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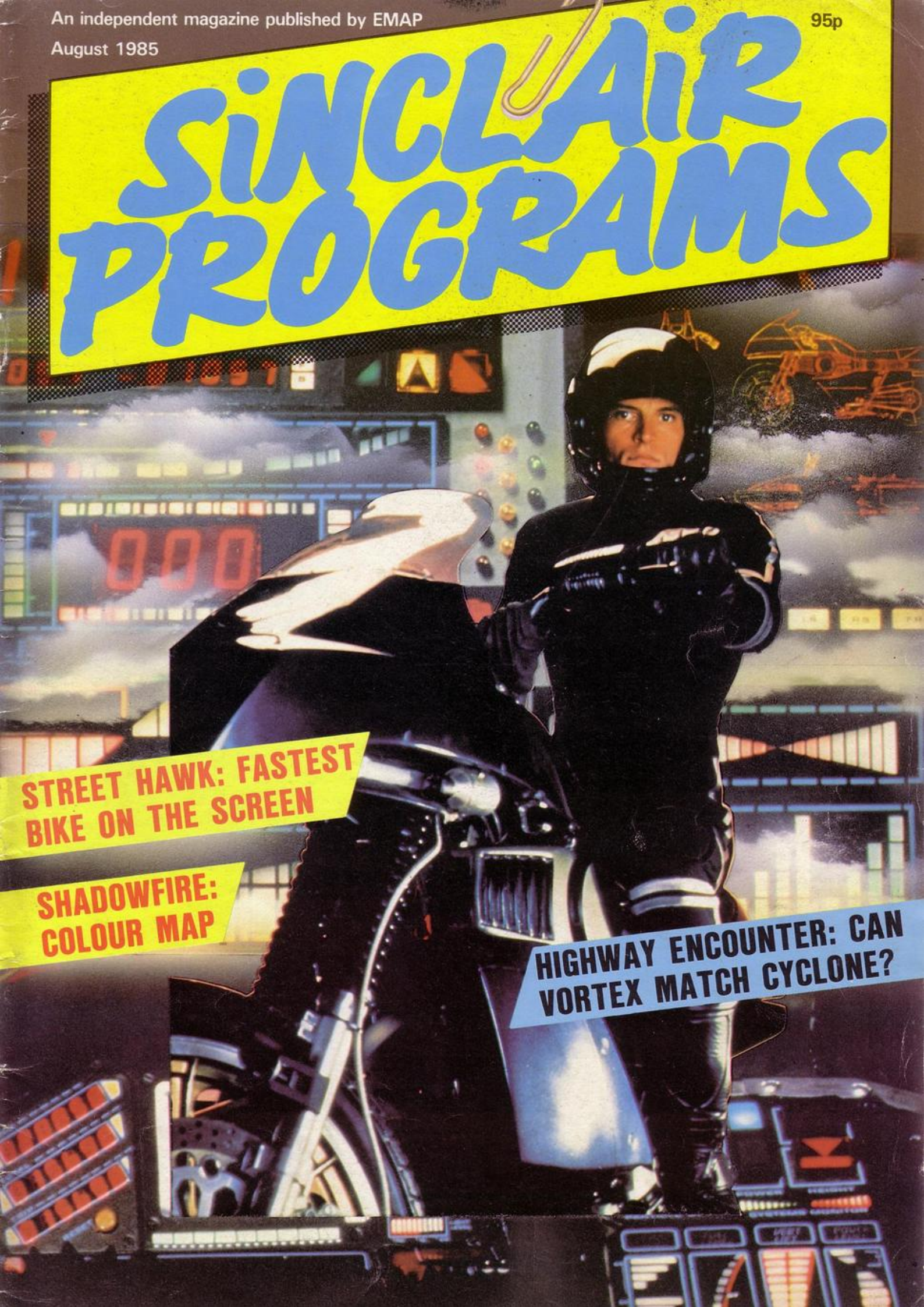
95p

SINCLAIR PROGRAMS



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SHADOWFIRE: COLOUR MAP

HIGHWAY ENCOUNTER: CAN VORTEX MATCH CYCLONE?

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THERE has been bloodshed, violence and frustration in the office this month, as the *Sinclair Programs* team fought their way through **Shadowfire.** Maps alone are not enough, you need to know exactly who to move where at any point.

The final assault on the Interrogation Chamber had us stumped until we rooted around in the armoury and handed the most enormous piece of equipment we could find to Maul. Even then things went wrong. We moved in, all guns blazing, lost a few personnel and found events were out of control. Our translator was dead and so Kryxix refused to be rescued.

Without a map, though, things seem hopeless, so we have produced a full colour map of Shadowfire for you. It cannot provide all the answers but if you remember that the entire team is important, and that they need a lot of rest to reach full strength you should not go too far wrong.

In future we will be publishing maps more frequently in *Sinclair Programs.* Let us know which games you would like to see mapped, and we will do our best to oblige.

If you are a keen mapmaker and own a map, or even a large part of a map of a popular game, why not send it in to us? As long as words and directons are clear, we will be able to use your information to help other games players.

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MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

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Priory Court,
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London EC1R 3AU

Programs should be on cassette. We cannot undertake to return them unless a stamped, addressed envelope is included. We pay £25 for the copyright of listings published and £10 for the copyright of listings published in the Beginners' section.

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Instructions for graphics characters are printed in lower-case letters in our listings. They are enclosed by brackets and separated by colons to distinguish them and the brackets and colons should not be entered.

Inverse characters are represented by the letter "i" and graphics characters by "g". Thus an inverse W would be represented by "iw", a graphics W by "gw", and an inverse graphics W by "igw".

Spaces are represented by "sp" and inverse spaces by "isp". Whenever any character is to be used more than once, the number of times it is to be used is shown before it, together with a multiplication sign. Thus "6★isp" means six inverse spaces and "(g4:4★i4:g3)" would be entered as a graphic four, followed by an inverse four repeated four times, followed by a graphics three.

Where whole words are to be written in inverse letters they appear in the listings as lower-case letters. Letters to be entered in graphics mode on the Spectrum are underlined.

Inverse characters may be entered on the ZX-81 by changing to graphics mode and then typing the appropriate characters and on the Spectrum by changing to inverse video and typing the appropriate letters. Graphics characters may be entered on the ZX-81 by changing to graphics mode and then pressing symbol shift while the appropriate characters are entered. On the Spectrum graphics characters may be obtained by changing to graphics mode and then pressing the appropriate character. User-defined graphics will appear as normal letters until the program has been RUN.

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- Popular Computing Weekly 7/3/85

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Dear Diary

In those quiet hours between the end of Sunday lunch and my mother's first question about whether I've done my homework yet, I often contemplate dad's bald patch.

On Sunday afternoons he's usually flaked out on the sofa, his thinning scalp peering over the sofa arm like some hideous transforming face in a horror movie.

In fact, I often think that dad's hair resembles one of those West German forests threatened by acid rain — imagine a clump of trees with poisoned lakes all round and random death within it and you get the picture.

Not surprising, then, that my project for this month's Sinclair Programs is a method of calculating which of his surviving hairs would die next.

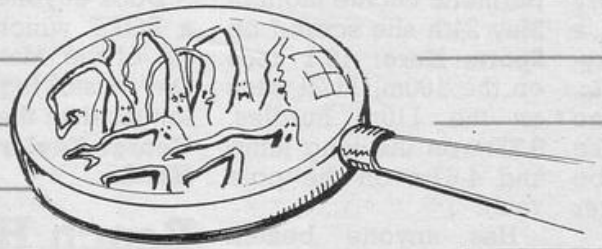
I realised, of course, that only dad's expiring follicles could really answer that question, but decided I could number the surviving hairs from one to 100 (there aren't many) and have a program decide at random which one was next for the floor of that big barber's shop in the sky.

But although it's easy to use RND to pick these numbers — using PRINT INT(RND*100)+1 — it's really hard to make sure you don't pick the same number twice.

Luckily, my temperamental sister Eustacia was as intrigued by the project as I was.

She recommended using an array of all the numbers to 100, and — after each one is selected — sticking it in the top end of the array where it wouldn't be picked again.

In the program we wrote lines 5 to 40 set up an array whose length you choose for yourself.



```
5 INPUT n
10 DIM a(n)
20 FOR i=1 TO n
30 LET a(i)=1
40 NEXT i
```

Lines 50 to 90 pick numbers at random from the 100 we've set up. The first number picked is then swapped with the last number in the array, the second number with the next to the last, and so on.

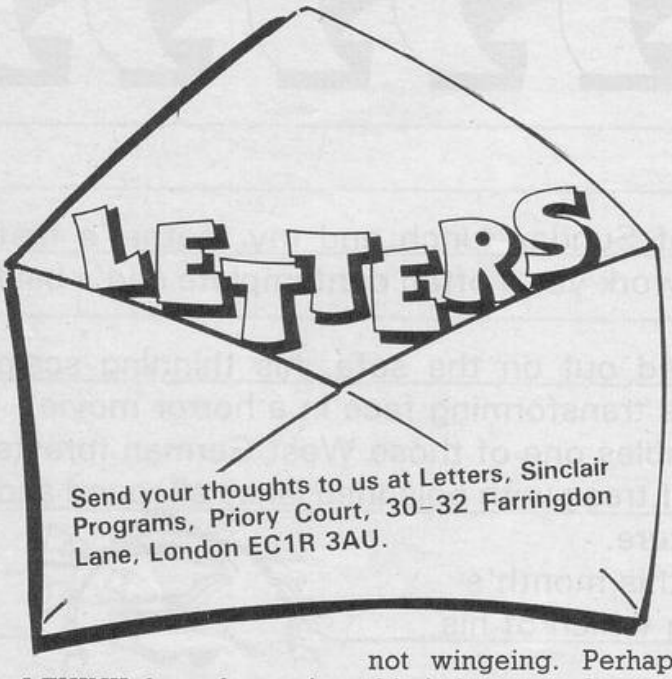
```
50 FOR i=1 TO n-1
60 LET r=1+ INT ( RND *(n+1-i) )
65 LET s=a(n+1-i)
67 IF r=s THEN GO TO 90
70 LET a(n+1-i)=a(r)
80 LET a(r)=s
90 NEXT i
```

You end up with 100 numbers in random order in the array, which you display with lines 100 to 120.

```
100 FOR i=1 TO n
110 PRINT a(i)
120 NEXT i
```

We'd just finished when dad woke up. He wanted to know how me and Eustacia had suddenly become friends. We said it was all thanks to him.

Sid.



I THINK the software industry has virtually stopped because people are bored with games, of whatever sort. True, people will play longer on one sort of game than on another. After a day or two, though, they are put away and forgotten.

Why not have a national system of games libraries like the normal book libraries? After all, very few people actually buy books, and it is very difficult to choose a game, because everyone likes different sorts. Then there would be no need for piracy because you would probably be bored with a game after three weeks, anyway.

Of course, this would only work with games, as programs which you need constantly, such as utilities, would have to be purchased like reference books.

Piracy will still go on, unfortunately, but then the record industry coped with it for the last ten years and they are not wingeing. Perhaps this is because they are not as optimistic as the software houses and other people with ginger beards, bald heads and glasses who I could mention, who invest their profits in a plastic bath on wheels.
Anon.

Sports Hero high scores

I CLAIM TO have a Supermum. On the night of May 24th she scored on **Sports Hero:** 10.1 secs on the 100m, 11.21 secs on the 110m hurdles, 9.37m on the long jump and 4.67m on the pole vault.

Has anyone beaten these scores?
James Wright,
Belton, Sth Humbs.

Smaller pictures

I THINK *Sinclair Programs* is great but it would be even better if you squeezed even more programs in by making the pictures which appear with the programs smaller. In the May issue, for example, you could have squeezed the ZX-81 program 333 into one page.
Peter Hughes,
Swansea.

Help!

What are you supposed to do on level three of **Jack and the Beanstalk?**
James Schneider

Help!

Could someone please provide me with infinite lives for **Mutant Monty?**
R Hawley

• *To fit more into this issue we have printed pictures smaller than usual on the final pages.*

International football win

I THINK I have achieved a record score on **Match Day.** I beat the international level 8-2 on the five minute each half game.

Does anyone know of a POKE which will get rid of the Match of the Day music? It goes on for longer than the game.
George Taylor,
Halifax.

Help!

Does anyone have any tips for **Knight Lore,** or an infinite lives POKE?
Kevin Abbott

Beach Head white flag

I HAVE completed **Beach Head** with a score of 178,000 points. A white flag came from the tank as the enemy surrendered.

I should like to congratulate US Gold on an excellent game.
Calum Scott,
Ayr, Scotland.

Booty: where is gold key?

IN BOOTY there are several different ways of obtaining key number five, depending on the different starting points of the pirates. The method published in June's edition was one of them.

My high score is 127, despite the fact that there are supposed to be only 125 pieces of booty. When your score reaches 125 and treasure left shows as zero, a message appears at the bottom of the screen. "You have 45 seconds in which to find the golden key". The 45 then ticks down to zero. If you are unsuccessful, the game does not end as would be expected. You can carry on and collect the extra booty, of which

there are at least three more pieces.

I have not yet found the golden key, but heavily suspect that it is key number six in the hold full of swords, as this is the only key that cannot be removed successfully.
Alan Windsor,
Wilford, Notts.

Help!

How do you persuade the cabbie to take you anywhere in **Sherlock? Anthony Rushton**

Excellent Airwolf

IN REPLY to your review of **Airwolf** from Elite published in the March edition, I am writing to say how wrong the reviewer was. I think that Airwolf is an excellent game. The reviewer said that it was classified as impossible (so does almost everyone else).

I too used to think that it was not possible until, one day, I broke through the first and second walls and dodged the radar in the game.

After some time, and lots of practice, I tried the game using the keyboard instead of the joystick. It is supposed to be impossible without a joystick. If this is so, then why can I do nearly half the first stage using the keyboard? I find that my performance is much better and easier using the keyboard.

Stephen Upton,
Yeovil, Somerset.

● *Anyone else find the game impossible, or are we the only ones?*

AFTER reading Shaun Lowe's letter in your April edition of *Sinclair Programs* I set out to beat his scores. After a few tries I could only manage around 280,000 on both days but, just as I was about to stop, I achieved the high scores of 349,523 on day one and 361,910 on day two.

Daniel Marlow,
Fareham, Hants.

Help!

Finders Keepers. How do you trade with the traders? How do you pass the cat at the exit? **David Nichol**

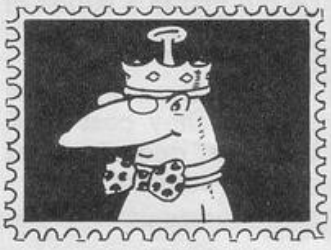
Decathlon best hurdles

I HAVE scored 472,781 on day two of **Decathlon.** My best scores were the 110m hurdles, which I completed in 9.21 seconds; the discus, which I threw 83m and the 100m which I ran in 8.31 secs.

Paul Stephens,
Offenham, Worcs.

Help!

Planet of Death. How do you pass the force field in the wind tunnel, work the computer and find your spaceship? **Christian Horsefield**



Bruce Lee beat these

I HAVE just finished that excellent game, **Bruce Lee.** It took me half an hour. On the final screen the wizard fires small fireballs at you. In order to finish you must dash to the end and get the bell.

My score was 111,925 points, and I nearly finished the game a second time.

Craig Buckley,
Warwick.

CAN ANYONE beat my score on **Bruce Lee?** I have managed a score of 670,550 and killed the wizard twelve times

Mark Pitt,
Yateley, Surrey.

Newsletters for the ZX-81

I SHOULD like to pass on news of two newsletters aimed at ZX-81 owners. One is run by Software Farm at 155 Whiteladies Road, Clifton, Bristol BS8 2RF. The other is ZX Broadsheet from Nick Godwin, 4 Hurkur Crescent, Eyemouth, Berwickshire. They are both well worth looking into. I am sure an SAE would be appreciated by both parties if readers are thinking of writing for details.

Chris Colley,
Cambridge.

Decathlon high scores

AFTER buying *Sinclair Programs* for the first time, I was interested by the high scores on **Decathlon.** I decided to try to beat these scores, and managed to complete the 110m hurdles in 9.32secs and throw the discus 82.13m.

Richard Milne,
Aberdeen.

IN THE January issue of *Sinclair Programs* Andrew Milner claimed that he had achieved 164,263 in **Daley Thompson's Decathlon.**

My score at this game is 291,528 on day one and 970,497 on day two.

Simon Grainger,
Bristol.

Help!

How do you escape level eight of **Monty Mole? A Huskisson**

NEWS

SAVED

RUMOURS abound that Sinclair has hit hard times with creditors now calling in outstanding monies.

Julian Goldsmith, on behalf of Sinclair Research confirms that the company owes "Around £15 million." Both Timex and Thorn EMI, major producers of the QL and Spectrum machines were expecting to begin receiving outstanding monies in May this year.

They have now agreed to a two month extension of the loans "Because thet wish the company to succeed and recognize that the problems have arisen through the seasonal nature of the market."

An encouraging development has been added by Robert Maxwell, publisher of *The Mirror.*

He is reported to have sunk £12 million into the ailing Sinclair Research at the end of June. Through his newly acquired 75% stake he will become Chairman, with Sir Clive Sinclair returning to the research and development side as president.

Rumours that a 128K machine is under development have been firmly denied but the possibility of a portable, 64K, flat-screened machine were not.

Goldsmith confirmed that Sinclair are looking into the idea of producing such a machine.

Will it have a 64K memory and be based on the Spectrum?

"When you look at it," says Goldsmith "It's certainly a sensible idea, especially when you look at the success of the Spectrum family."

However "no specifications at present, but our R & D people are looking into it although nothing is likely until next year."

Fantasy Four

THE Fantastic Four are joining forces again to appear in a new computer game from Adventure International.

The game will be called Quest Probe Three, following Quest Probe One and Two which starred the Incredible Hulk and Spiderman.

All four comic strip stars: Mr Fantastic, the Invisible Girl, The Thing and Human Torch will feature in the game.

Adventure International is also releasing a second new game, **Robin of Sherwood.**

It is set in Sherwood Forest and is planned to be the first in a series of games based on Robin Hood.

Both games are now on sale, they cost £9.95 and are described as graphic adventures.

SPIRITS IN THE MATERIAL WORLD

WHAT DO you get if you cross **Everyone's A Wally** with **Tir Nir Nog?**

The answer, according to Tim Langdell from The Edge, is their new game **That's The Spirit.**

He describes the game as "Zany fun. The setting is New York city where spirits are invading the buildings.

"Your mission is to rid the city of the spirits and solve a puzzle that has been set for you.

"The locations include sky scrapers and alleyways, which you may enter and explore, which are populated with breakdancers and fierce dogs."

The game retails for £7.95 and goes on sale in early August.

The Edge have also released **Fairlight** which is set in a fantasy land of dragons and dungeons. Price £9.95.

Jungle Book

WALT DISNEY Productions have signed an exclusive licence with US Gold to produce a series of computer games based on characters from the **Jungle Book** and two new Walt Disney films.

Production of the games has not yet begun and none are due out until November.

The follow up film to Wizard of Oz, Return to Oz will be released here later this month, but the game based on it is due out in November.

The second new film, The Black Cauldron, will be released for Christmas, but no date has been set for the game.

In addition, the licence allows that any Walt Disney characters may be produced by US Gold with games involving Mickey Mouse, Donald Duck and Pluto very real possibilities.

Fights at Gamesday

DO YOUR parents complain about the amount of time you spend indoors on your computer?

Next month you can kill two birds with one stone by visiting the Gamesday show in London.

Games Workshop has organised the show at which you will be able to watch demonstrations as well as play games yourself.

There will be competitions with spot prizes, lectures on science writing, fantasy art and many related events.

A number of software publishers have been approached to appear, so a selection of trade stands will be present.

Live mock battles have been planned with players' dressed in period costumes.

Gamesday is to be held on the weekend of 28th and 29th September at The Royal Horticulture New Hall, Greycoat Street, London SW1. Entrance fee will be £1.50.

Victoria is the nearest British Rail station to the event.

Ocean now spans the globe

ONE OF Japan's top coin-operated arcade games labels has been brought to Europe.

The Ocean Group have begun releasing the Japanese Konami games on their recently acquired Imagine label.

Yie Ar Kung-Fu is due for release this month. It features Oolong who must become a Grand Master of his chosen martial art in honour of his father. The settings vary from temples to mountains.

Hypersport and **Konami's Tennis** have already been released while **Hyper Rally, Konami's Golf, Mike** and **Comic Bakery** will be arriving in the shops for the months leading up to Christmas.

All the games are arcade and they will retail at £7.95 each.

Quest archive

ARE YOU a serious adventurer lost on your quest?

Hints Archive for Lost Adventurers, HALA for short, has been set up to offer help with clues and maps.

It is a newly formed group aiming to collect useful information and give advice on any Spectrum adventure game on the market.

Griffiths-Glover, self appointed Keeper of the Archive, asks that you send a SAE with any requests, and send as many clues as possible in order to build up the archive.

The address is: HALA, 38 Bellfield Drive, Well Lane, Willerby, East Yorks HU10 6HQ.

tír na nòg

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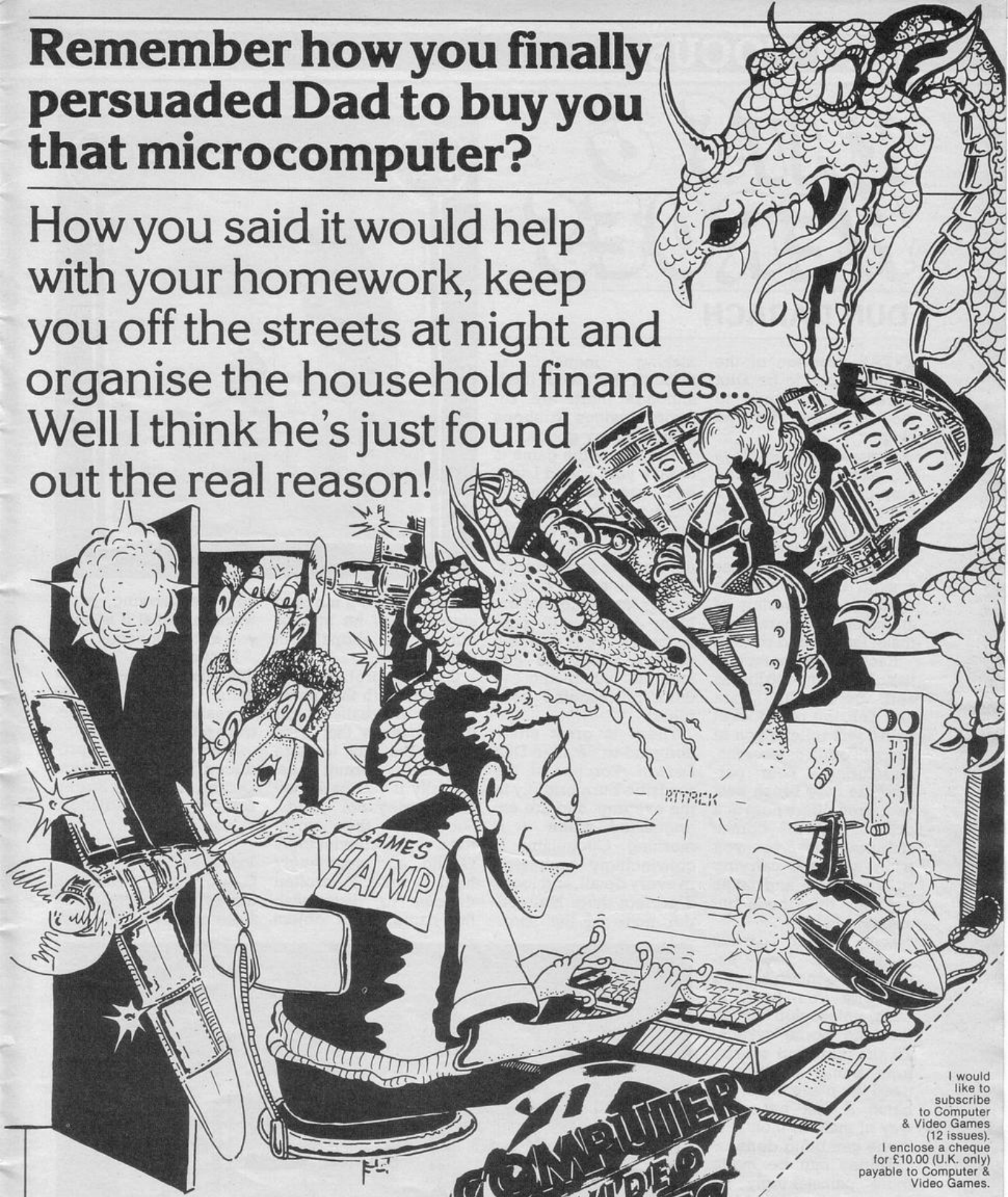
Remember how you finally persuaded Dad to buy you that microcomputer?

How you said it would help with your homework, keep you off the streets at night and organise the household finances... Well I think he's just found out the real reason!



If your computer isn't dealing in dragons, mastering mazes or generally opening up a whole new world of fun and fantasy, then it needs revitalising. Put it on a diet of Computer & Video Games magazine. A monthly dose will work wonders.

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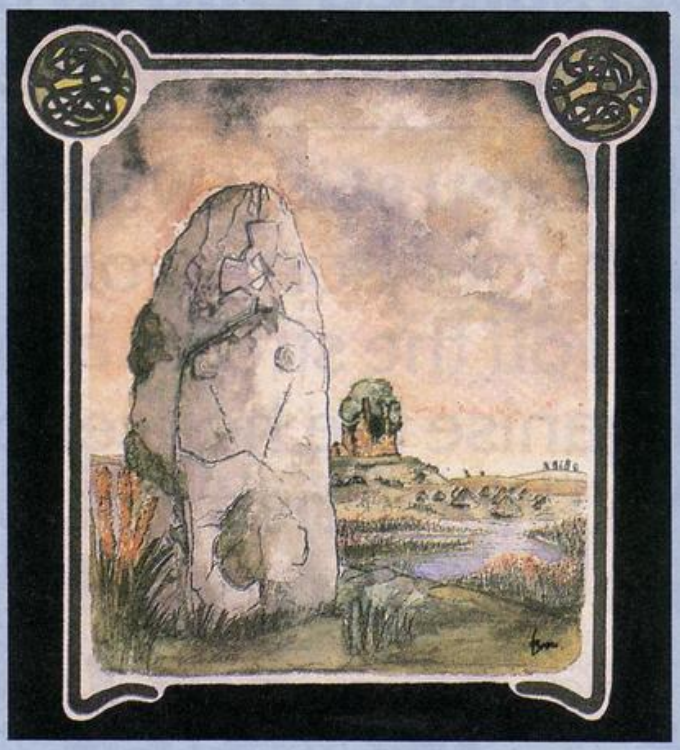


STAR program of the month has to be **Dun Darach,** the sequel to the excellent **Tir na Nog.**

Dun Darach employs the excellent animation employed in Tir na Nog, but takes it to new heights. Every road has a name, every door has a number, every shop has a sign. Cuchulainn, the hero, meets a variety of animated characters; male, female and rodent.

Each of the characters has its own attributes and personality. Kara and Keli, the pickpocket twins, will relieve you of any of your possessions, murmuring "Your pardon" as they brush past you. Bren offers help at a price. Ryde comes stomping up to you when you are carrying stolen goods, and takes not only the goods but also a hefty fine.

Dun Darach carries realism to new extremes. To move around the city you have to walk, unless you can afford the portal system. To prevent your money from being stolen you need to place it in the bank. A fast but risky way of making money is in the gambling dens.

Money can be made more painstakingly by buying and selling. Most shops will sell you goods, which can be sold at a profit, if you can find anyone who will take them; or offered to other characters who may have something you want. A faster way of making money is through the use of theft, although there are security devices in shops selling luxury goods.

The aim of the game is to save your friend Loeg, who has been imprisoned in Dun Darach by the sorceress Skar. This quest, though, should not be seen as a priority. First you need a map, money and information. Many weeks will pass before you know enough about the city and its inhabitants to think of rescuing your friend.

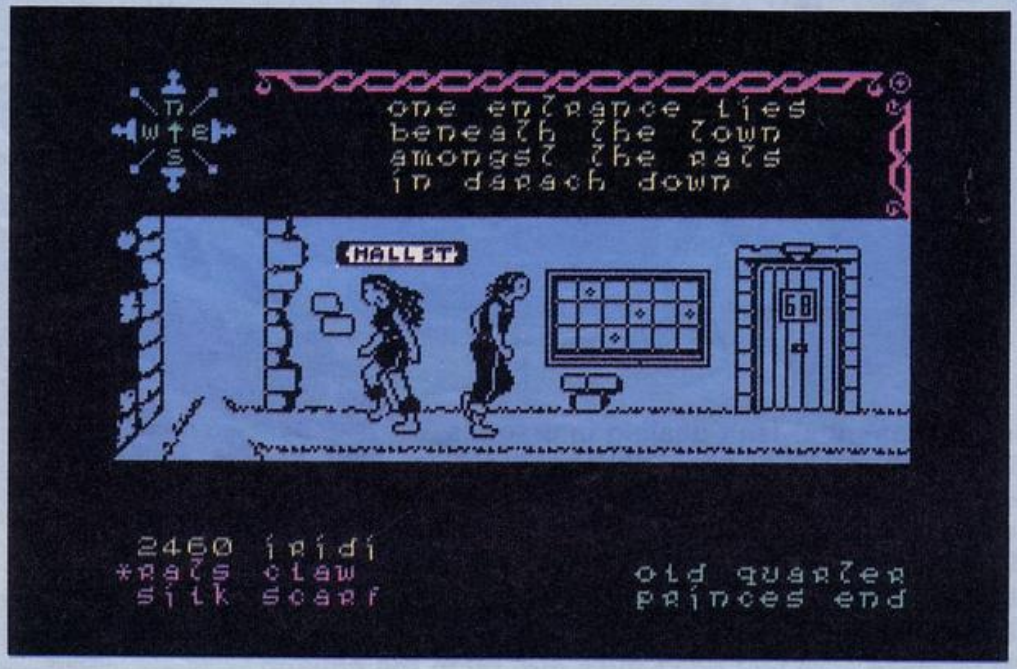
There is great attention paid to detail in Dun Darach. Torches at the roadside burn brightly in the evening, and are extinguished when it is morning. Cuchulainn is convincingly animated in every detail, and looks a perfect thug. No wonder none of the shopkeepers make a move to stop him as he stomps out of the shops with their goods!

Only two problems are apparent with the game. Firstly, so realistic are the distances that trips across the city tend to become boring, especially if you have neither money nor goods. Secondly, the script used is convincingly Gaelic, and annoyingly hard to read. It is often difficult to distinguish the name of an object you are carrying, or to work out what it is once you know its name.

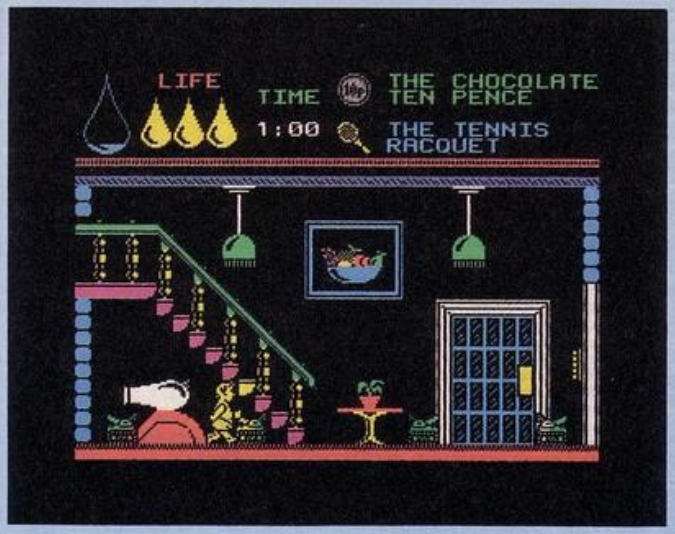
Reservations aside, this is an excellent game, taking standards of realism on the Spectrum one step further.

Dun Darach is produced by Gargoyle Games, 71 Kings Street, Dudley, West Midlands.

Price: £9.95
Game type: Animated adventure
Rating: 96%



HERBERT'S DUMMY RUN



WITH A name like **Herbert's Dummy Run** you know that this game has to be another Wally release.

Wally and Wilma have lost their son Herbert in the department store. They are waiting in the lost and found for him, with a supply of jelly babies. The better his progress, the more jelly babies they hold.

Like **Pyjamarama** and **Everyone's a Wally,** Herbert's Dummy Run combines arcade and adventure with a series of large, clear and distinctive graphics. Herbert can carry two objects at a time, and will automatically pick up an object as he passes over it.

As usual there are a whole series of interrelated problems to be solved. To light up events in the dark room you need the torch. When you find it, though, the torch is broken, so it must be taken to the lighting department for repairs. Once you have found out what is going on, you need a weapon. The popgun maybe? Well, find a cork, load it up and go and see.

Bound up with the animated adventure are a series of arcade games, most of which need special equipment to play. The game of **Breakout,** for example, requires the tennis raquet. Of course, having the correct equipment is not all you need. Skill is all-important. And, surely, not all games of Breakout involve the player having to dodge sprinting bricks?

Matters are made even more complicated by the department store being constructed on four levels. You can make your way from floor to floor by way of the stairs, or by using the lift. Being a Wally department store, though, there is only one lift. Walk through the lift door on the wrong floor and Herbert plummets down to the bottom of the lift shaft. Even using his nappy as a parachute is no use to him here.

A representative example of a Wally tradition, Herbert's Dummy Run is produced for the 48K Spectrum by Mikrogen, 44 The Broadway, Bracknell, Berks.

Price: £9.95
Rating: 81%

NODES OF YESOD

A BOUNCING hero explores underground passages, leaping from ledge to ledge, often falling from a great height, hindered in his progress by a variety of strange creatures. Yes, you are right, **Nodes of Yesod** does seem remarkably similar to **Underwwurlde.**

Smoothly scrolling graphics depict your search, beneath the surface of the moon, for a Monolith buried somewhere in its core. The weak gravity leads to a strange form of movement, so each large jump neatly encompasses a somersault, or two, or three.

The aims is to reach the monolith, having first collected the eight alchiems which give access to that chamber. This involves negotiating the majority of the maze, a task which is made slightly easier by the fact that there are several entrances, and it is possible to enter and leave the maze at ground level.

Matters are made more difficult by the other animated creatures. As in Underwurlde, most of these appear at random, materialising while you are in a room, getting in your way but generally doing very little more. Creatures which are a little more fixed and solid are the flying fish, quickly flowering plants, crawling insects and hopping birds. These are not lethal, but whenever you hit them, you bounce away again, often in an unexpected direction.

Also to be avoided are the red spacemen, who will steal your alchiems. Whatever you do, too, do not fall from a great height, as this means almost certain death.

A novel feature of Nodes of Yesod are the moles which burrow on the moon's surface. These friendly little creatures can eat through the moon's surface so, if you can persuade one to travel with you, they will make life considerably easier.

Nodes of Yesod is produced for the 48K Spectrum by Odin, The Podium, Steers House, Canning Place, Liverpool.

Price: £9.95
Game type: Arcade
Rating: 78%

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SAIMAZOOM

SAIMAZOOM is the first part of the Silversoft Indiana Smith trilogy.

Smith aims to collect several items of treasure from the jungles of Saimazoom. The jungles are rumoured to occupy around one hundred square miles, with one mile fitting on the screen at the time. According to this scale Smith is several hundred yards high, can do the one second mile and confronts the largest snakes ever seen.

Graphics are too large and blocky, with everything from rivers to cacti looking somewhat square. Lethal enemies appear while you are on a screen, and disappear once again if you leave an area and then immediately reenter it. This makes them ridiculously easy to avoid.

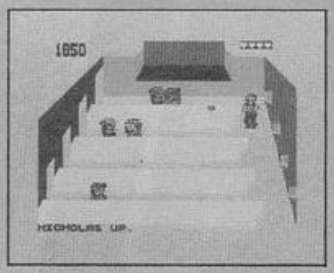
The major problem presented by the game is its maze-like format. All features of the landscape are solid and must be circumnavigated. Luckily you can carry up to four useful objects at a time. You could take four canoes, to cross all the rivers; or a gun to shoot anything on sight, or perhaps a useful looking key or sack.

