Home Computing WEEKLY

An Argus Specialist Publication

Aug 30-Sept 5, 1983 No 26

38p

Test your driving skill — there's a great TI-99/4A game to type in on page 9

Hit the pools jackpot and play bingo — two Spectrum programs

VIC-20 ski game to type in — page 21

Sprites the easy way with the 64

ocean

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'We'll help software writers'

Software authors will be shielded from sharp practice when a new group gets under way. And software companies will be protected from unscrupulous programmers.

The working title of the new group is the Society of Software Authors, under the umbrella of the Computer Trade Association.

CTA secretary Nigel Backhurst put the proposal at the annual meeting and now he wants software writers — whether they work full- or part-time — to get in touch with him.

Already the CTA is working towards standard documents covering terms of publication, a code of conduct and payment of royalties. Royalty percentages will not be covered.

Mr Backhurst gave two examples of poor behaviour which he hoped would be stamped out.

Continued on page 5

Your choice of cable software 'next year'

Home computer users will soon be able to choose how to receive software by cable.

Two big companies will next year be offering different deals to micro owners, once cable TV operators have signed deals to make it part of their services.

Thorn-EMI is planning to serve people who already own computers, starting with the Atari, VIC-20 and TI-99/4A and followed by the Commodore 64 and Spectrum.

Subscribers would be supplied with software on cassette or plug-in module to enable their computers to download from cable.

But W.H. Smith has signed a deal with The Games Network in America which means subscribers would get a specially-designed computer. Its software would be mainly American to start with, but UK programs would be encouraged.

Continued on page 5

ATTENTION!

- all ZX81 (16K) and Spectrum (48K) users -

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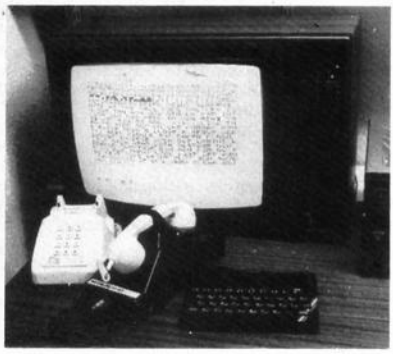

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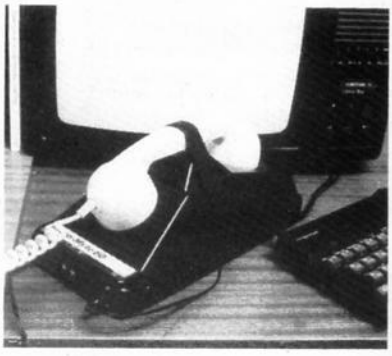

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..... HCW26

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SOFTWARE SUPERMARKET

Home Computing Weekly prints more software reviews than any other magazines.We test software for these computers — and more — in this issue

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Our ski program on page 21 packs a lot into the unexpanded VIC-20

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Argus Specialist Publications Ltd.
145 Charing Cross Road, London WC2H OEE. 01-437 1002

Home Computing Weekly is published on Tuesdays. Distribution by Argus Press Sales and Distribution Ltd, 12-14 Paul Street, London EC2A 4JS. Printed by Alabaster Passmore & Sons Ltd, of London and Maidstone, Kent. Design and origination by MM Design and Print,145 Charing Cross Rd.,London WC2H OEE

● Cover picture of Toni White by Colin Ramsey

Test your driving skill with the TI-99/4A program on page 9

Why did this couple spend the night under canvas? Find out on page 29

FOR FIRST TIME USERS...

A new series of books which introduce newcomers to the most widely used micros in the marketplace.

The books assume absolutely no knowledge about computers and the reader is shown even the most fundamental operations such as "switching on" and "loading a program". The books lead the reader through simple programming and then onto graphics, with several programs which show how to achieve pictures and even animation. The books contain a number of specially written programs which show the full potential of these machines.

"The text is liberally supported by all manner of useful diagrams and illustrations (including many black and white photographs of the screen). The overall presentation is excellent. The printing, setting out and listings are clear and positively invite the reader to have a go."

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READ-OUT HCW26

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An action game that needs nerve and quick reactions! Hurtling through a void, your task is to travel as long as possible, scoring points along the way. Be careful though as you will have to avoid your own trail and those of up to four chasers. As trails are left you will have to thread your way through, but don't forget the more trails the less space for manoeuvring. You will be terminated when you finally get caught in 'the Knot'.

For 48K Spectrum and compatible with Kempston, AGF and Mikrogen joysticks.

'It is the most astounding thing you'll see for a long time' – Popular Computing Weekly.

GSH

New Generation Software

New Generation Software FREEPOST Bath BA2 4TD

Software society

Continued from front page

● When discussing royalty payments, a software house told an author that only 200 cassettes had been sold when one retail chain alone had taken 5,000.

● The heads of two software companies were talking about future releases when they discovered that each was planning to bring out the same game. Two school boys had submitted the program under different names.

Through the CTA, the society could lobby the Government on subjects like grants and rent and rate rebates for fledgling industries.

At present development grants started at £50,000 and were for big projects. What was needed was a revamped scheme for those who needed only perhaps £2,000 to buy a couple of computers.

Mr Backhurst said: "We have the ridiculous situation where one of our members has got what everyone agrees is a good product and all he needs is £5,000 to finish it off over the next six months.

"But because the figure is so small he can't get the money. And even if he could it would take eight or nine months to come through under the present arrangements."

The subscription to the new group will depend on how it is set up — as a sub-group of the CTA, an associate, like the newly-formed Group of Software Houses, or affiliated.

The CTA now has a membership of 134, with 60 applications going through, and the annual subscription is £50.

Mr Backhurst sees the CTA as a forum through which various parts of the industry can talk to each other, particularly now another group is being set up.

This will be called the Society of Retail Micro Dealers and is being established by Barry Jones, of Microware.

Other points from the meeting:

● The CTA may join with Personal Computer Services, a distribution company, to produce fortnightly charts of best-selling software.

● A proposed bonding scheme for mail order purchases may be extended to cover retail sales in a similar way to the protection scheme run for holiday-makers by the Association of British Travel Agents.

● The CTA may encourage the setting up of an investment trust as a channel for speculative investmentors.

● From the end of October, there will be a CTA register of software titles as a free service to members who wish to check that the names of games are not already being used and to establish their titles. It would act only as an information service as names are at present registered with the Patent Office.

Computer Trade Association, 108 Margaret Street, Coalville, Leics LE6 2LX

Cable

Continued from front page

Peter Chandler, system manager of the home computer division of Thorn-EMI Video, said his company had technicians at work but field tests had not yet begun.

He saw it initially as a means of distributing Thorn-EMI's own software at a price cheaper than cartridge.

He said: "I see it as another premium channel that cable TV operators can offer to subscribers.

"We would put up a range of titles — not just games but educational and home management as well — rotating by 20 per cent each month.

"It's very important that people get the latest and greatest. It's the same with video. . . you can't offer films that are eight years old.

"And we will be making sure that you will not be able to transfer it onto cassette or disc."

Mr Chandler expected a number of systems to be on offer by late next year. Did he see the competition from W.H. Smith as a threat?

He said: "I don't know what you mean a threat. Healthy competition is a good thing. There will be a lot around, but ours will be broadly-based and better software."

The service would ensure that subscribers were only offered the "menu" of software for their own computer.

Thorn-EMI already runs Swindon's pilot cable TV service and is one of the companies bidding for Leicester.

Subscribers who sign up for the W.H. Smith service will get a U.S.-designed 64K computer with a typewriter-style keyboard. Each side of the keyboard will be five more keys — to allow two-player games — along with facilities for joysticks and video discs.

The computer, now being adapted for the UK, will be programmable by the user and can accept software on cassette.

Derek Ruffell, manager of corporate planning and development for W.H. Smith, said: "What differentiates this service from the others in America is that you don't have to provide a computer. One operator requires you to spend 150 dollars on a machine.

"With ours you do not have to buy any machine at all."

Each cable operator would have two mini-computers — plus a smaller one to add and delete subscribers — linked to a large W.H. Smith base computer which would feed the operators and monitor use.

He could give no estimate on the cost to the subscribers, saying: "If you sell anything it's got to relate to the traffic and, in this case, to the level of penetration."

Although at first the software on offer would be mainly American, he said: "We think it's important that there is a UK content."

With two-way cable systems the possibilities widened.

Mr Ruffell said: "We have been asked by several actual and potential cable operators about tele-shopping."

He stressed that the company's principal interest at present was to interest cable operators in taking the service — then it would be marketed to appeal to subscribers.

One possibility was that, as in America, new games would be licensed from software houses for the exclusive use of subscribers, two months before they went on retail sale.

To prevent piracy, each subscriber's computer would have a unique code. Software would only load if this code was present.

And, with an interactive system, there would even be a check on theft. Each day the host computer would check if the subscriber's computer was present.

And, in a further development, each address would be matched to the computer's code number. So if the computer was moved next door and plugged into a neighbour's cable it would be refused software.

Thorn-EMI Video, Thorn-EMI House, Upper St Martin's Lane, London WC2H 9ED

W.H. Smith and Son, Strand House, 10 New Fetter Lane, London EC4A 1AD.

You could be on our pages

We welcome programs articles and tips from our readers.

PROGRAMS should, if possible, be computer printed to a width of 48 characters (use a new ribbon) and/or sent on cassette. Check carefully that they are bug-free. Include details of what your program does, how it works, variables you have used and hints on conversion.

ARTICLES on using home computers should be no longer than 2,000 words. Don't worry about your writing ability — just try to keep to the style in HCW. Articles most likely to be published will help our readers make better use of their micros by giving useful ideas, possibly with programming examples. We will convert any sketched illustrations into finished artwork.

TIPS are short articles, and brief programming routines which we can put together with others. Your hints can aid other computer users.

Competitive rates are paid.

Keep a copy of your submissions and include an SAE if you want them returned. Label everything clearly and give a daytime and home phone number if you can.

Paul Liptrot, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE

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Buy a micro — for the future

Recently Lynda Carter argued in these columns that home computing should be kept for those with a specific application in mind. I couldn't disagree more — I think micros are an excellent preparation for the society of the future, and the more people that have them, the better.

Don't get me wrong. I'm not saying that I think that there will be a growing demand for computer programmers, and that all the people currently losing their jobs in traditional industries will be able to retrain and get jobs in computing, or start their own software companies and become millionaires.

For a start, though home computing is certainly booming, there isn't that much demand for software. And secondly, as time goes on, computers will themselves take a lot of the work out of programming. This is already happening — companies like Psion use computerised tools to speed up their program generation.

These tools will themselves get cheaper, as micros have got cheaper, and the day will come when laboriously writing a machine code program from scratch will be a thing of the past — a bit like building a car by making all of the components individually by hand.

Nor would I recommend anyone to buy a micro because it will help them to come to terms with the new technology that is increasingly going to affect our lives over the next few years. That's been the rationale behind a lot of recent public awareness schemes, like Information Technology 82 and the Micros in Schools project, and I think it's nonsense.

Why? Because the whole point of a lot of the improvements currently being made to computer system is to make them easier to come to terms with. At the moment, you need to be able to use a keyboard and understand a programming language to communicate with computers.

But in a few years, advances in speech synthesis and speech input will mean that you will be able to speak to your computer directly — and it will be able to give its reply, not via a message on a screen, but in a voice of its own. Devices like joysticks, light pens, "mice" and graphics tablets will make it easier and easier to use new technology.

So if it won't get you a job and it won't help you grapple with new technology, why am I saying that everyone should have a micro? Simply because, like it or not, we're all going to have to get used to a lot more leisure time in future.

Computers are going to be able to take up most of the jobs that currently fill our time — and anyone that thinks enough new jobs are going to be created to make up for the old jobs that will be lost is in for a nasty surprise.

To fill all that free time, we're going to have to find plenty of demanding and absorbing hobbies that will provide the mental stimulation and challenge to stop us turning into apathetic cabbages. And we're going to have to drop the idea that what we do to fill our time must necessarily have a purpose.

Home programming fits the bill perfectly. It demands concentration, logic and creativity. It doesn't damage your health, is fairly quiet, and after the initial outlay doesn't cost much.

Why knock it? I'd certainly rather spend a day programming my micro than a day working on a production line.

Jo Wilson
Teacher
Liverpool, Merseyside

● This space is for you to sound off about the micro scene, to present bouquets or to hurl brickbats. Share your views by sending them to Paul Liptrot, Opinion, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE. Please include your occupation and your interest in computing

Books and software get together

Publishing giant McGraw-Hill has turned its attention to home computer users, with a series of linked books and software.

For young ZX81 owners, ZX81/TS1000 Programming for Young Programmers and its companion cassette ZX81/TS1000 Programs for Young Programmers aims to reach the rudiments of BASIC programming.

Aimed at children of nine years upwards, it uses games and movements to maintain interest.

Its author is Linda Hurley, a housewife with two young children who are themselves learning about computers. The book costs £4.95 and the software costs £5.95.

Profile 1 is a 48K Spectrum spreadsheet program for handling numbers and text, intended for home and business use. It comes with a 12-page manual and software support service, and costs £9.95. A linked book is due out soon.

Finally, there's a full-function Z80 Assembler for Spectrum machine code programmers. It costs £9.95, and a related book on assembly language program will follow.

Extra memory for TI-99/4A

QA Data Systems has brought out a 32K RAM pack for the TI-99/4A which gives you 8K of directly-addressable RAM for machine-code programming.

It's sold along with an adaptor unit giving an extra two ports and a power supply, for £230. The adaptor alone costs £60.

QA, 9 St George's Street, Chorley, Lancs PR7 2AA

Other books and software are coming soon, covering subjects from adventure games to word processing.

McGraw-Hill, Shoppenhangers Road, Maidenhead, Berks SL6 2QL

First time users — it's a bargain

If you buy a ZX81 and 16K RAMpack during the next couple of months, you'll save an astonishing £30. Sinclair is offering a starter pack containing the ZX81, RAMpack and the cassette for just £45.

Normally the ZX81 costs £40, the 16K Sinclair RAMpack costs £30, and software cassettes cost around £5.

Aimes at the first-time user, the offer will last initially for two months. It is available from most Sinclair stockists, including Boots and John Menzies.

And if you're thinking of buying a printer for your ZX81 or Spectrum, Sinclair is also offering five free rolls of printer paper with every ZX printer bought during the period.

Sinclair Research, 25 Willis Road, Cambridge CB1 2AQ

The show the Scots are waiting for

If you live in Scotland, here's a date for your diary. The first Scottish Home Computer and Electronics Show is planned for 6-8 November, and will take place in the Anderston Exhibition Centre, Glasgow.

There'll be room for 96 stands with home computers, peripherals and software as well as a variety of other electronics equipment.

Trade Exhibitions Scotland, 53/55 Commissioner Street, Crieff, Perthshire PH7 4DA

TI-99/4A SOFTWARE

Two great new games for the unexpanded TI-99/4A.

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action for your Spectrum

Still those Spectrum games keep coming. This week our reviewers grapple with five of the new action releases

Tranz Am
£5.50

Ultimate Play The Game, The Green, Ashby De La Zouch, Leics

My award for blurb of the year must go to Ultimate for the sleeve of Tranz Am.

The waffle which, needless to say, the game does not live up to, goes on for 17 lines before coming to the actual playing instructions — all three lines of them! However, labelled diagrams of the screen were presented and gave me some idea what to expect.

You control a small red car (described as "A Super Blown Red Racer") which buzzes ("thunders") around the barren land — a scrolling play area at least 600 times screen size and a strong point of the program.

Your task is to collect the eight gold cups while avoiding the zippy little "Deadly Black Turbos" who are well programmed and at times quite frightening in their endeavours to collide with you.

Fuel can be replenished by driving over petrol stations (obviously the Highway Code went up with the bombs in 3472), while overheating causes drastic speed loss almost always at precisely the wrong moment.

All in all it's a good game and initially I found it quite compulsive

T.B.

instructions	50%
playability	65%
graphics	62%
value for money	60%

★★★

Zipzap
48K Spectrum
£5.50

Imagine, Masons Buildings, Exchange St. East, Liverpool L2 3PN

For their latest offering, Imagine have taken the graphics potential offered by 48K of memory and produced stunning results.

You steer the last remaining Droid round a planet inhabited by over twenty varieties of alien. You must collect up fuel cells to pass through the teleportal up to the next level.

And what an arrival! You are delivered through a twirling 3D tube of rays, passing through 3D portals. The aliens are incredible. All in 3D, they twist and turn as they move across the screen with smooth animation. It's worth it just to see the variation in aliens; faces, teeth, birds, worms, wheels, they're all there!

Not that you're likely to see them all for some time. This game is hard! You steer using only two keys which provide rotation, and thus variable direction, as your droid keeps going forwards. The program is also set up for four popular joysticks.

To sum up, professional packaging, amazing graphics, thoughtful facilities and well priced. The one snag? It's only my opinion, but I think the game concept is very ordinary considering the work expended on it.

