

MSX

COMPUTING



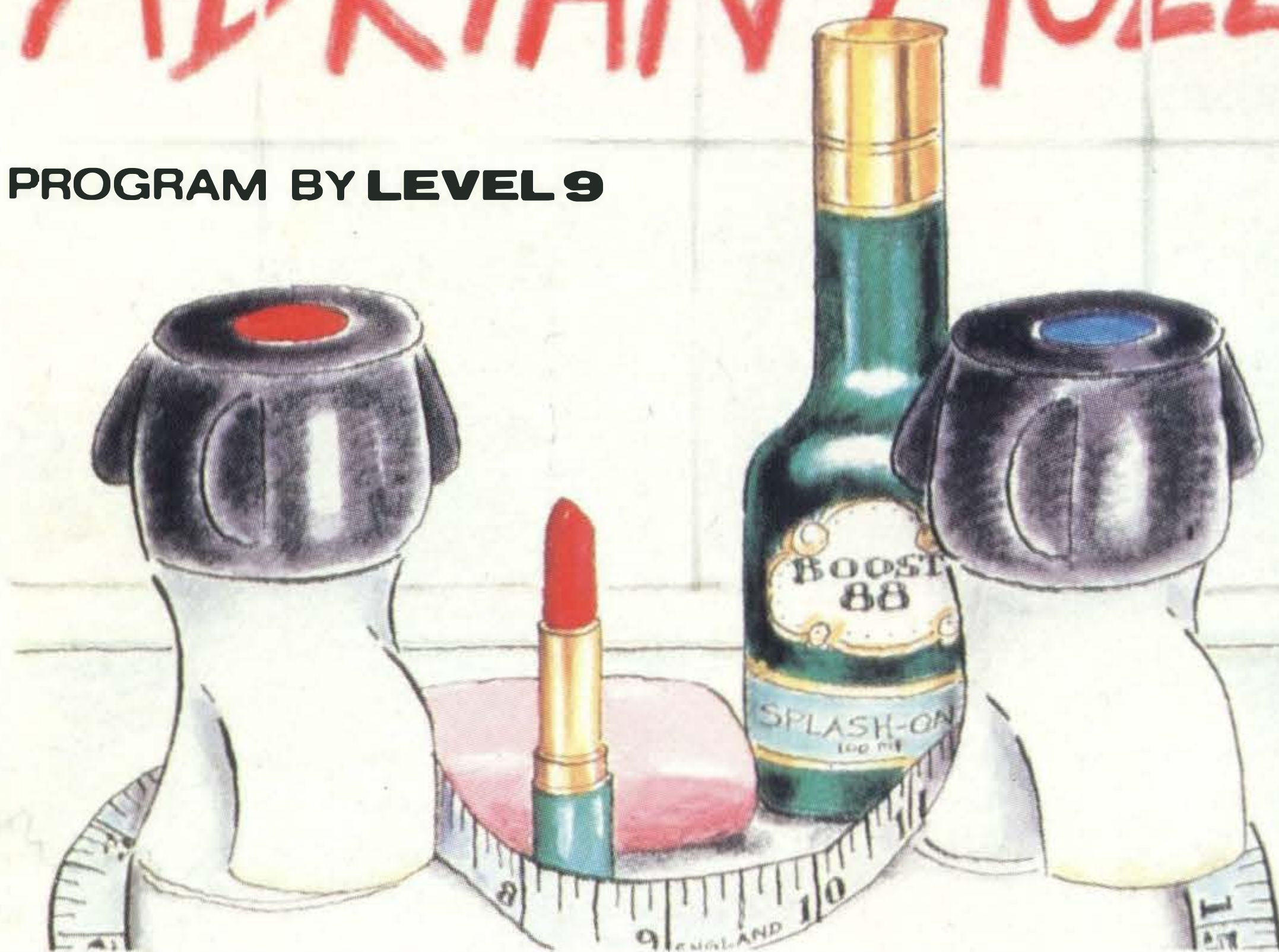
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ARCADE MAPS**

PLUS: USING THE "MISSING" 32K

CONVERSING WITH YOUR MSX

Sue Townsend THE GROWING PAINS OF ADRIAN MOLE

PROGRAM BY LEVEL 9



Virgin Games presents the computer version of "The Growing Pains of Adrian Mole." Based on Sue Townsend's best-selling book, and the popular TV series, the game allows you to help Adrian with day-to-day decisions. It's a text-based game with beautiful illustrations* and your aim is to make Adrian as popular as possible through your answers to multiple-choice questions. This four part game covers 18 months in the life of aspiring intellectual, Adrian, and is available for 7 different computers.

*BBC B version is not illustrated.

Produced by Mosaic Publishing Ltd.

The Growing Pains of Adrian Mole is available from all good software stockists.

If you have trouble finding it you can buy directly from Virgin Games.

Please **encircle the software you require** and send this tear-off to **Virgin Games Mail Order, 2-4 Vernon Yard, Portobello Road, London W 11 2DX**. Make cheques or crossed postal orders payable to Virgin Games Ltd. Please do not post notes or coins.

COMPUTER FORMAT	PRICE	RELEASE DATE
Spectrum 48/128 CASS	£9.95	10 February 1987
Commodore 64/128 CASS	£9.95	10 February 1987
Amstrad CPC CASS	£9.95	10 February 1987
BBCB CASS	£9.95	17 February 1987
MSX 64k CASS	£9.95	17 February 1987
Atari 400/800XL/XE CASS	£9.95	17 February 1987
Amstrad CPC 6128 DISC & PCW 8256/8512 DISC	£14.95	17 February 1987

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MSX COMPUTING

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FEBRUARY/MARCH 1987

READER CONTACT

MSX Computing is about to come under new management. Steve Mansfield is taking over as editor starting with the April/May issue. Steve is probably the most experienced writer on MSX in the English language, and long-term readers will remember his spell as deputy editor on *MSX Computing* right from the very first issue. Since leaving the magazine to pursue a freelance career he has stayed in touch by writing occasional articles for MSX readers and he brings to the magazine a wealth of technical experience.

One of his greatest assets as editor will be the extraordinary quality of the material contributed by the readers. Many computer magazines find it hard to know what their readers want. The *MSX Computing* postbag brings us 20 or 30 readers' letters every day, many addressed to our special arcade, adventure and program listings departments, and many containing valuable information which can then be shared with the whole readership. As an example, just turn to one of the three arcade game maps in this issue. They all started off as reader contributions.

If you have something to say about any aspect of using MSX computers, write in with your ideas. There's no need to send in a complete article as the first stage — a clearly written synopsis (up to about 200 words) will do if you want to see what we think of an idea. The kind of article we are looking for is between 1,200 and 2,000 words long, with some potential for illustration. We have facilities for re-drawing diagrams, and we can re-write your prose if necessary, so you don't have to be a combination of Arthur C. Clark and Leonardo Da Vinci. However, you should be in a position to give us clearly typed or word-processed text, double spaced, with writing on one side of the paper only. In particular we are interested in commissioning a complete MSX machine-code course, starting completely from scratch, to run over several issues. Write to us if you are interested.

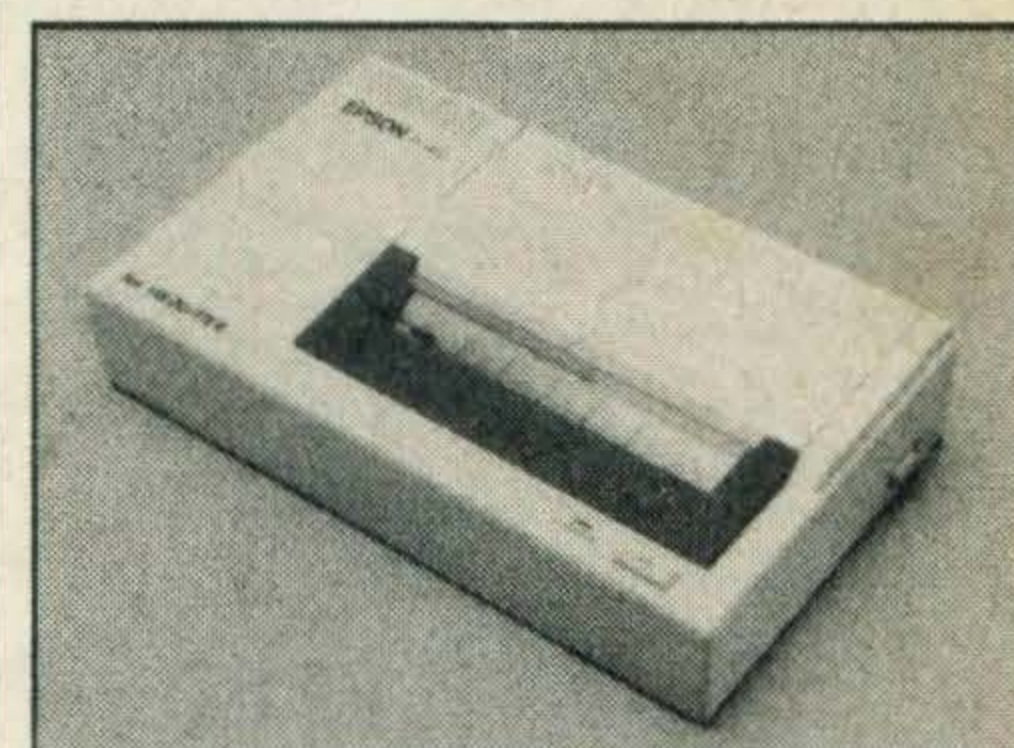
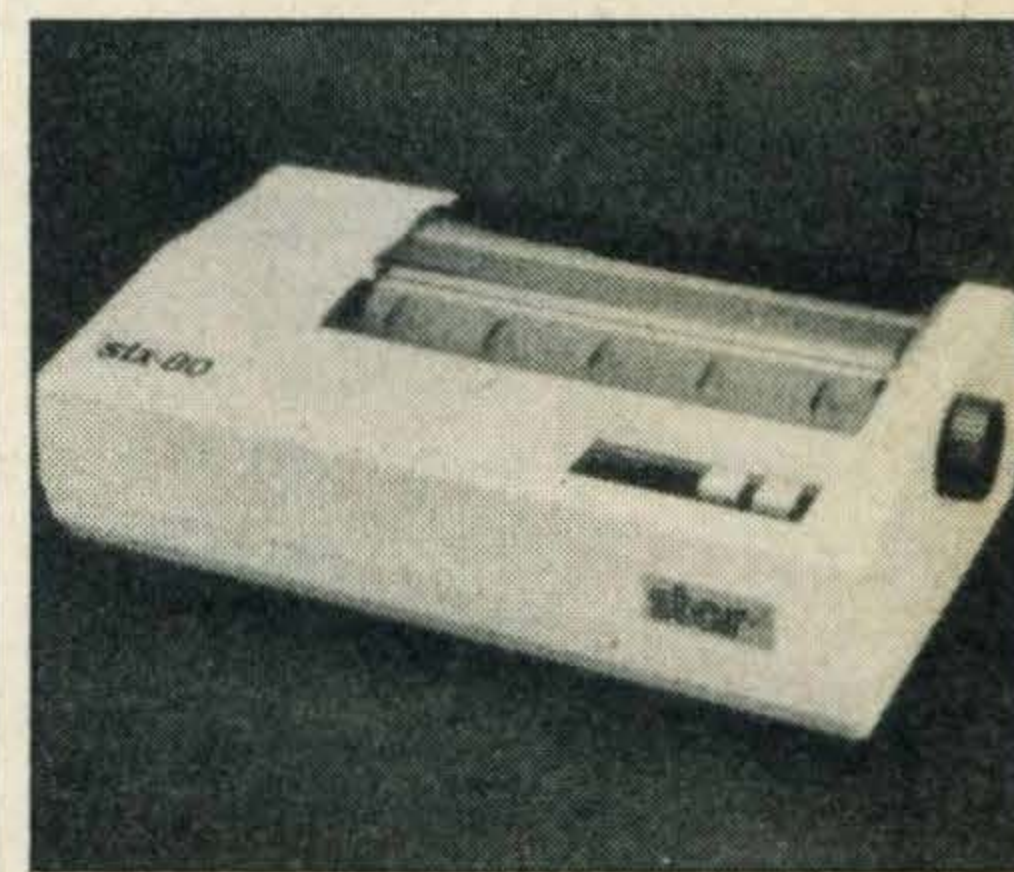
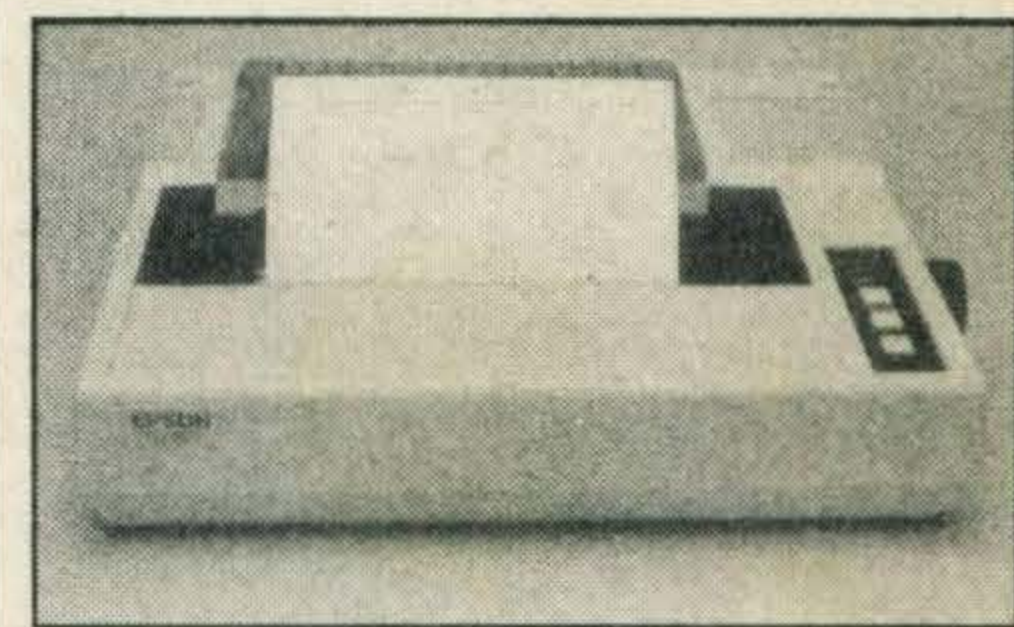
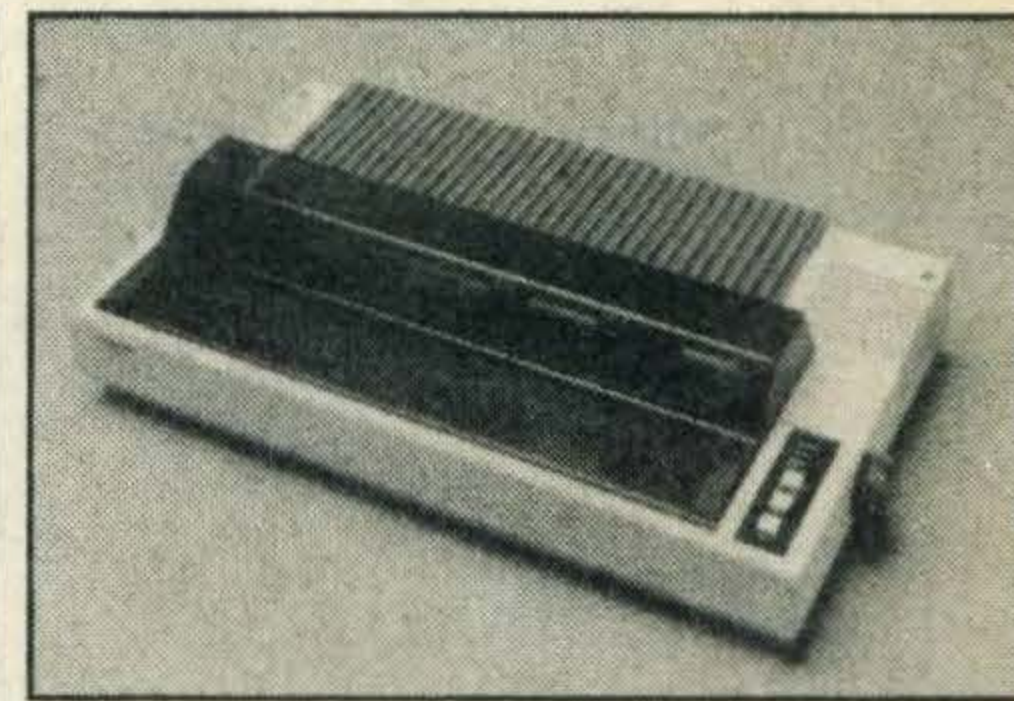
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Interactive adventure

Imagine a dismal world in which you are nothing but a lowly Orc. Imagine decades of oppression by your heartless human rulers.