Unfortunately it is all too easy, as you sprint around the jungle, to use up your last canoe while crossing a river and then to find yourself surrounded by water. Then the only option is to settle down and wait until you have died of thirst several times.

Produced for the 48K Spectrum by Silversoft, 271–273 King Street, London.

Price: £7.95
Rating: 36%

TAPPER



FOR FAST and totally furious arcade action on the Spectrum you want **Tapper.**

The game centres on a bar man who must keep all his customers happy. This means serving them as they walk up the bar, collecting all empty glasses, making sure no drinks are spilt, and collecting tips promptly.

The aim on each screen is to clear the bar, and the slower you are in your bar work the more characters will come crowding in.

There are three levels. Hard starts you off with a huge bonus, but fills your bar to bursting point even on the earlier screens. The other two levels differ in the amount of lives you are allocated, with easy leaving you just enough to get by.

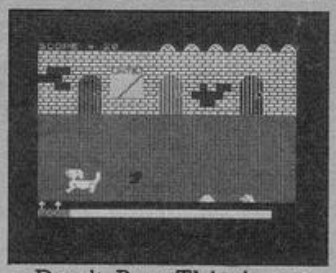
Different levels differ not only in the amount of people in the bar and how much they drink, but also in the bar layout. The length of the bars in later rooms vary, so that some characters will need to be served very quickly. The arrangement also differs and, although your movement is not restricted, it is difficult to keep an eye on what is happening on both sides of the screen.

Where the game is lacking is in the Spectrum's graphics capabilities. Two characters who appear simultaneously will be virtually invisible, while three who arrive in quick succession will be indistinguishable from four or two. This leads to mistakes which are down to the graphics presentation, not the player's ability.

For players with fast fingers on the keyboard Tapper is produced for the 48K Spectrum by US Gold, Unit 10, Parkway Ind. Cent, Heneage Street, Birmingham.

Price: £7.95
Rating: 72%

DON'T BUY THIS



HOW DO you review a game which explicitly tells you: **Don't Buy This?** Not only that, it tells you that these are meant to be five of the worst games ever.

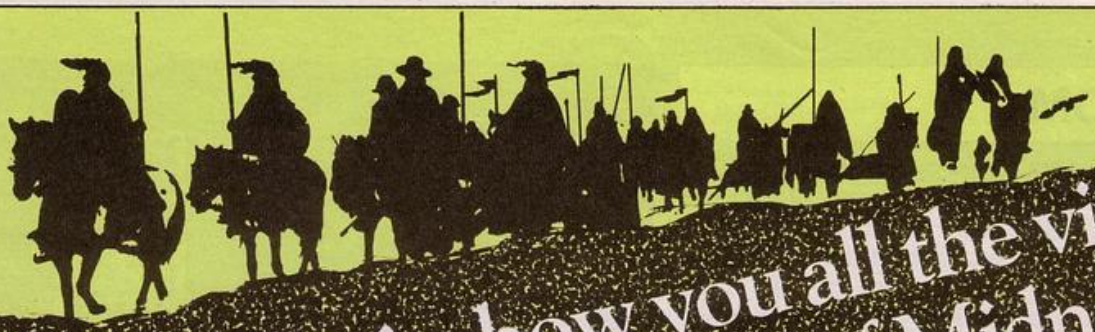
Fruit machine can safely claim to be one of the slowest versions of a fruit machine ever produced. Race Ace, offered 250 speeds to the budding racing driver, each of which managed to be either too fast or too slow. Still, what do you expect from eight screens of Basic?

Weasel Willy may be good, but we cannot comment, because it would not load. The loading screen was fairly rough, though, if that is any help. The gems of the piece are Fido One and Two in which, against a variety of backgrounds, a dog has to sit and smash moles to death with its tail.

Surely games for the Spectrum have not been of a high standard for long enough for the industry to start being smart-alec on the subject? These games were fairly amusing for five minutes on a review copy. Whatever you do, do not buy them.

Don't Buy This is produced for the 48K Spectrum by Firebird Software, Wellington House, Upper St Martin's Lane, London WC2.

Price: Too much
Rating: 9%



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ROCKY HORROR

DON'T DREAM IT, play it! What is it? **The Rocky Horror Show.**

The Horror show gets off to a good start as you enter the creepy house, illuminated only sporadically by flashes of lightning. Your first choice is one of sex. Do you want to play the part of Brad or Janet?

Your aim in the game is to search the house for the parts of the DeMedusa machine which will save your partner, who has been turned to stone.

On first sight, the views of the house are reminiscent of the landscape in **Dun Darach.** However, the number of locations is far smaller and, as you must pass each one several times each time you play the game, they quickly become tedious.

In the end, tedium is the hallmark of this game that started so well. Yes, the other inhabitants are well animated and say amusing things. Avoiding them, though, becomes imperative if you are to miss hearing the manic biker telling you yet again that he never loved his teddy. Yes, one character removes all your clothes, but the resulting graphic has all the sex appeal of an Action Man.

Parts of the machine have to be collected one at a time, which makes for a lot of boring coming and going. Even worse, when there are several characters on screen at once, the strain of so much animation begins to tell. Your pace slows to a shuffle, giving the impression of wading through lumpy custard.

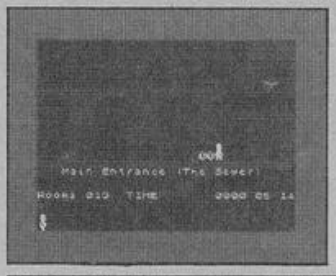
Rocky Horror Show is produced for the Spectrum by CRL, CRL House, 9 Kings Yard, Carpenters Road, London E15.

Price: £8.95
Rating: 56%

JET SET WILLY 2

NEW RELEASE from Software Projects, **Jet Set Willy Two** has the easy familiarity of an old friend.

It is a much extended version of the original **Jet Set Willy.** Willy still has to collect the rubbish from his mansion, but now it is around twice its original size, and things are not entirely as you left them.



The mood of games players is one of nostalgia. Do you remember how we spent all night trying to work out how to get past the guards at the front door? Does anyone remember how to get over the moon in Nomen Luni? Surely the wine cellar was not this difficult before?

The new rooms nearest to the bathroom are uninspiring and quickly ignored. Moving further things become far more difficult, and the problems are just as exasperating as before. Beware, for routes are not always as you remember them and you can end up in some of the worst rooms entirely by accident.

Despite its many challengers Jet Set Willy still looks good and it has lasted well. Surely, though, Software Projects could have done more than imitate their own success. New rooms are fun, but why not an entirely new house? Why not a whole new scenario?

The success of Jet Set Willy doubtless guarantees success to its extension. However, a year is a very long time in Spectrum computing, and there are better, more exciting products in the shops at the moment.

Produced for the 48K Spectrum by Software Projects, Bear Brand Complex, Allerton Road, Woolton, Liverpool.

Price: £6.95
Rating: 79%

TALISMAN

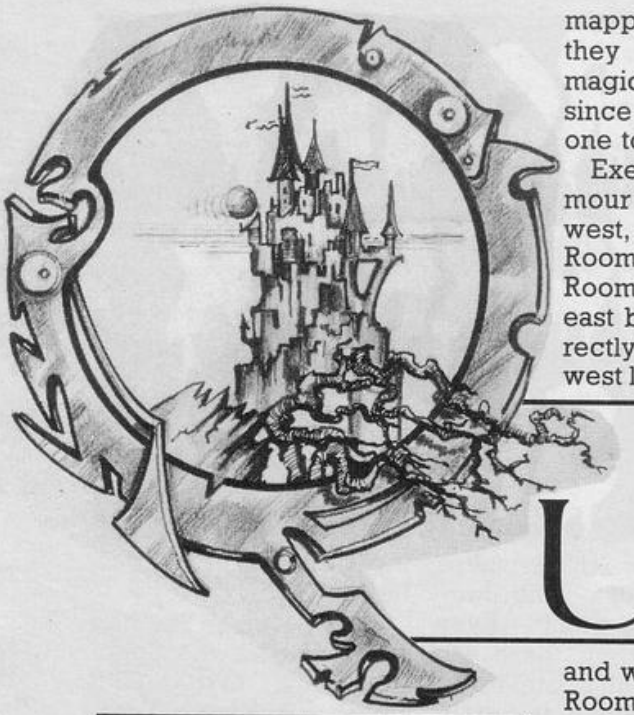
WITH ALL the great names out from Games Workshop at the moment, you might expect **Talisman** to be something special.

Up to four players select a character to control and set off through a varied landscape in search of the Crown of Command. Movement through the locations is easy, although the animation is far from convincing, especially at high speeds.

The game shows, rather too strongly, its roots in board game. You can stand in a location for as long as you like with nothing happening, but as soon as you press the EXPLORE HERE button, characters materialise out of thin air, and things happen which could not have been predicted by studying the view. Directions are also confusing. Running across the screen from right to left you will suddenly be asked if you want to move north or west, and you will then be spun off on a completely different tack.

Produced for the 48K Spectrum by Games Workshop, 27/29 Sunbeam Road, London.

Price: £7.95
Rating: 52%



QUESTLINE

Cathy Foot encounters dwarfs and wizards in her travels through Mirrorsoft's Ashkeron.

IN THE far and distant past, in the Principality of **Ashkeron,** there was need for a HERO, for the treasures of the Principality had been taken by an evil wizard. These treasures were more important to the Principality than would be normal, for without them any marriage in the Princely house would be cursed and evil days would fall on the whole population.

It was known where the treasures were to be found, the Court Magician discovered their whereabouts, but they could not be returned by magical means. It was for this reason that a HERO was called for.

More was known — the HERO had to come from among the common people and fulfil his task because HE so wished. The hiding place of the treasures was also known — they were to be found in the evil Wizard's castle, deep in an enchanted wood. Only one route led there, and that existed purely because the Wizard had to use most of his powers to maintain the magical properties of his castle and the surrounding wood.

These magical powers made it impossible for the castle to be mapped by mere humans, unless they were blessed with almost magical powers themselves, since directions changed from one toom to the next.

Exempli gratia, from the Armour Room to the Aviary was west, but to return to the Armour Room was north; from the Bathing Room to the Dressing Room was east but one could not return directly to the Bathing Room, since west led to the Grand Bedroom — and while east from the Dressing Room led to the North east Tower and staircase, west from there returned, not to the Dressing Room but to the Grand bedroom. Very useful for the Wizard, but an annoyance for the HERO.

The HERO was chosen, but had himself to choose to serve. His name was Stephen, a powerful and resourceful blacksmith, and his task was to find and return the Five Treasures of ASHKERON.

At the crack of dawn on the day of the Spring Equinox, most of the population of Ashkeron made their way through the enchanted wood — it must have been enchanted, since one place therein was indistinguishable from another — to the gates of the Wizard's castle. The Wizard was aware of the invasion of his privacy and, at the end of a magically induced storm, Stephen alone was left to enter the castle and brave the Wizard's wrath in attempting to recover and return the Five Treasures to the Prince, for only then could the Princess Zeraphina be united in wedded bliss with her true love.

Oh, HERO, I address these words from the unimaginable future to you alone, for from you alone comes success and the continued prosperity of the realm.

Many are the traps, mazes and puzzles which lie before you, Stephen the Blacksmith, and only your resourcefulness can win through to your goal. I lend you such aid and comfort as I may, be not unduly amazed at what you discover within the castle walls, nor at the ease with which you gain access thereto, for great will be your trials ere you gain and return the treasures to their rightful place.

At the Castle gates hold back, attend the arrival of the delivery cart. Conceal yourself thereon to gain admittance. This is the only means of access, death by drowning awaits he that dares attempt to cross the moat by any other means. Beware, too, the moat has an hypnotic power over mere humans, remain aware always of where it lies, lest you be called to premature death to the detriment of the principality.

Once within, descend with speed, else you will find yourself again without the walls, facing an irate driver, and with entrance still to gain. If this should hap, all is not yet lost for many are the carts that ply that route each day. They are as accursed as any London bus, but like that mythical beast, there is always "another one behind" on which passage may be gained. Think always as an adventurer: if the courtyard be flagged, why should any be loose? The help concealed thereunder is not great, nor yet is it of any immediate use, yet 'twill aid you reach your goal.

Beware the steed, 'tis fierce, and long has it wished to run the hills, the stableboy's advice attend, else sharp will be your fall. From stable unto Armour room is one pace north, from thence stride west until the South West Tower is attained, mount there, and in the Scorpian bedroom lies a cloak, your safety lies in it else you may find yourself in close converse with the headsman of this pile — a fate I would prefer to miss, if given choice.

The maid a candle has, but 'ware the cook, a witch I vow, much given to humming, a vice which disconcerts the butler, but since her time in the pantry is spent, where her provisions she guards from light fingered or

starving staff, the problems she provides are few. The candle may be lit from the kitchen fire but if the cellars you will scour a tinderbox will there be found. Beware to dare the attics without light, for in the dark no movement can you make, and blessed daylight swiftly fades to night.

Visible or invisible, the dwarf and Wizard yet can you find and treat you with despite; servant or lord, their power is great against you, you have been warned!

Since speed is of the essence, demand not the score too many times, each time will count against you when you do.

Although the Wizard has a reputation which seeks to name him evil, 'tis not fully so, for if he were as black as he is painted your task would be the harder. Let us say he serves dark forces, but is bored and seeks excitement in his life which you, perforce, supply. You have your goal, to win, his is the task to hold you back, and thus cause you to forfeit that goal.

His magics he will use in petty ways to discommode you, not to end your days. The spell most favoured causes every act to be reversed in its effect upon the universe about you, that left is right and put is take, thus, for a variable time limit, your interaction with the universe is reversed.

The dwarf, 'tis true, is not so kindly disposed, but even he will offer you fair fight. That he is skilled at weaponry while yours are skills to make, not wield, the mighty sword, and e'en the woodsman's axe you carry is more a tool than ever weapon was, yet is he fair and takes no mean advantage of your lacks.

Within the'enchanted wood and magic pile a genial genie trys to offer help, but this, I fear, is cryptic and in code, and costs the HERO from his tiny score, two whole points for each clue that's offered and among the offerings this one finds its place, when seeking means of egress from a room large, vaulted and, I fear, filled with ethereal folk who, though showing little interest in your presence, prefer it to your absence, these are the words that offer your release — "get out quietly behind". You pay for that!

The help I offer for the selfsame room is merely that the creatures can't stand noise, but still, beware, if they already have you in the air, for noise by then will merely cause your death.

This genie sometimes feels no urge to help at all, it can be quite a blow to feel unwell and ask for help only to hear that you are doing fine. You buckle at the knees, turn blue, and die, that's fine? Again I say beware! Oh, HERO bold, beware, if ere in Scarthorpe you have roamed, an **Urban Upstart,** then you know just why. The Wizard buys his cheese from that foul town. If you no Upstart have been, 'ware eating food from such foul sources.

A charted route I feel a must, so use my system with my kind regards, inscribe for each location on a scroll, description give and exits mark, then move, describe, move on. No map with easy image, but a route you have to lead you further in your quest. Good luck, you'll need it if the Wizard's grip you break and carry home the treasures to your Prince. Unless by random chance you play, this guide will always work, and chance misplace things alone.

Let the Game commence, and you, my dear HERO, make your moves on the Board of Life and Death — YOU HAVE BEEN WARNED!

The latest thing in adventure games seems to be "unique" new graphics systems, each one promising something closer to an inter-reactive video film seen from the HERO's viewpoint. Each time, in my opinion, they fail, while the problems I see as inherent in adventure games remain.

Surely the first computerised adventure games were written to run on mainframes before home computers were anything more than a twinkle in Uncle Clive's eye? And yet we still battle on with the same problems in syntax and input.

Take this game, it offers you "the UNIQUE WALK-THRU GRAPHIC SYSTEM" which, no argument, IS good, but the program does not recognise "examine" — surely one of the more beloved key words of adventurers everywhere and "look", however used, is taken to ask for a redescription of the current location.

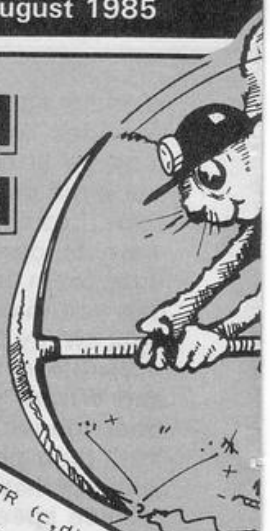
GOLD MINE

Benjamin Rabbit has found an underground Gold mine. He aims to collect all the gold and place it in his safe. Once he has collected five bars of gold he can escape to a new cavern. Blue lifts will take him up the lift shafts, and wagons will take him along the mine workings. Runaway wagons are a danger, for they may run him over. The major problem though is the killer bats, which will home in on Benjamin.

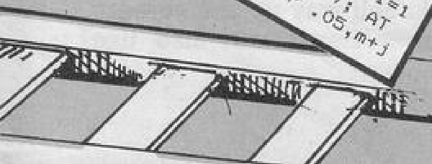
Written for the 48K Spectrum or Spectrum Plus by T Sherwood of West Bromwich, West Midlands.

Underlined letters are those to be entered in graphics mode.

```
1 GO TO 6000
105 FOR i=1 TO 2
120 LET y1=y+( INKEY$ ="O")-( I
NKEY$ ="9")
130 IF ATTR (x+1,y1) <> 7 THEN
 GO TO 1000
140 PRINT AT x,y;" "; AT x+1,y
;" "; AT x,y1;a$(i); AT x+1,y1;b
$(i): LET y=y1
150 IF ATTR (x+2,y) <> 3 THEN
 GO TO 1500
250 LET a1=a+2*(((x>a) AND ATT
R (a+2,b)=7)-((x<a) AND ATTR (a
-1,b)=7))*( RND >.5)
280 LET b1=b+(y>b AND ATTR (a1
,b+1)=7)-(y<b AND ATTR (a1,b-1)
=7)
300 PRINT AT a,b;" "; AT a1,b1
; INK 5;c$(i): LET a=a1: LET b=b
1
340 IF ATTR (x,y)=5 THEN GO T
O 3000
720 IF r<4 OR r>26 THEN GO SUB
 2300
740 LET r1=r+t: PRINT AT q,r;"
"; INK 4; AT q,r1;"GH"
750 LET r=r1
780 IF ATTR (x+1,y)=4 THEN GO
 TO 3000
940 NEXT i: GO TO 100
1005 IF ATTR (x+1,y1) <> 4 OR q
=x+1 THEN LET y1=y: GO TO 150
1010 POKE z+3,50: POKE z+5,7: PO
KE z+24,28: PRINT AT x,y;" "; A
T x+1,y;" "
1040 IF y>15 THEN GO TO 1200
1050 FOR j=3 TO 26
1060 LET l= USR z
1070 PRINT AT x,j;" C"; AT x+1,
j;" "; INK 4;"GH"
1075 IF ATTR (a,b)=7 THEN LET
 b=1+ INT ( RND *30): PRINT AT a
,b; INK 5;"E": GO SUB 9200
1080 IF ATTR (x+2,j+1)=179 THEN
 GO SUB 9200: PRINT INK 3; OVE
R 1; PAPER 0; AT x+2,j+1;" "
1090 NEXT j
1100 LET y=29: LET y1=y: GO TO 1
350
1200 FOR j=27 TO 4 STEP -1
1210 LET l= USR z
1220 PRINT AT x,j-1;"A "; INK 4
; AT x+1,j-1;"GH"; INK 7;" "
1230 IF ATTR (a,b)=7 THEN LET
 b=1+ INT ( RND *30): PRINT AT a
,b; INK 5;"E": GO SUB 9200
1250 IF ATTR (x+2,j)=179 THEN
 GO SUB 9200: PRINT INK 3; OVER
 1; PAPER 0; AT x+2,j;" "
1260 NEXT j
1280 LET y=2: LET y1=y
1350 PRINT AT x,j;" "; GO TO 13
0
1501 IF RND <.8 THEN GO TO 151
1502 PRINT INK 3; PAPER 0; OVER
 1; AT c,d;" "
1504 LET c=2+(2*(1+2*( INT ( RND
 *4)))): LET d=5+ INT ( RND *22)
: IF ATTR (c,d) <> 3 THEN GO T
O 1504
1505 PRINT INK 3; PAPER 6; OVER
 1; AT c,d; FLASH 1;" "
1510 IF ATTR (x+2,y)=7 THEN BE
EP .01,50-x*2: PRINT AT x,y;" "
; AT x+1,y;" "; LET x=x+2: PRINT
 AT x,y; a$(i); AT x+1,y;b$(i):
 GO TO 151
1600 IF ATTR (x+2,y) <> 133 THE
N GO TO 1800
1604 IF INKEY$ ="" AND ATTR (p
OKE z+24,28: LET p=x
1610 POKE z+3,15: POKE z+5,30: P
RINT AT p,y;"A"; LET l= USR z:
1620 IF INKEY$ ="" AND ATTR (p
-2,y)=7 THEN LET p=p-2: LET l=
USR z: PRINT AT p+3,y;"F": LET
 l= USR z
1630 FOR j=p+2 TO x+2: PRINT AT
 j,y;"B"; INK 5; PAPER 2; AT p+2
,y;"F"; AT p+3,y;"E": LET l= USR
 z: GO TO 1620
1670 POKE z+5,3: FOR j=p+2 TO x+
1: LET l= USR z: PRINT INK 5; AT
 j,y;" "; NEXT j: PRINT AT x+2,y
;" "; FLASH 1;"O": LET x=p: GO TO
 151
1820 IF b$(1) <> "P" AND ATTR (
x+2,y)=30 THEN POKE z+24,29: LET
 l= USR z: POKE z+3,0: POKE z+5,2
: LET b$(1)="P": PRINT AT x+2,y;
"F"; ATTR (x+2,y)=51 AND b$(1)="
P" THEN LET b$(1)="B": GO S
UB 9200: LET au=au+1
1840 IF au=5 THEN GO TO 2000
1850 GO TO 151
2010 LET sn=1
2020 GO SUB 9250
2080 GO TO 7049
2308 IF ATTR (x+2,y)=3 THEN LE
T q=x+1: GO TO 2321
2320 LET q=(4*(1+ INT ( RND *5))
)-1
2340 IF ATTR (q,3)=4 THEN LET
 r=3: RETURN
2350 LET r=27: LET t=-1: RETURN
3010 POKE z+3,0: POKE z+5,4: POK
E z+24,28: LET l= USR z: POKE z+
24,29: LET l= USR z
3050 LET l1=l1-1: IF l1=0 THEN
 GO TO 3200
3070 GO TO 9100
3220 PRINT #0; AT 0,19; PAPER 1;
 FLASH 1;" GAME OVER "; AT 1,1
3260 POKE z+5,13: LET l= USR z:
 POKE z+24,28: LET l= USR z:
3280 IF INKEY$ <> "" THEN GO
 TO 3280
3285 IF INKEY$ ="" THEN GO TO
 3285
3290 GO SUB 9250: GO TO 7040
6001 CLEAR ( USR "a")-100
6010 PRINT "PLEASE WAIT": RESTOR
E : LET z=( USR "a")-99
6020 LET g=0: FOR i=z TO z+28
6025 READ j: POKE i,j: LET g=g+j
: NEXT i
6026 FOR i= USR "a" TO USR "u"+
7
6028 READ j: LET g=g+j: POKE i,j
: NEXT i
6029 IF g <> 25668 THEN CLS : P
RINT "ERROR: LINE 6020-6098": ST
OP
6030 DATA 199,17,16,2,38,1,58,72
,92,31,31,31,14,254,238,16,237,1
21,67,16,254,37,32,244,1
```



```
6050 DATA 21,32,232,251,112,154,
159,61,93,117,124,56,8,62,93,157
,21,116,119,7,14,89,249,188,186,
174,62,28,16,124,186,185,168,46,
238,224
6055 DATA 0,129,219,255,126,24,0
,0
6060 DATA 183,183,183,183,183,18
3,183,183
6065 DATA 255,122,15,119,251,223
,248,112,255,190,240,238,223,251
,31,14
6070 DATA 255,255,255,255,255,23
9,238,68,253,255,255,239,238,106
,98,66
6080 DATA 255,255,3,247,239,192,
255,255,255,255,192,239,247,3,25
5,255,255,255,0,255,255,63,255,2
55,131,255,255,251,255,0,255,255
6090 DATA 0,0,60,24,231,195,255,
255,60,24,52,110,239,255,118,60
6095 DATA 0,0,24,60,126,219,129,
129
6098 DATA 128,63,32,32,32,32,32,
32,1,252,4,6,6,4,4,44,32,32,32
,32,63,128,231,4,4,6,6,4,252,1,2
31
6310 LET s=0: LET h=0: LET l$="A
A A ": LET m$="B-B-B-"
7040 LET a$="AC": LET b$="BD": L
ET c$="EQ"
7041 GO TO 9300
7044 BORDER 0: IF s>h THEN LET
h=s
7045 LET sn=1: LET li=3: LET s=0
7050 CLS : FOR j=2 TO 19: PRINT
INK 1; PAPER 3; AT j,0;"E"; PAP
ER 2; AT j,31;"F": NEXT j
7052 PRINT INK 0; PAPER 7; AT 1
8,0;"(isp)"; AT 19,0;"(isp)"
7055 FOR j=4 TO 20 STEP 8
7060 PRINT INK 3; AT j,0;"KNMML
MMNLMMKNKNNLMNLMMMKNNLMLNMK"; IN
K 1;"JJJIJJJIJJIIJJJIJIJJJIJJIJJ
IJJIJ": NEXT j
7063 FOR j=8 TO 16 STEP 8
7064 PRINT INK 3; AT j,0;"NNLML
MMMKNNNKNNLMMMMKNNKNNNMKNLMM"; IN
K 2;"JJIJJIJJJIJJIJJIJJJIJJIJJIJJ
IJJIJ": NEXT j
7065 PRINT INK 2; AT 1,0;"JIJJI
JIIJIJIJIJJIJJIJJJIJIJIJIJ"
7066 PRINT INK 0; PAPER 2; AT 0
,0;"JIJJIJIJIJJIJGOLDIIRUSHIJJIJIJ
JIJJ"
7067 PRINT AT 1,12; INK 6;"Cave
rn ";sn
7068 PRINT INK 3; AT 21,0;"KLMM
MNMKNNLNLMMMMMNKNMMLMMNLMMMK"
7100 LET q=15: LET a=18: LET b=1
: LET x=a: LET y=b
7200 RESTORE sn*100+8000
7210 FOR m=1 TO 6: READ j,k,n
7220 FOR i=n TO j-1: PRINT AT i
,k;" ": NEXT i
7230 PRINT INK 5; FLASH 1; AT j
,k;"O": NEXT m
8150 DATA 20,2,2,12,10,2,16,14,1
0,16,22,6,20,29,10,8,29,2
8200 DATA 20,2,10,20,12,14,12,9,
2,16,18,10,12,21,2,20,30,6
8300 DATA 8,1,2,16,2,6,20,9,6,16
,20,2,20,29,10,12,30,2
8400 DATA 12,2,4,20,2,16,16,11,4
,20,21,8,12,29,4,16,30,8
8900 PRINT INK 3; PAPER 6; AT 2
0,15;"RS"; AT 21,15;"TU"
8909 LET j=4
8910 LET k=3+( INT ( RND *26)):
 IF ATTR (j,k)=3 THEN PRINT PA
PER 3; AT j,k; INK 6;"P": LET j=
j+4: IF j=24 THEN GO TO 8912
8911 GO TO 8910
9050 LET r=3: LET au=0:
9070 FOR j=3 TO 19 STEP 8: PRINT
 AT j,3; INK 4;"GH": NEXT j
9090 PRINT AT 7,27; INK 4;"GH";
 AT 15,27;"GH"
9130 PRINT AT a,b;" "; AT x,y;"
 ": IF ATTR (x+1,y)=7 THEN PRI
NT AT x+1,y;" "
9140 LET x=18: LET y=1
9160 LET a=2*(1+2*( INT ( RND *4
))): LET b=1+ INT ( RND *30)
9164 LET c=2+(2*(1+2*( INT ( RND
*4)))): LET d=5+ INT ( RND *22)
: IF ATTR (c,d) <> 3 THEN GO T
O 9164
9166 PRINT INK 3; PAPER 6; OVER
1; AT c,d; FLASH 1;" "
9170 PRINT INK 5; AT x,y;"C"; AT x+1,y
;"D"; INK 5; AT a,b;"E"
9180 PRINT #0; AT 0,0; PAPER 3;"
GOLD #00000        LIVES-
" HIGH #00000
9185 PRINT #0; AT 1,13; PAPER 0;
 INK 3;"JIJIJI"; AT 1,0;"JI"
9190 PRINT #0; AT 0,13- LEN STR
$ s; PAPER 3;s; AT 1,13- LEN ST
R$ h; PAPER 3;h; AT 0,25;l$( TO
li*2); AT 1,25;m$( TO li*2)
9194 IF INKEY$ <> "" THEN GO
TO 9194
9195 IF INKEY$ ="" THEN GO TO
9195
9199 GO TO 100
9210 POKE z+5,7: POKE z+3,155: P
OKE z+24,28: LET l= USR z
9215 POKE z+3,50
9220 LET s=s+45: PRINT #0; AT 0,
13- LEN STR$ s; PAPER 3;s: RETU
RN
9250 FOR j=1 TO 24: LET l= USR 3
582: NEXT j: CLS : RETURN
9301 PAPER 1: BORDER 1: CLS
9308 PRINT INK 5; AT 0,0;"Benny
 Bunny In G O L D R U S H"
9309 PRINT FLASH 1; INK 6; OVER
 1; AT 0,15;"(g3:sp:ig3:sp:g3:sp
:ig3:sp:2*g3:sp:ig3:sp:g3:sp:ig3
:sp)": INK 4
9311 FOR j=28 TO 166 STEP 4: PLO
T 0,j: DRAW 70,-3: DRAW 90,3: DR
AW 94,-3: NEXT j: POKE z,243
9313 INK 6: FOR j=3 TO 18: PRINT
 AT j,11;"        ": NEXT
 j
9315 FOR j=20 TO 126 STEP 6
9320 PLOT 150-j/2,48-j/5: DRAW 5
,j: DRAW j*.7,5: DRAW 5,-(j+5):
 DRAW -(j*.7+7),0: NEXT j
9330 FOR j=120 TO 225 STEP 6
9332 PLOT 150-j/2,48-j/5: DRAW j
*.7+7,0: NEXT j: POKE z+29,201
9390 PRINT INK 4; AT 20,26;"GH
GH P"; INK 6;"    E"; INK 7: PAPE
R 0
9410 PRINT #0; AT 1,0;"1=INSTRUC
TIONS      0=START GAME"
9608 FOR m=0 TO 12 STEP 12: REST
ORE 9642: FOR k=1 TO 33: FOR l=1
 TO 2: PRINT AT 19,2;a$(1); AT
20,2;b$(1): READ j: BEEP .05,m+j
: BEEP .05,m+j+12: NEXT l: IF I
NKEY$ ="" THEN NEXT k: NEXT m:
 GO TO 9608
9642 DATA 2,2,0,0,4,4,7,7,12,11,
9,9,7,7,4,7,7,7,12,12,12,12,14,1
4,12,14,16,16,14,12,12,12,12,12,
16,16,14,14,12,12,9,9,7,7,4,4,2,
0,0,0,7,7,7,7,7,7,9,9,11,11,
12,12,12,12
9645 IF INKEY$ ="1" THEN GO SU
B 9250: GO TO 9700
9650 IF INKEY$ ="0" THEN GO SU
B 9250: GO TO 7042
9655 GO TO 9600
9710 BORDER 0: INK 6: CLS : PRIN
T PAPER 2;"     G O L D    R
 U S H"
9720 PRINT ." BENNY BUNNY DISCOV
ERS A GOLD     MINE. INSIDE THE U
NDERGROUND     CAVERNS HE WILL FI
ND..."
9725 PRINT .. FLASH 1;"BAGS OF
GOLD"; FLASH 0;": HE MUST TAKE T
HESE AND CARRY THEM ONE AT A TIM
E TO THE SAFE AT THE BOTTOM. IF
HE COLLECTS 5 HE WILL ENTER A
NEW CAVERN. THERE ARE 4 CAVERNS
."
9730 PRINT .. FLASH 1;"BATS"; FL
ASH 0;": IF AN EVIL BAT CATCHES
 BENNY HE LOSES A LIFE."
9735 PRINT .. FLASH 1;"LIFTS"; F
LASH 0;": IF HE STEPS ON TO A
 FLASHING BLUE LIFT IT WILL
 CARRY HIM UP.
 HE CAN JUMP OFF AT ANY TIME.
9750 PRINT FLASH 1;"MINE WAGGON
S"; FLASH 0;": LOOK OUT FOR THE
 RUNAWAY WAGGONS! IF BENNY IS
 RUN OVER...HE LOSES A LIFE."
9760 PRINT ..." IF HE JUMPS INTO
 A STATIONARY   WAGGON, IT WILL C
ARRY HIM ALONG THE PLATFORM. THI
S IS USEFUL    WHEN ESCAPING FRO
M THE BATS!"
9765 PRINT ..." IF HE RUNS A BAT
 OVER WHILE HE  IS RIDING IN A WA
GGON, THE BAT  CAN'T HARM HIM, A
ND HE GETS     BONUS POINTS."
9770 PRINT .." HE ALSO GETS BONU
S POINTS FOR   RIDING A WAGGON O
VER THE        FLASHING YELLOW S
QUARE."
9800 PRINT ........"
 CONTROLS"........."
 RIGHT___0"  LEFT___9
9860 INK 7: PRINT ......"
 PRESS A KEY"
9862 PAUSE 0: GO TO 9300
```



Unbeatable Street Hawk

How do you make a successful programme into a very successful program? Colette McDermott went to Ocean to find out.

JESSIE MACH rides super bike: **Street Hawk.**

As a vigilante; by night he rides around the streets of Los Angeles seeking out and destroying evil wherever it lurks; by day, a desk bound cop at police headquarters fending off the press who follow the Street Hawk's heroic adventures.

His bike is a powerful machine equipped with a console that would look equally at home on Concorde; infra-red tracking systems, altimeter and digital displays flashing brightly.

Street Hawk can travel at speeds exceeding 300 miles an hour, leap across buildings, and is armed with a laser gun. Not a member of the lesser-hair-dryer mob which stalks our streets.

This is the basic plot of the American television programme, Street Hawk, which has just finished its first showing on British television. If you are suffering from withdrawal symptoms, then the new Ocean game based on the series will be a valuable aid to your recovery.

Although still in its early development stage I was allowed a sneak preview of the game, which is due out shortly.

The game sets Street Hawk the task of protecting a VIP, who has decided to leg it to a secret destination, from enemy vehicles vrooming around his, or her, path.

The programmers, Nigel Aldarton and Mike Webb, are still undecided about the gender of their VIP 'We want to make it a female, perhaps a damsel in distress'' says Nigel, with a questioning tone in his voice.

They plan to reconstruct Street Hawk's fabulous console with a display panel set at the top of the screen. This will show many of the features already familiar to the bike as we know it.

The computer game will have an advanced warning scanner system for areas to the left and right off-screen, fuel, speed and height meters, scanner showing present position of the VIP and a score meter.

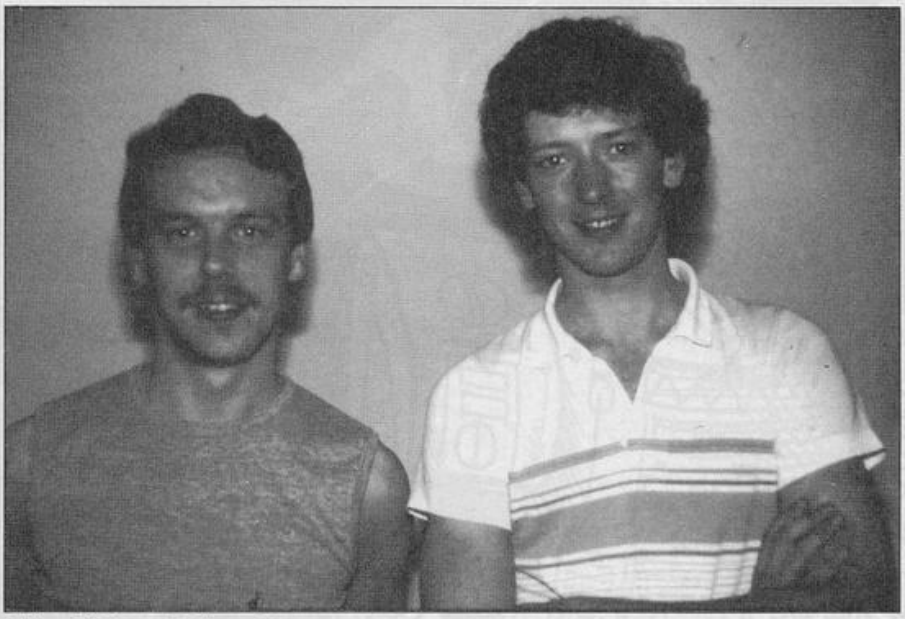
It is intended to make the whole display appear digital, just like the console in the television version.