D.M.

	90%
instructions	80%
playability	95%
graphics	90%
value for money	

★★★★★

Cookie
Spectrum
£6.50

Ultimate Play The Game, The Green, Ashby de La Zouch, Leics

If you want a game that is addictive, will make you laugh and put you off chunky chocolate for life then Cookie is my recommendation.

You play Charlie the Chef who has the terrifying task of trying to bake a cake amidst a host of intimidating ingredients, such as the Crafty Cheese and Chunky Chocolate, who do not want to go into his bowl.

Charlie can throw bags of flour at these grotesque groceries to make them change direction as they maraud about the screen and charge out of the pantry when he least expects it.

An added difficulty is the hilarious bin monster who eats ingredients and throws rampaging rubbish around.

The game starts with Colonel Custard and if you manage to hit ten of his species into the bowl you go on to tackle the Sneaky Sugar. After many frantic and enjoyable games I eventually became good enough to take on the mixed peel but was soon stomped into a tangy termination!

The graphics are well up to Ultimate's excellent level (the bin monster being a work of art) and good use of sound is made in this excellent game.

T.B.

instructions	80%
playability	95%
graphics	95%
value for money	100%

★★★★★

Terror-Daktil
48K £6.95

Melbourne House, 131 Trafalgar Road, London SE10

This program is an original attempt to recreate the high adventure sagas of the 1930s and 40s. In this it succeeds — you really do feel stranded on a jungle plateau and this atmosphere is a result of the truly excellent graphics.

Your old aeroplane has done a nose dive into a mountain and when your head clears morning has broken. In the distance you see what look to me like vaguebond space invaders gathering in formation.

Using the cannon, you take pot shots at these shapes (all in 3D) until suddenly you're in deep trouble. A Terror Daktil breaks from the pack and looms toward you, wings flapping and beak snapping in full 3D.

If you get hit by the prowling predator a comic strip flash appears on the screen and you lose a life. Should you manage to survive the onslaught for six days a rescue plane arrives — just like the movies.

The great graphics and well composed music (not just tunes here but full overtures of stirring stuff) certainly give this program lots of atmosphere but it fails as a game.

After a few goes it becomes extremely tedious and I ended up forgetting the game and marvelling at the graphics.

T.B.

instructions	70%
playability	30%
graphics	100%
value for money	55%

★★★

Centropods
Spectrum
£5.99

Rabbit, 380 Station Road, Harrow, Middlesex HA1 2DE

Don't put another penny in the Centipede machines but buy this tape instead. It is actually better than its arcade counterpart; quite a feat on the Spectrum!

A field of mushrooms sets the scene, in which a horde of Centropods move up and down, turning when they reach a mushroom and intent upon your destruction. These bothersome bugs can be beaten off with your can of insect repellent.

Occasionally a spider will bounce around menacingly and hitting this atrocious arachnid scores bonus points, as does hitting the fiddly flea who turns existing mushrooms rotten and manages to lay new ones in just the wrong places!

From time to time a rather stately looking snail glides across the screen, resisting all efforts to stop him.

The game makes the best use of just about every capacity the Spectrum has. The graphics are superb and the colours well chosen. Excellent use of sound too: as you clear one horde the next descends faster and screaming at a higher pitch.

No self-respecting Spectrum owner or arcade player can afford to miss this game. As I write this review I still have a sore trigger finger from too much playing. Need I say more?

T.B.

	75%
instructions	100%
playability	100%
graphics	100%
value for money	

★★★★★

Show off your skill at the wheel as you race round the forest

Prove your driving ability with this testing route through a forest. Graham Baldwin gives you the opportunity with his game for the unexpanded TI-99/4A

Now is your chance to be Roger Clark, Paddy Hopkirk or any of the great rally drivers in my Forest Rallye game.

You must drive your car round the forest road to the finishing line using keys E,S,D and X to steer. Hit trees and you will be penalised and driving out of the forest disqualifies you. Oh, by the way, you have no brakes...

Your score and best score are displayed at the end of the game to prove what a great driver you are.

If you find the control keys awkward to use, change the ASCII values of K in lines 750, 800, 850 and 900 to those of keys you find more comfortable.

How it works

140-300 colour screen, define characters and colours
320-410 print instructions, wait for key press
430-610 set up screen graphics
630-680 set initial variables
700-930 scan keys, calculate new position of car
950-1000 check car position, move car
1020-1080 car off track
1100-1230 finish, show scores and option for another game
1240-1290 car out of forest
1300-1310 data for course
1340-1380 PRINT AT routine

```
100 REM     *FOREST RALLY*
110 REM
120 REM   *BY GRAHAM BALDWIN*
130 REM
140 CALL CLEAR
150 CALL SCREEN(2)
160 REM  DEF GRAPHICS
170 CALL CHAR(96,"0000784CFFFF63")
180 CALL CHAR(97,"00001E32FFFFC6")
190 CALL CHAR(98,"307C74343C387070")
200 CALL CHAR(99,"7070383C34747C38")
210 CALL CHAR(104,"101038387C7C1010")
220 CALL CHAR(112,"FFFFFFFFFFFFFFFF")
230 CALL CHAR(120,"CCCC3333CCCC3333")
240 REM  DEF COLOURS
250 FOR I=1 TO 8
260 CALL COLOR(I,16,2)
270 NEXT I
280 CALL COLOR(12,9,16)
290 CALL COLOR(9,14,1)
300 CALL COLOR(10,3,1)
310 BST=0
320 PRINT TAB(8);"FOREST RALLYE"
330 PRINT TAB(7);"**************"::
340 PRINT "USE THE ARROW KEYS (ESDX) TO"::
350 PRINT "   DRIVE YOUR CAR THROUGH"::
360 PRINT "   THE FOREST. YOU WILL BE"::
370 PRINT "   PENALISED FOR LEAVING THE"::
380 PRINT "   FOREST OR HITTING TREES."::
390 PRINT "   PRESS ANY KEY TO BEGIN."
400 CALL KEY(0,K,S)
410 IF S=0 THEN 400
420 REM  SET UP SCREEN
430 CALL HCHAR(1,1,104,768)
440 FOR I=1 TO 10
450 READ A,B,C
460 CALL HCHAR(A,B,112,C)
470 NEXT I
480 FOR I=1 TO 11
490 READ A,B,C
500 CALL VCHAR(A,B,112,C)
510 NEXT I
520 RESTORE
530 M$="START"
540 RW=2
550 CW=2
560 GOSUB 1340
570 M$="FINISH"
580 RW=8
590 CW=5
600 GOSUB 1340
610 CALL HCHAR(7,2,120,3)
620 REM  INITIAL VARIABLES
630 R=4
640 C=4
650 X=1
660 Y=0
670 CD=96
680 CR=0
690 REM  SCAN KEYS
700 CALL KEY(0,K,S)
710 RE=R
720 CE=C
730 IF S=0 THEN 950
740 CALL SOUND(100,-2,3)
750 IF K<>69 THEN 800
760 Y=-1
770 X=0
780 CD=99
790 GOTO 950
800 IF K<>88 THEN 850
810 Y=1
820 X=0
830 CD=98
840 GOTO 950
850 IF K<>83 THEN 900
860 Y=0
```

Hints on conversion

Texas (TI) BASIC if fairly standard with two main exceptions. Single statement lines are used and sub-routines for graphics and sound are available, prefixed with CALL, as detailed below.

CALL CLEAR clears screen
CALL SCREEN defines screen colour
CALL CHAR defines a character with a 16-digit hex string from an eight by eight grid. Other machines will use a different method
CALL COLOR (character set, foreground, background) set colour of character
CALL HCHAR (row,column, character code, number of repeats) places character on screen at co-ordinates specified and optionally repeats character horizontally
CALL VCHAR similar to HCHAR but repeats character vertically
CALL GCHAR (row,column,variable) similar to a screen PEEK on other machines. Gives the ASCII code at the given screen co-ordinates
CALL SOUND (D,F,V) gives sound of duration D, frequency F and volume V. Three sounds can be produced at once.

Variables

R,C row, column of car
RE, RC erase row and column of car
X, Y decide direction of car
CD redefines car for different direction
CR number of crashes
BST best score

TI-99/4A PROGRAM

```
 870 X=-1
 880 CD=97
 890 GOTO 950
 900 IF K<>68 THEN 950
 910 Y=0
 920 X=1
 930 CD=96
 940 REM  MOVE CAR
 950 R=R+Y
 960 C=C+X
 970 IF (R>24)+(R<1)+(C>32)+(C<1)THEN 1240
 980 CALL GCHAR(R,C,OFF)
 990 CALL HCHAR(RE,CE,112)
1000 CALL HCHAR(R,C,CD)
1010 REM  CAR OFF TRACK
1020 IF OFF=112 THEN 700
1030 IF OFF=120 THEN 1100
1040 CR=CR+1
1050 CALL SCREEN(7)
1060 CALL SOUND(-400,-7,2)
1070 CALL SCREEN(2)
1080 GOTO 700
1090 REM  FINISH
1100 FOR I=110 TO 1100 STEP 110
1110 CALL SOUND(-400,I,1)
1120 NEXT I
1030 IF OFF=120 THEN 1100
1040 CR=CR+1
1050 CALL SCREEN(7)
1060 CALL SOUND(-400,-7,2)
1070 CALL SCREEN(2)
1080 GOTO 700
1090 REM  FINISH
1100 FOR I=110 TO 1100 STEP 110
1110 CALL SOUND(-400,I,1)
1120 NEXT I
```

```
1130 CALL CLEAR
1140 REM  SCORE COUNT
1150 IF (BST=0)+(BST>CR)THEN 1160 ELSE 1170
1160 BST=CR
1170 PRINT TAB(6);"YOU HIT ";CR;" TREES"::
1180 PRINT TAB(4);"BEST RUN SO FAR IS ";BST::
1190 PRINT TAB(7);"TRY AGAIN? (Y/N)":::
1200 CALL KEY(0,K,S)
1210 IF S<1 THEN 1200
1220 IF K=89 THEN 430
1230 IF K=78 THEN 1320 ELSE 1190
1240 FOR I=1100 TO 110 STEP -110
1250 CALL SOUND(-400,I,1)
1260 NEXT I
1270 CALL CLEAR
1280 PRINT "YOU DROVE OUT OF THE FOREST.":
1290 GOTO 1190
1300 DATA 4,4,9,3,14,6,4,21,9,8,27,3,12,20,
     6,9,16,3,16,16,13,22,14,15,20,7,5,15,
     4,2
1310 DATA 3,13,2,3,20,2,4,30,5,8,26,5,9,19,
     4,9,15,8,16,29,7,21,13,2,20,12,2,15,6
     ,6,8,3,8
1320 END
1330 REM  'PRINT AT' ROUTINE
1340 FOR I=1 TO LEN(M$)
1350 WD=ASC(SEG$(M$,I,1))
1360 CALL HCHAR(RW,CW+I,WD)
1370 NEXT I
1380 RETURN
```

WITH YOUR OCTOBER ISSUE OF

Personal Computing Today

FREE GIFT

THE PCT SHAPE MAKER

FREE GIFT

Want to design your own graphics characters but don't know how?

Then don't miss your FREE PCT SHAPE MAKER in our October issue. This specially designed grid tells you how to draw up your own individually created graphics characters on this PVC card.

You can make unlimited use of the PCT SHAPE MAKER because the card's surface can be written on and wiped off, once you have incorporated your character into your program.

To make your programs more visually exciting make sure to get your copy of PERSONAL COMPUTING TODAY.

On sale at newsagents from September 2.

Computerised balancing acts

Balancing your books and budget, that is. Our reviewers look at five financial programs for small businesses and the home

Homacc BBC B £19.95

Gemini Marketing, 9 Salterton Road, Exmouth, Devon

You always said you'd use your computer for something other than games, didn't you; things like keeping your bank account in order. Perhaps you even started to write a program yourself.

Well, if you really meant what you said, put your money where you mouth is and buy this.

You can set up a year of month by month budgets, then later on, put in the actual expenditure for comparison, have it plotted out, totalled and so on. It's all very idiot-proof and well presented, with a simple instruction leaflet to guide you.

There's a few improvements that could be made; for example, it can't deal with rebates (negative payments).

It's also very much on the pricey side, but then, one of its expenditure headings is computing!

B.J.

instructions	90%
playability	95%
graphics	85%
value for money	65%

★★★★

Personal Income Tax Newbrain £18.40

Grundy Business Systems, Somerset Road, Teddington, Middlesex TW11 8TD

The value of a package has to be in the eye of the beholder, or in this case, a Newbrain user. This one is now given away free with a new Newbrain — which is a very different matter from having to pay nearly £20 for it. My review is based on the assumption that you are buying it.

I'm not sure who this program is aimed at. It performs without apparent problems, but you have to do a lot of preparation work before you can use it. So perhaps there's a market for it in the busy offices of accountants, where junior clerks can do the spadework first.

It would certainly be a good idea to buy Money Which? from the Consumer Association at the same time. And if money is limited, then the Which? algorithms would be a better buy; at the end of the day you'd be more likely to have understood what you have submitted to your local tax office or financial adviser.

A.H.

instructions	60%
ease of use	60%
display	n/a
value for money	20%

★

Small Business Accounts 48K Spectrum £12.95

Sinclair Research, Stanhope Road, Camberley, Surrey

Assuming you make correct entries this program gives your current bank balance, profit and loss account, total debtors and creditors, balance sheet and your VAT return figures. And that's the end of the good news.

It can't tell you who owes you money, let alone how much or how long. You'll need some other way of finding this out, i.e. the manual system you are already using.

It's equally clueless about who you owe, so manual records for that, too. You're now doing duplicate entries and, since each entry needs a printer copy, buying lots of expensive paper.

Each profit and loss heading is coded on the purchase ledger but not on the petty cash — be prepared to make copious notes for your accountant.

Sale of assets ignores profit or loss on sale or depreciated value. VAT deduction on vehicles is not accepted — either lose the VAT on your commercial vehicles or note it elsewhere.

The total inflexibility of the system make the profit or loss figure more unreliable with each update.

D.C.

instructions	80%
ease of use	40%
display	n/a
value for money	10%

★

Sales Ledger and Purchase Ledger 48K Spectrum £24.95 each

Ramtop, 12 Milnthorpe Road, Burtonwood, Nr Warrington, Cheshire

Ramtop have three book-keeping programs for small businesses. Purchase Ledger can be used by all businesses for expenditure items. Sales Ledger is for businesses which issue invoices with sales. Sales Journal is for concerns such as shops which do not provide invoices. Each cost £24.95; the set of three will set you back £60.

I looked at two of them; as many of the comments I have to make apply to both this review covers the two together.

One 16-page manual covers all three programs. It is very difficult to use. The information given is very disjointed, it is limited in content and sometimes confusing.

As an example, the manual tells the user to stop the program and use the command RUN to clear data when starting a new file. It also recommends the user make certain program line changes. These are not actions I would expect to take with well-written software.

D.N.

instructions	20%
ease of use	20%
display	30%
value for money	10%

★

Home Account Spectrum £6.50

AM Electronics, 55 Welford Road, Blaby, Leicester LE8 3FT

Don't be misled by the title — this deals with your bank account only. What do you get? Firstly, a non-loading program, as instructions give wrong loading name.

Secondly, a headache! Example: "For credit values enter a negative value. Positive values are taken as debits". Got that?

You may think that £100 balance, plus £50 paid in, equals £150 balance but according to this program you must enter amounts paid in as 'minus', i.e. 100-50 = 150. A similar cheque entry becomes 100 + 50 = 50.

A seven-option menu includes automatic entry of standing orders, with prompts for date, seven-letter description and amount. It detects and verifies change in month name but happily accepts 4th ROM or 26th PIG, having no error check routine for real month name or order. So if no entries are made in July, it allows August to follow June and forgets the July standing orders.

With the bank check option, the convoluted instructions become mind boggling and could cause inadvertent entry or deletion of items, with disastrous consequences to the opening balance.

D.C.

instructions	30%
ease of use	50%
display	65%
value for money	50%

★★

How to hit the pools jackpot with your Spectrum

With the new soccer season about to start, David Nowotaik presents three programs for the 48K Spectrum which could help you win a fortune

Will 1983/84 be your season for a big win on the football pools? With the new season just starting, this article shows how you can use a 48K Spectrum to help you with that win.

Home computers can carry out thousands of calculations a minute. And that's just what you need to analyse the form of football clubs if you want to try and predict the outcome of games. **Listing 3** will do that for you.

However, those really big wins on the pools depend on the unpredictable happening — those games which are not expected to be drawn ending as score draws.

No computer can predict these results; you depend only on luck, picking numbers at random. For this, you don't really need a computer, but if you want to use your Spectrum (16K or 48K) you can us **Listing 1.**

When you RUN the program, first select the quantity of numbers you want between 1 and 55 (the number of matches on a football coupon), and the computer will list its choice of random numbers on the left side of the screen, then sort them, and print the sorted list on the right side.

