,14):"ANOTHER
CALCULATION (Y OR N)"
1940again$=GET$
1950ENDPROC

```




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The dread beast scrolls

The first of three machine-code routines for the Dragon 32 by Roger Walton

The Dragon has a poor reputation for lack of quality in its games software. This has often been due to the use of PMode 4 graphics displays. Although these provide maximum resolution, the user is limited to a two colour display. More recently, programs have appeared using PMode 3 graphics which are visually more appealing. With careful programming, excellent display becomes possible.

The purpose of this series is to provide a number of machine-code utilities which may be incorporated into programs using PMode 3.

PMode 3 requires four pages of graphics memory to display a full screen. The memory set aside for graphics by the Dragon 32 is reserved by the PClear command. PClear 4 is the default value. In normal use, memory addresses &H0600 to &H1DFF, a total of 6144 bytes of Ram, are used by PMode 3.

Each point displayed on the screen consists of two bits of memory. This means that each byte will display four points on the screen, giving $4 \times 32 = 128$ points per row. There are 192 rows down the screen so the display is 128×192 in PMode 3.

The bit patterns within a byte determine the colour which is displayed. The following table shows how this works:

bit pattern	colour displayed	
	Screen 1,0	Screen 1,1
00	green	buff
01	yellow	cyan
10	blue	magenta
11	red	orange

In the first program a routine is provided which will scroll a section of the screen to the left, two bits at a time. 'Wrap-around' has is to stop should be Poked into &H7F69 (see Basic listing one).

the screen as it disappears from the left. The full width of the screen is scrolled but the vertical height of the section scrolling can be set by the user. This is done by Poking the appropriate y-coordinates before Execing the routine. The y-coordinate at which the scroll should start needs to be Poked into &H7F68. The address at which the scroll is to stop should be Poked into &H7F69, (see Basic listing one).

An example of a use for this program would be to scroll a set of options across the bottom of the screen, as in the excellent *Chuckie Egg* game. A later article will provide a character set for this purpose.

The assembler listing is provided so that you can see how the routine works. The next article will show how to scroll the screen to the right and upwards.

```

10 ' LISTING 1
20 '*****
30 ' SCROLL PROGRAM, R. Walton, July '84 *
40 '*****
50 '
60 ' This program scrolls PMode 3 graphics left
70 ' across the screen, with
wrap-around built in
80 ' The section of the screen to be scrolled
90 ' is defined by it's X and Y coordinates
which should
100 ' be POKED into &H7F68 and &H7F69 before
EXECing the machine code
110 CLEAR 100,&H7F60
120 FOR LOC=&H7F61 TO &H7FEF
130 READ P$
140 P$="&H"+P$
150 P=VAL(P$)
160 T=T+P
170 POKE LOC,P
180 NEXT
190 IF T<>14274 THEN CLS:PRINT"DATA ERROR":STOP
200 CLS:PRINT"CODE LOADED."
210 PRINT"EXEC &H7F61 TO"
220 PRINT"CALL LEFT-SCROLL"
230 DATA 16,00,0B,06,00,1D,FF,00
240 DATA BF,00,00,00,00,00,86,20
250 DATA F6,7F,68,3D,C3,06,00,FD
260 DATA 7F,64,86,20,F6,7F,69,3D
270 DATA C3,06,1F,FD,7F,66,BE,7F
280 DATA 64,7F,7F,6A,31,88,1F,10
290 DATA BF,7F,6D,7F,7F,6B,A6,84
300 DATA 85,80,26,27,85,40,26,2E
310 DATA 68,84,68,84,1C,FE,30,01
320 DATA BC,7F,6D,2E,05,17,00,23
330 DATA 20,F2,A6,1F,BA,7F,6A,BA
340 DATA 7F,6B,A7,1F,BC,7F,66,25
350 DATA C8,20,2B,34,02,86,02,B7
360 DATA 7F,6A,35,02,20,CE,7C,7F
370 DATA 6B,20,CD,C6,02,F7,7F,6C
380 DATA 1C,FE,68,84,25,07,7A,7F
390 DATA 6C,5A,26,F4,39,A6,1F,BA
400 DATA 7F,6C,A7,1F,20,F0,39

```

Continued over the page

7F61	1015	PRT \$0C	
7F61	1020	*****	
7F61	1030	*	*
7F61	1040	* LEFT SCROLL FOR PMODE 3	*
7F61	1050	* ROGER WALTON, JULY : '84	*
7F61	1060	*	*
7F61	1070	*****	
7F61 16000B	1080	@START LBRA @IN	
7F64	1090	*****Reserve storage*****	
7F64	1100	@SCRST RMB 2	;lower scroll address
7F66	1110	@SCREND RMB 2	;higher scroll address
7F68	1120	@YIN RMB 1	;lower Y-coordinate
7F69	1130	@YOUT RMB 1	;higher Y-coordinate
7F6A	1140	@CARRY RMB 3	;used for wrap-around
7F6D	1150	@LINEND RMB 2	
7F6F	1160	*****Calculate screen addresses*****	
7F6F	1170	@IN EQU *	
7F6F 8620	1180	LDA #32	;32 bytes/line
7F71 F67F68	1190	LDB @YIN	;y-coordinate on entry
7F74 3D	1200	MUL	
7F75 C30600	1210	ADDD #\$600	;get screen address
7F78 FD7F64	1220	STD @SCRST	;scroll starts here
7F7B 8620	1230	LDA #32	
7F7D F67F69	1240	LDB @YOUT	
7F80 3D	1250	MUL	
7F81 C3061F	1260	ADDD #\$61F	
7F84 FD7F66	1270	STD @SCREND	;scroll ends here
7F87	1280	*****	
7F87 BE7F64	1290	LDX @SCRST	
7F8A 7F7F6A	1300	@GOON CLR @CARRY	;keep track of bits
7F8D 318B1F	1310	LEAY 31,X	;transferred between bytes
7F90 10BF7F6D	1320	STY @LINEND	
7F94 7F7F6B	1330	CLR @CARRY+1	
7F97 A684	1340	LDA ,X	
7F99 8580	1350	BITA #\$80	;save bit 7
7F9B 2627	1360	BNE @SET	
7F9D 8540	1370	@TEST BITA #\$40	;save bit 6
7F9F 262E	1380	BNE @SET1	
7FA1 6884	1390	@CONT1 ASL ,X	;scroll one bit
7FA3 6884	1400	ASL ,X	;and another
7FA5 1CFE	1410	@CONT ANDCC #\$FE	;clear carry
7FA7 3001	1420	LEAX 1,X	;point to next byte
7FA9 BC7F6D	1430	CMPX @LINEND	;if at line end
7FAC 2E05	1440	BGT @WRAP	;wrap around screen
7FAE 170023	1450	LBSR @SCROLL	;else keep on scrolling
7FB1 20F2	1460	BRA @CONT	;do next bit
7FB3	1470	*****	
7FB3 A61F	1480	@WRAP LDA -1,X	;point to last byte
7FB5 BA7F6A	1490	ORA @CARRY	;in line, setting bits
7FB8 BA7F6B	1500	ORA @CARRY+1	;if necessary
7FBB A71F	1510	STA -1,X	
7FBD BC7F66	1520	CMPX @SCREND	;is screen done
7FC0 25CB	1530	BLO @GOON	;if not, continue
7FC2 202B	1540	BRA @OUT	;else return to BASIC
7FC4	1550	*****	


```

7FC4 3402
7FC6 B602
7FCB B77F6A
d
7FCB 3502
7FCD 20CE
7FCF 7C7F6B
ed
7FD2 20CD
7FD4

7FD4 C602
7FD6 F77F6C
7FD9 1CFE
7FDB 6884
7FDD 2507
7FDF 7A7F6C
7FE2 5A
7FE3 26F4
7FE5 39
7FE6

7FE6 A61F
7FE8 BA7F6C
7FEB A71F
7FED 20F0
7FEF

7FEF 39
7FF0

1560 @SET PSHS A
1570 LDA #2
1580 STA @CARRY ;used to set bit 2 if neede
d
1590 PULS A
1600 BRA @TEST
1610 @SET1 INC @CARRY+1;used to set bit 1 if need
ed
1620 BRA @CONT1
1630 *****

1640 @SCROLL LDB #2
1650 STB @CARRY+2
1660 @SHIFT ANDCC #FE ;clear carry flag
1670 ASL ,X
1680 BCS @COPY ;copy bit
1690 @BACK DEC @CARRY+2
1700 DECB
1710 BNE @SHIFT
1720 RTS
1730 *****

1740 @COPY LDA -1,X ;take care of
1750 ORA @CARRY+2 ;transfer of bits
1760 STA -1,X ;between bytes
1770 BRA @BACK
1780 *****

1790 @OUT RTS
1800 END @START

```

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Spider Attack

on Spectrum

The object of this game for the 48K Spectrum is to make your way through six levels of a multi-storey maze, collecting boxes of treasure on your way, and finally

reaching a magic treasure chest.

Unfortunately your task is hampered by two man-eating spiders which patrol the maze. You carry a gun, but this can only stun them, and firing the gun uses up precious oxygen.

To escape from one level to the next you must simply make your way to the bottom

right hand corner of the screen.

The controls are:

- 1 = move left
- 2 = move right
- 7 = shoot left
- 8 = shoot right
- 9 = jump left
- 0 = jump right

```
10 FOR n=USR "a" TO USR "h"+7:
READ m: POKE n,m: NEXT n
20 DATA 60,125,255,0,0,0,125,6
30 DATA 67,167,157,189,39,35,3
4,4,194,229,185,189,228,196,68,3
40 DATA 60,66,129,165,129,66,6
66,129,66,126,102,231,6,31,
35,69,249,137,138,140,248
50 DATA 15,16,32,63,32,63,0,
248,20,28,244,20,24,240,0
60 LET s$="AAA AAA AA AAAAAA
A AA AA AAAAA A AAAAAA AA
A AAAAA AAAAA AAA AA AAAA
AAA AAAAA AAAAA AAA AA AAAA
A AA AAAAA AAAA A AAA A AAA
AAA A AA AAAAA AA AAAAA AAAAA
AAAA AAAAA AA"
70 DIM b$(16,704): FOR m=1 TO 6
FOR n=3 TO 21 STEP 3: LET a=IN
T (RND*190)+1: LET b$(m,n*32+1)
T (n+1)*32)=a$(a TO a+31): NEXT
n: NEXT m
80 PAPER 6: INK 1: BORDER 1: C
LS: LET l1=3: LET l1=1: LET sc=
0: LET am=20: LET air=20: LET x=
3: LET y=0: LET s=3: LET ss=3: L
ET s1=22: LET s2=27
90 PRINT b$(11): AT 21,0: "AAAA
AAAAAAAAAAAAAAAAAAAAAAAA" AT
0,0: "AIR:" AT 0,8: "LEVEL:" AT 0,
18: "SCORE:" FOR n=1 TO 12: PRIN
T AT INT (RND*16)+3,INT (RND*32)
: BRIGHT 1: "F": NEXT n
```

```
100 PRINT AT x,y: " " AT x-1,y:
: LET y=y+(INKEY$="2" AND y<31)
-(INKEY$="1" AND y>0): IF SCREE
N$ (x+1,y)=" OR ATTA (x+1,y)=1
13 THEN GO SUB 500
102 IF ATTA (x,y)=113 OR ATTA (
x-1,y)=113 THEN LET sc=sc+10
104 PRINT AT x,y: "E" AT x-1,y:
D: AT 0,4: FLASH (INT air/2),IN
T air,FLASH 0: " AT 0,14: I, A
T 0,24: sc AT 0,29: "DDD" (TO l1)
106 PRINT AT s,s1: " " AT ss,s2
108 IF INKEY$="0" OR INKEY$="9"
THEN GO SUB 1000
110 LET air=air-.05: LET s1=s1+
(RND*.5)+(RND*.5)-(RND*.5)-(RND
*.5)-(RND*.75): LET s2=s2+(RND*.5
)+(RND*.5)-(RND*.5)-(RND*.5): IF
s1>30 THEN LET s1=30
120 IF s1<0 THEN LET s1=0
130 IF s2>30 THEN LET s2=30
135 IF INKEY$="7" OR INKEY$="8"
THEN GO SUB 4000
140 IF s2<0 THEN LET s2=0
150 IF SCREEN$ (s+1,s1)=" " THE
N GO SUB 600
160 IF SCREEN$ (ss+1,s2)=" " TH
EN GO SUB 700
165 IF l1=6 THEN PRINT AT 20,30
: BRIGHT 1: FLASH 1: "GH"
167 IF (x=5 AND (y=s1 OR y+1=s1)
) OR (x=ss AND (y=s2 OR y+1=s2)
) THEN BEEP .6,-20: GO TO 7900
170 PRINT AT s,s1: "BC" AT ss,s2
: "BC"
```

Baud Walk



Price war

The price war on modems — predicted in Baud Walk on several occasions — is now showing signs of hotting up with the arrival of the cheapest yet approved 300/300 unit and some price slashing going on in the multi-standard modem arena.

Enter Answercall, best known for their business activities in telecommunications —

their *Minimo* modem shipped in from off-shore costs just £75.

The modem is very compact it's about half the size of a Spectrum — and comes with a power pack too. It has LCD to show when the line has been grabbed or dropped and all in all is a very neat package.

The drawback is that Answercall do not offer any software or recommend any software in the enclosed instructions. I would have thought this to do given that it's aimed at the home/hobbyist market as well as office automation uses — ie, hooked up to a word processor for telex.

In the multi-standard modem arena, Pace is currently offering its all-singing, all-dancing Nightingale for £136.85, the cheapest yet.

Nothing much appears to be stirring on the bulletin board front, but I know of at least one modem company which is planning to bring out bulletin board software to encourage growth of those types of dial-up databases.

About to break in a couple of weeks time is a Channel 4 advertising campaign from Micronet 800 who have been busily arranging demonstration centres so people can see the database before deciding to buy a modem and subscribe to the service.

I understand many Boots stores and some John Lewis and Spectrum Group stores will be offering this facility. If you already have a 1200/75 modem with viewdata software you could contact Freephone Prestel and arrange to see a

demonstration database from the comfort of your armchair, so to speak.

And just a little snippet to keep you hanging on ... a major publishing company is about to announce an education network service offering electronic mail and data file exchange possibilities. I'm sure PCW's intrepid reporting team will be at the official launch.

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.

QUARTERBACK



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 Surrey GU15 3AJ



Open Forum

```

180 IF x=20 AND y>29 THEN GO TO 5000
190 IF INT air=0 THEN GO TO 900
200 GO TO 100
501 LET t=30
505 IF ATTR (x+1,y)=113 THEN LET
T SC=SC+10
510 BEEP .1,t: LET x=x+1: PRINT
AT x,y,"E":AT x-1,y,"D":AT x-2,
y," ": IF SCREEN$ (x+1,y)=" " TH
EN LET t=t-5: IF t=-10 THEN LET
x$="YOU JUMPED TOO FAR": GO TO 8
000
515 IF SCREEN$ (x+1,y)=" " THEN
GO TO 510
520 PRINT AT x-1,y," ": RETURN
600 LET s=s+1: IF SCREEN$ (s+1,
s1)=" " THEN GO TO 600
610 RETURN
700 LET ss=s+1: IF SCREEN$ (ss
+1,s2)=" " THEN GO TO 700
710 RETURN
1000 IF x=2 THEN RETURN
1002 LET d=1: IF INKEY$="9" THEN
LET d=-1
1005 IF (d=1 AND y=31) OR (d=-1
AND y=0) THEN RETURN
1010 PRINT AT x,y," ":AT x-1,y,"
": LET x=x-3: LET y=y+d: FOR n=
0 TO 40 STEP 2: BEEP .03,n: NEXT
n
1020 IF d=1 AND y<30 THEN LET y=
y+1
1030 IF d=-1 AND y>0 THEN LET y=
y-1
1040 RETURN
4000 LET air=air-1: IF INKEY$="7
" THEN GO TO 4100
4005 PRINT AT s,s1,"BC":AT ss,s2
,"BC"
4010 FOR n=y+1 TO y+10: PRINT AT
x,n,"-": IF (x=s AND n=s1) OR (
x=ss AND n=s2) THEN FOR J=30 TO
0 STEP -1: BEEP .002,J: NEXT J:
PRINT AT s,s1," ":AT ss,s2," "
: LET sc=sc+50: LET s=3: LET ss=
3: LET s1=30: LET s2=27: GO TO 4
200
4020 IF n=30 THEN GO TO 4200
4030 NEXT n: BEEP .5,-25: GO TO
4200
4100 FOR n=y-1 TO y-10 STEP -1:

```

```

PRINT AT x,n,"-": IF (x=s AND n=
s1) OR (x=ss AND n=s2) THEN FOR
J=30 TO 0 STEP -1: BEEP .002,J:
NEXT J: LET sc=sc+50: PRINT AT s
,s1," ":AT ss,s2," ": LET s=3:
LET ss=3: LET s1=30: LET s2=27:
GO TO 4200
4110 IF n=0 THEN GO TO 4200
4120 GO TO 4030
4200 PRINT AT x,0," ": RETURN

```