Street Hawk is the only goodie in the game. The VIP does not really count because he, or she, is unable to defend him or herself.

The bad guys are played by jets, helicopters, cars, small bikes and missiles.

Some, like the cars, will attempt to kidnap Mach's ward; these cannot be destroyed by him. Others, like the missile, will have heat seeking war heads.

The helicopters are set on landing pads half way up the screen, and Street Hawk can also use



Mike Webb & Nigel Alderton

these as vantage points in his battle.

Attacks from the enemy can be made against both Street Hawk and the VIP.

Nigel and Mike had not quite decided the possible capabilities of the jet; they asked what I thought it might do!

If they were expecting some brilliant, earth-shattering 'New word' then I hardly think my stumbled, muscular-spasm-induced contribution of "Mmm!" will cause them to worry about their job security.

The graphics are remarkably small and Nigel explained: "We have developed the fastest sprite graphics ever written. This means that less memory is available for the usual graphics, but the game is faster."

Although the graphics are smaller this does not detract from the quality of the game, but the game establishes a new programming concept.

The enemy vehicles are capable of crossing the screen in a third of a second, which will happen at regular intervals.

The advance warning scanners on the display are therefore of paramount importance in playing the game as the scanners will detect enemy vehicles long before you see them, if you even can!

Street Hawk is capable of travel in any direction, including upwards. He can destroy the enemy with a laser gun, which has a rapid fire facility.

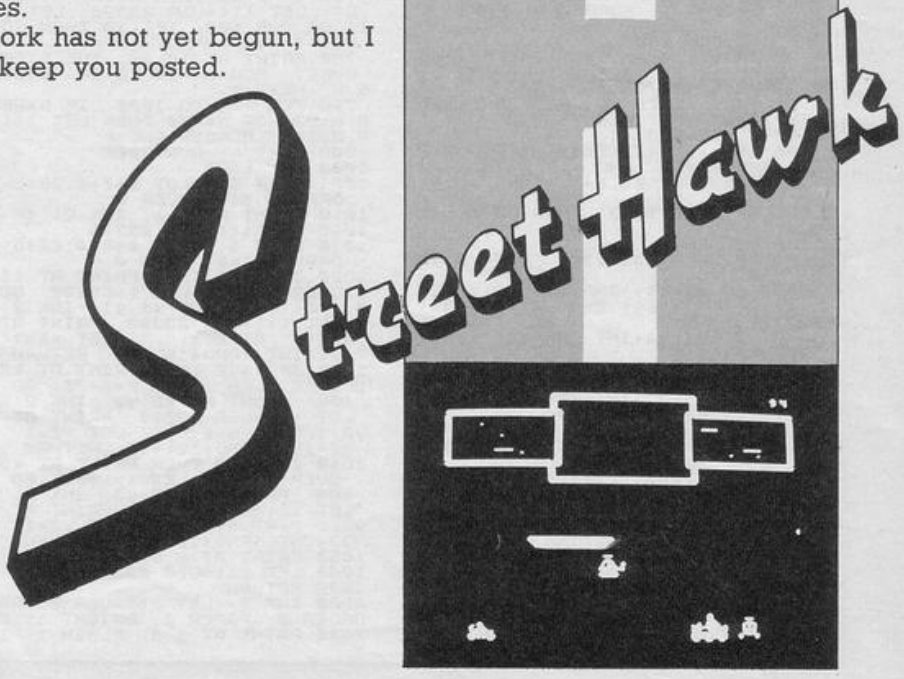
The game progresses in levels of difficulty and is designed to have fast non stop action. As the levels progress the game will become more aggressive.

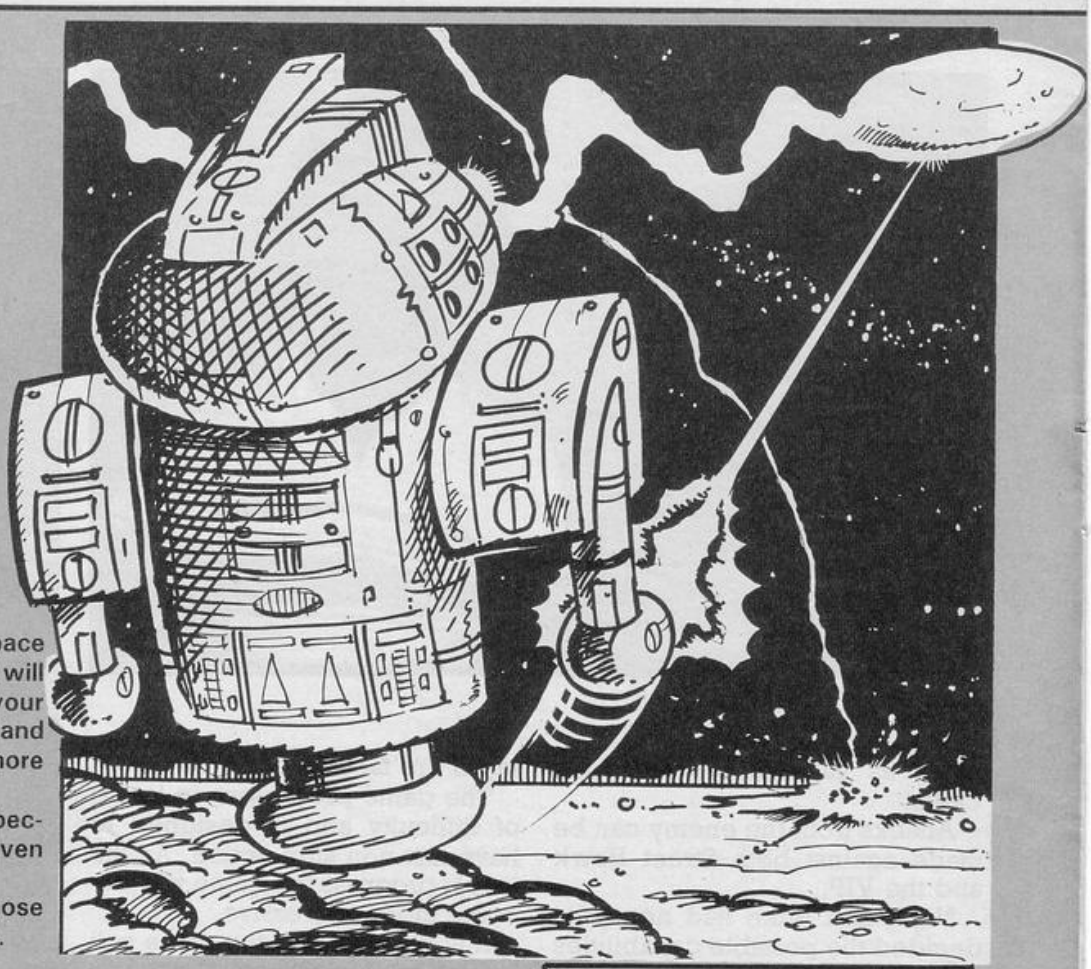
It is planned that the game will be unbeatable. That is, the levels continue in a never ending stream of difficulty.

All levels will include at least eight of each enemy vehicle and the VIP will have between six and eight lives.

Street Hawk begins a series of games, on the Ocean label, based on popular American programmes and based on themes such as **Knight Rider,** which is planned to be the next in the series.

Work has not yet begun, but I will keep you posted.





Shoot down as many space ships as you can. The game will end when you lose all three of your lives, or when two spaceships land at the same time. A score of more than 7500 is excellent.

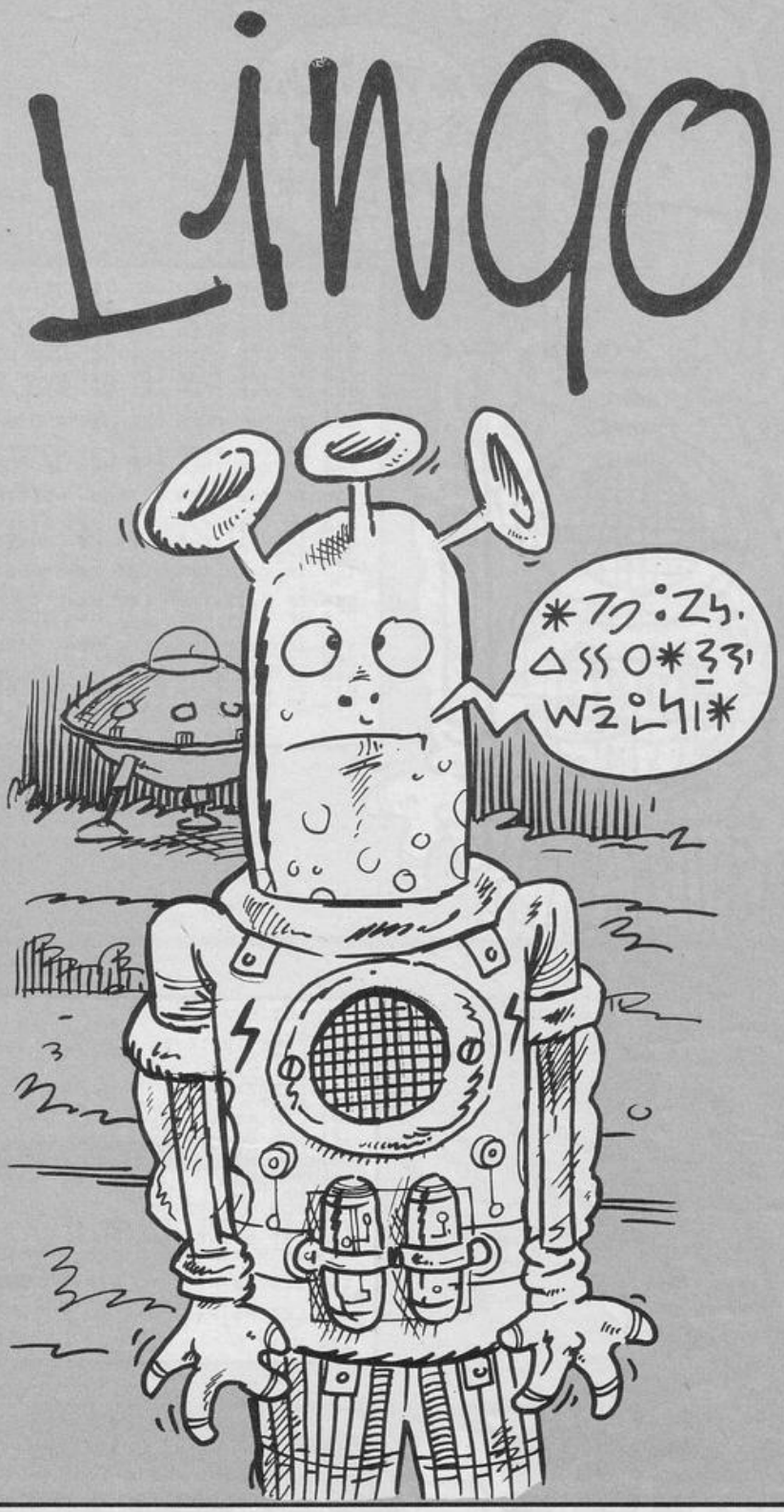
Robot was written for the Spectrum or Spectrum Plus by R Raven of Oud-Beijerland, Holland.

Underlined characters are those to be entered in graphics mode.

ROBOT

```
  1 GO TO 2000
  5 LET s=0: LET l=3
  10 LET lev=.1: LET a=15: LET x
1=1: LET x2=1: LET x3=1
  20 LET y1=INT (RND*10)+10
  25 LET y2=INT (RND*10)+10
  30 LET y3=INT (RND*10)+10
  50 BRIGHT 1: BORDER 0: PAPER 1
  INK 7: CLS
  60 GO SUB 400
  70 PRINT #0;AT 0,5; INK 6;"FFF
FFFFFFFFFFFFFFFFF"; INK 2;AT 1,
5;"▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀"
  80 FOR n=1 TO 50: PLOT RND*255
,RND*170: NEXT n
  99 GO TO 500
  100 LET a=a+(INKEY$="8" AND a<2
5)-(INKEY$="5" AND a>5)
  110 PRINT AT 21,a-1; INK 7;" A
"
  120 IF INKEY$="0" THEN GO SUB 1
000
  130 RETURN
  250 PRINT AT x1,y1;" ";AT x2,y2
;" ";AT x3,y3;" "
  260 LET x1=x1+(RND<lev+.2): LET
 x2=x2+(RND<lev+.1): LET x3=x3+(
RND<lev)
  270 LET y1=y1+INT (RND*3)-1-(y1
>25)+(y1<5)
  275 LET y2=y2+INT (RND*3)-1-(y2
>25)+(y2<5)
  280 LET y3=y3+INT (RND*3)-1-(y3
>25)+(y3<5)
  290 PRINT AT x1,y1; INK 4;"C";A
T x2,y2; INK 5;"D";AT x3,y3; INK
 6;"E"
  295 BEEP .005,(x1+x2+x3)/5
  300 IF x1>20 OR x2>20 OR x3>20
THEN GO TO 750
  310 RETURN
  400 PRINT AT 0,0; INK 6;"Score:
";s;AT 0,15;"Lives:";l;" "
  410 RETURN
  500 GO SUB 100
  510 GO SUB 250
  520 LET lev=lev+.005
  540 IF RND>.9 THEN PLOT RND*255
,RND*170
  600 GO TO 500
  750 PRINT AT 21,a;" ";#0;AT 1,5
; FLASH 1;"     I N V A D E D
"
  760 LET p=y1*(x1=21)+y2*(x2=21)
+y3*(x3=21)
  770 IF p<30 THEN PRINT AT 21,p;
"G": LET lll=USR 23398: LET l=l-
1: GO SUB 400: IF l>0 THEN GO TO
 10
  780 PRINT AT 10,10; INK 6;"GAME
 OVER": FOR n=-10 TO 10: BEEP .0
5,n: NEXT n
  790 FOR n=1 TO 1000: IF n=250 O
R n=500 OR n=750 THEN LET lll=US
R 23398: BORDER RND*6
  800 NEXT n: RUN 2000
1000 LET b=20
1001 OVER 1: PLOT a*8+4,22*8-8*b
: DRAW 0,140: OVER 0
1010 PRINT AT b,a; INK 2;"I"
1015 LET lll=USR 23375
1016 OVER 1: PLOT a*8+4,22*8-8*b
: DRAW 0,140: OVER 0
1020 IF a=y1 THEN PRINT AT x1,y1
; OVER 1;"H": LET s=s+100: GO SU
B 400: PRINT AT x1,y1; INK 2;"I"
: LET lll=USR 23398: PRINT AT x1
,y1;" ";AT b,a;" ": LET x1=1: LE
T y1=INT (RND*10)+10: RETURN
1030 IF a=y2 THEN PRINT AT x2,y2
; OVER 1;"H": LET s=s+75: GO SUB
 400: PRINT AT x2,y2; INK 2;"I":
 LET lll=USR 23398: PRINT AT x2,
y2;" ";AT b,a;" ": LET x2=1: LET
 y2=INT (RND*10)+10: RETURN
1040 IF a=y3 THEN PRINT AT x3,y3
; OVER 1;"H": LET s=s+50: GO SUB
 400: PRINT AT x3,y3; INK 2;"I":
 LET lll=USR 23398: PRINT AT x3,
y3;" ";AT b,a;" ": LET x3=1: LET
 y3=INT (RND*10)+10: RETURN
1050 PRINT AT b,a;" "
1060 LET lll=USR 23386
1080 RETURN
2000 INK 7: LET lll=USR 23398: B
ORDER 0: PAPER 1: BRIGHT 1: CLS
2010 PRINT AT 1,8; FLASH 1; INK
6;"ROBOT INVASION"
2020 BEEP 5,-60: PRINT AT 4,1; I
NK 7;"The aim of this game is to
      shoot down as many spacesh
ips    as possible."
2030 FOR n=1 TO 60: PRINT AT 8,R
ND*25+2; INK 5;"G": BEEP .05,n:
NEXT n: PRINT AT 8,2; INK 5;"GGG
GGGGGGGGGGGGGGGGGGG"
2040 PRINT AT 10,1; INK 6;"Dont
let them land."
2050 PRINT AT 12,1;"You have 3 l
ives.                The game end
s when you lose      them all or
when two ships       land at the
same time.": BEEP 10,-50
2060 LET a$=" Your controls are:

              5 - Left      8 - R
ight
                    0 - Fire
"
2070 PRINT : FOR n=1 TO LEN a$:
PRINT a$(n);: BEEP .05,-40: PAUS
E 3: NEXT n
2079 LET lll=USR 23398
2080 RUN 5
9000 SAVE "ROBOT" LINE 9050
9030 STOP
9050 RESTORE : FOR n=USR "a" TO
USR "a"+71: READ code: POKE n,co
de: NEXT n
9070 FOR n=23300 TO 23550: READ
code: POKE n,code: NEXT n
9080 RUN
9100 DATA
0,0,8,8,28,62,85,0,0,8,8,8,8,8,8
,0,0,60,90,255,219,66,90,0,0,60,
126,255,165,126,60,0,0,0,28,34,6
5,127,42,0,255,255,170,85,170,0,
0,0,24,36,189,165,102,60,36,66,0
,129,66,36,0,36,66,129,128,13,33
,2,16,34,4,48,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,197,213,67,16,
254,10,203,199,203,207,203,215,2
11,254,12,21,32,240,209,193,201,
197,213,175,203,199,203,207,203,
215,67,16,254,203,231,211,254,67
,16,254,203,167,211,254,21,32,23
9,209,193,201,22,3,30,128,205,50
,91,29,32,250,201,30,0,22,32,205
,29,91,28,21,32,249,201,30,0,22,
128,205,29,91,28,21,32,249,201,3
3,3,91,35,86,35,94,35,78,35,205,
29,91,13,32,250,125,254,28,56,23
9,201,33,3,91,35,86,35,94,35,78,
35,205,50,91,13,32,250,125,254,2
8,56,239,201,0,0,0,0,0,0,0,0,0,0
,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
,0,0,0,0,0,0,0,0
```

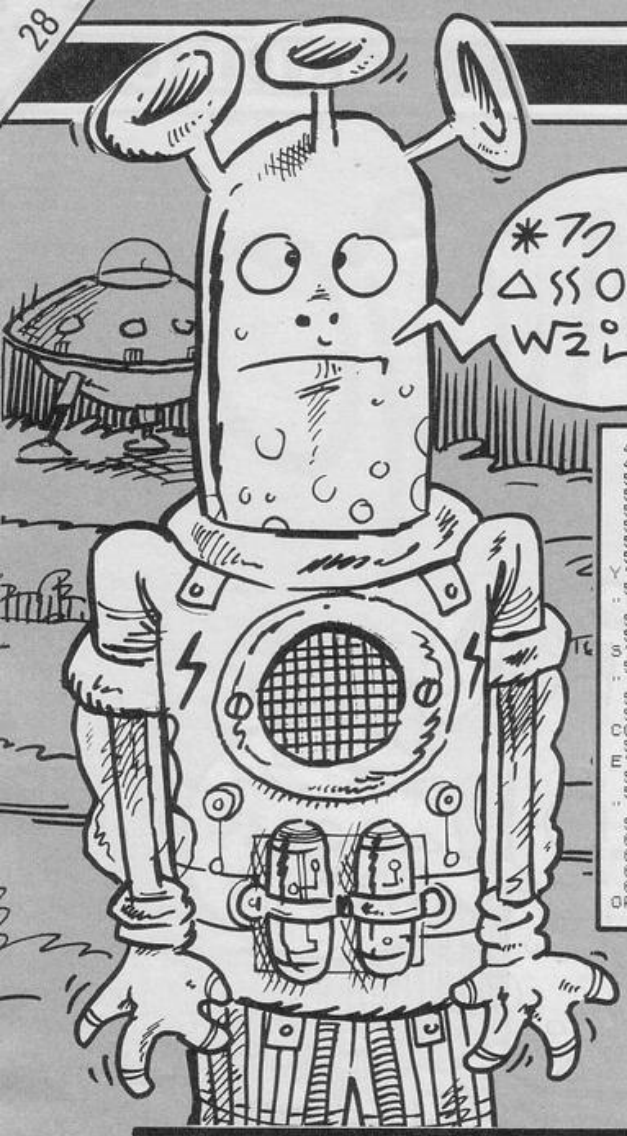
Lingo



Lingo is a joke as much as it is a program. At the press of a key, the ZX-81 will produce a grammatically correct but ludicrous sentence. For example: ''The rabid pterodactyl slurps incessantly outside the rotting pit.'' Vocabulary of your own can be added to the listing, making it easy to construct computerised greetings or insults.

Lingo was written for the 16K ZX-81 by Brian Nicol of Glenrothes, Fife.

```
   1 REM "LINGO" BY B.NICOL
   2 GOSUB 1000
  10 LET Q=INT (RND*20)+1
  20 IF Q=1 THEN LET A$="GREASY"
  25 IF Q=2 THEN LET A$="MORONIC
"
  30 IF Q=3 THEN LET A$="HAIRY"
  35 IF Q=4 THEN LET A$="DIRTY"
  40 IF Q=5 THEN LET A$="UGLY"
  45 IF Q=6 THEN LET A$="ABNORMA
L"
  50 IF Q=7 THEN LET A$="AGGRESS
IVE"
  55 IF Q=8 THEN LET A$="SPOTTY"
  60 IF Q=9 THEN LET A$="PARANOI
D"
  65 IF Q=10 THEN LET A$="SWEATY
"
  70 IF Q=11 THEN LET A$="FURIOU
S"
  75 IF Q=12 THEN LET A$="CONSTI
PATED"
  80 IF Q=13 THEN LET A$="DISGUS
TING"
  85 IF Q=14 THEN LET A$="SENILE
"
  90 IF Q=15 THEN LET A$="FLEA-R
IDDEN"
  95 IF Q=16 THEN LET A$="DRUNKE
N"
 100 IF Q=17 THEN LET A$="SHAGGY
"
 105 IF Q=18 THEN LET A$="BLOATE
D"
 110 IF Q=19 THEN LET A$="RABID"
 115 IF Q=20 THEN LET A$="SADIST
IC"
 120 LET W=INT (RND*20)+1
 125 IF W=1 THEN LET S$="GORILLA
"
 130 IF W=2 THEN LET S$="BUS CON
DUCTRESS"
 135 IF W=3 THEN LET S$="WARTHOG
"
 140 IF W=4 THEN LET S$="GRAVE D
IGGER"
 145 IF W=5 THEN LET S$="HIPPY"
 150 IF W=6 THEN LET S$="MONSTER
"
 155 IF W=7 THEN LET S$="CHELSEA
 FAN"
 160 IF W=8 THEN LET S$="SLOW-WO
RM"
 165 IF W=9 THEN LET S$="STREAKE
R"
 170 IF W=10 THEN LET S$="PTEROD
ACTYL"
 175 IF W=11 THEN LET S$="BEAUTY
 QUEEN"
 180 IF W=12 THEN LET S$="CYCLOP
S"
 185 IF W=13 THEN LET S$="MINIST
ER"
 190 IF W=14 THEN LET S$="BRAIN-
SURGEON"
 195 IF W=15 THEN LET S$="VIOLIN
IST"
 200 IF W=16 THEN LET S$="SEWER
RAT"
 205 IF W=17 THEN LET S$="WEREWO
LF"
 210 IF W=18 THEN LET S$="HORSE"
 215 IF W=19 THEN LET S$="WALLY"
 220 IF W=20 THEN LET S$="WOGAN"
 230 LET E=INT (RND*18)+1
 235 IF E=1 THEN LET D$="BURPS"
 240 IF E=2 THEN LET D$="EATS"
 245 IF E=3 THEN LET D$="PERCHES
"
 250 IF E=4 THEN LET D$="RASPS"
 255 IF E=5 THEN LET D$="SLAVERS
"
 260 IF E=6 THEN LET D$="BREAKS
WIND"
 265 IF E=7 THEN LET D$="CRAWLS"
 270 IF E=8 THEN LET D$="YELLS"
 275 IF E=9 THEN LET D$="VOMITS"
 280 IF E=10 THEN LET D$="WHISPE
RS"
 285 IF E=11 THEN LET D$="CRIES"
 290 IF E=12 THEN LET D$="DIES"
 295 IF E=13 THEN LET D$="SLURPS
"
 300 IF E=14 THEN LET D$="SNORTS
"
 305 IF E=15 THEN LET D$="BOUNCE
S"
 307 IF E=16 THEN LET D$="ATTACK
S"
 308 IF E=17 THEN LET D$="NOSE-P
ICKS"
 309 IF E=18 THEN LET D$="SPRAY-
PAINTS"
 310 LET R=INT (RND*10)+1
 313 IF R=1 THEN LET F$="INCESSA
NTLY"
 315 IF R=2 THEN LET F$="NOISILY
"
 320 IF R=3 THEN LET F$="HUNGRIL
Y"
 325 IF R=4 THEN LET F$="VIOLENT
LY"
 330 IF R=5 THEN LET F$="SKILLFU
LLY"
 335 IF R=6 THEN LET F$="MERCILE
SSLY"
 340 IF R=7 THEN LET F$="BEAUTIF
ULLY"
 345 IF R=8 THEN LET F$="QUICKLY
"
 350 IF R=9 THEN LET F$="SILENTL
Y"
 355 IF R=10 THEN LET F$="MANICA
LLY"
 400 LET T=INT (RND*8)+1
 405 IF T=1 THEN LET G$="IN"
 410 IF T=2 THEN LET G$="INSIDE"
 415 IF T=3 THEN LET G$="ABOVE"
 420 IF T=4 THEN LET G$="THROUGH
"
 425 IF T=5 THEN LET G$="OUTSIDE
"
 430 IF T=6 THEN LET G$="BELOW"
 435 IF T=7 THEN LET G$="OPPOSIT
E"
```



```
  440 IF T=8 THEN LET G$="NEAR"
  445 IF T=9 THEN LET G$="ON"
  500 LET Y=INT (RND*15)+1
  505 IF Y=1 THEN LET H$="SLIMY"
  510 IF Y=2 THEN LET H$="MOULDY"
  515 IF Y=3 THEN LET H$="SMELLY"
  520 IF Y=4 THEN LET H$="PURPLE"
  525 IF Y=5 THEN LET H$="RICKETT
Y"
  530 IF Y=6 THEN LET H$="ANCIENT
"
  535 IF Y=7 THEN LET H$="QUIET"
  540 IF Y=8 THEN LET H$="SPOTLES
S"
  545 IF Y=9 THEN LET H$="ROTTING
"
  550 IF Y=10 THEN LET H$="DIRTY"
  555 IF Y=11 THEN LET H$="MULTI-
COLOURED"
  560 IF Y=12 THEN LET H$="MASSIV
E"
  565 IF Y=13 THEN LET H$="TINY"
  570 IF Y=14 THEN LET H$="SODDEN
"
  575 IF Y=15 THEN LET H$="WEIRD"
  600 LET U=INT (RND*20)+1
  605 IF U=1 THEN LET J$="BRIDGE"
  610 IF U=2 THEN LET J$="TOILET"
  615 IF U=3 THEN LET J$="CHIP SH
OP"
```

```
  620 IF U=4 THEN LET J$="MANSION
"
  625 IF U=5 THEN LET J$="SUBWAY"
  630 IF U=6 THEN LET J$="SCHOOL"
  635 IF U=7 THEN LET J$="MINEFIE
LD"
  640 IF U=8 THEN LET J$="NUDIST
COLONY"
  645 IF U=9 THEN LET J$="CLOTHES
PEG"
  650 IF U=10 THEN LET J$="SHED"
  655 IF U=11 THEN LET J$="KENNEL
"
  660 IF U=12 THEN LET J$="JUNGLE
"
  665 IF U=13 THEN LET J$="CHINES
E LAUNDRY"
  670 IF U=14 THEN LET J$="TREEHO
USE"
  675 IF U=15 THEN LET J$="JOB-CE
NTRE"
  680 IF U=16 THEN LET J$="PUDDLE
"
  685 IF U=17 THEN LET J$="TOADST
OOL"
  690 IF U=18 THEN LET J$="MORGUE
"
  695 IF U=19 THEN LET J$="PLASTI
C-SURGERY CLINIC"
  700 IF U=20 THEN LET J$="CESS-P
IT"
  730 PRINT AT 9,1;"""""
  800 PRINT AT 9,2;"THE ";A$;" ";
S$;AT 10,2;D$;" ";F$;" ";AT 11,2
;G$;" THE ";H$;" ";AT 12,2;J$;".
"""
  850 PAUSE 4E4
  870 PRINT AT 9,0;"
  900 GOTO 10
  950 STOP
1000 FOR F=0 TO 7
1010 PRINT AT F,0;"
                  "
1020 NEXT F
1030 PRINT AT 2,4;"
  ";AT 3,4;"
  ";AT 4,4;"
  "
1035 PRINT AT 6,6;"A BRAN NICOL
PROGRAM"
1040 FOR F=15 TO 21
1050 PRINT AT F,0;"
                  "
1060 NEXT F
1070 PRINT AT 18,7;"GO ON...PRES
S A KEY"
1080 IF INKEY$="" THEN GOTO 1080
1090 RETURN
2000 SAVE "LING"
2001 RUN
```

HOPPY

```
    5 LET S=0
    8 CLS
   10 POKE 16418,0
   20 LET H=-1
   30 LET K=0
   40 LET Z=0
   90 FAST
  100 DIM A$(40,80)
  101 FOR N=1 TO 40
  102 LET A$(N)="
                  "
  103 NEXT N
  104 FOR N=1 TO 50
  105 LET A=INT (RND*30)+5
  110 LET B=INT (RND*51)+2
  111 IF A>=18 AND A<=22 THEN GOT
O 105
  115 LET A$(A)(B TO B+6)="
"
  120 LET A$(A+1)(B+2 TO B+4)="
"
  130 NEXT N
```

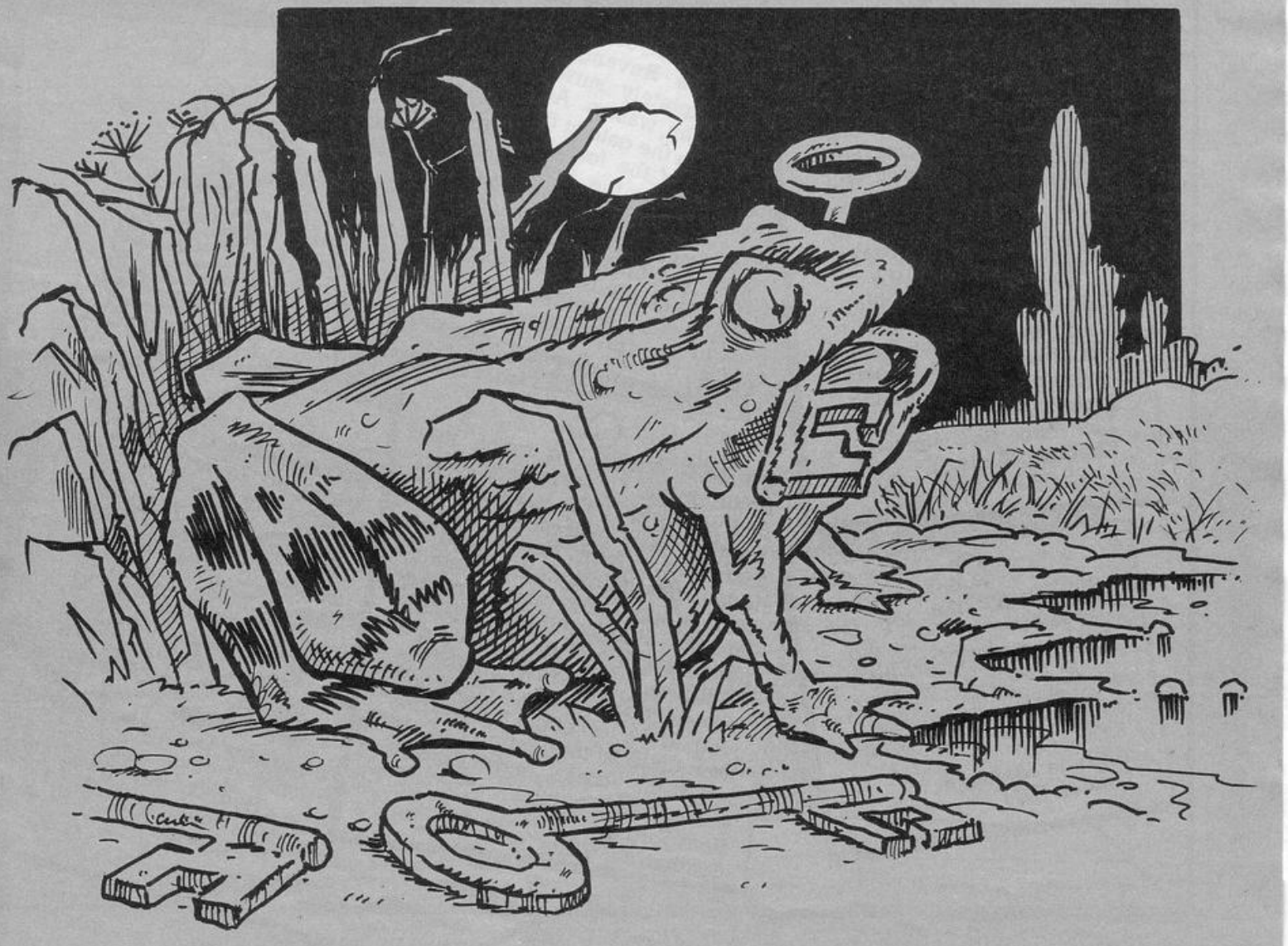
```
  132 LET A$(40)="
                  "
  133 LET A$(1)=A$(40)
  134 LET A$(20)(30 TO 31)="
"
  135 LET A$(21)(30 TO 31)="
"
  136 FOR N=1 TO 10
  138 LET A=INT (RND*34)+3
  140 LET B=INT (RND*55)+2
  142 IF A=20 OR A=21 THEN GOTO 1
38
  145 IF A$(A)(B)<>"" THEN GOTO
138
  147 LET A$(A-1)(B)="
"
  148 LET A$(A)(B)="
"
  149 NEXT N
  150 SLOW
  155 LET X=21
  160 LET Y=1
  165 LET A=19
  170 LET B=15
  175 LET T=27
  180 LET T$="
```

As time ticks away at the bottom of the screen, Hoppy the frog must collect the ten keys by the pond in order to win the game. Being a frog, Hoppy does not walk along the ground, he bounces. The size of his hops can be estimated by studying the hopometer at the bottom of the screen.

An excellent feature of this game is that the playing area extends over four screens, so bouncing off the top of the screen, or the side of the screen, takes you to another section of the play area.