If you want to increase your chances of winning a more modest amount, then Listings 2 and 3 should help you.

Listing 2 creates a data file for you, and deals with promotions and relegations between seasons. The data file so created is used by Listing 3 to predict the outcome of matches based on the form of clubs.

You will need to keep the data base up-to-date if the program is to have some reliability. This will mean devoting two-three hours per week entering results. If that hasn't put you off, then type in the two programs, SAVE them and I'll explain how they work.

RUN the program in Listing 2. It goes through all four divisions of the English league, then the three of the Scottish league, asking you to enter the names of the teams. Once you have entered all the names in one division you have the option to correct any mistakes.

Then the names are sorted into alphabetical order, and stored in the file. Once you've entered all the names, the program and data is stored on tape for use at the end of the season, when teams are moved between divisions in promotion and relegation.

When you re-load this program, it will automatically start in the promotion/relegation routine, and the on-screen instructions are self explanatory.

With the program and data file from listing 2 in your computer, MERGE the program in listing 3 into it. This effectively erases all the program lines of the file creation program, but keeps the data. This is now the prediction program. Start it with GOTO 10; the command RUN will erase all the data.

The prediction program is menu driven, with three main options.

The first allows you to enter results to maintain your data base. To enter results, select option 1 from the main menu, then select the league you require. All the teams in that league are shown on the screen. Enter the numbers alongside the home and away teams respectively, and the score. The score is entered as one number, e.g. enter 20 for a score of 2-nil.

The computer asks for confirmation that the information is correct. If yes, then the result is stored. The next question on the screen is "Any more?" If you want to enter more results from the same division enter yes, otherwise enter 'n'.

Try to enter results in chronological order, and keep your file up to date for reliability in the second option, the prediction of results.

When you select this option you first have to enter the 55 matches on the coupon. The instructions on the screen should be followed. Once all matches have been entered, the computer spends a few minutes doing lots of calculations.

Once complete, the computer prints out 20 matches on the screen in order of the most likely to result in a draw. The figures on the right hand side of the screen indicate the likelihood of a draw; the closer to zero, then the greater the chance of a drawn result.

At least, that's what the computer thinks.

Space does not permit an explanation of how the computer comes to its conclusion, so I leave you to work that out for yourself, if you wish. When all the 20 matches are displayed on the screen, pressing 'c' will give you a copy on the printer; pressing any other key returns you to the main menu.

The third option is to save the program and data. Use this when you have entered all the week's results and predicted next week's draws. When you re-load the program the following week, you are ready to start all over again.

You will need to have at least four matches played per team before you can start to predict results.

Therefore, enter results and save the data only for the first four weeks of the season. You'll be ready to start predicting draws (you hope!) in mid-September.

If you win using this program, send me your name and address, so I'll know where to send the begging letter!

Listing 1 — Lucky number generator

```
  10 REM Lucky Number Generator
  20 REM     by David Nowotnik
  30 REM        July, 1983
  40 REM
  50 PRINT AT 5,6; FLASH 1;"LUCK
Y NUMBER GENERATOR"
  60 PRINT AT 20,2;"How many num
bes do you want?"
  70 INPUT t
  80 IF t<1 OR t>16 OR t<>INT t
THEN GO TO 70
  90 DIM a$(55): DIM b$(t)
  95 CLS : PRINT AT 2,5;"O.K.- H
ere they are:"
 100 FOR i=1 TO t
 110 LET g=INT (RND*55)+1
 120 IF a$(g)<>" " THEN GO TO 11
0
 130 LET b$(i)=CHR$ g
 140 LET a$(g)="x"
 150 PRINT AT 4+i,5;g
 160 NEXT i: IF t=1 THEN GO TO 2
50
 170 FOR j=1 TO t
 180 FOR i=1 TO t-1
 190 IF b$(i)<b$(i+1) THEN GO TO
 220
 200 LET z$=b$(i): LET b$(i)=b$(
i+1)
 210 LET b$(i+1)=z$
 220 NEXT i: NEXT j
 250 PRINT AT 5,12;"Sorted:"
 260 FOR i=1 TO t
 270 PRINT AT 4+i,20;CODE b$(i)
 280 NEXT i
```

Listing 2 — File creation program

```
  10 REM Pools Forecast
  20 REM by David Nowotnik
  30 REM July, 1983
  40 REM
  50 REM File Creation Program
  60 LET pr=1
  70 DIM c$(7,14): DIM a$(130,25
): DIM q(8): DIM p$(12)
  80 FOR i=1 TO 12: LET p$(i)=CH
R$ 0: NEXT i
  90 LET e$=" Division"
 100 FOR i=1 TO 7: READ z$
 110 IF i<5 THEN LET z$=z$+e$
 120 LET c$(i)=z$: NEXT i
 130 DATA "1st","2nd","3rd","4th
","Scot Prem Div","Scots 1st Div
","Scots 2nd Div"
 140 FOR j=1 TO 8: READ q(j): NE
XT j
 150 DATA 1,23,45,69,93,103,117,
131
 200 REM Enter team names
 210 FOR i=1 TO 7: BORDER i: LET
 c=q(i+1)-q(i): IF pr=2 THEN GO
TO 400
 220 CLS : PRINT AT 2,9;c$(i);AT
 20,2;"Enter the team names"
 240 PRINT "(";c;" teams)"
 250 FOR j=1 TO c
 260 GO SUB 1000
 270 NEXT j
 280 PRINT AT 20,0;"     Is this
O.K.? (y/n)
                   "
 290 LET z$=INKEY$: IF z$="" THE
N GO TO 290
 300 IF z$="y" OR z$="Y" THEN GO
 TO 400
 310 IF z$="n" OR z$="N" THEN GO
 TO 330
 320 GO TO 290
 330 PRINT AT 20,3;"Enter the te
am number and the    team name, o
r 99 to stop"
 340 INPUT j: IF j=99 THEN GO TO
 400
 350 IF j<1 OR j>c OR j<>INT j T
HEN GO TO 340
 360 GO SUB 1000
 370 GO TO 340
 400 CLS : PRINT "Sorting into a
lphabetical order";,,TAB 12;"[redacted]
 410 FOR j=1 TO c: FOR k=0 TO c-
2
 420 LET y=q(i)+k: LET z=y+1
 430 IF a$(y)<a$(z) THEN GO TO 4
50
 440 LET z$=a$(z): LET a$(z)=a$(
y): LET a$(y)=z$
 450 NEXT k: NEXT j
 460 CLS : PRINT AT 2,9;c$(i): L
ET dd=4
 470 FOR j=1 TO c: IF j<=c/2 THE
N PRINT AT 3+j,2;a$(q(i)+j-1, TO
 12): GO TO 490
 480 PRINT AT dd,18;a$(q(i)+j-1,
 TO 12): LET dd=dd+1
 490 NEXT j
 500 PRINT AT 20,3;"Press any ke
y to continue"
 510 IF INKEY$="" THEN GO TO 510
 520 NEXT i
 530 CLS : PRINT "Place a blank
cassette into yourtape recorder.
"
 540 PAUSE 200
 550 SAVE "pools1" LINE 600
 560 CLS : PRINT "Program saved!
 Stop the tape."
 570 STOP
 600 CLS : PRINT AT 5,2;"Footbal
l Pool Prediction";AT 8,2;"Promo
tions and Relegations"
 610 PAUSE 100: DIM w(2)
 620 FOR i=1 TO 3
 630 GO SUB 2000
 640 NEXT i
 650 LET o=4: GO SUB 4000
 660 FOR i=5 TO 6
 670 GO SUB 2000
 680 NEXT i
 690 LET o=7: GO SUB 4000
 700 LET pr=2: GO TO 200
1000 INPUT z$: LET z$=(z$+"
                ")( TO 12)
1010 IF j<=c/2 THEN PRINT AT j+3
,0;j;TAB 3;z$: GO TO 1030
1020 PRINT AT j+3-c/2,16;j;TAB 1
9;z$
1030 LET a$(q(i)+j-1)=z$
1040 RETURN
2000 LET n=0: LET w(1)=q(i+1)-q(
i): LET w(2)=q(i+2)-q(i+1)
2010 FOR j=0 TO 1
2020 CLS : PRINT AT 2,9;c$(i+j)
2030 GO SUB 3000
2060 IF j=0 THEN GO SUB 2500
2070 IF j=1 THEN GO SUB 2600
2080 NEXT j
2090 RETURN
2500 INPUT "Enter the number of
teams          relegated ";nt
2510 IF nt<1 OR nt>4 OR nt<>INT
nt THEN GO TO 2500
2520 DIM y$(nt,12): DIM g(nt)
2530 FOR h=1 TO nt
2540 PRINT AT 21,0;"Enter team n
umber ";h
2550 INPUT z: IF z<1 OR z>w(1+j)
 OR z<>INT z THEN GO TO 2550
2560 LET g(h)=z: NEXT h
2570 PRINT AT 21,0;"Team numbers
 are ";: FOR h=1 TO nt: PRINT g(
h);" ";: NEXT h: PRINT "OK?"
2580 IF INKEY$="n" THEN PRINT AT
 21,0;"
                ": GO TO 2500
2590 IF INKEY$<>"y" THEN GO TO 2
580
2595 RETURN
2600 DIM v(nt)
2610 FOR h=1 TO nt
2620 PRINT AT 21,0;"Enter number
s of promoted teams"
2630 INPUT z: IF z<1 OR z>w(1+j)
 OR z<>INT z THEN GO TO 2630
2640 LET v(h)=z: NEXT h
2650 PRINT AT 21,0;"
                ";AT 21,0;"Te
am numbers are ";: FOR h=1 TO nt
: PRINT v(h);" ";: NEXT h: PRINT
 "OK?"
2660 IF INKEY$="n" THEN PRINT AT
 21,0;"
                ": GO TO 2600
2670 IF INKEY$<>"y" THEN GO TO 2
```

```
660
2680 FOR h=1 TO nt
2690 LET z$=a$(q(i)+g(h)-1)
2700 LET a$(q(i)+g(h)-1)=a$(q(i+
1)+v(h)-1)
2710 LET a$(q(i+1)+v(h)-1)=z$
2720 NEXT h
2730 RETURN
3000 FOR k=1 TO w(j+1)
3010 IF k<=w(1+j)/2 THEN PRINT A
T k+3,0;k;TAB 3;a$(q(i+j)+k-1, T
O 12): GO TO 3030
3020 PRINT AT 3+k-w(1+j)/2,16;k;
TAB 19;a$(q(i+j)+k-1, TO 12)
3030 NEXT k
3040 RETURN
4000 CLS : PRINT AT 2,9;c$(o)
4010 LET i=o: LET j=0: GO SUB 30
00: LET c=q(i+1)-q(i)
4020 INPUT "Enter the number of
changes ";nc
4030 IF nc=0 THEN RETURN
4040 IF nc>c THEN GO TO 4030
4050 FOR h=1 TO nc
4060 PRINT AT 21,0;"Enter number
 of team removed "
4070 INPUT tr: IF tr<1 OR tr>c T
HEN GO TO 4070
4080 PRINT AT 21,0;"Enter the na
me of the new team "
4090 LET j=tr: GO SUB 1000
4100 NEXT h
4110 PAUSE 100
4120 RETURN
```

Listing 3 — Prediction program

```
   10 REM Pools Forecast
   20 REM by David Nowotnik
   30 REM July, 1983
   40 REM
   50 REM Main Program
   60 REM
   70 DIM p$(31)
   80 BORDER 1: INK 0: PAPER 6: C
LS
   90 PRINT AT 3,2; PAPER 3;"  FO
OTBALL POOL FORECASTER "
  100 PRINT AT 6,5;"Select:"
  110 PRINT AT 10,8; PAPER 2;" 1.
 Enter results "
  120 PRINT AT 12,8; PAPER 4;" 2.
 Forecaster "
  130 PRINT AT 14,8; PAPER 5;" 3.
 Save file "
  140 PRINT AT 18,2; FLASH 1;"
    Press 1, 2, or 3          "
  150 REM
  200 GO SUB 250
  210 IF z$="1" THEN GO SUB 500
  220 IF z$="2" THEN GO SUB 2000
  230 IF z$="3" THEN GO TO 3000
  240 GO TO 80
  250 REM subroutines
  260 IF INKEY$<>"" THEN GO TO 26
0
  270 IF INKEY$="" THEN GO TO 270
  280 LET z$=INKEY$: LET z=CODE z
$-48
  290 RETURN
  300 PRINT AT 2,2;"
"
  310 PRINT : FOR i=1 TO 7: PRINT
 i;TAB 4;c$(i): NEXT i
  320 PRINT AT 20,4;"Press 1 to 7
"
  330 GO SUB 250: IF z<1 OR z>7 T
HEN GO TO 330
  335 LET t=z
  340 CLS : LET k=q(t): LET l=q(t
+1)-1: LET m=1+l-k
  350 PRINT AT 2,2;"Enter team( 1
 to ";m;" )"
  360 FOR i=1 TO m
  370 IF i<=m/2 THEN PRINT AT i+3
,0;i;TAB 3;a$(i+k-1, TO 12): GO
 TO 390
  380 PRINT AT i+3-m/2,16;i;TAB 1
9;a$(i+k-1, TO 12)
  390 NEXT i
  400 INPUT "Enter Home team numb
er ";ht: IF ht<1 OR ht>m THEN GO
 TO 400
  410 PRINT AT 18,2;"Home team =
";a$(k+ht-1, TO 12)
  420 INPUT "Enter away team numb
er ";at: IF at<1 OR at>m OR at=h
t OR at<>INT at THEN GO TO 420
  430 PRINT "    Away Team = ";a$(
k+at-1, TO 12)
  440 LET ht=ht+k-1: LET at=at+k-
1
  450 RETURN
  460 PRINT AT 18,0;: FOR j=1 TO
4: PRINT p$;
  470 NEXT j
  480 RETURN
  490 REM
  500 REM Enter results
  510 CLS : PRINT PAPER 2; INK 6;
"       Enter match Results
 "
  520 GO SUB 300
  530 INPUT "    Enter score ";z$:
IF LEN z$<>2 THEN GO TO 530
  540 LET x=CODE z$-48: LET y=COD
E z$(2)-48: IF x<0 OR x>9 OR y<0
 OR y>9 THEN GO TO 530
  550 PRINT " Score = ";x;" ";y;"
   Is this O.K? (y/n)"
  560 GO SUB 260: IF z$="n" THEN
GO TO 530
  570 IF z$<>"y" THEN GO TO 560
  580 FOR i=21 TO 13 STEP -1: LET
 a$(ht,i+3)=a$(ht,i): LET a$(at,
i+3)=a$(at,i): NEXT i
  590 LET a$(ht,13)=CHR$ at: LET
a$(at,13)=CHR$ ht
  600 LET a$(ht,14)="H": LET a$(a
t,14)="A"
  610 LET x$=CHR$ (16*x+y): LET a
$(ht,15)=x$: LET a$(at,15)=x$
  620 GO SUB 460: PRINT AT 18,10;
"Result Stored": GO TO 640
  630 GO SUB 460: PRINT AT 18,8;"
Result not stored"
  640 PRINT AT 20,6;"Any more? (y
/n)"
  650 GO SUB 260: IF z$="n" THEN
RETURN
  660 IF z$<>"y" THEN GO TO 650
  670 GO SUB 460: GO SUB 400
  680 GO TO 530
  690 REM
  700 REM
2000 REM Results Forecaster
2010 DIM w$(110): CLS
2020 PRINT AT 3,3; PAPER 1; INK
7;"   Results Forecaster    "
2030 PRINT AT 18,3;"First enter
 coupon matches": PAUSE 200
2040 LET tot=0: CLS : LET t=1
2050 GO SUB 340
2055 IF tot=0 THEN GO TO 2080
2060 FOR i=1 TO tot*2: IF w$(i)=
CHR$ ht OR w$(i)=CHR$ at THEN GO
 SUB 460: PRINT AT 18,4;"One tea
m previously entered": PAUSE 200
: GO SUB 460: GO TO 2130
2070 NEXT i
2080 PRINT "    Is this O.K.? (y/
n)"
2090 GO SUB 260: IF z$="n" THEN
GO TO 2050
2100 IF z$<>"y" THEN GO TO 2090
2110 LET tot=tot+1: LET w$(tot*2
-1)=CHR$ ht: LET w$(tot*2)=CHR$
at
2120 IF tot=55 THEN GO TO 2500
2130 GO SUB 460: PRINT AT 18,2;"
That was match no. ";tot
2140 PRINT "Any more from this l
eague? (y/n)"
2150 GO SUB 260: IF z$="y" THEN
GO SUB 460: GO SUB 400: GO TO 20
60
2160 IF z$<>"n" THEN GO TO 2150
2170 LET t=t+1: IF t>7 THEN GO T
O 2200
2180 GO TO 2050
2200 GO SUB 460: PRINT AT 18,3;
FLASH 1;" Error "; FLASH 0;"  th
ere are no more", "leagues!"
2210 PAUSE 200: PRINT PAPER 4;"
      Redo from the start      "
2220 PAUSE 200: RETURN
2500 CLS : PRINT AT 5,6;"All mat
```