```

REM 32 spaces
5000 LET s=3: LET ss=3: LET s1=3
0: LET s2=27: LET x=3: LET y=0:
CLS: PRINT AT 10,10: FLASH 1: B
RIGHT 1,"LEVEL:" AND ((>6,STR$
((1+1) AND ((>6, FOR n=1 TO 3:
FOR m=-20 TO 40 STEP 2: BEEP .00
9,m: NEXT m: NEXT n: LET li=1+1
: CLS: IF li>7 THEN GO TO 90
5005 BEEP .3,24: BEEP .6,20: BEE
P .2,21: BEEP .2,23: BEEP .2,24:
BEEP .5,30: BEEP .5,30: BEEP 1,
25
5010 PRINT AT 10,11: BRIGHT 1: F
LASH 1:"BONUS:" (INT air)*100:AT
12,2: FLASH 0:"PRESS ANY KEY TO
PLAY AGAIN":AT 14,6:"YOUR SCORE
":sc+((INT air)*100): PAUSE 0:
PAUSE 0: RUN
7900 LET x$="GOT BY THE SPIDERS"
: OVER 1: PRINT AT x,y,"BC": OVE
R 0
8000 FOR n=0 TO 7: BEEP .1,n+5:
PRINT AT x,y: INK n:"E":AT x-1,y
,"D": NEXT n: LET x=3: LET y=0:
LET li=1+1: IF li=0 THEN GO TO
9000
8010 CLS: GO TO 90
9000 IF INT air=0 THEN LET x$="Y
OUR AIR SUPPLY RAN OUT"
9010 BEEP .5,10: PAUSE 3: BEEP .
3,10: PAUSE 1: BEEP .2,10: PAUSE
1: BEEP .3,10: PAUSE 4: BEEP .3
,13: PAUSE 1: BEEP .15,12: PAUSE
1: BEEP .3,12: PAUSE 1: BEEP .1
5,10: PAUSE 1: BEEP .3,10: PAUSE
1: BEEP .2,9: PAUSE 1: BEEP 1,1
0: PRINT AT 10,0: BRIGHT 1:"YOU
ARE DEAD-PRESS A KEY TO PLAY":AT
0,0: BRIGHT 0:x$: PAUSE 0: BEEP

```

Spider Attack
by S Inger

Arcade Avenue



Infinite lives

By the time you read this *Jetset Willy* will be making its, no doubt considerable, impact on the Commodore charts. I understand that it is also being transferred onto the Amstrad. Versions of *Manic Miner* are similarly being prepared for the BBC, Amstrad, Dragon and MSX which must be a huge relief for the non-Spectrum owning readers of this column that are wondering what all the fuss is about Miner Willy every few weeks. Even the Vic has its own 16K version of the *Perils of Willy*. Infinite lives pokes will be eligible once the games have been around for a while if

you're happier hacking than playing games. (Incidentally I hope all you hackers are rushing to buy System 15000.)

Meanwhile amongst all this flurry of activity from Software Projects, Commodore owners should try to catch a glimpse of the game they licensed from American company Sierra Online — BC's *Quest For Tires*.

From what I've seen it has a disappointingly simple jump, dodge, rescue the helpless maiden plot, but the graphics are wonderful in that they capture almost exactly the nuances of the pictures of cartoonist Johnny Hart (no relation to Tony Hart) who writes the BC comic strip. His cartoons are packed full of inventiveness, humour and rich imagery and I am all for them being drawn upon to improve computer games.

Now on to the first couple of letters I have had about Ocean's *Decathlon*. From James Cockings of Sheffield

comes this tip.

"I started to play this super game in reverse by trying to get the lowest distance I could on the discus. The man did a quarter turn and I threw the discus up at 36 degrees. The discus went up and up till it landed in the crowd and I got 186.86m." (I think you should have got 20 years!) "When I finished the game it restarted again where I left off with three athletes left — infinite lives!"

Still with Daley Thompson from Port Glasgow comes what appears to be a syndicate of athlete games players headed by J. J. Smith.

"My personal best for decathlon is 100 metres, 8.74s; long jump, 10.08m; shot put, 33.15m; high jump 2.38m; 400 metres, 27.42m; 110 metres hurdles 9.38s; pole vault, 5.04m; discus, 75.90m; javelin, 132.4m; 1500 metres, 268.11s. Total decathlon score was 716,690 with 493,465 scored on day two.

"On *Micro Olympics* by Da-

tabase Publications our record scores are 100 metres, 8.04 — self; 200 metres, 16.12 — A. McIntyre and self; Javelin 102.48 m — G. Wilkinson and self; long jump, 9.5 — A. McIntyre, G. Wilkinson and self; high jump, 2.40 — self.

"My other high scores are *Halls of the Things* 726; *Invasion of the Body Snatchers* 4650; *Splat!* 14,855; *Penetrator* 78,430; *3D Ant Attack* 40,844; *Sabre Wulf* 179,000; *Chuckie Egg* 221,000; *Winged Warlords* 14,000 (which caused it to crash); *Full Throttle* 1st place."

Imagine the muscles that guy must have in his fingers!

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.

Words

on BBC

This is a simple word processor using the mode 7 screen. It is quite easy to operate, you just type what ever you want until you reach the end of the page.
Press shift & to get : which prints the screen

to a Epson printer
Press shift & to get ' which saves the screen to tape or disk
Press shift & [to get { which loads a save screen from tape or disk

```

10 REM *****
20 REM * MACHINE CODE / BASIC *
30 REM * WORD PROCESSOR V.1.0 *
40 REM * BY S.C.PITHERS *
50 REM * (C) JUNE 1984 *
60 REM *****
70 REM
80 CLS
90 DIM S$ 300
100 FOR Q=0 TO 1
110   PZ=S$
120   OPT 0
130   .word%
140   LDA E22:JSR MFFEE
150   LDA E7:JSR MFFEE
160   LDA E200:LDX E1:LDY E0:JSR MFFFA
170   LDA E12:JSR MFFEE
180   LDX E0
190   .L
200   LDA DA,X
210   CMP EASC*":BEQ BW
220   JSR MFFEE:INX:BNE L
230   .BW LDA E13:JSR MFFEE
240   .BG JSR MFFEE:STA S$
250   .R CMP E13:BEQ RT
260   LDA S$
270   CMP EASC*":BEQ pr
280   CMP EASC*":BEQ sa
290   CMP EASC*":BEQ lo
300   .BB
310   JSR MFFEE
320   JMP BG
330   .pr
340   LDA E2:JSR MFFEE:LDA E1:JSR MFFEE
350   LDA E27:JSR MFFEE:LDA E1:JSR MFFEE

```

\ SETTING MODE7
 \
 \ DISABLE ESCAPE
 \ CLS
 \
 \ PRINT TITLES
 \
 \ LABEL WITH CARRIAGE RETURN
 \ WAIT FOR INPUT
 \ COMPARE WITH 13, BRANCH IF =
 \
 \ 3 CMP TO CHOOSE WEATHER TO LOAD
 \ SAVE OR PRINT TO A PRINTER
 \
 \ PRINTER PROCEDURE

Microradio

GW6JJN



Spot check

Since computers have been around in amateur radio, they have mostly been put to use for logging and calculation purposes, as well as for transceiving existing modes of communications such as Morse or RTTY. Many people, myself included, have long argued that this was a waste of the available technology. What is needed is a new and more efficient mode or modes that use computer technology to provide faster, efficient and more comprehensive communication. This has been achieved in two ways. Firstly with *AMTOR* and secondly with the packet radio systems.

This week I shall concen-

trate on *AMTOR* and a new program for the Dragon which brings it within the range of the ordinary amateur. *AMTOR*, to put it very simply, is a highly sophisticated form of Radio Teletype which has handshaking protocols and extensive error checking. One of the great problems with RTTY in difficult conditions is whether the message has actually arrived at its destination. With *AMTOR*'s error checking ability, this problem is solved.

AMTOR is an amateur version of an existing system which is used on marine frequencies for weather reports known as *NAVTEXT* and for commercial transmissions known as *TOR/SITOR*. Until now, it was quite difficult and expensive to get on the air with *AMTOR*. Thanks to the prolific radio software house Grosvenor Software, it is now possible to use *AMTOR* on the Dragon. If you have a conventional RTTY interface then only a 1KHz clock circuit is required in addition to the software. The clock and/or a full unit is avail-

able from PNP.

AMTOR on the Dragon supports three modes of communication, FEC which is like RTTY with less errors, ARQ which is the full *AMTOR* with handshaking and error detection/correction, and a mode called *LISTEN* which is a monitor mode. As usual with Grosvenor's software there is full split screen operation, type ahead facility, ten user memories and the contact review facility.

A status line continuously displays vital mode and error information and there is a USOS (unshift on space) facility which means that the program always transmits the correct shift after spaces. As usual there is the 24 hour real time clock display which is instantly transmittable.

Dragon *AMTOR* is available on cassette for £39, on disc (Dragon DOS) for £44 and best of all, on *om* cartridge for £49. For people who wish only to listen in on *AMTOR* traffic, there is a receive only cassette at £24.

What I find fascinating is that

Grosvenor are producing their programs on cartridge which means instant and safe use. They are now offering combinations of their programs in this form as follows: *AMTOR* + RTTY or *AMTOR* + Morse at £59 and *AMTOR* + RTTY + Morse at £69.

When you consider that the Grosvenor programs are probably the ultimate in amateur radio software and remember that the Dragon is retailing around £100 nowadays, then it is beginning to make sense to get a Dragon to use as a dedicated amateur terminal. The total cost with all the interfaces/terminal unit hardware involved is still under £200. Such a possibility was only a dream a year or two ago.

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.


```

360 LDA $51:JSR $FFEE:LDA $1:JSR $FFEE
370 LDA $45:JSR $FFEE
380 LDA $00:STA $70:LDA $70:STA $71
390 .AA
400 LDY $00
410 .BB
420 LDA $1:JSR $FFEE
430 LDA ($70),Y:JSR $FFEE
440 INY:BNE $B
450 INC $71:LDA $71:CMF $60
460 BNE $A:LDA $3:JSR $FFEE
470 JMP $B
480 .SA LDA $1:STA $75:RTS
490 .LB LDA $2:STA $75:RTS
500 .RT JSR $FFEE:LDA $10
510 JSR $FFEE:JMP $B
520 .DA
530 EQU $ "
540 EQU "Siemens M/C word Processor" \ DATA FOR TITLE
550 RTS
560 NEXT
570 CALL wordX
580 IF %75=1 PROC$AVE:CALL $B
590 IF %75=2 PROC$LOAD:CALL $B
600 CALL $B
610 END
620
630
640 DEF PROC$AVE
650 *SAVE "SCREEN" 7C00 7FFF
660 $Z=$00
670 ENDPROC
680
690
700 DEF PROC$LOAD
710 *LOAD "SCREEN" 7C00
720 $Z=$00
730 ENDPROC

```

\ END OF PRINTER PROCEDURE
 \ SAVING PROCEDURE
 \ LOADING PROCEDURE

Words
 by S Pithers

The Music Box



Sound synthesis

New products ready for the expected Christmas boom seem to be flooding in mercilessly. Don't worry if you haven't seen any of the goodies yet — this is the computer market, after all, and the practice of early announcement and late delivery has become a tradition.

Perhaps top of anybody's shopping list has to be the Yamaha CX5M. Don't be deceived — this isn't just any old MSX micro. The CX5M is an MSX micro plus what is effectively an entire digital synthesi-

ser complete with keyboard, MIDI interface and Yamaha's DX7/9 hardware and software.

The DX7 and DX9 synths (which retail at around £1500 and £800 respectively) use a new form of sound synthesis based on frequency modulation. Previous systems have either attempted to reconstruct a sound wave numerically (direct synthesis) or have used analogue or digital oscillators, filters and envelope generators to produce a basic sound wave and then process it. FM synthesis uses the fact — long known — that when you combine two different sound waves by frequency modulation, the result will be a whole range of sound waves with different frequencies.

The technical details are elaborate, but the system is similar to the one by which VHF radio and the video part of television pictures are transmitted. Since the process is complicated, nobody thought to do it before Yamaha developed their

YM2151 chip. The nearest thing to FM synthesis was the production of vibrato — the effect obtained when the frequency of a note varies slightly and rapidly. (It's worth experimenting with vibrato on your micro to see how some interesting effects can be obtained — all you have to do is rapidly change the frequency or pitch of a note in a regular fashion while it's playing.) Digital techniques have allowed Yamaha to develop a set of algorithms for FM which can be relatively simply understood by the non-expert.

The CX5M comes complete with an FM voicing program allowing you to control the YM2151 chip which is contained in a bolted-on unit under the main computer. You get a mini-keyboard too but it is very small and the CX5M MIDI doesn't allow you to run the computer from any MIDI keyboard, which is a great pity, especially since cheap MIDI keyboards are now becoming

available (the £449 MK900 from Siel, to take a notable example).

Also unavailable is the Music Macro program which, like other CX5M software comes on cartridge (there's no disc-drive at present), and allows you to use the FM system from Basic. For those of us stuck in Basic without FM, the CX5M offers an AY-3-8910 standard MSX programmable sound generator, which is hardly compensation.

Still, at around £600 for the package, Yamaha seem to have come up with a winner.

Gary Herman

The Music Box is a new weekly column with news, reviews and readers comments on all aspects of micros and music.

Any readers with experience of computer music making or companies with new product news are invited to write to: drop a line explaining what they're doing to: Gary Herman, The Music Box, 12-13 Little Newport Street, London WC2R 3LD.

Days

on Spectrum

The Spectrum manual, on page 163, gives a program which converts a date to the right day of the week. This program, however, only works for dates of the 20th century. The program below works for any date inclu-

ding other centuries. This is based on the formula $V = A \bmod 7$, where $A = (2.6m - 0.2) + d + y(y/4) + (c/4) - 2c$. m is the number of the month (Jan=11 of the previous year, Feb=12 of the previous year, Mar=1, Apr=2 and so on), d =day, y =year and c =(century-1). By $A \bmod 7$ we mean the remainder of $A/7$ which, in turn can be found by the formula $A \bmod 7 = A - (7 * (A/7))$ where $(A/7)$ is the integer part of $A/7$.

Program Notes

20-50 Set the introduction
60 Prompts input of date
70-150 Find value for Y(ear), M(onth), D(ay) and C(entury)
160 Sets value for A
170 Introduces formula
180-250 Finds and prints the right day of the week
260-270 Prompts for another try
280 Stop

```
10 REM *****
11 REM *** DAY OF THE WEEK ***
12 REM ***** BY *****
13 REM *** CHARLES BAJADA ***
14 REM **** 17th MAY 1984 ****
15 REM *****
20 CLS : PRINT AT 0,9;"DAY OF
THE WEEK" AT 0,9; OVER 1;
```

```
30 PRINT AT 2,0;" This progr
ame gives you the day of the we
ek of any date you may enter. G
ive the correct data and let the C
omputer do the rest FOR FULL DATE
enter date in the form 03/04/19
45."
40 PRINT AT 20,4; FLASH 1;"PRE
35 ANY KEY TO CONTINUE"
50 PAUSE 0: IF INKEY$="" THEN
30 TO 60
60 CLS : INPUT "FULL DATE:";D$
: PRINT AT 0,12;D$
70 LET M=VAL D$(4 TO 5)-2: IF
M=-1 THEN LET M=11
80 IF M=0 THEN LET M=12
90 IF M=11 OR M=12 THEN GO TO
110
100 GO TO 120
110 LET X=VAL D$(7 TO 10): LET
X=X-1
```

