

X

USER

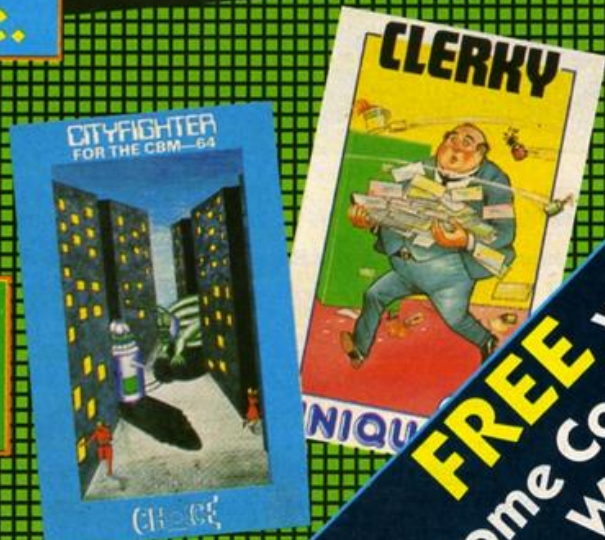
No 4



● Transform your Spectrum into a business machine.

● Software reviews: read what the critics think.

● Games and graphics for you to type in.



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Weekly

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Free with Home Computing Weekly

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Welcome to the fourth issue of ZX User. By now, all you regular readers will be used to seeing this free supplement — what do you think of it?

We're interested in your points of view. Send your comments and observations to us — and don't forget your listings and tips.

There's a nice cool, leisurely game

in store for you in this week's issue: bowls. Just right for a sweltering hot summer's day. You can also gamble on the luck of the draw, grapple with graphics and pick out nuances of colour — not to mention saving injured passengers after a train crash.

We hope you enjoy this week's issue. Happy reading!

You can get into print

WE WELCOME programs and articles from our readers. If you feel that your work meets our standards, please submit it to us for consideration for publication.

Programs must always be sent on cassette. Listings are helpful, but not necessary. Check carefully that they are bug-free. Include full details of what your program does, how it works, variables you have

used and hints on conversion. See the programs in this issue for guidance on what your paperwork should include.

Articles on using the Spectrum and the ZX81 should be no longer than 2,000 words. Those most likely to be published will help our readers make better use of their computers by giving useful advice, possibly with programming examples, tables and so on. Short hints are also welcome.

All submissions will be acknowledged and the copyright in such works which will pass to Argus Specialist Publications Ltd will be paid for at competitive rates.

Keep a copy of your work and include an SAE. Label everything clearly and give a daytime and home phone number if you can. All work for consideration should be sent to:

Paul Liptrot, ZX User, No. 1 Golden Square, London W1R 3AB

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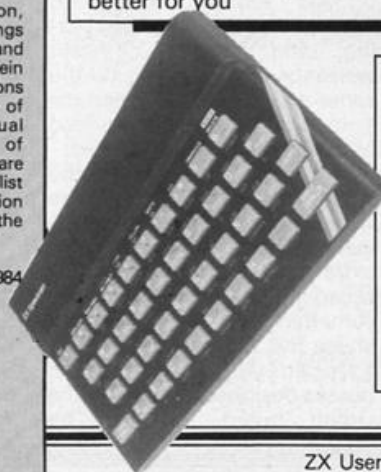
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Perhaps you don't realise it, but the Spectrum can form the cornerstone of a very professional wordprocessing system at quite a modest cost. More importantly, you can build it up gradually, piece by piece.

The first requirement is software. Undoubtedly, the Spectrum wordprocessor is Tasword Two. Recently reviewed in HCW, it received maximum ratings in all departments. It allows you to use the screen as you paper, making amendments, additions and corrections as you go.

No more worrying about ends of lines, forming neat paragraphs, typing the same old letter time after time or messing about with rubbers and correction fluid. Tasword takes care of the lot, and even goes so far as to give the Spectrum 64 characters to a line.

Better still, following the detailed manual supplied, the program can be customised to

Having read the detailed instructions supplied, I soon had the system set up, with the traditional little black box hung on the back of my Spectrum.

Almost all Centronics type interfaces for the Spectrum require additional software to recognise the Spectrum's LLIST and LPRINT commands. This is not necessary using Tasword, but must be loaded above RAMTOP for use with your own programs. Unfortunately, the Tasman interface will not recognise COPY, but a RAND USR call can be included in your programs to copy both text and graphics screens.

There are snags, however. A commercial program, other

that, if you want something approaching typewriter quality, don't buy one of the cheaper Seikoshas. Save up a bit longer, and buy a printer which will serve your needs well into the future. After all, it costs more than your Spectrum!

If the bug has bitten you badly, you will soon find that the standard Spectrum keyboard is holding back your typing, and if you are using your Spectrum for business,

removed, and the holes for the interface and cassette leads must be altered using a drill, saw and a Stanley knife. It's easy enough to do if you're careful, as the plastic is quite soft.

You then need to make two

Now, use your Spectrum as a business machine

any self-respecting touch typist will refuse to use it. What you need now is a decent keyboard.

Following the advice contained in a previous ZX supplement, I chose the Fuller FDS. It features a full space bar, properly printed legends on the keys (not just sticky labels) and a number of extra keys. Briefly, you can access full stop, comma, red extended mode and green extended mode with a single keypress, and all the cursor keys and the delete key work without having to caps shift.

It makes programming much quicker, and typing with Tasword a real dream. They could have been designed to work together.

There are four options for fitting your Spectrum inside the Fuller case. Take the whole Spectrum board out of the original case and screw it in; easy enough but nervewracking, and goodbye Sinclair warranty. Alternatively, do the same again but add Interface 1, in which case an extra lead at additional cost is required.

Or just take the lid off the Spectrum and mount the whole lot, including Interface 1 inside. Finally, using a buffer at extra cost, mount the fully cased Spectrum inside. Being something of a coward, I chose the "lid off mode".

To do this, all the plastic bosses designed to support the circuit board have to be

holes in the case bottom through which to bolt the Spectrum and Interface 1. The keyboard is powered from the ZX power supply, and the Spectrum draws its juice from a shortish flying lead attached to the keyboard circuit board. Two ribbon connectors plug into the Spectrum, and away you go!

Fuller says you can mount the power supply inside the case too, but mine wouldn't fit the mountings. Instead, a friend of mine fitted a Reset button, a SAVE/LOAD switch, and proper sockets for power, mic and ear connections, together with a sound amplifier, speaker and volume control. There's plenty of room.

The result is magic; a vast improvement. The only quibbles are that the extended mode legends printed in red are rather difficult to read, and anything plugged into the user port needs to be lifted up a little. Fitting is a bit of a fiddle but the results are well worth it.

So now I have a fully fledged wordprocessing system and a grown up Spectrum. Frankly, it's so good with the Microdrive that I'm thinking of ignoring the QL and sticking to my faithful Spectrum!

Seikosha GP 100A Mk2 complete with Tasman Centronics interface from larger branches of Boots: £229

Fuller FDS keyboard: Fuller Microsystems, The ZX Centre, 71 Dale St, Liverpool 2: £49.95 + £2.50 p&p.

Tasword Two: Tasman Software, 17 Hartley Crescent, Leeds LS6 2LL: £13.90

use a Microdrive (perhaps your first acquisition) which almost eliminates saving and loading time. You can thus easily save all your standard letters, blockbusting novels, essays and business forms. It's simple to run off another copy when you require it.

Although Tasword drives the ZX Printer quite happily, it can also be configured to drive your next major purchase, a full size printer, through a variety of interfaces including Interface 1, Kempston, Tasman, Morex and Cobra Centronics Interfaces.