Okay, if you work for a publishing company you probably won't have to tax your imagination too hard. You'll already know what it feels like to be in the world of Level 9's latest game, *Knight Orc*, which is being distributed by Rainbird.

This is the latest and perhaps most ambitious of the company's adventures. *Knight Orc* boasts a high level of interaction with the characters, which lead independent lives. To solve the adventure you need to organise at least five of the characters to help you.

The game also has an improved interpreter — so important if you don't want to spend all your time trying to guess which words the program can understand. This one knows 1000, apparently.

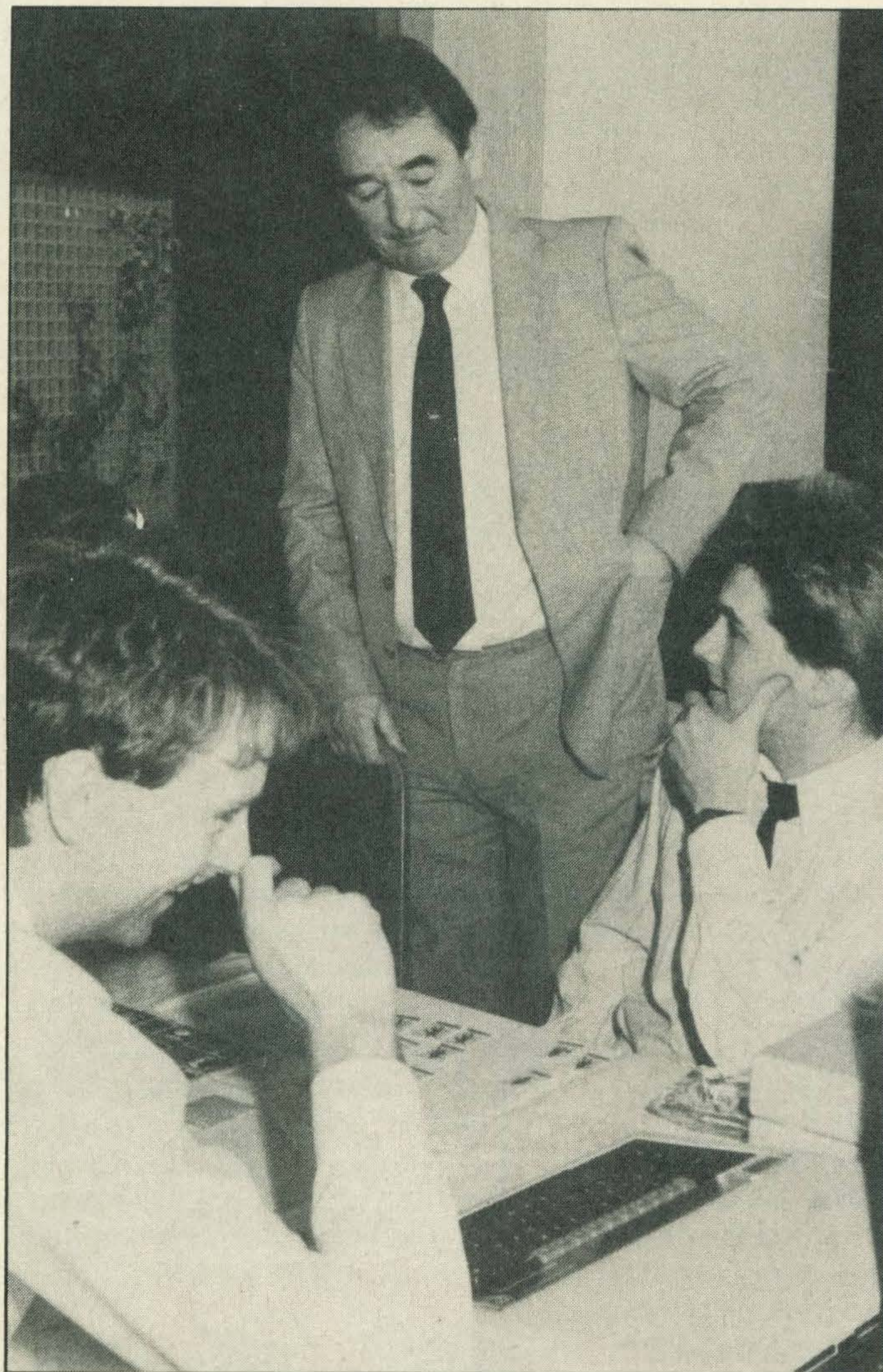
No price has yet been announced for the MSX version, but stay tuned.

Oh. By the way, apologies to Rainbird. The last issue of MSX Computing said that *Jewels of Darkness* is from Firebird when it's actually from Rainbird.

The writer responsible was doubtless confused by the multitude of names on the packaging, including Firebird, Rainbird and Level 9. All the same, the luckless scribe has been lightly boiled in oil for this error.

Eaglesoft prices

And the winner of last issue's competition to spot the deliberate mistake is... everyone who spotted the incorrect prices we gave on three of the software reviews. Just in case you are one of the three readers who didn't ring in to tell us all about the error of our ways, we listed three Eaglesoft games, *Fuzzball*, *Meaning of Life* and *The Ape Man Strikes Again*, all at the incorrect price of £2.99. The official tag is £7.95 each, taking them well out of the budget category.



Guess who put Superglue in Cloughie's pocket

You too can be Brian Clough

You'd be forgiven for thinking that a game called Brian Clough's Football Fortunes is another horror movie spinoff. But no, it's actually a football manager simulation.

We're not told if the game features an 'Over the Moon' table in place of the more usual high scores, or if it says 'You're fired' whenever you lose.

What we are told is that this is a game for two or more players who compete in the buying and selling, winning and losing of a single football season. Sounds like fun, although someone's bound to wind up as sick as a parrot.

The package includes the computer program and a game board and cards. All you need

to supply yourself is a 'sheepskin coat, flat cap and suitable list of clichés.

The game comes somewhat cheaper than buying a real football team, and has the other advantage that you don't have to turn out every Saturday to watch it lose. The price is £14.95

The biggest mystery surrounds the photograph which accompanies the launch of the program.

Why have we been subjected to this horrific view of what we assume is a top CDS executive picking his nose. Mr Clough, unable to watch, fumbles in his pocket for something. What could it be? A gun? A knife? A handkerchief?

Too good to be true?

Just because you want an MSX-2 machine doesn't necessarily mean that you have to forsake your current micro. A company by the name of MOS MSX Software in Hull is offering an upgrade system that just might turn MSX-1 machines into the new, advanced spec.

If we sound a little cagey it's because we haven't seen the device, and there are several nagging technical doubts. We're trying to contact the company for a review sample of the product so that we can give you the full low-down.

The adapter is claimed to work with any MSX micro having two cartridge slots. It gives you 128k video RAM, all eight MSX-2 screens, a battery-backed clock, extended Basic commands and RGB video output.

However, the device is said to conform to the minimum MSX-2 specification — which isn't saying a lot. That spec includes 64k of main memory, and that's all you'll get with this adapter. Most real MSX-2 micros will come with much more than that.

The adapter costs £89.99, which is a lot if you then find out that it doesn't give you complete MSX-2 compatibility. Still, if someone at MOS is reading this, we'd be delighted if you could put our minds at rest by sending us the gear.

Repair man

It's only when your computer dies that you realise how much you need it. Fortunately, help is at hand.

We've been contacted by Kevin Gallagher, who informs us that he can repair MSX micros. We can't personally vouch for his services, never having had a computer curl up its toes, but he may be worth contacting if your local shop just stares at your machine in horror.

Kevin is also writing an advanced engineering mathematics library in Basic.

If you want to contact Kevin, his address is: 1 East Street, Herne Bay, Kent.

House of Maxwell

It gives you a real warm glow inside when you see a family sticking together, even in the rough, tough world of software publishing.

What prompted these thoughts was a recent press release from Mirrorsoft. The release informed us that Pergamon Press has just acquired two US software companies — Spectrum Holobyte and Nexa Corporation — which are being merged to form the Sphere Corporation.

What's interesting about that is that the announcement wasn't made by Pergamon's boss, but by its deputy publisher, Kevin Maxwell.

Who is the top boss? Well, the fact that the release was issued by Mirrorsoft — a subsidiary of Pergamon — should



Captain Bob and his chopper

give you a clue. Yep, the top banana at Pergamon is none other than Kevin's dad, well-known friend of the unions and self-effacing newspaper publisher, Robert Maxwell.

Names, you see, are important to the Maxwells. That's why Pergamon is currently suing business software producer Lotus for alleged infringement of a trademark.

Branching out at CDS

Next time you're in your favourite games shop you may notice some new packages under the CDS label.

CDS is well known for its computer games, but under no circumstances should you try to stuff the new products into your cartridge slot or cassette machine. The chances are they won't fit anyway, but if you do manage to get them in you won't get them out again.

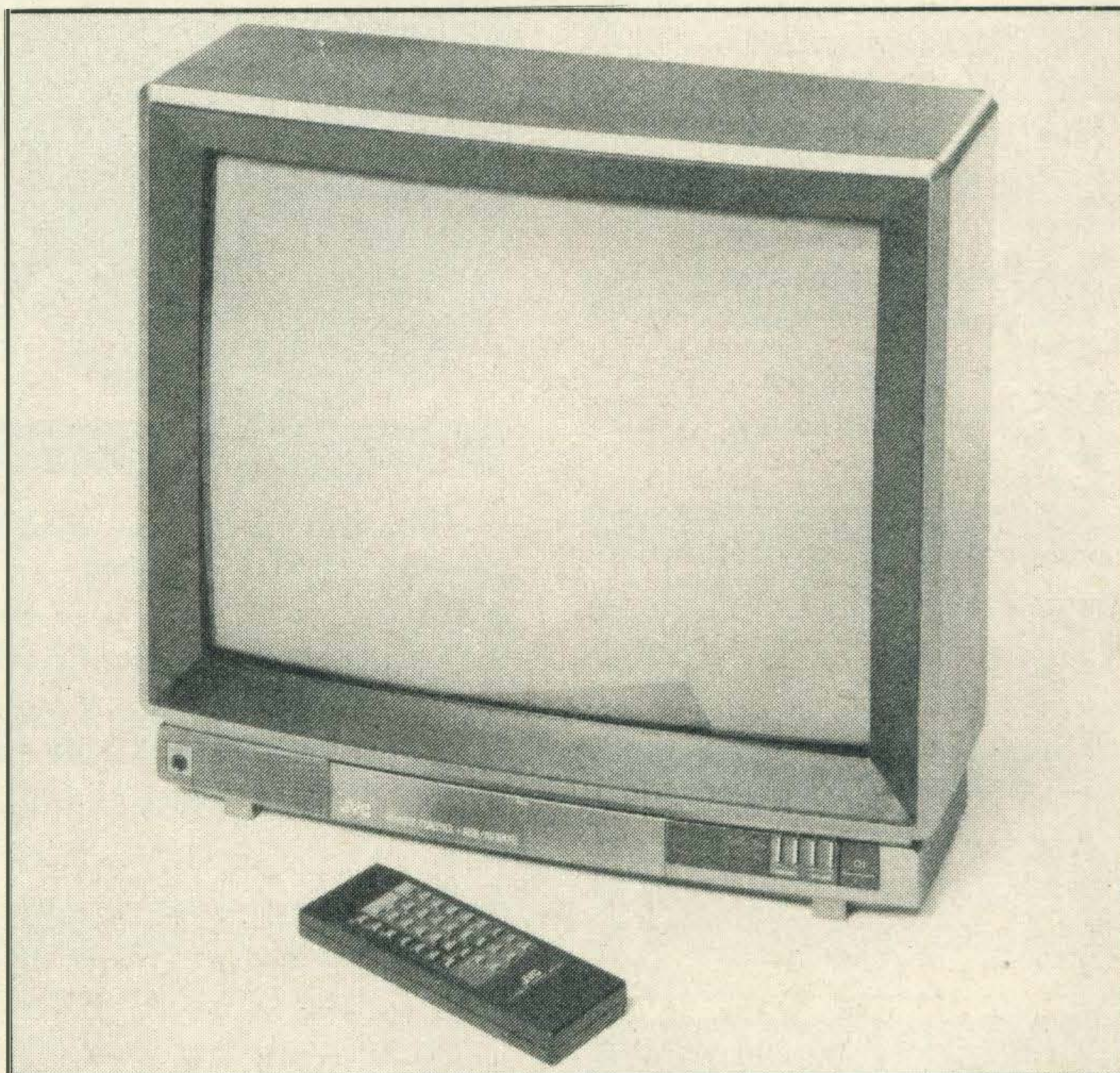
The reason for this apparent incompatibility? The new products are actually dedicated games machines, not software packages.

Under the Systema label, CDS has launched chess, bridge, draughts, backgammon, reversi and four-in-a-line machines.

Prices range from £19.95 for four-in-a-line to £199.95 for the Turbostar chess machine which has an IQ level roughly equal to 31 Sun readers.

Meanwhile, here at *MSX Mansions*, we're wondering why they bothered when there are so many excellent games machines already out there, all compatible with each other and with names like Toshiba, JVC, Sony, Mitsubishi . . .

TV technology



TV pictures are notoriously hard to caption

Although the company doesn't bother to mention it in the press handout, JVC's shiny new, high-tech TV can be used as an RGB computer monitor.

The TV, wittily entitled the C-210EK, has features like an FST tube, 30-channel preset facility, infrared control and the ability to handle virtually every broadcast system.

The promotional literature makes it sound more like a jet

fighter than a TV: 'used the most advanced computer aided design techniques . . . to push performance parameters to the limit . . . multi-function on-screen display' and that kind of thing. Just what you need to watch *Hancock's Half Hour*.

If you want a colour TV and you want a colour monitor, check it out. And in case you're wondering, it costs £370.

Adrian grows up

There's something terribly appropriate about *The Growing Pains of Adrian Mole* being released by Virgin, even if the game was produced by Mosaic.

The new game is a follow-up to *Diary of Adrian Mole*, and is timed to take maximum advantage of the TV serialisation.

Mosaic has teamed up with Virgin, the latter company being responsible for distribution and promotion. That seems fairly clear and simple, so to confuse matters we'll tell you that the game was actually programmed by Level 9.

When we tried to ring Virgin to find what the price of the game will be, the person we needed to speak to was at lunch. The time was 4.00 in the afternoon. These software people have impressive lunches. Undaunted, we found from our spies that the most likely price is £9.95.

Interfaces

Today *Chuckie Egg*, tomorrow the world. Your computer might look as though it's sitting in its own little universe, but in fact it has the capacity to reach out into the world at large.

All it needs to reveal these hidden talents is a little help. Electronic and Computer Workshop can supply this help. The company has launched a series of kits which provide MSX computers with the necessary interfaces with which to sense or control the outside world.

These cards include an eight-channel analogue input multiplexer (if you don't know what that means you won't want one), analogue-to-digital (A/D) and vice versa ports, a Centronics printer port (just in case you need another one), eight-channel logic input (useful for robotics), a real-time clock and a general purpose output card. Phew!

Prices for the cards vary, but the A/D converter, for example, is £22.22 and the real-time clock £46.10. You can contact the company on (0245) 262149.

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Konami simulator arrives

Flat out in top gear you hit 240 mph down the Mulsanne straight at Le Mans. Although this is the fastest point on the circuit, it is the only place where you have enough time to take in your surroundings; the glorious embers of sunset glowing against the mottled cloud-scape, the mind-numbing blare of the Porsche's turbocharged flat-six engine, the discomfort of the cramped driving position . . .