```
120 LET d=VAL D$(1 TO 2)
130 LET c=VAL D$(7 TO 8)
140 LET y=VAL D$(9 TO 10)
150 IF M=11 OR M=12 THEN LET y=
y-1
160 LET a=(2.6*M-0.2)+d+y+(INT
(y/4))+(INT (c/4))-2*c
170 LET day=a-(7*(INT (a/7)))
180 PRINT AT 5,0;D$;" was/is a
190 IF day>=0 AND day<1 THEN PR
INT AT 5,21;"SUNDAY"
200 IF day>=1 AND day<2 THEN PR
INT AT 5,21;"MONDAY"
210 IF day>=2 AND day<3 THEN PR
INT AT 5,21;"TUESDAY"
220 IF day>=3 AND day<4 THEN PR
INT AT 5,21;"WEDNESDAY"
230 IF day>=4 AND day<5 THEN PR
INT AT 5,21;"THURSDAY"
240 IF day>=5 AND day<6 THEN PR
INT AT 5,21;"FRIDAY"
250 IF day>=6 THEN PRINT AT 5,2
1;"SATURDAY"
260 INPUT "ANOTHER DATE ?";X$
270 IF X$="Y" THEN GO TO 60
280 STOP
```

Days
by C Bayada

Book Ends



Book Gateway to Computing Book 1 Price £4.95 Micro Commodore 64 (Spectrum, BBC, Dragon 32, Electron also available) Supplier Shiva Publishing Limited, 64 Welsh Row, Nantwich, Cheshire CW5 5ES

Ian Stewart's book is aimed at the young, absolute beginner and is one of three available in versions for a variety of micros.

This first volume introduces many of the major Basic commands, it emphasises the need for careful punctuation and other practicalities, and takes a quick look at the workings of the computer, all in a humorous, informal style.

It uses cartoons, diagrams and many small tests and examples to avoid being dry or daunting. It should provide a firm base for any youngster interested in doing more than zapping aliens; however,

buying all three parts will prove a costly investment. Recommended, though.

John Minson



Book Commodore 64 Machine Code Price £6.95 Micro Commodore 64 Supplier Shiva Publishing Limited, 64 Welsh Row, Nantwich, Cheshire CW5 5ES

To fully exploit the potential of any computer you need machine code, but sadly it is a subject that can make even dedicated programmers quail.

Now Commodore 64 users have Ian Stewart and Robin Jones's excellent introduction to the subject. By breaking it down into byte-sized nibbles (sorry!) they have tamed most of its terrors.

Machine code is primarily concerned with careful mani-

pulation of simple processes, and the authors illuminate the logic of these through many practical examples. Moving from binary and hex numbers to hi-res graphics, and including several hand-assembly aids, the book provides a painless grounding for anybody interested in communicating directly with their 64's CPU.

John Minson



Book The Electron Puzzle Book Micro Electron Price £8.95 Supplier Sigma Technical Press, 5 Alton Road, Wilmslow, Cheshire SK9 5DY

Written principally with the Electron in mind, this book nevertheless assumes a minimum working knowledge of BBC Basic. Through posing problems and offering alterna-

tive solutions, the book aims to develop the serious computer user's ability to solve puzzles and problems in a logical manner. New information is reinforced through a series of graded problems — each concerned with making words, numbers, sounds and graphics.

The book is written in a somewhat 'chatty' style. There are four chapters containing 50 problems with their solutions. All the puzzles require you to produce some result on the TV screen — simple words, random words and numbers, etc. Once these have been solved, the problems are made more complex when they are developed further with graphics and sounds. Not a book for beginners, but good for more serious programmers wanting to learn how to apply programming skills in an interesting and logical way.

Ian Waltham

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Tony Bridge's Adventure Corner



Games without frontiers

One of the more amusing pastimes to which I treat myself occasionally, is reading the adverts in the Computer Press (without which...) — the prerequisite nowadays for a game to sell well would seem to be either the reward of a disgustingly huge cash prize, or the endorsement of some disgustingly healthy athlete (who has probably never been within five miles of a home computer!). If not one of these two, then the program is "The Official" version of some boring TV soap opera or horror film. Because of all this, software houses feel it natural to charge rather more than what used to be the norm for computer games. A price of £5 or so is, I think, not too steep — after that, beware! Programs such as *The Hobbit*, and *Elite* (the new spacezap-management-strategy-adventure for the BBC) are exceptions.

It comes as a nice surprise, then, to see a small band of software writers clinging to the pioneering spirit of a couple of years ago (remember when Bug-Byte and Quicksilver occupied little trestle tables and sold their software from cardboard shoe boxes?). When Gilsoft released *The Quill* a few months ago, I expressed the hope that programs written with it would stay in the lower price bracket — after all, the hard work has been done by Gilsoft.

The name of 8th Day Software cropped up not long ago in the Corner, and I am pleased to say that they have recently released a suite of six adventures, all written with the aid of *The Quill*, and all costing an incredible £1.75 each.

Like Scott Adams programs, the 8th Day products, which, incidentally, go under the collective name of Games without Frontiers, are graded in terms of difficulty. Thus, *Ice Station Zero* is a Beginners Game, *Cuddles*, *Quann Tulla* and *In Search of Angels* are moderately difficult, while only advanced adventurers should tackle *Four Minutes to Midnight* and *Faerie*.

As I've said before, titles are very important in attracting interest in an adventure, and these are guaranteed to grab the attention. The beginner's game *Ice Station Zero* is of the standard "get-everything-you-can-and-explore-as-much-as-possible" variety, in which you, the player, have to cross the Polar ice-cap in search of Stirling, an international terrorist. *Quann Tulla* places you in the shattered hull of a spaceship deep in space. Eventually, battling against robots and highly advanced computer systems, you are pitted against the might of an evil, corrupt Empire.

In Search of Angels is another James Bond-like romp, while *Cuddles* pitches you straight into the horrors of the nursery, from which you have to escape (lots of chances, here, to throw dishes of sloppy baby food around the place!). *Four Minutes to Midnight* is set in the devastation caused by a bacteriological disaster. Intriguingly, the player has to recruit five other characters to help in our eventual success. The other "Advanced" adventure in this collection is *Faerie*, which is a Midsummer Night's fantasy on the Spectrum, with all kinds of weird creatures, and hoards of fairy gold.

There are no fancy screen layouts, or redesigned character sets here — all the adventures are pretty workmanlike in their execution; all excellent value and guaranteed to give the keen adventurer, as well as the beginner, lots to think about. Each game starts off with an artfully-drawn title page to set the atmosphere (for example, *Quann Tulla* opens with a James Blish *City in Flight*) — unfortunately, the old spectre of The Spelling Mistake raises its head every so often. It beats me why, even in inexpensive software, someone isn't made responsible for checking every word.

Quann Tulla, as well as some of the others, displays one of the odd quirks which *The Quill* may be found guilty of, and which

the lazy programmer falls foul of — the limited-move syndrome. In many *Quill'd* adventures, this takes the form of "so-many-moves-before-the-player-dies-of-hunger/thirst". This is fair enough, of course, but the anomaly comes after the player has solved this particular problem — it invariably doesn't arise again! Now, this has always struck me as rather silly — after all, if ten (or whatever) moves without food/water is enough to kill you off, why, after satisfying that hunger/thirst, should you then appear invulnerable during the rest of the adventure?

Anyway, the present adventure presents this problem as a requirement for the adventurer to discover how to survive in an airless environment — a certain number of moves are allowed before you die of oxygen starvation, and the same number of moves are required to discover the gas mask and put it on. As this little sequence is at the beginning of the game, you can very quickly start again, and gradually eliminate all the wrong moves.

Ice Station Zero is conducted in a similar way — once out of the tent at the start, you are shadowed by a pack of hungry wolves. Make the wrong move, and you are instantly set upon and killed off. The rest of the adventure, though, seems pretty logical (for example, you may take your gloves off when warm, but you must don them again once outside). A good beginner's game, with lots of atmosphere.

The others in the series are also pretty competent. *Faerie*, one of the Advanced games, is nicely laid-out, with little coloured hearts framing the location descriptions, and rather hard puzzles, too.

Overall, the series of Games Without Frontiers is well worth investigating, even though Eddie Waring himself doesn't get a mention, and despite the fact that the frequent spelling mistakes sometimes lead to the player having to actually mis-spell to make the program understand (as in "GET THE BROACH"!). The price excuses this sort of unfortunate lapse, and the atmosphere and logical puzzles in all the adventures makes up for any bad layout — after all, the whole series is still cheaper than some individual programs. And 8th Day provide a complete back-up service, with hint sheets and clues. (8th Day Software, 18 Flaxhill, Moreton, Wirral, Merseyside L46 7UH.)

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Legal advice

P West of Scarborough, writes:

Q I am writing to ask you for legal advice. I am 15 years of age and my friend is almost 16. We have written several adventure games and are trying to sell them by buying cassettes, recording the tapes ourselves etc. However, we do not know how we stand legally to avoid other people copying our games and what licences or other things we would need to obtain. Could you help us?

A There are no real legal steps that you can take to protect your software. The law as it stands offers little protection. My advice would be to put copyright notices on any loading screens, and also to place copyright notices within your program code. Unless you can prove that someone has actually copied your code, there is no action you can take.

Screen in motion

Craig Lambie of Paisley, writes:

Q I own a Vic 20 and I was wondering why the whole screen moves when I type 9*16 ↑ 3,8+8.

Also, is there a chess program available for the unexpanded Vic?

A Are you sure you did not type in *Poke*, etc? Location 36864 (9*16 ↑ 3) is one of the Vic screen pointers, so that is why the screen moves when you set it to 16 (8+8).

There does not appear to be a chess program for the unexpanded Vic at the moment, although I'm sure that some

wide-awake software house will immediately set about writing one now.

Ace stockists

Paul Dunlop of Horsley, Glos., writes:

Q I am very interested in buying a Jupiter Ace and I have a few questions to ask.

Do any retailers still stock the Ace, if so how much?

How many Aces were made before Cantab went bust? What modifications need to be made to a Sinclair 16K Ram pack to make it Ace compatible?

A Very few retailers still stock the Ace; you would find it much easier to buy one direct from Boldfield Electronics who now market the Ace. A 16K Ace will cost you around £50.

Sales figures are difficult to come by, but at least 20,000 must have been sold. The low cost of Ace add-ons makes it unprofitable to try and adapt existing Sinclair, or other bits and pieces.

Just a myth?

Lap Ki Kan of London, writes:

Q In one of your earlier issues, you revealed to us a device to allow CBM 64 users to run Spectrum programs. Please can you give me more information on it and its cost?

A The mysterious Spectrum emulator has not yet emerged into the sight of an eagerly waiting world and rumours abound as to whether it is just a myth.

From a technical standpoint the idea of being able to fit a Z80 emulator as well as a commercial Spectrum program into the Commodore 64 seems highly unlikely.

Just hype, I would suggest. Don't hold your breath.

Basic problem

William McCulloch of Bonnyrigg, Midlothian writes:

Q I have a Vic20 computer and have been pro-

gramming in Basic for some time. When I use the Ram area at the top of the 16K expansion, user defined graphics characters do not work. I would be obliged if you could give me some advice on this matter.

A As I don't know what you are doing, or how you are trying to create your user defined characters, I can only suggest what might be going wrong. It seems most likely that you have forgotten to relocate the screen in Ram or to have moved the character set. Both these actions are performed by the following code:
POKE 648,30:POKE 642,32:
POKE 36869,240:POKE 36866,150:POKE 0,108:POKE 1,0:
POKE 2,192:SYS(0)
POKE 52,28:POKE 56,28:CLR
FOR i=7168 TO 7679:POKEi,PEEK(i+25600):(NEXTi
POKE 36869,255

If this does not cure your problem then write to me again with full details of what you are doing.

Cobol compiler

Geoff Haydock of Salford, writes:

Q I hope to be joining a course in Computer Studies shortly, during which I will be learning COBOL. I would like to purchase a COBOL compiler for my CBM 64, but have been unable to find one. I would be grateful if you could supply information of any available programs, together with the appropriate addresses and prices.

A COBOL for the CBM 64... no problem... except the cost. You will need to run CP/M on your machine before you can run COBOL. This in itself is not that cheap. CIS COBOL is distributed by Microfocus, who can be contacted on Swindon 695891.

However, there is yet more bad news. You will need discs, of course, and a printer, but the worst news is that CIS COBOL

costs £488.75. Bad news, eh? Unfortunately, that is the cheapest version available for the CP/M CBM 64.

On/off power

Ian Adey of Halifax, West Yorkshire, writes:

Q I would be grateful if you could tell me the *Poke* address which switches on/off power to the CN2 cassette on the Commodore 64.

A Memory location 1 is the I/O Port address byte and Bit 5 of this is the cassette motor control bit. If it is set on, the motor is turned off, if this bit is off the motor is turned on. Obvious really, isn't it?

The other bits in this byte are used for very important purposes, so they are best left untouched. So, to turn the motor on you could write (in Basic) *Poke 1, (Peek 1 and 251)*.

To turn the motor off you would have to save the contents of address 1 and *Poke* the saved value back when you had finished with the cassette.

Price restriction

Paul Tang of Burton-on-Trent writes:

Q I am considering buying a modem, but am unsure as to which one to get. I am restricted to the ones under £100. Could you suggest one please? Could I get one in kit form for my BBC B?

A In the under £100 range, the Maplin Modem is probably your best bet. It comes in two forms: ready-made or as a kit—the choice is yours. You can contact Maplin on 0702-552941. Although the Maplin modem does not offer the same range of facilities as the more expensive varieties at £40 or so, it offers very good value for money to those just entering the world of computer communications.

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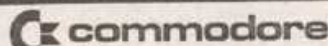
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SPECTRUM GAMES. Gnasher £1, Mrs Mopp £1, 30 Tank £2.50, JP Jacker £2.50, BD Seidda B Attack £3, Race Fun £3, Glug Glug £4, all originals. Ring Jason 4.30pm 01-291 3672.

SPECTRUM 48K & joystick, interface, mags, software (original), £200+, b/w TV, leads, etc... Quick sale £210 ono. May deliver. Write John Bell, 22 Pether-ton Road, Highbury N5 for details etc.

SPECTRUM GAMES, Arcadia, T.L.L., Jetpac, Hunchback, Atic Atac, Zzoom, Manic Miner, Sabre Wulf, Alchemist. Worth £59. Also Mocoder 2 worth £10. Sell the lot for £40. Tel: Wells 72423 after 6pm.

48K SPECTRUM issue 3 + sound amplifier, heat reducer + save/load/on/off switches + over £100 worth original software including Deathchase, Cyrus Chess, Trashman, Atic Atac, World Cup, Level 9, Ant Attack etc. £160. Ring (East Grinstead) 0342 27072.

SPECTRUM 32K Ram, upgrade kit, (East London Robotics) for issue 3 Spectrum, v.g.c. £13. Kempston joystick interface £6, software: Hawstead £5, Beachhead £4, Rapsallion, Baxx bluff, Dangermouse £3.50. Phone Michael 01-3402 630.

48K SPECTRUM + tape recorder, s/w, mags, case. £300. Sell for £225 or swap for CBM64 + C2N tape recorder. Tel: 01 800 3691.

SPECTRUM 48K boxed, Kempston joystick. £300. Original s/w mags, cassette recorder. £240 ono. Tel: Loughborough 231392 evas.

SPECTRUM 48K + cassette recorder, s/w, mags. £160. Or swap for CBM + C2N. Tel: 0533 660585.

48K SPECTRUM + £40 worth of books & magazines, over £200 worth of s/w (original). Colwyn Bay 31783.

48K SPECTRUM, 20 months old, hardly used, several tapes, magazines. £100 ono, 554 5645 after 4pm.

48K SPECTRUM, quickshot joystick, programmable interface (downsway). ZX printer (4 rolls), books, mags, s/w, electronic games, mint condition, worth £350. Sell £175. Tel: 01 647 5092 (Croydon) after 4pm.

48K SPECTRUM. Over 200 games. Original 50 mags. Quickshot joystick + Kempston interface. Dust cover. Excellent condition. £350. Sell £175 ono. High Wycombe. 26681.

SPECTRUM 48K plus software for £150. Phone Andrew 051 430 7608 — or swap for 1541 disk drive for Commodore 64.

SPECTRUM 16K. Perfect condition, including leads, power supply, plus good selection of software. Delivery can be arranged at cost. £65. Telephone 041 638 3343 and ask for Garrey.

SPECTRUM SOFTWARE many good titles include Jetpac, Snooker, Atic Atac, Mugsy and Mr Wimpy, worth over £170. Will sell for £100 ono. Will not

split. Telephone Silverstone 857628 after 7pm.

48K SPECTRUM, Interface I, micro-One, ZX printer, DTCronics joystick interface. Over £85 of original s/w. 4 microdrives, cartridges, Quickshot joystick, mags and books, all worth £470. Sell £230. Tel: 01-593 6480.

SPECTRUM S/W, Ultimate, Imagine, Quicksilver, etc. All originals. Offers. Andrew 01-743 6968.

SPECTRUM 48K joystick interface £100. S/w original £130. Tel: Garston 673030.

SPECTRUM 48K 11 months old, recently serviced, over 100 games, original only. £223 ono. Tel: Jason 01-866 0438 after 4.45.

48K SPECTRUM & joystick interface, many games all originals inc Atic Atac, Jetpac, Psytron, Monty Mole and many more. £160 only. Tel: 01-359 3828.