A full size printer should be selected with care! I got caught out by not spending enough. Having taken the advice of my machine's importers, DRG Business Machines, I bought a complete package of Seikosha GP100A, Tasman Interface and leads from my local branch of Boots.

than Tasword, to which is set up drive the ZX printer won't drive any of these interfaces, and perhaps more important, the software to drive the Tasman interface sits in the area of memory which is likely to be used by any toolkit or extended BASIC package you may care to use.

The Kempston interface software sits in the printer buffer, and thus overcomes this problem. However, it disappears when the COPY or NEW commands are used, and has to be reloaded. The interface software can also be loaded from Microdrive.

The Seikosha has proved very reliable, if rather noisy, in use. The problem here is the typeface created by the dot matrix. Whilst it is clear, clean and very uniform, and unlike many cheaper printers it uses ordinary paper at an ordinary price, the tails of letters g, y, q, and p don't descend as on an ordinary typewriter, but rather sit on top of the line. This looks rather peculiar and off-putting.

DRG claims this fact is well known, but they certainly didn't tell me about it! As a result, I have to advise you

Well, if not state of the art, then on its way.
These programs are a mixed bunch, but they
have one thing in common — good reviews.
Read why

State of the art reviews

Block Buster 48K £5.95

A quiz based on words for one or two players where correct answers lead to a block being placed on the play board. When sufficient blocks have been won to stretch from one side to the other, you win. If you answer incorrectly, your opponent gets a chance to win the block, thus cutting off your route.

That's the bare bones, but the game is a lot more sophisticated. For a start, sound and graphics are rather fine, and, unusually for a quiz, you have the opportunity to 'interrupt' the question and beat your opponent to a point. So knowledge and timing is important.

The package contains an additional question tape for use when you know the built-in ones. The level of difficulty is set by altering the amount of time. Thankfully, even when playing against your Spectrum you have a reasonable chance of winning, thanks to some clever programming.

D.M.

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

★ ★ ★ ★ ★

Zipper Flipper 48K £5.95

Sinclair Research, 25 Willis Rd, Cambridge CB1 2AQ

You either like the game of pinball, or you don't, and I do. So when I read on the inlay card that this is pinball as you have never played it before I was a bit sceptical.

But it's true. I've never played a game of pinball like this one. While clocking up pinball scores you have to break down a wall which then gives access to the fruit machine part of the game. When the ball lands on any of the three reels you can nudge that reel to get the symbol of your choice.

When, or rather, if, you manage to score on the fruit machine, that score is added to your pinball score. If you reach 10,000 then you get a free ball and a faster game.

B.B.

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

★ ★ ★ ★ ★

Moder-80 £6.95

Seven Stars, 15 Gloucester Avenue, London NW1 7AU

A reasonably priced and well packed 'all in one' non-symbolic assembler, disassembler and monitor for simple machine code development. The blurb says: 'ideal for the beginner', and 'all you need to get started reading, writing and debugging machine code programs'.

Sadly, this was not to be. I know a little about machine code, but this foxed me. The booklet doesn't claim to teach assembly language programming, but you don't find that out until you've paid! While it may indeed tell you all about Moder-80, it's not very friendly to a beginner, and neither are the error messages within the program. After half a dozen inexplicable SYNTAX ERRORS, I gave up on one feature.

If you already know enough to

make use of them, it has facilities to write assembly code using hex or decimal, modify it using hex, copy it into another area of memory, assemble it, insert a breakpoint, and step through it. The contents of the registers can be dumped to screen, as can source code, and some full size printers can be used. A notable and welcome first is the facility to copy to Microdrive.

A noble attempt to help the novice, Moder-80 deserves a fuller manual, written simply but with wider scope and greater detail.

D.M.

instructions	50%
ease of use	50%
display	85%
value for money	70%

★ ★ ★

World Cup Football 48K £6.95

Artic, Main St, Brandesburton, Driffield YO25 8RL

An amazing piece of machine code programming for the Spectrum! You and your friends can choose any of 40 teams and battle it out. Or the computer will play against you.

Selection over, the field is displayed with line drawn 3D on rather lurid green. Behind, a fully animated crowd shouts and waves to the ref's whistle and a number of well known football chants, some excruciatingly out of tune.

The opposing teams of six players are cleverly animated silhouettes of white or black, something like the characters in Valhalla. Using keys, Sinclair or

Kempston joysticks, you control one at a time, nearest the ball, which turns blue when available for play. Action is fast and furious, so you'll need your wits about you and plenty of practice. Kick off, throws in, and goal kicks are all automatic, and as play progresses, a different section of pitch is revealed.

When two or more players occupy the same space for a tackle, they both tend to disappear to be replaced by a moving smudge, which is difficult to make sense of. A must for soccer fans.

D.M.

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

★ ★ ★ ★

Linkword French 48K £12.95

Silver Soft, London House, 271/273 King St, London W6

A complete teach-yourself French package using the Gruneberg Linkword Language System, giving a vocabulary 350-plus words with basic grammar in 10 hours. The idea is to link a French word with a visual image of a similar sounding English word.

The package consists of program cassette, audio cassette (providing pronunciation back-up) and instruction manual containing a mini-dictionary of the words.

The program contains five sub-programs per side, part one being Animals, part two Furniture and Fittings, and so on. Each appears on screen as a translation of the English, with phonetic pronunciation and below that a way of remembering it by linking it with an English word. At the end of a section a test appears, requiring you to type in the English meanings — pressing ENTER producing the answer.

Then the words and translations are listed on screen before an introduction to the gender of those words, again using the Linkword method followed by a test and display.

An invitation to choose black and white or colour television produces little use of colour — an omission — and there is no reinforcement by ticks, sound or scoring when correct. However, a useful way to acquire a basic vocabulary.

T.W.

instructions	95%
ease of use	90%
display	65%
value for money	90%

★ ★ ★ ★

More reviews in the
next issue of ZX User

ACE IS HIGH

Place your bets on the luck of the draw in this game by H. Shaw. High cards win, but don't worry – no money changes hands so you can't lose out

Play your cards right and win against your micro! This isn't only a game of chance: if you can remember which cards have been turned up so far, your odds will be better.

You start with £500. Five cards are dealt face down and you must place your bet, in whole units, and you can't spend more money than you have. You stand to win five times your bet if you can guess whether the next card to be turned up will be higher or lower than the preceding one. The whole hand must be right or you lose your stake.

Ace is high and the odds are weighted in favour of the dealer – if two successive cards are the same value you lose your bet.

After 50 cards (10 hands) have been played, the pack will be reshuffled, and you will be notified of this on screen. Start exercising your memory here and increase your chances of winning.

The game ends when you lose your money, which is bound to happen sooner or later. You will be shown the highest amount of money you managed to accumulate throughout the game.

This is a simple but addictive game, and a number of strategies will improve your chances. Of course, the great advantage is that you will not be out of pocket at the end of the game – but neither will you have amassed a fortune.

How it works

- 30-120** set variables
- 130-170** load UDGs from data statements in lines 1500-1640
- 190-210** set colours and print five cards face down
- 220-330** initial information on your financial position and input of bet
- 360-540** print each of the five cards as you bet and they are turned face up

- 560-690** select next card and check if already dealt
- 700-790** derive the graphics for any numbered card
- 800-930** title
- 940-1160** instructions
- 1180-1200** record highest score
- 1210-1300** print face down cards
- 1310-1370** check if selected card still in pack, check number of cards played. Reshuffle when 50 cards played
- 1380-1490** print face cards
- 1500-1640** data statements for UDGs
- 1650-1740** high score, do you want to go again?