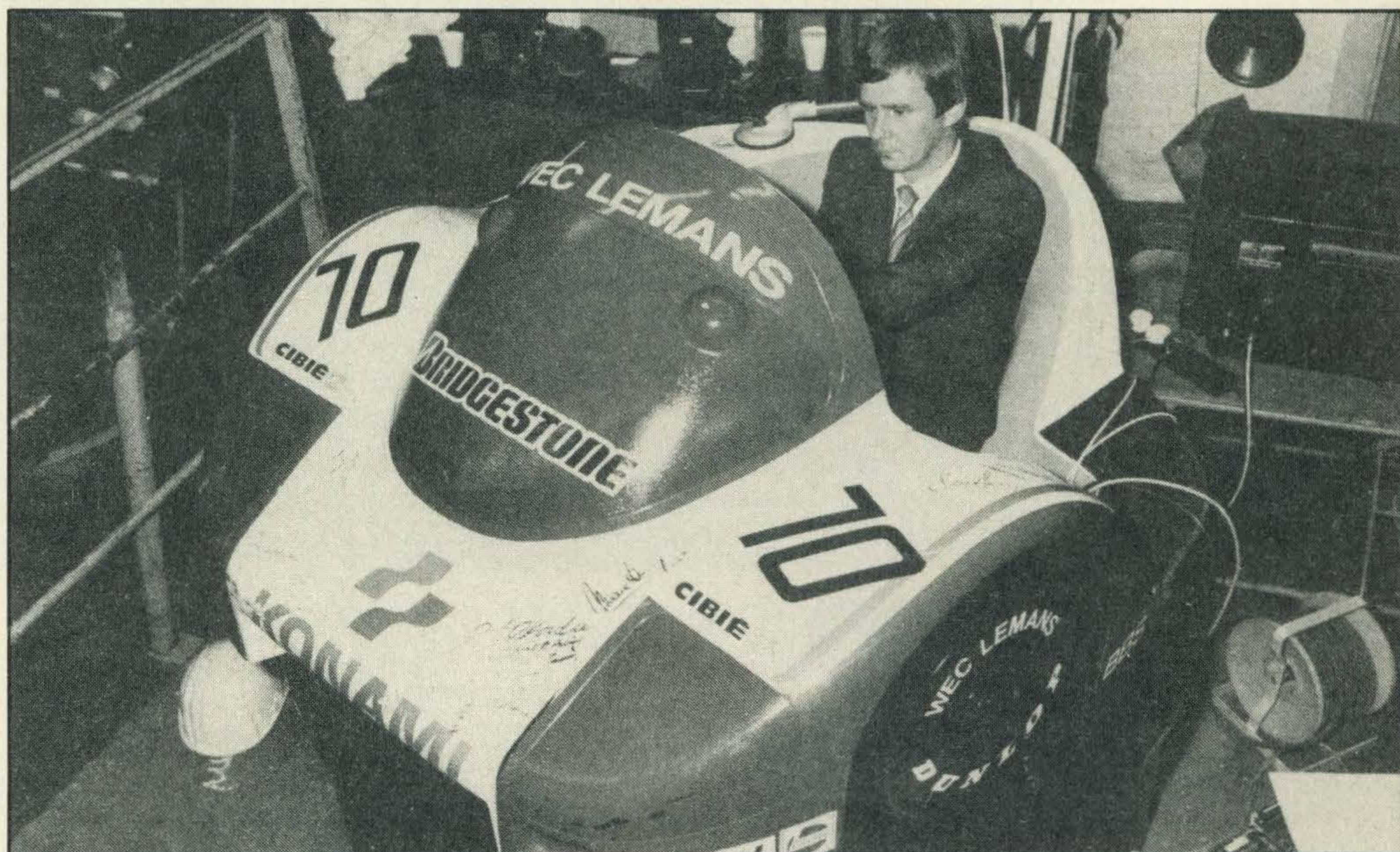
Whoops, better stop day-dreaming — here comes the corner already. Hard on the brakes and the 962C slows slightly, flames popping from the exhausts on the overrun. Puffs of tyre smoke reveal your error as you lock up the wheels in panic. A theoretically much slower Porsche 935 sweeps through on the inside, and you boot the power on as you sweep out of the corner.

Sliding out towards the edge of the track you brace yourself for the jarring thump of the wheels hitting the kerb. If you want to make it through to dawn, you'll have to stop making these stupid mistakes.

If all this had been for real, the *MSX Computing Racing Team* would have lasted about ten minutes of the famous Le Mans 24 hour endurance race. As it was, however, even the worst crashes were no problem. Just a push on the starter button put us back at the start of the race, with Konami's new racing car simulator bursting into noisy life once more.

Known in the trade as *WEC Le Mans 24* this arcade machine advances the state of the video game art.

Instead of standing in front of



Konami's marketing man tries his new company car

it, you climb in and sit down. The twelve-inch leather-bound steering wheel and right-hand gear lever fall readily to hand. One deviation from the genuine Porsche 962C is the two-speed semi-automatic transmission, but that's actually a bonus point, as you have more than enough to keep you busy once you are out on the track.

Moving off from rest the steering feels heavy but direct. An over-hasty twitch of the wheel lurches the whole simulator from side to side, and an accidental spin or crash rotates you violently from side to side, almost throwing you out of the seat.

The physical movement of the simulator puts it in a class of its own among arcade machines. Electro-hydraulic systems concealed within the base slew the cockpit up to 45

degrees left and right, reproduce tooth-rattling bumps and vibrations, and even give the driver feedback through the steering.

The computer power masterminding the system is formidable. The memory size of two and a half megabytes makes it equivalent to about forty MSX micros — enough to record all the landmarks of the famous Le Mans circuit in remarkable detail. The data in all this memory is manipulated by a number of custom processors, each dedicated to a specific function such as graphics, sound or movement.

And with what effect! The images produced are almost up to television quality; in fact, the overall level of realism is considerably better than can be achieved with laser disc games, where the contrast

between the pre-recorded background and the computer-generated foreground tends to destroy the illusion.

Among the hazards to be faced are competitors' cars which are quite likely to lose control and spin off the circuit right in front of you. Since 24 hours (the endurance of the real Le Mans event) would be rather a long time to spend sitting in an arcade machine, the Konami version of the race lasts about ten minutes. Assuming, of course, that you are good enough to qualify. Day turns gradually into night, just to add to your problems, and the sense of relief when the sun peeps back over the horizon is immense.

Over a hundred and fifty of these extraordinary machines have already been ordered by UK arcade owners.

Late bits and pieces

For when you're in an expansive mood, Star has launched a new printer — the wide carriage NX-15.

Star has never been shy about launching printers. The company has more models than you can comfortably shake a stick at. However, it seems to have struck gold recently with its 80-column NL-10 model, claiming that it

has taken around 25 per cent of that sector of the market.

Printers are obviously popular items out there, and a lot of you have been using them to let us know what you think. Great! Keep it up!

Our secretary has just struggled out from under an impressive pile of mail to give us some important news about user clubs.

Most of these clubs, she reliably informed us, run on shoestrings and are having trouble meeting the postage costs which have been the result of the enormous interest in these groups.

She went on to tell us that some of these clubs had written in — hence the mail mountain — to ask us to ask you to include an SAE whenever you write to

them. If you don't, sending you a reply could put the club out of business, which defeats the whole object. Just thought we'd mention it.

It's also worth mentioning that we can't reply to letters individually. Please don't send SAEs with your letters. When we have to write to people, we've been given permission by our publisher to buy a stamp.

The great shark hunt

This is a tale of everyday PR folk. Once upon a time, the boys and girls at Virgin Games used to sell lots and lots of software for home computers. Now they sell Virgin Games — in the publicity sense, that is. We'll leave all that stocks and shares nonsense to the pink papers.

One day, when the folks at Virgin had no new games to promote, and hadn't had their name in the magazines for a while, one of them looked up from his or her *Beano* and said: 'I've got an idea.'

Normally that would be a sacking offence, but that day everyone was bored with playing the usual office games of Pass the Buck and Hunt the Stapler so they decided to listen.

Let's take the company logo of a laughing shark,' said the owner of the idea, 'make a model of it and crash it into somebody's roof.'

No-one could come up with a reason why they shouldn't do this and so, lo and behold, it came to pass.

By a stroke of luck, verging on the miraculous, there was a photographer passing who managed to get this historic event on to film. Even more incredible, the laughing shark



You'll believe a shark can fly . . .

was once featured in a 1974 cartoon crashing a party by going through the roof. Amazing! What a coincidence! There is a Santa Claus!

Alas, we are unlikely to hear of the shark again. It has been

dropped as the Virgin Games logo. But, no doubt, we can rely on the Virgin publicity people to keep us busy with more ludicrous stories so that we don't have to waste our time worrying about the software.

Network developments

We've just been sent details of an interesting attempt at getting MSX owners to talk to each other.

MSX Network is a system of bulletin board-type systems exclusively for MSX users. It is being set up by Phillip Tate who hopes to 'strengthen the hold of MSX in the United Kingdom.'

The scheme is certainly ambitious. The idea is to run the system on MSX micros scattered around the country, which can communicate with each other for the purpose of relaying messages.

Phillip hopes to use MSX-2 micros to do the work—with the machines suitably tweaked to run three disk drives and a hard disk.

But don't be fooled into thinking that this is just another bulletin board with big ideas.

The whole operation is designed to be commercially viable, with companies being invited to take space on the system.

We're not talking about peanuts, either. Any company taking out a reasonably large area is looking at coughing up around £2000 a year.

As we said, it's an interesting idea, but doubts remain. Much as we love MSX computers, restricting the system to MSX owners will severely limit its appeal to advertisers and companies.

There's also some doubt about how far the system has got. In his covering letter, Phillip asks whether we're interested in writing the software to run it! He also says that the system will use MSX graphics, including the drawing routines, which

will involve users in buying special software to access the system. That will also put people off, and presumably that software hasn't been written either.

In the general information, Phillip mentions that he is looking for companies to design and manufacture cartridge modems and software, and expects the modems to be sold for £50 and the software developed free! Hmm. Doesn't sound like any company we know.

In the meantime, if you want to contact Phillip Tate, leave a message on the Stockton Fido bulletin board. This runs at 300 baud, eight data bits, one stop bit, no parity, and the number is (0642) 605838. The board can be accessed between 18.00 and 6.00 only.

EYP goes online

For those of you who prefer not to let your fingers do the walking, unless it's across the keys of your micro, you might be interested to hear that Yellow Pages is finally available online.

People with suitably equipped micros can dial the Electronic Yellow Pages (EYP) direct. Alternatively, Prestel account holders can now go via a gateway service.

The biggest surprise about this service is that it's free — if you forget about the fact that BT's charging you for the call.

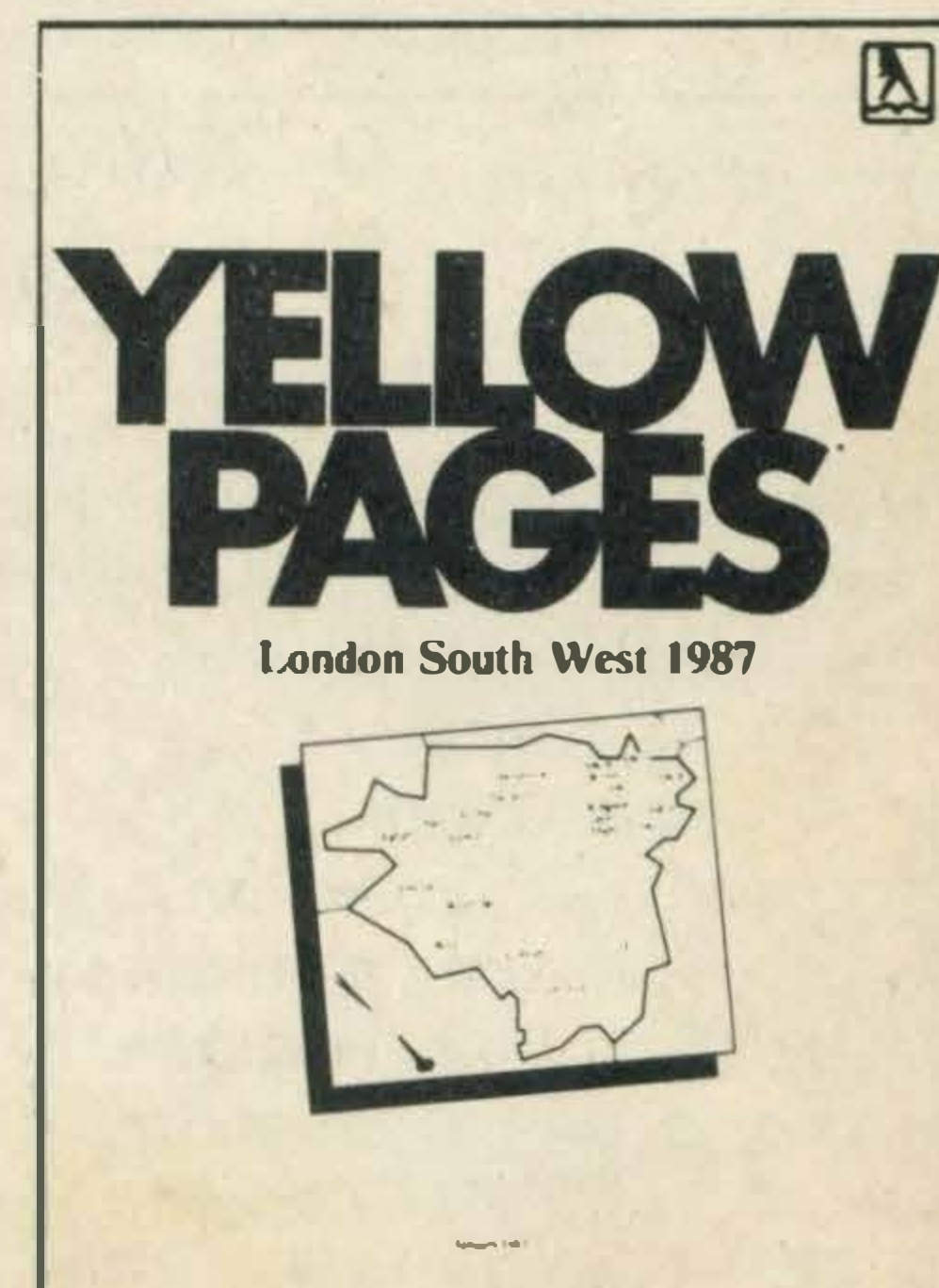
At the moment the coverage is not as extensive as the paper version. To start with, London, Reading, Guildford, Watford and St Albans will be the only areas covered.

All advertisers who take space in the paper edition will be entitled to do so on the electronic version — but, of course, that doesn't mean that they will. For example, only a quarter of the advertisers in the London South West edition have taken space on EYP.

The main advantage with EYP — apart from the fact that you no longer have to remember where you put the book—is that advertisers can display time-sensitive information.

The main disadvantage with EYP is that you can't use it to prop up a wobbly table.

Details on how to access the system will be included in all paper editions of the Yellow Pages for the areas covered. If you live outside these areas and still want to access the database, ring the EYP helpline on (0734) 506259.





Tank attack

muddle

Can you help me with a problem we encountered when entering the *Tank Attack* listing in your December/January issue? Some of the lines seem to be printed in the wrong order.

Andy Walker
Bristol

They are indeed. On page 63, the section from line 1230 to line 1460 should in fact be inserted into the middle of the right-hand column on page 62, following the normal order of ascending line numbers. The only tricky bit is that line 1460 has been split. The second part is 4,BF:GOSUB1230:GOTO160. You can find it on page 62 lurking between lines 1220 and 1470.

True MSX-2

I currently own a Sony Hit Bit and successfully run Yamaha's older music software on it. I am thinking of upgrading my system to MSX-2 by purchasing the Yamaha CX5M II/128 and new software. I await with interest your review of this computer, especially if it takes the form of a comparison with the old CX5M. Is the CX5M II truly an MSX-2 machine?

I am also looking for professional quality word processing software, and am considering Multitext, Aackotext, Wordstar and the Computermates word processor.

Lastly, is there an MSX-3 on the horizon? Is it likely that an MSX machine is being developed with the capabilities of the Atari 1040 ST or the Commodore Amiga?

Bryan Connell
Western Australia

We're afraid

it isn't . . .

The Yamaha CX5M II/128 is not an MSX-2 computer. It conforms to the standard MSX specification, but goes on to add some extra features of its own. These are mainly to allow new ver-

DOS7 BAG

Here's your chance to have a say. Have you been let down by a supplier lately? Or pleasantly surprised by the service you've received? Or perhaps you're just plain stuck on level 1,001 of your favourite arcade action megagame?

Whether it's a word of praise, a moan, programming tips or a word of advice, we want to hear from you. It's your page, so put pen to paper — now.

sions of the music cartridges to run.

A comparable approach was taken by Spectravideo with the X'Press, though in this case the improvements over the MSX specification are mainly aimed at users of CP/M software. The X'Press might well be worth considering if it is available in Australia.

Aackotext and the Computermates word processors are both available in rather nice MSX-2 versions. Sadly, in this country at least, the hardware manufacturers do not seem keen on selling MSX-2 computers to go with them. MSX-3 is no more than a vague whisper. The Motorola 68000 CPU would seem a sensible basis if the MSX manufacturers do decide to compete with Atari and Commodore.

MSX disks

I am writing in connection with the article Two's Company,

which dealt with adding a disk drive to your MSX. Does this include the Yamaha CX5M II (128K). I do not have this computer yet but would like this information for future reference.

Can you also tell me where to get more information on the CX5M, as every time I ask in various music shops I get conflicting replies.

J Tomlinson
Nottingham

The article you refer to only covers adding a second, cheaper disk drive to machines which already have one attached. Regrettably, you can't use a cheap drive as number one because you need the disk interface cartridge. This is only sold with the high-priced official disk drives from the mainstream MSX manufacturers.