SPECTRUM SOFTWARE OCP, editor-assembler, Apocalypse, Caesar The Cat. All perfect, half-price. Phone 0963 62544. Originals only.

SPECTRUM 48K + microdrive + interface I + printer + 14 rolls printer paper + currah microspeech + synthesiser + Kempston joystick + CCR80 cassette unit + software + well over 100 magazines. Best offer secures. Worth £500+. Phone Hornchurch 57487.

48K SPECTRUM cassette, all leads, interface I, microdrive, 1 cartridge, DK Troniks, keyboard Mark 2, sound amp, games + some utility programs. Bargain at £180. Plus Desk. Might split. Write N Eagles, 20 Wheatley Street, W Bromwich B70 9TY.

SPECTRUM 48K + Fuller FDS keyboard + Sinclair interface 2 + Kempston interface + joystick, cassette recorder and lots of software £170 or swap for CBM 64. Tel: 0244 (Chester) 547167 after 6pm.

BOXED 48K Spectrum, AGF programmable board, interface, joystick, 30 games, originals only. Magazines, tape recorder. Offers over £200. Slough (0753) 29888.

SPECTRUM SOFTWARE Lords, Midnight, Hobbit, Pyramid, Flight Simulation, Penetrator, Jet-pac, collectors pack from £2 to £8.50+. Offers! Tel: Cambridge 313501 between 5-6pm.

SPECTRUM SOFTWARE for sale — dungeon builder (graphic adventure writer), brand new. £6. Stonkers £2.50. Tel: 0532-657038 and ask for Andy.

SPECTRUM SOFTWARE for sale, large selection, also want text adventures for Spectrum. Your list for mine. Sautler, 45 The Maries, Exmouth, Devon, Ex4 4NE. Phone 0395 273243 evenings only.

FOR SALE: Spectrum software at much less than half price. All originals including Manic Miner, W.T.H.A.S. and many more. SAE for list to: Chris Hall, 51 Clevely Park, Belfast BT8 4NB.

SPECTRUM SOFTWARE selling up (computer beyond repair). Over 120 titles, only £2 each. Phone Southend (0702) 617608 after 6pm.

SPECTRUM S/W. All originals, Great Britain Ltd £2, Battle of Britain £2, Trader Trilogy £6. Or trade for interface 2 or similar with Ram slot. G Fleming, 15 St Leonards Road, Stockport SK4 2RD.

48K ZX Spectrum with full size keyboard, joystick interface and joystick 1. Lots of software and books £120. Tel: 021-748 3578. Also stack light rifle with games £20.

ZX SPECTRUM software for sale: TLL, Pslon Flight Simulator, Pirmania, Aspect Editor/Assembler, Molar Maul, Meteor Storm. Worth over £50. The lot for £30 ono. Phone Chris (0532) 783334. Leeds area.

48K SPECTRUM + Kempston joystick, DK light pen, 20 s/w titles, original Arcade Adventure, FDRH, word processor. £130 the lot. Tel: Chris 0222 733 484.

48K SPECTRUM and Sinclair printer. Also £100 worth of top software including 3D Ant Attack and Chequered Flag. Will sell for £200 inclusive on. Tel: Burgess Hill 2760 after 6pm.

SPECTRUM BRAND new 32K Ram upgrade kit from East London Robotics £13. Software for sale: Hampstead £5, Beachwood £4, Rapsallion, Coderave Mat, Dangermouse, Pyjamarama, Braxx Bluff £3.50. Phone Michael 01-340 2630.

48K SPECTRUM, interface one, two microdrives, twelve cartridge, ZX printer, software and books. All half price of less. Phone (0442) 46030. Will sell separately and deliver if required.

48K SPECTRUM, DK Tronics keyboard, sound amplifier, Kempston interface, champion joystick. Will split. Games all originals. Going cheap 2-35 each. All reasonable offers considered. Ring Ali on 01-274 2982 after 6pm.

ORIGINAL SPECTRUM software for sale, under half price including top titles, Sabre Wulf, Lords of Midnight, Valmalla etc. Craddock 40851 evenings.

48K SPECTRUM, Alpacom printer, £40 worth of software, worth £240. Sell for only £170. All boxed and in good condition. 143 Cat Hill, Cockfosters, Herts. Tel: 01-449 1571.

48K SPECTRUM, £60 of software, Protek joystick interface, Spectrum Books, games writers pack. All in good condition. Worth over £200. Sell for £80. Tel: Birmingham 475-3464 Paul. Not Saturday mornings.

SPECTRUM SOFTWARE for sale including Fred, Ant Attack, Jetpac, Tranzan, Rommel's Revenge, Horace Games, Galaxians, and many more (all originals) £2.50 each or sell collectively. Phone Steve 01-660 3542 weekends only.

48K SPECTRUM, Centronics interface, ZX printer, joystick etc for sale. Also original software and books. SAE for list. Quanton 15 Letter Dail, Cairnbaan, Lochgilphead, Argyll, Scotland.

48K SPECTRUM plus FDS keyboard £75. Two microdrives plus interface 1 £75, Alpacom 32 printer £25, Currah Mspeech £12, Stonechip Echo, amplifier £7, tape recorder (compatible) £10. Plus tons of software. Grays Thurrock (0375) 30869.

48K SPECTRUM + interface 1 + microdrive + Cambridge joystick + micro speech + DK keyboard + cassette recorder + lots of recent software. Total package worth over £450. Will sell for £290. Tel: Ruislip 08956 38204 evenings.

48K SPECTRUM and joystick interface for sale, £100 ono. Brand new unwanted gift. Tel: Dartford 331597 or write: H Coe, 24 Craydene Road, Slade Green, Kent DA8 2HR.

48K SPECTRUM, cassette recorder, £50 worth software + books and mags. Only £95 ono or swap for Atari peripherals. 021 357 8026.

48K SPECTRUM, Kempston interface and over 100 games for sale including Kokotoni Wilf, Monty Mole, for £129. Still under guarantee. Ian Vatcher 0202 721010, 49 Belmont Road, Park Stone, Poole, Dorset.

LOOK £850 worth of Spectrum software for sale. Includes games, adventures, utilities, educational software. Over 140 tapes, all original. First £200 secures the lot. Ring (0325) 321907 before it's too late!

SPECTRUM 48K 930 software games and program manuals. £100. Tel: Slough 23062.

SPECTRUM S/W, White Lightning £12, Quicksilver, Fares Designer £10, Protek Hunter Killer £4. Will send post free. Tel: (0622) 26657 after 6pm.

16K SPECTRUM, hardly used, perfect working condition. Leads, manual, original packaging £60. Tel: 01-956 4676.

SPECTRUM 48K, sound chip by computer sound £100. Also s/w, Atic Atac, Trans Am, Lunar Jet Man, Cookie, Jet Pac, all originals. £2.75 e. Tel: Stanford (0780) 544921.

48K SPECTRUM. Over £150 s/w, originals only. Tape recorder, Cambridge intelligent joystick, interface + quickshot joystick. £210 the lot. Tel: 01 749 3976.

48K SPECTRUM, keyboard, tape recorder, joystick interface, telesound module, over £250 of software and books. £210 ono. Phone 0753 889988 (office hours) and ask for Nik.

SPECTRUM SOFTWARE Daley's Decathlon, Pimania, Piromania, Olympimania, Kosmic, Kang, Spectipede (originals), any others? Wanted, any Automata, Dark Star, Kokotoni Wilf, Black Hawk, Frank N Stein, Tir Nanog, Block Buster. 0763 61392.

FOR SALE 48K Spectrum, sound expander, printer, comcon, joystick, lots of software, reader. Buyer must collect. £200. Phone Rosin England 3654 (STD) or Write Emurch on Way Churchill Ro Thetford.

SPECTRUM 48K, tape recorder, amplifier, joystick interface, £50+ software, worth £260 except £150 ono. Genuine reason for sale. All v.g.c. Tel: Rayleigh (0268) 781244 after 6.00 pm.

SPECTRUM 48K programs £2 mad Martha, chess player, football manager, Starship Enterprise, Test Match, Spartrix Munchman, 007 spy. All originals. Gordon 0222 751550.

FOR SALE Spectrum s/w hobbit £8, Arcadia, stonkerd, lunar jetman, atic atac @ £3. Flight simulation, hunter killer @ £4.50, full throttle chequered flag @ £4.50, many more, originals ask for Spencer 051 924 8832.

48K SPEC £200 s/w tape recorder + sprint 4X Faster loadings unit Int2 dust cover + mags igc worth £430 sell for £280 ono. Phone (0933) 317858.

SPECTRUM 48K, Printer (both boxed), ten rolls paper, tape recorder, joystick (no interface), executive case, manuals, books, £200+ of original software. Value £500+ new, sell for £325 ono. Phone Stevenage 351465.

48K SPECTRUM, plus Kempston, Sinclair II interfaces + joystick. Also ZX printer with paper. All leads manuals supplied. + Rom's software includes Hobbit sabrewolf valhalla jet pac ant attack bugaboo. Quick sale £180 ono. Tel: Lincoln (0427) 88689.

SPECTRUM 48K with fuller FD42 keyboard + b/w t.v. worth over £200.00 sell for £194.99 + software (free) Tel: (051) 207 3149.

48K SPECTRUM with joystick interface, joystick, £100 of software, boxed with 6 months guarantee plus 100% reliable tape recorder, mags etc. Hardly used £130 Ring 01-863 5113. Ask for Deepak.

25 SPECTRUM originals including avallion, pyramid, magna etc. Worth over £150 sell for £50. No swaps. No offers. Quick sale wanted. Phone Richard, Peterborough 235175.

48K SPECTRUM for sale, £85. Also ZX printer £25, Phone Clitheroe (0200) 22721 or Write 7 Hereford Drive, Clitheroe, Lancs BB7 1JP.

48K SPECTRUM for sale, ZX thermal printer + 3 rolls of paper, 18 software cassettes, 25+ magazines, worth over £300. will sell for £190. Tel: 061 439 2769 after 4 pm.

ZX SPECTRUM 48K + Quickshot 2 joystick and interface + over £200 worth of software, books and magazines. Asking only £200 will deliver if local. Ring Warrington (0925) 816405 after 4 pm. (very good condition)

48K SPECTRUM, £50 fuller keyboard, over £350 of top software, quickshots 1 + II, 16K ZX81 Klick keys, magazines + books. Swap for QL, for details, Andri De Silva, 59, Sunninghill Avenue, Hove 4, Sussex.

SPECTRUM 48K with cassette player. Offer! Ashstead 77824.

SPECTRUM s/w, all originals £2.50. Titles inc: Trans Am, Hungry Horace, Pool, Vetpac, many more. Tel: Hartfield 812.

48K SPECTRUM + kempston joystick lots of s/w eg. lunar jetmen, manic minos etc. Tel: Ascot 21160. Sell £110.

SPECTRUM Software. Time trap adventure 48K, £2.00 + cassette, £2.50 without cassette. Also adventure quest and American football £6.00 each. Both 48K Neville Blenkinsopp, 14 Rush Park, Bishop Auckland, Co. Durham.

SPECTRUM 48K, In fairly good condition + tape recorder, joystick interface, quickshot 2 and 135 games. Also book, magazines and all leads. And manuals. Only £140. Tel: Blackburn 61967.

Commodores for Sale

CBM 4032 computer. Excellent condition perfect order. Looks new! Also books and software (games, business, utilities etc). Accept £225 ono cash or P/exch. For BBC. (0244) 675717.

VIC-20 (unexpanded) + C2N cassette unit + manuals + book of games + 3 games cassettes £75 (Tyneside) 091-2852003.

VIC 20 + starter pack + 32K ram + boss joystick + C2N + centronics interface + £165 (original) software £20 of books + mags All worth over £400, will accept £180. Phone 01-807 1724.

PET/CM software for sale. Complete collection business, games, utilities, educational etc. Over £250 worth. Accept £55 ono the lot! Also some pet spares. soundbox, keyboard, crt roms etc. (0244) 675717.

COMMODORE 64, tape deck, joystick, 20 games, physics + chemistry O'level revision, instruction to basic, spare leads, slide boxed. Under guarantee. Worth over £400. Accept £230. Tel: 01-853 4416 after 5.30.

VIC 20 + cassette deck + joystick + £150 of original s/w, magazines v.g.c. suit beginner only £95. Tel: 01-892 6575.

VIC 20 + cassette + 16K suitcase ram pack + quickshot joystick + games programmers reference guide will sell for £120 ono Tel: 0429 870 685 after 6 pm.

CBM 64 software for sale. Twin kingdom valley, the hulk, £5 each. HGS assembler package £10. (cost £210). Tel: 0703 556022 after 5 pm, ask for Andy. original S/W only.

VIC 20 starter pack inc. £80 of s/w. Bargain at £100. Tel: 01-203 1282.

CBM 64, Boxed and still under guarantee, C2N cassette unit, reference guide, books, listings and software, £220 ono. Phone Jason on (01, if outside London) 949 5086 after 5pm.

VIC 20, C2N 8K Ram pack, intro to Basic 1 + joystick, £55 worth of s/w, books + mags. All cost £260. Sell £100. Tel: Cowbridge, St Gtair 04463 3551.

CBM 64 + C2N + 2 joysticks and a few tapes, v.g.c., all boxed, £150 no offers. Buyer collects. Tel: after 7pm or weekends Walton-on-Thames 222489.

VIC 20 C2N cassette deck plus a few games for sale, good condition, £80 o.v.n.o. Phone Brighton (0273) 410430.

VIC 20, cassette unit, 16K switchable Rampack, lots of games including Rom game, joystick, dust cover. £120 ono. Tel: (0922) Blox. 403924 after 5pm.

VIC 20 starter pack plus 16K Ram pack plus £70 worth of software and joystick in excellent condition. £110 ono. Tel: Stevenage 359579.

COMMODORE 64, easy script word processor, brand new, never used, only £30. Worth £65. Phone Harpenden (05827) 5232. Ask for Ian, after 5pm.

VIC 20 + cassette deck + joystick + 16K switchable Ram pack + approx 300 games + 24 weekly computer course + 2 Vic books + amount of magazines excellent condition (boxed). Nice xmas present for £170 ono. Alic Seagrane, 34 Allendale St. Colne, Lancs, BB8.

WANTED 16K Spectrum tape recorder, manuals, software etc. Phone (02774) 54406 after 5.30pm or 32 Little Norsey Rd, Billericay, Essex, England CM11 1BL ask for Steven McNally.

CBM, VIC 20, C2N, 3K Ram, Quickshot j/s, dust cover, 10 original games, Chessmistry, Revision. 2 cartridges, £130. Tel: 0632 573081.

VIC 20 + cassette, joystick, 3 cartridges, Chess, monsters, music composer + books. £100 — 01 221 0046.

VIC 20 + tape recorder + 16K expansion, Quickshot joystick, s/w inc: Matrix, Jet Pac, completely boxed as new. £100 ono. Tel: Jason 0952 811258, 7pm.

CBM 8250 dual disk drive with JCL interface, £490 or will swap for a compact disc music system. Tel: 021-440-2124.

VIC 20, C2N cassette recorder, 20K Ram (switchable) ZX printer + interface + paper, speech synth, Vicit II, joystick + reference guides + manuals + over £50 software. Worth £350, sell £180 ono. Tel: Stoke-on-Trent (0782) 314666.

COMMODORE 64, original software, Scramble, Cubert, Revenge, Hobbit Frogger, Kong, Token of Ghal. Must be a bargain at £12 for the lot. Telephone 0493 661024.

VIC 20, 32K, C2N, 30 top games, Intro to Basic, worth £300, sell for £130 ono. Tel Mayfield 872041 during day. Under 1 year old, send to Gorse, Crowborough, E Sussex.

VIC 20 + cassette deck, Basic Put 1 16K Ram. Kempston joystick, 50 original games, mags. £130. Tel: Stevenage (0438) 1913.

VIC 20, C2N, 16K switchable Ram, five cartridges, £180 (of) software inc. Skyhawk, Trader + Intro Basic Pt 1, joystick, mags, books, all v.g.c., colour TV game, 5 cartridges, adaptor, boxed. All for £245, 0292 45477.

VIC 20 plus C2N recorder, both in mint condition. Plus super expander, two games cartridges, ten games cassettes, programmers guide. Worth £250, sell for £90. Phone Birmingham 475-3464 ask for Paul.

VIC 20, C2N cassette, two cartridges, joystick, lots of software mags, books etc. £150 ono, plus Intro Basic 1. Tel: Canvey 684825.

VIC 20 for sale, C2N cassette + introduction to Basic Part 1 + over £200 worth of games + mags. Still boxed under guarantee. £90 ono. Bellshill 745962.

VIC 20 and C64 owners!! For sale: "Easyfile" only £35, "Intro to Basic Part 1" £7, "Mission Impossible" £3, or swap for original "Raid on Fort Knox". Phone now!! 0558 822509 (quick!!).

VIC 20 with C2N tape deck, 8K stack store board with Vic Kit II, s/w, magazines, separate, any offers: 051 722 13735.

Acorns for sale

ACORN ELECTRON for sale, very good condition, complete with leads and introduction books. £400 worth of software — many originals. Only for £200. Phone (05827) 5232. Ask for Ian, after 5pm.

ACORN ELECTRON first byte joystick interface for sale, only £10, includes tape and instructions and box. Phone Harrenden (05827) 5232 after 5pm. Ask for Ian.

ACORN 0.90 disc interface. £65. Ring 863-57113 (London).

ACORN ELECTRON BBC Date Recorder, Quickshot II, Joystick, original s/w, all leads + all boxed, 3 month old, hardly used, £250. Books & mags included. Tel: Percival on 01-902 5036 anytime.

ACORN ELECTRON cassette lead, suitable for all cassette recorders with ear and mic sockets, only £1. David Roberts, 25 Oxwich Road, Mochdre, Colwyn Bay, Clwyd.

BBC B large range of accessories, s/w etc, all latest specifications. V.g.c. £325. Tel: Orpington (0689) 71211.

BBC B 1.2 O/S Cumana 100K disk drive plus 132K solidisk sideways Rom. Fitted 5 months old, little used, £575 (Basingstoke) 251623.

BBC B, brand new unwanted present, fill in your own guarantee, yours for £360. Tel: Long Eaton (0602) 735065 after 5.30pm.

BBC PRISM acoustic modem + Rom software for sale, £35 ono. Phone Giuseppe on 01-672-4212.

BBC B 1.2 O/S. Official monochrome monitors + cassette player, 8 months old, lots of s/w + mags. All superb condition, hardly used. £450. Tel: 01 444 8349 eves.

BBC S/W (original) brand new trak, planetoid, magic garden, smarsh grab, cubemaster etc. Tel: 01-892 6575 (£5-£7).

BBC 'B' v.g.c. original packaging instruction manual — welcome tape. Corsham 714426 (eves).

BBC Disk drive, 200K 80 track £85. Tel: 01-699 3426 eves, or 01-480 5811 (X 6535).

ACORN ELECTRON. BBC data recorder. Books, mags, programs include, chess, guardian, blagger, flight simulator, twin kingdom valley, draw + many more + dust cover. Cost £326. Sell £225. Tel: 061-225 3063.

BBC SOFTWARE micro olympics, cyclon attack, birdie barrage, spinx adventure, space invaders £3.50 each or lot for £15. All originals. Tel: 0323 870794.

CASTLE of riddles by Acornsoft for the BBC 'B' computer, brand new and unused. Worth £9.95, only £4.00. David Roberts, 25, Oxwich Road, Mochdre, Colwyn Bay, Clwyd.

FOR SALE: BBC 'B', DFS, disc doctor, look disc drive, 10 discs, cassette lead, manual, books, + software, £400 no offers. Tel: 0446 711372 after six and ask for Dennis.

BBC B + Disk interface + disk drive (200k) 40-80 track. Switchette books, mags, v.g.c. £550. Tel: Mike 01-602 0277.

BBC 2, ZX printer interface £10.00. Tel: Bournemouth (0202) 518345, after 5pm. Gary.

ORIGINAL Roms, graphics, gremlin, disk doctor, caretaker, all £20 each, wordwise £30. Quill £9, for Spectrum (0923) 54466. Mike (Graphic pad £85).

BBC SOFTWARE for sale. £4 each. Blagger, Son of Blagger, Intruders, Space Shuttle, Air Traffic Control Simulator, Vortex, Vision's Snooker, Gemini Missile Control. Tel: Darlington (0325) 55410 after 4pm.

BBC-B, 40 track, double sided disk drive, double density disk interface, cassette recorder, joystick, 10 disks, advanced user guide, £520+ of software. Worth £1300+, offers around £700. Telephone Robert, (0255) 507717.

BBC 'B', disk interface, single disk drive, star printer, S/W Ram, Roms, light pen, joysticks, software, books and cables. Worth over £1000 will sell for £800 ono. Tel: John, Durham 62913.

BBC ROM WORDWISE (original) including Manual for £26, includes P & P. Tel: Blandford (0258) 53742 (anytime).

ACORN ELECTRON + recorder & games (Aviator & Chuckey-Egg), + 2 books, many mags. £320. Boxed. Offers: Peter, Tel: 551049 Billingham.

BBC MICRO £330 twin 40 track disk drive, power supply. Tel: Mike 01-949 0120, after 7pm.

BBC ACORN DSS for sale. Offers. Tel: Tim on 42642 (Hornchurch).

ACORN ELECTRON CASSETTE LEAD. Suitable for cassette recorders with ear and mic sockets. Only £2.00. David Roberts, 25 Oxwich Road, Mochdre, Colwyn Bay, Clwyd.