Variables

PACK number of cards played

- MON** amount of money you have
- HIGH** highest amount accrued
- CN** card number (value)
- BET** your bet
- K PRINT AT x** value for card being turned face up
- IC** ink colour for card graphics
- LC** number (value) of last card turned face up
- CS** card suit. Value 1-4 to slice the string A\$ and select card suit
- A\$** string of four suits
- N\$** string of card numbers (ace to king)
- S\$** symbol of current card suit
- Arrays: RS (4,13)** your suits of 13 cards; **G\$ (7,5)** graphics of card to be printed.

User Defined Graphics
GRAPHICS H heart, C club,

D diamond, S spade, A upright crown, B upright face, E upright right shoulder, F upright left shoulder, K inverted left shoulder, J inverted right shoulder, I inverted face, G inverted crown, L tunic squiggle, N tunic squiggle, M tunic cross.

Until you have run the program, the letters in GRAPHIC mode will reproduce as letters. They will amend when the program is run, but you may find it helpful to type in lines 130-170 and 1500-1640 and RUN, before typing in the rest of the program. This will set the UDGs and as you type in the remainder of the program the correct symbols will print.

```

10 RANDOMIZE
20 PRINT "START"
30 LET MON=500
40 LET HIGH=0
50 DIM A$(4,13)
60 LET PACK=0
70 LET MON=500
80 LET HIGH=0
90 LET MON=500
100 LET HIGH=0
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1650 PRINT AT 96,0; "*****"
1660 PRINT AT 97,0; "*****"
1670 PRINT AT 98,0; "*****"
1680 PRINT AT 99,0; "*****"
1690 PRINT AT 100,0; "*****"
1700 PRINT AT 101,0; "*****"
1710 PRINT AT 102,0; "*****"
1720 PRINT AT 103,0; "*****"
1730 PRINT AT 104,0; "*****"
1740 PRINT AT 105,0; "*****"
1750 PRINT AT 106,0; "*****"
1760 PRINT AT 107,0; "*****"
1770 PRINT AT 108,0; "*****"
1780 PRINT AT 109,0; "*****"
1790 PRINT AT 110,0; "*****"
1800 PRINT AT 111,0; "*****"
1810 PRINT AT 112,0; "*****"
1820 PRINT AT 113,0; "*****"
1830 PRINT AT 114,0; "*****"
1840 PRINT AT 115,0; "*****"
1850 PRINT AT 116,0; "*****"
1860 PRINT AT 117,0; "*****"
1870 PRINT AT 118,0; "*****"
1880 PRINT AT 119,0; "*****"
1890 PRINT AT 120,0; "*****"
1900 PRINT AT 121,0; "*****"
1910 PRINT AT 122,0; "*****"
1920 PRINT AT 123,0; "*****"
1930 PRINT AT 124,0; "*****"
1940 PRINT AT 125,0; "*****"
1950 PRINT AT 126,0; "*****"
1960 PRINT AT 127,0; "*****"
1970 PRINT AT 128,0; "*****"
1980 PRINT AT 129,0; "*****"
1990 PRINT AT 130,0; "*****"
2000 PRINT AT 131,0; "*****"

```

YOU SHOULD'VE
BEEN IN
THE MOVIES!

Scenes from the silver screen dominate these games. You're a cowboy stopping a runaway train, the Incredible Hulk, a hero from a distant galaxy. Lights, action, sound — roll the cameras!

The Incredible Hulk 48K £9.95

Adventure International, 119 John Bright St, Birmingham B1 1BE

The first of the Questprobe series from Adventure International, featuring characters from Marvel Comics, this is a logical extension of now standard marketing ploys. Find a character that appeals to kids, then produce everything from T-shirts to plastic mugs and computer games. A plastic mug is a plastic mug, whatever its colour, but the quality of adventures varies. How does this measure up?

The graphics window is smaller than Hobbit standard, but the pictures really do have that Marvel quality. Rather fine. The input interpreter is another matter. Basically, it accepts just two words of "verb-noun" variety. Stray from this and the computer doesn't understand. After Valhalla or the Hobbit, it's difficult to return to this low level of sophistication.

As to the story, it's difficult to say after the relatively short time allowed for review. Certainly, the detailed leaflet gives clues to a mixture of sci-fi and sorcery, which starts when you find yourself as Dr Banner, alter ego of the Hulk, tied to a chair. Half an hour later, and two deaths, about four moves had been made successfully! A hints sheet is available.

Overall, I was disappointed with this, coming as it does from Scott Adams. I was expecting something spectacular and different. Instead, a rather ordinary adventure structure is helped along by good graphics and a well known character.

D.M.

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

★ ★ ★

Energy 3000 48K £4.90

Elm Computers, 52 Bateman Rd, East Leake, Loughborough, Leics LE12 6NN

A simple loading screen of a bulldozer precedes the option of instructions followed by keyboard or joystick selection. This fast machine code game is, according to the insert, set in the year 3000 when Dr Minestrone has selected you to remove Pink Tar from the old 20th century mines as an alternative fuel to uranium — the supply of which is running out.

You have to mine the Pink Tar with a bulldozer (so much for the advance of science), driving it to the transformer on the surface. After 10 deposits you are moved

to another mine — but watch out for the mutant Creepy Crawlies lurking below, which increase in number and nastiness the harder you work.

Sounds great does it not? Forget it. This game does not live up to its sales pitch. The graphics are poor, use of colour and sound almost negligible. Screen bottom shows lives left, time left and current score — no hall of fame.

I scored 1,275... just by leaving the bulldozer on the surface, where it picked up pearls, while I made a cup of coffee! T.W.

instructions	85%
playability	30%
graphics	35%
value for money	40%

★ ★

Clerky 48K £5.99

Unique, 16 Thorney Lane South, Iver, Buckinghamshire

Clerky is a busy office clerk who likes his beer. That much is evident from the shape of his figure!

The only way he can get out to his favourite pub is to collect all the letters and file them away. However, if he gets ink on his shirt, or gets hit by a flying rubber, he has to start all over again. How does he get ink on his shirt? Flying inkpots, that's how. I well remember a certain miner being clobbered by objects more bizarre than flying inkpots. You need very keen eyesight to see these inkpots though because they are black on a dark background, which makes for a

very difficult game.

You shouldn't have any loading problems, but there is a problem after you have loaded. The inlay card states either user defined keys, or a joystick, but I can't find any way of defining my own keys. However, Clerky responds to the keyboard quite well, and the movement is quite smooth.

There are 10 levels of play with four lives, and a high score chart. An amusing theme but not my own idea of an addictive game. The game may get better as you progress to higher levels, but I don't think so. B.B.

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

★ ★ ★ ★

Stop the Express 48K £5.95

Sinclair Research, 25 Willis Rd, Cambridge CB1 2AQ

After loading, with no problems, the first thing that you notice is that the hero on the screen doesn't look one bit like the drawing on the inlay card. I much prefer the one on the screen.

It would appear that the scene for this game is the wild and woolly west of America because the villains are called Redmen. The hero is a tousled-haired character who has the task of stopping a train, with a little bit of help from you, of course. If you get really lucky you may capture a Firebird to help you with your task. The race to stop the train starts off in true Western fashion on the top of it.

Hopefully surviving the rooftop chase, you have yet to get into a carriage and make your way to the driver's cabin to stop the train, which is the name of the game.

A novel theme, well presented, and quite good graphics. Once you have sorted out the keyboard there is a positive response to your keypress, but using a joystick makes for a better game. B.B.

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

★ ★ ★ ★

City Fighter 48K £5.50

Choice Software, Choice Buildings, 75 Belfast Rd, Carrickfergus, Co. Antrim, Northern Ireland

On average, I would say that less than one per cent of all tapes that I review have loading problems. This one has no such problem. But, if it did, I am informed on the inlay card that I can get a replacement free.

And, with a delightfully impish sense of humour, I am solemnly informed that I am hereby licensed to use this game on any computer I choose, but it will only run on a Spectrum!