SPECTRUM PROGRAM

```
ches entered"
2510 PRINT AT 10,1;"  Take 5 whi
le I look into"
2520 PRINT "      my crystal ball
!"
2530 DIM s(55)
2540 FOR i=1 TO 55
2550 DIM u(2): DIM o(2): LET o(1
)=CODE w$(2*i-1): LET o(2)=CODE
w$(2*i)
2560 FOR j=1 TO 2: LET u(j)=CODE
 a$(o(j),25): NEXT j
2570 LET pb=(u(1)-u(2))/(u(1)+u(
2))+.2
2580 LET pc=0
2590 FOR k=1 TO 2
2595 REM
2600 FOR j=13 TO 22 STEP 3
2610 REM
2620 GO SUB 4000
2630 NEXT j: NEXT k
2640 LET s(i)=ABS (pb+(pc/8))
2650 NEXT i
2660 DIM g$(55)
2670 CLS
2680 PRINT "The top 20 possible
draws are:"
2690 FOR i=1 TO 20
2700 LET z=10
2710 FOR j=1 TO 55
2720 IF s(j)<z AND g$(j)=" " THE
N LET y=j: LET z=s(j)
2730 NEXT j
2740 LET g$(y)="o"
2750 PRINT y;TAB 3;a$(CODE w$(2*
y-1), TO 12);a$(CODE w$(2*y), TO
 12);(INT (1000*s(y)))/1000
2760 NEXT i
2770 IF INKEY$="" THEN GO TO 277
0
2780 IF INKEY$="c" THEN COPY
```

```
2790 RETURN
3000 CLS : PRINT AT 2,2;"Save th
e program and data"
3010 SAVE "pools" LINE 10
3020 CLS : PRINT AT 4,7;"O.K. -
That's it": STOP
```

```
4000 LET sc=CODE a$(o(k),j+2)
4010 LET hg=INT (sc/16): LET ag=
sc-hg*16
4020 IF hg>ag THEN LET ot=1.2
4030 IF hg<ag THEN LET ot=-1
4040 IF hg=ag THEN LET ot=0
4050 LET pd=(u(k)-CODE a$(CODE a
$(o(k),j),25))/(u(k)+CODE a$(COD
E a$(o(k),j),25))
4060 IF a$(o(k),j+2)="A" THEN LE
T pd=-pd
4070 LET pd=pd+.2
4080 LET corr=ot-pd
4090 IF k=1 AND a$(o(k),j+2)="A"
 OR k=2 AND a$(o(k),j+2)="H" THE
N LET corr=-corr
4100 LET pc=pc+corr
4110 RETURN
```


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Access

The easy way to sprite-ly programming

Sprites are one of the features that make the Commodore 64 so popular. David Rees' Mapper makes them simple to construct

Create sprites on your Commodore 64 the easy way with my Sprite Mapper program which can also be used to design user defined characters.

When you are ready to use the program first change the screen to the background colours you will use with the sprite, then RUN the program.

During sprite creation a sprite will be used to demonstrate the actual appearance. So initially you are asked to define sprite size and colours.

How it works

40-250 initialise sprite to be displayed
300-430 draw grid
500-600 get characters, flash cursor
700-1020 determine key, take action accordingly
1100-1270 POKE your data to the screen and demonstration sprite
1500-1620 print out data and wait for key-press to end

```
5 V=53248:CL=PEEK(646)
9 REM*[CLS]
10 PRINT"■";
20 PRINT," *  SPRITE MAPPER  *"
30 PRINT,"     BY DAVID REES"
39 REM*[CRSR DWN]
40 PRINT"■PLEASE ENTER SPRITE MODE:(Y/N)■"
50 INPUT"MULTICOLOUR";A$
60 A=0:IF A$="Y" THEN A=1:GOTO80
```

```
70 IF A$<>"N" THEN 50
80 INPUT"EXPANDED-X ";A$
90 X=0:IF A$="Y" THEN X=1:GOTO110
100 IF A$<>"N" THEN 80
110 INPUT"EXPANDED-Y ";A$
120 Y=0:IF A$="Y" THEN Y=1:GOTO140
130 IF A$<>"N" THEN 110
140 INPUT"COLOUR 1";C1
150 IF A=0 THEN 200
160 INPUT"COLOUR 2";C2
170 INPUT"COLOUR 3";C3
180 POKEV+37,C2:POKEV+38,C3
200 POKEV+39,C1
210 POKEV,232:POKEV+1,60
220 POKEV+28,A:POKEV+29,X:POKEV+23,Y
230 FORN=0TO62:POKE16320+N,0:NEXTN
240 POKEV+21,1
250 POKE2040,255
299 REM*[CLS]...[BLK]
300 PRINT"■","    SPRITE MAPPER■"
309 REM*[RVS ON]
310 FORN=0TO25:PRINT"■ ";:NEXT:PRINT
318 REM*[RVS ON][BLK].[RVS OFF][CYN]..[BLK]
319 REM*[RVS ON].[RVS OFF]
320 A$="■ ■┌┐┌┐┌┐┌┐┌┐┌┐┌┐┌┐┌┐┌┐┌┐┌┐┌┐┌┐┌┐┌┐■■ ■"
330 IFA<>1THEN350
338 REM*[RVS ON][BLK].[RVS OFF][CYN]..[BLK]
339 REM*[RVS ON].[RVS OFF]
340 A$="■ ■┘└┘└┘└┘└┘└┘└┘└┘└┘└┘└┘└┘└┘└┘└┘└┘└■■ ■"
350 FORN=0TO20:PRINTA$:NEXT
359 REM*[RVS ON]
360 FORN=0TO25:PRINT"■ ";:NEXT:PRINT
370 POKE646,CL
399 REM*[HOME]...[CRSR DWN..8][CRSR LFT..3]
400 PRINT"■","■■■■■■■■■■■■↑SPRITE"
409 REM*[CRSR DWN..2]
410 PRINT"■■",,,"PRESS"
420 PRINT,,,"E FOR"
430 PRINT,,,"END. "
500 XX=0:YY=0:L=1105
510 LL=L+XX+YY*40
520 IFA$<>""THENZ=20
530 POKELL,255AND(PEEK(LL)+128)
```

The display then switches to a grid of 24 by 21 or, in multicolour, 12 by 21.

A cursor showing your drawing position can be moved in any direction using the cursor keys.

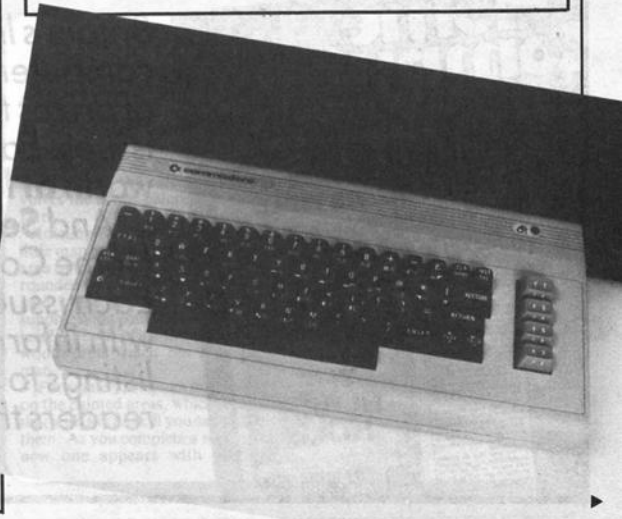
To draw simply press the number of the colour chosen. It will then fill the space on the grid and the demonstration sprite. Safeguards are provided so that the cursor does not move off the grid or draw the wrong colour.

When you have finished press E. Colour and byte data will fill the screen in the format of the *sprite (reading across, then* down).

As data fills the whole screen, after you have noted the figures press any key to end, as READY will appear and the screen will scroll up, blanking out data.

● All lines containing Commodore's special characters have a REMark before them giving the details in case they are difficult to recognise

```
540 FORT=0TOZ:NEXT
550 POKELL,255AND(PEEK(LL)+128)
560 FORT=0TOZ:NEXT
570 Z=180:GETA$:IFA$=""THEN520
580 GOSUB700
590 IFE=1THEN1500
600 GOTO510
699 REM*[CRSR RGT]
700 IFA$<>"■"THEN730
710 XX=XX+1+A:IFXX>23THENXX=23-A
720 RETURN
729 REM*[CRSR LFT]
730 IFA$<>"■"THEN760
740 XX=XX-1-A:IFXX<0THENXX=0
750 RETURN
759 REM*[CRSR DWN]
760 IFA$<>"■"THEN790
```



```
770 YY=YY+1:IFYY>20THENYY=20
780 RETURN
789 REM*[CRSR UP]
790 IFA$<>"□"THEN820
800 YY=YY-1:IFYY<0THENYY=0
810 RETURN
820 IF A$="E" THEN E=1
900 IF A$="0" AND A=1 THEN POKELL+1,32
910 IF A$="0" THEN POKELL,32:GOTO1100
920 IF A$="1" THEN POKELL,160
930 IF A$="1" AND A=1 THENPOKELL+54273,C1
935 IF A$="1" AND A=1 THENPOKELL+1,160
940 IF A$="1" THEN POKELL+54272,C1:GOTO1100
950 IF A=0 THEN RETURN
960 IF A$="2" THEN POKELL,160:POKELL+1,160
970 IF A$="2" THEN POKELL+54273,C2
980 IF A$="2" THEN POKELL+54272,C2:GOTO1200
990 IF A$="3" THEN POKELL,160:POKELL+1,160
1000 IF A$="3" THEN POKELL+54273,C3
1010 IF A$="3" THEN POKELL+54272,C3:GOTO1200
1020 RETURN
1100 IFA=1THEN1200
1110 S=PEEK(LL):P=-(S=160)
1120 PO=16320+INT(XX/8)+YY*3
1130 M=2↑(7-XX+INT(XX/8)*8)
1140 N=255-M
```

```
1150 POKEPO,(PEEK(PO)ANDN)+M*P
1160 GOTO710
1200 S=PEEK(LL):T=PEEK(LL+54272)AND15
1210 P=(S=160)*(2*(T=C1)+(T=C2)+3*(T=C3))
1220 PO=16320+INT(XX/8)+YY*3
1230 Z=4↑(3-(XX-INT(XX/8)*8)/2)
1240 M=Z+2↑(7-((XX-INT(XX/8)*8)AND14))
1250 N=255-M
1260 POKEPO,(PEEK(PO)ANDN)+Z*P
1270 GOTO710
1499 REM*[CLS]
1500 PRINT"□ SPRITE DATA";
1510 PRINT" COLOURS USED WERE:"
1520 PRINT,"1:";C1,"2:";C2,"3:";C3
1530 IFA=1THENPRINT"SPRITE WAS IN MULTICOLOUR"
1540 PRINT"GRAPHICS DATA FOR SPRITE"
1550 FORY=0TO20
1560 FORX=0TO2
1570 PRINTPEEK(16320+X+Y*3),
1580 NEXTX
1590 IFY<20THENPRINT
1600 NEXTY
1610 POKEV+1,150
1620 GETA$:IFA$=""THEN1620
```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Get going with some action games

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Subs Jupiter Ace plus 16K £6.50

JRS, 15 Wayside Avenue, Worthing, Sussex BN13 3JJ

Full marks (well...almost!) for a really imaginative opening sequence of aquatic graphics, designed to establish the submarine location of the subsequent action, although perhaps it was not such a good idea to repeat it before every game.

There is nothing to tell you how to start the game (press any key, actually) and if you do nothing the super graphics just go on... and on.... and on!

The game? "Destroy the enemy ships with your torpedoes but beware of depth charges," says the blurb and says it all.

There is only one playing speed — sub-aqua moderato — and the sound background just goes on regardless of the zaps, which one should be signalled somehow audibly as well as visually.

Still, it's quite a pleasant game with some claims to originality, which is certainly a plus. It's good for find an application which is not simply a straightforward translation into Forth of the old familiar munchipakvaders stuff.

G.M.

instructions	75%
playability	70%
graphics	90%
value for money	80%

★ ★ ★ ★

Tank Atak Commodore 64 plus joystick £9.20

Supersoft, Winchester House, Canning Road, Wealdstone, Middlesex HAS TSJ

Tank Atak is a version of the arcade favourite Battlezone, adapted for the 64 and with many of the features of the original.

A distant mountain range can be seen through a tanks gun sights. The cross hairs can be moved using the joystick to aim at the enemy vehicles. Only a direct hit on the turrets of the enemy tanks when they are in range will destroy them.

Enemy forces come in four types. The basic enemy is a green tank which will attempt to run for cover before turning to fire. Blue command tanks will come straight as you, and must be hit quickly. Each of these is accompanied by a harmless reconnaissance saucer which is worth bonus points.

Survive ten attacks and you go to the next wave, with a chance of hitting the flagship for a large bonus. Sound and graphics are used to the full in this imaginative game, which makes an interesting change from the usual hectic shoot-out.

D.A.

instructions	70%
playability	69%
graphics	85%
value for money	69%

★ ★ ★ ★

Sniper Dragon-32 plus joystick £6.50

Soft Joe's, Business Centre, Claughton Road, Birkenhead, Merseyside

This tape offers a high-res apartment block with 'targets' popping up at the windows. You, the sniper, are armed with a joystick controlled gunsight-and take pot-shots. You lose lives if you miss within the time limit for each target.

There are two major drawbacks to this game. Firstly, the so-called "smart" targets are disappointing blobs. An "ultimate" version (to quote the blurb) might surely be expected to have something more realistic or interesting.

Secondly, the control of the gunsight, although smooth, was a little too slippery. It was the same sensation as trying to control the little ball in one of those hand-held puzzles which rolls around and never quite goes where you want it to. Perhaps with a self-centering joystick I might have done better.

At the start you are given the choice of novice or expert and at the end you are given an assessment — quite amusing at times.

On the whole I found it very frustrating and unrewarding. What looked like an initially good graphic presentation failed to create any interest.

M.P.

instructions	90%
playability	40%
graphics	50%
value for money	50%

★ ★ ★

Persac/Blitz TI-99/4A £4.99

Pasesoft, 213-215 Market Street, Hyde, Cheshire

Persec, not to be confused with the TI cartridge called Parsec, is a game in which you have to defend the earth from an alien invasion.

An invader, intent on destroying earth and all in his way, randomly moves to the left and right firing at earth and your base as he proceeds down the screen. Zap him and his followers to score and beat the invasion.

If an invader lands I think the earth is destroyed. But how effective this is I cannot say, as the program crashes at this point.

Blitz (screen title Alien Sabotage) is yet another game on the destruction theme. As a pilot of a crippled alien craft it is your task to clear a landing strip in a built up area in order to land safely. By using two keys alternately to fire I was able to land every time.

The screen playing instructions for both games are clear and concise. Screen display and sound are good, but I lost interest in both games as there is no increase in degree of difficulty and play became repetitious.

C.E.

instructions	95%
playability	50%
graphics	70%
value for money	50%

★ ★ ★

Slap Dab VIC-20 £6

Anirog, 8 High St, Horley, Surrey

In the constant search for the scenarios, programmers seem to have seized on almost any type of plot. One of the recent types involves the act of painting in some form.

In simple terms, you control a little man and try to paint a square area of the screen. This area is surrounded by a border apart from a gate where you refill your paint supply. What could be simpler? Or is it? The act of painting disturbs woodworms which run after the man.

Fortunately, they can only move on the painted areas, which means that with a little skill you can evade them. As you complete a screen, a new one appears with nastier worms. And so you go on until you run out of lives.

This is a nice original game will good graphics and sufficiently difficult to satisfy anyone. The price is right and I recommend this game as a good buy.

A.W.

instructions	65%
playability	80%
graphics	90%
value for money	90%

★ ★ ★ ★

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KB/JS VIC 20 16K £7.90

SLAP DAB

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Brilliant multi-colour graphics, expanded screen, lift, rolling barrels, ladders, running score/Hi-score and not to forget the hand bag bonus in this all M/C presentation.

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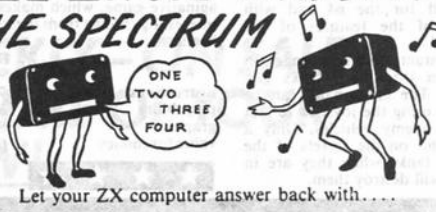

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Ski to a victory tune . . . or to a waiting ambulance

Slalom packs a lot into the unexpanded VIC-20, thanks to the way Mike Roberts has written his two-part program. There's seven skill levels, hi-res graphics, sound and music

Variables (part 2)

V volume register
V1,V3 music voices one, three
T 22 constant
JS left side of course marker
N number of course sections
H number of elements of g$()
K keyboard PEEK location
M 8 constant for keyboard
P 200 constant for sound
R scReen start-1 constant
W 20 constant
G%,G$ arrays for flag positions, course graphics
D$ spaces
B$,P$ blank line, thin line
U 14 constant for finish
C$ course line with flag on temporary
C man's colour map location
L man's screen Location
S Space constant
Z one constant
Y Y position of man
Q far right of course constant
L%,R% left, right movement constant
T% number of flags constant
F% skip line constant
A%,B%,E%,D% parts of man
A,I,A$ temporary variables
G counter of number of crashes
B temporary variables for ambulance

The object of Slalom is to guide your skier down the slope, skiing around flags to the finish.