Hoppy was written for the 16K ZX-81 by Peter Sansom of Huntingdon, Cambridgeshire.

```
"
 185 LET Y$="
          "
 200 PRINT AT 0,0;"
                   "
 205 FOR N=1 TO 20
 210 PRINT AT N,0;"
                   ";AT N,31;"
"
 215 NEXT N
 220 PRINT AT 21,0;"
                   "
 225 PRINT AT 22,0;"TIME:";T$( T
O T-1);" ";AT 23,0;"HOPS:
                   "
 230 FOR N=X TO X+19
 235 PRINT AT N-X+1,1;A$(N)(Y TO
Y+29)
 240 NEXT N
 245 LET H=H+1
 250 IF H>0 THEN GOTO 395
 255 IF A=1 THEN GOTO 450
 300 PRINT AT A,B;"X"
 320 PRINT AT 23,0;"HOPS:
                   "
 321 IF Z=10 THEN GOTO 1500
 325 LET T=T-.02
 330 PRINT AT 22,T+4;" "
 335 IF T<=1 THEN GOTO 1000
 350 IF INKEY$="" THEN GOTO 300
 351 LET B$=INKEY$
 352 IF B$="0" THEN GOTO 900
 353 IF B$<>"7" AND B$<>"5" AND
B$<>"8" THEN GOTO 300
 355 LET H=0
 360 PRINT AT 23,H+5;""
 361 IF H=26 THEN GOTO 370
 362 LET H=H+1
 365 IF INKEY$<>"" THEN GOTO 360
 395 LET M=B
 400 FOR K=A-1 TO A-H STEP -1
 405 LET M=M+(B$="8")-(B$="5")
 410 PRINT AT K,M;
 415 LET O=PEEK (PEEK 16398+256*
PEEK 16399)
 416 IF O=CODE "
" THEN GOTO 600
 417 IF O=CODE "
" THEN GOTO 650
 418 IF O=CODE "
" THEN GOTO 700
 419 IF O=CODE "
" THEN GOTO 800
 420 IF O<>CODE "
" THEN GOTO 45
0
 422 PRINT AT A,B;"
"
 425 LET A=K
 430 LET B=M
 435 PRINT AT A,B;"X"
 436 LET T=T-.02
 437 PRINT AT 22,T+4;" "
 438 IF T<=1 THEN GOTO 1000
 439 LET H=H-1
 440 NEXT K
 450 LET H=-1
 451 FOR N=A TO 1000
 455 PRINT AT N+1,B;
 460 LET O=PEEK (PEEK 16398+256*
PEEK 16399)
 461 IF O=CODE "
" THEN GOTO 750
 464 IF O=CODE "
" THEN GOTO 850
 465 IF O<>CODE "
" THEN GOTO 30
0
 470 PRINT AT A,B;"
"
 471 LET T=T-.02
 472 PRINT AT 22,T+4;" "
 473 IF T<=1 THEN GOTO 1000
 475 LET A=A+1
 480 PRINT AT A,B;"X"
 495 NEXT N
 500 LET Y=Y+30
 505 LET B=1
 525 GOTO 225
 650 LET Y=Y-30
 655 LET B=30
 675 GOTO 225
 700 LET X=X-20
 705 LET A=20
 725 GOTO 225
 750 LET X=X+20
 755 LET A=1
 775 GOTO 225
 800 LET Z=Z+1
 803 LET S=S+100
 805 LET A$(K+X-1)(M+Y-1)="
"
 810 GOTO 422
 851 LET Z=Z+1
 852 LET S=S+100
 853 LET A$(N+X)(B+Y-1)="
"
 855 GOTO 470
 900 PRINT AT A,B;"
"
 901 LET B=INT (RND*25)+2
 905 LET A=INT (RND*15)+3
 915 LET T=T-2
 918 IF T<0 THEN LET T=0
 920 PRINT AT 22,5;"
                   ";AT 22,5;T$( TO
T)
 945 GOTO 450
1000 FOR A=1 TO 20
1002 PRINT AT 22,0;"******YOU RA
N OUT OF TIME*******"
1010 PRINT AT A,A;"GAME - OVER"
1012 PRINT AT 22,0;"******YOU RA
N OUT OF TIME*******"
1020 NEXT A
1030 PRINT AT 23,0;"
                   ";AT 23,17;S
$
1100 PRINT AT 0,4;"ANY KEY FOR A
NOTHER GAME"
1105 PRINT AT 0,4;"
                   "
1110 IF INKEY$="" THEN GOTO 1100
1120 CLS
1150 RUN
1500 FOR A=1 TO 20
1503 PRINT AT A,1;"++++++++
                   +++++++"
1505 PRINT AT A,1;"--------CONGR
ATULATIONS-------"
1510 NEXT A
1515 PRINT AT 23,0;"
                   "
1520 PAUSE 4E4
1522 LET S=S+(INT T*100)
1525 CLS
1530 GOTO 15
2000 CLS
2005 PRINT AT 0,8;"
"
2010 PRINT AT 2,0;"YOU MUST COLL
ECT THE 10 KEYS ( )BEFORE YOUR T
IME RUNS OUT."
2020 PRINT AT 5,0;"JUMP LEFT AND
 RIGHT WITH KEYS 5 AND 8, AND UP
WARDS WITH 7."
2030 PRINT AT 8,0;"MEASURE THE P
OWER OF YOUR JUMPS ON THE HOPOME
TER AT THE BOTTOM  OF THE SCREEN
 BY HOLDING THE    RESPECTIVE KE
Y DOWN."
2040 PRINT AT 13,0;"IN AN EMERGE
NCY YOU CAN PRESS 0 AND YOU WILL
 APPEAR IN A RANDOM POSITION ON
THE SCREEN (DON""T   USE THIS TO
O OFTEN FOR IT USES  A LOT OF TI
ME."
2045 PRINT AT 18,0;"THE PLAYING
AREA IS 4 TIMES THE SIZE OF THE
SCREEN SO YOU CAN   JUMP OF THE
EDGES OF THE SCREEN SOMETIMES."
2055 PAUSE 4E4
2060 RUN
9900 CLEAR
9905 SAVE "HOPP"
9910 GOTO 2000
```



You've got it Licked

A USEFUL memory-saving statement which I use in my ZX-81 program is PAUSE 4E4. This enables you to PAUSE the program in which it appears for as long as you like, until you press any key on the keyboard. It will then continue the program.

William Turner,
Staunton, Glos.

TO REACH the ring from the goblin's dungeon in **The Hobbit** you must move SE, N, SE, U, W, SE, S, N and SW. From the ring move NE, NW and E to reach the goblin's back door. Wear the ring, and keep checking that you are wearing it.

Lee Gunner,
West Harrow

IN **Inca Curse,** extinguish the fire in the fire room by typing SMOTHER FIRE, GET LAMP, USE MATCH, DROP BLANKET, USE CHISEL, DROP CHISEL, UP.

To remove the panels in the panelled room use the key on one of them. Type USE KEY, GO OPEN. The other needs a gold bar of no value. Type PRISE PANEL, CLIMB HOLE.

Once in the sand dungeon type DOWN with the special items.

Timothy Moore,
Dawlish, Devon

GIFT from the Gods. Find Clytaemnestra as soon as possible. Follow her until she enters one of the special rooms. Follow her in and you will find that she has died.

Fly rather than walk, to prevent the small snake from stealing energy.

Stop after reaching any hole in the ceiling and move slightly back and forth. This allows you to avoid falling water.

Lawrence Bowman,
Shefford, Beds.

CANNOT reach the location to the north of Icemark in **Doomdark's Revenge?** The area is completely surrounded by the frozen wastes. Access is gained from the gate at the northernmost tip of the forest of Farorn. Turn west at the first junction in the tunnel and follow it through. You will then face an Ice Lord, so a reasonably powerful army and allies will be necessary.

Gary Snedden,
Forfar, Scotland

START AT the top in **Ghostbusters.** Giving your name as CODEBUSTERS and your number as 46305631. This will allow you to begin with £999,990.

Abdulla Mahooth,
London SW1

JET SET WILLY. To reach the bottle on the Conservatory Roof, find your way to the Banyan Tree from the side nearest the Nightmare Room. Jump to the second ledge sticking out of the ground. Turn around and jump forward into the blue see-through place above the first ledge sticking out of the ground. Now climb the tree. When you can go no further jump to the top of the trunk, jump from there to the platform on the left of the screen, and then walk across to the bottles.

Paul Jordan,
Southwick, Wilts

KILLING monsters in **Gift from the Gods.** All are killed by sweeping your sword down.

Pile of skulls: run into the room and start sweeping when by the monster. Continue sweeping until it is stunned, then lunge.

Blue skulls with snakes: hit one of the top two snakes. These are easiest to hit when they first appear.

Hydras: you need to hit a head.

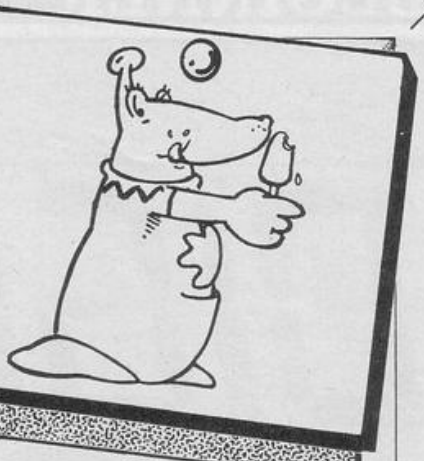
A McLeish

GAIN INFINITE lives on **Kokotini Wilf** by typing MERGE "" and then starting the tape. Stop the tape when the error message appears on screen. Enter 10 POKE 23693,0: CLEAR 24100: LOAD "" CODE: RANDOMIZE USR 65100: LOAD "" CODE: RANDOMIZE USR 41712.

Steven Wallace, Fife, Scotland

I WONDER if your readers are aware of the fact that, if they are having trouble using colour TVs as monitors, they can have their TV modified to make it compatible with the computer. I had my TV modified by a local TV shop for £15. I have now found a new life. Games are far more enjoyable, and progrmming easier when the colours are so clear.

R M Foss, Manchester.



STUCK in the **Temple of Vran?** Remember that Warts do not like cats, especially if they are awake. Elephants love peanuts. The bow and arrow is not a weapon.

John Rundle, Aldershot, Hants

Pen-friends

Anthony Rushton, Well Cottage, Whitchurch Road, Bunbury, nr Tarporley, CW6 9SX is the 12 year old owner of a 48K Spectrum. He enjoys programming and playing games. His favourite games are **Bug Eyes, Baseball** and **Dukes of Hazzard.**

J Borg, Michael Ville, Night Shade Street, Santa Lucia, Malta is thirteen years old and owns a 48K Spectrum. He would like a penfriend with whom he can swap games, programs and ideas.

Andrew Carpenter, 12 Curtyn Close, Abingdon, Oxon, OX14 1SE would like a penfriend with a 48K Spectrum who will be willing to exchange programs and ideas. He owns over a hundred programs and his favourites are **Finders Keepers, Hobbit** and **Sabre Wulf.**

Adrian Spesser, 5 Sycamore Road, Delves, Walsall, West Midlands would like a UK penfriend who also owns a ZX-81. He feels that the ZX-81 is still a useful computer, although there are few games produced for it, and would like to pick up and pass on as many tips as possible.

Alice Chapman, 35 Hidcote Boyce, nr Chipping Campden, Glous, GL55 6LX is mad on the 48K Spectrum and would like a penfriend from anywhere in the world. She would like to swap programs, and she would also like tips on the adventure **Mountains of Ket.**

DIGITAL CLOCK

DIGITAL CLOCK written by D Galbraith gives a continuous screen display of the time from when it is set to start by the user's input. It gives hours, minutes, and seconds just as a digital watch does, except, unlike most digital watches, this is a 24 hour clock. For example, 3 pm will appear as 15:00:00. It is a useful program to help the beginner to understand how to use the Spectrum's timing ability. Many arcade games test a player's skill against the clock, so this will show you how to build a clock into your own program.

Variables

A variable is a name given to a location in memory used to store a number. The value of a variable usually changes while the program is running. Here are the main variables used in Digital Clock.

hr is the hour of day.
min is the minute of the hour.
sec is the second of the minute.
These 3 variables are initially set by the user, but thereafter by the computer's clock.
n is the number of frames which would have been shown on the TV screen had the computer been switched on for the time shown. Because mains frequency in this country is 50 Hz, the Spectrum is able to display 50 frames per second, and certain locations in memory store the frame count from switch on. It is by modifying the contents of these locations that we can simulate a real clock, so n in this case is made a frame count to suit our clock time.
m is a frame count like n. Two counts are needed as you will see.
a, b and c are really n broken down into three bytes.

How it works

Lines

20 Prints title. A variable is set up for a GOTO in line 200.

40-90 Read hours, minutes and seconds for start time and convert to number of frames by accumulating in n.

110-130 Convert n into three byte format. You will probably be familiar with two byte format where the high order byte is how many times a number can be divided by 256, and the low order byte is the remainder. For three bytes, the highest order (a) is how many times n will divide by 65536 (256×256). The next order (b) is how many times the remainder divides by 256 with the lowest order (c) being the remainder of this.

140 POKEs frame count into system variable FRAMES. As you will see from Chapter 25 of your Spectrum manual these are the three bytes at locations 23672, 23673, 23674. Least significant first, so these bytes are filled with c, b, a in that order.

150-300 This is the "runclock" loop which will continuously update the time for as long as your Spectrum runs. The frame count starts to be incremented by the computer automatically from the time it is set up by line 140, adding 1 to c every 1/50 sec, setting c to zero, whenever it reaches 255, simultaneously adding 1 to b, etc.

160-180 Monitor the present frame count twice and hold as n and m (in seconds when divided by 50). Two counts are necessary because of the hidden danger of transition between the three bytes as they are being PEEKed. Pages 130-131 of the manual explain this more fully. The correct count is the larger of the two, which is found in line 180.

190-200 Determine hour and reset frame count to zero if hour greater than or equal to 24.

210-220 Calculate minutes and seconds.

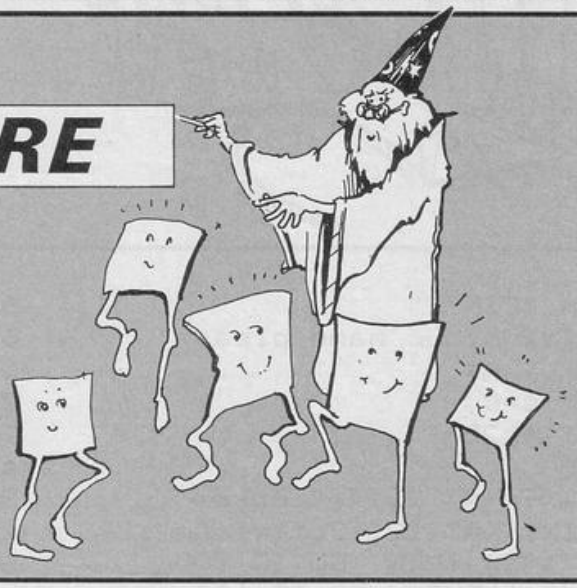
230-290 Convert hr, min, sec into string variables (holding characters rather than numbers). This allows a 0 to be prefixed to a number less than 10, so that hours, minutes, seconds will always be printed as 2 digits each in line 290.

300 Loops back to 150.

```
  5 CLS
 10 REM DIGITAL CLOCK BY D.GALB
RAITH
 20 LET runclock=150: PRINT  AT
 7,5;"24 Hour Digital Clock"
 40 INPUT "Enter hours",hr
 50 LET n=hr*3600*50
 60 INPUT "Enter minutes",min

 70 LET n=n+min*60*50
 80 INPUT "Enter seconds",sec

 90 LET n=n+sec*50
110 LET a= INT (n/65536)
120 LET b= INT ((n-a*65536)/256
)
130 LET c=n-65536*a-256*b
140 POKE 23674,a: POKE 23673,b:
 POKE 23672,c
150 REM runclock
160 LET n= INT ((65536* PEEK 23
674+256* PEEK 23673+ PEEK 23672)
/50)
170 LET m= INT ((65536* PEEK 23
674+256* PEEK 23673+ PEEK 23672)
/50)
180 LET n=n*(n>m)+m*(n <= m)
190 LET hr= INT (n/3600)
200 IF hr >= 24 THEN  POKE 2367
4,0: POKE 23673,0: POKE 23672,0:
 GO TO runclock: REM Midnight-se
t time to zero.erroneous entry o
f time greater than 24 hours wil
l cause clock to start at time z
ero
210 LET min= INT ((n-hr*3600)/6
0)
220 LET sec=n-60*min-3600*hr
230 LET h$= STR$ hr
240 IF hr<10 THEN  LET h$="0"+h
$
250 LET m$= STR$ min
260 IF min<10 THEN  LET m$="0"+
m$
270 LET s$= STR$ sec
280 IF sec<10 THEN  LET s$="0"+
s$
290 PRINT  AT 12,11;h$;":";m$;"
:";s$
300 GO TO runclock
9999 SAVE "dig clock" LINE 1
```

BEGINNER

MAGIC SQUARE



A magic square is one in which the sum of the numbers running horizontally, vertically and diagonally is always the same. Magic Square will create one of these squares to the size of your choice, beginning with the number of your choice.

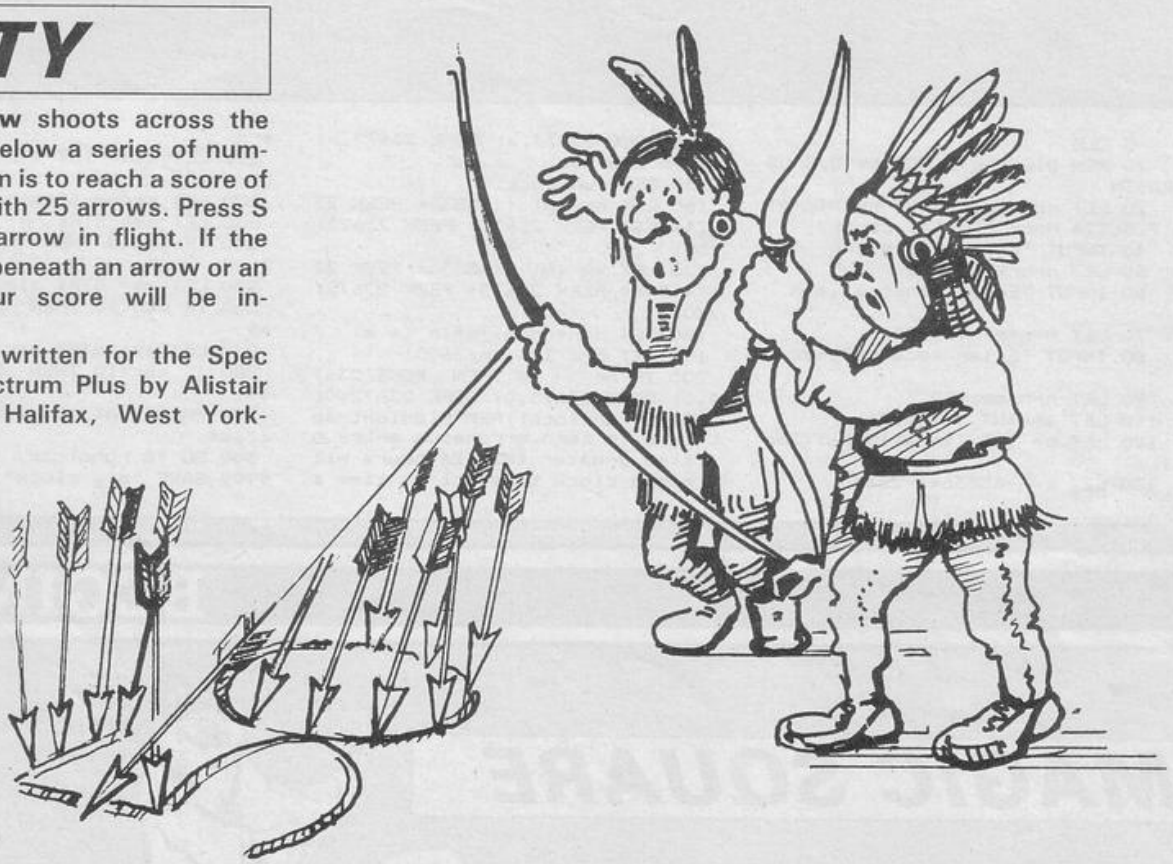
Written for the Spectrum or Spectrum Plus by J Rundle of Aldershot, Hampshire.

```
  10 DIM m(25,25)
  20 PRINT "ENTER SIZE OF SQUARE
"
  30 INPUT N
  40 PRINT "ENTER STARTING NUMBE
R"
  50 INPUT Y
  60 LET S=Y
  70 PRINT N;" BY ";N;" MAGIC SQ
UARE STARTING"
  80 PRINT " WITH THE NUMBER ";S

  90 PRINT
 100 LET K=1
 110 LET H=1
 120 LET J=(N+1)/2
 130 LET M(H,J)=S
 140 LET S=S+1
 150 IF S>N^2+Y-1 THEN  GO TO 29
0
 160 IF K<N THEN  GO TO 200
 170 LET K=1
 180 LET H=H+1
 190 GO TO 130
 200 LET H=H-1
 210 LET J=J+1
 220 LET K=K+1
 230 IF H <> 0 THEN  GO TO 260

 240 LET H=N
 250 GO TO 130
 260 IF J <= N THEN  GO TO 130

 270 LET J=1
 280 GO TO 130
 290 FOR I=1 TO N
 300 FOR J=1 TO N
 310 PRINT M(I,J);"   ";
 320 NEXT J
 330 PRINT
 340 PRINT
 350 NEXT I
 360 PRINT
 370 PRINT "THE CONSTANT IS ";(N
↑3+N)/2+N*(Y-1)
```

FIFTY

Your arrow shoots across the screen, below a series of numbers. Your aim is to reach a score of exactly 50 with 25 arrows. Press S to stop the arrow in flight. If the arrow stops beneath an arrow or an asterisk, your score will be increased.

Fifty was written for the Spectrum or Spectrum Plus by Alistair Sutcliffe of Halifax, West Yorkshire.



```
  5 REM "FIFTY"
 10 PRINT "Your name please"
 15 INPUT A$
 20 LET s=0
 22 LET t=25
 24 CLS
 25 PRINT  AT 2,14;"Score=";s
 26 PRINT  AT 12,12;"Tries=";t
 27 IF s=50 THEN  GO TO 200
 28 IF t<1 THEN  GO TO 100
 29 IF s>50 THEN  PRINT "BUST!!
": STOP
 30 LET a=0
 35 BORDER 1: PAPER 5: INK 0
 50 PRINT  AT 5,12;"*1*/*2*/*5*
"
 55 PRINT  AT 7,a; PAPER 5;" ↑"

 60 LET a=a+1
 62 IF a>27 THEN  GO TO 30
 65 IF  INKEY$ ="s" THEN  GO TO
75
 70 GO TO 55
 75 IF a>11 AND a<15 THEN  LET
s=s+1
 80 IF a>15 AND a<19 THEN  LET
s=s+2
 85 IF a>19 AND a<23 THEN  LET
s=s+5
 86 LET t=t-1
 89 PRINT  AT 10,12;"READY": FO
R x=0 TO 400: NEXT x
 90 GO TO 24
100 PRINT  AT 15,10;"Game Over"

110 STOP
200 PRINT "Game and match to ";
A$
```

Please complete this form and enclose it with any program which you send to us for possible publication.

To: Sinclair Programs, Priory Court, 30-32 Farringdon Lane, London EC1R 3AU.

I enclose .....Program(s) for the .....computer.

I guarantee that each program submitted is my original work.

Signed.....

Name.....

Address.....

.....

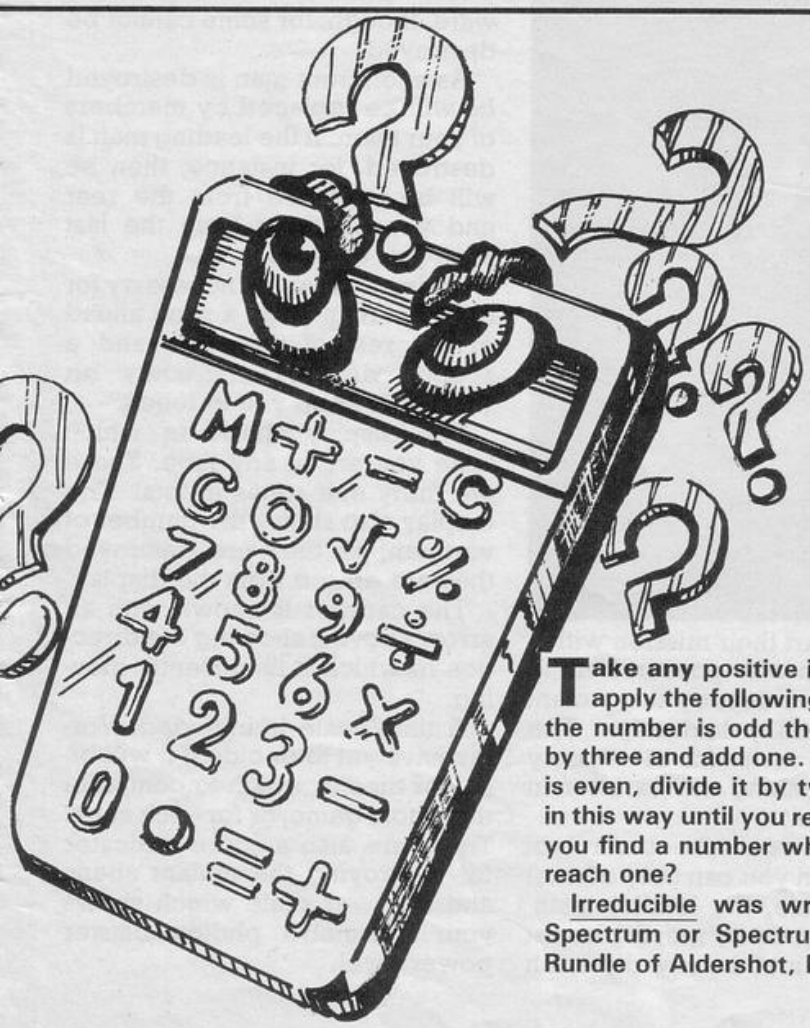
ROMNUM

This short utility program allows you to convert Roman numerals to their decimal equivalents. Enter a Roman numeral such as VIII or MD and the equivalent will quickly be calculated.

Romnum was written for the 16K ZX-81 by Keith of Taunton, Somerset.

```
  5 REM "ROMNUM"
 10 PRINT "TYPE A ROMAN NUMERAL
";
 20 INPUT R$
 30 PRINT AT 0,22;R$
 40 LET S=0
 50 LET M=1000
 60 LET D=500
 70 LET C=100
 80 LET L=50
 90 LET X=10
100 LET V=5
110 LET I=1
120 FOR N=1 TO LEN R$-1
130 LET S=S+VAL R$(N)
140 IF VAL R$(N+1)>VAL R$(N) TH
EN LET S=S-2*VAL R$(N)
150 NEXT N
160 LET S=S+VAL R$(LEN R$)
170 PRINT AT 4,0;"DECIMAL EQUIV
ALENT   ";S
```

BEGINNER



IRREDUCIBLE

Take any positive integer. Now, apply the following rules to it. If the number is odd then multiply it by three and add one. If the number is even, divide it by two. Continue in this way until you reach one. Can you find a number which does not reach one?

Irreducible was written for the Spectrum or Spectrum Plus by J Rundle of Aldershot, Hampshire.

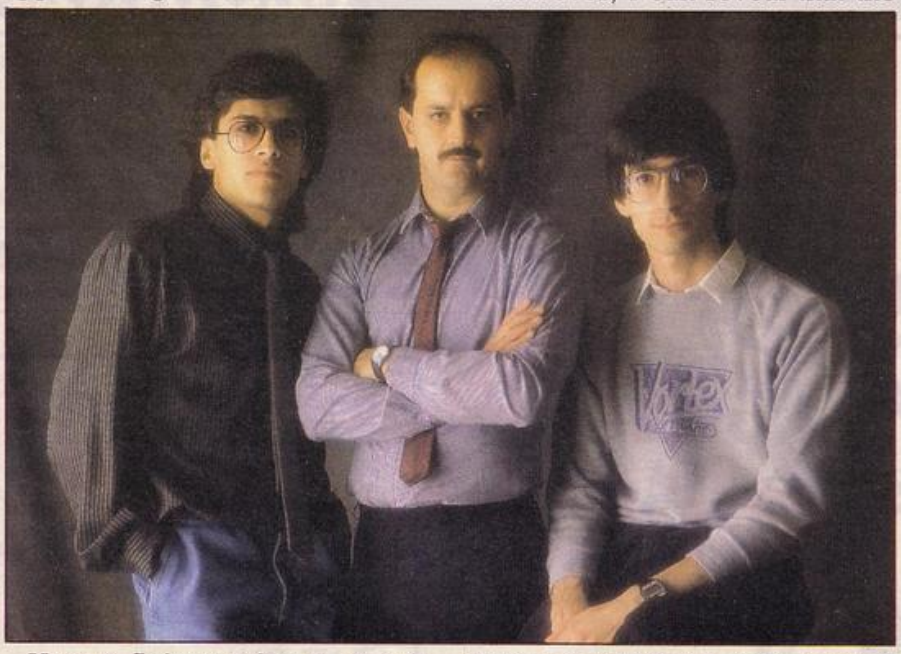
```
 10 CLS
 20 PRINT "ENTER A NUMBER  "
 30 INPUT N
 40 LET X=1
 50 LET A=N
 60 LET B= INT (A/2)
 70 IF A=B+B THEN  LET A=A/2
 80 IF A=B THEN  GO TO 100
 90 IF A <> B+B THEN  LET A=A*3
+1
100 IF A=N THEN  GO TO 190
110 IF A <= 1  THEN  GO TO 140

120 LET X=X+1
130 GO TO 60
140 PRINT
150 PRINT N;" TO 1 IN ";X;" STE
PS ": PRINT  "ANOTHER GO Y/N"
160 ,INPUT Q$
170 IF Q$(1)="Y" THEN  GO TO 10

180 IF Q$(1) <> "Y" THEN  STOP

190 CLS
200 PRINT "YOU HAVE DONE IT!!!"

210 PRINT A;" = ";N;" IN ";X;"
STEPS"
220 STOP
```

HIGHWAY ENCOUNTER

How do you follow the phenomenally successful Tornado Low Level and Cyclone? Colette McDermott went to Vortex to find out what is next.

CAN YOU help the Vortmen save Planet Earth? Mutant aliens have been dumped on Earth and they are planning to take over.

The aliens are crossing the highway dropping dangerous objects, in an attempt to stop the approaching Vortmen.



Vortex Software have, at last, unveiled their first game for this year. It is called **Highway Encounter** and it has been well worth waiting for.

The game is set in the 21st Century, a time when Vortmen protect the highways.

From their base in Zone 30 five Vortmen, one in the lead position and four behind him, must take a canister to zone zero and destroy the alien base.

Vortex would not reveal what happens when the Vortmen reach their final destination "We want to keep an element of surprise in the game" said Luke Andrews managing director of Vortex.

However, I can reveal that the Vortmen start their mission with a leading man who goes in front to seek out and destroy the mutant aliens' carefully laid traps. The remaining men travel closely together pushing the canister in front of them.

Although you take control of the Vortmen you can only control one at a time, the leading man. This you can do by moving him at any speed and in any direction you require.

The following men will advance forward at a steady but slow pace, never deviating from their set path.

The leader must ensure that their path is kept clear. He can do this by collecting objects from any zone or by firing his powerful photon blaster at an object. Beware, though, for some cannot be destroyed.

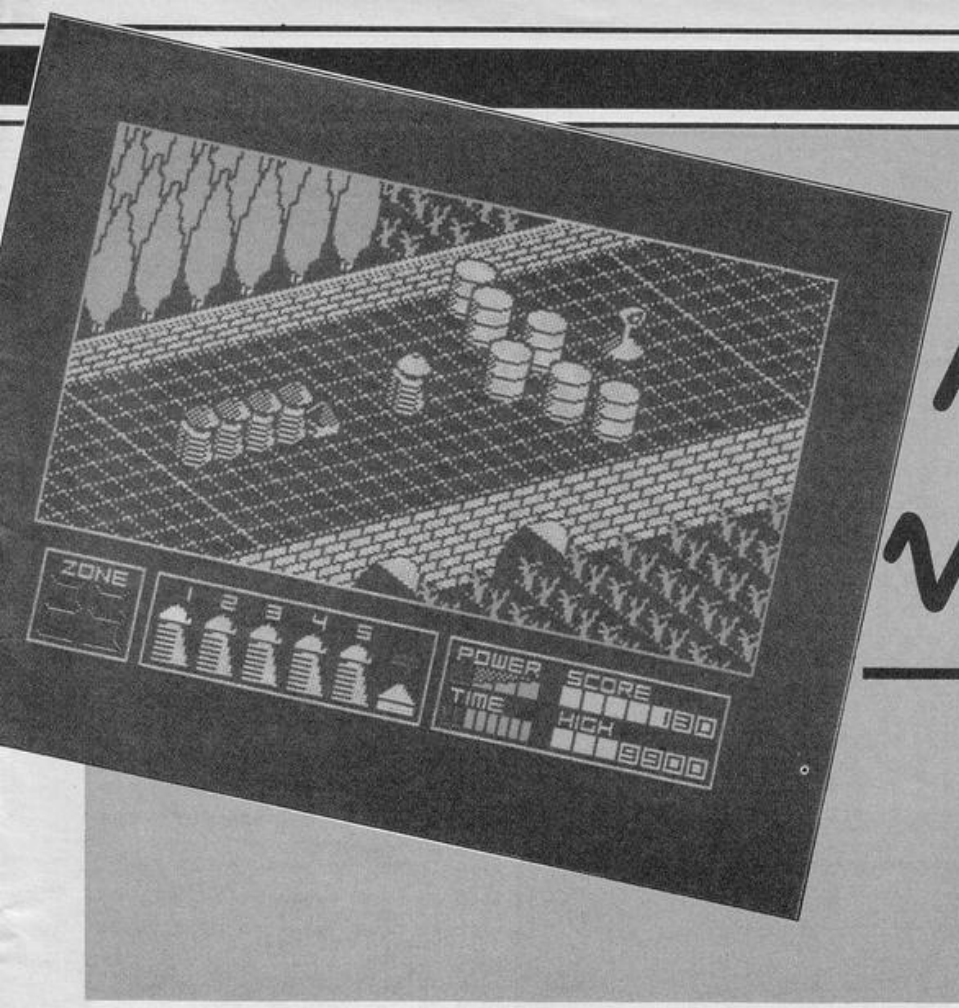
As each front man is destroyed he will be replaced by members of your team. If the leading man is destroyed, for instance, then he will be replaced from the rear and you continue from the last zone you entered.

At times it may be necessary for the front man to go a zone ahead of the rest of the team and a special display, constantly on view, will keep you in touch.

The display shows in which zone you are at any time. There are thirty one zones in total. The display also shows the number of vortmen; as they are destroyed they are erased from the display.

The canister is shown with an arrow above it showing the direction in which it is currently moving.

A time scale is included. Vortex have yet to decide if it will be set for time in which to complete the whole game, or for each zone. There are also a score indicator for destroying the mutant aliens and a power scale which shows your Vortmen's photon blaster power level.



help the vortmen

There are five mutant aliens crossing the highway; some have two heads and some will gobble up the vortmen. They are heading towards zone thirty from zone zero so the vortmen will meet them coming along the highway.

Each zone has different obstacles that must be cleared from the path of the four vortmen pushing the canister.

This can be done only by the leading vortman who can destroy them with his photon blaster, blocking their path, using objects from other zones or whatever takes your imagination.

Vortex say that you should "Try everything, there are no holds barred."

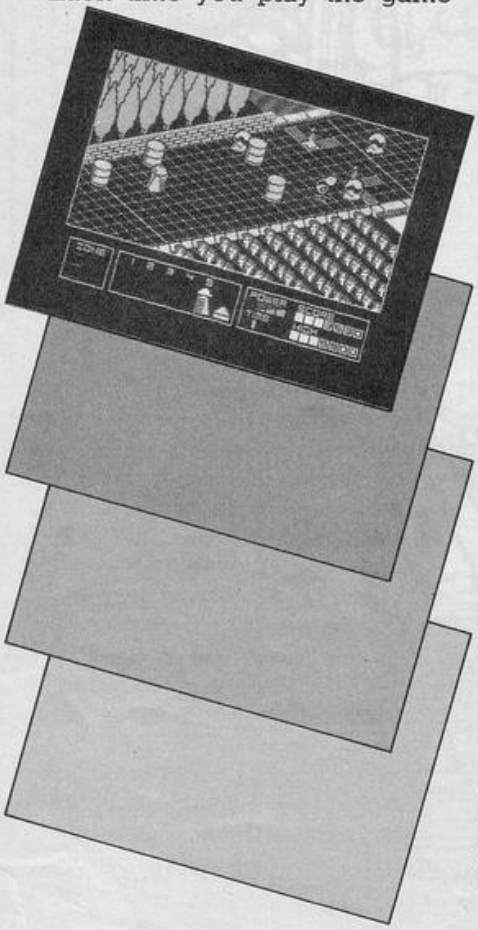
For instance, in one zone I came across, a spiky metal ball was bouncing from side to side on the highway. Returning to an earlier zone I found a large stone boulder which I pushed into the middle of the metal ball's path, thereby allowing my team of vortmen a safe passage.