The game itself is a battle between you, and the Zygorian battle fleet, and is set in the Earth city of Choiceville. The screen shows a curious mixture of an aerial view of the battle, but not of the buildings, which form a kind of maze.

You are in a four-phase mage-blast, which initially requires eight keys to control it. Thank goodness you can re-define the keys. Now and again a human form appears, and if you rescue four of them in one screen you get an extra life. B.B.

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

★ ★ ★



Don your whites and bowl along

```

1 REM Bowl By A.G.Bird.1984
2 POKE 256/9,201 PRINT AT 10,10:"Please Wait." : GO SUB 9000
3 GO TO 7000
4 BORDER 4: PAPER 4: CLS
5 INPUT "How many bowls do you want ? " : bowls
6 FOR f=1 TO bowls NEXT f
7 LET s=1: LET a=1: LET b=1: LET s=1: LET a=1: LET b=1
8 PRINT AT 0,0: "AT 1,0: BOWLS " : AT 3,0: "By " : AT 4,0: "A.G.Bird."
9 PRINT AT 19,0: "AT 20,0: " : AT 21,0: "
10 PRINT AT 19,0: "AT 20,0: " : AT 21,0: "
11 LET s=INT (RND*14)+1: LET a=INT (RND*17)+1
12 PRINT AT a,y: INK 7: " : FALSE 50
13 FOR a=1 TO 5: PRINT AT a+1,y-5: "Back " : BEEP .2,a*3: NEXT a: PRINT AT a+1,
y-5: " : FOR f=1 TO 25: NEXT f: NEXT a
14 REM Main Loop
15 FOR v=1 TO bowls
16 REM Backhand/Forehand
17 FOR f=1 TO 300: NEXT f PRINT AT 19,10: BRIGHT 1: PAPER 3: "Type or shot
"
18 PRINT AT 20,8: "Backhand or Forehand"
19 FOR f=10 TO 12 STEP -1: PRINT AT 21,f: PAPER 6: (B) or (F) : AT 21,f+13: P
APER 4: " : BEEP .02,f: NEXT f
20 IF INKEY="B" THEN LET type=5: GO TO 70
21 IF INKEY="F" THEN LET type=4: GO TO 70
22 GO TO 50
23 GO SUB 8000
24 REM Angle
25 PLOT 24,12: DRAW 16,20: PLOT 26,10: DRAW 19,15: PLOT 28,8: DRAW 20,8
26 PRINT AT 17,5: "AT 18,6: " : AT 19,7: "3"
27 PRINT AT 19,10: PAPER 3: BRIGHT 1: "Angle of Delivery "
28 FOR f=10 TO 14 STEP -1: PRINT AT 21,f: PAPER 6: "1,2 or 3 ? " : AT 21,f+13: P
APER 4: " : BEEP .02,f: NEXT f
29 IF INKEY="1" THEN LET angle=1: GO TO 110
30 IF INKEY="2" THEN LET angle=2: GO TO 110
31 IF INKEY="3" THEN LET angle=3: GO TO 110
32 GO TO 100
33 GO SUB 8000
34 REM Weight
35 PRINT AT 19,9: PAPER 3: BRIGHT 1: "Strength of shot "
36 PRINT AT 20,9: "Keep your finger on " : AT 21,11: "to alter strength"
37 PRINT AT 21,9: PAPER 5: "5"
38 IF INKEY="5" THEN GO TO 130
39 FOR f=20 TO 21: PRINT AT f,9: " : NEXT f
40 IF s=2 THEN PRINT AT 21,7: "Press B to deliver bowl."
41 IF INKEY="B" THEN GO SUB 8000: GO TO 200
42 IF INKEY="C" THEN LET s=25: IF s>10 THEN LET s=1: PRINT AT 20,15: "
: GO TO 145
43 PRINT AT 20,14: INK 2: s=1
44 GO TO 145
45 REM Man
46 PRINT AT 19,0: "AT 20,0: " : AT 21,0: " : FOR f=1 TO 200: NEXT f
47 IF INKEY=" " THEN GO TO 230
48 GO TO 210
49 PRINT AT 19,0: "AT 20,0: " : AT 21,0: " : FOR f=1 TO 200: NEXT f
50 IF INKEY=" " THEN BEEP .2,20
51 PRINT AT 19,0: "AT 20,0: " : AT 21,0: "
52 GO SUB angle*1000
53 REM Wood Movements
54 REM Angle 1
55 FOR z=1 TO INT s+4
56 IF ATTR (a,b)=39 THEN BEEP .01,50: PRINT AT a,b+1: INK 7: " : GO TO 1030
57 IF ATTR (a,b)=33 THEN BEEP .02,10: PRINT AT a-1,b: INK 1: "
58 PRINT AT a,b: INK 1: " : PAUSE p: PRINT AT a,b: "
59 LET a=a-1: LET b=b+1: LET p=p+1
60 NEXT z
61 GO TO type*1000
62 REM Angle 2
63 FOR z=1 TO INT s+2
64 IF ATTR (a,b)=39 THEN BEEP .01,50: PRINT AT a-1,b: INK 7: " : GO TO 2030
65 IF ATTR (a,b)=33 THEN BEEP .02,10: PRINT AT a-1,b: INK 1: "
66 PRINT AT a,b: INK 1: " : PAUSE p: PRINT AT a,b: "
67 LET a=a-1: LET b=b+1: LET p=p+1
68 NEXT z
69 GO TO type*1000
70 REM Angle 3
71 FOR z=1 TO INT s-2
72 IF ATTR (a,b)=39 THEN BEEP .01,50: PRINT AT a-1,b+1: INK 7: " : GO TO 303
0
73 IF ATTR (a,b)=33 THEN BEEP .02,10: PRINT AT a-1,b+1: INK 1: "
74 PRINT AT a,b: INK 1: " : PAUSE p: PRINT AT a,b: "
75 LET a=a-1: LET b=b+1: LET p=p+1
76 NEXT z
77 GO TO type*1000
78 REM Bias 1
79 GO SUB 4100
80 LET a=a-1: LET b=b+1: GO SUB 4100
81 LET a=a-1: LET b=b+1: GO SUB 4100
82 LET a=a-1: GO SUB 4100
83 LET a=a-1: GO SUB 4100
84 LET a=a-1: LET b=b+1: GO SUB 4100
85 PRINT AT a,b: INK 1: "
86 LET a=a-1: LET b=b+1: LET p=p+1: LET s=1: NEXT v
87 PAUSE 500: GO TO 7000
88 IF ATTR (a,b)=39 THEN BEEP .01,50: PRINT AT a-1,b: INK 7: " : GO TO 4120
89 IF ATTR (a,b)=33 THEN BEEP .02,10: PRINT AT a-1,b+1: INK 1: "
90 PRINT AT a,b: INK 1: " : PAUSE p: PRINT AT a,b: " : RETURN
91 REM Bias 2
92 GO SUB 5100
93 LET a=a-1: LET b=b+1: GO SUB 5100
94 LET b=b+1: GO SUB 5100
95 LET b=b+1: GO SUB 5100
96 LET a=a-1: LET b=b+1: GO SUB 5100
97 PRINT AT a,b: INK 1: "
98 LET a=a-1: LET b=b+1: LET p=p+1: LET s=1: NEXT v
99 PAUSE 500: GO TO 7000
100 IF ATTR (a,b)=39 THEN BEEP .01,50: PRINT AT a,b+1: INK 7: " : GO TO 5120
101 IF ATTR (a,b)=33 THEN BEEP .02,10: PRINT AT a-1,b+1: INK 1: "
102 PRINT AT a,b: INK 1: " : PAUSE p: PRINT AT a,b: " : RETURN
103 REM Title
104 BORDER 1: INK 7: CLS
105 FOR f=10 TO 15: PRINT AT 21,f: "Bowls " : BEEP .02,f: NEXT f
106 PRINT AT 5,17: "Bowls " : BEEP .02,16: PRINT AT 4,19: "Bowls " : BEEP .02,17
107 FOR f=20 TO 24: PRINT AT 3,f: "Bowls " : BEEP .02,f-3: NEXT f
108 PRINT AT 4,25: "Bowls " : BEEP .02,22
109 PRINT AT 5,26: "Bowls " : BEEP .02,23: PRINT AT 6,26: "Bowls " : BEEP .02,24
110 PAPER 6: INK 0: PRINT AT 3,11: "By A.G.Bird." : AT 17,10: "At any le: " : AT 19,
18: " for a game. "
111 PAUSE 0: BEEP .5,10: GO TO 5
112 REM Clear screen routine
113 BEEP .5,10: FOR f=17 TO 21: PRINT AT f,5: " : N
EXT f: RETURN
114 REM Graphics
115 FOR a=65280 TO 65479
116 READ a: POKE a,8: NEXT a
117 DATA 0,0,3,3,3,3,3
118 DATA 0,0,128,64,128,128,0,128
119 DATA 7,11,11,11,11,11,11
120 DATA 192,160,160,160,160,160,160
121 DATA 2,2,2,2,2,2,2,14
122 DATA 128,128,128,128,128,128,128,128
123 DATA 192,160,167,151,151,14,128,128
124 DATA 0,0,0,0,0,5,4,9
125 DATA 0,4,14,28,28,224,224,224
126 DATA 17,5,2,8,6,740,129,129
127 DATA 208,144,208,40,7,195,6,195
128 DATA 144,128,128,128,128,128,128,128
129 DATA 0,0,128,128,128,128,128,128
130 DATA 29,56,86,174,174,82,84,136
131 BORDER 5: PAPER 5: CLS
132 PRINT AT 12: PAPER 6: "Bowls " : PAPER 5: "It's a sunny afternoon on the
village green, and conditions
are perfect for a gentle " : "relaxing game
of bowls."
133 PRINT "The jati will be played for you " : "somewhere on the green, and yo
u " : "Are here as many woods as you " : "like to test your skill and " : "judgemen
t."
134 PRINT AT 11,6: "ENTER 6: Press any key "
135 PAUSE 5
136 RETURN