Colliding with flags yields penalty points, as does going around flags in the wrong direction. If you crash three times into the flags, arrows or the markers at the side of the slope you get driven to hospital in an ambulance.

The game has seven skill levels, high resolution colour graphics and sound, plays music, and (if REMS are removed) fits on a basic 3.5K VIC-20.

The game is in two parts. It is best to save the programs on tape in sequence, as one program loads the other.

Part one displays the instructions, writes the graphics and music data into reserved memory, then loads and runs the second program. Line 10 of program 1 checks to see if all 160 items of data have been typed in correctly as otherwise it can be hard to detect errors in lines and lines of data.

Part two is the actual game. The skier is guided by using the INST/DEL key to move right, and the left arrow key to move left. If no key is pressed then the man will travel in a straight line down the slope.

You must go around the posts in the direction of the arrows or 10 penalty points are added to your score. Points are also deducted for a bad start or finish.

When the game starts you are given the option of seeing the course and then that of changing it for another course.

Happy skiing . . . and remember there is always an ambulance waiting to carry your body off for some other mug to try his skill on the slopes!

How it works (part 1)

10-15 check character and music data
100-255 instructions
260-290 choose skill level
300-310 check level entered is within limits and store it
800 reserve memory for characters and music data
810 read and store character and music data
850 load and run Slalom part 2
960-1120 data for 16 user-defined characters
1200-1210 data for The Yellow Rose of Texas music

How it works (part 2)

0 skip main movement routine
1-2 erase and reprint skier
3 print broken skis after crash
4-6 key input routine
7-90 set up variables
100-172 create course array in G$
180-190 view course?
200 display course
205 change course
220 print start banner, course
250-255 play The Yellow Rose of Texas
280 print start of slope
290-380 main loop: prints slope, checks movement/crashes
440-465 end, display score, high score etc
467 print man in final position
470-480 encore?
500-620 ambulance movement routine

Part 1 — instructions, data for graphics and music and loads and runs part 2

```
1 REM** SLALOM PT1      MIKE ROBERTS 1983 **
5 REM** CHECK DATA **
10 FORI=1TO159:READA:B=B+A:NEXT:IFB<>10633THENPRINT"ERROR IN DATA":STOP
15 RESTORE
99 REM** INSTRUCTIONS **
100 POKE36879,25:PRINT"■■■
```

VIC-20 PROGRAM

Part 2 — the main game program

```
0 GOTO7:REM** SLALOM PT2      MIKE ROBERTS 1983 **
1 POKEC,O:POKEC-Z,O:POKEC+Z,O:POKEC+T,O:REM** MOVE MAN ROUTINE **
2 POKEL,A%:POKEL-Z,B%:POKEL+Z,E%:POKEL+T,D%+D:RETURN
3 POKEL-E-Z,S:POKEL-E,S:POKEL-E+Z,S:POKEL-E+T,S:RETURN
4 POKE198,0
5 GETA$:IFA$=""THEN5
6 RETURN
7 V=36878:V1=V-4:V3=V-2:T=22:J$="■■■■■■■■ ":N=10:H=31:K=197:M=8:F=200:PRINT"□
9 REM** SET UP VARIABLES **
20 R=7679:W=20:DIMO%(16),O$(H):D$="■   ":B$="■                    ":F$="_____
_____
40 POKEV1,O:U=14:C$="■■■"+B$+J$:C=30498:L=7778:S=160:POKE36869,255:Z=1:V=7:Q=17
50 O$(Q)=B$+"■"+F$+"\":O$(N)=D$+"| F I N I S H |
70 O$(19)=D$+"/"+F$+"4":O$(W)=D$+"|"+LEFT$(B$,U)+"|
80 L%=21:R%=23:T%=151:F%=44:FORI=ZTO2:O$(H+I)=O$(W):NEXT:FORI=ZTO3
90 A%=50:B%=51:E%=52:D%=54:O$(T+I)=LEFT$(B$,4-I)+"/"+LEFT$(B$,U+I*2)+"■■■■■":N
EXT:F$="
99 REM** SET UP COURSE **
100 G%(F)=T:FORI=ZTOU:G%(I)=INT(RND(Z)*PEEK(Z))+PEEK(O):IFATHENG%(I)=16-G%(I)
110 A=F:IFO%(I)<=VTHENA=Z
150 NEXT:O$(F)=C$:FORI=ZTOU:A$="0":O$="■":IFO%(I)<=VTHENA$="1":O$="■
170 A$="■"+LEFT$(B$,O%(I)*Z)+O$+"■■"+A$+A$+O$+"■■
172 O$(I)=A$+LEFT$(B$,25-(LEN(A$)-4))+J$:NEXT:O$(T%)=C$:O$(16)=C$
179 REM** OPTIONS **
180 PRINT"■■DO YOU WANT TO SEE THE      COURSE
190 GOSUB4:IFA$<>"Y"THEN220
200 FORI=FTOT%:FORJ=FTOU:PRINTC$:NEXT:PRINTO$(I):NEXT
205 PRINTC$:PRINTC$:PRINT"■■CHANGE THE COURSE(Y/N)":GOSUB4:IFA$="Y"THENRUN
209 REM** PRINT START BANNER **
220 PRINT"□"O$(Q):PRINTD$"|  S T A R T  |":FORI=19TO25:PRINTO$(I):NEXT:GOSUB1
229 REM** MUSIC **
250 POKEV,T%:FORI=OTO28STEP2:A=PEEK(7648+I):POKEV3,A
255 A=PEEK(7648+I+Z)*2:FORJ=OTOA:NEXT:POKEV3,O:NEXT
260 FORI=OTO11:PRINTC$:NEXT
289 REM** MAIN LOOP **
290 E=T:X=9:PRINTO$(O):FORR=ZTOH:IFACNTHENFORB=OTOT%:PRINTC$
340 X=X+D:GOSUB3:E=T:L=L+D:C=C+D:GOSUB1:J=PEEK(K):D=O:IFJ=VTHEND=-Z
345 C%=O:IFPEEK(L+L%)<>SORPEEK(L+R%)<>SORPEEK(L+F%)<>STHENC%=Z:GOTO500
350 IFJ=VTHEND=Z
365 IFA>OTHENPRINTO$(A):E=T:NEXT:GOTO440
370 NEXT:POKEV3,P:IF(G%(A-Z)<=VRNDX>G%(A-Z))OR(G%(A-Z)>=VRNDX<G%(A-Z))THENF=F+Z
380 PRINTO$(A):E=F%+(A=Q)*T:POKEV3,O:NEXT
399 REM** END **
440 F=F-3:PRINT"■■■ YOU HAD"F"FAULT";:IFF<>ZTHENPRINT"S";
460 PRINT:IFF<=PEEK(R)THENPOKER,F:PRINT"■■■AND A NEW HIGH SCORE
465 PRINT:PRINT"■■HIGH SCORE IS NOW"PEEK(R)
467 IFC%=OTHENL=L+66:C=C+66:GOSUB1
470 PRINT"■■■■ ANOTHER TRY (Y/N)":GOSUB4:IFA$<>"N"THENRUN
480 PRINT"□":POKE36869,240:END
499 REM** AMBULANCE **
500 F=F+5:POKEL+LX,59:POKEL+T,57:POKEL+RX,58
502 POKEV-Z,220:FORI=15TOOSTEP-Z:POKEV,I:FORD=ZTO75:NEXTD,I:POKEV-Z,O:POKEV,T%
505 FORI=OTO500:NEXT:G=G+Z
507 IFG<3THENPOKEL+LX,S:POKEL+RX,S:D=SGN(9-X):GOSUB3:GOTO365
510 A=-(XOO):B=X:GOSUB610
520 POKEL-T,191:POKEC-T,2:FORI=OTO1000:NEXT:POKEL-T,161:FORI=OTO1000:NEXT:POKEL
-T,S
530 A=X:B=19:GOSUB610
540 PRINTTAB(I)"■   ■■■■■  ":GOTO465
600 POKEV3,((NOT1)ANDZ)*P:POKEV1,(IANDZ)*P:FORJ=OTO100:NEXT:RETURN
610 POKEV,T%:PRINT"■■■■■■";:FORI=ATOBSTEPSGN(B-A):PRINTTAB(I)"■■ ■.-■■■■■ ■./□■
■■■"
620 GOSUB600:NEXT:POKEV,0:RETURN
```


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Adventures past and future

Times change, but adventures seem to go on for ever. Here our intrepid reviewers set off into time and space in search of star ratings for you

Smugglers Cave
48K Spectrum
£6.95

Quicksilva, 13 Palmerston Road, Southampton SO1 1LL

With a Yo ho ho, it's away we go to the Cornish coast in 1753 where, as a revenue officer, you are searching the caves for the treasure of Captain Blackbeard.

It is much the same format as most adventures on the market nowadays — the screen is split with a drawing, in this case a line sketch, at the top and the instructions at the bottom.

The English is the classic Robert Newton style with lots of Ee's and 'baints and whilst the problems are not too difficult, certainly set you thinking. I must point out though, that in the limited time. I only got a little way into the game.

The response time to commands was good, no doubt because of the machine code, and didn't leave you waiting around while the machine thought about it.

For anyone who likes adventure, this is a game that they will certainly enjoy, though the articles seem to be set in the same place each time, so once solved, the game is easy to run through again. Still, very enjoyable while it lasts.

N.B.

instructions	90%
playability	100%
graphics	80%
value for money	95%

★★★★★

Xadom
48K Spectrum
£6.95

Quicksilva, 13 Palmerston Road, Southampton SO1 1LL

Your mission is to enter the alien base and recover the Aartifact. You may not take any weapons or other objects with you but must rely on what you find there. On your wanders round the base, you will come across various aliens and traps, and you have limited power reserves.

The game employs excellent 3D graphics and involves you taking your little figure around either 20, 100 or 200 rooms to find the Aartifact, depending how long you want to play, and avoiding the deadly traps and aliens you encounter which seem to be set up randomly each time you play the game.

The program uses a very friendly style from the moment it is run. It asks for your name so that it can speak to you on a more personal level, and gives you the opportunity of swapping the usual cursor keys with a set comprising of Z,X,L and Symbol Shift, which are far more convenient to use.

There is also a help menu which is genuinely helpful while not giving anything away. You can also alter the speed during the play of the game.

The only thing I found slightly annoying was the screen display when you lose a life. This is fine for the first five times but tend to get a bit slow after that.

N.B.

instructions	100%
playability	100%
graphics	100%
value for money	100%

★★★★★

Colossal Adventure
32K Atari 400/800
£9.90

Level 9 Computing, 229 Hughenden Road, High Wycombe, Bucks HP13 5PG

This has to be the bargain of the year.

If you are an adventurer, chances are that you will have ventured into the father cave of them all, Colossal Cave. As the name suggests, this is a recreation of that same adventure game — but whereas the original was a 64K Fortran program, this if for the 32K Atari.

Nevertheless, it is as far as I can tell a near-perfect copy of the original, with the added bonus of an extra 70 rooms at the end-game.

You start the game near a well house, and from there you must set out to try and find the treasures and bring them back.

You get a full instruction book, and an envelope for a reply to one question if you get stuck.

The game responds quickly and is (for once) nearly free of spelling mistakes. If adventures are your game, then this is your adventure — at an incredible price.

M.F.

instructions	95%
playability	95%
graphics	n/a
value for money	99%

★★★★★

Demon Knight
48K Spectrum
£9.99

ASP Software, 145 Charing Cross Road, London WC2

I love Adventure, but I'm a rabbit — unless it's someone else's game, where my uninvited suggestions are invariably brilliantly correct.

This is a text-only Adventure and, excepting Help, Quit and Inventory, requires two-word commands.

The screen describes Location, Visible Objects and Obvious Exits, hinting Invisible or Unobvious ones. You are carrying and wearing nothing — hope it doesn't rain.

Starting outside a Massive Portcullis, which defies all attempts to climb or tunnel under, and foced in the only available direction, you are soon wandering dusty paths, amid rotting rubbish — this is not a clean adventure — collecting items to kill the Demon Knight and rescue the inevitable Princess. Female players note mandatory sex change.

Help occasionally gives cryptic clues. Exits seem (note the word) to allow forward or back. Reaching Location 5, which apparently only backtracts, I spent considerable time, staggering between One and Five, using all objects and my clearly pitiful intelligence to no avail.

D.C.

instructions	90%
ease of use	90%
display	75%
value for money	70%

★★★★

Blue Dragon
32K BBC £7.48

Reviewing adventure games is always a problem. Like the questions on Mastermind, they are easy if you know the answers and difficult if you don't! Therefore all that reviewers can really do is to point out what they subjectively feel to be their virtues and weaknesses, and remember that one man's meat is another man's poison.

This is a traditional text only adventure with all the magic, witches, dragons etc. one usually expects of such programs. In fact if I had one criticism it would be that it doesn't take the idea of adventures any further along the road.

Since it's written entirely in machine code, there are a large number of locations and the response of the computer is very fast indeed.

The range of commands is extensive, and there are some areas where you must choose only one of a suggested pair of responses. You tend to make your mistakes only once — it's no fun being a frog!

The clues range from the obvious to the subtle and I'm reliable informed that there is a fiendishly difficult maze near the finish of the game.

The screen display is attractive and uncluttered with a good use of colour.

D.C.

instructions	80%
playability	90%
graphics	n/a
value for money	85%

★★★★

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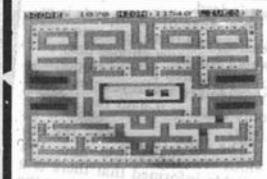

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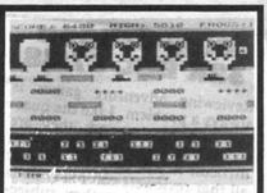

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Eyes down ... for a game of computer bingo

All the family can join in David Nowotnik's Spectrum bingo program. It produces bingo cards as well as 'calling' the numbers. And it's easy to convert for the ZX81

How it works

100-160 fill b array
200-270 main title, create storage variables
500-520 increment card counter, set card headings
1000-1080 fill array a(9) with numbers between 1 and 3, so total equals 15. This sets the total of numbers in each column
1090-1260 fill each column in turn with random numbers valid for what column, sort into numerical order
1270-1440 arrange numbers so there are five per row
2000-2150 print matrix of numbers on screen
2160-2240 draw 9 × 3 boxes which enclose numbers
2250-2295 place numbers in a file, for checking later
2310-2350 copy card on the printer
2370-2400 another card?
3000-3120 start the game — print heading, and array of 90 numbers
3150-3190 check for keypres and respond
3200-3300 select a random number, print on screen, using FLASH and BEEP to alert caller
4000-4125 house called. Input 'line' or 'full house', and card number
4130-4225 check to see if 'house' call is correct
5000-5090 check to see it 'line' call is correct
6000-6130 print result of the check

Eyes down and look in — here's a program which will allow all the family to play a game of bingo at home.

You'll need a Spectrum (16 or 48K) with a printer. You need the printer as the program will produce bingo cards for you.

The program is written so as to be easy to convert for use on the ZX81. But, more on that later.

When you RUN the program, the computer will display a bingo card on the screen. Each card will contain two blocks of 15 numbers, chosen at random within the constraints set by the requirements of a bingo card.

That is, you must have the 15 numbers in a matrix of nine columns and three rows. There must be at least one number per column, and numbers are sorted so that there are five numbers per row.

If there is more than one number in a column, they appear in numerical order down the column. There are two blocks of numbers per card.

Once the card drawing routine on the screen is finished, a copy of it is dumped on the printer to be used by one player. This can be repeated until you have at least one card for each player.

An example of a card is shown in **figure 1.**

Once you have all the cards you need, you can start the game. All the numbers available to be called (1 to 90) are displayed on the screen.

As the game progresses this acts as a reminder of the numbers called, as the numbers called will appear in a different colour.

One member of the family has to act as caller; he/she presses a key, a number is displayed, and he or she has to tell the others the number.

In case you're unfamiliar with the game, the object is to cross out numbers as they appear. When all the numbers in one row have been crossed out you call bingo, or house (or anything you like!) to let the caller know you claim to have won the first part of the game.

The caller will check your entry be pressing the h key. The computer will ask whether to check for a line or full house (enter l or f), and the card number. Enter the number at the top right of the card.