Other zones have floors of fire, or a maze of stationary stone slabs on the road leaving you to decide what to do before your men arrive.

It is possible to delay your team at times when you are pondering your next move. Push objects in their path and they will wait, but they will then be sitting targets for the mutant aliens.

Highway Encounter has a seemingly endless variety of obstacles, many of which cannot be destroyed.

Each time you play the game the zones will change and objects once found there will have moved into another zone. These changes are also affected by the speed at which you play the game.



All the zones are reached only by the highway, with each one in much the same setting; a large highway with a path looking like a grid scale. It is set slightly above the ground, which consists of country scenery such as ploughed fields and forests.

The games went on sale on July 14th, with a retail price of £7.95.

Vortex are a small software company with two full time staff: Luke Andrews, managing director and former teacher; Costa Panayi, chairman, chief programmer and former engineer plus Crete Panayi, director on a part-time basis due to his involvement with a Manchester based advertising agency.

Both Luke and Costa are very confident that their new game will be an even bigger hit than **Cyclone** due to their professional approach to the game.

They said that their attitude to their first games **Android 1** and **Two** had been "Amateur". With **Tornado Low Level** this became more serious and with **Cyclone** very serious.

"Now, with the new game, we have taken a new direction with the computer. Crete will take on more work with the advertising side and we will be employing more full time programmers."

However, they will not release many games on to the market each year, although they plan to release another game called **Revolution** before Christmas.

PELMANISM

This is a computerised version of the card game, Pelmanism. Each player takes it in turn to place face up two of the cards on the screen. If the two cards have the same value they may be taken, otherwise they are returned to their original place, face down. The winner is the player with the most cards when all have been removed from the board.

Pelmanism was written for the 16K ZX-81 by M Watts of Kingswood, Bristol.

```
  1 REM PAIRS BY M.P.WATTS
  2 FAST
  3 CLS
 10 LET SC=0
 20 LET SC1=0
 30 LET SC2=0
 40 DIM E$(2,40)
 50 LET E$(1)="01234567890123456
789012345678901234567890123456789"
 60 FOR F=1 TO 40
 70 LET X=INT (RND*40)+1
 80 IF E$(1,X)=" " THEN GOTO 70
 90 LET E$(2,F)=E$(1,X)
100 LET E$(1,X)=" "
110 NEXT F
120 SLOW
130 LET A$=E$(2,1 TO 10)
140 LET B$=E$(2,11 TO 20)
150 LET C$=E$(2,21 TO 30)
160 LET D$=E$(2,31 TO 40)
180 PRINT AT 8,2;"1 2 3 4 5 6 7
 8 9 0"
190 PRINT AT 10,0;"A ■ ■ ■ ■ ■
■ ■ ■ ■ ■"
200 PRINT AT 12,0;"B ■ ■ ■ ■ ■
■ ■ ■ ■ ■"
210 PRINT AT 14,0;"C ■ ■ ■ ■ ■
■ ■ ■ ■ ■"
220 PRINT AT 16,0;"D ■ ■ ■ ■ ■
■ ■ ■ ■ ■"
230 LET PLAYER=1
240 GOSUB 1000
245 IF SC1+SC2=20 THEN GOTO 1
250 LET PLAYER=2
260 GOSUB 1000
270 IF SC1+SC2=20 THEN GOTO 1
280 GOTO 230
1000 IF PLAYER=1 THEN LET SC=SC1
1005 IF PLAYER=2 THEN LET SC=SC2
1010 PRINT AT 0,0;"PLAYER ";PLAY
ER;" SCORE ";AT 0,15;"  ";AT 0,1
5;SC
1015 IF SC1+SC2=20 THEN GOTO 400
0
1020 LET CARD=1
1025 PRINT AT 2,0;"FIRST CARD "
1030 LET C=0
1035 INPUT F$
1040 GOSUB 1300
1045 IF F$="  " THEN GOTO 1025
1050 GOSUB 1200
1055 IF C=1 THEN GOTO 1025
1060 LET CARD=2
1065 PRINT AT 2,0;"SECOND CARD"
1070 LET C=0
1075 INPUT G$
1080 IF G$=F$ THEN GOTO 1075
1085 LET F$=G$
1090 PRINT AT 2,0;"                "
1095 GOSUB 1300
1100 IF F$="  " THEN GOTO 1065
1105 GOSUB 1200
1110 IF C=1 THEN GOTO 1065
1115 FOR F=0 TO 50
1120 NEXT F
1125 IF Z$=S$ THEN GOSUB 3000
1130 IF Z$=S$ THEN PRINT AT SL,S
C-2;" ";AT ZL,ZC-2;" "
1135 IF Z$=S$ THEN GOTO 1000
1140 IF Z$<>S$ THEN PRINT AT SL,
SC-2;"■";AT ZL,ZC-2;"■"
1145 RETURN
1200 LET B=VAL F$(2)
1210 IF B=0 THEN LET B=10
1220 IF F$(1)="A" THEN GOSUB 150
0
1230 IF F$(1)="B" THEN GOSUB 160
0
1240 IF F$(1)="C" THEN GOSUB 170
0
1250 IF F$(1)="D" THEN GOSUB 180
0
1260 RETURN
1300 IF LEN F$<>2 THEN LET F$="
 "
1310 IF CODE F$(1)<38 OR CODE F$
(1)>41 THEN LET F$="  "
1320 IF CODE F$(2)<28 OR CODE F$
(2)>37 THEN LET F$="  "
1330 RETURN
1500 LET L=10
1510 IF A$(B)=" " THEN LET C=1
1520 IF C=1 THEN RETURN
1530 PRINT AT L,B+2;A$(B)
1540 IF CARD=1 THEN LET S$=A$(B)
1550 IF CARD=2 THEN LET Z$=A$(B)
1560 GOSUB 2000
1570 RETURN
1600 LET L=12
1610 IF B$(B)=" " THEN LET C=1
1620 IF C=1 THEN RETURN
1630 PRINT AT L,B+2;B$(B)
1640 IF CARD=1 THEN LET S$=B$(B)
1650 IF CARD=2 THEN LET Z$=B$(B)
1660 GOSUB 2000
1670 RETURN
1700 LET L=14
1710 IF C$(B)=" " THEN LET C=1
1720 IF C=1 THEN RETURN
1730 PRINT AT L,B+2;C$(B)
1740 IF CARD=1 THEN LET S$=C$(B)
1750 IF CARD=2 THEN LET Z$=C$(B)
1760 GOSUB 2000
1770 RETURN
1800 LET L=16
1810 IF D$(B)=" " THEN LET C=1
1820 IF C=1 THEN RETURN
1830 PRINT AT L,B+2;D$(B)
1840 IF CARD=1 THEN LET S$=D$(B)
1850 IF CARD=2 THEN LET Z$=D$(B)
1860 GOSUB 2000
1870 RETURN
2000 IF CARD=1 THEN LET SL=L
2010 IF CARD=1 THEN LET SC=B*2+2
2020 IF CARD=2 THEN LET ZL=L
2030 IF CARD=2 THEN LET ZC=B*2+2
2040 RETURN
3000 IF SL=10 THEN LET A$((SC/2)
-1)=" "
3010 IF SL=12 THEN LET B$((SC/2)
-1)=" "
3020 IF SL=14 THEN LET C$((SC/2)
-1)=" "
3030 IF SL=16 THEN LET D$((SC/2)
-1)=" "
3040 IF ZL=10 THEN LET A$((ZC/2)
-1)=" "
3050 IF ZL=12 THEN LET B$((ZC/2)
-1)=" "
3060 IF ZL=14 THEN LET C$((ZC/2)
-1)=" "
3070 IF ZL=16 THEN LET D$((ZC/2)
-1)=" "
3080 IF PLAYER=1 THEN LET SC1=SC
1+1
3090 IF PLAYER=2 THEN LET SC2=SC
2+1
3100 RETURN
4000 CLS
4010 PRINT AT 0,10;"GAME OVER"
4020 PRINT AT 5,12;"SCORES"
4030 PRINT AT 9,9;"PLAYER 1 - ";
SC1
4040 PRINT
4050 PRINT TAB 9;"PLAYER 2 - ";S
C2
4060 PRINT
4070 PRINT AT 17,4; PRESS A KEY
FOR NEW GAME                OR S T
O STOP"
4080 IF INKEY$="S" THEN STOP
4090 IF INKEY$="" THEN GOTO 4090
4100 RETURN
9000 SAVE "PAIRS"
9500 RUN
```

Machine code refreshes parts Basic cannot reach

Last month we showed how machine code can add speed to a Basic game. Tony Rickwood gives more details.

LAST MONTH, I showed how a piece of machine code programming could dramatically improve the speed at which four ghosts could chase **Pacman.** Much of the programming is still in Basic. The purpose of the m/c is to replace a Basic subroutine by which the computer gives chase.

Why does the m/c make the ghosts move so much faster?

A group of Basic lines such as those for ghost control (lines 4000-4140, see Program 2 in last **Program Tutor**) which are executed every time a scan is done for keyboard control mean a lot of processing time is being wasted in interpretation. No wonder the four ghosts look so tired! The machine code gives time a shot in the arm by allowing them to escape the bonds of Sinclair's interpreter!

To supercharge your own maze games, you need to understand how my routine works to be able to adapt it. I will assume you have Programs one and two from Part One on cassette, with the m/c also dumped (from Program One) and called "GCODE".

What GCODE does

The bytes of m/c are assembled from the listing in Figure 1 using a commercial assembler program. If you really want to start writing your own code or adapting other people's, a good assembler is essential. So forget the games for a while and save your money for a useful piece of software instead!

Like the Basic subroutine it replaces, the assembler listed in Figure 1 works on the VARS (variables) area of memory to access and update the ghost coordinates. Of course, the Basic conceals how this is done. To understand how the assembler does it, let us first see how VARS is structured. With Program Two loaded, add the following lines:

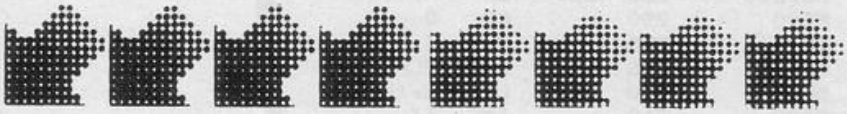
```
9000 LET Z = PEEK 23627 + 256
x PEEK 23628
9010 FOR I = Z TO Z + 200:
PRINT I, PEEK I: NEXT I
```

Now RUN and, when the maze appears, press BREAK and type GOTO 9000. You will see a screen display of the first 200 bytes of VARS. The first number will be 97. Look at Appendix A of the manual and you will see that this is the character code for "a". This is the first variable to be stored on RUNning. The "0,0,3,0,0" numbers which follow represent the initial value of "a". Keep scrolling and you will see that VARS has been expanded to suit the sequence in which variables are met by the program. Those of interest are for ghost and pacman coordinates, contained in lines 100-120 of the Basic.

How GCODE works

Like good Basic programs, good assembler is put together from building blocks called modules. The modules in Figure 1 are numbered according to sequence of development, as it is usual to develop subroutines before the main program.

Module 1: DATA (lines 40-60). These three lines set up the first 27 bytes of m/c with the character codes for the variable names. You will see that some of these appear twice. We know that the first part of the MAIN module will deal with storing current ghost coordinates as old, so we will be accessing current, old, current, old, etc., for all eight coordinates. This order is defined in the first two lines of DATA. The second part will update the current ghost coordinates once pacman coordinates have been read, so only current variables appear in the third line.



The DEFB mnemonic means "DEFine Byte". It is NOT a Z80 mnemonic because it is not assembled into operation codes like the mnemonics seen so far. Instead, it is called an "assembler directive", used by most assembler programs. The directive in this case is that the assembler should decode the variable names into character codes and fill out as many bytes with these as required (except for the zero which will be used to mark the end of data).

In essence, DATA tells the CPU in advance what character codes will be scanned in VARS. Ghost and pacman coordinates are accessed frequently and frequently used data is usually specified in this way.

Module 2: SCAN (lines 840-920). This m/c subroutine is the real work horse of the routine as a whole, and works by scanning VARS for a particular coordinate. Input data is the character code to be scanned or, rather, a pointer to tell the CPU where it can be found in the DATA. We will use IX register pair for this memory pointer.

The output is also a memory pointer showing where the value of the variable is stored in VARS. Choice of registers other than IX is dictated by the key instruction

continued

Figure 1

```
                10 ;GHOSTCHASE ASSEMBLER
                20 ;by Tony Rickwood
                30 ;
616B626C        40 DATA   DEFB "a","k","b","l","c","m","d","n"
656F6670        50        DEFB "e","o","f","p","g","q","h","r"
78796162        60        DEFB "x","y","a","b","c","d","e","f","g","h",0
                70 ;
                80 ;MAIN PROGRAM
                90 ;
DD21918E       100        LD   IX,DATA
0608           110        LD   B,8
               120 ;
CD2A8F         130 OLD    CALL SCAN
7E             140        LD   A,(HL)
57             150        LD   D,A
DD23           160        INC  IX
CD2A8F         170        CALL SCAN
72             180        LD   (HL),D
DD23           190        INC  IX
10F1           200        DJNZ OLD
               210 ;
CD2A8F         220 NEW    CALL SCAN
46             230        LD   B,(HL)
DD23           240        INC  IX
CD2A8F         250        CALL SCAN
4E             260        LD   C,(HL)
DD23           270        INC  IX
DD7E00         280 NEXT   LD   A,(IX)
FE00           290        CP   0
C8             295        RET  Z
CD2A8F         296        CALL SCAN
5E             300        LD   E,(HL)
DD23           310        INC  IX
CD2A8F         320        CALL SCAN
56             330        LD   D,(HL)
DD2B           340 XTEST  DEC  IX
78             360        LD   A,B
93             380        SUB  E
281C           390        JR   Z,YTEST
380B           400        JR   C,DECX
1C             410 INCX   INC  E
CD3A8F         420        CALL ATTR
FE06           430        CP   6
200E           440        JR   NZ,ENDX
1D             450        DEC  E
180F           460        JR   YTEST
1D             470 DECX   DEC  E
CD3A8F         480        CALL ATTR
FE06           490        CP   6
2003           500        JR   NZ,ENDX
1C             510        INC  E
1804           520        JR   YTEST
CD2A8F         530 ENDX   CALL SCAN
73             540        LD   (HL),E
DD23           550 YTEST  INC  IX
79             570        LD   A,C
92             590        SUB  D
281C           600        JR   Z,END
380B           610        JR   C,DECY
14             620 INCY   INC  D
CD3A8F         630        CALL ATTR
FE06           640        CP   6
200E           650        JR   NZ,ENDY
15             660        DEC  D
180F           670        JR   END
15             680 DECY   DEC  D
CD3A8F         690        CALL ATTR
FE06           700        CP   6
2003           710        JR   NZ,ENDY
14             720        INC  D
1804           730        JR   END
CD2A8F         740 ENDY   CALL SCAN
72             750        LD   (HL),D
DD23           760 END    INC  IX
CD3A8F         770        CALL ATTR
3606           780        LD   (HL),6
18A3           800        JR   NEXT
```

MODULE 1

MODULE 2

continued

```
            820 ;SUBROUTINES
            830 ;
C5          840 SCAN    PUSH BC
2A4B5C      850         LD   HL,(23627)
01C800      860         LD   BC,200
DD7E00      870         LD   A,(IX)
EDB1        880         CPIR                  MODULE 3
23          890         INC  HL
23          900         INC  HL
C1          910         POP  BC
C9          920         RET
D5          930 ATTR    PUSH DE
C5          940         PUSH BC
210058      950         LD   HL,22528
4B          960         LD   C,E
5A          970         LD   E,D
1600        980         LD   D,0
0605        990         LD   B,5
CB23       1000 MULT    SLA  E
CB12       1010         RL   D
10FA       1020         DJNZ MULT
7B         1030         LD   A,E              MODULE 4
89         1040         ADD  A,C
3001       1050         JR   NC,HLSET
14         1060         INC  D
5F         1070 HLSET   LD   E,A
19         1080         ADD  HL,DE
7E         1090         LD   A,(HL)
C1         1100         POP  BC
D1         1110         POP  DE
C9         1120         RET
```

at line 880.

CPIR is a block handling instruction read as "ComPare, Increase and Repeat". It searches a number of bytes of memory (specifed in BC) for the first occurrence of a byte (specified in register A). HL is used as the base address (where we want the search to start). It will finish holding the address of the byte immediately following the byte (if found).

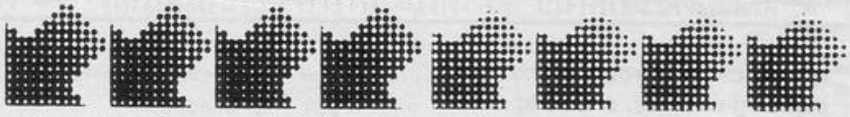
Here, the base HL is set to the address pointed to by the system variable VARS (line 850). The first 200 bytes (which we know will hold all our coordinate data) are to be searched (line 860). The byte to be searched out is pointed to by IX (line 870).

After the CPIR, HL will point to the byte after the character code of variable. The coordinate value itself is two bytes on from this so HL must be INCremented twice (lines 890-900).

Module 3: ATTRibute (lines 930-1120). The output for this subroutine will be the value of the attributes at a new ghost position (which will be tested for collision with a maze wall in the MAIN routine). This result will be stored in register A. Input is the position to be tested and is held in DE (D=y, E=x).

HL is, once again, a memory pointer; this time for the attribute file (line 950). Lines 960-1020 convert the y coordinate to the number of bytes into the attribute file needed to get to the start of the row containing the test position. This means multiplying y by 32 (32 bytes for each row).

For machine code, this has to



be thought of as multiplying by two five times, which is done by shifting the bit pattern of the value of y five times to the left. As y × 32 requires two bytes, lines 960-980 get x out of the way for the moment (LD C,E) so that y can go into register E with D=O. Lines 990-1020 are a DJNZ loop to do the multiplication. The rest of the subroutine brings back x and adds the result to the start of the attribute file.

Module 4: MAIN (lines 80-800). First, our DATA memory pointer IX is set to the address of the first byte of data. Lines 110-200 (OLD) store all the current ghost coordinates as old, so that old ghosts can be erased on return to Basic.

The next section, called NEW, continues with the main task of moving the ghosts nearer to pacman. Pacman coordinates, x and y are placed in registers B,C (lines 220-260). IX is now incremented ready for "a" (next variable in the DATA list). The new cordinates are updated in the sequence seen in the third line of DATA, with the NEW loop being terminated by testing for end of data (lines 280-295).

The y,x coordinates of each ghost in turn are set up in registers DE (lines 296-330). Lines 340-540 (XTEST) manipulate the x coordinate in E. First, we need to know x(ghost)−x(pacman). The 3 possibilities are controlled as follows:

a) x(pacman) = x(ghost): move to YTEST

b) x(pacman) < x(ghost): move to DECX (decrement x(ghost))

c) x(pacman) > x(ghost): move to INCX (increment x(ghost))

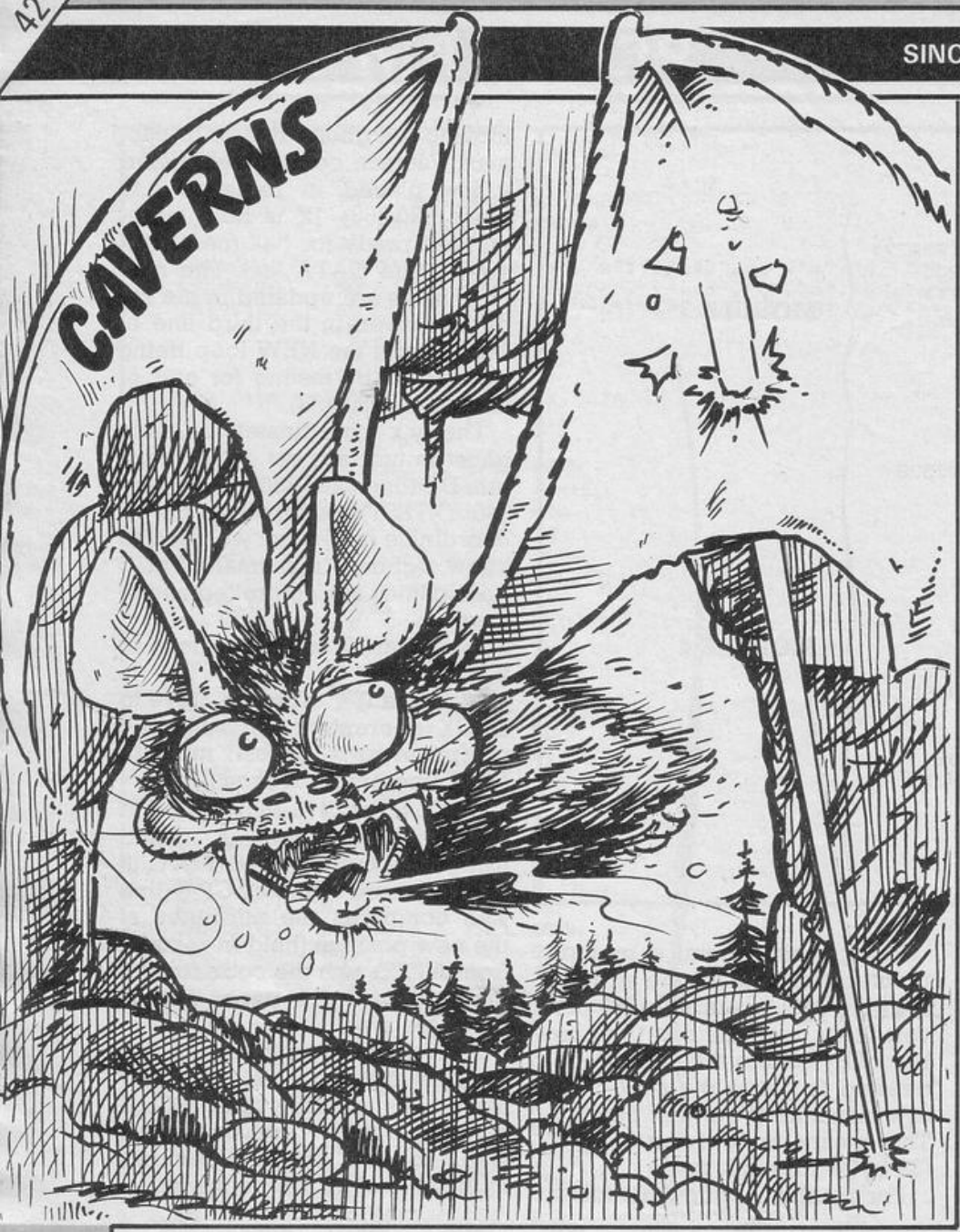
INCX (lines 410-460): The ATTRibute subroutine is called using the current y(ghost) with the increased x(ghost). CP 6 (line 430) compares the attributes at the new position (held in register from ATTR) with the code for yellow ink on black paper (which indicates a wall).

A non zero result means that the new x(ghost) is valid, so control moves to ENDX (line 440). A zero result means collision with a wall, so line 450 DECrements x(ghost) back to where it was.

Control then moves to YTEST. DECX (lines 470-520) does the same as INX in the opposite sense. Lines 530-540 (ENDX) terminate the XTEST section with a CALL SCAN to get the new x(ghost) entered into VARS (line 540).

The last section, YTEST (lines 550-750) update y(ghost) in the same way as XTEST works on x(ghost).

Finally, END (lines 760-800), increments IX ready for the next ghost variables to be read. More important, it changes the attributes at the new ghost position just calculated to make the ghost look like a wall, at least until it is printed as a ghost on return to Basic. This prevents other ghosts from occupying the same position.



Fly quickly through the fast scrolling caverns, shooting down the bat-like Galacian Invaders.

Caverns uses machine code as well as Basic. To enter this, you should enter:

1 LET
A=1+1+1+1+1+1+1+1
+1+1+1+1+1+1+1+1+1+1+1

Check that there are 33 characters after the equals sign, and then enter identical lines 2, 3 and 4. You should now have four lines containing 33 characters following the equals sign. Save this and then type RUN. The screen will go blank and the instructions will appear. If the program works correctly, press N when "Game Over" appears. Delete lines 6 and 1130–2150, then type RUN 500. The program will SAVE itself and then RUN.

Caverns was written for the 16K ZX-81 by Anthony Magrath of Rugby, Warwickshire.

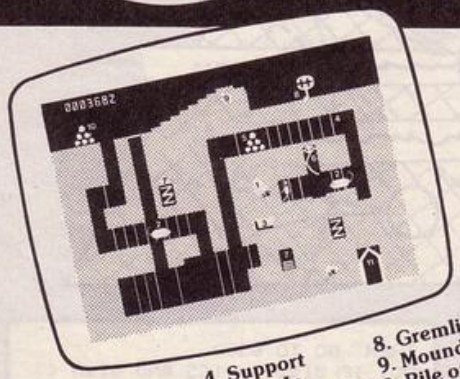
```
  0
  0
  5 REM >>>CAVERNS<<< MAGROBYTE
  6 GOSUB 1130
  7 LET H$="000000"
  8 GOSUB 160
  9 GOSUB 900
 10 PRINT AT 0,0;">>>>CAVERNS
BY A.J.MAGRATH<<<"
 11 PRINT AT 22,0;"
                  LIVES:3 SCO
RE:000000 HI:";H$
 12 PRINT AT Y,3;
 13 POKE 16516,PEEK 16398
 14 POKE 16517,PEEK 16399
 15 PRINT "  "
 16 FOR F=1 TO 2
 17 LET L=1+1
 18 PRINT AT 23,1;"LIVES:";CHR$
 (LI+156);AT 23,7;LI
 20 NEXT F
 40 GOSUB (1030 AND USR 17002)
 50 LET LI=LI-1
 70 IF LI THEN GOTO 12
 71 PRINT AT 23,7;LI
 75 LET S$=""
 80 FOR F=DF+775 TO DF+781
 90 LET S$=S$+CHR$ PEEK F
 91 NEXT F
 92 IF S$>H$ THEN LET H$=S$
 100 LET S=VAL S$
 110 CLS
 115 PRINT AT 3,7;"G A M E  O V
E R";TAB 7;"  "
 120 PRINT AT 5,4;"YOU HAD A SCO
RE OF ";S,,TAB 5;"WHEN YOU WERE
KILLED"
 125 PRINT ,,TAB 7;"HIGH SCORE="
;VAL H$
 130 PRINT ,,TAB 8;"ANOTHER GAME
?"
 140 IF INKEY$<>"Y" AND INKEY$<>
"N" THEN GOTO 140
 150 IF INKEY$="Y" THEN GOTO 8
 155 STOP
 160 CLS
 161 PRINT TAB 8;"C A V E R N S"
;TAB 8;"  "
 170 PRINT "  A MAGROBYTE PROD
UCTION  "
 180 PRINT ,,"  MANOEUVRE YOUR C
RAFT (  )",,,"THROUGH THE GREA
T TERRESTRIAL",,,"CAVERNS AND TR
Y TO DESTROY THE",,,"GALACIAN IN
TRUDERS (<)."
 190 PRINT ,,"    KEYS:";TAB 10;
"UP=";CHR$ PEEK 16720;TAB 10;"DO
WN=";CHR$ PEEK 16724;TAB 10;"FIR
E=";CHR$ PEEK 16728
 200 PRINT ,,"ENTER DIFFICULTY
LEVEL (0>9)",,," OR PRESS R TO R
EDEFINE KEYS"
 205 LET A$=INKEY$
 210 IF A$="R" THEN GOTO 300
 215 IF A$>"9" OR A$<"0" THEN GO
TO 205
 220 POKE 17025,(VAL A$+1)*15
 230 CLS
 240 RETURN
 250 IF INKEY$<>"" THEN GOTO 250
 260 LET B$=INKEY$
 270 IF B$="" THEN GOTO 260
 280 PRINT "=";B$
 290 RETURN
 300 CLS
 310 PRINT "ENTER THE NEW KEY FO
R:"
 320 PRINT ,,TAB 10;"UP";
 330 GOSUB 250
 340 POKE 16720,CODE B$
 350 PRINT TAB 10;"DOWN";
 360 GOSUB 250
 370 POKE 16724,CODE B$
 380 PRINT TAB 10;"FIRE";
 381 GOSUB 250
 390 POKE 16728,CODE B$
 400 GOTO 160
 500 SAVE "CAVERN8" BY A.MAGRATH
 510 RUN
 900 POKE 16418,0
 905 POKE 16520,10
 910 LET DF=(PEEK 16396+256*PEEK
 16397)
 920 POKE 16507,3
 930 POKE 16508,18
 950 POKE 16632,15
 960 POKE 16648,15
 970 LET LI=3
 980 LET Y=10
 990 RETURN
1030 LET Y=INT (PEEK 16516+256*P
EEK 16517-DF)/33
1040 FOR F=1 TO 3
1050 PRINT AT Y-1,5;"  ";TAB 4;"
  ";TAB 5;"  "
1061 PRINT AT Y-1,4;"    ";TAB 3;
"      ";TAB 4;"    "
1065 PRINT AT Y-1,4;"    ";TAB 3;
"      ";TAB 4;"    "
1070 NEXT F
1080 PRINT AT Y-1,4;"    ";TAB 3;
"    ";TAB 4;"    "
1090 PRINT AT Y-1,3;"      ";TAB
3;"      ";TAB 3;"      ";AT 22,3;
"      ";TAB 1;"LIVES:"
1100 IF Y<1 THEN LET Y=1
1110 IF Y>21 THEN LET Y=21
1120 RETURN
1130 IF PEEK 16513=118 THEN RETU
RN
1140 POKE 16510,0
1150 POKE 16511,56
1160 POKE 16512,2
1170 LET A=16513
1180 FAST
2000 LET A$="7676182E50031598010
30AFE1B23030AFE1B28F9FE76283BFE0
0281B181BED4B8340ED5F80470A81328
340ED4FED4B0C402A0C4003160023030
AFE1B28CFFE03"
2010 LET A$=A$+"200A032303232303
230318EBFE7628037718E43A7B409238
33284836602314037AFE1620D23A8340
CB4F28103A7C40FE17C83C327C40D60E
327B40C93A7B40FE"
2020 LET A$=A$+"01C83D327B40C60E
327C40C93A7C409238C9201E3A8340CB
4F2804360418BE368118BA3A8340CB4F
28043684 18AF360718AB360018A7CDBB
02444D51143E0028"
2030 LET A$=A$+"03CDBD070101007E
2A8440112100FE3C2814FE3D282FFE32
2830110400197EFE00C0010000C9E5C1
A7ED52228440E5C5E1C11E040AFE00C0
7E360002230 31D20"
2040 LET A$=A$+"F3010000C9E5C119
18E03A86403C328640CB57280A110400
197EFE00C0361B010000C92A84402B36
003A88403D20043A7C4087328840 57D6
053012ED4B7C4081"
2050 LET A$=A$+"2A0C400121000 93D
20FC2B3613CDBB02444D51143E002005
3E033286402A0C401116031916180100
0015C82B7EFE7628F5FE132833180200
00FE1B20EE360023"
2060 LET A$=A$+"7EFE002002361BFE
13280418DE0000E5010B032A0C40097E
FE2528073C77E1360018C8361C2B18EF
36002B7EFE0020043618B7FE7628AE
012100FE83C8FE1B"
2070 LET A$=A$+"200518CB00000009
7EFE0028E3A7ED42ED427EFE0028D9FE
83C8FEB4C8FE82C8FE03C8FE1B28A818
C73A87403D20123AF8403DFE0720023E
0832F8403208413E"
2080 LET A$=A$+"553287400 10000CD
3741 79FE00C0CDA44179FE00C0CD9F40
18CF3D20E9CD9F400101000579FE0028
FA18BE3A8340328740060590 38CE18BE
"
2090 FOR F=1 TO LEN A$ STEP 2
2100 POKE A,16+CODE A$+CODE A$(2
)-475
2110 LET A=A+1
2120 LET A$=A$(3 TO )
2130 NEXT F
2140 SLOW
2150 RETURN
```

LOOK!

SOFTWARE FARM

NOW THERE ARE 3

HI-RES PROGRAMS FOR THE 16K ZX-81



1. Nuggets
2. Giant Rats
3. Burrowing Rat
4. Support
5. Cave In
6. Snake
7. Snake Nest
8. Gremlin
9. Mound
10. Pile of Earth
11. Cave

FORTY NINER

In 1849 the Great American Gold Rush started. Almost everyone who could sold up everything and dashed to the west coast to look for this precious metal – including you!

You must excavate this precious metal – but can you survive the giant rats and that vicious Gremlin which will come to infest your mine? Can you trick the snakes into leaving their comfortable nests and destroy the rats for you? Can you keep the Gremlin at bay?

Riches await you – but so do the hazards!

ROCKET MAN

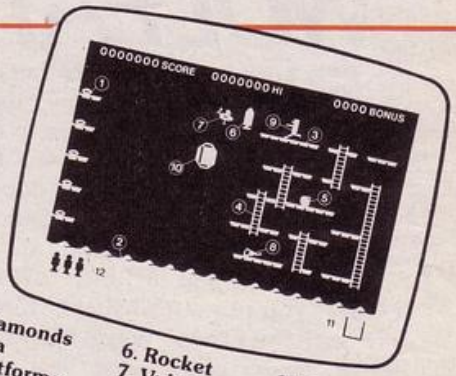
Get rich quick by collecting Diamonds that are simply lying there waiting for you!

Oh . . . I forgot to mention that there are one or two problems!

There is an expanse of shark infested water between you and the Diamonds and a strange breed of Bubble that seems hell bent on getting you in it! Somehow you must cross it . . . .

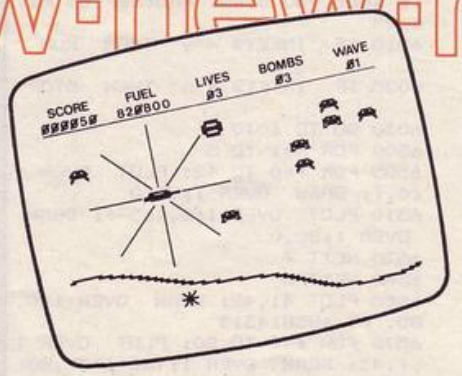
You have a Rocket Pack to help you (a Vulture on higher levels) but you must rush around the platforms and ladders collecting cans of fuel (legs of lamb with the Vulture) and cursing that weird Bubble. Once you have enough fuel then it's Chocks Away!

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



1. Diamonds
2. Sea
3. Platforms
4. Ladders
5. Fuel Cans
6. Rocket
7. Vulture
8. Leg of Lamb
9. Player
10. Bubloid
11. Fuel Gauge
12. Men remaining

new·new·new·new·new·n



Z-XTRICATOR

A long time ago, in a galaxy far, far, away a terrible war took place between two hostile races. Any prisoners taken could not expect to live very long in the hands of their captors. Their only hope lay with a group of valiant warriors – the XTRICATORS – whose task it was to rescue fellow beings from the alien planet's surface. You are about to take on the role of such a warrior . . . .