```


What better for a sweltering hot summer's day than a nice cool game of bowls. You play on luscious green grass, sporting whites which keep out the heat and retain your serenity. That's why you often see bowls being played by those of more mature years.

Why don't you take it easy and have a break from violent games? Even if you can't play the real thing, here's a great game so that you can pretend you're really there. Soak up the atmosphere, sip the barley water, stay cool and develop your skills while maintaining friendly relationships with those around you.

Variables

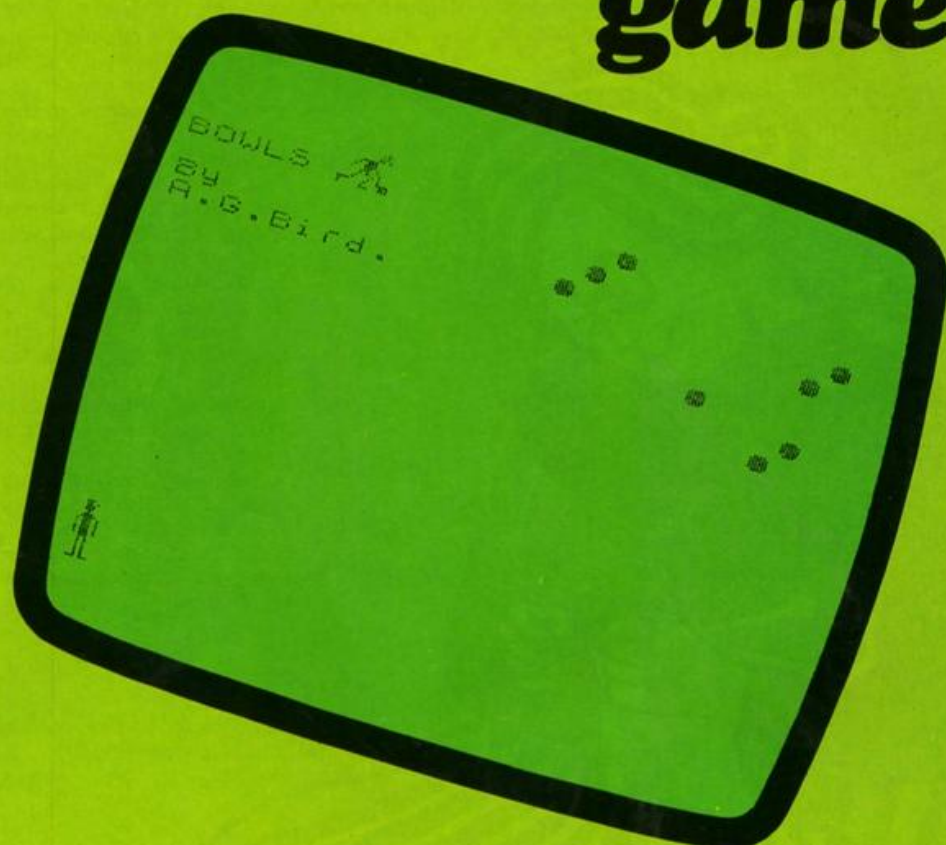
a,b position of bowl
x,y position of jack
p slows down bowls
s strength of shot
ss strength indicator
Bowl number of bowls
type shot type (backhand or forehand)
angle angle of delivery (1, 2 or 3)
z used in delivery of bowl loop
f general purpose loop

How it works

1-5 GOSUB graphics, instructions, keyboard BEEP
6-8 set up variables
10-25 set up screen
30 start of main loop
35-70 backhand or forehand
80-110 angle of shot
120-180 strength of shot
200-300 main bowling routine
1000-1100 delivery of bowl, angle 1
2000-2100 delivery of bowl, angle 2
3000-3100 delivery of bowl, angle 3
4000-4130 bias of forehand shot
5000-5130 bias of backhand shot
7000-7060 start of new game routine
8000 clear screen routine
9000-9230 graphics
9500-9900 introduction

There's no stress or strain in this game of bowls, written for you by Andrew Bird. Take your time, aim carefully and be a good sport

Take it easy and have a break from violent games



Don't get

This game gives us all a pleasant break from alien-zapping and fast finger work. What's required here is fine judgement and an eye for colour.

It will particularly tell you whether you're colour blind or not, as you have to distinguish between shades of green and tints of orange.

You also have to be able to manoeuvre carefully through a packed stockroom whilst you search out the elusive ball of wool. Let me explain — you're an assistant in a wool shop and each customer comes in and shows you a sample of the ball of wool she needs. You have to test your powers of observation and memory by retaining the colour in your head and finding it from the stockroom.

You will no doubt improve your skills as the game progresses, and the program has taken this into account. Gradually the time each customer shows you her sample is reduced, so you must absorb the information much quicker.

Don't get too harrassed — your job doesn't depend on it, as it's only a game. At the end of this game you should really be spot on for colour recognition.

Variables

Dim p array for 18 paper colours
pa,in paper and ink colours of customers' wools

pp,ii other paper and ink colours

c,cc number of customers

sc score of correct guesses

time time sample shown for

v vertical position of customer

z counter for whether wool chosen

x,y position of girl

w ball of wood used for customers' sample

s counter for paper and ink array

att ATTR number of correct ball of wool

a ATTR number of wool chosen

a\$,b\$,c\$ girl character

f,n general purpose loops

How it works

3-5 variables

8-90 set up wool colours

100-122 inside shop.