The computer checks your calls and, if correct, you win that part of the game. You then go on to full house. Here the object is to be the first to strike out all 15 of the numbers in one of the two boxes on your card. Again, the computer will check your call.

One problem you may have is in marking the bingo card.

ZX Printer paper appears resistant to ballpoint pens and pencils, and only certain types of felt tip marker pens appear to work on it.

To make the game more interesting, you could have a wager, or offer a prize. That's all right if it's kept in the family, but you have to obtain a licence if you want to use the game for profit or a charitable cause. ▶

Figure 1 — what the bingo cards look like

		23	31	42		63		83
	13	29			51	65	75	
2	16				52		76	87

	15		35		51	63	70	
			38	44	56		74	82
6		22		49		68		89

```
  100 DIM b(9,2)
  110 LET z$="090110101020103010401050106010701180"
  120 FOR i=1 TO 9
  130 LET b(i,1)=VAL z$(i TO 2)
  140 LET b(i,2)=VAL z$(3 TO 4)
  150 LET z$=z$(5 TO )
  160 NEXT i
  200 INK 0: PAPER 5: BORDER 5: CLS
  210 PRINT AT 10,9;"COMPUTER BINGO"
  220 PRINT AT 15,0; INK 1;"Press a key for your first card"
  230 IF INKEY$="" THEN GO TO 230
  240 RANDOMIZE
  250 LET z$=""
  260 INK 1: PAPER 5: BORDER 2
  270 LET n=0
  500 CLS
  510 LET n=n+1
  520 PRINT " Computer Bingo     Card No. ";n
 1000 REM Set up a bingo card
 1005 FOR h=0 TO 1
 1010 DIM a(9)
 1020 LET x=0
 1030 FOR i=1 TO 8
 1040 LET a(i)=INT (RND*11/5)+1
 1050 LET x=x+a(i)
 1060 NEXT i
```

Main variables

a(9) used for generating a random number in each column. b(i,1) is the range of numbers, and b(i,2) is the start of range in column i
c(9,3) the matrix of one bingo card
i,j,k,h loop counters
n the number of cards issued
t$(90) holds the 'flags' on whether or not a number has been called
z$ the file of numbers in every card

Hints on conversion for ZX81 etc

The program is almost entirely written as one statement per line for easy conversion. Obviously, the Spectrum commands INK, PAPER, FLASH, and BEEP have to be ommitted as will the high resolution line drawing routine, lines 2160 to 2240.

Lines 3250 to 3300 cause a colour change in the number display to indicate which numbers have been called.

This is carried out by POKEing the attribute file. For the ZX81, you will have to convert this routine to over-print the number in inverse characters.

```
1070 IF x>14 OR x<12 THEN GO TO
1020
1080 LET a(9)=15-x
1090 DIM c(9,3)
1100 FOR i=1 TO 9
1110 FOR j=1 TO a(i)
1120 LET c(i,j)=INT (RND*b(i,1))
+b(i,2)
1130 IF j=1 THEN GO TO 1160
1140 IF c(i,1)=c(i,2) THEN GO TO
1120
1150 IF j=3 AND c(i,3)=c(i,2) OR
c(i,3)=c(i,1) THEN GO TO 1120
1160 NEXT j
1170 IF a(i)=1 THEN GO TO 1260
1180 FOR j=1 TO a(i)-1
1190 FOR k=1 TO a(i)-1
1200 IF c(i,k)<c(i,k+1) THEN GO
TO 1240
1210 LET y=c(i,k)
1220 LET c(i,k)=c(i,k+1)
1230 LET c(i,k+1)=y
1240 NEXT k
1250 NEXT j
1260 NEXT i
1270 FOR i=3 TO 2 STEP -1
1280 LET x=0
1290 FOR j=1 TO 9
1300 IF c(j,i)<>0 THEN LET x=x+1
1310 NEXT j
1315 IF x=5 THEN GO TO 1410
1320 FOR k=x TO 4
1330 LET y=INT (RND*9)+1
1340 IF c(y,i)<>0 THEN GO TO 133
0
1350 IF c(y,i-1)=0 THEN GO TO 14
00
1360 LET c(y,i)=c(y,i-1)
1380 LET c(y,i-1)=0
1390 GO TO 1430
1400 IF c(y,1)=0 THEN GO TO 1330
1410 LET c(y,i)=c(y,1)
1420 LET c(y,1)=0
1430 NEXT k
1440 NEXT i
2000 REM print card
2100 FOR i=1 TO 9
2110 FOR j=1 TO 3
2120 IF c(i,j)=0 THEN GO TO 2140
2130 PRINT AT h*10+j*2+3,3*i;c(i
,j)
2140 NEXT j
2150 NEXT i
2160 FOR i=1 TO 4
2170 PLOT 20,76-h*80+i*16
2190 DRAW 216,0
2200 NEXT i
2210 FOR j=1 TO 10
2220 PLOT j*24-4,140-h*80
2230 DRAW 0,-45
2240 NEXT j
2250 FOR j=1 TO 5
2260 FOR i=1 TO 9
2270 IF c(i,j)=0 THEN GO TO 2290
2280 LET z$=z$+CHR$ c(i,j)
2290 NEXT i
2295 NEXT j
2300 NEXT h
2310 COPY
2320 LPRINT
2330 LPRINT
2340 LPRINT
2350 LPRINT
2360 CLS
2370 PRINT AT 5,5;"Another Card
(y/n)?"
2380 IF INKEY$="n" OR INKEY$="N"
THEN GO TO 3000
2390 IF INKEY$="y" OR INKEY$="Y"
THEN GO TO 500
2400 GO TO 2380
3000 INK 0: PAPER 4: BORDER 4: C
LS
3010 PRINT AT 10,9;"COMPUTER BIN
GO"
3020 PRINT AT 15,1; PAPER 2; INK
6;"  Get ready to start a game
"
3030 DIM t$(90)
3040 PAUSE 200
3050 INK 0: PAPER 6: BORDER 3: C
LS
3060 PRINT "          Computer Bi
ngo"
3080 FOR i=0 TO 6
3090 FOR j=1 TO 10
3100 PRINT AT i*2+2,j*3-2;j+i*10
3110 NEXT j
3120 NEXT i
3150 PRINT AT 21,0; INK 6; PAPER
1;"Press any key-h for house ca
lled"
3160 LET x$=INKEY$
3170 IF x$="" THEN GO TO 3160
3180 PRINT AT 21,0;"
"
3190 IF x$="h" OR x$="H" THEN GO
TO 4000
3200 LET m=INT (RND*90)+1
3210 IF t$(m)="x" THEN GO TO 320
0
3220 LET t$(m)="x"
3230 PRINT AT 21,4; PAPER 1; INK
7;" The next number is "; FLASH
1;m; FLASH 0;" "
3240 BEEP .5,1: BEEP 1,-2: PAUSE
100
3250 LET d=INT ((m-1)/10): LET v
=m-10*d
3260 LET k=22590+d*2*32+v*3
3270 POKE k,150: POKE k+1,150
3280 PAUSE 200
3290 POKE k,23: POKE k+1,23
3300 GO TO 3150
4000 PRINT AT 21,5; FLASH 1;" HO
USE CALLED"
4010 INPUT "A Line or Full house
";x$
4020 IF x$(1)="l" OR x$(1)="L" T
HEN GO TO 4040
4030 IF NOT (x$(1)="f" OR x$(1)=
"F") THEN GO TO 4010
4040 INPUT "Enter card number ";
w$
4050 FOR i=1 TO LEN w$
4060 IF CODE w$(i)<48 OR CODE w$
(i)>57 THEN GO TO 4040
4070 NEXT i
4080 LET w=VAL w$
4090 IF w=0 OR w>n THEN GO TO 40
40
4100 PRINT AT 21,5;"    Checking
"
4110 LET u=1+(w-1)*30
4120 LET win=0
4125 IF x$(1)="l" OR x$(1)="L" T
HEN GO TO 5000
4130 FOR i=1 TO 2
4140 LET m=0
4150 FOR j=1 TO 15
4160 LET r=CODE z$(u)
4170 IF t$(r)="x" THEN LET m=m+1
4180 LET u=u+1
4190 NEXT j
4200 IF m=15 THEN LET win=1
4210 NEXT i
4220 GO SUB 6000
4225 IF win=0 THEN GO TO 3150
4230 PRINT AT 21,0;"          Anothe
r Game? (y/n)"
4240 IF INKEY$="n" OR INKEY$="N"
THEN STOP
4250 IF INKEY$="" THEN GO TO 424
0
4260 RUN
5000 FOR i=1 TO 6
5010 LET m=0
5015 FOR j=1 TO 5
5020 LET r=CODE z$(u)
5030 IF t$(r)="x" THEN LET m=m+1
5040 LET u=u+1
5050 NEXT j
5060 IF m=5 THEN LET win=1
5070 NEXT i
5080 GO SUB 6000
5090 GO TO 3150
6000 IF win=1 THEN GO TO 6100
6010 PRINT AT 21,0;"          Wr
ong Call
"
6020 BEEP 1,-2
6030 RETURN
6100 PRINT AT 21,0;"          Corr
ect!
"
6110 BEEP 1,5
6120 PAUSE 200
6130 RETURN
```

Deeds of daring on the Dragon

Our reviewers fought the Dragon in these action games — including three of Microdeal's new releases

Phantom Slayer £8

Microdeal, 41 Truro Road, St Austell, Cornwall PL25 5JE

A machine-code game played in a 3-dimensional maze.

You can choose easy or hard mazes and three speeds for the phantoms. The maze varies each time but there are always three phantoms lurking in it — except in the training maze, which has no phantoms at all.

Phantoms always know where you are and try to reach you by the most direct path. You can defend yourself against them, but at least three hits are needed before they die.

However, only one touch from a phantom kills you and heralds the end of a game at which time your score is displayed. You score two for a hit and 10 for a kill, and with each kill you get the chance to see the maze from above.

An audio tone warns of nearby phantoms. There is an escape hatch shown by a green square, but in all the games I played I only found it once.

This game doesn't give you a fighting chance — the odds are on the phantom every time. He only needs one shot, while you must hit him at least three times. He also has a nasty habit of sneaking up behind you and shooting you in the back.

J.M.

instructions	80%
playability	60%
graphics	85%
value for money	65%

★ ★ ★

Storm (joystick) £8

Microdeal, 41 Truro Road, St. Austell, Cornwall PL25 5JE

This is the arcade game known as Tempest. It's an unusual and abstract variation of the space battle theme.

On screen you are presented with a rectangular web from the centre of which come the Rainbow Raiders. You are a line which moves around the perimeter firing your gun and scoring points according to the colour of the Raider. The deadliest of these is the Millibar, which stalks the perimeter and, if it collides with you, destroys one of your lives.

This version originally comes from Computerware, an American firm, and is very colourful. Written in machine code, it is as fast and smooth as you would expect. It contains such features as on screen scoring, a record of the highscore and fifteen levels of difficulty.

I had a slight problem with the many pages of on-screen instructions, which are worth reading for this game, because the starting procedure involved keypressing and the joystick for level selection which seemed confusing at first.

It's a deceptive game. The initial temptation to dash around shooting at everything is not the best of tactics, as your shots are limited.

M.P.

instructions	70%
playability	80%
graphics	90%
value for money	80%

★ ★ ★ ★

Bopswizzle £5.95

Bamby Software, Leverburgh, Isle of Harris PA83 3TX

Described as a "splendiferous fun game", Bopswizzle is really a set of simple tasks combined into one game and dressed up with some very imaginative instructions.

Looking forward to tangling with the Bobwangles, Smoochers, Yerkles, Gloops and Wiggles, I was disappointed to find that very little skill was required.

The tasks were mostly based on sheer luck, very often resulting in a premature end to the game. If this happens, the program has to be RUN again and the full rigmarole of instructions etc. has to be suffered once more.

The game progresses with a tiresome sequence of C to continue followed by M to move (no direction specified). The object is to collect three black pearls. These appear at random as do the imaginary creatures which may cause your demise.

Unfortunately another creature, a common or garden bug, may rear its ugly head resulting in a DD error (due to an attempt to dimension the same arrays in consecutive lines 780 & 790).

Overall, then, not a good example of commercial software. I wouldn't pay more than a couple of pounds for it, even when debugged.

E.C.

instructions	75%
playability	20%
graphics	20%
value for money	20%

★ ★

Racer Ball (joystick) £8.00

Microdeal, 41 Truro Rd, St. Austell, Cornwall PL25 5JE

This is an import from America, written entirely in machine code. It's a Pacman variant and a good one with very smooth controls.

This time you are a Racer Ball "guarding the corridors on the Moonbase". The Laseroids are your enemy, and there are the usual energy pills to reverse the tables.

Bonus points are awarded as different fruits appear increasing in value as you clear each screen. There are 16 levels of difficulty, on screen scoring and a high score table at the end.

The graphics, given the new scenario, are good but I thought the appearance of fruit in this situation was most peculiar — aren't there enough space-type objects that could have been created?

The sound effects were superb, and blended in with this fast-moving game very well.

I can understand how addictive these games are as they generate a high level of concentration and involvement. The killer instinct forces you on to attempt the unattainable. If you've been after a Pacman game on your machine, then I think this is a very enjoyable version, allowing you to start at a gentle pace and working you up to the frenzied frontiers of impossibility.

M.P.

instructions	100%
playability	100%
graphics	90%
value for money	90%

★ ★ ★ ★ ★

Gridrunner (1 joystick) £7.95

Salamander Software, 17 Norfolk Road, Brighton, East Sussex

Gridrunner was originally a Llamasoft success from Jeff Minter, and has now been Dragonised by Salamander — a regular Noah's Ark of combinations.

Your ship patrols the bottom seven levels of a 27 × 17 grid, the machine code action ensuring speedy diagonal as well as horizontal and vertical joystick movements.

Descending the grid Katerpillar-like are linked Droids,. which you can destroy by hitting the Leader Droid only, otherwise they split into segments.

You may think the only good Droid is a dead Droid, but unfortunatley these mutate into Pods, which have to be shot several times to prevent them descending the screen with a burst of lethal energy.

If all that's not enough, there are also X/Y Zappers patrolling the borders and creating more Pods, with the Y Zapper occasionally unleashing a plasma beam which destroys everything in its path (Tactical hint: keep out of its path.)

With 31 different waves of Droids to see off, this game has just about everything you could want and should soon be shooting up the software charts, if it isn't already.

M.G.

instructions	90%
playability	95%
graphics	90%
value for money	95%

★ ★ ★ ★ ★

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The spare-time sideline that took off

Richard Shepherd Software has come a long way since, at their first computer fair, Richard and Elaine Shepherd had to stay in a tent. Candice Goodwin met the Shepherds — and John Salthouse, their new manager — at their new offices.

Sitting in their brand new premises at Elm House, 23 Elmshott Lane, Cippenham, near Slough, Richard and Elaine Shepherd look as if they don't quite know what has hit them.

Only a few months ago they were selling software in their spare time from the dining room of their house in Maidenhead. Now Richard is in the software business full time and Elaine will join him shortly. They have the new office, and two full-time employees. Their programs are on sale in Smiths, Menzies and other multiples, as well as selling abroad.

But it's really all taken off since the beginning of this year. As Richard put it: "If someone had said to me in January that all this would have happened by the summer, I'd have laughed."

When Richard Shepherd Software first started up 18 months ago, Richard was working as a certified accountant and Elaine worked for a publicity company.

Richard got interested in computers through a job which involved running a computer department. "I asked my company to send me on a programming course, but they wouldn't," he said. "So I decided to buy a ZX81 and a RAMpack and teach myself."

Meanwhile, on a visit to a client, Elaine had been shown a computerised version of the Dungeons and Dragons adventure game running on a large computer. She was so taken with it that she urged Richard to buy an adventure game for his ZX81 — but the game proved to be a big disappointment. "I thought that perhaps we should have a go ourselves", Richard said.

Richard's first effort was a collection of ZX81 games and utilities, sold under the name of Bargain Bytes through small ads in computer magazines. Unfortunately its launch clashed with the arrival of the Spectrum on the scene, and demand for ZX81 fell overnight. There was nothing for it but to buy a Spectrum and try again.

The pair had more luck with Ship of the Line, which Richard says is the first strategy game ever written for the Spectrum. They took it to the Edinburgh computer fair, where they were one of only three companies selling programs for the new machine. Elaine recalled: "When we went to Edinburgh, we couldn't afford a hotel, and had to camp. We woke up in the middle of the night to find that Scottish football hooligans were shaking the top of the tent."

But despite the primitive conditions, the show generated a lot of interest in Richard Shepherd Software. With some more of Richard's programs, including the now well-known Transylvanian Tower, plus some written by another local programmer, they graduated to half page ads.

John Salthouse (left), with Elaine and Richard Shepherd — poised on the threshold of something really big?

By now it was getting near Christmas, and the programs started to sell like hot cakes. "About December 22 we had loads of people writing saying, 'I know it's late, but can you get something to us?'", said Elaine. "On December 23 we were at the sorting office until 3 am. We didn't want to disappoint people."