BBC 'B' SOFTWARE for sale. Cosmic Cruiser, Hunchback, Gunsmoke, Intruders, all originals. £3.00 each. Write to Justin Lewis, 166 King Street, Brynmajor, Gwent, South Wales.

ACORN ELECTRON SOFTWARE, Escape from Moonbase Alpha, Pettigrews Diary. All originals, £3.00 each. David Roberts, 25 Oxwich Road, Mochdre, Colwyn Bay, Clwyd.

Dragons for sale

DRAGON 32 v.g.c. with £80 of s/w (original), all leads plus books, mags and 2 joysticks. Will sell for £80 the lot. Ring after 4pm 061 724947 S Hilton.

DRAGON 32 joystick, light pen, user mags, books, dust cover, £250 s/w original inc: Chess, Hunchback, Pedro, Return of the King. Excellent condition. £385. Sell £150. Tel: 031 334 6927 eves.

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DRAGON 32 £50 games, 2 joysticks, tape recorder, dust cover, 3 books + other mags, will accept any offers above £80. Tel: Wickford 05351. Ask for Craig.

DRAGON 32, 3 joysticks, light pen, many books, all Dragon users, Rom cartridge, £150+ worth of software, £220 ono or swap for BBC B, or Electron and Interface One. V.g.c. Telephone Whiteabbey 63388.

DRAGON 32 £75 ono, joysticks nine adventure and game tapes still in box, hardly used.

Mr Beneridge, 62 Grove Road, Berry Hill nr Coleford, Gloucs GL1 6BQX.

DRAGON 32 Q light pen, joysticks, dust cover, Dragon famer, software games and utilities. Also user magazines. All for only £100. Boxed and less than one year old. Tel: 01-360 3443.

DRAGON 32 v.g.c. £50. Tel: 0494 33950 after 5.30pm.

DRAGON 32 for sale, 2 joysticks, £150 of software, dust cover, magazines etc, v.g.c. all for £130 ono. Phone Byfleet (0932) 41506 after 4pm.

DRAGON SOFTWARE for sale — Jurvior's Revenge, Kriegspiel, Ughl, Chucky Egg, 8 Ball Pool, just £4 each or £18 for the lot. Please ring Rams. (070682) 2025 and ask for Richard.

DRAGON 32 £85 ono, boxed as new, complete with all leads and manual, excellent condition. Tel: (0484) 683788.

FOR IRISH readers!!! Dragon 32 software for sale: 21 Original games from

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DRAGON 32 s/w original, worth £100, sell for £60. Tel: 01-730 1688 after 4pm.

DRAGON USER group in the Romsey and Southampton area welcomes new members. Weekly meetings, fortnightly newsletter. £1 per annum for membership. Please telephone West Wellow (0794) 23041 evenings.

DRAGON 32 plus £250+ of software including music composer etc. Quick sale including books, magazines etc only £100! Tel: (Oundle) 0832-74112.

DRAGON 32 boxed with books. Over £200 worth of s/w plus cassette recorder + joystick sell for £125 ono. Tel: 061 707 2810 after 5pm.

DRAGON 32, 2 x leads, 2 cassette recorder. Dust cover, mags, 3 joysticks (1 quickshot) storage unit £210 of original s/w. Inc: Cartridges. Cost £530 sell £125 ono. Tel: 01-858 4672 eves.

DRAGON 32 Joystick, printer case, Dism/Demon and Hi-Res edit cartridge £100 of original s/w. Books, mags etc. excellent condition. £105 ono. Tel: 01-689 0531 (Croydon).

DRAGON s/w + books Inc. Creeps Ville rage of darkness, spirit, telewriter, joystick, book, ring for details. Lots more. Tel: 0959 74133. Original games only.

DRAGON HARDWARE: JCB voice synthesizer £20, Hi-res £15, DASM £10. Also: Sprint £7, Quickshot £7, Textstar £5, Space Shuttle, Cursing, Danger ranger £5 for all 3. All mint condition. Tel: Craig on Wickford 05351 Now!

DRAGON 32 with B/W TV, joystick, and lots of software, £120 ono. 01-632 7625, after 6 pm, Andrew.

DRAGON 32 boxed as new. Cassette recorder, 2 joysticks, dust cover, 46 latest games, Original, all dragon user mags, teaching books. Quick sale, mint condition. £700-£175. 44866 (Hornchurch).

ORIGINAL DRAGON SOFTWARE, Buzzard Bail, Simulator, Cuthbert in Jungle, Chuckie Egg, the King, Leggit Up Persicope. Worth over £40.00. Will sell all for £20.00. Phone Fareham 235466 evenings or weekends.

DRAGON 32, joystick, mags and lots of software. For sale £60, or swap for 48K Spectrum (will pay extra cash). Ring 845461. Write to: Mark Gradie, 32 Sherwood St., Warsop, Mansfield, Notts.

Ataris for sale

ATARI 1050 disk drive, inc: OOS 2 + 3 + manuals, £150. Also s/w Print, Pole Position, Jumbo Pilot, Quix Computer World. Also many more. Tel: Farnham 863428.

ATARI 32K, 400, 1010 recorder, 7 cartridges, Pole Position, ONO 25 cassettes (original), Zaxxon, Basic I, joystick. Bargain. Cost £600. Sell £150 ono. Tel: 01 462 2996 eves.

ATARI 600XL computer with £180 worth of software etc. Unused and in perfect condition. Cost £320. Sell for £120. Serious offers considered. Ring 863-5113 (London).

ATARI S/W /s, original inc: Bruce Lee, Zaxxon, Fort Apocalypse, Astro Chase, Spitfire Race, Frogger. Ring 01-791 0136 after 8pm.

ATARI 400 computer for sale without Basic, one month old, unwanted gift. £40 ono. Tel: (021) 358 1010.

ATARI VCS for sale, includes 17 games including Defender, In by 500 etc. Also

includes joysticks, paddles, driving and keyboard controls (complete set). £90 ono. Tel: Weybridge (0932) 55203 eves or weekends.

ATARI 600XL inc. tape recorder, joystick, software, cartridges and tapes, books! £140. Tel: Abingdon (0235) 26420.

48K ATARI 800 with 1010 recorder and 2 joysticks inc. Quickshot Interface. 25 games inc. Defender, Popeye, Donkey Kong + 4 adventures £200. Call Ashford 72661.

ATARI V.C.S. 18 games, Space Invaders, Superman, Chess, Asteroids etc. £130, will split games £5 to £10 swap for Spectrum. 70 Regent Street, Moulton, Northwich, Cheshire.

ATARI VCS with joysticks, paddles, leads etc. 5 cartridges inc. Berserk, Asteroids. Good condition £50 ono. Tel: 01-960 0094 eves.

ATARI 800 48K, 810 disk drive, 410 tape deck, ASM/ED, Centipede, Defender, Raiders, Macro Assembler, Leads, Manuals, etc. Several tapes and books. Offers around £250. Tel: 01-445 3281.

ATARI 800 + cass. + s/w + books + mag + basic + manual. Excellent cond. £180 or swap CBM 64 + cass. Buyer must collect. Write with phone number to Steve Sanger, 30 Station Ave., Wickford, Essex SS11755.

ATARI 800 recorder, 7 cartridges, 35 cassettes, incl. Zaxxon, Atari 400 32K s/w good condition. Any reasonable offers. Quick sale. Tel: 01-462 2996, evenings.

ATARI V.C.S. console, joysticks, paddles, and 21 games including Star Raiders, Space Invaders, Berzerk, and many more good games. V.G.C. £200 ono. 10 Maple Crescent, Clarendon, Portsmouth, Hants. Tel. Horndean 592268.

ATARI 400 with basic cartridges and over 80 programs on Roms and tapes: Pole Position, Star Raiders, Missile Command, Solo Flight, Air Strike II. Boxed and under guarantee. Offers: 09544 733.

ZX81s for sale

ORIGINAL ZX81 software, ZX-casil 'O' level programming language. New £6. Also Mocoder, compiles Basic programs into Machine Code. New £8. Sell £3 each or £5.50 pair. Phone David, Oxford (0865) 735936.

ZX81 FOR sale + 16K Ram pack + joystick interface + over £85 of s/w. Sell for £75 ono or swap for 16/48K Spectrum. Phone 683 0140. Ask for Doug (eve's).

16K ZX812 plus 18 original software programs and manual. Must collect — Torbay area, only £20. Telephone Simon after 6pm weekdays (0803) 211264.

16K ZX81 + s/w + books. All v.g.c. £30 or swap for v.g.c. ZX Printer. Tel: Shrewsbury (0743) 63921 (Dave).

ZX81, 16K, KD Graphics, UDG board + AGF joystick, DK Tronics, full size keyboard, £100 of computer mags. £60 ono. Tel: 0952 811258 after 7pm.

ZX81 2 books for sale includes 60 of the best ZX81 games only £4.00. Phone (0604) 409816 and ask for Paul.

ZX81, S/W mags. 16K Ram £29. Tel: Driffield 418068.

ZX81 16K with Spectrum tyre keyboard + s/w tapes + books. Cost over £100. Sell £45. Tel: Simon or Leighton Buzzard (0525) 375369.

SINCLAIR ZX81 16K, full size full travel keyboard. Complete with all leads and manual. 7 original cassette, games + services applications £55. Tel: 01-577 2839.

ZX81 + 16K mags, books £35.00 Tel: Mrs 01- 602 0277.

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AQUARIUS ACCESSORIES 16K Ram pack, 16K games, inc. Millipede, Frogger, Battlezone, originals + Aquarius user mags + various information, cost £65, sell £49. Tel: Nottingham 623078.

TANDY GCP-115, colour graphics printer + Dragon lead, boxed, cost £167, sell for only £89. Tel: 01-360 3443.

TANDY PRINTER CGP115 printer plotter with Basic printer cable + screen dump utilities, good condition, £90. Tel: Rotherham 525913 (after 6pm).

AQUARIUS COMPUTER and software, written programs, original box, 2 books all levels + cassette lead, manual etc. £75 ono. Tel: 061 789 5070.

AQUARIUS — COMPLETE system including printer plus logo, extended Basic, Filemorf Finform, 16K and games. £110. Tel: 051 427 7257.

FOR SALE Aquarius 4K computer, advanced dungeons and Dragons cartridge with books. Still boxed, excellent condition, £40 ono. Tel: 051-526 8204.

TANDY DMP100 printer — RS232-Centronics-Dot addressable graphics — ideal for Spectrum with interface 1 — including RS232 cable and Spectrum screen dump software — £300 new, sell for £135 ono. Tel: 0272 684615.

TANDY TRS-80, 16K, level 2, complete with video display unit, tape recorder, software programs, manuals, ideal first computer or Christmas gift. As new. £150 ono. Phone Dormans Park 673 (Surrey).

COLOUR GECIE EG200 + s/w, £145 ono. Tel: Halifax 68596.

ELECTRON BOX guarantee quick shot 1, 6 books, games, mags, all leads, joystick, interface. All for £250 ono. Tel: Leon 01-870 1884.

AQUARIUS COMPUTER for sale, 4K with mini expander, data recorder, burger time cartridge and program book. Will not sep. £77, all boxes, leads and manuals included, excellent condition. Tel: Std. 72193.

AQUARIUS MINI expander, plus hand controller, £200 ono. Tel: 031 663 4934.

VIDEO GELIE + all leads, s/w + manuals, wanted 4 channel F.M. radio control outfit or £75. Tel: 0438 720521.

TANDY L2 16K with microline 80 printer plus utilities & assembler, £150, 01 892 1867.

AQUARIUS COMPUTER plus 4 games for £60 + 2 manuals, boxed 687 388 (Lincoln).

For Sale

MAGS FOR SALE P.C.W., C. & V.G. and others over £100 worth, only £20 ono. Write or phone (St. Helens) 815128 or 8 Dawn Close, Thatto Heath, St. Helens, Merseyside WA9 5JR. Ask for Mark.

FOR SALE CAMBRIDGE Computing programmable interface and Quickshot (1) joystick four months old. Very good condition. Boxed £25 ono. Phone Cobham 65645. Ask for Paul.

DKTRONIC/SPECTRUM keyboard good condition £35 ono. 4-way tape loader unused £20 ono. Phone 01-449 4165.

COLOUR MONITOR Toshiba CX500 4½" screen not RGB PAL-B tuner VHF/UHF £200 ono. 8 x 9½ x 10½ inches. 061-7952185.

ATMOS COMPUTER must sell. Still boxed, under guarantee and in excellent condition. Offers around £100. Includes year's subscription to Oric Owner. M. Swanson, 5 High Street, Spilsby, Lincs. 0790 52120.

ORIC-148K + £150 software including: Zorgon's Revenge, Xenon 1, leads, manual. Used once, worth over £300. Bargain at £100. Tel: Bolton 591736.

CURRAH SPEECH for 48k Spectrum. Tel: Ashford 39956.

SINCLAIR FLAT-SCREEN TV order form for sale to highest bidder, or swap for CBM64 disk versions of Beach-Head or Zaxxon. Ring D. Fearn on 0452 830675.

YASEU FT101 ZDFM mk 3, many extras, swap for BBC B with DFS and disk drive or colour monitor. P. Bridges (G 60DLJ) 0703 891875. Will deliver anywhere in UK.

FOR SALE HCR's Epron programmer £25, Sir Computers Mk II Rom board + C.C. Graphics extension £65, Checkout, Swoop, Humphrey, Vortex, Boris, Legion, Arena £3.50 each. Phone 736-7714. Ask for Salvinder.

ORIGINAL DRAGON games top selection Dash/Demon hi-res cartridges Dragon Forth joystick half-price. Ring Derby 556284. Lightpen.

T199/4A FOR SALE includes extended Basic, top cartridge games, real speech. Phone (0698) 747409 after 5pm. Offers around £100.

ORIC 1, CASSETTE recorder £50 of books £40 of s/w. Original 10 editions of Oric Owner + 7 other goodies. Any offers over £60. Considered. Tel: 01-699 5354.

MAPLIN MODEM with case and leads £300 bought sell £70. Tel: 061620 7369.

ORIGINALS — PSST, Starship Enterprise, Alchemist and others — only £3.00 each, or swap some for Spectrum, joystick, interface by negotiation. Call Anthony on 01-455 4830 after 6pm, not Saturdays please.

QL AH VERSION, No Kludge. Two months old, including Manual, Psion Software, plus 16 blank Microdrive cartridges. Cost new £450. Will sell for £320 ono. Ring: Woking 68027 after 7pm.

TOMB OF DREWAN Vic 20 £7.00 Alien cartridge £5.00. Also many other originals cheap eg Visions, Snooker £3.00 Phone Lichfield (05432) 52440 after 7pm.

FOR SALE SIR'S Romboard + C.C. Graphics extension £66 BBC 'B' + lots of mags £300. Dictator, Boris, Vortex, Challenger, Humphrey, Laser — Reflex, Checkout, Pengo. £3 each. Phone 736-7714 after 6pm.

MCD — 1 3" cassette disk drive + 1 cassette — drive has no casing and needs to be electronically modified to work. Tel: for details 01-724 0166.

SWORD M5 DATA recorder, 2 Basic cartridges (Falk + BASIC G) 1 game cartridge, 1 tape game. £100 ono. Tel: 01 679 4310 eves.

TRS 80 COLOUR computer 16k Still boxed manual, magazines + leads. Hardly been used. V.g.c. £100 ono. Tel: 01-674 3996.

ORIC 1, 48K plus £110 worth s/w + £20 worth of books. £100 ono. Ring Ray (0377) 47367 10-5pm.

INTERFACE ONE microdrive, 12 cartridges, converted games Hobbit, Jet Set & Manic Hunchback + many more also Currah Speech & microdrive book £140 worth over £200. Tel: 0924-407459.

SORD M5 HARDLY used, in mint condition. Also Basic-G and two joy pads. Will sell for £170 the lot. Phone 021 551 4577 any day. Ask for Jagjit.

INTERFACE ONE microdrive twelve cartridges converted games, Hobbit, Jet Set & many more also Currah Speech & microdrive book £140. Worth over £200. Tel: 0924 407459.

127 VARIOUS MAGAZINES (monthlies and weeklies) PC weekly PCW PCN HCW YC etc worth £66 + for £20 lot or split — Mark 01-660 5074 buyer collects (Purley, Surrey).

ORIC-1 48K, excellent condition, with joystick interface, five books and over twenty games. Worth £300, bargain at only £100. Tel: 0254 76371 (evenings).

FOR SALE: ZX printer, v.g.c. £30 ono: Protek joystick interface £10 ono: Scope 2 Language £14 ono. Wanted: Fuller FDS keyboard: programmable joystick interface. Phone Chris (0482) 781517 after 6.00pm.

SOLIDISK SIDEWAYS SW32 sell for £42. Wordwise Rom sell for £25. Write to J. Stemmer, 14 Princes Street, Cardiff CF2 3PR.

PHILIPS G7000 TV game plus Freedom Fighters cartridge good cond. £35 Phone Southend 0702 712796.

MTX 512 AS NEW, 9 months old, hardly used, want £200. Phone Isle of Wight (0983) 754884 evenings.

SPEECH REGISTER for 48k Spectrum owners with young children. Send for further details including your child's

name and age (1-7 years), 38, Home-dale House, 3 Brunswick Road, Sutton, Surrey SM1 4DG.

COLOUR TV game + 6 games inc. gun + controller £10. Tel: (0604) 409816.

OKI MICRODRIVE 82a 9X9 Dotmatrix + printer, parallel + serial interface 120 CPS. 2 decoders, graphics. Blocks. £200 ono. Andreas 01 882-5687 (eves).

PRISM VTX 500, modern for Spectrum full user-to-user software £70. Tel: 041 882 0261.

POPULAR COMPUTING Weekly. Issues, Trigger command joystick, under guarantee + interface £15 + printer listings and other computing mags. Tel: 021 308 2064.

MEMOTECH MTX 512 + speech synthesiser unit + cassette data recorder worth £400. Sell for £325. Tel: Hemel Hempstead 0442 45113 eves.

DOUBLE DENSITY disk interface suitable for BBC micro. Allows information to be stored on disk. Tel: Joe 061 881 4496 after 4pm w/days.

1525 PRINTER (new) £175. 1515 printer £120. 1520 printer plotter £65. Tel: 01-840 3610.

UNUSED Mr. Do cartridge for colevision £10. 01-470 0861.

T199/4A COMPUTER complete with cassette leads instruction manuals programme books and still in box very good condition £45. Tel: Maidstone (code 0622) 53760 or swap for Oric or Spectrum.

ORIC 1 48K lead, power pack, some S/W. Manual, 60 game program book. Under g/tee. £90. Tel: Leighton Buzzard. 375985.

PRINTER/PORTABLE electronic typewriter, brother EP22 with RS232 interface, includes lead and software for BBC. Suits most computers. Little used. Sheet/rolls, ordinary or thermal paper (included) £99. Tel: 0202 887092.

NEWBRAIN A £99. 64K memory expansion £150. Floppy controller and CPM £125. Large power supply £30. Newbar assembler £20. Various odds and software. All unused. Vic 01-904 5849 evenings.

QL FOR sale. Latest JM Rom version. Only used once. RS232 lead included must sell for financial reasons. Tel: 0904 769184.

ORIC ATMOS 48K with 13 tapes hobbit chess zenoni etc. plus joystick interface 8 books lots type in progs £110 ono. wife not compatible Lea Valley 9-711927.

VIDEO 6Ames system, with unique built-in TV including 2 games £33. Tel: Brighton 695351.

CURRAH Speech, manual, cassette £20. Dk'tronics light pen, manual, cassette, £12.50. bug-byte cookbook, two cassettes, new, unused, boxed, unwanted gift. £5.50. 0428-713019.

COMPUTER SWAP

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

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

It cannot be swapped.

Warning: It is illegal to advertise pirated software.

COMPUTER SWAP

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

Name.....

Address.....

Telephone.....

SMITH'S complete compatible cassette recorder 4 months old. Not needed anymore. Cost £35. Sell £22.00. Tel: Simon on L/Buzzard (0525) 375369.

METTEL Intellivision colour TV games machine complete in original box. 3 Rom cartridge games. Ideal Xmas gift £55.00. Tel: 01-577 2839.

AMSTRAD CPC464 for sale. Brand new unwanted gift complete with monitor bargain at £180. Phone John 021-784-0138.

ZX MICRODRIVE + Interface I Inc: 2 microdrive cartridge. Perfect condition £89. Tel: clownland 53157 eves only. **NEW DAISYWHEEL PRINTER** & monitor. Guaranteed £250. 01-736 7938.

ORIC 1 48K, brand new, with high quality tape deck, around £80 worth of software and books. Software includes Hunchback, The Ultra, Harrier Attack. Offers above £100. Ring Nuneaton 327603, evenings.

TRS-80 64K disk drive plus S/W and RS232 interface £450. Tel: (0584) 810015

PROGRAMMABLE CAMBRIDGE joystick interface with joystick for £20 with tape. Brand new magazines for sale: Your Computer, C and VG, PCW, ZX Comp. New Quickshot I joystick for £6 in box. New. Phone Staines 57086.

48K MODI TRS 80 + expansion interface + monitor + disk drive + cassette recorder + sound box + 200 programs on 20 cassettes and 50 disks + 4 books + manuals. £375 061-928 2923 (home), 061-273 3333 ext 3129 (work) Mike Hounsborne

ORIC 1 48K Original programs inc: machine code writer, disassembler, Zenon, Donkeykong, 2 books + mags. Excellent condition £95. Tel: Ipswich 57160

COLEVISION TV game + 9 games. Steering wheel. £175 ono. 0703-464186 after 6pm.

TEXAS TI994A 16K computer extended Basic speech synthesiser + s/w + manuals as new £150. Tel: 01-992 6548