Please send me:

		QTY	TOTAL AMOUNT
FORTY NINER	£5.95		
ROCKET MAN	£5.95		
Z-XTRICATOR	£5.95		
		TOTAL	

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

Software Farm,
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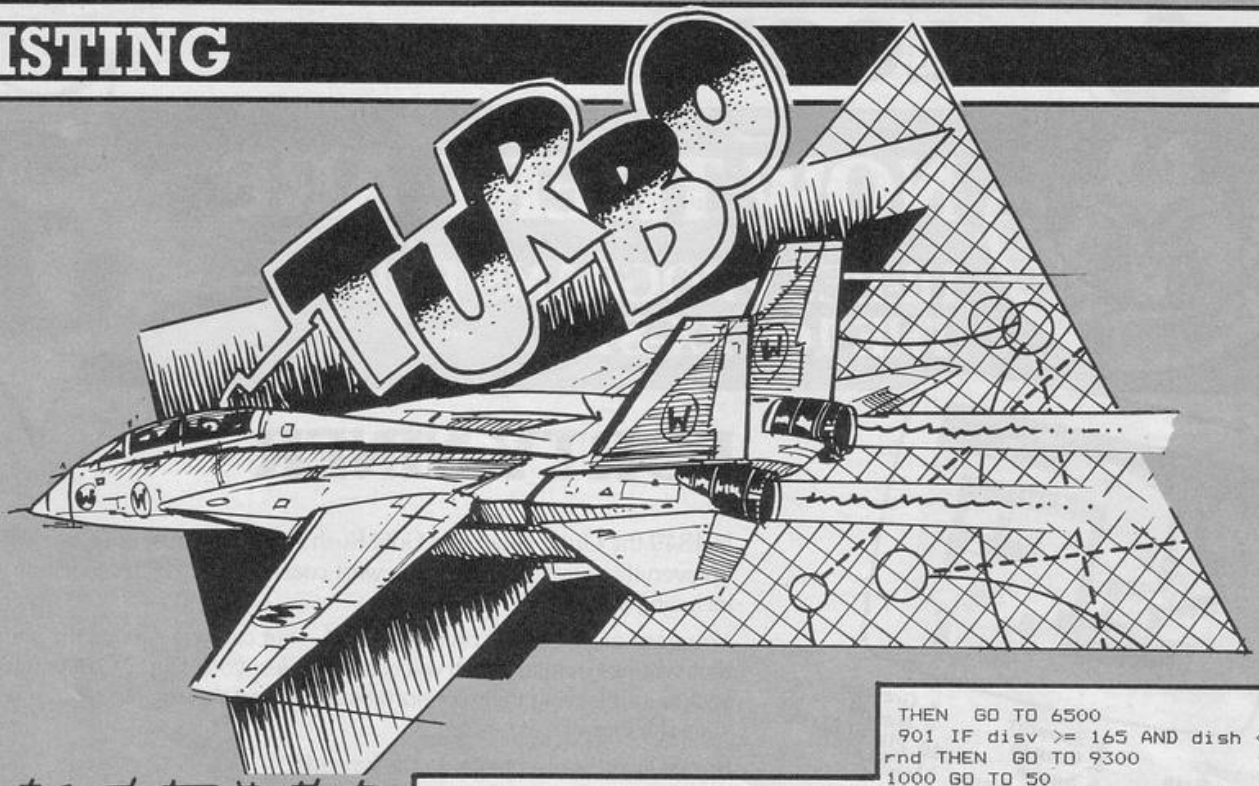
Software Farm, 155 Whiteladies Road, Clifton, Bristol BS8 2RF.
Telephone (0272) 731411. Telex 444742 AFMADV G

LISTING



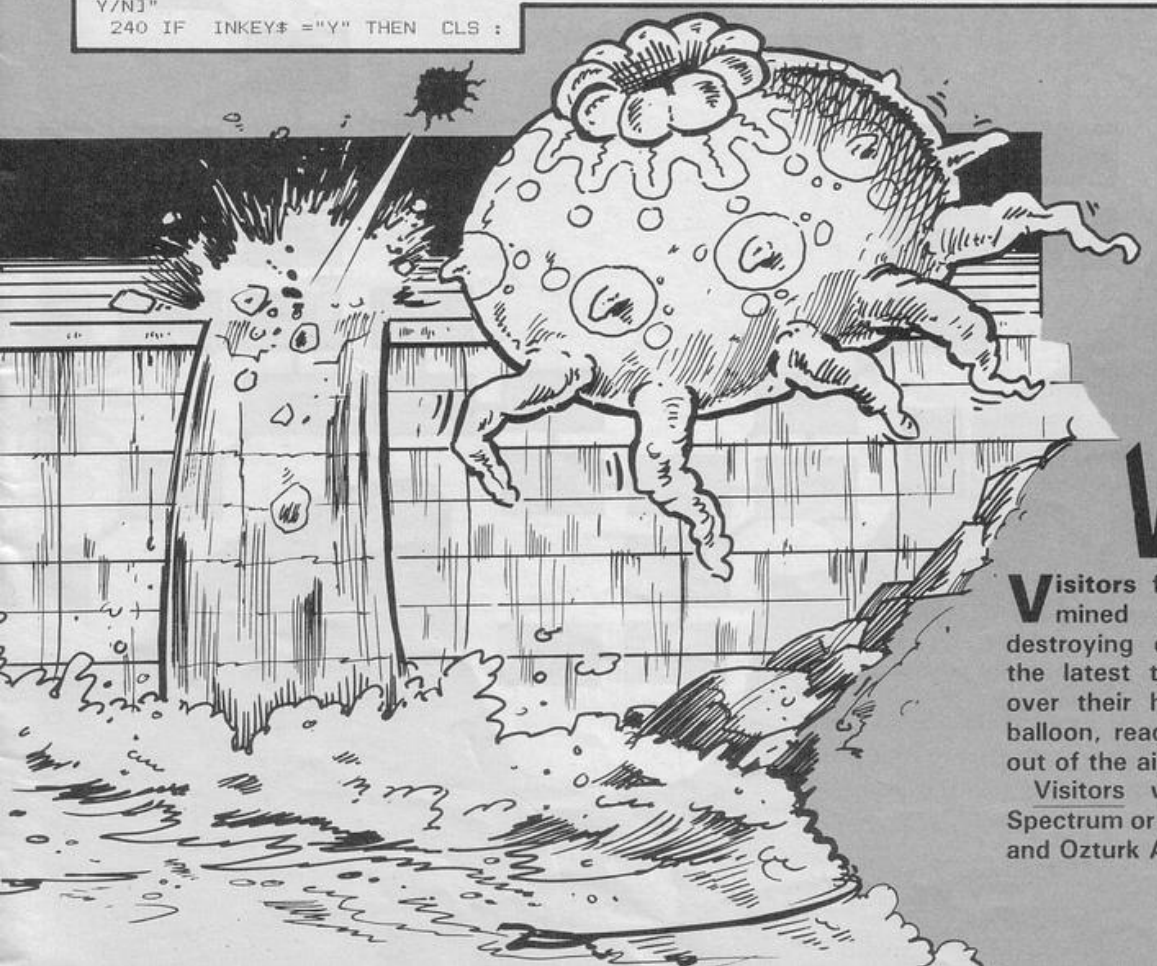
WOLFAIR

Fly your plane, the Wolfair jet up the screen to the escape warp. Use the cursor keys to move in the normal directions, Q to increase rotor power, A to decrease rotor power, V for turbo and B for speed brake. Travelling at turbo over the whole distance will mean that you run out of fuel before you reach the escape warp. However, if you never enter turbo you will be hit by the enemy missiles which show up on your radar every so often.

Wolfair was written for the Spectrum or Spectrum Plus by Neal Hughes of Telford, Shropshire.

```
  1 BORDER 0: LET fuel=100: LET
 x1=0: LET mh=0: LET mv=0: LET u
=25: LET z=0: CLS : LET s$="get
red(ee) t(oo) pl(aa) (aer)wulf":
 PAUSE 1: FOR f=0 TO 500: NEXT f

  2 DATA 0,-1,-3,2,0,-1,-5,-5

  3 FOR f=1 TO 3: READ a: BEEP
.4,a: NEXT f: FOR f=0 TO 50: NEX
T f: FOR f=1 TO 3: READ a: BEEP
.4,a: NEXT f: FOR f=0 TO 1: READ
 a: BEEP .15,a: NEXT f: BEEP .9,
-3
  4 PRINT  AT 0,0;"MULTI-VEIW";
 AT 0,0; OVER 1;"__________": LE
T disv=0: LET dish=40: LET a=0:
LET b=0: LET c=0: GO SUB 5: GO T
O 7
  5 PLOT  OVER 1;92,145+b: DRAW
 OVER 1;17,c
  6 RETURN
  9 LET rnd= INT ( RND *78)+2:
PLOT rnd,165
 10 PLOT 80,0: DRAW 0,175: PLOT
 194,10: DRAW 20,40: PLOT 207,10
: DRAW 8,40: PLOT 223,10: DRAW -
8,40: PLOT 237,10: DRAW -21,40

 20 PLOT 210,50: DRAW 11,0, PI
/4: PLOT 194,20: DRAW 43,0, PI /
4: PLOT 202,35: DRAW 26,0, PI /4
: PLOT 194+43,35: DRAW 0,-25: DR
AW  OVER 1;-43,0: DRAW 0,40: DRA
W 43,0: DRAW 0,-20
 25 CIRCLE 100,145,10
 26 LET hei=1: GO SUB 5555
 30 PLOT 119,157: DRAW 0,11: DR
AW 122,0: DRAW 0,-31: DRAW -122,
0: DRAW 0,20: DRAW a,0: PRINT  A
T 1,15;"MIN."; AT 1,26;"MAX."
 48 GO SUB 49: GO TO 50
 49 PLOT 119,157: DRAW  OVER 1;
a,0: PRINT  AT 3,15;a*5;" mph  "
: RETURN
 50 PLOT  OVER 1;dish,disv: LET
 disv=disv+(a/150)
 52 PRINT  AT 10,12;"FUEL="; IN
T (fuel);"00 "
 54 IF  INKEY$ ="5" AND b<5 THE
N  GO SUB 5: LET b=b+1: LET c=c-
2: GO SUB 5: PLOT  OVER 1;mh,mv:
 IF x1=1 THEN  LET mh=mh+2: PLOT
 mh,mv
 56 IF  INKEY$ ="6" AND hei<100
0 THEN  LET hei=hei+1: GO SUB 55
55
 58 IF  INKEY$ ="7" THEN  LET h
ei=hei-1: GO SUB 5555
 60 IF  INKEY$ ="8" AND b>-5 TH
EN  GO SUB 5: LET b=b-1: LET c=c
+2: GO SUB 5: PLOT  OVER 1;mh,mv
: IF x1=1 THEN  LET mh=mh-2: PLO
T mh,mv
 61 LET dish=dish-b: IF dish <=
 0 THEN  LET dish=79
 62 IF dish >= 80 THEN  LET dis
h=1
 63 PLOT dish,disv
 64 IF a>70 THEN  LET fuel=fuel
-.6
 65 IF a <= 69 THEN  LET fuel=f
uel-.1
 66 IF fuel <= 0 THEN  GO TO 75
00
 67 IF x1=0 THEN  GO TO 69
 68 IF z=80 THEN  GO TO 5000
 69 LET z= INT ( RND *100): IF
z=80 THEN  GO TO 5000
 70 IF  INKEY$ ="q" AND a<60 TH
EN  GO SUB 49: LET a=a+1: GO SUB
 49
 75 IF  INKEY$ ="b" AND a>10 TH
EN  GO SUB 49: LET a=a-10: GO SU
B 49
 80 IF  INKEY$ ="a" AND a>0 THE
N  GO SUB 49: LET a=a-1: GO SUB
49
 89 GO SUB 90: GO TO 92
 90 IF  INKEY$ ="v" THEN  GO SU
B 49: LET a=112: GO TO 49
 91 RETURN
 900 IF disv >= 165 AND dish=rnd
 THEN  GO TO 6500
 901 IF disv >= 165 AND dish <>
rnd THEN  GO TO 9300
1000 GO TO 50
5000 IF x1=1 THEN  GO TO 5004
5001 LET x= INT ( RND *30)+201

5002 LET x1=1
5003 LET mh=x: LET mv=10
5004 PLOT  OVER 1;mh,mv: IF mh<2
15 THEN  LET mh=mh+1
5005 IF mh>215 THEN  LET mh=mh-1

5010 LET mv=mv+1
5020 IF a>108 THEN  LET mv=mv-(a
-108)
5030 IF mv=50 THEN  GO TO 6001

5040 BEEP .001,60: PLOT  OVER 1;
mh,mv
5050 IF mv <= 10 THEN  LET x1=0:
 PLOT  OVER 1;mh,mv
5554 GO TO 70
5555 PRINT  AT 8,12;"HEIGHT=";he
i;"00 feet "
5560 IF hei<1 THEN  PRINT "You h
it the ground.Another go?": GO T
O 6010
6000 RETURN
6001 CLS : PRINT "An enemy missi
le shot you down. Another go may
be?"
6010 IF  INKEY$ ="y" THEN  RUN

6020 IF  INKEY$ ="n" THEN  STOP

6030 GO TO 6010
6500 FOR h=1 TO 5
6505 FOR f=0 TO 42: PLOT  OVER 1
;0,f: DRAW  OVER 1;80,0
6510 PLOT  OVER 1;0,165-f: DRAW
 OVER 1;80,0
6520 NEXT f
6540 NEXT h
6550 PLOT 41,42: DRAW  OVER 1;0,
80, PI *85814313
6570 FOR f=0 TO 80: PLOT  OVER 1
;f,43: DRAW  OVER 1;(80-f*2),80:
 NEXT f
6900 PRINT "Well done!!!!": GO S
UB 9000: PRINT "Another go?": GO
 TO 6010
7500 PRINT "out of fuel!Another
go?": GO TO 6010
9000 BEEP .1,2: BEEP .1,4: BEEP
1,5: BEEP .1,5: BEEP .1,7: BEEP
1,9: BEEP .1,7: BEEP 1,5: BEEP
1,4: BEEP .1,4: BEEP 2,2
9200 RETURN
9300 PRINT  AT 10,0:"you didn't
make it to the time  warp escape
 hole so you are     trapped for
ever."
9310 PRINT "Another go?": GO TO
6010
```

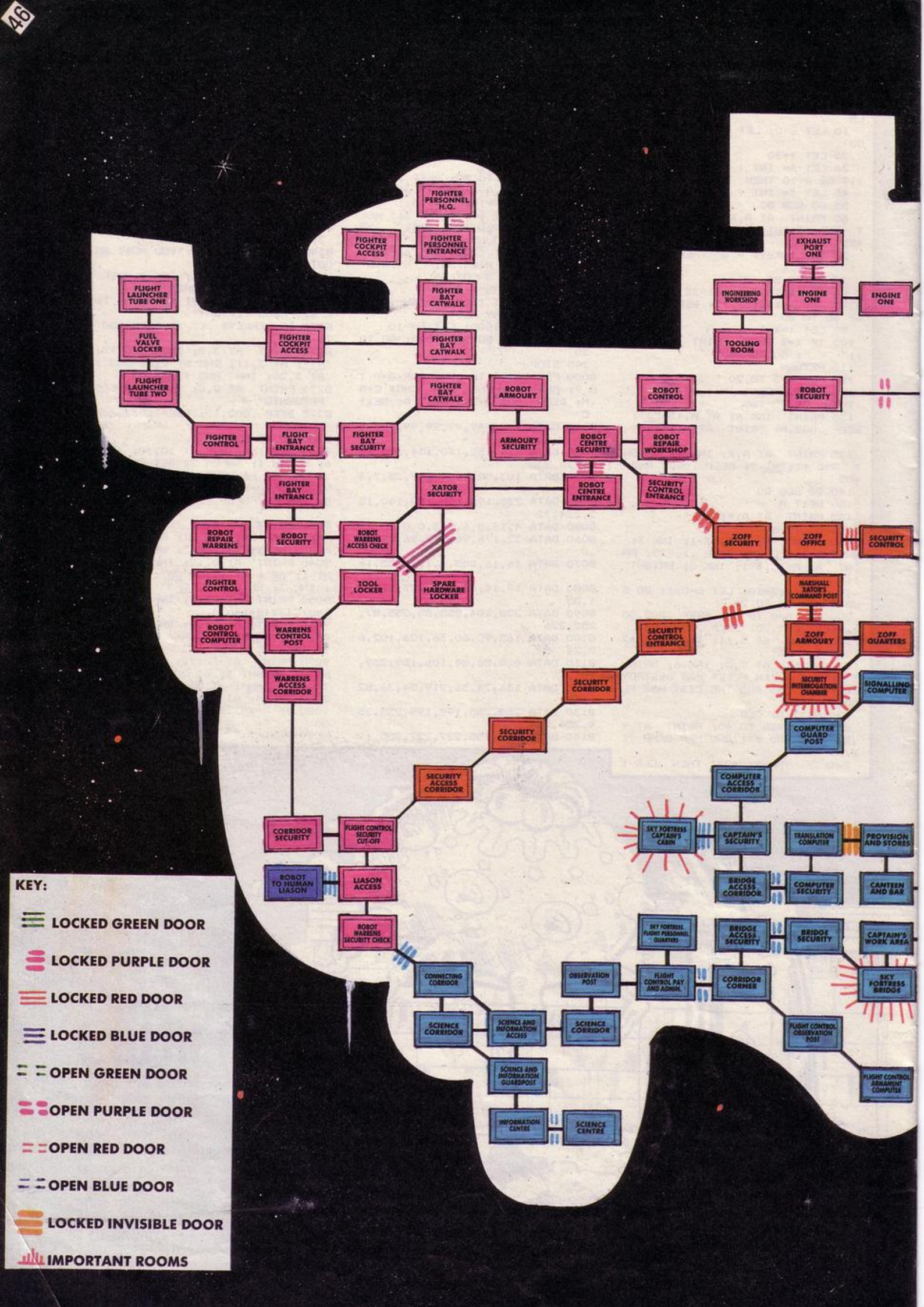
```
  1 POKE 23658,8
  5 BORDER 0: PAPER 0: INK 7: C
LS
 10 LET S=0: LET D=0: GO SUB 80
00
 20 LET X=30
 30 LET A= INT ( RND *21): IF A
>17 OR A<10 THEN  GO TO 30.
 40 LET I= INT ( RND *7)+2
 55 GO SUB 80
 60 PRINT  AT A,X; INK I; BRIGH
T  RND *1;"HI ": BEEP .002, RND
*55
 70 IF  INKEY$ ="0" THEN  GO TO
120
 75 GO TO 55
 80 IF  ATTR (A,X-1)=22 THEN  P
RINT  AT A,X-1;"   ": BEEP .1,-1
6: GO TO 20
 90 LET X=X-1
100 IF X=9 THEN  PRINT  AT A,X-
1;"    ": GO TO 200
110 RETURN
120 FOR M=3 TO 20
125 IF  SCREEN$ (M+1,13) <> " "
THEN  GO TO 160
130 PRINT  INK 6; AT M,13;"J":
BEEP .002,M: PRINT  AT M,13;" "

135 PRINT  AT A,X; INK I; BRIGH
T  RND *1;"HI ": BEEP .002, RND
*55
140 GO SUB 80
150 NEXT M
155 PRINT  AT A,X;"   "
156 GO TO 60
160 PRINT  AT M+1,13-1; INK 3;
BRIGHT 1;;"LLL": BEEP .1,-25: PR
INT  AT M+1,13-1; INK 3; BRIGHT
1;"   "
170 LET S=S+10: LET D=D+1: GO S
UB 9060: GO TO 20
200 FOR A=0 TO 30: BEEP .002,50
: BEEP .002,30: BEEP .002,50
205 PRINT  AT 5,11; INK  RND *7
;"GAME OVER"
210 PRINT  AT 7,0; INK 6; BRIGH
T 1;"THE ALIEN FLEET HAS DESTROY
ED   THE DAM AND THE CITY HAS FL
OOD"
220 NEXT A: CLS
230 FOR A=20 TO 40: PRINT  AT 9
,5; INK  RND *7;"ANOTHER GAME ?(
Y/N)"
240 IF  INKEY$ ="Y" THEN  CLS :
 LET D=0: LET S=0: GO SUB 8200:
GO TO 20
245 IF  INKEY$ ="N" THEN  CLS :
STOP
250 BEEP .002,A-3: BEEP .002,A-
10: BEEP .002,65
260 GO TO 230
300 FOR A=20 TO 50: BEEP .002,A
-3: BEEP .002,A-6: BEEP .002,A-1
0: BEEP .002,A+10: NEXT A
310 PRINT  AT 10,0; INK 3;" WEL
L DONE YOU SAVED THE  CITY   YO
U GAIN 1000 BOUNS POINTS "
315 PRINT  AT 12,3; INK 6;"NOW
FOR YOUR NEXT MISSION.      THIS
TIME YOU MUST SHOOT 25
   MORE SAUCERS"
320 PRINT  AT 16,8; FLASH 1; IN
K 5;"PRESS  ANY KEY"
325 LET S=S+1000: LET D=-10
330 PAUSE 0: GO SUB 9000: GO TO
20
340 STOP
8000 FOR C=144 TO 157: FOR A=0 T
O 7: READ N: POKE  USR  CHR$ C+A
,N: BEEP .002,A+20: NEXT A: NEXT
C
8010 DATA 7,25,49,97,99,99,103,1
03
8020 DATA 224,152,140,134,198,19
8,230,230
8030 DATA 103,99,99,49,49,25,7,4

8040 DATA 230,198,198,140,140,15
2,224,32
8050 DATA 4,14,5,6,5,3,0,0
8060 DATA 32,176,96,160,96,192,0
,0
8070 DATA 16,16,255,1,1,1,255,16

8080 DATA 19,14,127,85,127,117,3
1,35
8090 DATA 228,184,255,85,255,87,
252,226
8100 DATA 165,90,60,36,126,102,6
0,24
8110 DATA 0,0,56,84,106,189,239,
181
8120 DATA 136,74,36,219,24,36,82
,145
8130 DATA 255,255,199,199,255,25
4,254,254
8140 DATA 255,255,227,227,255,12
7,127,127
8210 PRINT  AT 5,2; INK 4; BRIGH
T 1;"VISITORS ARE FROM SPACE AND
    THEY ARE HERE TO FLOOD CITIE
S       BY DESTROYING DAMS "
8220 PRINT  AT 9,2; INK 3; BRIGH
T 1;"YOUR MISSION IS TO STOP THE
M    BY DROPING BOMBS ON TO THE
    SAUCERS FROM YOUR HUGE BALOO
N"
8230 PRINT  AT 15,5; INK 6;"AB";
 AT 16,5;"CD - YOUR BALOON"; INK
 3; AT 17,5;"EF"
8240 PRINT  AT 18,3;"YOU MUST SH
OOT  15 SAUCERS"
8250 PRINT  AT 19,3; INK 3;"USE
'0' TO DROP YOUR BOMBS"
8260 PRINT  AT 21,9; FLASH 1; IN
K 6;"PRESS KEY ANY"
8270 IF  INKEY$ <> "" THEN  GO
TO 9000
8273 PRINT  AT 3,8; INK  RND *7;
"HI"; AT 3,11; INK 6;"VISITORS";
 AT 3,20; INK  RND *7;"HI"
8274 PRINT  AT 0,8; INK 6;"AKERS
 PRESENTS"
8275 BEEP .002,10: BEEP .002,60

8280 GO TO 8270
9000 CLS : PRINT  AT 10,10; INK
6; FLASH 1; PAPER 2;"GET READY":
 PAUSE 5: PAUSE 50: CLS
9020 FOR A=8 TO 21: PRINT  AT A,
8; INK 6; PAPER 2;"GGG": NEXT A

9030 PRINT  AT 9,0; INK 5;"KKKKK
KKK": FOR A=10 TO 21: PRINT  AT
A,0; INK 5;"(8*ISP)": NEXT A
9040 PRINT  AT 0,12; INK 6; BRIG
HT 1;"AB"; AT 1,12;"CD"; AT 2,12
; INK 3; BRIGHT 1;"EF"
9050 PRINT  AT 21,0; INK 4;"(20*
isp)CITY(8*isp)"
9060 PRINT  AT 21,0; BRIGHT 1; P
APER 6; INK 1;" SCORE= "; PAPER
1; INK 6;S
9070 PRINT  AT 20,12; PAPER 7; I
NK 2; BRIGHT 1; AT 20,16;"MN"; A
T 20,19;"MN"; AT 20,23;"MN"; AT
20,26;"MN"; AT 20,29;"MN"
9080 IF D=15 THEN  CLS : GO TO 3
00
9090 RETURN
```

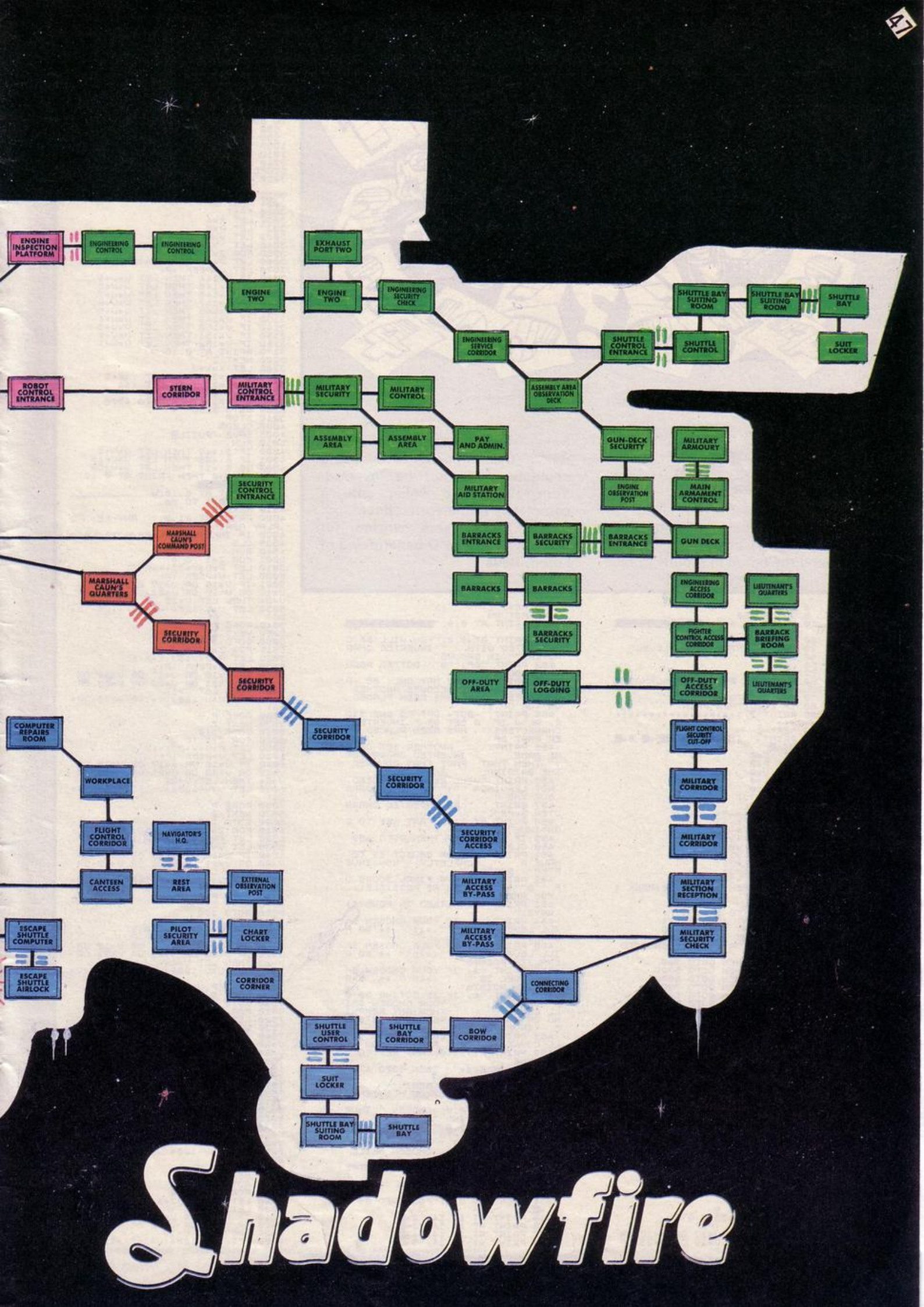


visitors

Visitors from space are determined to flood cities by destroying dams. Equipped with the latest technology, you hang over their heads in an immense balloon, ready to blast their shots out of the air.

Visitors was written for the Spectrum or Spectrum Plus by Eray and Ozturk Aker of London SE13.


FIGHTER PERSONNEL H.Q.
FIGHTER COCKPIT ACCESS
FIGHTER PERSONNEL ENTRANCE
FIGHTER BAY CATWALK
FLIGHT LAUNCHER TUBE ONE
FUEL VALVE LOCKER
FIGHTER COCKPIT ACCESS
FIGHTER BAY CATWALK
FLIGHT LAUNCHER TUBE TWO
FIGHTER BAY CATWALK
FIGHTER CONTROL
FLIGHT BAY ENTRANCE
FIGHTER BAY SECURITY
FIGHTER BAY ENTRANCE
ROBOT REPAIR WARRENS
ROBOT SECURITY
ROBOT WARRENS ACCESS CHECK
FIGHTER CONTROL
TOOL LOCKER
SPARE HARDWARE LOCKER
ROBOT CONTROL COMPUTER
WARRENS CONTROL POST
WARRENS ACCESS CORRIDOR
CORRIDOR SECURITY
FLIGHT CONTROL SECURITY CUT-OFF
ROBOT TO HUMAN LIASON
LIASON ACCESS
ROBOT WARRENS SECURITY CHECK
CONNECTING CORRIDOR
SCIENCE CORRIDOR
SCIENCE AND INFORMATION ACCESS
SCIENCE AND INFORMATION GUARDPOST
INFORMATION CENTRE
SCIENCE CENTRE
OBSERVATION POST
SCIENCE CORRIDOR
ROBOT ARMOURY
ARMOURY SECURITY
XATOR SECURITY
ROBOT CENTRE ENTRANCE
ROBOT CENTRE SECURITY
ROBOT CONTROL
ROBOT REPAIR WORKSHOP
SECURITY CONTROL ENTRANCE
SECURITY CONTROL ENTRANCE
SECURITY CORRIDOR
SECURITY CORRIDOR
SECURITY ACCESS CORRIDOR
SKY FORTRESS FLIGHT PERSONNEL QUARTERS
FLIGHT CONTROL PAY AND ADMIN.
ROBOT SECURITY
ZOFF SECURITY
ZOFF OFFICE
SECURITY CONTROL
MARSHALL XATOR'S COMMAND POST
ZOFF ARMOURY
ZOFF QUARTERS
SECURITY INTERROGATION CHAMBER
SIGNALLING COMPUTER
COMPUTER GUARD POST
COMPUTER ACCESS CORRIDOR
SKY FORTRESS CAPTAIN'S CABIN
CAPTAIN'S SECURITY
TRANSLATION COMPUTER
PROVISION AND STORES
BRIDGE ACCESS CORRIDOR
COMPUTER SECURITY
CANTEEN AND BAR
BRIDGE ACCESS SECURITY
BRIDGE SECURITY
CAPTAIN'S WORK AREA
CORRIDOR CORNER
SKY FORTRESS BRIDGE
FLIGHT CONTROL OBSERVATION POST
FLIGHT CONTROL ARMAMENT COMPUTER
EXHAUST PORT ONE
ENGINEERING WORKSHOP
ENGINE ONE
ENGINE ONE
TOOLING ROOM
KEY:
LOCKED GREEN DOOR
LOCKED PURPLE DOOR
LOCKED RED DOOR
LOCKED BLUE DOOR
OPEN GREEN DOOR
OPEN PURPLE DOOR
OPEN RED DOOR
OPEN BLUE DOOR
LOCKED INVISIBLE DOOR
IMPORTANT ROOMS


ENGINE INSPECTION PLATFORM
ENGINEERING CONTROL
ENGINEERING CONTROL
EXHAUST PORT TWO
ENGINE TWO
ENGINE TWO
ENGINEERING SECURITY CHECK
ENGINEERING SERVICE CORRIDOR
SHUTTLE BAY SUITING ROOM
SHUTTLE BAY SUITING ROOM
SHUTTLE BAY
SUIT LOCKER
SHUTTLE CONTROL ENTRANCE
SHUTTLE CONTROL
ASSEMBLY AREA OBSERVATION DECK
ROBOT CONTROL ENTRANCE
STERN CORRIDOR
MILITARY CONTROL ENTRANCE
MILITARY SECURITY
MILITARY CONTROL
ASSEMBLY AREA
ASSEMBLY AREA
PAY AND ADMIN.
GUN-DECK SECURITY
MILITARY ARMOURY
SECURITY CONTROL ENTRANCE
MILITARY AID STATION
ENGINE OBSERVATION POST
MAIN ARMAMENT CONTROL
MARSHALL CAUN'S COMMAND POST
BARRACKS ENTRANCE
BARRACKS SECURITY
BARRACKS ENTRANCE
GUN DECK
MARSHALL CAUN'S QUARTERS
BARRACKS
BARRACKS
ENGINEERING ACCESS CORRIDOR
LIEUTENANT'S QUARTERS
SECURITY CORRIDOR
BARRACKS SECURITY
FIGHTER CONTROL ACCESS CORRIDOR
BARRACK BRIEFING ROOM
SECURITY CORRIDOR
OFF-DUTY AREA
OFF-DUTY LOGGING
OFF-DUTY ACCESS CORRIDOR
LIEUTENANT'S QUARTERS
COMPUTER REPAIRS ROOM
SECURITY CORRIDOR
FLIGHT CONTROL SECURITY CUT-OFF
WORKPLACE
SECURITY CORRIDOR
MILITARY CORRIDOR
FLIGHT CONTROL CORRIDOR
NAVIGATOR'S H.Q.
SECURITY CORRIDOR ACCESS
MILITARY CORRIDOR
CANTEEN ACCESS
REST AREA
EXTERNAL OBSERVATION POST
MILITARY ACCESS BY-PASS
MILITARY SECTION RECEPTION
ESCAPE SHUTTLE COMPUTER
PILOT SECURITY AREA
CHART LOCKER
MILITARY ACCESS BY-PASS
MILITARY SECURITY CHECK
ESCAPE SHUTTLE AIRLOCK
CORRIDOR CORNER
CONNECTING CORRIDOR
SHUTTLE USER CONTROL
SHUTTLE BAY CORRIDOR
BOW CORRIDOR
SUIT LOCKER
SHUTTLE BAY SUITING ROOM
SHUTTLE BAY

Shadowfire

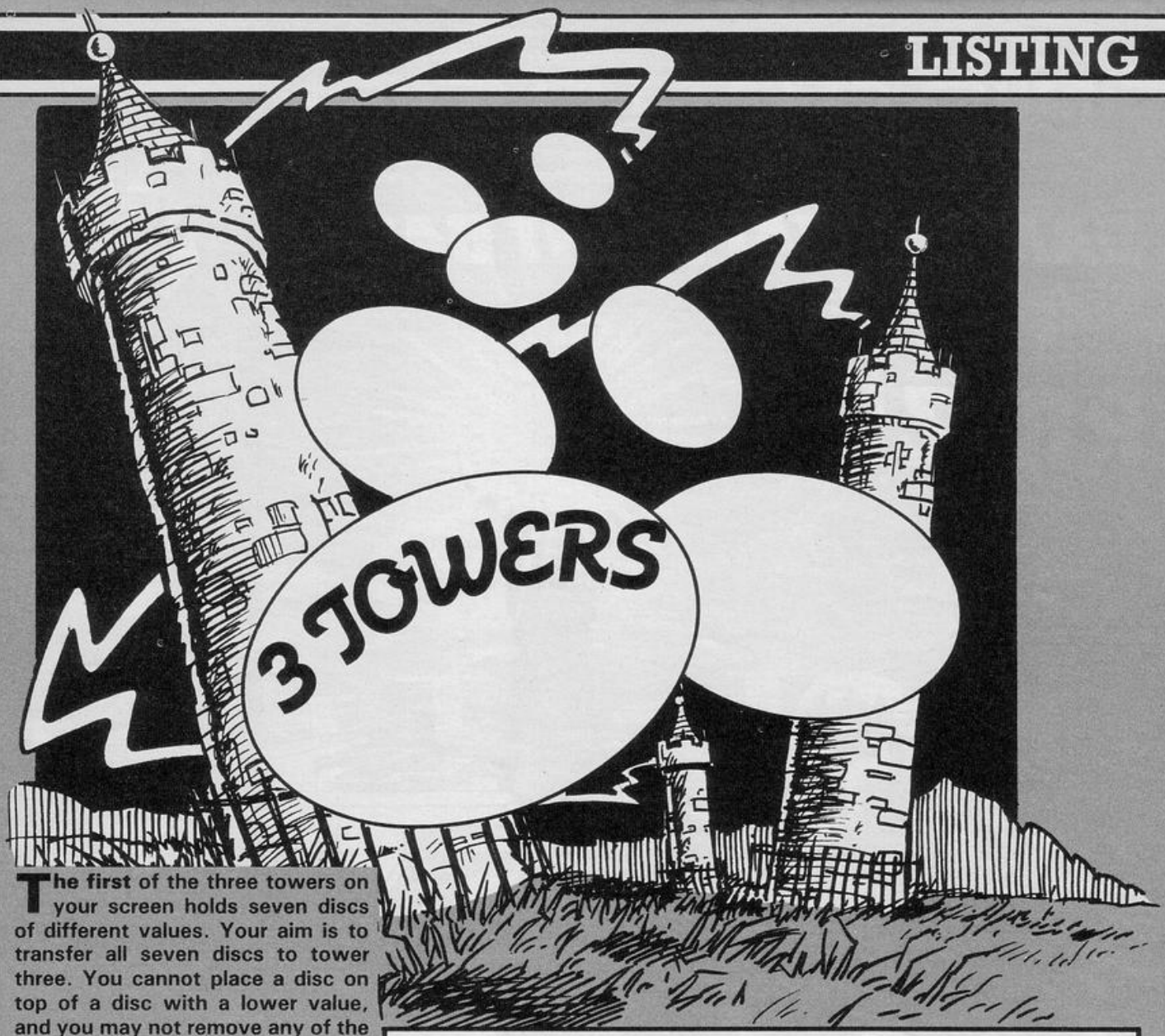
PICK PUZZLE

You will be confronted with inverted characters spread around the board in groups of nine.