124-160 customer routine

170-190 girl walks to stockroom

195-270 inside stockroom

310-895 move girl

1000-1050 check ATTR of wool chosen

5000-5050 compare wool chosen with sample

6000-6050 end of game routine

7000-7100 instructions

9000-9130 graphics

Develop your observational skills in Andrew Bird's fun game.



in a tangle

You're in a wool shop and you have to track down matching yarns — but it's not as easy as it sounds

1 REM The Wool Shop

By A.G.Bird 1984

2 GO SUB 9000: GO SUB 7000

3 LET sc=0: LET time=400

4 LET c=c-1: IF c<0 THEN GO TO 6000

5 LET v=27: LET z=0: LET x=20: LET y=10: LET a\$="EE": LET b\$="GH": LET c\$="I

8 BRIGHT 0: BORDER 7: PAPER 7: INK 0: CLS

9 REM Wool colours

10 DIM p(18): DIM i(18)

20 LET w=INT (RND*18)+1

25 LET pa=INT (RND*6)+2: LET in=INT (RND*7)+1

30 FOR f=1 TO 18

40 LET pp=INT (RND*6)+2

50 LET ii=INT (RND*7)+1

60 IF pp=pa AND ii=in OR pp=in AND ii=pa THEN GO TO 40

70 LET p(f)=pp: LET i(f)=ii

80 NEXT f

90 LET p(w)=pa: LET i(w)=in

99 REM Inside shop

100 PRINT AT 0,6: INK 2: INVERSE 1: " THE WOOL SHOP "

102 INK 0: PLOT 46,175: DRAW 0,-48: PLOT 209,175: DRAW 0,-48

104 PLOT 0,80: DRAW 46,46: DRAW 163,0: DRAW 46,-46: PLOT 224,112: DRAW 0,24: DRAW 8,-8: DRAW 0,-24

106 FOR f=6 TO 21 STEP 5

108 BRIGHT 1: PRINT AT 8,f: INK 1: INVERSE 1: "EED"

110 PRINT AT 9,f: PAPER RND*6+1: INK RND*6+1: "BBB": AT 10,f: PAPER RND*6+1: INK

RND*6+1: "BBB": AT 11,f: PAPER RND*6+1: INK RND*6+1: "BBB"

112 NEXT f

114 BRIGHT 0: PRINT AT 10,4: a\$: AT 11,4: b\$: AT 10,9: "ME": AT 11,9: b\$: AT 10,19: a\$:

A
T 11,19: b\$

116 PRINT AT 16,2: "Stock": AT 17,2: "Room.": PLOT 4,40: DRAW 10,10: DRAW 46,0: DRAW 0,-20: DRAW -46,0: DRAW -10,10

118 PLOT 34,20: DRAW 0,10: PLOT 38,20: DRAW 0,10

120 PRINT AT 21,0: PAPER 5: "

122 PRINT AT 20,10: PAPER 8: a\$: AT 21,10: b\$

124 FOR f=9 TO 18: PRINT AT f,v: a\$: AT f+1,v: b\$: BEEP .06,-20: PRINT AT f+1,v: c\$:
: BEEP f/200,-f

126 IF v=18 THEN GO TO 130

128 PRINT AT f,v: " ": AT f+1,v: " ": LET v=v-1: NEXT f

130 PLOT 162,28: DRAW 26,14,1: PLOT 162,28: DRAW 36,14,1: PLOT 198,42: DRAW 36,0:
: DRAW 0,32: DRAW -62,0: DRAW 0,-32: DRAW 16,0