DISK DRIVE TEAK 5 1/4" 40 track, 100K with cables for BBC micro £100 Tel: Luton (0582) 27573.

ITT 20.20 DISK DRIVE Texaco monitor, word processor s/w £300. Tel: 01-736 7938.

TERMINAL with VDU, 100 key keyboard RS232 centronics + cassette ports up to 19600 baud, 80 column £60 or swap for hardware. Fleming, 15 St Leonards Rd, Stockport SK4 2RD. Phone 061-432 4538.

SPECTRAVIDEO 328, real keyboard, sprites and three sound channels, 32K Basic, cassette unit, five games + Sprite editor, all boxed £260, call Tony on Newcastle 2712398 after 4pm weekdays.

COLOUR GENIE 32K tape recorder, 6 tapes, books. Can be seen working. £100 cash. Tel: (0727) 52744

CAMBRIDGE Computing program-mable joystick and interface for Spectrum. Joystick has two independent fire buttons and is microdrive compatible. For quick sale before Christmas, only £20 (includes tape). Phone: Bookham 56327.

THREE CHANNEL SOUND generator for Spectrum. Includes instructions, demo tape, 5W "Beep" amplifier. Uses AV-3-8910 sound chip, easily programmed. Only £15 ono. Phone: Bookham 56327.

BROTHER EP-22 printer/electronic typewriter with power supply and ribbons. As new. Ideal for Spectrum. £135 ono. Tel: Alan (0294) 64235, evenings.

FRENCH OR GERMAN language translator and vocab tester for 48K Spectrum. A bargain at £3.00. Send P.O., cheque straight away to Monksoft,

Highland Blue Boys Park, Minchin-hampton, Stroud, Glos. GL6 9JT.

ATMOS 48K, £150. Software including Hunchback, Hobbil, Scuba Dive, Zor-gans revenge, joystick and interface, and six books. What a bargain at £220. Tel: 0733 264461 after 6pm

SHARP MZ80A as new 48K integral cassette and monitor. Games utilities and books £300. Any offer considered. Tel: Worthing (0903) 6790370 after 6pm weekdays, any time weekends.

ENHANCE YOUR SPECTRUM Beep! Harmony generator will digitally generate seven octave range in harmony with Spectrum! Also generates thirds and fifths. Fantastic effect. Kit: £22 or built: £28. Bookham 56327

HOME COMPUTER COURSE by Orbis in binders. Good condition £18 ono. Tel: 01-853 5106.

Wanted

WANTED ATARI VCS with LG. Ass cartridges swap Spectrum 48K tape recorder Kempston interface joystick. Any area. B. Larkin, 25 Stekley Walk, Great Lever, Bolton.

WANTED FOR TEXAS TI99/4A RS232 card, disc drive card, TI logo, 'P' card, modules etc. Please phone prices. Bournemouth 020 433704.

WANTED SWAP ELECTRONIC organ Wuritzer 4030R with swinging rhythm and multi-matic percussion, two key-boards, pedals complete with stool. Perfect for best BBC (B) package or similar (0803) 842 862 D. V. Gray (Devon).

WANTED SPECTRUM SOFTWARE Beachhead, Decathlon, Monty Mole, Hulk, Avalon, Sherlock, Braxx Bluff, Eureka, White Lightning. Best offer secures purchase. Write S. Winter, 28 Criss Grove, Chalfont St Peter, Gerrards Cross, Bucks SL9 9HQ.

SWAP CURRAH MICRO SPEECH and Kempston/Protek joystick interface with Quickshot II Stik (all boxed) will swap the lot for Alpha-com printer. Phone Steve 01-853 1179 (eves).

WANTED SINCLAIR interface 1, microdrive and cartridges to swap for Prism VTX5000 Modem. Also wanted Stonechip joystick interface to swap for £36 of s/w incl. Sabre Wolf, Mugsy. Tel: (0287) 32561 (after 4pm on weekdays).

SWAP PRAKTIKA MTL3 35mm camera, plus Helios 85-210mm zoom lens plus tripod and other bits for Spectrum 48K or sell £100. Write R. Ainley, 25 Grange Avenue, Marsden, Huddersfield, W. Yorks HD7 6AQ.

WANTED SWAP brand new Brother portable typewriter for Commodore printer or one compatible. Tel: Mablethorpe (Lincs) 77352. Ask for Mr Watson.

SWAP CB RIG and accessories Rig, has R. bleep 40CH FM CBX for Vic20 starter pack. Also wanted Vic20 or 64 not working for parts. Please ring 051 644 6028.

SWAP YAESU FT-101Z transceiver. Also Yaesu FC-902 A.T.U. for BBC-'B' computer and hardware software or any good computer system. Whiteabby 61997.

WILL SWAP £70 of original super Spectrum computer games for one working ZX microdrive and one blank microtape. Telephone Grangemouth 488120.

SWAP DRAGON 32, B/W T.V., joystick, 3 books, printer lead, and over £600 worth of software for Amstrad CPC 464 or sell for £150 ono. Call Dean on 021 523 9710 after 5pm.

WILL ANYBODY swap my copy of Understanding Your Spectrum for Over The Spectrum or Supercharge Your Spectrum? Ring 01 330 5492.

EXCHANGE COMPUTER Battleships for small cheap computer i.e. Aquarius, ZX80 etc. Replies to H. Waller, 36 Spinney St., Raunds, Northants NN9 6ES. Buyer collects if possible.

SWAP ATARI VCS all boxed, 2 months guarantee, with 14 games, bargain at £100 or will swap for a Spectrum 48K. Must be in good condition 0582 599576.

WANTED FDS type keyboard for ZX81, reasonably priced, 021 444 8128 weekdays.

SWAP MY Acorn Electron, perfect condition (under guarantee) all loads, s/w, manual, radio, cassette recorder, 14" colour TV for BBC B in good condition (leads, manual). 061-442-4008.

WANTED 1541 disk drive, Multiplan, The Last One etc. Tel: 0484 29990 after 7pm.

SWAP AN Oric 48K + 25 games and £200 for an Amstrad CPC464 (colour monitor). Contact: N Blon, 47 Oakwood Road, Brickel Wood, St. Albans, Herts. Also Spectrum for sale. Garston 862305 (eves).

SWAP TI 99/4A adventure cassette software, Adventureland, Mission Impossible, Mystery Funhouse, Pyramid, Voodoo, Odyssey, for extended Basic or mini memory or sell £3.50 each. 32 Glenshesk Park, Dunmurry, Belfast BT17 9BA.

WANTED JUPITER ace or ZX printer, will pay £15 or swap Spectrum software including Hurg, Football Manager, Maniacs and more. Contact Steve, 29A Artillery Terrace, Guildford, Surrey.

WANTED BBC B with disk drive, will exchange Dewalt 125 Radial Arm Saw with sturdy stand, extended table and extra 80 tooth CTC blade for cabinet work. 0423 74386.

SWAP VIC 20 with no sound complete with game, joystick and manual for a good condition ZX printer or £20. Telephone (0924) 443557 after 7pm.

WANTED SINCLAIR 48K or 16K (Mark 1 or 2) Spectrum + power pack, must be v.g.c. No peripherals necessary. South England only. Southampton 332285.

WANTED ALPHA Can 8125 printer + TC Interface cable for TI994A. Tel: Staines 54366 eves.

RS232 LEAD for use with interface one to go to standard RS232 compatible printer. Swap for any recent software for ZX Spectrum. Must be original. Ring Paul 08864-588 (Worcester).

WANTED BBC B OS 1.2 Basic II. Also DFS and other extras considered (up to £450 available) can travel to view. Please phone John 0642 484785 (Red-car) after 5pm or weekends.

WANTED MODEM for CBM 64 + s/w. Tel: 051 722 3735.

WANTED SPECTRUM hardware inc: Interface 1 + Microdrive and any other add ons. Also s/w to buy. Tel: Les 01-928 5151, Ext 3775.

SWAP AMSTRAD concise Firm Ware manual for Amstrad Concise Basic manual. Tel: Norwich 402089.

SWAP CBM 64 + C2N + £160 of software for Electron with similar (or BBC B) or sell for £240. Swap 1541 disk drive for colour monitor (0904) 707699.

PURCHASED A Commodore 64 but wishing you had bought a 48K Spectrum + books + magazines + over 60 strategy, arcade + simulation software + tape recorder. Swap for Commodore 64 or sell for £170 ono. 02509 61566.

WANTED SPECTRUM 48K or 16K cheapish. In the Anglia area. Phone (0604) 45658 ask for Mr Robert Haynes.

WANTED:- ANY information or software for the ZX80, especially required 16K Ram pack. Also for Vic-20, Thorn/EMI's "Pharaoh's Curse", Terminal's "Rescue from Castle Dread" and Atari-

soft's "Defender". (Urgent). 0558 822509.

SWAP COMMODORE 64, C2N, joystick, 7 books, 4 cartridges and 18 tapes for £450. Cost about £600. Tel: 0790 53161 after 4pm and ask for Jason.

SWAP MY Vic-20 + cash for CBM 64, plus joystick. Must be reasonable condition. Phone Phil 01-577-2083.

WANTED BBC model B with all lead Q s/w, £250 cash available. Tel: 01 504 5214.

WANTED CBM 3032 and 3040. Must be in good condition. Tel: Romford 46948.

WANTED ZX printer in good condition, pay up to £20. Tel: Mr Allen. 01-590 8301 after 6pm.

CBM 64 Q C2N + joystick + s/w, swap for BBC. Tel: (0249) 659866.

WANTED FELLOW MZ700 enthusiasts in North London to exchange ideas and give mutual help/advice. Phone 01-889 1090 evenings.

WANTED VERY poor unemployed Spectrum owner needs your unwanted ZX printer. Must be incredibly cheap (or free!!). Tel: (0752) 893121. Someone out there must be feeling generous today!

48K SPECTRUM Q s/w to swap for Atari 800. Tel: 0744 815076.

ADVENTURE HELPLINE

The Hulk on Spectrum. How do I get out of the dome? How can I remove the ring and still stay as The Hulk? Stephen Douglas, 10 Hillside Close, Abotts Langley, Watford, Herts.

Knights Quest on Spectrum. How do I get past the vines in the forrest? Segn Devaney, 19 Gil-bridge Road, Whalley Range, Mer 16.

McKenzie on Spectrum. How do I repair the jet-pack and the and-roid? How do I get the power pack? P M Brannigan, 11 Morningside View, West Derby, Liver-pool.

Hobbit on Spectrum. I cannot get out of the elvin kings cellar. Daved Guthrie Jr, 4 County Houses, Easter Kintrae, Elgin Moray, Scotland.

Valhalla on Spectrum. How do I get Ofnir? Stuart Jones, 20 Diane Drive, Rhyl, Clwyd, N Wales.

Hobbit on Spectrum. I cannot get through the magic door, or kill the dragon. How do you get back home once you've killed it? Neil Putson, 16 Parkside, Ladgate Lane, Middlesborough, Cleveland.

Madniss and the Minotaur on Dragon. I can't find the mus-hrooms, on level 1 so I can't access the magic spells. Richard Iveson, the Cottage, Patrington, N Humber-side.

Feasibility Experiment jon Commodore 64. Where is the wick for the lamp? What should I do with the dragon? Richard Blythe, 4 Meriden Avenue, Garforth, Leeds, W Yorks.

224System 15000 on Commodore 64. I can't get started. I don't know what to do when the screen displays 'please instruct'. Set Cane, 39 Hy Regt RA, BFPO 16, W Germany.

Hobbit on Spectrum. I need some help with getting past the bulbour eyes on the way back. Stephen Jeffries, 14 Preston House, Pad-dock, Walsall, W Midlands.

Twin Kingdoms Valley on BBC. How do you get the master key off the dragon in the north tower? Bruce Robertson, c/o Sgt Robert-son, J 189, 31 PC Sqn RE, BFPO 35.

Snowball on Spectrum. Can anyone tell me how to use the lift and get somewhere? Please! Conn Iggliden, 50 Elm Avenue, East-cote, Ruislip, Middx.

Mountains of Ket on Spectrum. How do you cross the stream? How do you form a stable relation-ship with the horse?? Brian Diggle, 12 West Park Avenue, Leeds LS8.

Hobbit on Oric. Alder escaping from the govins dungeon, how do I avoid being recaptured and where is the ring? David Wain, 38 Cole-raine Road, Great Barr, Bir-mingham B42.

224Knights Quest on Spectrum. How do I rescue the dwarf and then get iast the dragon? Help! Conn Iggliden, 50 Elm Avenue, East-cote, Ruislip, Middx.

Twin Kingdom valley on Commodore 64. How do I get through the crack in the sand slope near watersmeet? Marin Hodges, 52 Granville Drive, Kingswinford, West Midlands.

Twin Kingdom Valley on BBC. When you get the uniform jout of the guard's room, what use is it to you? Can you get into the armoury? If so, how? Glen Sugden, 25 Trede-gar Road, Emmer Green, Reading, Berks.

Espionage Island on Spectrum. What use are the jlanding lights? How do you get past the tand? J Gaffney, 57 Portland Crescent, Barrow-in-Furness, Cumbria.

Gems of Stradus on Amstrad. How do you get over the jpit? How do you pass the guard? A Byrne, 190 North Gower Street, London NW1.

Urban Upstart on Soectrum. How do I get past the football fan? What jis the noise at the back of the fish shop? Where is the plane? Adam Buckle, 188 Barnsley Road, Cudworth, nr Barnsley, s Yorks.

Ring of Power on Commodore 64. How do I pass the pirate? How do I read the notes in the milk bottle? Mrs P A Taylor, 167 Uplands Road, West Moors, Wimborne, Dorset.

Quest Adventure on Commodore 64. How do I get the jewel encrus-ted sword and mace? Mrs P A Taylor, Uplands Road, West Moors, Wimborne, Dorset.

Espionage Island on Spectrum. Can anyone helpjme find the combination for the safe? Stephen Howard, 69 Cranbourne Road, Northwood, Middx.

Hobbit on Commodore 64. How do I get across the black river in the wooden boat? Nigel Davies, 19

Parc Lane, Groes-Faen, nr Ponty-clun, Mid-Glam, Wales.

Ship of Doom on Spectrum. How do I get the key from the glass? Andrew Gibson, 18 King's Meadow Road, Colchester, Essex.

Fantasia Diamond on Spectrum. I have got into the fortress via the broken window and I cannot get any further because of the guar-dian, E Dubro, 43 Adelaide Drive, Colchester, Essex.

Voodoo Castle on Vic20. How do I remove the animal heads? And how do I remove the boards in the chimney? Charles Wade, 93 May-field Avenue, Grove, Wantage, Oxon.

Adventureland on vic20. Where do I find the container to put the gas in? How do you kill the dragon without waking it? John Irvine, 81 Alma Road, Enfield, Middx.

Ship of Doom on Spectrum. How do you take the cover off the key? Stephen stuppel, 65 Douglas Buildings, Marshalsea Road, Lon-don SE1.

Feasibility Experiment on Spec-trum. I have five treasures and a working lamp. How do I get past the display caninet guard? Can I do anythingb withe the dragon/lion/ emperor and gladiator except kill them? How do I open the door down the mine? Marcus Groan, 15 Cuofton Street, Rusholme, Man-chester. PS I can help anyone having problems with Snowball.

Spectrum	
1 (2)	Daley Thompson's Decathlon (Ocean)
2 (3)	Beachhead (US Gold)
3 (1)	Tornado Low Level (Vortex)
4 (5)	Kokotoni Will (Elite)
5 (8)	Sherlock Holmes (Melbourne House)
6 (9)	Avalon (Hewson)
7 (4)	Delta Wing (Creative Sparks)
8 (6)	Pull Throttle (Micromega)
9 (—)	Danger Mouse in Trouble (Beyond)
10 (—)	Lords of Midnight (Creative Sparks)

(Figures compiled by WH Smith)

BBC B	
1 (1)	Elite (Acornsoft)
2 (—)	Mr Ee (Micropower)
3 (2)	Frank (Aadvark)
4 (8)	Erik the Viking (Mosaic)
5 (7)	Smash & Grab (Superior)
6 (6)	Wallaby (Ultimate)
7 (—)	Jet Pac (Acornsoft)
8 (10)	Aviator (Data Base)
9 (4)	Micro-Olympics (Addictive)
10 (3)	Football Manager (Addictive)

(Figures compiled by WH Smith)

Vic 20	
1 (3)	Flight 015 (Craig Communications)
2 (—)	Perils of Willy (Software Projects)
3 (2)	Duck Shoot (Mastertronic)
4 (—)	Computer War (Creative Sparks)
5 (—)	Max (Anirog)
6 (—)	Wizard & the Princess (Melbourne House)
7 (8)	Phantom Attack (Mastertronic)
8 (9)	Jet Pac (Ultimate)
9 (5)	Snooker (Visions)
10 (—)	Bewitched (Beaujolly)

(Two titles tie for 4th position)

(Figures compiled by Boots/Websters)

Books	
1 (5)	Weird Computer Games (Usborne)
2 (1)	Commodore 64 Programmers Reference Guide (Pitman)
3 (6)	Mystery of Silver Mountain (Usborne)
4 (8)	Sinclair User Book of Games & Programs (Penguin)
5 (—)	Very Basic, Basic on the Spectrum (Century)
6 (—)	Beginners Micro Guide (Granada)
7 (—)	Basic Made Easy on the Spectrum (Arrow)
8 (4)	Computer Spy Games (Usborne)
9 (—)	Complete Commodore 64 (Granada)
10 (2)	100 Programs for the Spectrum (Prentice-Hall)

(Figures supplied by Boots/Websters)

Commodore 64	
1 (—)	Football Manager (Addictive Games)
2 (—)	Flight Path 737 (Anirog)
3 (—)	Trollie Wallie (Interceptor Micro)
4 (—)	Kennington (Leisure Genius)
5 (—)	Pystron (Beyond)
6 (1)	Shutlock (Melbourne House)
7 (—)	Cluado (Leisure Genius)
8 (—)	International Soccer (Commodore)
9 (—)	Fort Apocalypse (US Gold)
10 (—)	Spitfire Ace (US Gold)

(Figures compiled by Boots/Websters)

Dragon 32	
1 (1)	Hunchback (Ocean)
2 (3)	Skramble (Microdeal)
3 (4)	Mr Dig (Microdeal)
4 (8)	Chuckie Egg (A & F)
5 (3)	Cuthbert in Space (Microdeal)
6 (5)	Kriegspiel (Beyond)
7 (—)	Dragon Chess (Oasis Software)
8 (7)	Ring of Darkness (Watersoft)
9 (—)	Sprint Magic (Knight)
10 (—)	Sprint (Oasis)

(Two titles tie for 2nd and 9th positions)

(Figures supplied by Boots/Websters)

Atari	
1 (1)	Solo Flight (A & F)
2 (3)	Zaxxon (Centresoft)
3 (—)	Captain Suckys Gold (English)
4 (5)	Tank Commander (Creative Sparks)
5 (—)	Sub Commander (Creative Sparks)
6 (—)	Airstrike II (English)
7 (6)	Slinky (Centresoft)
8 (4)	Cybernome (L & B)
9 (8)	Leggit (Imagine)
10 (7)	Computer War (Thorn EMI)

(Two titles tie for 8th position, three for 9th position)

(Figures compiled by Boots/Websters)

Diary

Event	Dates	Venue	Admission	Organisers
Home Computer Show	Nov 8-10 12.00pm-9.00pm Nov 11 12.00pm-6.00pm	Royal Dublin Society (Main Hall) Baldridge Dublin 4	£2.00 adults £1.00 children	SDL Exhibitions Dublin 904171
Buxton Home Computer Fair	Nov 10 10.00am-5.00pm	Paxton Suite Pavilion Gardens Buxton	£1.00 adults 50p children	Technical Promotions 0298 6174
Home Computer Exhibition	Nov 10 10.00am-6.00pm	David Davies Gallery Newtown Powys Wales	20p	Newtown and District Computer Club 0695 28715
Microelectronics Applications	Nov 10 10.00am-4.00pm	Barden High School Burnley Lancs	50p	Barden High School 0282 36324
London Micro Market	Nov 10 10.00am-6.00pm Nov 11 10.00am-4.00pm	Wembley Exhibition Centre	£1.50 adults 75p children	ECC Publications 01-389 3535
Compec 84	Nov 13-15 10.00am-6.00pm Nov 16 10.00am-4.30pm	Olympia	£3.00	Reed Exhibitions 01-643 8040
6809 Colour Show for Dragon and Tandy Users	Nov 17-18 10.00am-6.00pm	Royal Horticultural Halls London SW1	£2.00 adults £1.00 children	Computer Marketplace 01-930 1612
Christmas ZX Microfair	Nov 17 10.00am-6.00pm Nov 18 10.00am-5.00pm	Alexandra Palace London N22	£1.50 adults £1.00 children	Mike Johnston 01-801 9172
Humberside Computer Fair	Nov 18 11.00am-5.30pm	Winter Gardens Cleethorpes	50p (accompanied children 25p)	Grimby Computer Club 0472 694047
Computer Auction	Nov 28 8.00pm	Bonington Hotel Southampton Row London WC2	Free	Crocker Computer Auctions 01-387 5838
Electron and BBC Micro User Show	Dec 6-9	New Horticultural Halls London SW1	£3.00 adults £2.00 children	Database Publications 061-456 8383

New Releases

NO FRILLS



Drelbs is the latest American import to be launched on the discerning Great British Public by US Gold, who so recently brought us the official version of *Zaxxon*.

Originally produced by Synapse — one of the top US houses — it is an excellent little game, drawing on, but not plagiarising, several arcade themes.

It consists of two main screens. The first is a swivelling maze, as in *Ladybug*, in which you, a drelb, must create squares whilst being pursued by two different sorts of nasty. This is fun. The squares change colour, and are now solid.

When you have made all the squares you can, they start changing into nasty faces... all except one, which is a door into the next screen. Here you rescue all your frozen Drelb brethren by tagging them, avoiding being zapped by new nasties. Success takes you back to the first screen, but

harder. Few frills, just pretty good.

So why is US Gold's other Synapse title *Fort Apocalypse* so utterly abysmal?

Program *Drelbs*
Price £5.95(C) £12.95(D)
Micro CBM 64 & Atari 32K
Supplier US Gold