For information on the CX5 range contact Yamaha on (0908) 71771, or write to the company at Mount Ave-

nue, Bletchley, Milton
Keynes MK1 1JE.

Interrupted

journey

Please can you help me with the *Dams Raid* listing in your December/January 1987 issue? I have successfully entered and run the first of the two listings. Part way through the second listing I had to break off, and therefore saved the program. I later completed this but now find that I have two separate listings. How do I join up these two programs to get Dam Raid to run?

My second listing, when run, stops at line 2260 with an overflow error.

Eric Harker
Huddersfield

Dam Raid should consist of two programs. The first program loads and runs, then the second program will automatically load (assuming it is next on the cassette). However, from your letter we suspect that you mean the second listing is split into two parts, as a result of the interruption when you were typing it in. You can join these together using the MERGE command — see your manual for details.

Low-cost

printing

In the December/January edition Steve Mansfield talks of budget printing. Some budget! My printer is a Tandy CGP-115 colour graphics printer/plotter which can be bought for as little as £50 in one of Tandy's frequent sales.

It has its limitations. Being slow (12cps) and using 4½ inch roll paper it is not really suitable for word processing. However, the print quality is good (it uses mini ball-points) and it can print in four colours and produce graphics. For producing the all-important listings and experimenting with graphics I find it excellent.

No mention was made of the cost of printer cables which can be high. Mine came from Maplin, PO Box 3, Essex, and cost £12.

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£159 TOSHIBA HXP550 PRINTER. Toshiba originally sold these at £349 but due to our bulk purchase we now have unbeatable deals on this quality dot matrix printer. It has a 2K memory buffer and is supplied with the cable to connect it to ANY MSX1 or MSX2 computer. It prints at 105 cps in superscript, subscript, Pica, Condensed, Proportional or Elite fonts. The type can be varied from 5 to 17 characters per inch. It uses ordinary fanfold or single sheets of paper up to A4 size.

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We also have models with single or double disks built-in. The top of the range model has 1.4 Megabytes of disk store, built-in superimpose and facilities to digitise and save a TV or video picture. Prepare to be absolutely amazed at the quality of the 512 colour pictures — MSX2 program disks include RED LIGHTS OF AMSTERDAM (£19.95), CHOPPER 2 (£12.95) and CHESS 2 (£21). Come in and see MSX2 in action. Ring for full details.

SOFTWARE

KNIGHT COMMANDER adds 40 commands to Basic but leaves full memory free. **Deletes** spaces, **Links** lines, **Recovers** New'ed Programs, **Dumps** Variables, **Searches** for ?, **Saves** Pictures, **Prints** Screens, **Displays** Time, 26 new defined keys, flashing cursors etc. The Compressor alone **Saves** lots of memory & makes programs run faster! **£15**

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MSX Feb/March '87

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Serious club wanted

I am an Italian owner of both MSX-1 and MSX-2 machines (Sony 75 and 700) and read your magazine frequently. I would like to make contact with a serious MSX club in Britain, interested not only in games but also in more serious applications. I am particularly interested in finding out more about the disk system and I appreciate the articles by Allan Wood in this respect.

Major Plazzogna Dario
Via Frattini 18
37121 Verona
Italy

Lost letter

Recently I received a letter from Australia in response to a letter published in your magazine about a Prestel user group. Unfortunately I have misplaced the letter and consequently have no record of the address. Could I ask the group to contact me again?

On another note, we are still in the business of establishing contact with as many MSX users as possible along with any club, company or user group interested in having their name or services published nationwide, free of charge. Anyone wishing to get in touch should contact me at the address below. Please include as much information about yourself as possible.

V R Wyland
35 Beechway
Maghull
Merseyside L31 1HP

Experiments

Congratulations on the improvements to MSX Computing. In my opinion the manufacturers have let us down, but I hope you will not do the same.

I would like to hear from other users who have developed any designs for addons, as a group of us in the area have got together and would like to do some experimenting. With any in-

formation or diagrams for MSX, please contact me at the address below.

D Weller
61 The Quadrangle
Eastleigh
Hants SO5 4FX

Yet more on resetting

I feel I should add to the discussion on reset buttons, though I am sure you are getting tired of the subject. In the December/January issue there is a request for a method of resetting the machine through the cartridge port. There is a way, and although I have not tried it I am certain that it will work.

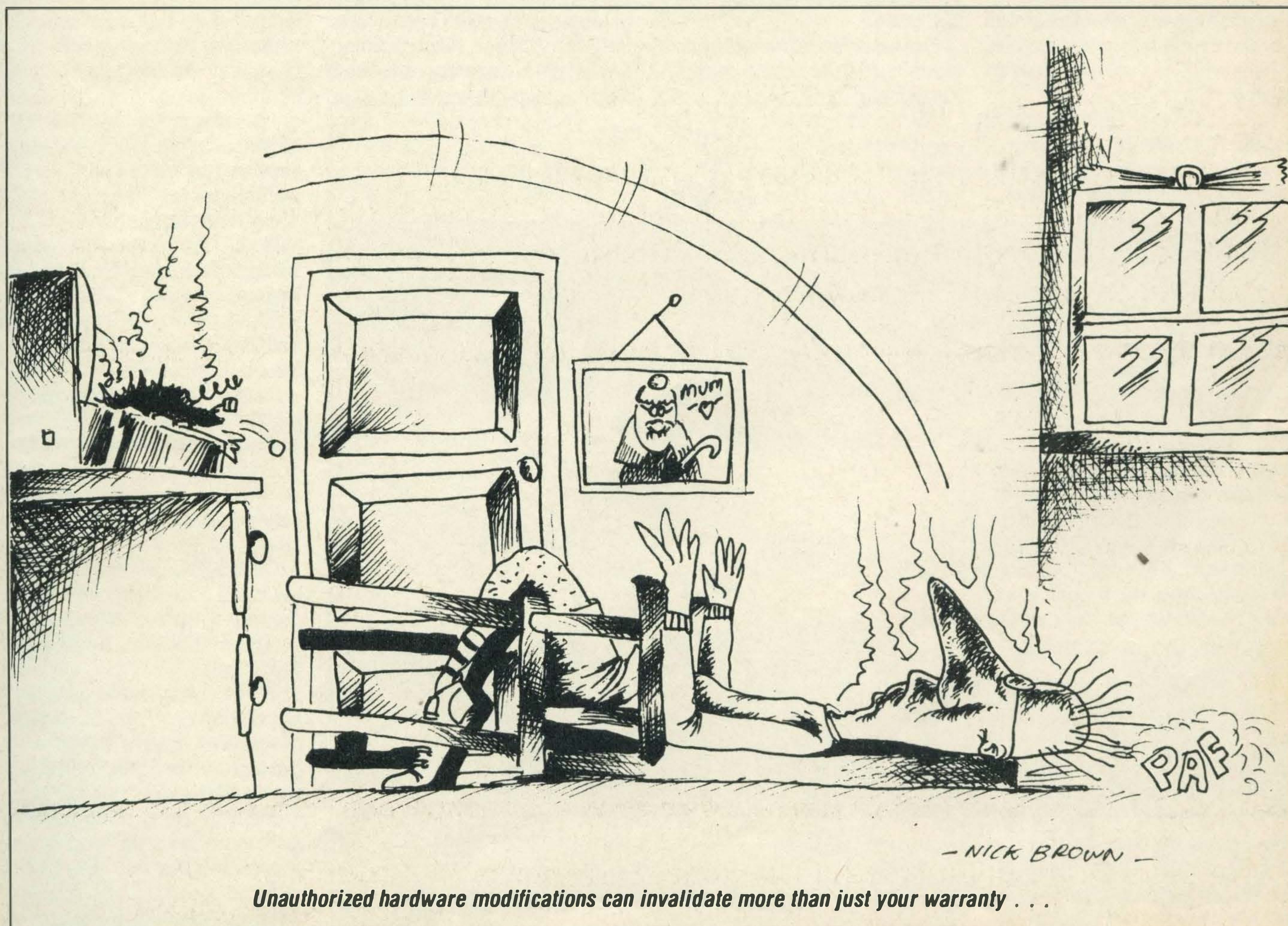
Pin 15 in the cartridge slot needs to be brought down to zero volts (ground) by connecting it to pin 41 or pin 43. Doing it this way would not invalidate any warranty: all you need to do is etch a PCB as required and add a simple push to make switch. A standard cassette box could be

used as a case. Why doesn't some company bring out a reset cartridge?

I recently purchased a disk drive and a Toshiba HXE600 additional I/O slot to give me two cartridge ports. If I put a games cartridge in the second slot it will not work, though it works in the first slot and the original one on the computer. Would it be possible to make cartridge games work from the second slot by using a short machine code routine? I could then write a menu program to use as the auto-loading program on disc, which would then let me select either the programs on the disc or the game.

David Haslett
Preston

While you might stay within the letter of the warranty by not actually opening the case of the machine, we feel that you would still be on thin ice if you managed to damage your machine while attempting this operation, perhaps by making a mistake in your board design.



Unauthorized hardware modifications can invalidate more than just your warranty . . .

ARCADE ANGLE

It looks as though we're doing something right. Judging by the colossal flood of mail, the Arcade Angle pages are compulsory reading for many of you.

A large number of people have written in asking for a *Finders Keepers* map, but until recently the only one we'd had sent in was unacceptably inaccurate. We're nothing if not thorough.

Then, as if by magic, a map appeared, and all you have to do to find it is turn to page 34.

The other game causing severe grief at the moment is *Knight Tyme* by Mastertronic. So we open this issue's Arcade Angle with a plea from Kevin Gorey.

KNIGHT TYME

'I have been playing Knight Tyme for quite a while now,' says Kevin. 'I can't progress through the outpost because I can't join together the three pieces of the Golden Sundial of Alpha. Murphy says the Sundial of Alpha needs great power to be joined. Help!'

The answer to Kevin's problem was supplied by Lee Simpson and Paul Brogden of Nottinghamshire. It goes like this: drop the pieces of the sundial in a pile and cast a lightning bolt spell to weld the sundial together. Use the lightning bolt to mend the time machine as well, but do all this only when your magic level is above 80 per cent.

KNIGHTMARE

Still on the knight theme, I thought it may be a good idea to have some more tips on Konami's *Knightmare*. It seems the letter printed in Arcade Angle in the Christmas issue, requesting help with *Knightmare*, has touched a nerve with desperate

Nick Brown presents another selection of arcade hints and answers your questions

readers.

An anonymous reader has submitted a solution the size of your average novel (along with a seemingly endless list of other conquered games). We haven't the space to print it all, but there are a few tips you might find useful.

Exits can be found along the sides of the screen, often

between columns, bushes or rocks. Shoot at these until question marks are revealed, and then exits will appear to transport you one or more levels ahead.

Another thing to consider is the yellow bishop symbol which gives an extra life. There is one on every level. The floating power pill should only be used

as red when you are on levels two, five or eight, as there are no bridges.

On other levels bridges have to be found by shooting them and made to appear by shooting them some more. The red power pill does make you indestructible, but there's a catch — it also stops your firepower, and with no fire you can't open bridges before you run out of screen and drown in the river.

SOCCER

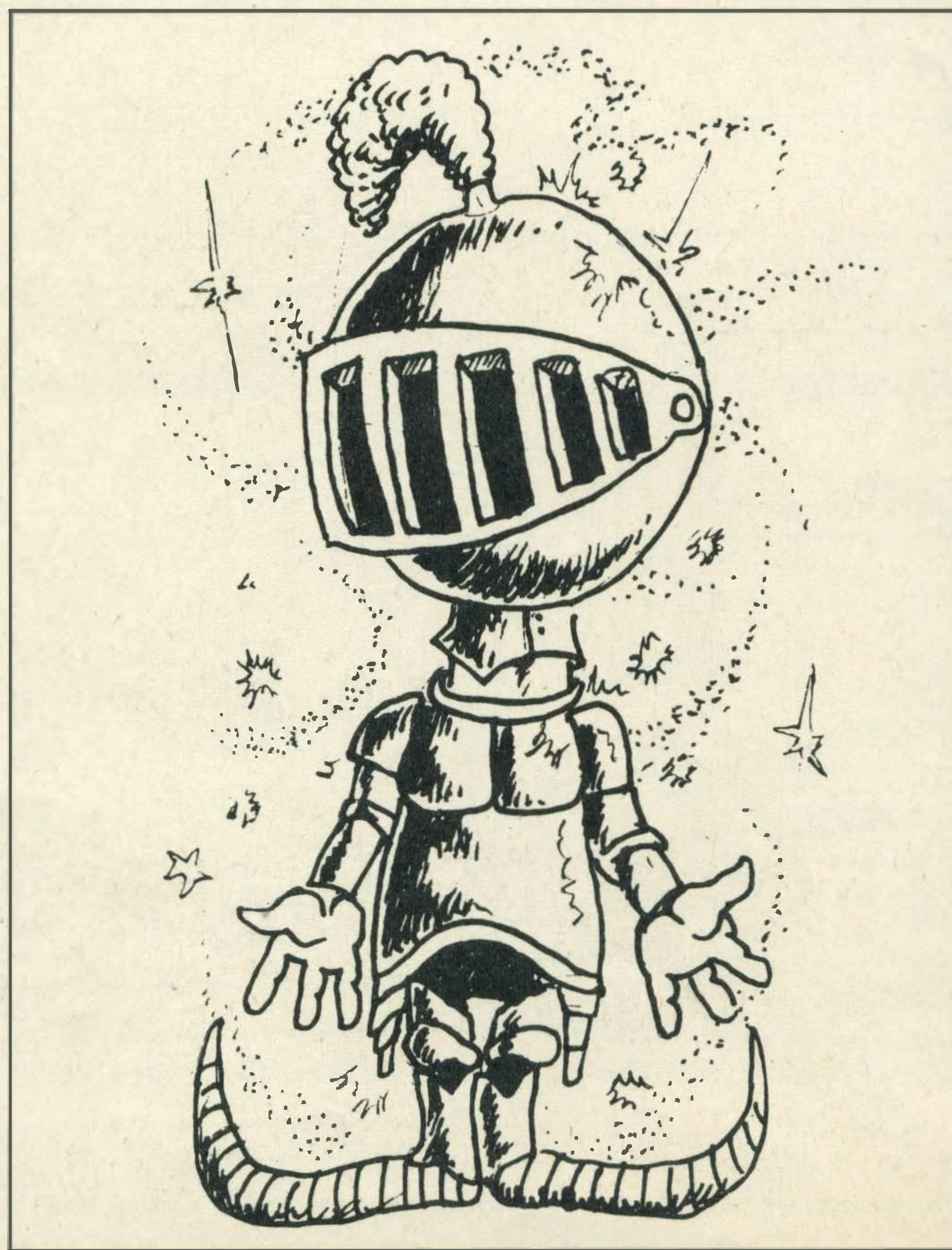
As a break from all that violence, let's take a look at Konami's *Soccer* game. The best way to tackle this (pun intended) is using the gentle art of Blastomatics. At kick-off, forget all that fancy strategic stuff — run as far as you can with the ball towards your opponent's goal.