135 PRINT AT 13,22: INT (RND*4)+2: " Balls": AT 14,22: "of this": AT 15,22: "Please."

140 PRINT AT 18,18: "I": AT 18,17: PAPER pa: INK in: BRIGHT 1: "B"

145 LET time=time-40: IF time<0 THEN LET time=0

150 FOR f=1 TO time: NEXT f

160 FOR f=12 TO 18: PRINT AT f,20: " ": NEXT f: PRINT AT 18,17: " E"

170 PAPER 8

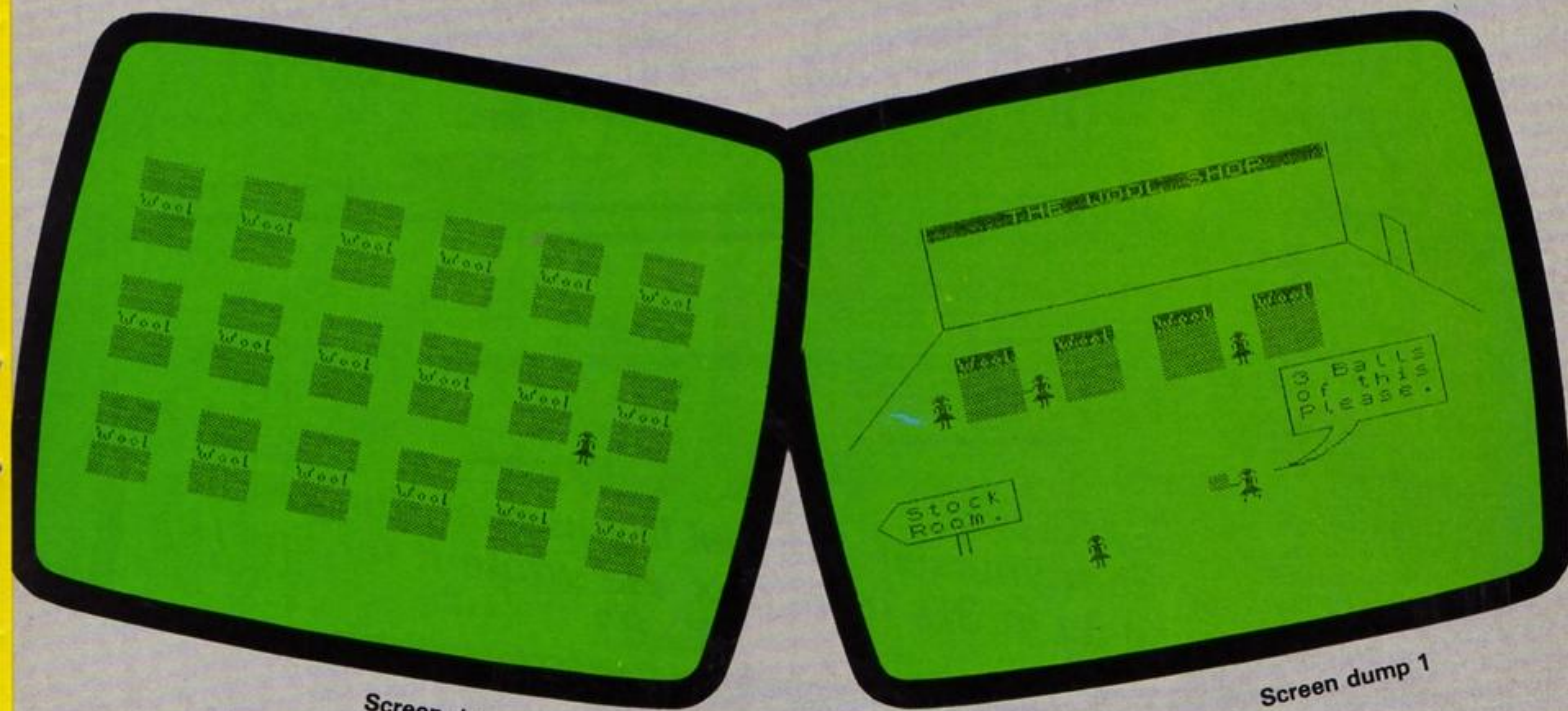
175 IF y=0 THEN GO TO 195

180 IF INKEY\$="5" THEN PRINT AT x+1,y: c\$: FOR f=1 TO 10: NEXT f: BEEP .02,-20:


```

LET y=y-1: GO TO 190
185 GO TO 175
190 PRINT AT x,y+1;" ";AT x+1,y+1;" ";AT x,y;a$;AT x+1,y;b$: FOR f=1 TO 10: N
EXT f: BEEP .02,-15: GO TO 175
194 REM Inside Stockroom
195 CLS : LET y=30: PRINT AT x,y;a$;AT x+1,y;b$
200 PAPER 7: LET s=0
210 FOR f=0 TO 14 STEP 7
220 FOR n=2 TO 27 STEP 5
230 LET s=s+1
240 BRIGHT 1: PRINT AT f,n; PAPER p(s); INK i(s);"BBB";AT f+1,n;"BBB";AT f+3,
n;
"BBB";AT f+4,n;"BBB"
250 PRINT AT f+2,n; PAPER 1; INK 7;"BCD"
260 NEXT n: NEXT f
270 LET att=64+8*pa+in
290 BRIGHT 0
299 REM Move girl
310 IF INKEY$="" THEN PRINT AT x,y;a$;AT x+1,y;b$
320 IF INKEY$="5" THEN GO SUB 500
330 IF INKEY$="6" THEN GO SUB 600
340 IF INKEY$="7" THEN GO SUB 700
350 IF INKEY$="8" THEN GO SUB 800
370 GO TO 300
500 LET c$="I_": LET y=y-1
510 IF y<0 THEN LET y=0
520 GO SUB 1000
550 PRINT AT x,y;a$;AT x+1,y;c$;AT x,y+2;" ";AT x+1,y+2;" "
560 FOR f=1 TO 10: NEXT f: BEEP .01,-20
570 PRINT AT x+1,y;b$
580 FOR f=1 TO 10: NEXT f: BEEP .01,-15
590 IF z=1 THEN GO TO 5000
595 RETURN
600 LET x=x+1
610 IF x>20 THEN LET x=20
620 GO SUB 1000
650 PRINT AT x,y;a$;AT x+1,y;c$;AT x-1,y;" "
660 FOR f=1 TO 10: NEXT f: BEEP .01,-20
670 PRINT AT x+1,y;b$
680 FOR f=1 TO 10: NEXT f: BEEP .01,-15
690 IF z=1 THEN GO TO 5000
695 RETURN
700 LET x=x-1
710 IF x<0 THEN LET x=0
720 GO SUB 1000
750 PRINT AT x,y;a$;AT x+1,y;c$;AT x+2,y;" "
760 FOR f=1 TO 10: NEXT f: BEEP .01,-20
770 PRINT AT x+1,y;b$
780 FOR f=1 TO 10: NEXT f: BEEP .01,-15
790 IF z=1 THEN GO TO 5000
795 RETURN
800 LET c$="K_": LET y=y+1
810 IF y>30 THEN LET y=30
820 GO SUB 1000
850 PRINT AT x,y;a$;AT x+1,y;c$;AT x,y-1;" ";AT x+1,y-1;" "
860 FOR f=1 TO 10: NEXT f: BEEP .01,-20
870 PRINT AT x+1,y;b$
880 FOR f=1 TO 10: NEXT f: BEEP .01,-15
890 IF z=1 THEN GO TO 5000
895 RETURN
999 REM ATTR Wool check
1000 IF ATTR (x,y)<>56 THEN LET a=ATTR (x,y): LET z=1
1010 IF ATTR (x+1,y)<>56 THEN LET a=ATTR (x+1,y): LET z=1
1020 IF ATTR (x,y+1)<>56 THEN LET a=ATTR (x,y+1): LET z=1
1030 IF ATTR (x+1,y+1)<>56 THEN LET a=ATTR (x+1,y+1): LET z=1
1050 RETURN
5000 IF a<>att THEN GO TO 5030
5010 PRINT AT 21,2; INK 4; FLASH 1;" Correct ": FOR n=1 TO 3: FOR f=0 TO 20: BEE
P .02,n*f: NEXT f: NEXT n: LET sc=sc+1
5020 PRINT AT 21,12; INK 2;"Customer Satisfied": FOR f=1 TO 200: NEXT f: GO TO 4

```

Screen dump 2

Screen dump 1

```

5030 PRINT AT 21,2; INK 1; FLASH 1;" WRONG ": FOR n=1 TO 3: FOR f=40 TO 0 STEP -
2: BEEP .02,f-n*10: NEXT f: NEXT n
5040 PRINT AT 21,12; INK 1;"Customers Sample "; BRIGHT 1; INK in; PAPER pa;"B"
5050 BEEP .2,10: BEEP .4,0: BEEP .6,-10: FOR f=1 TO 200: NEXT f: GO TO 4
5999 REM End of game routine
6000 BORDER 3: PAPER 3: INK 0: CLS
6010 PAPER 6: PRINT AT 4,7;" You have had ";sc;" ";AT 6,5;" satisfied customers
"
6020 IF sc=cc THEN GO TO 6050
6030 FOR f=1 TO 300: NEXT f: PRINT AT 10,11;" HOWEVER ";AT 15,0;" ";cc-sc;" Com
plained to the manager! "
6040 BEEP 2,-30
6050 PRINT AT 21,0;" Hit a key for another days work": PAUSE 0: RUN
6999 REM Instructions
7000 BORDER 5: PAER 5: INK 0: CLS
7010 PRINT AT 0,0; PAPER 2; INK 7;" The Wool Shop By A.G.Bird 1984 "
7020 PRINT "" Your job in the wool shop is"" fetch balls of the correct"" c
oloured wool from the stock"" room for your customers."
7030 PRINT "" However, as the day goes on,""" they seem to be in more & more""
" of a hurry, and only show you"" thier sample of wool breifly."
7040 PRINT AT 19,1;"Use keys 5,6,7 & 8 to move"
7050 FOR f=-30 TO 30: BEEP .02,f+RND*30: NEXT f
7060 INPUT ; PAPER 6;" How many customers do you want?";c
7070 LET cc=c
7100 CLS : RETURN
8999 REM Graphics
9000 FOR g=65368 TO 65471: READ r: POKE g,r: NEXT g: RETURN
9010 DATA 170,85,170,85,170,85,170,85
9020 DATA 0,65,65,34,42,42,20,0
9030 DATA 0,0,0,16,41,41,16,0
9040 DATA 0,8,8,136,72,72,140,0
9050 DATA 3,7,11,1,7,11,11,11
9060 DATA 128,192,160,0,192,160,160,160
9070 DATA 3,7,15,31,2,2,2,6
9080 DATA 128,192,224,240,128,128,128,192
9090 DATA 3,7,15,31,4,8,8,24
9100 DATA 128,192,224,240,128,224,32,0
9110 DATA 3,7,15,31,2,14,8,0
9120 DATA 128,192,224,240,64,32,32,48
9130 DATA 3,7,11,1,7,11,243,3

```


Here's your chance to be a hero. There's been a train crash and many people need your help.

See how many you can rescue. But be warned, there are fast-moving trains on the tracks whose drivers are not aware of the disaster.

Full instructions are in the program.

My highest score so far is 17,940. If you can beat that, please write in to ZX User.

How it works

5 GOSUB for instructions

6-130 main variables and strings

40-140 go into fast mode and then draw screen display, then return to slow mode

170-370 main routine

400-570 game over and high scorers are asked to input their names in inverse

700-710 SAVE program and autostart when LOAded

Variables

A,B your position

C,D position of moving train

T position of unconscious people (*) on each track at random

F used for loops

S score

HS high score

A\$ graphic of train

B\$ and H\$ name of high scorer in inverse letters

Hints on conversion

This program should convert very easily. The FAST statement will go into fast mode and print the screen display quickly and SLOW will change it back to normal. You could ignore that.

But the PEEK on line 160 will have to be changed. It is there so that if your character (A) touches any part of the train you will lose a life.