Unit 10
Parkway Ind Centre
Heneage Street
Birmingham B7

STRAY DNA

As we all know, being the last surviving member of your race is something of a trial. For a start, there's never anyone around to drive you home after a heavy session down the pub. It also takes a hell of a long time to get served.

Still, as far as I am concerned, it is no excuse to go wandering around a 4096-room complex collecting orbs and stray bits of DNA, dressed in a one-piece yellow jump-suit. Is this the reason that apparitions (formed from pure energy) are



out to get you? Nevertheless Xavior has been set the task of resurrecting the human race.

Well implemented and designed this PSS game may be, but it does seem to owe something (well quite a lot, really) to that well known hit — *Atic Atac*.

I shall carry on waiting for *Swords and Sorcery*.

Program *Xavior*
Price £5.95
Micro Spectrum 48K
Supplier PSS
482 Stoney Stanton Rd
Coventry
CV6 5DG

DISPLAYED

The Soft Sell is a programming utility which enables you to construct advertising sequences and announcements to run on a Dragon. A total of 17 graphic displays can be sequenced together to create the kind of display used in window fronts, etc.

There is an extensive manual with the program which even covers things like plugging in the computer. Actually creating the text and designs is a matter of using cursor keys to trace an outline and other keys to add colour and copy one part of the screen to another.

It's pretty easy to use and I suppose may be a boon to shopkeepers everywhere. I can't help wondering why it's for the Dragon which has amongst the worst graphics of any home micro. It's also pretty expensive at £17.25.

Program *The Soft Sell*
Price £17.25
Micro Dragon
Supplier Micro Sign
P.O. Box 60
Woking
Surrey

VOCAB TEST

Kosmos have been issuing language teaching programs for a while now and is one of the few companies that has a Spanish



tutorial program. *The Spanish Tutor* has recently been released for the Commodore 64.

All the programs use a simple tutorial program to teach basic keyboard familiarity and have facilities for you to add your own grammar and vocabulary. Pre-recorded lessons include basic vocab, verb conjugations, prepositions and complete phrases. The language can also be tested in a variety of ways. The course is divided over two tapes which have an awfully silly Spanish man on the cassette cover.

Program *The Spanish Tutor*
Price £8.95
Micro Spectrum
Supplier Kosmos
1 Pilgrims Close
Harlington
Dunstable
Beds

This Week

Program	Type	Micro	Price	Supplier
Return to Eden	Ad	Amstrad CPC424	£9.95	Level 9
Football Manager	S	Amstrad CPC424	£7.95	Addictive Games
Horse Lord	Arc	BBC B	£6.95	Century
PCW Games Collection	Arc	BBC B	£4.95	Century
Project Planner	Bus	BBC B	£24.95	Triptych
Micro Utilities	Ut	BBC B	£6.95	Shiva
Eureka	Ad	Commodore 64	£14.95	Software Domark
Cliffhanger	Arc	Commodore 64	£7.95	New Generation
Di's Baby	Arc	Commodore 64	£6.95	Microdeal
Drelbs	Arc	Commodore 64	£9.95	US Gold

Program	Type	Micro	Price	Supplier
Fort Apocalypse	Arc	Commodore 64	£9.95	US Gold
Gun Dogs	Arc	Commodore 64	£7.95	Hill MacGibbon
Guzzler	Arc	Commodore 64	£7.00	Interceptor
Psi-Warrior	Arc	Commodore 64	£9.95	Beyond
Quango	Arc	Commodore 64	£7.00	Interceptor
Thrusta	Arc	Commodore 64	£7.45	Software Projects
Entrepreneur	Ut	Commodore 64	£24.95	Tryptic
Maggie Database	Ut	Commodore 64	£39.95	Audiogenic
Swift Spreadsheet	Ut	Commodore 64	£19.95	Audiogenic
Wordcraft	Ut	Commodore 64	£24.95	Audiogenic
PCW Games Collection	Arc	Electron	£4.95	Century
Shapes & Colours	Ed	QL	£12.50	Key Software

FLAGSHIP

With one exception, support for the Oric/Atmos would seem to have dried up. The exception is a French company called No Man's Land whose products are now available in this



country. *Tyrann* is probably the flagship of its range — it's an adventure with graphics in the Dungeons and Dragons style.

To begin you choose your character — Warrior, Thief, Druid or Magician — each has its own strengths and weaknesses. You then move around the village of Colanaur which is displayed in line drawn pictures with simple perspective.

You may trade, be forced to fight, use some objects and save games and characters for later use. You get a nice manual and at £8.95 the program is not overpriced by Oric standards. Good news for drought hit Oric/Atmos owners.

Program *Tyrann*

Price £8.95
Micro Oric/Atmos
Supplier No Man's Land
High Tech Units
1 and 2 Conlon
Developments
Water Lane
Darwen
Lancs

UNDERGROUND

Interceptor produce well written, fun games that really only ever have one major failing — they are never original. The latest Commodore release is a case in point. *Quango* is a game in which you burrow around underground chased by robots as you try to encourage your mushrooms to grow. Kill the robots by digging the ground from underneath stones which then fall on them — remind you of something? Yes, it's *Dig Dug* in a new guise.

Not that it's a bad game, unlike *Manic Miner* there aren't that many versions of *Dig Dug* around. Consequently as a game it hasn't become that wearisome. Angus (you) dodges robots and strange weeds whilst making his way towards the centre of each cavern.

There are various caves, as you get deeper and deeper so underground streams slowly flood the passages, making it more difficult for Angus to harvest his crop of mushrooms. Quite fun if unspectacular.

Program *Quango*
Price £7.00
Micro Commodore 64
Supplier Interceptor Micros
Lindon House
The Green
Tadley
Hants

SKYSCRAPER

Plummet is one of a growing range of Spectrum games from Interceptor and it's actually pretty good. The idea is to rescue the mayor who is stuck in a lift. Why a mayor? I know not.

His salvation comes when you — Orson — collect enough ropes to tie the line securely to its supporting chain. The game is played over three screens forming a giant skyscraper. Orson collects ropes scattered about the screen, dodges a variety of irrelevant objects and makes his way to the lift.

There is a Zombie Doorman who appears and disappears and whom you can stun with a tranquiliser dart — the game may be basically only dodge and grab, but there's enough different about it to make it interesting for at least a couple of minutes. The graphics are large and sprite-like, but they suffer from the inevitable co-

lour change when they pass one another.

Program *Plummet*
Price £7
Micro Spectrum
Supplier Interceptor Micros
Lindon House
The Green
Tadley
Hants

NEW COMMANDS

The Commodore 64 has terrible Basic. This is a fact accepted through the great passages of time as immutable and certain. To improve this situation, there have been a great number of extensions to Basic beginning with Simon's Basic and continuing every other month with another one from someone else.

Possibly the definitive extension to Basic will prove to be *Breden's Basic* written by Visions and marketed by CSM. It is beautifully packaged in a fold-out wallet, one side containing the cassette and disc and the other contains the large, Spectrum manual type book which explains how to use the new commands.

Obviously the bulk of the new commands are concerned with sound and graphics; eg, EMOB to turn on a sprite, Envelope simplifies the sound command.

It doesn't end there, though, you get useful structured basic commands like While... Do... Else and Repeat... Until and commands like CBit to clear a specific bit. If you are into programming, own a Commodore 64 and have a spare £39.95, then this is for you.



This Week

Program	Type	Micro	Price	Supplier
Barrow Quest	Ad	Spectrum	£5.95	UCS
Eureka	Ad	Spectrum	£14.95	Domark
Jewels of Babylon	Ad	Spectrum	£5.50	Interceptor
Astronaut	Arc	Spectrum	£6.95	Software Projects
BMX Trials	Arc	Spectrum	£6.95	Lainlan
Fahrenheit 3000	Arc	Spectrum	£5.95	Softstore
Magic Roundabout	Arc	Spectrum	£6.95	CRL
Trio	Arc	Spectrum	£5.95	Addictive Games
Warlords	Arc	Spectrum	£6.95	Century
Xavior	Arc	Spectrum	£5.95	PSS

Program	Type	Micro	Price	Supplier
American Football	S	Spectrum	£6.95	Softstore
Falklands Crisis	S	Spectrum	£9.95	Lainlan
Grand Prix Manager	S	Spectrum	£6.95	Addictive Games
Punch Line	S	Spectrum	£6.95	Lainlan
Superpower	S	Spectrum	£5.95	CCS
Sound Effects	U	Spectrum	£6.95	Lainlan
Run Your Own League	Ut	Spectrum	£6.95	Addictive Games
Fatty Henery	Arc	Vic 20	£6.95	Software Projects

Program Breden's Basic
Price £39.95
Micro Commodore 64
Supplier CSM
 Strand House
 Great West Road
 Brentford
 Middlesex

NO MISTAKE

Gener 80 is a sophisticated editor-assembler for the Spectrum which does amazing things.

The source code is processed immediately so that syntax mistakes are immediately spotted — the program can assemble 3000 lines in under 10 seconds.

You can edit anywhere on screen, use block move and delete, use all standard Z80 mnemonics and even use Sinclair system variable names as labels. All code can be saved either to tape or microdrive — *Gener 80* itself can also be saved to microdrive from the original cassette.

Obviously not intended for beginners, the program nevertheless comes with a 32-page manual which is pretty good and quite helpful, even for the novice.

Program *Gener 80*
Price £7.95
Micro Spectrum
Supplier Seven Stars
 15 Gloucester Avenue
 London NW1 7AU

PULSATING

Skyline Attack from Century Software is pretty much your classic blam blam stuff which only has a reason for its existence if you don't already have



something similar.

Basically, it's *Defender* as you move your highly manoeuvrable jet back and forth across scrolling screens and blast everything in sight, except canisters of medical supplies that occasionally drop from the sky.

It's all reactions, screen fulls of pulsating aliens — the only new feature is that it takes place over a number of recognisable skylines like Paris and London. If you've just bought your Commodore and don't have anything to kill yet, then this is for you. If not, forget it.

Program *Skyline Attack*
Price £7.95
Micro Commodore 64
Supplier Century Publishing
 Portland House
 12-13 Greek Street
 London W1V 5LE

RETRIEVED

A potentially useful utility from a company called Lost n Found Software is *Get it Back*, a disc-

based program that can retrieve lost files.

What this and similar systems allow is the retrieval of information on disc which appeared to have been lost through disc damage and have resulted in error messages when you attempted to load them.

Obviously you can't get everything back if you have completely wiped information from a disc and put something new on it — rather it's intended for those cases where you know that the stuff is still there, but just can't seem to get to it.

How the program works I know not — probably it just searches through the disc, loading up what data it can find and ignoring errors. Seems like it's a program worth having anyway. It's easy to use too.

Program *Get it Back*
Price £6.99
Micro Commodore 64
Supplier Lost n Found
 17 Pitfield Street
 London N1

FULL HOUSE

Fancy playing *Bingo* on your micro? No, I don't either. Still, if you feel you've been missing out by being too old to subscribe to the *Sun* and you've lost your *Times* Portfolio card, you could at least win REAL MONEY on *Bingo* from Tynesoft.

Up to four people can play the computer and beyond saying that it plays *Bingo*, there's not much comment I can make. However, every time someone wins the last four numbers called are compared with four 'lucky numbers' at the

bottom of the screen. If the numbers match then you go into the draw for £100. You prove this by saving it to tape.

If you have a Currah speech synthesizer then the program will actually shout the numbers out.

Personally, I don't like *Bingo* and will be putting my X in the box for no publicity.



Program *Bingo*
Price £5.95
Micro Spectrum
Supplier Tynesoft
 Addison Industrial Estate
 Blaydon upon Tyne
 Tyne and Wear
 NE21 4ZE

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

Addresses

Addictive Games, 71 Richmond Hill, Bournemouth BH2 6HE **Audiogenic**, PO Box 88, 39 Sutton Industrial Park, London Road, Reading, Berks RG6 1AZ **CCS**, 14 Langton Way, London SE3 **Century Software**, 12-13 Greek Street, London W1 **CRL**, 9 King's Yard, Carpenter Road, London E15 **Domark**, 228 Munster Road, London SW6 **Hill McGibbon**, St Bartholomew House, 92 Fleet Street, London EC4 **Interceptor**, Lindon House, The Green, Tadley, Hants **Key Software**, Newlands, Durley Brook Road, Southampton **Level 9**, 229 Hughenden Road, High Wycombe, Bucks HP13 5PG **Llaintan**, Pontyberem, Llanelli, Dyfed **Microdeal**, 41 Truro Road, St Austell, Cornwall PL25 5JE **New Generation**, The Brooklands, 15 Sunnybank, Lyncombe Vale, Bath BA2 4ND **PSS**, 452 Stoney Stanton Road, Coventry CV6 5DG **Shiva Software**, The Hawthorns, 64 Welsh Row, Nantwich, Cheshire **Softstore**, Suite 1, 39c Paddington Street, London W1 **Software Projects**,

Bear Brand Complex, Allerton Road, Woolton, Liverpool **Triptych**, TBL Book Service, Freepost, Camberley, Surrey GU15 3BR **US Gold**, Centresoft, Unit 10, The Parkway Industrial Estate Centre, Heneage Street, Birmingham B7 4LY.

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.



Grown-up's MSX

The latest news is that the CP/M disc operating system is to be implemented on the QL. Not only that but Amstrad will be providing it as an integral part of their disc system. Even the ever-receding Enterprise offers amongst its specifications CP/M compatibility.

Further confirmation that home micros are rapidly crossing the divide into the heady world of small business systems and 'serious software'. If you can control your feverish excitement for a second let's stop and think about what CP/M is, and what it can do — I believe that for 95% of people it is going to be an overblown waste of time.

The idea of CP/M came about as an attempt by Digital Research to overcome the continuing problems of non-compatibility between different hardware systems, and avoid prolonged and unnecessary duplication of effort in software development. In short, it is a sort of grown-up's MSX.

Despite its undoubted success I feel there are several prevalent misconceptions about what CP/M can offer that need clearing up.

The most commonly quoted justification for its existence is that it allows software compatibility between different computers and gives access to a back-catalogue of over 3000 programs. Unfortunately this is only true up to a point. Whilst the major headaches of software redesign and debugging that accompany a conversion from say the Spectrum to the CBM 64 can be avoided, you will not be able to go out and buy any old CP/M program and run it on your micro. No machines can be completely software compatible without the rigid internal architecture and Rom constraints that characterise the MSX machines or the more 'highly compatible' IBM clones.

What this means is that you will only have

access to the fraction of the 3000 CP/M titles that Amstrad, Enterprise or anyone else decide to convert, unless you fancy doing the job yourself. Only the mainstream big-selling programs are likely to make an appearance.

The other by question about CP/M is, how many of the fraction of the 3,000 programs which are converted will you actually want? The biggest barrier I can see for most people is the price. For instance the Wordstar, word processing package which must be the single biggest seller for CP/M still changes hands at the whopping price of £250 — more than most home hardware systems cost!

When you consider how many people make do with their versions of *Tasword*, or *Easyscript*, is it really worth paying ten to twenty times as much for something that, after extensive use, I can assure you is still a fairly average word processor?

As I understand it, some professional business software writers regard CP/M as having been a positive hindrance to the development of quality software by encouraging a lowest common denominator approach.

In particular 16 and 32-bit 'wonder micros' have been forced to develop a pseudo CP/M standard of their own to satisfy business users who are keen to keep the software they are familiar with and want to avoid the problems of re-entering data files etc.

CP/M is becoming a bottom-line standard perpetuating old technology in a way that many fear MSX will do.

In contrast, the chaotic non-standard home computer scene has seen the arrival of software that has squeezed the very last drop out of the capabilities of the hardware — just look at some of the Spectrum programs coming out now.

People who are forced to run CP/M on their QL because of a shortage of software should feel cheated — the evolution to 16-bit (or is it 32?) has been phenomenally fast so why slam the brakes on now and start getting involved with an 8-bit standard?

As CP/M begins to look more and more arthritic to business users, Digital Research will no doubt be delighted to see a new market opening up for in the low-end home computer sector.

Nevertheless, from Amstrad's point of view CP/M probably didn't look like such a bad idea.

After all, if you can find everything you need for your work on popular CP/M discs, why not run them on the best value hardware you can find? Besides which, it plays games as well.

Tony Kendle

Leaf it out

Puzzle No 132

As is my usual practice when packing for the summer holidays, I always include an ample supply of reading matter in case of wet weather. There were a number of books that I had put ready, and these are listed below (the figures in brackets after each title indicate the number of pages in the edition that I had).

- 1) The Rubaiyat of Omar Khayyam (64)
- 2) Twelfth Night by William Shakespeare (89)
- 3) The Shorter Poems of Wordsworth (107)
- 4) Tom Brown's Schooldays by Thomas Hughes (111)
- 5) Pygmalion by G. B. Shaw (147)
- 6) Wuthering Heights by Emily Bronte (168)
- 7) Sleeping Murder by Agatha Christie (175)
- 8) The Pickwick Papers by Charles Dickens (192)
- 9) 1984 by George Orwell (204)
- 10) War and Peace by Leo Tolstoy (241)

I am bound to say that this was the cause of some disagreement between my wife and I, who felt that ten books was somewhat excessive. As a compromise, I chose just five of the books, but even so, these provided me with a total of 800 pages.

Which books did I take?

Solution to Puzzle No 127

The total distance ran was 290582 paces.

The program examines each integer from 1 to 1000 to see if it is a multiple of seven or 13 or to see if it contains any of the digits seven, one or three. Only if neither of these conditions apply is twice this distance added to the total (to account for the return journey).