Some of the groups overlap and, where this happens, overlapping characters will not be inverted. Your aim is to finish with a completely non-inverted board.

Pick Puzzle was written for the 16K ZX-81 by D Bauernfeind of Luton, Beds.

```
  4 CLEAR
  5 GOSUB 450
 10 PRINT AT 0,7;" PICK PUZZLE
"
 20 PRINT
 30 PRINT "ENTER SKILL LEVEL"
 40 INPUT S
 50 CLS
 55 FAST
 60 PRINT "  ABCDEFGHIJKLMNOPQR
STUVWXYZ"
 70 FOR Z=1 TO 20
 80 IF Z<10 THEN PRINT " ";
 90 PRINT Z;"++++++++++++++++++
++++++++";Z
100 NEXT Z
101 PRINT "  1=■2=■3=■4=■5=■ 6=■
7=■8=■9=■  "
110 LET D=0
120 LET P=0
125 LET V=0
130 LET X=0
140 LET Y=0
150 DIM K$(3)
160 DIM A(9)
170 LET A(1)=-34
180 LET A(2)=-33
190 LET A(3)=-32
200 LET A(4)=-1
210 LET A(5)=0
220 LET A(6)=1
230 LET A(7)=32
240 LET A(8)=33
250 LET A(9)=34
260 LET D=PEEK 16396+256*PEEK 1
6397
265 RAND
270 FOR W=1 TO 5
280 LET X=INT (RND*24)+4
290 LET Y=INT (RND*18)+2
292 LET L=INT (RND*10)+1
293 IF L<=0 OR L>=10 THEN GOTO
292
294 IF L=1 THEN GOTO 309
296 IF L=2 THEN GOTO 5000
297 IF L=3 THEN GOTO 6000
298 IF L=4 THEN GOTO 7000
299 IF L=5 THEN GOTO 8000
300 IF L=6 THEN GOTO 9000
301 IF L=7 THEN GOTO 5500
302 IF L=8 THEN GOTO 6500
303 IF L=9 THEN GOTO 7500
309 GOSUB 400
310 NEXT W
315 SLOW
320 INPUT K$
324 IF K$="END" THEN GOSUB 3000
330 LET X=CODE (K$)-35
340 LET Y=VAL K$(2 TO )
350 IF X<4 OR X>27 OR Y<2 OR Y>
19 THEN GOTO 320
356 INPUT U
357 IF U=1 THEN GOTO 369
358 IF U=2 THEN GOTO 5000
359 IF U=3 THEN GOTO 6000
360 IF U=4 THEN GOTO 7000
361 IF U=5 THEN GOTO 8000
362 IF U=6 THEN GOTO 9000
363 IF U=7 THEN GOTO 5500
364 IF U=8 THEN GOTO 6500
365 IF U=9 THEN GOTO 7500
369 GOSUB 400
370 GOTO 320
400 FOR Z=1 TO 9
410 LET P=D+Y*33+X+A(Z)
415 LET V=PEEK (P)
417 IF V=16 OR V=17 OR V=18 OR
V=19 OR V=20 OR V=22 OR V=23 OR
V=24 THEN LET V=21
420 LET V=V-128+(V=149)+128*(V=
21)
425 POKE P,V
430 NEXT Z
440 RETURN
450 PRINT AT 0,9;" PICK PUZZLE
"
451 PRINT AT 1,2;"YOU WILL BE C
ONFRONTED WITH  ""INVERTED CHAR
ACTERS"" IN GROUPS"
452 PRINT "OF ""9"" DOTTED ABOU
T THE BOARD."
453 PRINT "THERE MAY ONLY BE -P
ART- OF ONE SET BECOUSE ANOTHER
CHARACTER  SET HAS BEEN PLACED
ON TOP OF IT"
454 PRINT "-BUT- OFF TO ONE SID
E. ALSO IF  A SET OF ""INVERTED
CHARACTERS""  HAS BEEN PLACED OV
ER PART OF  "
455 PRINT "  ANOTHER SET OF T
HE SAME  ""INVERTED CHARACTER
"" THEN THAT  PART THAT COVERED
THE ORIGINAL  "
456 PRINT "WILL BE RE-INVERTED,
NOT LEAVINGA ""+"" ON THE BOARD
BUT THE "
457 PRINT " ""RE-INVERTED CHARA
CTER SYMBOL"""
458 PRINT AT 21,0;"ANY KEY TO C
ONTINUE"
459 IF INKEY$="" THEN GOTO 459
460 CLS
461 PRINT "  YOUR OBJECT IS TO
HAVE A  COMPLETLY ""NON-INVE
RTED"" BOARD,"
462 PRINT "WITH A FINAL SCORE O
F ""0"" (OR ASLOW AS POSSIBLE).
YOU ARE "
463 PRINT "PENALIZED IN FOUR(4)
WAYS:"
464 PRINT "1. IF YOUR CHOSEN SK
ILL LEVEL IS  ""<=11"" ** 50 P
ENALITY POINTS"
465 PRINT "2. IF YOUR CHOSEN SK
ILL LEVEL IS  ""<=26"" ** 20 P
ENALITY POINTS"
466 PRINT "3. IF YOUR CHOSEN SK
ILL LEVEL IS  ""<=49"" **  5 P
ENALITY POINTS"
467 PRINT "4. IF SELECTING 50 O
R MORE FOR  YOUR CHOSEN SKI
LL LEVEL  THEN ANY REMANI
NG OR PARTLY  REMANING SETS O
F ""INVERTED "
468 PRINT "  CHARACTERS"" WI
LL COUNT  AGAINST YOU"
469 PRINT AT 21,0;"ANY KEY TO C
ONTINUE"
470 IF INKEY$="" THEN GOTO 470
471 CLS
500 PRINT "  TO  BEGIN"
505 PRINT AT 1,0;"YOU MUST INVE
RT A RANDOMLY"
510 PRINT AT 2,0;"CHOSEN ""INVE
RTED CHAR."", AND "
515 PRINT AT 3,0;"ITS ""8"" NEI
GHBOURS. REPEAT TO  CLEAR ALL T
HOSE SET BY YOUR "
525 PRINT AT 5,0;"CHOSEN SKILL
LEVEL."
530 PRINT AT 7,0;"ENTER ""LETTE
R"" THEN ""NUMBER"""
532 PRINT AT 8,15;"THEN ""N/L""
"
534 PRINT AT 9,0;"FOLLOWED BY
1=■"
535 PRINT AT 10,14;"2=■"
536 PRINT AT 11,14;"3=■"
537 PRINT AT 12,14;"4=■"
538 PRINT AT 13,14;"5=■"
539 PRINT AT 14,14;"6=■"
540 PRINT AT 15,14;"7=■"
541 PRINT AT 16,14;"8=■"
542 PRINT AT 17,14;"9=■"
543 PRINT AT 18,14;"THEN N/L"
544 PRINT AT 20,0;"WHEN FINISHE
D TYPE ""END"""
546 PRINT AT 21,5;"NEW LINE TO
CONTINUE"
550 IF CODE INKEY$<>118 THEN GO
TO 550
552 CLS
555 RETURN
1000 SAVE "PLAIN"
1010 RUN
3010 PRINT AT 21,0;"THE ABOVE -
SCORES AGAINST YOU"
3020 PRINT AT 0,0;"  SCORE =
"
3022 FOR B=1 TO 50
3024 NEXT B
3026 FAST
3030 LET X=4
3037 LET P=0
3039 LET W=0
3040 LET Y=2
3050 FOR Z=1 TO 9
3060 LET P=D+Y*33+X+A(Z)
3070 LET V=PEEK (P)
3080 IF V=144 THEN LET W=W+9
3090 IF V=145 THEN LET W=W+8
3100 IF V=146 THEN LET W=W+7
3110 IF V=147 THEN LET W=W+6
3120 IF V=148 THEN LET W=W+5
3130 IF V=149 THEN LET W=W+4
3140 IF V=150 THEN LET W=W+3
3150 IF V=151 THEN LET W=W+2
3160 IF V=152 THEN LET W=W+1
3170 PRINT AT 0,10;W
3200 NEXT Z
3202 LET X=X+3
3203 IF X=31 THEN LET Y=Y+3
3204 IF X=31 THEN LET X=4
3205 IF Y=23 THEN SLOW
3206 IF Y=23 THEN GOTO 4500
3209 GOTO 3050
3210 STOP
4000 CLEAR
4005 SAVE "PUZZLE"
4010 RUN
4500 IF S<=49 THEN LET W=W+5
4501 IF S<=26 THEN LET W=W+15
4502 IF S<=11 THEN LET W=W+30
4503 IF W=0 THEN PRINT AT 0,13;"
PERFECT SCORE"
4506 PRINT AT 0,10;W
4507 FOR B=1 TO 50
4510 NEXT B
4520 PRINT AT 21,0;"  ANY KEY TO
 PLAY AGAIN"
4530 IF INKEY$="" THEN GOTO 4520
4535 CLS
4540 RUN
5001 FOR Z=1 TO 9
5010 LET P=D+Y*33+X+A(Z)
5020 LET V=PEEK (P)
5021 IF V=16 OR V=17 OR V=18 OR
V=19 OR V=20 OR V=21 OR V=22 OR
V=24 THEN LET V=23
5030 LET V=V-128+(V=151)+128*(V=
23)
5040 POKE P,V
5050 NEXT Z
5060 GOTO 310
5510 FOR Z=1 TO 9
5520 LET P=D+Y*33+X+A(Z)
5530 LET V=PEEK (P)
5540 IF V=16 OR V=17 OR V=19 OR
V=20 OR V=21 OR V=22 OR V=23 OR
V=24 THEN LET V=18
5550 LET V=V-128+(V=146)+128*(V=
18)
5560 POKE P,V
5570 NEXT Z
5590 GOTO 310
6010 FOR Z=1 TO 9
6020 LET P=D+Y*33+X+A(Z)
6030 LET V=PEEK (P)
6040 IF V=16 OR V=17 OR V=18 OR
V=19 OR V=20 OR V=21 OR V=23 OR
V=24 THEN LET V=22
6050 LET V=V-128+(V=150)+128*(V=
22)
6060 POKE P,V
6070 NEXT Z
6090 GOTO 310
6510 FOR Z=1 TO 9
6520 LET P=D+Y*33+X+A(Z)
6530 LET V=PEEK (P)
6540 IF V=16 OR V=18 OR V=19 OR
V=20 OR V=21 OR V=22 OR V=23 OR
V=24 THEN LET V=17
6550 LET V=V-128+(V=145)+128*(V=
17)
6560 POKE P,V
6570 NEXT Z
6590 GOTO 310
7010 FOR Z=1 TO 9
7020 LET P=D+Y*33+X+A(Z)
7030 LET V=PEEK (P)
7040 IF V=16 OR V=17 OR V=18 OR
V=19 OR V=20 OR V=21 OR V=22 OR
V=23 THEN LET V=24
7050 LET V=V-128+(V=152)+128*(V=
24)
7060 POKE P,V
7070 NEXT Z
7090 GOTO 310
7510 FOR Z=1 TO 9
7520 LET P=D+Y*33+X+A(Z)
7530 LET V=PEEK (P)
7540 IF V=17 OR V=18 OR V=19 OR
V=20 OR V=21 OR V=22 OR V=23 OR
V=24 THEN LET V=16
7550 LET V=V-128+(V=144)-128*(V=
16)
7560 POKE P,V
7570 NEXT Z
7590 GOTO 310
8010 FOR Z=1 TO 9
8020 LET P=D+Y*33+X+A(Z)
8030 LET V=PEEK (P)
8040 IF V=16 OR V=17 OR V=18 OR
V=19 OR V=21 OR V=22 OR V=23 OR
V=24 THEN LET V=20
8050 LET V=V-128+(V=148)+128*(V=
20)
8060 POKE P,V
8070 NEXT Z
8090 GOTO 310
9010 FOR Z=1 TO 9
9020 LET P=D+Y*33+X+A(Z)
9030 LET V=PEEK (P)
9040 IF V=16 OR V=17 OR V=18 OR
V=20 OR V=21 OR V=22 OR V=23 OR
V=24 THEN LET V=19
9050 LET V=V-128+(V=147)+128*(V=
19)
9060 POKE P,V
9070 NEXT Z
9090 GOTO 310
```



The first of the three towers on your screen holds seven discs of different values. Your aim is to transfer all seven discs to tower three. You cannot place a disc on top of a disc with a lower value, and you may not remove any of the discs from the towers. How quickly can you complete the challenge?

Three Towers was written for the 16K ZX-81 by Manuel Luna from Porto, Portugal.

```
  2 REM MANUEL LUNA - SET84
  5 LET TENT=0
 10 LET A=7
 15 LET B=0
 20 LET C=0
 30 DIM A$(7,5)
 40 DIM B$(7,5)
 45 DIM C$(7,5)
 50 LET A$(1)="77777"
 52 LET A$(2)="66666"
 55 LET A$(3)="55555"
 57 LET A$(4)="44444"
 60 LET A$(5)="33333"
 65 LET A$(6)="22222"
 70 LET A$(7)="11111"
100 GOSUB 8100
110 CLS
120 FAST
140 PRINT AT 4,0;"CHANGES = "
145 PRINT AT 4,10;TENT
150 FOR X=0 TO 6
160 PRINT AT 21-X,5-INT ((LEN A
$(X+1))/2);A$(X+1)
170 PRINT AT 21-X,15-INT ((LEN
B$(X+1))/2);B$(X+1)
180 PRINT AT 21-X,25-INT ((LEN
C$(X+1))/2);C$(X+1)
190 NEXT X
200 FOR X=21 TO 15 STEP -1
210 PRINT AT X,5;"■";AT X,15;"■
";AT X,25;"■"
220 NEXT X
230 PRINT AT 14,5;"A";AT 14,15;
"B";AT 14,25;"C"
240 SLOW
250 IF A=0 AND B=0 THEN GOTO 25
00
260 PRINT AT 8,0;"DISC FROM ?"
270 LET F$=INKEY$
280 IF F$<>"A" AND F$<>"B" AND
F$<>"C" THEN GOTO 260
290 IF (F$="A" AND A=0) OR (F$=
"B" AND B=0) OR (F$="C" AND C=0)
 THEN GOTO 260
300 PRINT AT 8,0;"DISC TO ?  "
310 LET G$=INKEY$
320 IF G$<>"A" AND G$<>"B" AND
G$<>"C" THEN GOTO 300
330 IF F$=G$ THEN GOTO 260
340 PRINT AT 8,0;"           "
350 LET TENT=TENT+1
400 IF F$="A" AND G$="B" THEN G
OTO 1000
410 IF F$="A" AND G$="C" THEN G
OTO 1100
420 IF F$="B" AND G$="A" THEN G
OTO 1200
430 IF F$="B" AND G$="C" THEN G
OTO 1300
440 IF F$="C" AND G$="A" THEN G
OTO 1400
450 IF F$="C" AND G$="B" THEN G
OTO 1500
1000 IF B$(1)="      " THEN GOTO
1020
1010 IF VAL A$(A)>VAL B$(B) THEN
 GOTO 2000
1020 LET B=B+1
1030 LET B$(B)=A$(A)
1040 LET A$(A)="     "
1050 LET A=A-1
1060 GOTO 120
1100 IF C$(1)="      " THEN GOTO
1120
1110 IF VAL A$(A)>VAL C$(C) THEN
 GOTO 2000
1120 LET C=C+1
1130 LET C$(C)=A$(A)
1140 LET A$(A)="     "
1150 LET A=A-1
1160 GOTO 120
1200 IF A$(1)="      " THEN GOTO
1220
1210 IF VAL B$(B)>VAL A$(A) THEN
 GOTO 2000
1220 LET A=A+1
1230 LET A$(A)=B$(B)
1240 LET B$(B)="     "
1250 LET B=B-1
1260 GOTO 120
1300 IF C$(1)="      " THEN GOTO
1320
1310 IF VAL B$(B)>VAL C$(C) THEN
 GOTO 2000
1320 LET C=C+1
1330 LET C$(C)=B$(B)
1340 LET B$(B)="     "
1350 LET B=B-1
1360 GOTO 120
1400 IF A$(1)="      " THEN GOTO
1420
1410 IF VAL C$(C)>VAL A$(A) THEN
 GOTO 2000
1420 LET A=A+1
1430 LET A$(A)=C$(C)
1440 LET C$(C)="     "
1450 LET C=C-1
1460 GOTO 120
1500 IF B$(1)="      " THEN GOTO
1420
1510 IF VAL C$(C)>VAL B$(B) THEN
 GOTO 2000
1520 LET B=B+1
1530 LET B$(B)=C$(C)
1540 LET C$(C)="     "
1550 LET C=C-1
1560 GOTO 120
2000 SLOW
2010 FOR X=1 TO 30
2020 PRINT AT 10,11;"IMPOSSIBLE"
2030 PRINT AT 10,11;"IMPOSSIBLE"
2040 NEXT X
2050 PRINT AT 10,11;"           "
2060 GOTO 260
2500 PRINT AT 6,8;"CONGRATULATIO
NS"
2520 PRINT AT 9,10;"PRESS A KEY"
2530 PRINT AT 9,10;"PRESS A KEY"
2540 IF INKEY$="" THEN GOTO 2520
2550 CLS
2560 RUN
8100 PRINT "          INSTRUCTIO
NS          "
8105 PRINT
8110 PRINT "1) THREE TOWERS: A ,
B E C ;"
8115 PRINT
8120 PRINT "2) AT TOWER A THERE
ARE 7 DISCS;"
8125 PRINT
8130 PRINT "3) YOUR JOB CONSISTS
 TO PASS ALL   DISCS,ONE BY ONE,
TO C;"
8135 PRINT
8140 PRINT "4) BUT YOU CANOT PUT
 HIGHER VA-    LUE DISCS ON LOWE
R ONES;"
8160 IF INKEY$="" THEN GOTO 8160
8170 RETURN
9000 SAVE "THREE TOWERB"
9010 RUN
```

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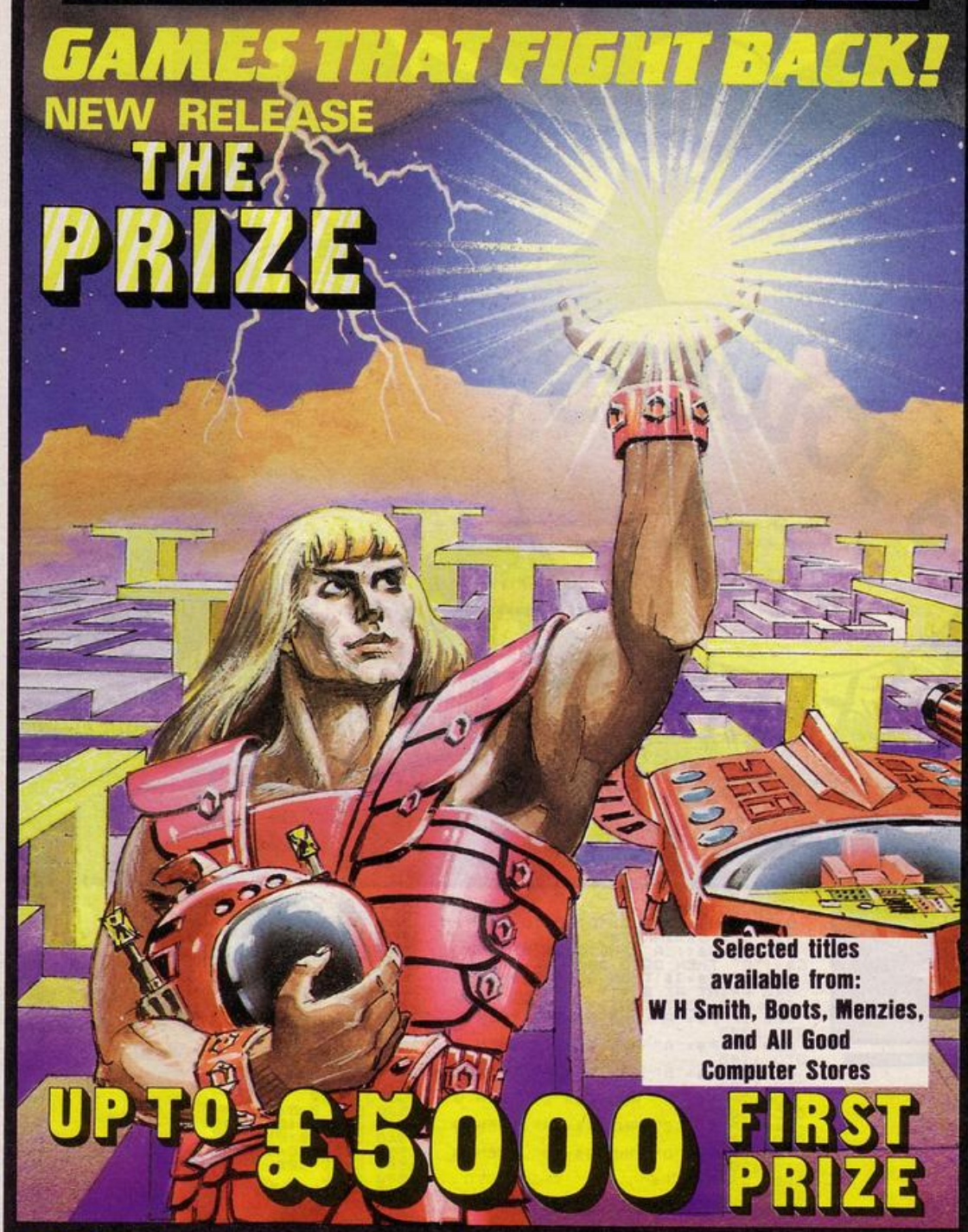

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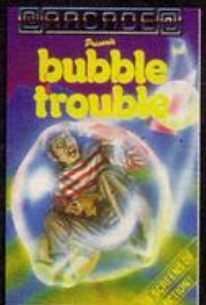

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FIREFIGHTER

Benjamin Rabbit is the new recruit at Burrowville Fire Station. As soon as he is left in charge, the firebug tries to burn down the fire station. Benjamin must put out the fires by stamping on them or by running over a fire bucket which will fall onto the flames. He loses energy when he steps on a fire or runs into the firebug. If Benjamin manages to drop all the fire buckets in one room to the ground level, he will start a new room.

Firefighter was written for the 48K Spectrum or Spectrum Plus by T Sherwood of West Bromwich, West Midlands.

Underlined characters are those to be entered in graphics mode.

```
1 GO TO 6000
100 FOR p=1 TO 3
110 FOR i=1 TO 2
120 LET y1=y+( INKEY$ ="O" AND
ATTR (x,y+1) <> 2)-( INKEY$ ="9
" AND ATTR (x,y-1) <> 2)
140 PRINT INK 8; OVER 1; AT x,y;a$(3-i); AT
x,y1;a$(i); AT x+1,y;b$(3-i); AT
y=y1
220 IF ATTR (x+2,y)=150 THEN
GO SUB 3200
410 LET b1=b+(y>b)-(y<b)
415 IF RND >.8 THEN LET b1=b+
(b>y AND b<30)-(b<y AND b>1)
420 LET a1=a+4*(( ATTR (a+2,b1)
=4)-( ATTR (a+2,b1)=3))
430 PRINT OVER 1; INK 8; AT a,
b;c$(3-i); AT a+1,b;i$(3-i); AT
a1,b1;c$(i); AT a1+1,b1;i$(i): L
ET a=a1: LET b=b1
490 IF a=x AND b=y THEN GO SUB
4200
600 IF ATTR (x+2,y)<7 THEN GO
SUB ATTR (x+2,y)*100+1000
920 NEXT i: NEXT p
930 LET q=(1+ INT ( RND *5))*4:
LET r=1+ INT ( RND *30): IF AT
TR (q,r)=41 THEN PRINT FLASH 1
; INK 6; PAPER 2; AT q,r;"E": LE
T u=u+1: PRINT #0; AT 1,1; PAPER
8;u;" ": IF u>7 THEN LET f=f-2
: PRINT AT 21,f+6;" ": IF f=0
THEN GO TO 4000
995 GO TO 100
1305 IF INKEY$ ="" THEN PRINT
INK 8; OVER 1; AT x,y;a$(i); AT
x+1,y;b$(i): LET x=x-4: PRINT
INK 8; OVER 1; AT x,y;a$(i); AT
x+1,y;b$(i): FOR j=12 TO 36 STEP
12: BEEP .03,j: NEXT j
1399 RETURN
1405 IF INKEY$ ="" THEN PRINT
OVER 1; INK 8; AT x,y;a$(i); AT
x+1,y;b$(i): LET x=x+4: PRINT
OVER 1; INK 8; AT x,y;a$(i); AT
x+1,y;b$(i): FOR j=36 TO 12 STEP
-12: BEEP .03,j: NEXT j
1499 RETURN
1605 POKE z+3,70: POKE z+5,5: PO
KE z+24,28
1610 LET j=x+2
1620 PRINT INK 1; PAPER 5; AT j
,y;e$(e)
1625 FOR j=j+1 TO j+3: PRINT AT
j,y; INK 6;"G"
1627 LET l= USR z
1628 IF ATTR (j+1,y)=150 THEN
POKE z+3,0: POKE z+5,2: POKE z+2
4,29: LET l= USR z: LET s=s+35:
LET u=u-1: PRINT #0; AT 1,8; PAP
ER 8;s; AT 1,1;u;" "
1630 IF ATTR (j-1,b)=6 THEN GO
SUB 4400
1635 IF ATTR (j+1,y)=6 THEN PO
KE z+3,150: LET l= USR z: POKE z
+3,70: PRINT AT j,y;" ": LET j=
j+1: GO TO 1625
1637 PRINT AT j,y;" ": NEXT j
1642 PRINT AT j,y; INK 6;"G"
1650 IF j=20 THEN PRINT INK 1;
PAPER 5; AT 20,y;e$(e): POKE z+
3,60: POKE z+5,30: POKE z+24,28:
LET l= USR z: LET g=g+1: PRINT
#0; AT 1,22; PAPER 8;g: IF g=20
THEN LET e=e+1: GO TO 7000
1672 LET f=f+2*(f<23): PRINT AT
21,0; INK 3;"ENERGY"; INK 2;"RR
RR";: FOR j=5 TO f: PRINT INK 4
;"R";: NEXT j
1699 RETURN
3205 POKE z+3,130: POKE z+5,2: P
OKE z+24,28: LET l= USR z
3210 LET u=u-1: LET s=s+15: PRIN
T #0; AT 1,1; PAPER 8;u;" "; AT
1,8;s
3220 PRINT INK 1; PAPER 5; AT x
+2,y;e$(e)
3230 LET f=f-2: PRINT AT 21,f+6
;" ": IF f=0 THEN GO TO 4000
3299 RETURN
4005 PRINT AT 21,0; INK 6; FLAS
H 1;"ENERGY"
4010 IF s>h THEN LET h=s
4020 LET c=0: LET e=1: LET s=0
4025 POKE z+3,0: POKE z+5,25: PO
KE z+24,28: LET l= USR z
4080 PRINT AT 21,0; INK 5; FLAS
H 1;" ALL ENERGY LOST "; INVERS
E 1;" PRESS A KEY "
4090 IF INKEY$ <> "" THEN GO
TO 4090
4091 IF INKEY$ ="" THEN GO TO
4091
4099 GO TO 9200
4210 POKE z+3,30: POKE z+5,255:
POKE z+24,28: LET l= USR z
4220 LET f=f-4: PRINT AT 21,f+6
;" ": IF f<1 THEN GO TO 4000
4230 PRINT AT a,b; OVER 1; INK
8;c$(i); AT a+1,b;i$(i)
4250 LET a=18: LET b=1+29* INT (
RND *2): PRINT AT a,b; OVER 1;
INK 8; PAPER 8;s: RETURN
4410 PRINT AT a,b; OVER 1; INK
8;c$(i); AT a+1,b;i$(i): RE
TURN
4430 FOR k=1 TO 8: POKE z+5,k: L
ET l= USR z: LET l= USR z: NEXT
k: POKE z+5,5
4440 PRINT AT a,b;" "; LET a=18
: LET b=1+29* INT ( RND *2): PRI
NT INK 8; OVER 1; AT a,b;c$(i);
AT a+1,b;i$(i)
4450 LET s=s+85: PRINT #0; AT 1,
8; PAPER 8;s: RETURN
6003 PAPER 0: INK 7: BORDER 0: C
LS
6005 CLEAR ( USR "a")-100
6010 RESTORE 6010
6015 LET z=( USR "a")-99
6016 LET m=0
6020 FOR i=z TO z+28
6025 READ j: LET m=m+j: POKE i,j
: NEXT i
6026 FOR i= USR "a" TO USR "r"+
7
6027 READ j: LET m=m+j: POKE i,j
: NEXT i
6028 IF m <> 16582 THEN PRINT "
ERROR IN DATA...6030-6094": STOP
6030 DATA 199,17,16,2,38,1,58,72
,92,31,31,31,14,254,238,16,237,1
21,67,16,254,37,32,244,1,21
6050 DATA 32,232,251,112,154,159
,61,93,117,124,56,8,62,93,157,21
,116,119,7,14,89,249,188,186,174
,62,28,16,124,186,185,168,46,238
,224
6060 DATA 43,184,109,46,228,62,1
64,25,0,255,54,127,0,0,0,0,60,66
,0,255,126,126,60,60
6070 DATA 231,36,60,126,255,153,
255,126,0,0,0,0,0,129,102
6080 DATA 239,239,239,0,254,254,
```

```
254,0,66,126,66,126,66,126,66,12
6
6090 DATA 40,40,40,40,40,40,40,4
0
6091 DATA 36,60,126,255,153,255,
126,231,36,36,36,231,231,0,0,0
6093 DATA 8,8,28,28,62,62,119,99
,73,107,34,62,28,28,8,8
6094 DATA 255,239,221,179,78,53,
72,18,0,1,1,255,255,0,0,0
6200 LET a$="AC": LET b$="BD": L
ET e$="JOJAG": LET f$="KORFK": L
ET g$="LPPLP"
6210 LET c$="HI": LET i$="NM"
6220 LET c=0: LET e=1: LET s=0:
LET h=0: LET f=24
6230 DIM d$(5,24): POKE z+24,28:
LET d$(1)="Burrowville Fire Sta
tion": LET d$(2)="  The Roof G
arden  ": LET d$(3)="  Fire S
tation Basement ": LET d$(4)="
fice  ": LET d$(5)="  Benny's Of
Storeroom  "
6300 GO TO 9200
7003 LET c=c+1
7005 IF e>5 THEN LET e=1
7010 LET u=0: LET g=0
7020 CLS
7030 FOR j=2 TO 20: PRINT INK 2
;3;" ";d$(e);" "
7040 PRINT PAPER 2; INK 6; AT 0
,j; AT j,0;" "; AT j,31;" ": NEXT
j
7041 PRINT INK 3; AT 1,1;"(g2)"
; AT 0,1;"(ig2)"; PAPER 1; AT 0,
2;"(g2)"
7042 PRINT INK 3; AT 0,30;"(ig1
)"; AT 1,30;"(g1)"; PAPER 1; AT
0,29;"(g1)"
7060 FOR j=4 TO 20 STEP 4: FOR k
=0 TO 31: PRINT AT j,k; INK 1; P
APER 5;e$(e): NEXT k: PRINT IN
K j/4; PAPER 0;"FFFFFFFFFFFFFFFF
FFFFFFFFFFFFFFFF": NEXT j
7065 FOR j=4 TO 16 STEP 4: LET 1
= INT ( RND *15)+1: PRINT AT j,1
;1; INK 4; AT j+1,1+15;" "; AT j
+1,1+15;" ": NEXT j
7080 FOR j=1 TO 3: PRINT AT j,0
; INK 2;"J"; AT j,31;"J"; AT j+1
6,0;"J"; AT j+16,31;"J": NEXT j
7320 FOR i=4 TO 16 STEP 4: LET k
=0
7322 LET j=( INT ( RND *8))*4+1
7324 IF ATTR (i,j)=41 THEN FOR
l=-2 TO 1: PRINT INK 4; AT i+1
,j;g$(e); NEXT l: LET k=k+1
7326 IF k<3 THEN GO TO 7322
7328 NEXT i
7330 FOR i=4 TO 16 STEP 4: LET k
=0
7332 LET j=( INT ( RND *15))*2+1
7334 IF ATTR (i,j)=41 AND ATTR
(i+4,j)=41 THEN FOR l=1 TO 4:
PRINT INK 3; AT i+l,j;f$(e): NE
XT l: LET k=k+1
7336 IF k<3 THEN GO TO 7332
7338 NEXT i
7340 FOR i=4 TO 16 STEP 4: LET k
=0
7350 LET j=2*(1+ INT ( RND *14))
7355 IF ATTR (i,j)=41 THEN PRI
NT AT i,j; INK 6;"G": LET k=k+1
7360 IF k<5 THEN GO TO 7350
7370 NEXT i
7450 LET f=24: PRINT AT 21,0; I
NK 3;"ENERGY"; INK 2;"RRRR"; INK
4;"RRRRRRRRRRRRRRRRRR"
7456 PRINT #0; PAPER 2; AT 0,0;"
LFIRES LSCORE LHIGH LG LSCREENL
L L L L
7460 PRINT #0; PAPER 8; AT 1,1;u
; AT 1,8;s; AT 1,15;h; AT 1,22;g
; AT 1,25;c
7470 LET u=0: LET x=2: LET y=30:
LET a=18: LET b=1+29* INT ( RND
*2)
7480 PRINT OVER 1; INK 8; AT x,
y;a$(2); AT x+1,y;b$(2); AT a,b;
c$(2); AT a+1,b;i$(2)
7605 POKE z+3,0: POKE z+5,2: POK
E z+24,29
7610 LET l= USR z: RESTORE 9296
7620 FOR j=1 TO 32: READ k: BEEP
.12,k-40: IF INKEY$ ="" THEN
NEXT j: GO TO 7610
7690 GO TO 100
9205 CLS : POKE z,243: PRINT ''
PAPER 2;"  Benny Bunny  - FIREF
IGHTER  "; AT 21,0;"1=INSTRUCTI
ONS  0=START GAME"
9207 FOR j=5 TO 18: PRINT INK 1
; PAPER 5; AT j,0;"JJKJJJJOJJJJJ
LJJJJPJJJJKJJJJJLJJJ"; AT j, RND
; INVERSE 1;"E"; INK 2; PAPER 6;"E"
9208 PRINT AT 13,0; INK 4;"GFFG
FFFFFFFFFFFFFFFFFFFFFFGFG"
9215 POKE z+29,201
9220 FOR n=52 TO 28 STEP -12: RE
STORE 9296
9230 FOR j=4 TO 19: FOR i=1 TO 2
9235 PRINT AT 14,j;" ";a$(i);"
";c$(i); AT 15,j;" G";b$(i);"
";i$(i)
9250 READ k: BEEP .1,k-n: NEXT i
: PRINT AT 14,j;"  "; AT 1
5,j;"  "; PAUSE 5: NEXT j
9280 IF INKEY$ ="" THEN NEXT n:
GO TO 9220
9285 IF INKEY$ ="0" THEN GO TO
6301
9296 DATA 30,54,30,42,30,66,30,5
4,28,52,28,40,28,64,28,52,33,57,
33,45,33,69,33,57
9297 DATA 30,42,54,66,30,42,30,6
6
9340 CLS : INK 6: PRINT '''"BENN
Y IS THE NEW RECRUIT IN THE BURR
OWVILLE FIRE SERVICE.
HE IS LEFT IN CHARGE, THE FIRE
BUG TRIES TO BURN DOWN THE FIRE
STATION !"
9345 PRINT '''"BENNY MUST PUT OUT
THE FIRES BY STAMPING ON THEM,
OR BY RUNNING OVER A FIRE BUCKET
WHICH WILL FALL ON TO THE FLA
MES."
9350 PRINT '''"HE LOSES SOME ENER
GY WHEN HE STEPS ON A FIRE, O
R IF HE BUMPS INTO THE FIREBUG."
9355 PRINT ''' INVERSE 1;"ALSO H
E LOSES ENERGY VERY FAST IF THE
RE ARE MORE THAN 7 FIRES ON THE
SCREEN AT THE SAME TIME. "
9360 PRINT '''"THE GAME ENDS IF B
ENNY LOSES ALL HIS ENERGY."
9365 PRINT '''"HE GAINS EXTRA ENE
RGY WHENEVER HE TOUCHES A FIRE
BUCKET."
9370 PRINT '''"HE GETS POINTS FOR
PUTTING OUT FIRES, AND IF HE D
ROPS A BUCKET ON TO THE FIREBUG
S HEAD, HE GETS A BONUS AND T
HE FIREBUG IS SENT BACK TO TH
E CORNER."
9375 PRINT '''''''"IF BENNY DROPS
ALL 20 BUCKETS TOTHE BOTTOM OF
THE SCREEN, HE WILL RESTART O
N A NEW SCREEN."
9380 PRINT PAPER 2;''''
CONTROLS
T ";"  LEFT...9  ": PRIN
..0  "  RIGHT..
9385 PRINT '''"BENNY WILL CLIMB T
HE LADDERS TO MOVE UP, AND SLIDE
DOWN THE POLES TO MOVE DOWN
.''''
9470 INK 7: PRINT #0;"
S A KEY TO START"  PRES
9480 PAUSE 0: GO TO 9200
```

Light Fingered Larry

Larry is a robber who has just broken into the strongroom of the City Bank. The door has slammed shut behind him, and the burglar alarm is ringing. The only way to escape is to reach the door with the same amount of money in his swag bag as that in the City Bank bag. Each of the bags in the strongroom contains a positive or negative amount of money, so jumping from one to another allows him to alter the contents of his swag bag.