The big break came with the first order, for Transylvanian Tower, from Smiths. The order came on 22 February — a date that's engraved on Richard and Elaine's memory. "We'd been sending them samples since before Christmas, and then suddenly up popped this order — we had just four weeks to get duplicating and colour packaging done", said Elaine.

"Transylvanian Tower went straight in at number three in Smiths' software charts and has stayed in the Top Ten for three months. We didn't really expect it do so well — but we're thrilled."

At that point Richard took the big step of throwing in his job as an accountant completely. Elaine joins the company full time on September 15, but says, "I think I put in 20 to 30 hours a week now."

All the programs in the current range: Ship of the Line, Transylvanian Tower, Everest Ascent, Super Spy and Cash Control — were written by Richard.

Unlike the heads of most software companies, who have to abandon programming to administer to the needs of the business, Richard has taken on someone to run the business for him while he concentrates on programming.

The new recruit is John Salthouse, an old friend of Richard and Elaine's, who used to work as a manager at Dixons. For him, joining the company was just bowing to the inevitable.

He said: "I used to get desperate phone calls saying 'we want to get away from computers. Let's go for a meal.' Then we'd spend the whole evening talking about computers."

With her publicity experience, Elaine is clearly well set up to take care of marketing and supervising the artwork for the cassette inlays. And the book keeping is handled by Rita Lawson, another old friend of the Shepherds.

Richard Shepherd Software's next two offerings are Devils of the Deep and Invincible Island. Devils of the Deep is something of a novelty — an all-graphics adventure in which you control a diver who moves around a three-dimensional seabed in search of a treasure.

Invincible Island breaks with company tradition in that it's written by an outside programmer, Peter Cook. It has a split screen divided between hi-res graphics and text.

When he has time to get around to it, Richard wants to convert all of the current range of Spectrum games for the Oric, Dragon, and possibly Commodore 64.

He'd also like to write games that take advantage of the possibilities opened up by the recently-launched Microdrives for the Spectrum — when he can get hold of a Microdrive, that is. "We're eagerly awaiting that letter from Sinclair", he said.

Richard and Elaine refuse to get into the game of quoting figures, but the say they are very happy with the way the company is going financially — particularly that they've never had to borrow any money.

"We're completely self-financing", said Richard. "I negotiated an overdraft when we got the Smiths order, but we never had to use it. We now spend phenomenal sums on artwork and so on, but it all comes out of what's coming in.

"And it's very nice feeling in the current economic climate to be running a business that can employ people. I'm proud to have created a certain number of jobs."

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How to improve your Spectrum's character

Character making made easy — thanks to David Nowotnik's program for the Spectrum

None of the published programs I've seen to help design new characters on the Spectrum did all that I wanted — so I decided to write my own.

When the program is RUN the user selects which character (a to u) is to be re-designed.

Having made that selection, aneight by eight grid is produced on the screen. This is an enlarged representation of the character square.

You enter which pixels you would like turned 'on', by entering row and column numbers (e.g. 23, 56). If you change your mind, and want to turn 'off' a pixel, simply enter the pixel co-ordinates a second time.

When you think you have finished, enter s. The computer spends a few seconds on binary to decimal conversion, then POKEs the appropriate numbers in the UDG storage area, and displays the finished product at normal character size. If, having seen the character, you want to make further changes, the program allows you to do this.

Once you are satisfied, the program gives you the option of designing another character, or stopping.

When you select stop, the program will display all 21 UDGs, one at a time showing you in which eight bytes the character is stored, and the values held by those bytes (in case you want to POKE in the values from a program using those characters).

Press any key to move onto the next character. Finally, you have the option to save all 21 characters on tape.

It is a common misconception that the Spectrum can only provide 21 user defined graphics characters. By clever use of the UDG system variable (combined with the variable RAMTOP or the CLEAR command to create more storage space) it is possible to create several blocks each containing 21 UDGs.

As my program makes use of the system variable UDG, it is possible to use it to produce more than one block of 21 characters. To do this, once the program stops, POKE a new value into the two bytes of the system variable UDG, and re-RUN the program.

```
  10 REM     UDG  construct
  20 REM    © 1982, D.P. Nowotnik
  30 REM
  40 LET u=PEEK 23675+256*PEEK 2
3676
  50 BORDER 0
  55 PRINT AT 4,4;"UDG Character
 Design Aid";AT 6,5;"© 1982, D.P
. Nowotnik."
  60 INPUT " Which character (a
to p)? ";a$
  70 LET a=CODE a$: IF a<97 OR a
>112 THEN GO TO 60
  80 CLS
  85 LET a=a-97
  90 PRINT AT 2,2;"UDG character
";a$
  95 INVERSE 1
 100 PRINT AT 8,12;" 12345678 "
 120 FOR i=1 TO 8: PRINT AT 8+i,
12;i;AT 8+i,21;" ": NEXT i
 130 PRINT AT 17,12;"          "
 140 INVERSE 0
 150 FOR i=111 TO 159 STEP 8
 160 PLOT i,103: DRAW 0,-64
 170 NEXT i
 180 FOR i=96 TO 48 STEP -8
 190 PLOT 104,i: DRAW 64,0: NEXT
 i
 200 DIM c(8,8)
 205 FOR i=1 TO 8: FOR j=1 TO 8:
 LET c(i,j)=0: NEXT j: NEXT i
 210 PRINT AT 21,0;"Input row, c
olumn , or s to STOP"
 220 INPUT b$: IF b$="s" OR b$="
S" THEN GO TO 400
 230 LET b1=CODE b$: IF b1<49 OR
 b1>56 THEN GO TO 210
 240 IF LEN b$<2 THEN GO TO 220
 250 LET b2=CODE b$(2): IF b2<49
 OR b2>56 THEN GO TO 220
 260 LET b1=b1-48: LET b2=b2-48
 270 IF c(b2,b1)=0 THEN LET c(b2
,b1)=1: PRINT AT 8+b1,12+b2;"■":
 GO TO 300
 280 LET c(b2,b1)=0: PRINT AT 8+
b1,12+b2;" "
 290 PLOT 104,104-8*b1: DRAW 64,
0
 295 PLOT 103+8*b2,103: DRAW 0,-
64
```

```
 300 GO TO 220
 400 PRINT AT 21,0;"
                   ";AT 21,2;"UD
G ";a$;" =";
 410 LET e=u+8*a
 420 FOR i=1 TO 8: LET d=0
 430 FOR j=0 TO 7
 440 IF c(8-j,i)=1 THEN LET d=d+
2↑j
```

```
 445 NEXT j
 450 POKE e+i-1,d: NEXT i
 460 PRINT CHR$ (144+a);" O.K.?"
 470 IF INKEY$="n" THEN GO TO 21
0
 480 IF INKEY$<>"y" THEN GO TO 4
70
 490 PRINT AT 21,0;"
                    ANY MOR
E? (y/n)"
 500 IF INKEY$<>"" THEN GO TO 50
0
 510 IF INKEY$="n" THEN GO TO 54
0
 520 IF INKEY$="y" THEN RUN
 530 GO TO 510
 540 FOR i=0 TO 20: CLS
 550 PRINT "List UDG byte valu
es - ";CHR$ (i+97);" ";CHR$ (i+1
44);",";
 560 FOR j=0 TO 7: PRINT u+8*i+j
PEEK (u+8*i+j);",";
 570 IF INKEY$="" THEN GO TO 570
 580 NEXT i
```

'NOW WIN THE POOLS'

THIS IS MEANT FOR **YOU** — ESPECIALLY IF YOU USE A SINCLAIR ZX81 or SINCLAIR SPECTRUM COMPUTER, or even ANY COMPUTER.

HAVE YOU EVER HAD THAT DREAM OR EVER WISHED THAT YOU HAD "WON ON THE POOLS" — AT LAST YOU CAN TURN IT INTO REALITY.

THERE **IS** A SECRET OF "HOW TO WIN ON THE FOOTBALL POOLS" — **IT CAN BE DONE.** I DISCOVERED THE SECRET A LONG TIME AGO — NOW, **FOR THE FIRST TIME** I'M PREPARED TO SHARE IT WITH YOU.

HOW DOES THIS INTEREST YOU — I HAVE DOCUMENTARY EVIDENCE BY WAY OF POOLS WINNINGS DIVIDEND SLIPS/ CANCELLED CHEQUES, etc, SHOWING MY PRESENT WINS ON THE POOLS AS FOLLOWS:—

First Dividends	Second Dividends	Third Dividends	Fourth Dividends	Fifth Dividends	Sixth Dividends
765	1,818	2,942	1,952	631	93

A GRAND TOTAL OF 8,201 (EIGHT THOUSAND, TWO HUNDRED AND ONE DIVIDENDS — so far).

I HOLD THE UNCHALLENGED WORLD'S RECORD FOR POOLS WINS

I AM MAKING THIS VERY SPECIAL, REDUCED PRICE OFFER TO READERS OF HOME COMPUTING WEEKLY FOR A LIMITED PERIOD ONLY.

Do not let anyone tell you that it is impossible to "WIN ON THE POOLS" — since I perfected my method, **I HAVE WON REGULARLY** for over **TWENTY-FIVE YEARS** — proof that it is no 'flash-in-the-pan'.

I have CHALLENGED THE WORLD with my record of wins and with all the evidence that I possess — NO ONE has ever been able to accept the Challenge — I KNOW NO ONE EVER WILL.

MY SECRET IS NOW PLACED ONTO COMPUTER CASSETTE FOR YOU.

THE METHOD IS THE GREATEST TREBLE CHANCE WINNER IN THE HISTORY OF FOOTBALL POOLS — IT WILL LAST FOREVER — BOTH FOR ENGLISH AND AUSTRALIAN FOOTBALL POOLS, WITH EQUAL SUCCESS.

I now intend to give a limited number of people the opportunity of making use of my method — perfected over 25 years and proving itself on **EVERY ONE OF THOSE TWENTY-FIVE YEARS.**

You will have noted details of my personal achievements so far, as given to you above.

A GRAND TOTAL of 8,201, yes 8,201 POOLS DIVIDENDS, including **765 FIRST DIVIDENDS.**

My Pools Winnings Dividend slips now number so many, that they fill a very large suitcase and will stand as my evidence of all claims in **ANY COURT OF LAW IN THE WHOLE WORLD.**

Taking just the past 25 years into consideration, I have won ON AVERAGE over 328, (THREE HUNDRED AND TWENTY—EIGHT) Pools Dividends **EVERY YEAR** — or — AN AVERAGE of over **SIX DIVIDENDS EVERY WEEK** for **TWENTY—FIVE YEARS.**

You have my absolute Guarantee of the complete authenticity of every claim, cheque, document, letter, etc, contained herein.

I do have losing weeks, but ON AVERAGE my winnings show over SIX DIVIDENDS **EVERY WEEK** for the past 25 years.

I know that you are now utterly flabbergasted, it always happens to everyone with whom I come into contact. Please just sit back and **imagine** for a moment my **FIRST DIVIDEND** wins alone — they now number 765 (seven hundred and sixty-five) and will probably be even more by the time this advertisement appears in print.

I AM NUMBER ONE IN THE WORLD AND NO ONE DISPUTES IT.

For as long as I continue to enter the Football Pools my wins will continue. I have already said, they apply, with equal success to both English and Australian Football Seasons.

I intend to release a STRICTLY LIMITED NUMBER of copies of my cassette, (either for Sinclair ZX81 or Sinclair Spectrum) — DO NOT DELAY AND FIND YOU ARE TOO LATE, in which case I would have to refund your money.

I am so confident of **YOUR** success that if do **not** win at least THREE FIRST TREBLE CHANCE DIVIDENDS in the first 20 weeks of entering, I will completely cancel the balance of the purchase price and you do not have to pay me another penny, at any time, no matter how vast your winnings.

I only wish that space would allow me to give you photographs of my winnings slips, cancelled cheques, etc, but it is of course impossible — they now number 8,201 dividends. I have however given JUST A FEW EXTRACTS from ORIGINAL LETTERS I hold from my small Clientele.

I am the Inventor and Sole Proprietor of my method, Registered as EUREKA — ('I have found it'). I am known as The Professor in Pools Circles — I am of the Highest Rank in Forecasting — this is beyond dispute. I am marketing a limited number of Computer Cassettes, under my Registered Company — FOOTBALL ENTERPRISES.

My initial charge for a copy was £75, but for this SPECIAL REDUCED PRICE OFFER I will send you a copy, (for ZX81 or Spectrum) for £20, (twenty pounds) ONLY, plus your Promise to pay me the balance of £55 — **ONLY** IF YOU WIN AT LEAST THREE FIRST TREBLE CHANCE DIVIDENDS IN YOUR FIRST 20 WEEKS OF ENTERING — otherwise you owe me NOTHING FURTHER.

This is surely proof absolute of my supreme and utter confidence in my own abilities and in the capabilities of my discovery. I could easily CHARGE £2,000 per cassette on the evidence I possess, but that would not be fair to everyone, which is what I want to do.

My method is WORLD COPYWRIGHT, any infringement and immediate proceedings will be taken, without prior warning. It is truly ingenious and has stood the test of time.

My cassette is simplicity itself to operate and you'll be given FULL DETAILS for weekly calculating. Your entry need not involve you in any large weekly stakes, you can enter for as little as 25p, if you wish.

I charge NO COMMISSION on any of your wins — no matter how BIG they may be.

I realised a long time ago, that it was no good sitting down and **dreaming** about winning the pools, so I burnt the candle at both ends, working late into the night, occasionally RIGHT THROUGH THE NIGHT, I **KNEW** there was a way, eventually it all paid off and has been doing so ever since.

I am unable to vary my offer to anyone, so please do not request it, as I shall very easily dispose of the cassettes I have prepared and am making available.

IMMEDIATELY I perfected my method I commenced winning right away, (first with just a little £163, the first week I used it), I HAVE NEVER LOOKED BACK SINCE, amongst all those dividends was one for over **EIGHT THOUSAND POUNDS** for just **one eighth of a penny stake.**

I will release a copy on cassette, to you, on receipt of the completed order form and your Signature thereon, confirming you will treat it in the STRICTEST CONFIDENCE between us and retain it for your **OWN USE ONLY.**

PLEASE NOTE:
If you happen to be the proud owner of a Computer, **other than** a Sinclair ZX81 or Sinclair Spectrum, you can still purchase a copy of my method, for the same price and program it YOURSELF on to YOUR OWN COMPUTER.

Don't take my word for it, read what people write about me and my method:—

I won on Zetters last weekend. It was not a big sum, but all the same it was a very nice surprise for me. J.C., Lancs.

I appreciate the straightforward method you adopt, which is such a contrast to the rubbish of misrepresentation which is so common in the Betting World, by unscupulous and self-opinionated charlatans. C.H., Devon

Winnings cheque received today, sincere thanks. D.N., Devon

I congratulate you on your achievement. R.R., Wales

I should like to thank you for a most exciting season and look forward to hearing from you again. J.C., Hants.

I would like to acknowledge cheque and say how much I appreciate your integrity. J.M., Scotland

Many thanks for your system, it is all you say and more. J.C., Lancs.

Your wonderful system won me £3,527. I intend to visit London soon and will be able to come and see you personally. (Overseas Client). P.M., Kampala.

Many thanks for trying so hard to please us all, your brother should be thanked also. One of our daughters, WHOSE HUSBAND YOU HELPED ENORMOUSLY, has just phoned, the four of them have just spent a lovely holiday in Spain. K.R.,Isle of Man.

I sent in my FIRST entry last week and won 2nd and 3rd dividends, as you will see from the enclosed certificate. One more and I would have collected over £400 for FIRST dividend. Once I've won a fair amount I shall be staking from winnings and at 2p per line, A FIRST DIVIDEND last week at this would have been over £3,000. C.A., Yorks.

I am very interested indeed and enclose £20 herewith. I agree to pay you the balance of £55 **ONLY** if I win at least THREE FIRST TREBLE CHANCE DIVIDENDS in my first 20 weeks of entering — otherwise I owe you NOTHING FURTHER at any time — no matter how much money I win. My Signature below is my Undertaking to retain complete and absolute confidence about the method.

Name.....

Address.....

.....

.....

Signature HCW26

The Managing Director,
Football Enterprises,
'Anvon',
9 New Road,
Haverfordwest, Pembs.