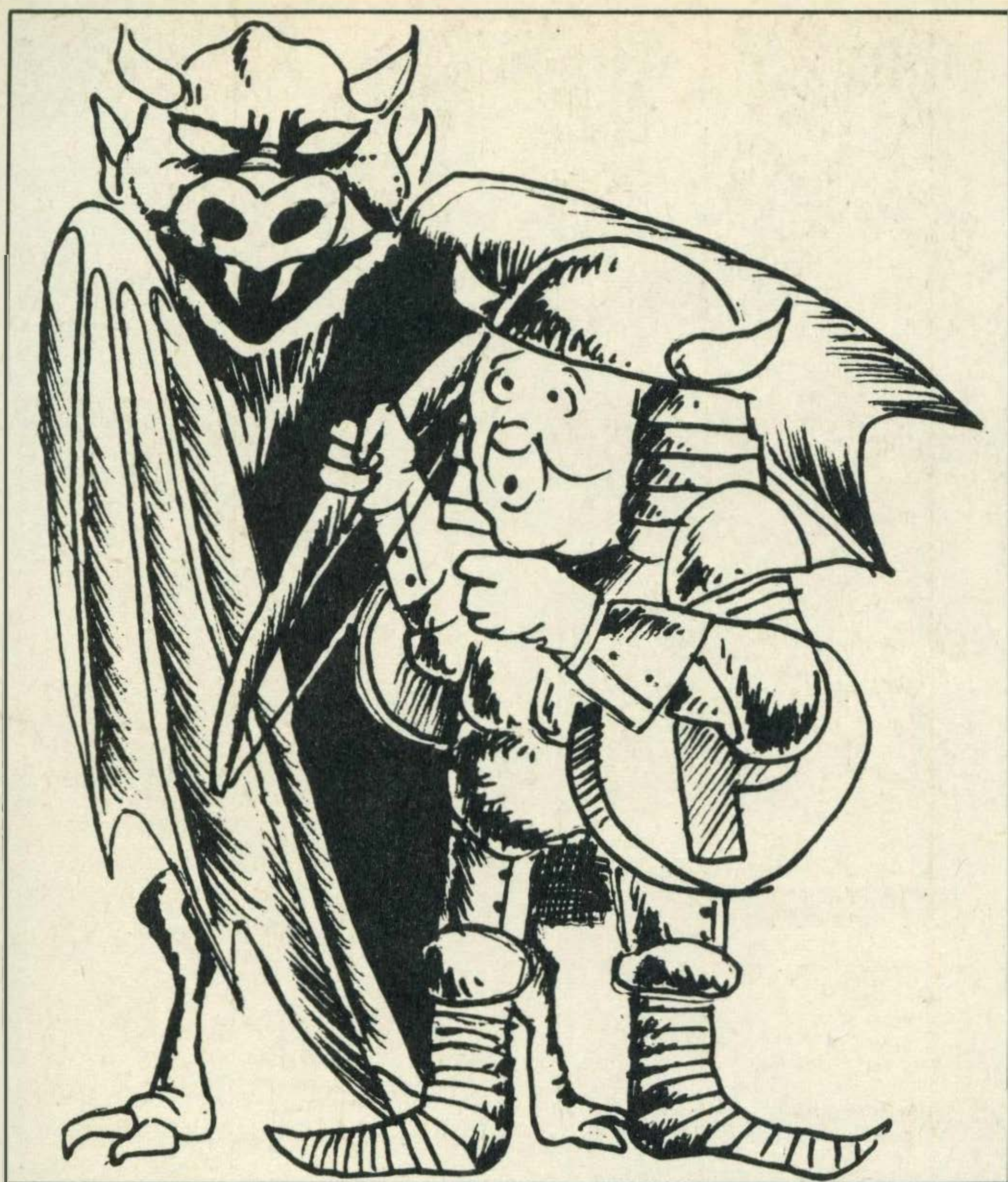
If you are in any danger of being tackled then blast the ball forward, running after it instantly. Just before you reach the ball you should find that one of the other side gets it.

Tackle him as soon as he picks it up and he should give you just enough time to have a good charge at goal and go for a shot. Using this technique I managed to beat level five, 14-4.

David Ovington of Camberley uses a rather more refined method. On the first three levels he recommends a hit and run technique.

When comfortably inside the opposition half, but out of sight of the goal, take a shot kick to get the ball forwards, chasing it with the nearest man, but stop just before he is near the ball. As soon as the opposition player gets the ball, slide tackle him and you should be opposite the goal with only the keeper to





beat.

On the fourth and fifth levels these tactics will not work. Winning takes a lot of practice, but what David suggests is to pass the ball about until in a good position and take a shot. The chances are that it will go out for a corner. Pass to the nearest man and then to the centre where you can take another shot.

TURMOIL

'Please could you include this poke for *Turmoil* in your magazine. It is for infinite lives,' writes Paul Sykes of Chesham.

Using the poke is pretty simple. Load the game with LOAD"CAS:". When you get the OK prompt back, list the program and delete the 'R' on the end of the first line. Use the following two lines:

```
10 POKE &HEC1, &H000
20 DEFUSR0=&HE646 :
A=USR(0)
```

After this, RUN the program. Paul also has a question about the game: 'can anyone complete level P, as I think it is an impossible screen?'

INTERNATIONAL KARATE

Not my favourite game but here's a useful tip: as soon as you start, do a flying kick followed instantly by a side kick. If the first fails to nail your opponent, then the side kick will do the job.

NEMESIS

Okay, so this isn't a tip, but it's interesting all the same. Mat-

thew Preece of Kent came across an intriguing problem when he had his micro fixed.

'About a month ago I bought Konami's new release *Nemesis*, which worked perfectly on my Toshiba HX-10. But then the worst possible thing happened — my Toshiba broke, and life as I knew it stopped.

'I managed to rent another computer and sent my HX-10 to be fixed. A few weeks later my computer arrived and I put *Nemesis* on. But instead of the usual streamlined spaceship, I got a little, fat blue one. Did they

put the wrong chip in my computer? Did Konami experiment with other types of ship, and how can I get my sleek white fighter back?

That's a tricky one, Matthew. Have you experienced any strange effects on other Konami games? How did your *Nemesis* cartridge work on the rented computer? If it was OK, then the fault must be in the computer.

Next we move on to martial arts mayhem with some tips for the Konami's bone-crushing *Yie Ar Kung Fu II*. I was so pleased to beat this game that I compiled a list of key moves which will get you a long way through.

YIE AR KUNG FU II

● Yen Pei

This fellow is unable to dodge the low kick, so that must be your main weapon. The flying kick can also be used to good effect, so simply pile in remembering to keep the right distance — close, but not within his striking range.

● Lang Fang

After she has thrown her first fan you can jump over it and kick her. High kicks and flying kicks are to be preferred.

● Po Chin

This fat blob can pose a problem if he paralyzes you, so jump over his first gas bomb and hit him with a flying kick. Then stay in close, jumping into the air and landing on him with a flying kick. He'll soon go down.

● Wen Hu

One of your meanest adversaries unless you use this technique. As soon as you start, jump towards him and do a flying kick. If you are quick you may be fast enough to kick him before his mask comes off, or if you are really good you might manage to kick both mask and man together. Using the same technique as for Po Chin drop on him and stay close keeping an eye on the flying mask if it is airborne

● Wei Chin

Jump over his first boomerang and stay in close using a combination of drop kicks and high kicks. This character specialises in triple kicks which are almost impossible to duck, so things may degenerate into an unplanned scrap.

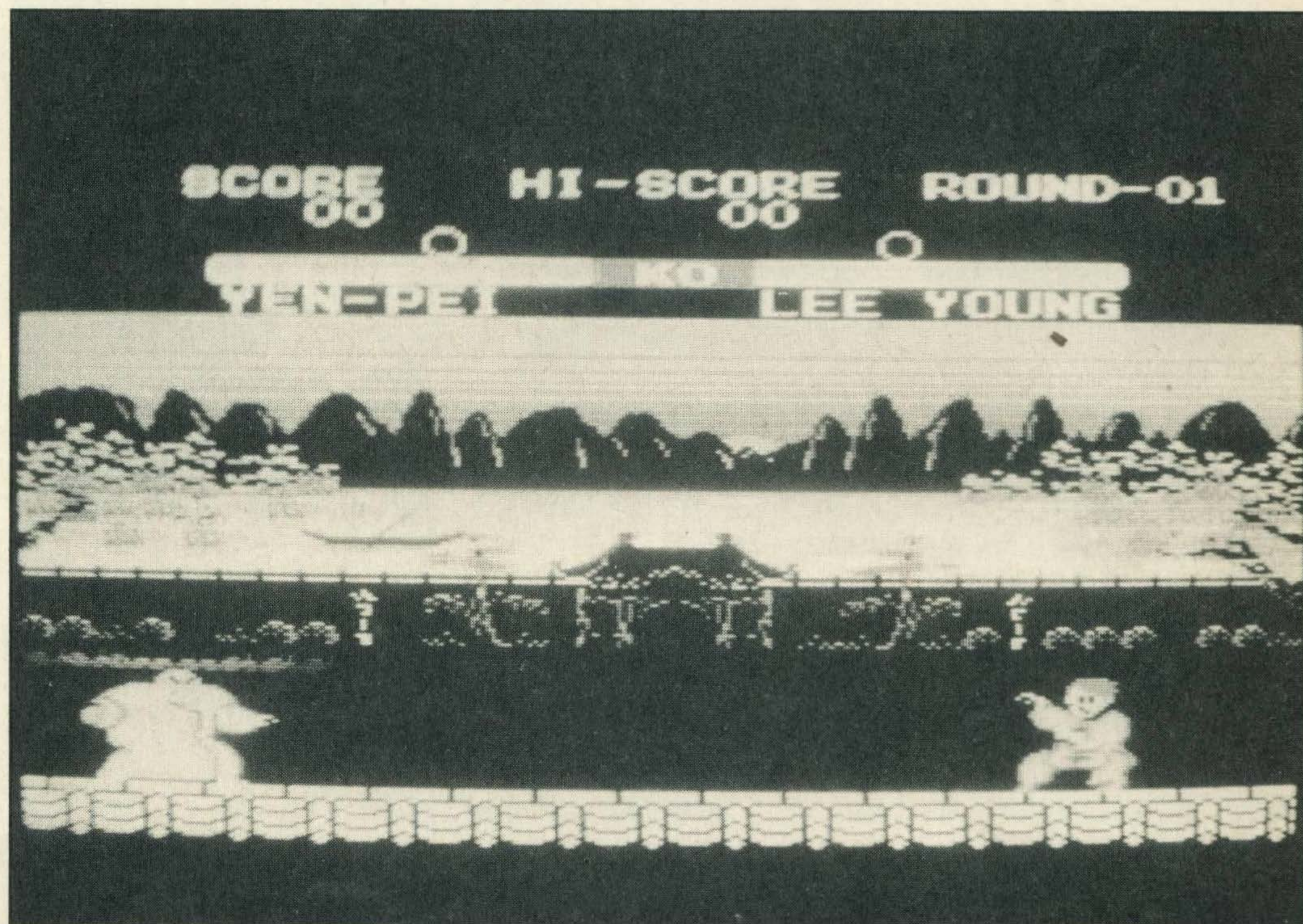
● Wei Ling

This sweet little girl is only too keen to kick you to bits, and it is wise to maintain a discreet distance. As usual, jump over her first knife and use the drop kick technique.

If she catches you with the first blow of a triple kick, duck immediately and the other two will pass harmlessly over your head. She will then slip past you and it is wise to catch her with a low kick. Then turn around and continue with drop kicks until she goes down.

● Han Chen

A nasty piece of work with hardly any martial art weapons. Do not jump at him as you run a



Yie Ar Kung Fu II



- NICK BROWN -

The moral dilemma posed by Konami's cheat cartridges

grave risk of hitting one of his bombs in mid-lob, when you crash to the ground paralysed by the blast. Instead, walk towards him and use the drop kick technique, avoiding his low kicks and catching him with low kicks when he tries to slip past.

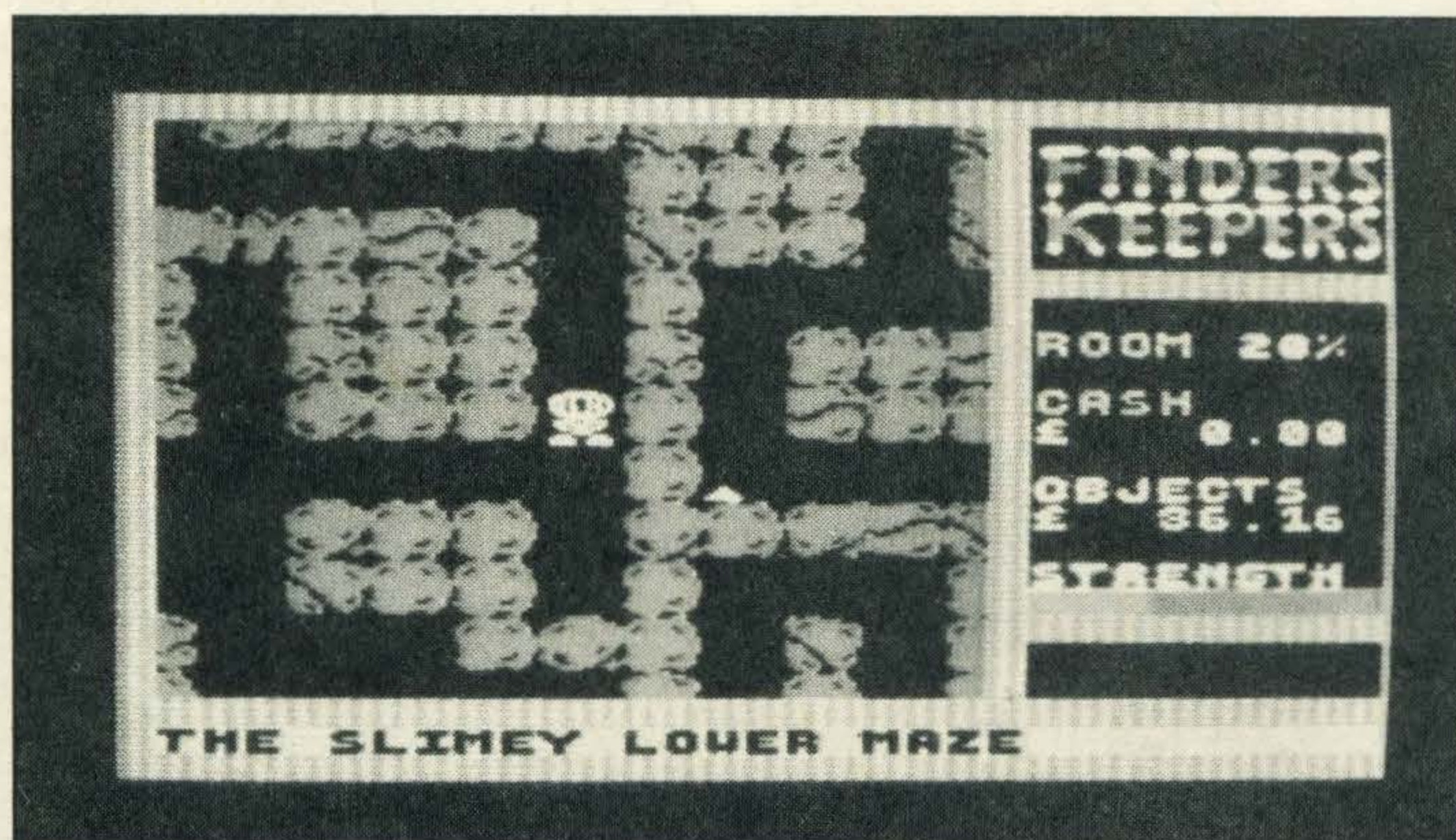
● Li Jen

This is the Kung Fu Master, though I am not sure why, when he doesn't use a move himself. By this stage you should have at least two cups of tea and if you are lucky you may even get the chow mein. Don't use either unless you get a proper start.

Move into kicking range and jump at him with a flying kick followed by a succession of low kicks. You should get in at least three before he moves away. Now you have cost him at least half his energy, use the chow mein if you have it, or run after him to finish him off with low kicks. By saving the tea for when your energy is low you should stay well in control for the rest of the fight.

● BOULDERDASH

Gwydion Hawkins was kind enough to send in some assistance for any readers having a hard time on Boulderdash. As



Finders Keepers

soon as the game loads select cave 1/1, 1/2 or 1/3. Collect as many objects as possible and as soon as no more are available press 'ESC'. The number of points scored should provide another life to continue on the same screen.

GROG'S REVENGE

● David Wainwright of Coalville has a problem with this game, one I haven't tried yet. He wants to know how to select different mountains. Anyone with this information should write in to the magazine and we'll pass it on.

David isn't one of those people who just ask questions

without giving anything in return, however. If you play *Ghostbusters*, type in your name as Jon, say you have an account, and enter account number 1234. You may be surprised at your starting money.

BOUNDER

'Could I interest you in cheat pokes for *Bounder* and a cheat mode for *Valkyr*?' asks Robin Hickman of Derby. You certainly could, Robin, and thanks for sending them in. For *Bounder*, before loading type in POKE 40000,ASC("b") and repeat using all the letters from the word "bouncy" in lower case. Then

load the game and wait until all the messages have scrolled past — you are now in cheat mode.

For *Valkyr*, hold down ESC, TAB, CTRL, SHIFT and the up, down and left cursor keys down simultaneously. The word 'CHEAT' will appear in the top left corner of the screen.

JET SET WILLY

Ivan Cort of Blackburn needs your help. He's stuck on *Jet Set Willy*, despite many hours of tireless play. He has found 58 of the 60 rooms, but cannot locate the Laboratory or one other room which he is unable to identify. If anyone can shed some light on the subject, please write in.