Apart from that, you could add some sounds, colours and defined graphics.

```

1 REM *****
2 REM *****3D TRAIN TRAX*****
3 REM *****BY HUNG NGO*****
4 REM *****
5 GOSUB 600
6 LET HS=0
7 LET H$=""
10 LET S=0
15 LET A$=""

```

```

20 LET A=14
30 LET B=23
40 FAST
50 FOR F=0 TO 5
60 PRINT AT F,0
70 NEXT F

```

Earn yourself a medal if you beat Hung Ngo's score in 3D Train Trax. He wrote it for the 16K ZX81




```

80 PRINT AT 5,0,"";AT 21,0;"
90 PRINT AT 1,8;"3D TRAIN TRAX
";AT 3,5;"SCORE";AT 3,19;"HI-SCOR
";AT 21,1;H$
100 PRINT AT 7,0;A$;AT 12,0;A$;
AT 17,0;A$
110 FOR F=1 TO 5
115 LET T=INT (RND*15)+6
120 PRINT AT 9,T;"*";AT 14,T;"*
";AT 19,T;"*
130 NEXT F
140 SLOW
170 LET U=INT (RND*3)
180 IF U=0 THEN LET C=7
190 IF U=1 THEN LET C=12
200 IF U=2 THEN LET C=17
210 LET U=INT (RND*2)
220 IF U=0 THEN FOR D=0 TO 24 S
TEP 3
230 IF U=1 THEN FOR D=0 TO 24 S
TEP 4
250 PRINT AT C,D;"";AT C+
1,D;"";AT C+2,D;"";A
T C+3,D;"
260 PRINT AT A,B;
265 LET P=PEEK (PEEK 16398+256*
PEEK 16399)
270 IF P=23 THEN GOSUB 350
280 IF P=1 OR P=139 OR P=136 TH
EN GOTO 400
289 PRINT AT A,B;"A";AT A,B;" "
290 LET A=A+(5 AND A<18 AND INK
EY$="6")-(5 AND A)&3 AND INKEY$="
7")
300 LET B=B+(INKEY$="8" AND B<=
28)-(INKEY$="5")
310 NEXT D
320 GOTO 100
350 LET S=S+10
360 PRINT AT 4,6;5;AT 4,21;H$
370 RETURN
400 PRINT AT 11,11;"GAME OVER"

```

```

410 IF S>H$ THEN GOSUB 500
420 PRINT AT 16,0;"
430 PRINT AT 16,0;"DO YOU WANT
ANOTHER GAME ?(Y/N)"
435 PRINT AT 17,0;A$
440 IF INKEY$="Y" THEN GOTO 470
450 IF INKEY$="N" THEN STOP
460 GOTO 420
470 CLS
480 GOTO 10
500 PRINT AT 16,0;"HI-SCORE-PL
ASE ENTER YOUR NAME"
501 PRINT AT 17,7;"IN INVERSE L
ETTERS"
510 INPUT B$
520 LET H$=S
530 LET H$=B$
570 RETURN
600 PRINT AT 3,0;"3D T
RAIN TRAX"
605 PRINT "

```

```

610 PRINT "YOU ARE AT THE RAIL
WAY TRACKS. YOU MUST TRY TO SAV
E AS MANY UNCONSCIOUS PEOPLE
AS YOU CAN.
615 PRINT "
620 PRINT "YOU MUST AVOID THE
TERRIBLE FAST MOVING TRAINS.
THE TRAINS MOVE RANDOMLY.
625 PRINT "
630 PRINT "THE KEYS YOU REQUIRE
ARE :-
7
5+8
6
635 PRINT "
640 PRINT "PRESS ANY KEY TO ST
ART PLAYING"
645 PRINT "
650 IF INKEY$="" THEN GOTO 650
660 CLS
670 RETURN
700 SAVE "3D TRAIN TRAX"
710 RUN

```



If you're grappling with graphics, here's help. Just type in M.V. Zajac's program and user-defined graphics will be simple



Create great graphics the easy way

```

10 POKE 23658,8
20 LET N=1: DIM V$(21): DIM W$(21)
30 LET T=0: LET P=1: DIM F(8)
40 LET X=6: LET Y=11
50 CLS: PRINT AT 10,0:"PLEASE ENTER PAPER COLOUR (0-7)";
60 INPUT V$(N): IF V$(N)<"0" OR V$(N)>"7" THEN GO TO 50
70 CLS: PRINT AT 10,2:"PLEASE ENTER INK COLOUR (0-7)";
80 INPUT W$(N): IF W$(N)<"0" OR W$(N)>"7" THEN GO TO 70
90 CLS: PRINT AT 2,2:"0=BACKGROUND COLOUR (PAPER)";AT 3,2:"1=FOREGROUND COLOUR (INK)";
PLOT 87,128: DRAW 65,0: DRAW 0,-65: DRAW -65,0: DRAW 0,65: FOR I=93 TO 143 STEP 8: PLOT I,127: DRAW 0,-64: NEXT I: FOR I=72 TO 120 STEP 8: PLOT 88,1: DRAW 63,0: NEXT I
100 IF INKEY$="0" THEN GO TO 200
110 IF INKEY$="1" THEN GO TO 210
120 PAUSE 50: GO TO 100
130 IF Y+1>18 THEN GO TO 160
140 LET Y=Y+1
150 GO TO 120
160 PRINT AT X,Y+2:T: GO SUB 300
170 LET Y=Y+1: LET X=X+1: LET T=0: PAUSE 50
180 IF X>13 THEN GO TO 330
190 GO TO 100
200 PRINT PAPER VAL V$(N);AT X,Y;" ";: GO TO 130
210 PRINT INK VAL W$(N);AT X,Y;" ";: GO TO (Y+1)*10
220 LET T=T+128: GO TO 130
230 LET T=T+64: GO TO 130
240 LET T=T+32: GO TO 130
250 LET T=T+16: GO TO 130
260 LET T=T+8: GO TO 130
270 LET T=T+4: GO TO 130
280 LET T=T+2: GO TO 130
290 LET T=T+1: GO TO 130
300 LET F(P)=T
310 LET P=P+1
320 RETURN
330 PRINT AT 21,5:"PRESS 'C' TO CONTINUE"
340 IF INKEY$="C" THEN GO TO 360
350 GO TO 340
360 FOR I=0 TO 7
370 POKE USR CHR$(143+N)+1,F(I+1)
380 NEXT I
390 CLS: PRINT AT 10,5:"PRESS 'C' TO CONTINUE"
400 FOR I=1 TO N
410 PRINT PAPER VAL V$(I): INK VAL W$(I);AT 21,I:CHR$(143+I):
420 NEXT I
430 LET N=N+1: IF N=21 THEN PRINT FLASH 1;AT 19,0:"YOU ONLY HAVE ONE CHR SPACE LEFT"
440 IF INKEY$="C" THEN GO TO 460
450 GO TO 440
460 IF N=22 THEN RUN
470 GC TO 30

```

My Graphic Creator program runs on any Spectrum and is very easy to use.

All you have to do is to follow the on-screen instructions.

How it works

- 10 set CAPS lock
- 20-40 set up variables
- 50-80 input colour routine
- 90 draw grid
- 100-120 read keyboard for input
- 130 detects a completed row
- 140 advances to next square
- 150 return to read keyboard
- 160 prints value of each row or byte
- 170 advances to next row
- 180 detects whether the whole grid is filled
- 190 returns to read keyboard
- 200-210 print routine
- 220-290 calculates value of each bit printed
- 300-320 stores value of each byte
- 330-350 screen prompt

Variables

- N number of character currently being defined
- T value of each byte in the grid
- P counter
- I used in loops
- x, y position of first byte
- DIM F(8) stores each of eight bytes which make up the character
- DIM V\$, DIM W\$ stores colours for each character