```
10 LET DISTANCE = 20 FOR N = 1 TO 1000 30 IF N/7 = INT(N/7) OR N/13 = INT(N/13) THEN GOTO 100 40 NS = STR$(N) 50 FOR F = 2 TO LEN(NS) 60 Z$ = MID$(NS,F,1) 70 IF Z$ = "7" OR Z$ = "1" OR Z$ = "3" THEN GOTO 100 80 NEXT F 90 DISTANCE = DISTANCE + (N*2) 100 NEXT N 110 PRINT DISTANCE
```

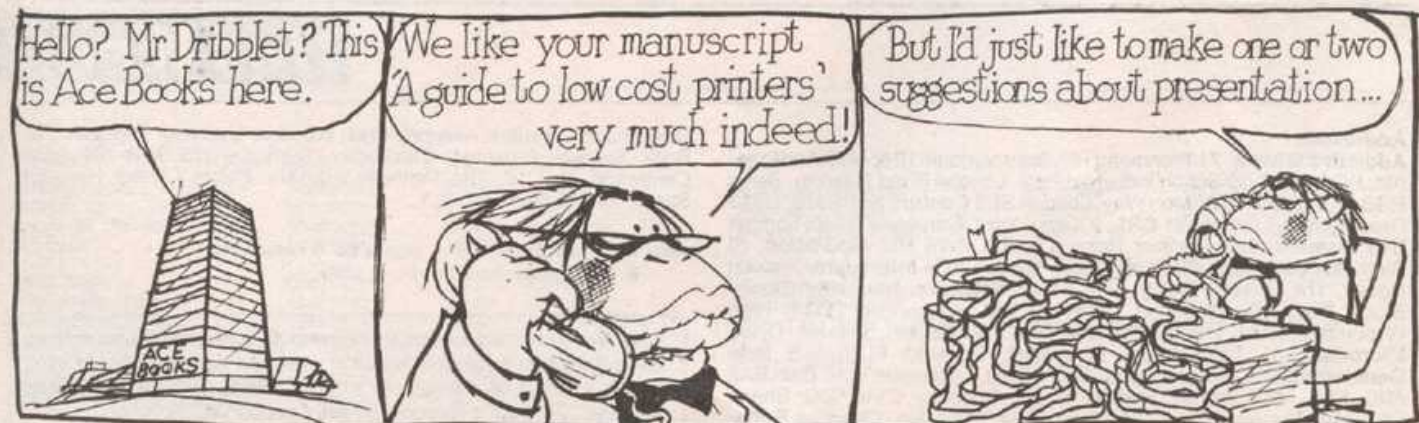
Winner of Puzzle No 127

The winner is B. A. Kidd of Holsworthy, Devon, who receives £10.

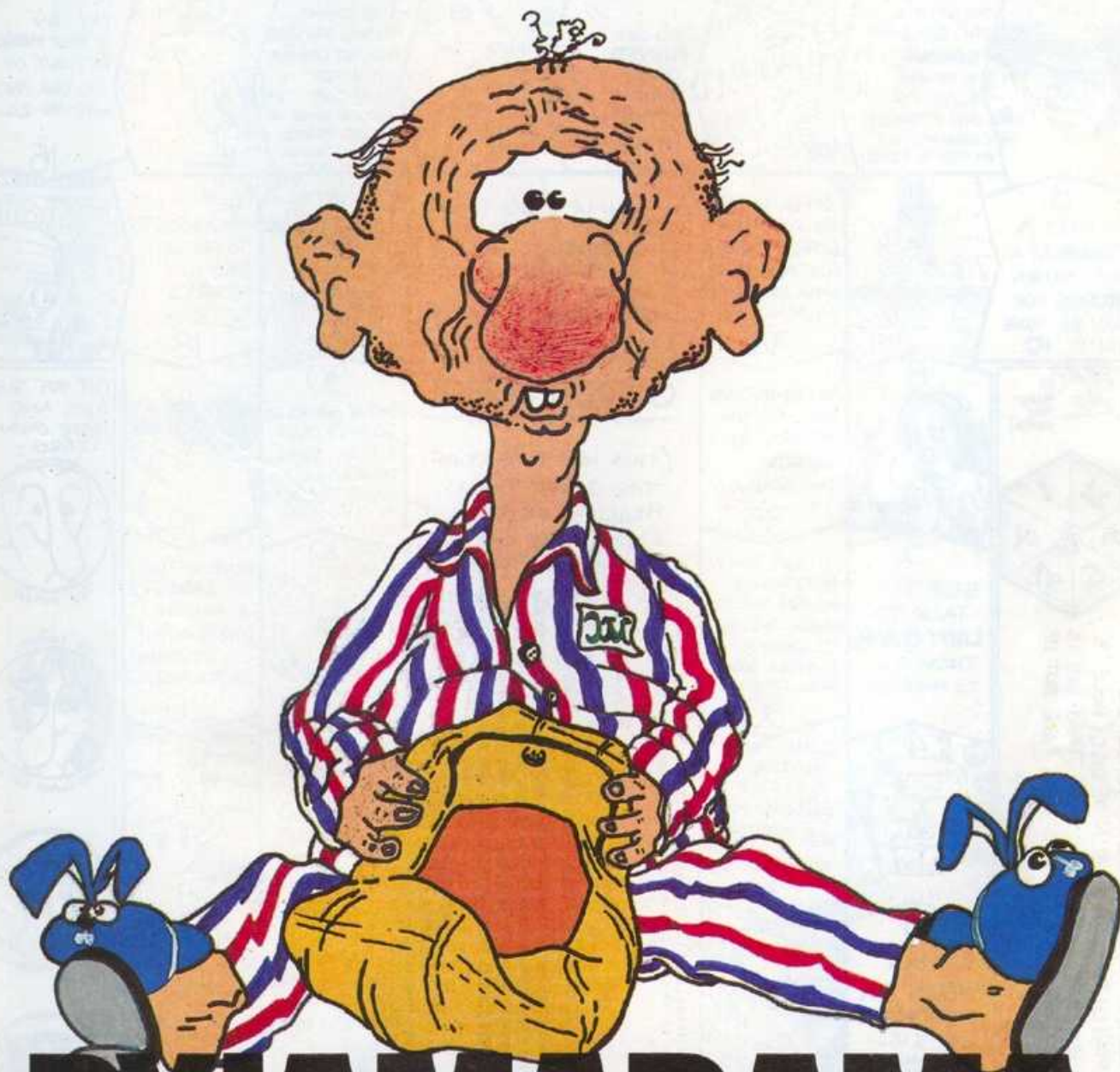
Rules

If the puzzle prize 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 132 is November 23.

The Hackers



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AUTOMATA UK PRESENTS THE PI is CAST

SIMPLE-MINDED FUN FOR JADED, MIDDLE-AGED POLTROONS, DEVISED BY PIMAN, GRAPHICS AND OFFENSIVE ADDITIONAL TEXT BY GREMLIN EVANS. ALL CHARACTERS ©1984 AUTOMATA UK LTD.

NO, IT CAN'T BE...
8 YOU MEET A PIMAN AT A FAIR. YOU BUY CRUSOE FOR ONLY £6. MOVE ON TO 10.

10 YOU LOCATE THE GOLDEN SUNDIAL OF PI IN PIMANIA. £6000 FOR ONLY A TENNER! CONGRATULATIONS!! ON Y'GO TO 12

12 YOU GET PLEEYED ON £6 2 HIC! STAGGER ON TO SHIKSHTEEN (16)

14 YOU'RE CAUGHT PIRATING SOFTWARE AND GET CHUCKED OUT OF THE GAME. HOP THROUGH HOUSE ON ONE LEG BEFORE STARTING AGAIN ON THROW OF SIX.

16 PAY £6 TO HELP MORRIS GET OUT OF THE CAR PARK. MOVE TO 20...

18 GET WHOLESALERS TO PAY UP FRONT... ADVANCE TO 31

20 DOUBLE TOP IN DARTZ - A WINNER FOR 5 QUID! GO STRAIGHT TO SQUARE 24!

22 PI-DAY. IT MOVE BACK TO 7, PORKY!

24 BLESS YOU! ONLY £5. YOUR DISC ARE ROADED - ON TO SQUARE 28! AH-SO!

26 YOU UPSET LURCH, THE OFFICE PARROT (WELL, WE THINK HE'S A PARROT) AND HE CHASES YOU BACK 8 SQUARES

28 YOU'RE BOWLED OVER WITH PI-BALLED AT ONLY £6. ROLL ON TO SQUARE 30.

30 NEW WHEELS JOHN? ONLY A FIVER, JOHN. DRIVES YOU ROUND THE BEND TO 32, JOHN.

32 GO TO JAIL - PAY £6 AND MOVE DIRECTLY TO 35.

34 TURN UP ON THE WRONG DATE TO WIN THE GOLDEN SUNDIAL. GO BACK TO 11, MATE

36 OFFER WHOLE-SALE CREDIT... SUFFER CASH-FLOW PROBLEMS BANK SAYS GO BACK TO 7

38 JUMP FROM BLAZING BUILDING IN PIROMANIA. £6 HOSPITAL FEE, BUT LAND ON SQUARE 40.

40 THE TOP, PIMAN'S GREATEST HITS. VOL. 1 & 2. IN, MAY NOT BE, BUT THEY'RE ONLY £3 EACH. YOU'VE WON THE GAME, SMARTY-KNUCKERS!

42 THAT'S AUTOMATA'S PLACE... SO MOVE ON 3 SQUARES, ALREADY!

39 TELEPHONE-SALES PERSON TRYING TO SELL YOU ADVERTISING MAKES YOU TAKE MISS A TURN.

37 JUMP FROM BLAZING BUILDING IN PIROMANIA. £6 HOSPITAL FEE, BUT LAND ON SQUARE 40.

36 START OWN SOFTWARE HOUSE. THROW AGAIN AND GO TO SQUARE NUMBER SHOWN (ROUGH LUCK, KID)

35 YOU PH-IN-ERE MAIL-ORDER SERVICE, £6. AWARDED TWO SQUARES.

33 GO TO JAIL - PAY £6 AND MOVE DIRECTLY TO 35.

32 TURN UP ON THE WRONG DATE TO WIN THE GOLDEN SUNDIAL. GO BACK TO 11, MATE

34 OFFER WHOLE-SALE CREDIT... SUFFER CASH-FLOW PROBLEMS BANK SAYS GO BACK TO 7

36 OFFER WHOLE-SALE CREDIT... SUFFER CASH-FLOW PROBLEMS BANK SAYS GO BACK TO 7

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42 THAT'S AUTOMATA'S PLACE... SO MOVE ON 3 SQUARES, ALREADY!

17 MUNICIPAL

19

21

23

25 BUY AUTOMATA SOFTWARE ON 24 HR ANSWERING SERVICE. 0705 735242 / SPEED YOUR ORDER TO SQUARE 31.

27

29

31

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43

ORDER FORM

(THIS ISN'T PART OF THE GAME! THIS IS REALITY! ORDER YOUR UNMISSABLE GOODIES HERE, FOLKS!!)

I enclose the right money, or debit my ACCESS/VISA Card. My Card number is: _____

Card holder's signature: _____ Tel. Number: _____

Card holder's address: _____ Expiry Date: _____

Port Code: _____

NO EXTRAS! All our prices include VAT and Postage & Package. 24 hr - CREDIT CARD HOT LINE (0705) 735242. Send your order and payment to: AUTOMATA UK LTD, 27 HIGHLAND ROAD, PORTSMOUTH, HANTS, PO4 9DA, ENGLAND.

HOW TO PLAY 'THE PI IS CAST': FIRST, IF PERMITTED SCISSORS, CUT OUT COUNTERS & DIE DISC. INSERT DUD MATCH THROUGH HOLE 'A' OF DISC (HOLE 'B' FOR 'LOADED' VERSION). PASTE THE LOT ONTO THIN CARD. NOTE THAT DIE IS UNUSUAL IN NUMBERING. FOR 'N' SYMBOL, SUBSTITUTE OWN AGE, BUT IF YOU GO PAST '40', CONTINUE COUNTING FROM SQUARE ONE.

(IT MIGHT NOT WORK)

CUT OUT THE DISCS AND PASTE ONTO CARD.

THE PIMAN

THE LOVELY LADY CLAIR SINGING

PORKY

RASTAPIMAN

SHETTIBITZ

IF EGOCENTRIC, USE SMALL ROUND PHOTO OF SELF.