Well, that appears to be all we have room for this month. If you need help in defeating a game, or if you are one of the lucky few who can beat any program known to man, write in with your questions and guidelines to

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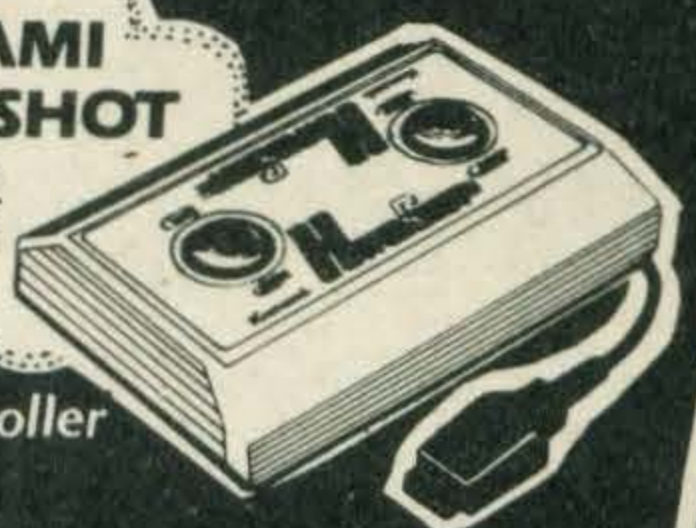
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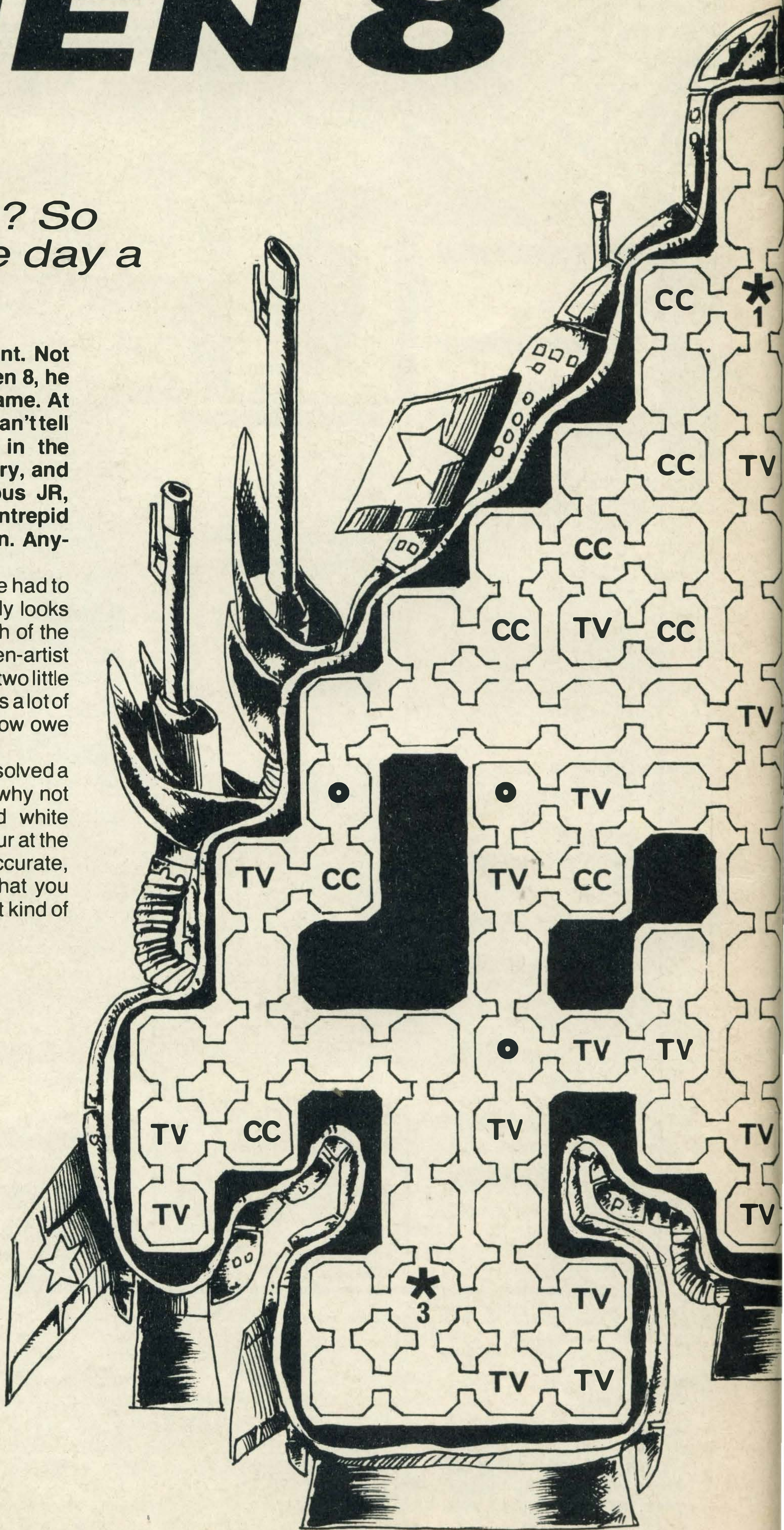
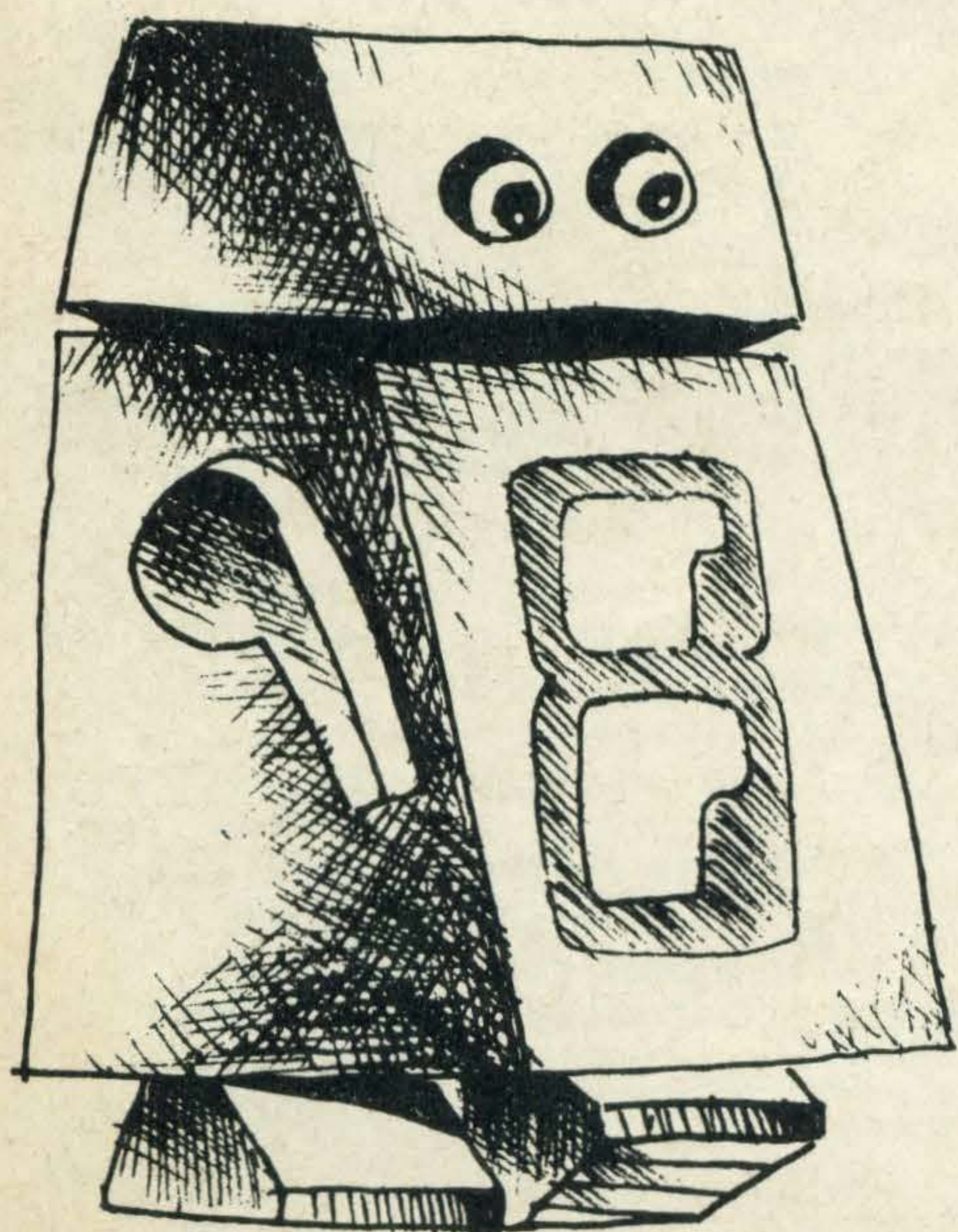
ALIEN 8

Baffled by Alien 8? So were we, until one day a letter arrived . . .

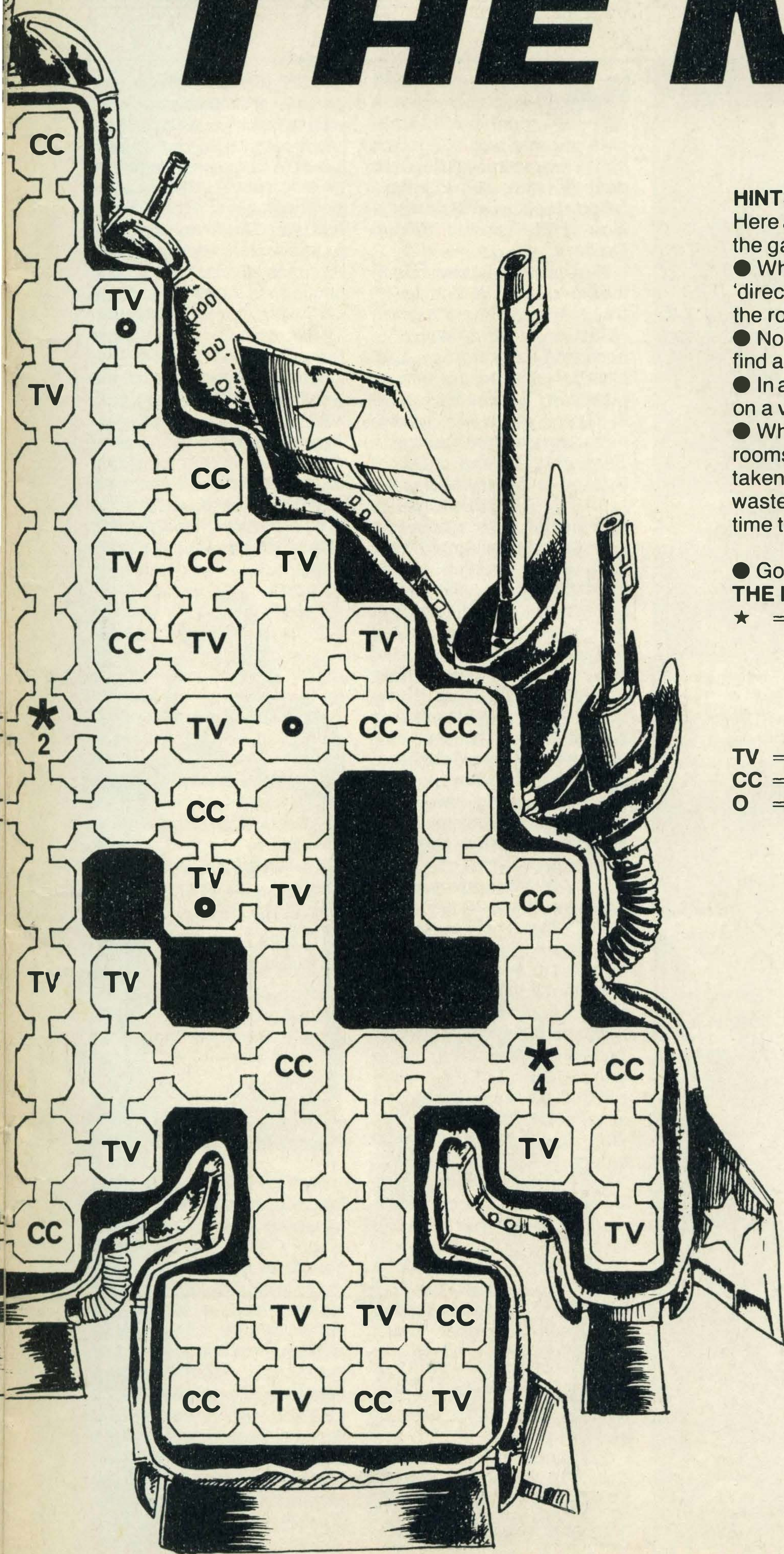
J R Daddow is nothing if not persistent. Not content with completing Ultimate's Alien 8, he has taken the time to map the whole game. At least, we assume JR is a 'he' — you just can't tell with those anonymous initials. But in the absence of any evidence to the contrary, and taking our lead from that other famous JR, we're going to assume that our intrepid cartographer is of the male persuasion. Anyway, back to the game.

Not having JR's skill with a joystick we've had to take him at his word, but the map certainly looks very comprehensive. He supplied a sketch of the layout which was then drawn up by ace pen-artist Nick Brown, who is also responsible for the two little robots. Thanks a lot guys. We're sure there's a lot of frustrated Alien 8 players out there who now owe you their undying gratitude.

As for the rest of you — if you've recently solved a game and have a mean skill with a pen, why not send us a map? We prefer black and white drawings as we've no facility for using colour at the moment. Please make sure the maps are accurate, and include playing hints and tips and what you think of the game, how long it took you, that kind of thing.



THE MAP



HINTS AND TIPS

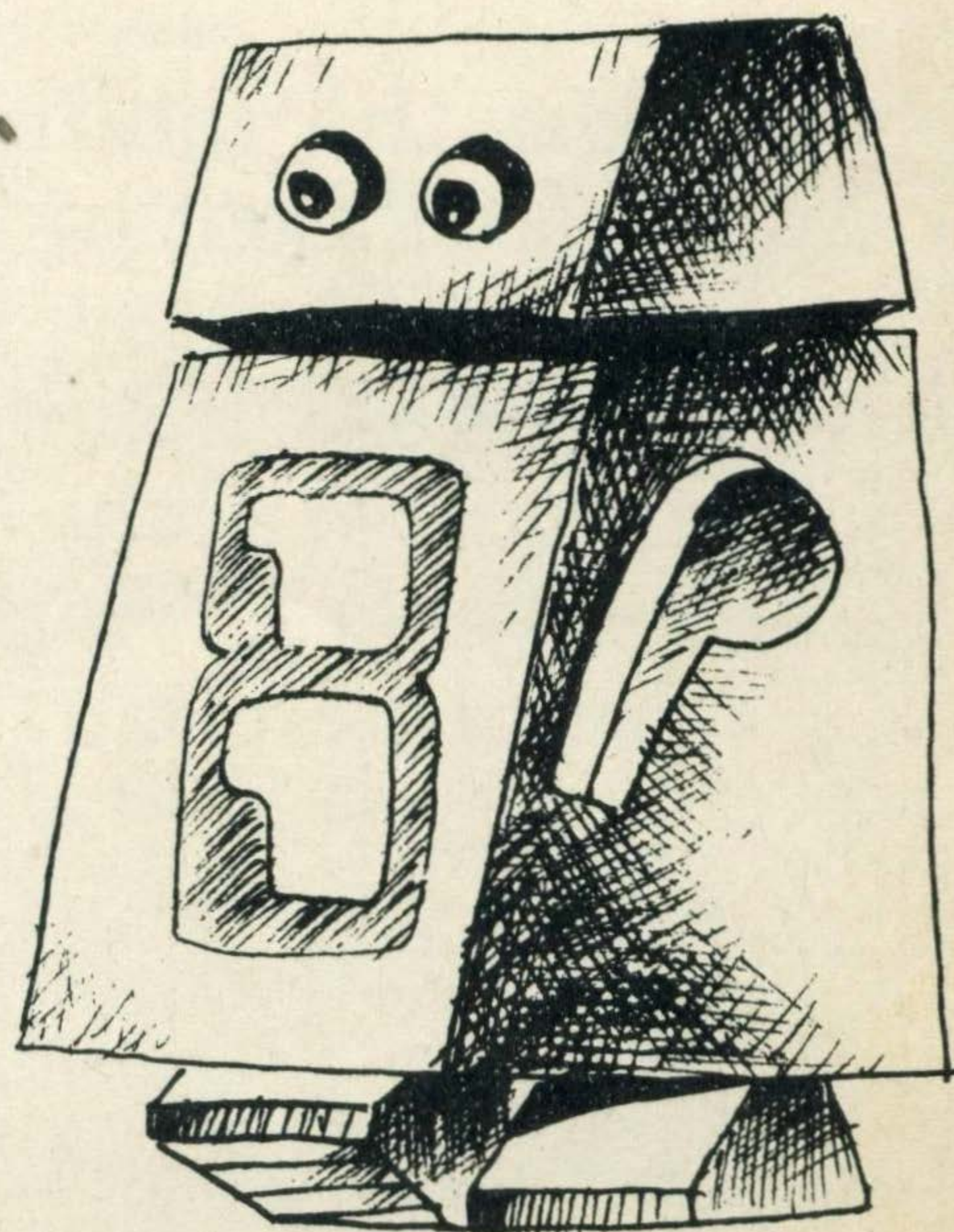
Here are JR's helpful comments for getting through the game:

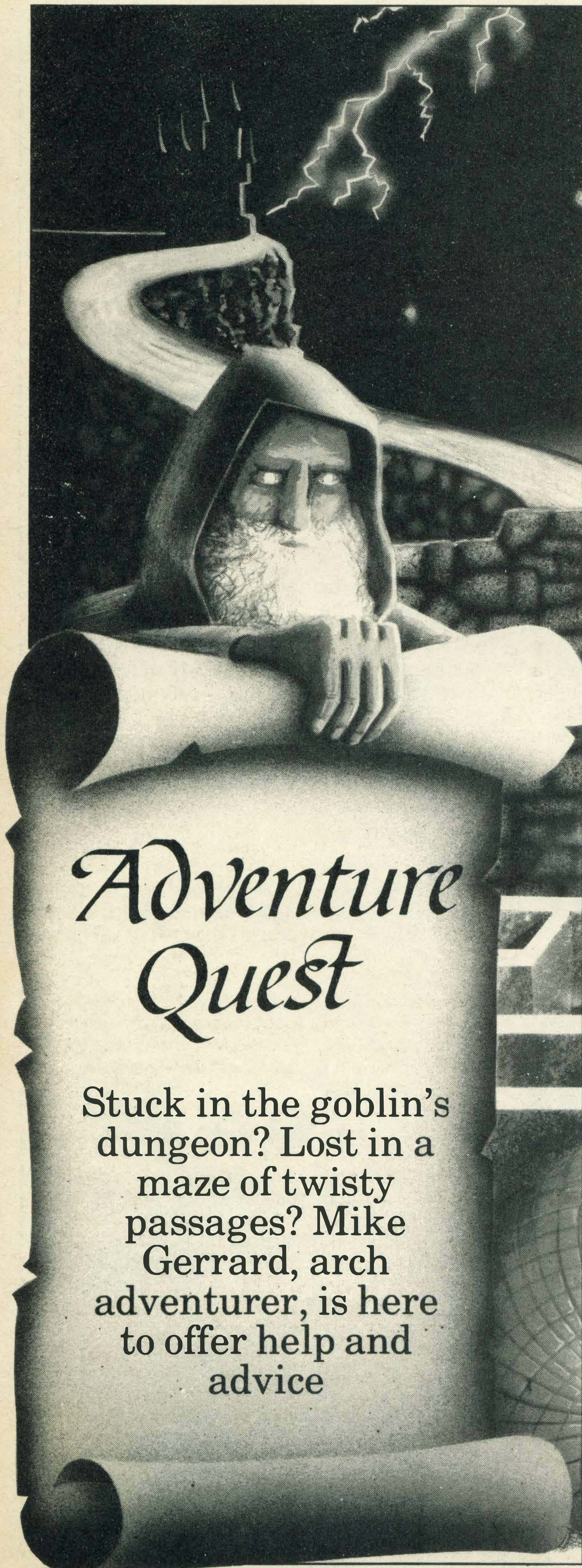
- When presented with the menu, always choose 'directional control'. This will enable you to control the rebodroids.
- No room is impossible — keep trying until you find a solution.
- In a room with clockwork mice on the floor, stand on a valve, so the little monsters can't get you.
- When using a map, it is a good idea to mark the rooms you have activated and the valves you have taken with a cross, so you don't return there and waste time. As it is, you have got only just enough time to complete the game.

● Good luck!

THE KEY

- ★ = one of four starting positions which can be identified by:
 - 1 Blue pyramids
 - 2 Green shells
 - 3 Purple rods
 - 4 Blue squares
- TV = thermolec valve
- CC = chamber of cryonaughts
- O = directionally controllable rebodroid





Adventure Quest

Stuck in the goblin's dungeon? Lost in a maze of twisty passages? Mike Gerrard, arch adventurer, is here to offer help and advice

With a two-month gap between columns, it's inevitable my postbag builds up, so let's get straight down to dealing with some letters before looking at Rainbird's wonderful new *Silicon Dreams*

First out of the in-tray and into the out-tray is V. W. Warren, 32 Stafford Road, Great Yarmouth NR31 OEX, who admits to becoming rapidly bored of alien-zapping on his newly-purchased Sanyo, and is now immersed in several adventures. How to cross the river in *Zakil Wood* is one question. Strange as it may seem, the answer is: SEHSUB HCRAES. For anyone else who's just kissed alien-zapping goodbye, the clues or answers I give in this column are all printed backwards to avoid the risk of anyone inadvertently reading the answer to a problem that they're struggling away trying to solve for themselves. Plenty of adventurers would refuse a hint till the last possible moment, when they're in danger of punching the monitor in frustration, and giving away the answer to a problem is the equivalent of telling someone "The butler did it."

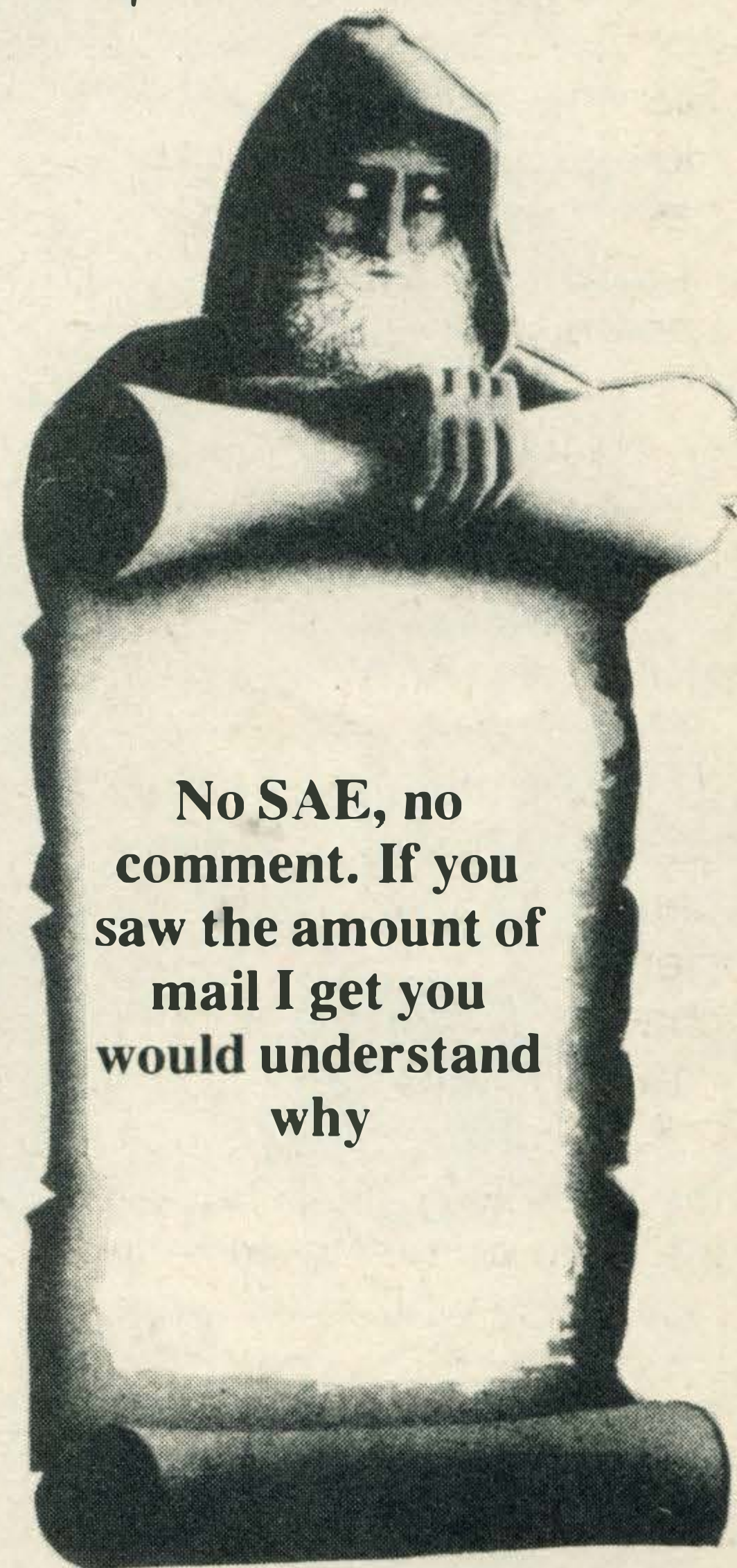
V. W. Warren also asks if I deal with arcade-adventures, to which the strict answer is No, though out of the kindness of my heart I'll occasionally mention them if someone's stuck, which this reader is on *Elidon*, *Nightshade* and *Knightlore*. Send any help that you can to Chez Warren, and if anyone can help on *Knight Tyme* then contact N. Knights, 3 Hawbeck Way, Spencerbeck, Middlesbrough, Cleveland TS7 9QS.

"You could send me a clue sheet on *Zakil Wood*," says a reader whose name looks like Vilam Viong, of Charlton, south London.

Well I could, Vilam, but I won't 'cos you didn't send a stamped addressed envelope. That's something I am strict on. No SAE, no comment. If you saw the amount of mail I get in a typical month then you'd understand why.

Still stuck in *Zakil Wood* is Felim Stewart of County Donegal, and that's *after* receiving my clue sheet! Felim can't get through the Path of

Eternal Sleep because the given list of directions won't fit in as one input, yet when he tries them individually he doesn't seem to be moving as he still gets the message about his head going round. First things first, you do type the directions in as separate commands, not all in one long instruction. And second things second, although it may seem after you type in each direction that you haven't moved because the location description and the head spinning message both stay the same, you have in fact moved to a different location so don't give up till you've typed in all the commands which will (and I know because I've done it) take through to the other side of the wretched Path of Eternal Sleep.



No SAE, no comment. If you saw the amount of mail I get you would understand why

One problem at this stage that a few people have written to me about is with the command GET LEAVES, which doesn't always seem to work. It may not work if you're already carrying too many objects, but otherwise it should be fine and all I can say is that I've checked this time and again on my own version of the game and GET LEAVES enables you to get the leaves. If your version won't allow you to get them, which you need to do to finish the game, check with Mr Micro who published *Zakil Wood*.

Same game, similar prob-

lem, and that's for Gary Elton of no fixed abode — at least, there's no address on his letter. Gary's chopped down a tree but can't pick it up again, and the only problems I can think of there is that you're carrying too many objects. There's no sneaky problem preventing you getting the tree, so far as I know.

Martin Green of Woolwich wants to know how to get into the cottage on the other side of the river. He's tried beating down the door with the axe, and says that any sentence containing the word IN is interpreted as a request for an inventory. The answer's a simple and less violent approach: EGATTOC RETNE.

Let's get out of *Zakil Wood* and into another wood, this one being at the start of *Castle Blackstar*, where M. R. Smith of Houghton le Spring is stuck. I have to say that I hate the start of this game, where you're immediately flung into a quite complicated maze and carrying no objects that would allow you to map it properly. Getting through is therefore pure chance, and it's very boring to sit there typing N, S, W and E in random fashion till you hit on a way through. But the rest of the game is excellent and it's worth persevering with as there's plenty of fun and genuine challenge later on. I can't give you directions to get through the forest maze (can anyone help on that?), but I can tell you that there are three special locations in the maze that you must visit before you move on. There are also objects at these locations, so once you've located one it does make the map-making easier.

Mr C. Jacobs of Barley Green, Birmingham, is struggling with *Colossal Adventure*, wondering how to deal with the dragon, for one thing. You can't have tried very hard, Mr Jacobs: SDNAH ERAB RUOY HTIW NOGARD KCATTA. How to open the rusty gate to the Giant's room: LIO EMOS DNIF. When not struggling with *Colossal*, Mr Jacobs dips into *Adventure Quest*, asking how to get past the octopus and defeat the sphinx. For the octopus you need to be carrying: GAB EHT. You get rid of the sphinx by clever use of

MROWDNAS EHT. This is one of those problems I solved by accident, without realising what I'd done — I moved away from the location and when I went back the sphinx had disappeared so I had to look up the solution to what had done it. Read the messages and listen to the sounds carefully on that one.

The Price of Magik is what's puzzling Barrie Fleming of Glasgow, and how to open the door in the stone room is not the least of his worries. The simple answer to that is to say that you somehow open it from the other side. Barrie says he has 11 spells, of which he's got seven of them working, but the seven he lists don't include the one that will enable him to see through the door in the stone room: PSE SI ENO TAHT. Then you'll need a few more spells and to think about the order in which you might cast them. And cast some of them more than once.

Some cheating on that same game from G. Lucas, which I pass on purely out of interest, knowing my readers wouldn't stoop to such awful depths of depravity. Mr Lucas says that when you die, type RESTORE or RESTART several times, then when the Lenslok routine comes up, deliberately type in the wrong codes. This should result in you being returned to

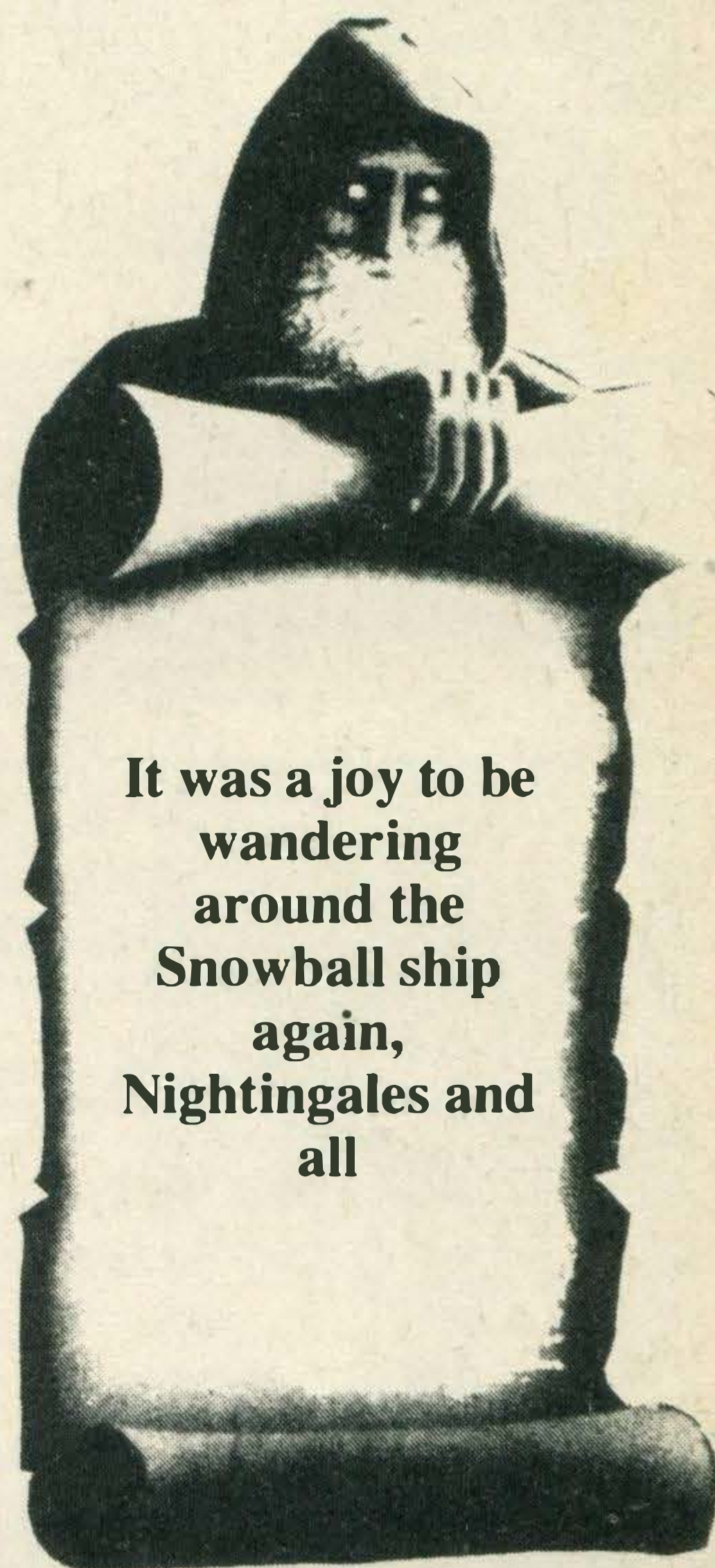
wherever it was you died, but with 245 stamina points now to your credit. Could be useful when fighting foes. I mean, not that you would cheat, of course. Nor, I'm sure, would you use Mr Lucas's other sneaky piece of information, that when you're in the boat trying to read the plaque on the riverbed, you should type DOWN, then when you're returned through lack of air just type OOPS to allow you to return to the riverbed and read the plaque, I haven't tried that one myself but it sounds a neat cheat.