Light Fingered Larry was written for the Spectrum by A Gordon of Cramlington, Northumberland.

```
  1 BORDER 0: BRIGHT 1
  2 LET bh=0
  5 GO SUB 9000: GO TO 8000
 40 INK 4: FOR n=0 TO 22: PRINT
 AT 0,n;"H"; AT 20,n;"H": NEXT
n
 50 FOR n=1 TO 19: PRINT  AT n,
0;"H"; AT n,22;"H": NEXT n
 60 FOR n=23 TO 31: PRINT  AT 1
6,n;"H"; AT 20,n;"H": NEXT n
 70 PRINT  INK 3; AT 0,26;"FG";
 AT 1,26;"D(isp)E"; AT 2,25;"B(3
*isp)C"; AT 3,23;"YOUR SWAG"
 80 INK 5: PRINT  AT 4,26;"FG";
 AT 5,26;"D(isp)E"; AT 6,25;"B(3
*isp)C"; AT 7,23;"CITY BANK"; AT
 8,25;"TOTAL"
 90 PRINT  INK 6; AT 10,23;"THI
S HAUL"; AT 13,23;"BEST HAUL"
100 LET sc=0
110 LET ct= INT ( RND *50)+5
115 PRINT  PAPER 5; INK 0; AT 6
,26;"#  "; AT 6,27;ct
120 PRINT  PAPER 3; INK 7; AT 2
,26;"#0 "
121 PRINT  INK 6; AT 11,26;"#
"; AT 11,27;sc; AT 14,26;"#";bh
125 FOR n=1 TO 17 STEP 4
130 INK 3: PRINT  AT n,2;"FG  F
G  FG  FG  FG "
135 PRINT  AT n+1,2;"D(isp)E D(
isp)E D(isp)E D(isp)E D(isp)E"

140 PRINT  AT n+2,1;"B(3*isp)A(
3*isp)A(3*isp)A(3*isp)A(3*isp)C"
: NEXT n
150 PRINT  FLASH 1; INK 2; PAPE
R 6; AT 18,23;"EXIT"; AT 17,22;"
H"; AT 18,22;"H"; AT 19,22;"H"

195 PAPER 3: INK 9
200 REM **SET*SWAG*VALUES**
205 DIM a(5,5)
210 FOR x=1 TO 5: FOR y=1 TO 5

220 LET a(x,y)= INT ( RND *30)-
15
225 PRINT  AT x*4-1,y*4-2;a(x,y
)
230 IF a(x,y)>0 THEN  PRINT  AT
x*4-1,y*4-2;"+";a(x,y)
235 NEXT y: NEXT x
499 REM **MAIN*GAME**
500 LET yt=0: LET v=2: LET w=3:
LET ti=1000
520 PRINT  AT v,w;"I"
525 LET ti=ti-1
530 IF ti<40 THEN  BEEP .25,10:
 BEEP .20,8: PRINT  FLASH 1; PAP
ER 0; AT 21,1;"THE POLICE ARE CO
MING"
535 IF ti <= 0 THEN  GO TO 7000

550 IF  INKEY$ ="5" THEN  LET w
=w-4: PRINT  AT v,w+4;" ": GO SU
B 5000
555 IF  INKEY$ ="8" THEN  LET w
=w+4: PRINT  AT v,w-4;" ": GO SU
B 5000
560 IF  INKEY$ ="6" THEN  LET v
=v+4: PRINT  AT v-4,w;" ": GO SU
B 5002
565 IF  INKEY$ ="7" THEN  LET v
=v-4: PRINT  AT v+4,w;" ": GO SU
B 5002
600 GO TO 510
4999 REM **MOVES**
5000 IF w<3 THEN  LET w=3
5001 IF w>19 THEN  LET w=19
5002 IF v<2 THEN  LET v=2
5003 IF v>18 THEN  LET v=18
5025 LET yt=yt+a(v/4,w/4)
5030 IF yt<0 THEN  LET yt=0
5035 IF yt>99 THEN  LET yt=99
5040 PRINT  AT 2,27;"  "; AT 2,2
7;yt
5045 FOR b=1 TO 4: BEEP .015,0:
NEXT b
5050 IF yt=ct AND v=18 AND w=19
THEN  GO TO 6000
5100 RETURN
6000 PAPER 0
6005 PRINT  AT 17,22;" "; AT 19,
22;" "
6010 FOR n=21 TO 30: PRINT  AT 1
8,n;" I": BEEP .015,n: NEXT n
6020 RESTORE 6030
6025 FOR b=0 TO 7: READ r,s: BEE
P r,s: NEXT b
6030 DATA .35,20,.30,20,.09,23,.
2,21,.2,20,.2,18,.2,16,.2,28
6040 FOR n=1 TO 19: PRINT  AT n,
1;"                          ": NEXT
n
6045 PRINT  AT 21,0;"
          "; AT 18,31;" "
6060 PRINT  AT 7,6;"YOU MADE IT"
; AT 9,2;"GET SET FOR ANOTHER";
AT 11,8;"ROBBERY"
6062 LET sc=sc+yt
6065 IF sc>bh THEN  LET bh=sc
6070 FOR n=0 TO 250: NEXT n
6100 GO TO 110
7000 REM **OUT*OF*TIME**
7010 RESTORE 7020: FOR b=0 TO 10
: READ r,s: BEEP r,s: NEXT b
7020 DATA .45,0,.3,0,.15,0,.45,0
,.3,3,.15,2,.3,2,.15,0,.3,0,.15,
-1,.45,0
7030 PAPER 0: CLS : PRINT  AT 8,
10;"YOU'RE NICKED"; AT 10,1;"PRE
SS ANY KEY FOR ANOTHER GAME"
7040 PAUSE 0
8000 PAPER 5: INK 0: CLS
8020 PRINT  TAB 4;"I LIGHT FINGE
RED LARRY I"
8030 PRINT '" Larry has just rob
bed the City  Bank, but the stro
ngroom door   has closed behind
him.A special combination holds
the door      tight shut. The on
ly way to     escape is to dash
around the    room adding  and t
aking away    the amounts of  ma
ney that are  marked on the swag
-bags."
8040 PRINT '" The aim is to fini
sh at the     <EXIT> with the sa
me amount of  money in your swag
-bag as the   City Bank. See how
 many times   you can rob the ba
nk before     YOU'RE NICKED."
8050 PRINT ''; TAB 5;"PRESS ANY
KEY TO PLAY"
8490 PAUSE 0
8500 PAPER 0: CLS
8510 GO TO 40
9000 RESTORE 9010: FOR n= USR "a
" TO  USR "i"+7: READ a: POKE n,
a: NEXT n
9010 DATA 129,195,231,231,231,23
1,195,129,1,3,7,7,7,7,3,1,128,19
2,224,224,224,224,192,128
9020 DATA 15,31,63,127,127,255,2
55,255,240,248,252,252,254,255,2
55,255,28,30,15,7,3,1,3,15,39,11
1,110,110,124,248,246,15
9025 DATA 251,251,251,0,223,223,
223,0,126,255,153,153,231,189,66
,126
9999 RETURN
```

Fisher

Sitting patiently by your fishing line you feel a small tug from below. Is it a fish, or have you hooked another boot? Decide quickly whether to haul in your catch or let it go. Fish bring points with them, boots end your game.

Fisher was written for the 16K ZX-81 by Jaap ud Boon of Katwyk aan Zee, Netherlands.

```
  1 REM +-----THE FISHER-----+
  2 REM + AUTHOR: J V/D BOON +
  3 REM + HOORNESLAAN 581    +
  4 REM + KATWIJK A/ZEE Z.H. +
  5 REM +--------------------+
  6 GOSUB 1000
 10 LET A$="ZX-81"
 20 LET HS=0.
 30 CLS
 40 RAND
 50 PRINT AT 0 0;"+------------
----------------"
 60 PRINT AT 20,0;"+------------
----------------"
 70 PRINT AT 5,5;"BEST FISHER:"
;A$;AT 8,5;"HI-SCORE:";HS
 80 PRINT AT 9,23;"O";TAB 15;"=
=====▄▄▄";TAB 15;"I      ▄▄▄";TAB
 15;"I    ▄▄▄";TAB 15;"I  ▄▄▄
▄▄▄";TAB 15;"I    ▄X X";TAB 15;"
I";TAB 15;"I";TAB 15;"I";TAB 15;
"J"
 90 PRINT AT 21,0;"**********▛
▀▀▀▀ ▀ ▀▜**********"
100 IF INKEY$="" THEN GOTO 100
110 IF INKEY$<>"" THEN GOTO 110
120 LET S=0
130 CLS
140 POKE 16418,0
150 PRINT AT 3,5;"SCORE:0";AT 1
7,0;"********************"
160 FOR Y=16 TO 23
170 PRINT AT Y,21;"▄▄▄▄▄▄▄▄▄▄"
180 NEXT Y
190 PRINT AT 10,23;"O";TAB 15;"
=====▄▄▄";TAB 15;"I      ▄▄▄";TA
B 15;"I    ▄▄▄";TAB 15;"I  ▄▄▄
▄▄▄";TAB 15;"I    ▄X X";TAB 15;
"I";TAB 15;"I";TAB 15;"I";TAB 15
;"J"
200 PRINT AT (5*RND)+18,(RND*20
);"▛";AT (5*RND)+18,(RND*20);"▜"
;AT (5*RND)+18,(RND*19);"  ";AT
(5*RND)+18,(RND*19);"  ";AT 18,1
5;"I"
210 IF INKEY$<>"" THEN GOSUB 30
0
220 GOTO 200
300 PRINT AT 18,15;"  ";AT 17,15
;"  ";AT 16,15;"  ";AT 15,15;"  ";A
T 14,15;"  ";AT 13,15;"  ";AT 12,1
5;"  ";AT 11,15;"  "
310 PRINT AT 11,22;"▛";AT 10,22
;"▌";AT 9,22;"▙";AT 8,22;"I";AT
7,22;"I";AT 6,22;"I";AT 5,22;"I"
;AT 4,22;"I";AT 3,22;"I------?"
320 PRINT AT 19,15;
330 LET N=PEEK (PEEK 16398+256*
PEEK 16399)
340 IF N=171 THEN GOSUB 400
350 IF N=157 THEN GOTO 500
360 PRINT AT 11,22;"  ";AT 10,22
;"  ";AT 9,22;"  ";AT 8,22;"  ";AT
7,22;"  ";AT 6,22;"  ";AT 5,22;"  "
;AT 4,22;"  ";AT 3,22;"  "
370 PRINT AT 19,15;"J";AT 18,15
;"I";AT 17,15;"I";AT 16,15;"I";A
T 15,15;"I";AT 14,15;"I";AT 13,1
5;"I";AT 12,15;"I";AT 11,15;"===
===▄▄▄"
380 RETURN
400 PRINT AT 3,29;"▛"
410 LET S=S+10
420 PRINT AT 3,11;S
430 RETURN
500 PRINT AT 3,29;"▜";AT 1,2;"▛
YOU HAVE CAUGHT A BOOT▜"
510 FOR T=0 TO 100
520 NEXT T
530 IF S>HS THEN GOTO 600
540 GOTO 30
600 CLS
610 POKE 16418,2
620 PRINT AT 10,1;"YOUR NAME PL
EASE (MAX. 6)"
630 INPUT A$
640 IF LEN A$>6 THEN GOTO 630
650 LET HS=S
660 GOTO 30
1000 PRINT TAB 8;"THE FISHER"
1010 PRINT
1020 PRINT """THE FISHER"" IS A
GAME WHERE YOU",,"HAVE TO CATCH
AS MUCH FISHES AS",,,"YOU CAN,BU
T LOOK OUT FOR THE",,"BOOTS....
.....THEY ARE",,,"THE EN
D OF YOUR FISHINGPLEASURE."
1030 PRINT
1040 PRINT "FISH=""▛""",,"BOOT="
"▜"""
1050 PRINT
1060 PRINT "FOR DRAWING UP THE F
ISHING-ROD  YOU CAN USE EVERY KE
Y"
1070 PRINT
1080 PRINT "GOOD LUCK..."
1090 PRINT AT 21,0;"**********▛
▀▀▀▀ ▀ ▀▜**********"
1100 IF INKEY$="" THEN GOTO 1100
1110 IF INKEY$<>"" THEN GOTO 111
0
1120 RETURN
2000 SAVE "FISHER"
2010 RUN
```

Guardian of the Prism

Your quest, as the mighty prismatic warrior, is to solve the riddle of the Eternal Prism by entering the mauve cave at its summit. The guardian of the prism stands in your way. Climb the prism using the blue tunnels and the magic red caves.

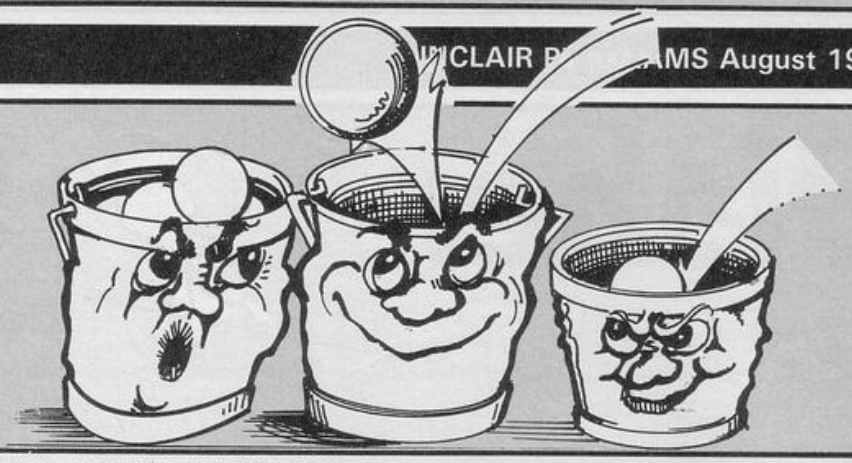
Guardian of the Prism was written for the Spectrum or Spectrum Plus by Stephen Burke of Scrafield, Lincolnshire.

```
  2 BRIGHT 0: BORDER 7: PAPER 7
: INK 9: CLS : BRIGHT 1
  5 GO SUB 9000: REM UDG
  6 GO SUB 8000: REM INSTRUC
 10 REM DRAW PRISM
 15 LET a$="
                "
 20 FOR f=0 TO 15: PLOT 235,15:
 DRAW  INK 4;f,10: DRAW  INK 4,-
f+3,135: NEXT f
 40 FOR f=2 TO 18 STEP 2
 50 PRINT  AT f,0; PAPER 4; BRI
GHT 1;a$; AT f+1,0; BRIGHT 0;a$

 60 FOR g=1 TO 2: PRINT  PAPER
4; INK (g+((f=2) AND G=2)); AT f
+1,1+ RND *27;"A": NEXT g
 70 NEXT f
 80 FOR f=0 TO 10: PLOT 0,15: D
RAW  BRIGHT 0; INK 7;f,135+f: DR
AW  INK 7;-f,10: NEXT f
 100 REM SET VARIABLES
 200 INPUT  FLASH 1;"SPEED (TRY
8)>";L: IF  NOT L THEN  GO TO 20
0
 500 LET T=0: LET a=4: LET b=11:
 LET C=0: LET x=20: LET y=11
 900 LET X1=X: LET Y1=Y: LET A1=
A: LET B1=B
1000 PRINT  INK 7; BRIGHT 1; AT
A1,B1; PAPER 8;" "; AT A,B;"B"

1100 PRINT  BRIGHT (x1 <> 20); A
T x1,y1; PAPER 8;" "; AT X,Y; BR
IGHT (X <> 20);"C"
1200 LET X1=X: LET Y1=Y: LET A1=
A: LET B1=B
2000 IF a=x AND b=y THEN  FOR i=
0 TO 10: OUT 254, RND *255: PRIN
T  FLASH 1; INK  RND *7; PAPER
RND *7; AT a,b;"*": BEEP .03,i:
BEEP .05,i-20: NEXT i: PAUSE 0:
PRINT  PAPER 4; BRIGHT 1; AT A,B
;" "; AT X,Y;" "; PAUSE 0: GO TO
 500
2100 IF  ATTR (x-1,y)=99 THEN  B
EEP .03,0: PRINT  PAPER 4; AT x,
y;" "; FOR f=-30 TO 50: PRINT  A
T x-1,y; INK  RND *7;"C": BEEP .
01,f: PRINT  AT 21,5; PAPER 1+ R
ND *7;"WELL DONE  TIME=";T: NEXT
 F: PAUSE 0: RUN
3000 REM MOVE GUARDIAN
3010 IF  ATTR (a-1,b)>96 THEN  L
ET c=0: BEEP .03,0: LET a=4+( IN
T ( RND *6))*2:
3020 IF  RND >.3 THEN  LET b=b+(
b<y AND B<28)-(b>y AND b>1)
3030 IF  RND >.3 THEN  LET C=C+1
: IF C=L THEN  LET A=A+2*((A<X A
ND (A+2)<20)-(A>X AND A-2>2)): L
ET C=0
4000 REM MOVE WARRIOR
4010 IF  INKEY$ ="7" AND  ATTR (
x-1,y)=98 THEN  BEEP .03,30: LET
 xx=x: LET x=B+( INT ( RND *6))*
2: IF  RND >.7 THEN  LET x=xx-(2
 AND xx<2)
4020 IF  INKEY$ ="7" AND  ATTR (
x-1,y)=97 THEN  BEEP .03,0: LET
x=x-2
4040 LET y=y+( INKEY$ ="8" AND Y
<28)-( INKEY$ ="5" AND Y>1)
6000 LET T=T+1: GO TO 1000
8001 PRINT  BRIGHT 0; AT 6,5;"YO
U THE WARRIOR C                MU
ST REACH THE MAUVE             CA
VE AT THE TOP OF THE           ET
ERNAL PRISM.THERE ARE          MA
GIC CAVES TO HELP YOU          EN
TER THEM AT YOUR PERIL         BY
 USING KEY 7
                               KE
Y 5=LEFT  8=RIGHT              BE
WARE OF THE GUARDIAN B         IT
 CAN CHANGE LEVELS             BU
T HOW OFTEN DEPENDS            ON
 THE SPEED YOU INPUT"
8100 PAUSE 0: RETURN
9000 FOR f=0 TO 22: READ a: POKE
  USR "a"+f,a: NEXT f
9001 DATA  BIN 00011000
9002 DATA  BIN 00111100
9003 DATA  BIN 00111100
9004 DATA  BIN 01111110
9005 DATA  BIN 01111110
9006 DATA  BIN 11111111
9007 DATA 0
9008 DATA  BIN 11111111
9100 DATA 60,127,153,255,36,126,
129,0
9200 DATA  BIN 00011000
9201 DATA  BIN 00111100
9202 DATA  BIN 01011010
9203 DATA  BIN 10011001
9204 DATA  BIN 11111111
9205 DATA  BIN 01011010
9206 DATA  BIN 00100100
9207 DATA 255
9500 RETURN
9999 SAVE "PRISM" LINE 1
```

Bucket Stall



At the Spectrum fairground you come upon the Bucket Stall. This stall tests your judgement, for you must throw balls into buckets which are placed at different distances from you. Input the strength which you feel is necessary to throw each of the balls into the buckets.

Bucket Stall was written for the Spectrum or Spectrum Plus by C Baker of Chesterfield, Derbyshire.

Underlined letters are those to be entered in graphics mode.

```
 10 BORDER 6: PAPER 6: INK 1: C
LS : GO SUB 290: PRINT  AT 0,10;
"BUCKET STALL"''" You must judge
 the strength"''" (200min-450max
) to throw the"''" ball into the
 bucket."''" You have 10 balls."

 20 FOR r=1 TO 4: BEEP .3,24: B
EEP .3,12: NEXT r: FOR r=1 TO 2:
 FOR n=0 TO 36 STEP .5: BEEP .00
5 ,n: NEXT n: PRINT  AT 18,2;"PR
ESS ANY KEY": PAUSE 0: CLS : LET
 shots=0: LET hi=0: LET sc=0: LE
T b$=""
 30 PRINT  PAPER 4; INK 1; AT 0
,0;"CCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCC"; AT 21,0;"CCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCC"
 40 FOR N=0 TO 9: PRINT  PAPER
4; INK 1; AT N,0;"C": NEXT N: FO
R N=17 TO 21: PRINT  PAPER 4; IN
K 1; AT N,0;"C": NEXT N: FOR N=0
 TO 21: PRINT  PAPER 4; INK 1; A
T N,31;"C": NEXT N
 50 FOR n=17 TO 20: PRINT  PAPE
R 2; INK 1; AT n,1;"!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!": NEXT n
 60 PRINT  INK 0; AT 5,2;"A"; A
T 5,10;"AAA"; AT 5,15;"AA"
 70 PRINT  BRIGHT 1; AT 21,6;"2
00"; AT 21,14;"300"; AT 21,25;"4
00"; AT 18,10;"BUCKET STALL"
 80 LET f= INT ( RND *18)+10: F
OR N=6 TO 9: PRINT  PAPER 2; INK
 1; AT N,1;"!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!": NEXT N: PRINT  AT 7
,8;"10 BALLS FOR 10P"
 90 FOR N=10 TO 16: PRINT  INK
0; AT N,2;" ": NEXT N
 100 PRINT  AT 14,1; INK 0;"A";
AT 15,1;"B": PRINT  PAPER 2; INK
 0; AT 15,2;"E"
 110 IF shots=9 THEN  GO TO 230

 120 LET shots=shots+1: PRINT  A
T 1,1; PAPER 7; INK 1;"BALLS:";s
hots; AT 3,9;"YOUR SCORE=";sc; A
T 1,9;"HI-SCORE=";hi;" by ";b$

 130 INK 0: PRINT  AT 15,f;"CD":
 LET p=40: INPUT "STRENGTH ?(200
 TO 425)";rng
 140 IF rng>425 THEN  PRINT  FLA
SH 1; INK 0; AT 15,5;"STRENGTH T
OO HIGH!!!": PAUSE 100: PRINT  P
APER 6; AT 15,5;"
     ": GO TO 130
 150 IF RNG<200 THEN  PRINT  FLA
SH 1; INK 0; AT 15,5;"STRENGTH T
OO WEAK": PAUSE 150: FLASH 0: PR
INT  AT 15,5;"
     ": GO TO 130
 160 PRINT  AT 9,3;"STRENGTH=";r
ng
 170 LET a=rng* COS ( PI *p/180)
: LET b=rng* SIN ( PI *p/180): F
OR x=0 TO b/16 STEP .5: LET c=.0
1*(b*x-16*x*x)
 180 IF a*x>6200 THEN  GO TO 220

 190 PLOT  PAPER 6; INK 0;.04*a*
x+12,4*c+50: BEEP .005,c+25: NEX
T x
 200 IF  ABS (a*b/3200-f)<1 THEN
 GO TO 220
 210 PRINT  AT 9,16; INK 0; FLAS
H 1;"MISSED": BEEP .5,-20: PAUSE
 150: CLS : GO TO 30
 220 PRINT  AT 10,10; INK 0; FLA
SH 1;"YOU GOT IT": FOR N=-10 TO
20: BORDER 1: BORDER 2: BORDER 3
: BORDER 4: BORDER 5: BORDER 6:
BEEP .03,n: NEXT n:: NEXT n: LET
 sc=sc+1: PAUSE 50: CLS : GO TO
30
 230 IF sc>0 AND hi<sc THEN  LET
 hi=sc: CLS : GO TO 260
 240 PRINT  FLASH 1; AT 5,2;"END
 OF GAME"; FLASH 0;" ANOTHER GO
(Y/N) ?": INPUT a$
 250 IF a$="y" OR a$="Y" THEN  L
ET sc=0: LET shots=0: CLS : GO T
O 30
 255 IF a$="n" OR a$="N" THEN  S
TOP
 270 PRINT  AT 5,2;" BEST SCORE
SO FAR"; AT 7,1;" ENTER INITIALS
 max.8 letters": INPUT b$
 280 LET shots=0: LET sc=0: CLS
: GO TO 30
 290 FOR i=1 TO 5: FOR n=0 TO 7:
 READ a: POKE  USR  CHR$ (i+143)
+n,a: NEXT n: NEXT i: RESTORE 30
0
 300 DATA 56,56,60,56,56,112,112
,127
 310 DATA 248,248,248,248,248,11
2,112,112
 320 DATA 192,192,96,96,48,48,25
5,255
 330 DATA 3,3,6,6,12,12,255,255

 340 DATA 3,3,6,48,48,96,192,255,2
55
 350 RETURN
```

STAY ALIVE!

Out on the launch pad in your space ship, the area suddenly begins to fill up with aliens. Instead of taking off your new objective is merely to stay alive. Shoot down the aliens for as long as you can.

Stay Alive was written for the Spectrum or Spectrum Plus by Jonathan Boutell of Bedford, Bedfordshire.

Underlined letters are those to be entered in graphics mode.

```
  1 RESTORE
 10 REM defender graphics
 20 FOR n=0 TO 7: READ a: POKE
USR "a"+n,a: NEXT n
 30 DATA 192,240,60,63,63,60,24
0,192
 40 FOR n=0 TO 7: READ a: POKE
USR "b"+n,a: NEXT n
 50 DATA 3,15,60,252,252,60,15,
3
 60 FOR n=0 TO 7: READ a: POKE
USR "c"+n,a: NEXT n
 70 DATA 255,153,187,255,255,24
,36,195
 80 LET a$="A": LET b$="B"
 90 LET x=20: LET y=0
 95 INK 0: CLS
 100 PRINT  AT 0,0;"          Def
ender               "
 110  PRINT  AT 1,0;"The object
of the game is to    stay alive
as long as possible  by shooting
 the invading aliens.Points are
scored for the time  it takes fo
r the aliens to kill you.You die
 if you crash into an alien
                      To move your
spaceship you use  ~q~ for up
                      ~a~ for dow
n                     ~o~ for lef
t                     ~p~ for rig
ht                    ~m~ to fire
"
 115 PRINT  AT 19,0;"Input level
 1-5 (1 is easiest)": INPUT c
 116 IF c>5 THEN  GO TO 115: IF
c<0 THEN  GO TO 115
 120 PAUSE 0
 130 CLS
 140 BORDER 7: PAPER 7: INK 1: C
LS
 145 FOR d=0 TO c*50
 146 PRINT  AT  RND *21, RND *31
;"C": NEXT d
 160 INK 0
 165 LET c$=a$
 170 PRINT  AT x,y;c$
 181 BEEP .05,10
 182 PRINT  AT  RND *21, RND *31
; INK 1;"C"
 185 PRINT  AT x,y;" "
 190 IF  INKEY$ ="q" AND x>0 THE
N  LET x=x-1
 200 IF  INKEY$ ="a" AND x<21 TH
EN  LET x=x+1
 210 IF  INKEY$ ="o" AND y>0 THE
N  LET y=y-1: LET c$=b$
 220 IF  INKEY$ ="p" AND y<31 TH
EN  LET y=y+1: LET c$=a$
 230 IF  INKEY$ ="m" THEN  GO TO
 1100
 300 IF  SCREEN$ (x,y) <> " " TH
EN  GO TO 1000
 310  GO TO 170
1000 LET t= INT ((256* PEEK 2367
3+ PEEK 23672)/50):  PRINT  AT 0
,0;"YOU ARE DEAD! YOUR SCORE WAS
 ";t: FOR n=1 TO 300: NEXT n: RU
N
1100 IF c$=a$ THEN  GO TO 9000

1200 IF c$=b$ THEN  GO TO 8000

8000 FOR a=y-1 TO 0 STEP -1: PRI
NT  AT x,a; INK 2;"-": NEXT a
8010 FOR a=y-1 TO 0 STEP -1: PRI
NT  AT x,a; INK 2;" ": NEXT a: G
O TO 235
9000 FOR a=y+1 TO 31: PRINT  AT
x,a; INK 2;"-": NEXT a
9010 FOR a=y+1 TO 31: PRINT  AT
x,a; INK 2;" ": NEXT a: GO TO 23
5
```

3D TRAIN TRAX

Standing at the railway track, watching the trains go by, you suddenly notice that there are unconscious people on the railway tracks. Could they have been overcome by poison gas? Are they victims of mass hysteria? You have no way of knowing. What is apparent is that there is no way to stop the trains, and you must get those people off the tracks as quickly as possible.

3D Train Trax was written for the 16K ZX-81 by Hai Ngo of Spencer, Northampton.

```
  1 GOSUB 600
  5 LET HS=0
  6 LET H$="ZX81"
 10 LET S=0
 15 LET A$="
                                                "
 20 LET A=14
 30 LET B=23
 40 FAST
 50 FOR F=0 TO 5
 60 PRINT AT F,0;"
                                                "
 70 NEXT F
 80 PRINT AT 6,0;"
                                                "
                    ;AT 21,0;"
                                                "
 90 PRINT AT 1,8;"3D TRAIN TRAX
";AT 3,5;"SCORE";AT 3,19;"HI-SCO
RE";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 V=INT (RND*3)
180 IF V=0 THEN LET C=7
190 IF V=1 THEN LET C=12
200 IF V=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$="6")-(5 AND A>9 AND INKEY$="
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;S;AT 4,21;HS
370 RETURN
400 PRINT AT 11,11;"GAME  OVER"
410 IF S>HS 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 PLS
E ENTER YOUR NAME"
501 PRINT AT 17,7;"IN INVERSE L
ETTERS"
510 INPUT B$
520 LET HS=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 REQIRE
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 TRA"
710 RUN
```

Listing 2

```
  10 REM 00000000000000000000000
00000000000000000000000000000000
00000000000000000000000000000000
0000000000000
  20 REM 100 CHARACTERS IN LINE
10
  30 LET A=16514
  40 LET A$="2A0C40230E1606207EF
E00200236802310F6230D20F0C92A0C4
0230E167E23061F562B72232310F92B7
723230D20EEC901D6022A0C40095401D
6022A0C4009545D01B5022A0C4009EDB
82A0C400122000906203600231OFBC90
0000000"
  50 POKE A,16*CODE A$+CODE A$(2
)-476
  60 LET A=A+1
  70 IF A=16607 THEN GOTO 100
  80 LET A$=A$(3 TO )
  90 GOTO 50
 100 SLOW
 110 PRINT AT 21,0;"DATA OK..."
 120 PRINT AT 0,0;"NOTE:DO NOT E
DIT OR DELETE       TRAILING CHAR
ACTERS IN LINE 10   OR THE MACHIN
E CODE WILL CRASH"
 130 POKE 16510,0
 140 PRINT AT 10,
0;"LINE ONE NOW
 LINE 0"
 150 STOP
9000 SAVE "M"
9010 FAST
9020 LIST
```

Alien Lander

The aliens are here! Shoot them down before they land. Move left with key A, right with key D and fire with J.

Not the most original of scenarios, but this version of Alien Lander incorporates a machine code scroll, making it fast-moving. Enter listing one, which is the machine code loader, followed by listing two.

Alien Lander was written for the 16K ZX-81 by Andrew Pitcher of Dursley, Gloucestershire.

Listing 2

```
   0 REM E£RND7;-"4 7( PLOT 7$4
LIST TAN E£RND7;-?77( RAND F277$
4 INPUT TAN "CHR$ "E£RND=??"  "E£
RND= GOSUB E£RND" 6 ="40 7( CLS
TAN

  10 LET PAPER=16514
  20 LET INK=16528
  30 LET LINE=16418
  40 LET LEFT=16537
  50 LET DOWN=16562
  60 LET CODE=PEEK 16396+256*PEE
K 16397+1
  70 LET SCORE=0
  80 LET HIGH=0
  90 LET SHIP=3
  94 POKE 16524,00
  95 LET ALIEN=0
  96 GOSUB 500
 100 LET MOVE=3
 110 POKE LINE,0
 120 POKE INK,128
 130 LET DRAW1=28
 140 LET DRAW2=INT (RND*10)+1
 150 PRINT AT DRAW2,DRAW1;"
                          "
 160 FOR I=0 TO INT (RND*20)
 170 PRINT AT 22,MOVE;"
                          "
 180 IF INKEY$="A" AND MOVE>3 TH
EN LET MOVE=MOVE-1
 190 IF INKEY$="D" AND MOVE<28 T
HEN LET MOVE=MOVE+1
 200 IF INKEY$="J" THEN GOTO 700
 210 LET SCROLL=USR LEFT
 220 NEXT I
 230 FOR J=DRAW2 TO 22
 240 PRINT AT 22,MOVE;"
                          "
 250 IF INKEY$="A" AND MOVE>3 TH
EN LET MOVE=MOVE-1
 260 IF INKEY$="D" AND MOVE<28 T
HEN LET MOVE=MOVE+1
 270 IF INKEY$="J" THEN GOTO 900
 300 LET SCROLL=USR DOWN
 310 NEXT J
 320 LET ALIEN=ALIEN+1
 330 IF ALIEN=3 THEN GOTO 350
 340 GOTO 140
 350 FOR I=0 TO 5
 360 NEXT I
 370 CLS
 380 RAND USR PAPER
 390 PRINT AT 10,7;" NEVER GIVE
UP ? "
 400 LET SHIP=SHIP-1
 410 IF SHIP=0 THEN GOTO 2000
 420 FOR I=0 TO 30
 425 LET ALIEN=0
 430 NEXT I
 440 CLS
 450 GOTO 140
```

1	Knight Lore	Ultimate
2	Daley's Decathlon	Ocean
3	Jet Set Willy	Software Projects
4	Lords of Midnight	Beyond
5	Matchday	Ocean
6	Sabre Wulf	Ultimate
7	The Hobbit	Melbourne House
8	Manic Miner	Software Projects
9	Booty	Firebird
10	Underwurlde	Ultimate

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3	Airwolf	Elite
4	Horace goes Skiing	Psion
5	3D Tunnel	New Generation

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