Please tick if cassette is for:
Sinclair ZX81 (16K) ☐
Sinclair Spectrum (48K) ☐
Any other Computer ☐

Top Ten programs for the Dragon-32

1	The King	Microdeal (2)
2	Space War	Microdeal (1)
3	Android Attack	Microdeal (3)
4	Frogger	Microdeal (5)
5	Nightflight	Salamander (4)
6	Planet Invasion	Microdeal (6)
7	Dragon Trek	Wintersoft (9)
	Champions	Peaksoft (8)
8	Morocco Grand Prix	Microdeal (–)
	Cuthbert Goes Walkabout	Microdeal (7)
9	Space Shuttle Simulator	Microdeal (10)
10	Typing Tutor	Dragon (–)

Compiled by Boots. Figures in brackets are last week's positions

Top Ten programs for the Spectrum

1	Flight Simulation	Psion (1)
2	Jet Pac	Ultimate (2)
3	Mad Martha	Microgen (3)
4	Horace and the Spiders	Psion/M. House (6)
5	Super Spy	Richard Shepherd (5)
6	Maniac Miner	Bug Byte (7)
7	Pssst	Ultimate (–)
8	Transylvanian Tower	Richard Shepherd (4)
9	Penetrator	Melbourne House (–)
10	Ah Diddums	Imagine (–)

Compiled by W. H. Smith. Figures in brackets are last week's positions

Top Ten programs for the ZX81

1	Space Raiders	Sinclair (1)
2	Espionage Island	Sinclair (2)
3	Flight Simulation	Sinclair (4)
4	History	Sinclair (–)
5	Geography	Sinclair (–)
6	Football Manager	Addictive Games (3)
7	1K Games	Sinclair (5)
8	Defender	Quicksilva (7)
9	Fantasy Games	Sinclair (10)
10	Scramble	Quicksilva (8)

Compiled by Boots. Figures in brackets are last week's positions

Top Ten programs for the VIC-20

1	Arcadia	Imagine (1)
2	Wacky Waiters	Imagine (2)
3	Cosmiads	Bug Byte (4)
4	Sargon 2 Chess	Commodore (–)
5	Panic	Bug Byte (3)
6	Skyhawk	Quicksilva (–)
7	Catcha Snatcha	Imagine (5)
8	Cosmic Crunch	Commodore (–)
9	Escape MCP	Rabbit (6)
10	Cyclons	Rabbit (7)

Compiled by Boots. Figures in brackets are last week's positions

Micros go to school in Minnesota

Just about everyone in this country having an interest in educational computing has heard about MECC (Minnesota Education Computing Consortium) which was the first organization to actively develop and market quality educational software for use, primarily, in schools.

It should therefore come as little surprise to find that over 75 per cent of the schools in Minnesota have computers in their classrooms being used for instructional purposes.

Quality Education Data (QED), a Denver, Colorado, based research firm called nearly 16,000 school districts in the U.S. to obtain information on computer usage. They compiled some interesting statistics.

For example, almost 60% (about 2,300) of the schools in New York have micros. Alaska, possibly not considered in the front line of technology, had micros in over half of its schools.

Some differences in various regions of the country were found. Commodore has a large share of the micros in use in New York, and Tandy is very big in the southwestern portion of the country.

★★★★

A company called Entex has just introduced its Model 2000 Piggy Back as an expansion unit to work with the Coleco, Atari, Sears, and Columbia video game playing machines. It contains 2K of RAM, 1K of video RAM, and 8K of ROM including a BASIC interpreter. It is expandable to 34K and is controlled by a Z80A. It uses a typewriter-style keyboard with nine user-defineable function keys and separate cursor control keys. It carries a list price of $125.

If you own either an Atari 400 or 800 and wish to hook up a printer which uses a Centronics-compatible interface, you might be interested in this. Interface No. 1 allows such a connection using controller jacks J3 and J4. A printer handler program is provided that loads via cassette or disc, replaces the resident printer handler, and takes up under 128 bytes of user memory while remaining compatible with all Atari games and programs. This neat little device costs all of $85 and is available from Looking Glass Microproducts, P.O. Box 5084, Loveland Colorado 80537, (303) 669-2681.

★★★★

If you own a VIC-20, Commodore 64 or Timex/Sinclair 1000 take a look at a series of low cost games and programs on cassette and cartridge that seem to be somewhat out of the ordinary, and are packaged very professionally.

For example, Time and Money Manager is a program containing a package of financial and scheduling aids designed to help you plan wisely how best to spend your time as well as help you make solid financial decisions. COCO2 is an educational program which teaches you how to develop your own arcade games.

It teaches you game theory, programming, logic, and graphics techniques, yet it requires no previous programming knowledge or experience. The rest of the product line looks equally interesting, especially the rather unique peripherals. If you would like more information, send an inquiry to Human Engineered Software, 71 Park Lane, Brisbane CA 94005, (415) 468-4110. I believe it will be well worth it.

That's it for this week

Bud Izen **Fairfield, California**

Send your letter to Letters, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE. Don't forget to name your computer — the best letter could win £5-worth of software. Queries cannot be answered on this page

Mushroom mix-up

I was pleased to read your good review of Mushroom Mania by Arcadia, because I bought it myself some time in April. Shortly afterwards, though, I had to send it back because it was only recorded on the fast speed, and failed to load.

I rang Arcadia and they confirmed they had my cassette and that they would send a replacement off in the next week.

However, even after sending off three or four letters — the last, sent by recorded delivery, warning that I would contact my solicitor — I have had no reply.

The only possibility is that the cassette got lost in the post, but surely a company with any sense would have told me by now?

If the software industry is experiencing a boom, then I'd like to wake up when it's all over.

I have an Oric-1 and had to pay full price for it, so I am not pleased at the price everyone else is paying. Nor am I pleased at paying out for a machine that doesn't do as specified.

One final word: I've heard that the Dixons chain has received a batch of Orics with the wrong BASIC — they'll crash if MUSIC 2, 3, 4, 15 is typed in.

John Airey, Ryton, Tyne and Wear

Mr Love, for Arcadia, said: "When we first launched the Oric software we had unforeseen problems with loading reliability. Since then, we've changed suppliers a couple of times, and lately we've had very few cassettes returned due to loading problems.

"We've also had some problems with letters going astray. Any queries should be sent to us at Arcadia, FREEPOST, Swansea SA3 4ZZ."

Dimples in your Keyboard

Pleased as we are to receive any sort of mention in Home Computing Weekly we must point out that 'drawing circles over the keys' is what the Improver is carefully designed not to do (HCW 21). Anyone who tries it on their own stands a good chance of seriously damaging their keyboard.

By the way, we can now offer the Improver for £1 (because of economies of scale).

S. J. McQuillen, Kinmel Bay, Rhyl

What price fast loading?

As a Spectrum owner, I was very glad to hear that the Microdrive had finally arrived, but I couldn't believe the price of the cartridges.

Nigel Searle, managing director of Sinclair Research, was stated as saying, in your article on the Microdrive (HCW 22): "We have planned capability to build **at least** half a million cartridges per week."

Now surely at such a high rate of planned production, all the hard research work has gone into the cartridges must be over. And if it's possible to make that quantity of cartridges a week, it can also be said that they just can't cost that much money to produce.

So how can an item of which half a million or more can be made each week cost as much as £4.95? Surely the more you make of something, the lower in price it should become.

As far as I can foresee, if the cartridges stay at that price, software put on to the cartridges by software houses would cost over twice as much as tape software costs now, and as it was advised in the article that a safety measure it would be wise to make a back-up copy, what is the point?

You might get a program loaded quicker, but if it costs you twice as much, what price loading time?

I don't want to put down the sheer brilliance of the Microdrive and ZX interface 1 — for their price and technical superiority, they are the best thing to hit the home computer market since the Spectrum.

So a big well done to Sinclair for the Microdrive and interface, but not so well done on the price of the cartridges.

Jon Lemmon, Norwich, Norfolk

Bill Nichols, for Sinclair Research, said: "When Nigel Searle talked about quantities of over half a million cartridges a week, he was referring to theoretical capability — the quantities being produced at the moment certainly aren't anything like that high.

"Though we're more than keeping pace with current demand, you've got to remember that the cartridges are a totally new product, so we're taking it slowly at first and exercising strict quality control.

"I wouldn't like to comment on whether prices will come down in the future."

Gardening tip

Thank you for a most novel and amusing game in Slugs and Ladders (HCW 23).

May I and my 10-year-old fellow enthusiast Matthew Gotliffe offer this idea for a more interesting winning finish. As the flowers grow, a rendition of Country Gardens is played!

```
1610 CALL SOUND (400, 349,1)
1611 CALL SOUND (200,349,1)
1612 CALL SOUND (200,330,1)
1613 CALL SOUND (400,294,1)
1614 CALL SOUND (400,294,1)
1615 CALL SOUND (400,262,1)
1616 CALL SOUND (200,262,1)
1617 CALL SOUND (200,233,1)
1618 CALL SOUND (400,220,1)
1619 CALL SOUND (200,220,1)
1620 CALL SOUND (200,233,1)
1621 CALL SOUND (400,262,1)
1622 CALL SOUND (400,175,1)
1623 CALL SOUND (400,196,1)
1624 CALL SOUND (400,220,1)
1625 CALL SOUND (400,220,1)
1626 CALL SOUND (400,196,1)
1627 CALL SOUND (800,175,1)
1628 PRINT
1629 CALL SOUND (2000,349,
     1440,1,523,1)
```

Stanley Watson, Uckfield,

Carry on complaining

I was amazed to read the reply from Christine Computing to John Woods' complaint about the lack of good software for the TI-99/4A (HCW 22).

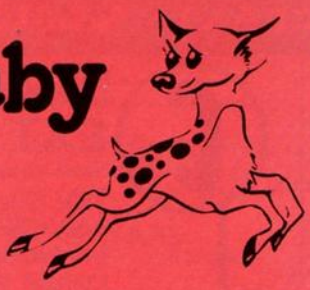
It is not the responsibility of consumers to do software companies' market research for them, nor are they obligated to buy products from product lists if there is nothing on the list that satisfies their requirements.

There is a shortage of good software for this machine, but more software houses are now looking at the TI-99/4A, ourselves included. So this demand should be satisfied, at least in part, in the near future.

As for complaining to magazines like yours; John Woods' complaint has provoked a response from two software houses so far; and others will have seen it, I am sure.

K. L. Lovell, Lizard Games, Telford, Shropshire

Bamby SOFT WARE



GOLDEN APPLES OF THE SUN:
The Golden Apples have been stolen and hidden in seven different locations. Can you recover them all? There's a surprise once you have. Hi-res graphics and text. **£8.45**

STOCKMARKET:
Test your skill on the stockmarket. Prices are influenced by your own actions, and Government actions — just like the real thing! See if you can make a million. Text **£5.95**

ALIEN ODDESSY:
A four-part adventure game. This tape contains the first two parts, in which you must escape from the Castle, then journey across the Great Grass Plains to the Mountains of the Moon. Hi-res graphics and text. **£9.95**

MINI—GAMES:
Four short games on tape consisting of Blackjack, Maths Test (5 levels of difficulty) Guess the Number, and Layers, a game in which you try to survive a year in the farming business. Text. **£5.95**

INTER—PLANETARY TRADER:
You are the Captain of a Starship. You have to buy a cargo, and attempt the inter-stellar jump to your destination. But beware, meteors and space pirates are out to get you. Text. **£5.95**

DRAGON TI-99/4A for SPECTRUM 48

DATABASE: (DRAGON)
A personal filing system we can modify to suit your own requirements. Please ask for quote. **Approx. £15.95**

SURPRISE: (DRAGON)
Regain the magic ring, but to do so you must first find the key to the Tower, avoid robbers, and more. Then bewitch the Dragon, and you're home and dry — almost. Hi-res graphics and text. **8.45**

SCANNER 13: (DRAGON)
Set in the City of the future, this game combines the best elements of both arcade and adventure games. Destroy the evil Drones before they destroy you and your City. Three levels of difficulty. Hi-res graphics and text. **£8.45**

BOPSWIZZLE: (DRAGON)
A splendiferous fun game! Beat the ghastly Gloops and the yucky Yerkies, amongst other nefarious nasties. Collect pearls at the same time! Low and hi-res graphics and text. **£5.95**

AMAZING: (DRAGON)
Series of five mazes specially for the under 5's ranging from quite simple to fairly complex. An excellent way to amuse pre-school children, and they learn from it too. Hi-res graphics. **£5.95**

ALONE AT SEA: FOR THE TI99/4A (T1-99/4A)
Try and escape the sinking ship, but don't forget your supplies which are hidden somewhere. Text **£6.50**

K-64 (T1-99/4A)
A mind-bender. Cover the squares once only using the knight and its valid moves. Easy?! Full graphics. **£6.50**

MYSTERY MANOR: FOR THE SPECTRUM (SPECTRUM)
Find the murderer before he (or she) finds you and your career as Detective Solvit! Graphics and text. **£6.50**

MASTER CODE: FOR THE SPECTRUM (SPECTRUM)
Based on the famous game. Try your skill against the computer. You **CAN** beat it . . . Graphics and text. **£6.50**

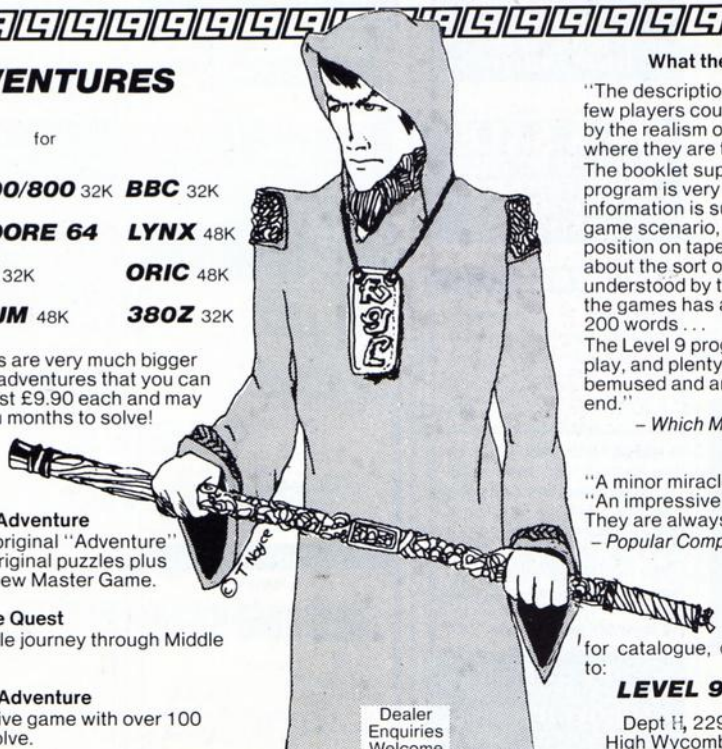
All available immediately from Bamby Software, Leverburgh, Isle of Harris PA83 3TX. Includes our no quibble guarantee.
Access orders welcome by mail or telephone: 085982 313 Dealer Enquires Welcome and 48 hour delivery

ADVENTURES

for

ATARI 400/800 32K ***BBC*** 32K
COMMODORE 64 ***LYNX*** 48K
NASCOM 32K ***ORIC*** 48K
SPECTRUM 48K ***380Z*** 32K

These games are very much bigger than normal adventures that you can buy. They cost £9.90 each and may well take you months to solve!



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The classic original "Adventure" with all the original puzzles plus a complete new Master Game.

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An epic puzzle journey through Middle Earth.

3) Dungeon Adventure
A truly massive game with over 100 puzzles to solve.

Dealer Enquiries Welcome

What the reviewers say

"The descriptions are so good that few players could fail to be ensnared by the realism of the mythical worlds where they are the hero or heroine . . . The booklet supplied with each program is very helpful. Extensive information is supplied about the game scenario, saving your current position on tape and there are hints about the sort of words which are understood by the computer. Each of the games has a vocabulary of about 200 words . . .
The Level 9 programs are great fun to play, and plenty happens to keep you bemused and amused for hours on end."
– Which Micro & Software Review, August

"A minor miracle of programming", "An impressive suite of adventures. They are always a pleasure to play"
– Popular Computing Weekly, 12 May & 23 June

Send order, or SAE for catalogue, describing your micro, to:

LEVEL 9 COMPUTING

Dept H, 229 Hughenden Road
High Wycombe, Bucks HP13 5PG

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HUNT WINS GRAND PRIX

At yesterday's Monaco Grand Prix, a hunting party strayed onto the track at the climax of the race. Cars were halted as the hounds rampaged around the circuit. "The whole place has gone to the dogs," one driver was reported as saying. The race was restarted; riders and drivers battled bitterly around the course before the Hunt thundered past the finishing line to take the chequered flag (it hasn't been seen since).

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ended in tragedy ye
terday as Carl and Fr
plunged down a crev
to a grisly death. Ha
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was quoted as sa
"Yuk". Continued on p

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Thousands dead in Ice Storm

Muduras the M
said yesterday

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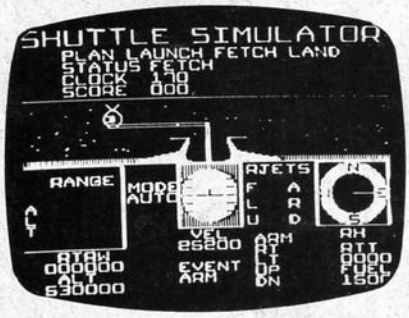

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