Kevin Harris of County Durham writes to me grovellingly about *Emerald Isle*, where I'd already told him that to solve one particular problem he needed the long rope. Fine, he says, but where's the long rope?? TNEMUNOM EHT WOLEB, say I.

Nigel White says can anyone help him in *Special Operations*, and if so can they write to him at 70 Ingress Gardens, Greenhithe, Kent DA9 9HN. Peter Blake of Co Antrim in the *Emerald Isle* says that I have to help him with his problems in *Snowball* and *Emerald Isle*. Oh I do, do I? Oh all right, while I've still got room.

In *Emerald Isle*, how to get past the butler: DROW EHT SI HTLAEW. How to open the lamp: RETAW HTIW TI LLIF TSUJ. Where is the wallet: KRAP RAC EHT NI. Where is the airport: YTIC NREDOM FO WS TSOPNGIS DNOYEB. In *Snowball*, how to get past the waldroid: TNIAP FO NAC EHT EDOLPXE. Where is the ammo for the hand-gun: NUG FO DNIK TAHT T'NSI TI. You should fire it when you're ECAPS NI GNITAOLF. How to use the control console: first you RIAHC NI TIS then you ROSIV RAEW then NEERCS ENIMAXE. You look at the number you're interested in, then work it with a KNILB. And what do you do with the revival unit: TI HTIW ENOEMOS EVIVER. What else?

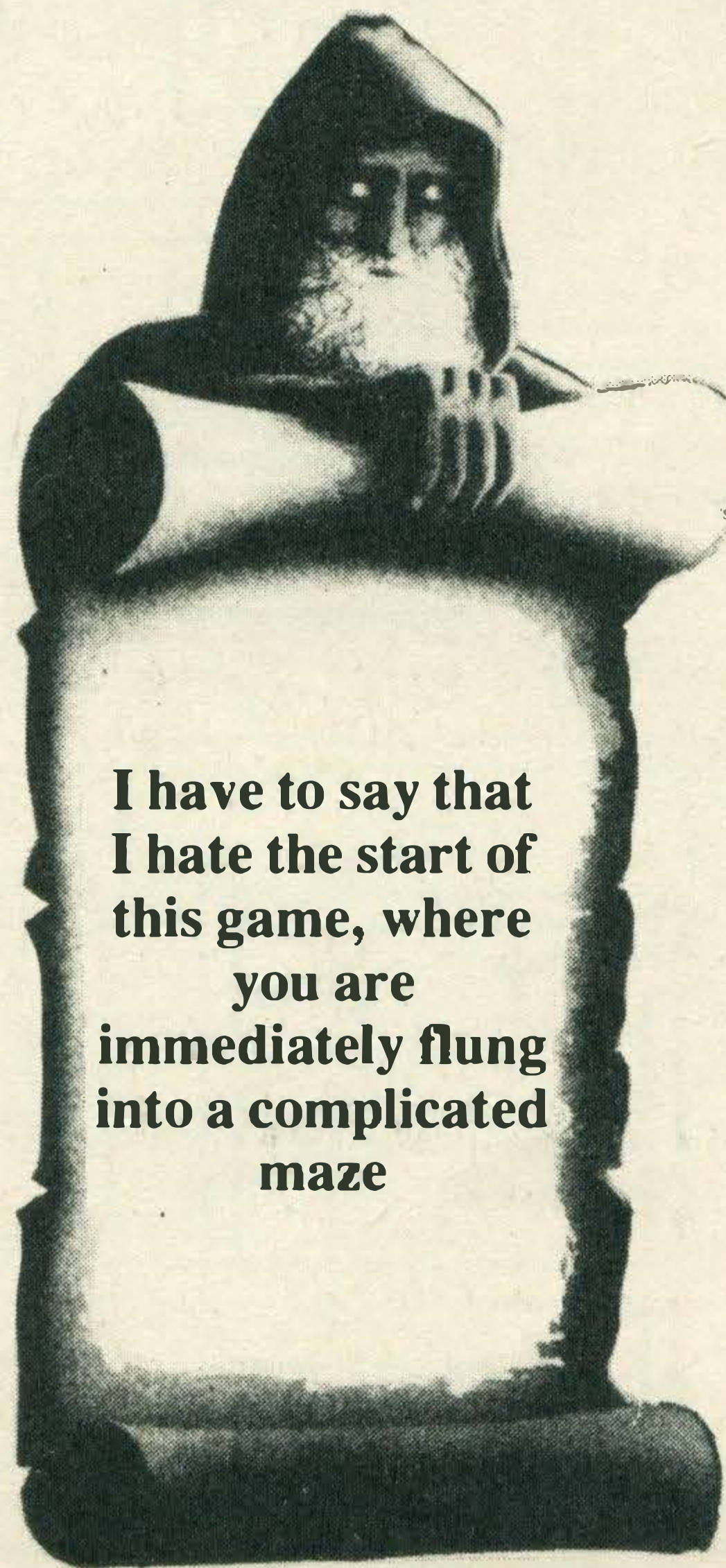
"*Snowball* has got to be one of the best adventures of all time," Peter reckons, and there are plenty who'd agree with him. Those of you who haven't yet sampled it are in for a treat, especially now that you can get it in Rainbird's latest repackaging of Level 9 titles, *Silicon*



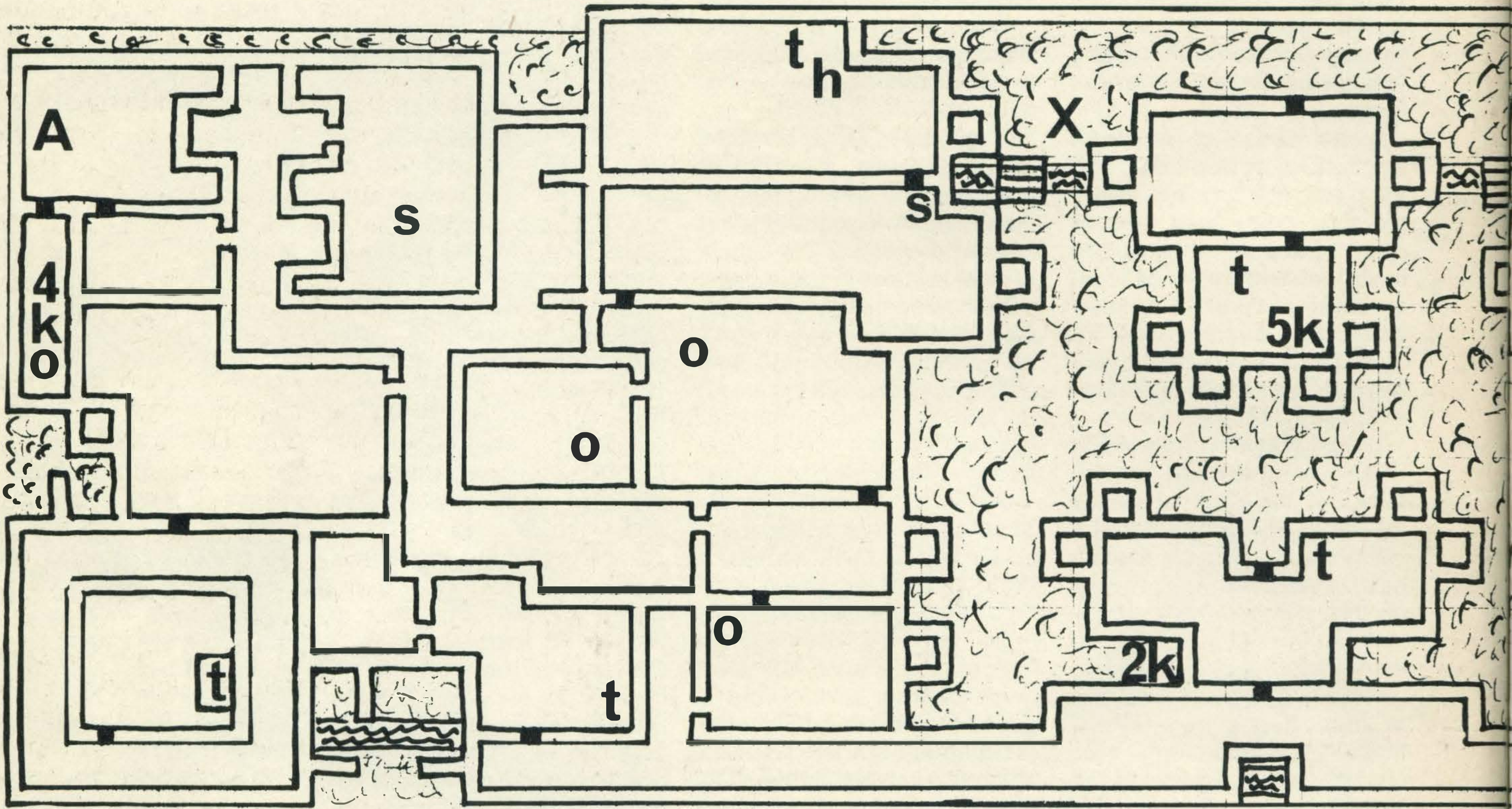
Dreams. As with *Jewels of Darkness*, this takes three earlier linked Level 9 adventures and puts them in one package for £14.95, along with a booklet. The adventures have all been redone to take advantage of Level 9's latest comprehensive adventure-writing system, with a much larger vocabulary and lengthier text. In the case of *Snowball*, the first in the trilogy, this has also meant adding graphics. I was a bit worried that this might spoil one of my favourite games, but not a bit of it, and with lengthier location descriptions it was a joy to be wandering round the Snowball ship again, Nightingales and all.

The other two titles in this trilogy are *Return to Eden* and *The Worm in Paradise*, and I'd say that even if you're only buying it for one of those adventures, it's worth the price of admission for the packaging and the improved presentation. In fact it must be very tempting even if you already own all three of them. A trilogy of cheers to Rainbird for not neglecting MSX owners with this one, and do go out and buy the adventures if you want to make sure you still have adventures to buy in the future.

That's it until the next issue — don't forget to keep those adventure clues and questions flowing in.



AVENGER

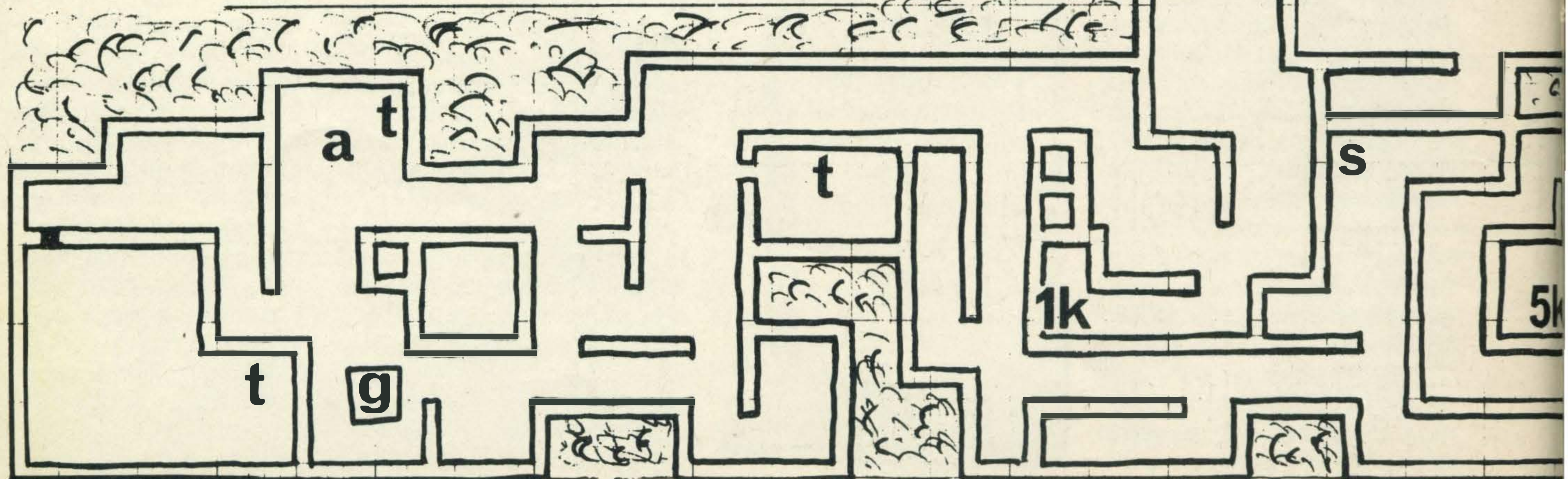
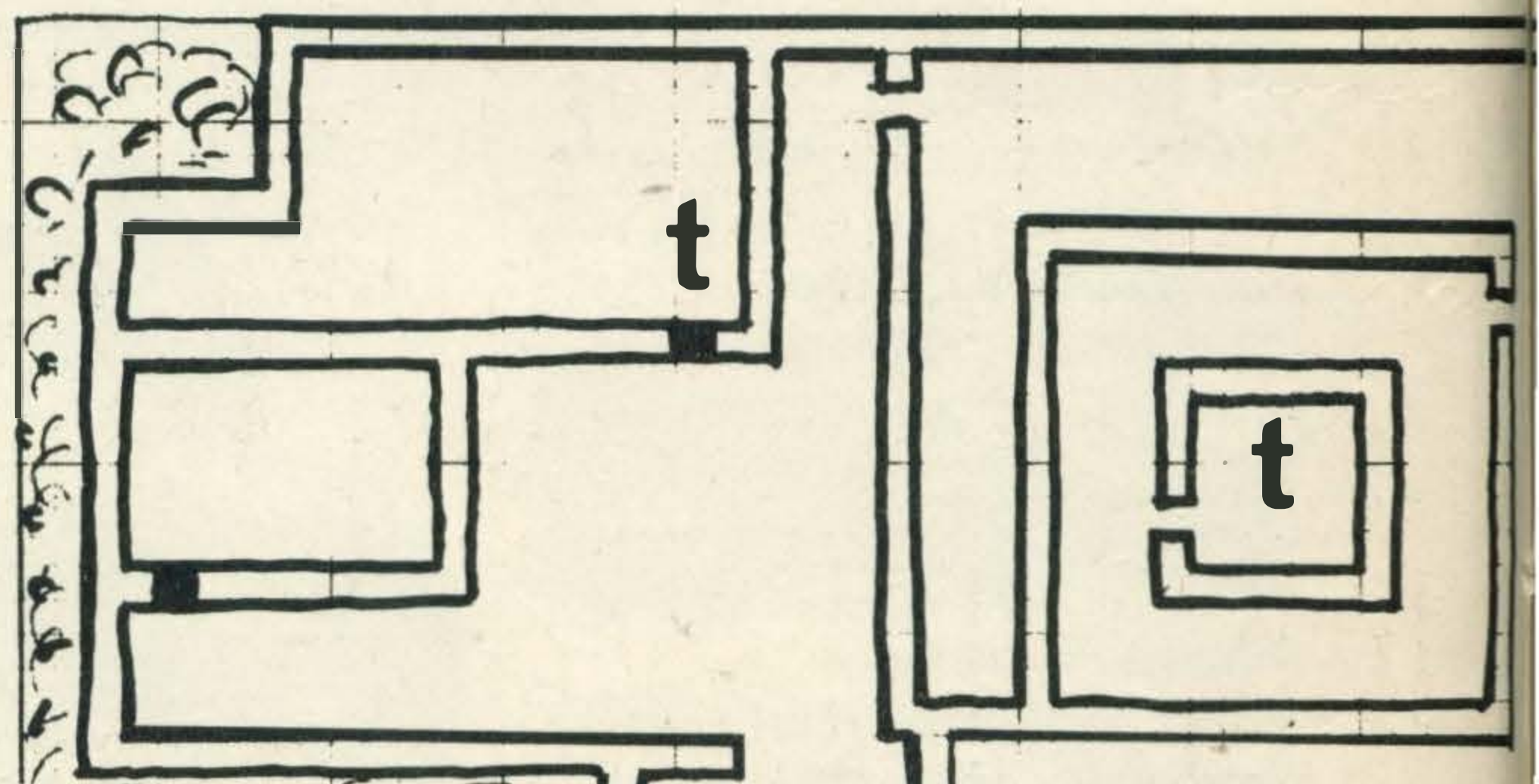


The starting stage

KEY TO SYMBOLS

- | | |
|---------------------------------|--------------------------------------|
| & magic rope | k keys to be picked up (with number) |
| A amulet | o spider holes |
| a arrival point from trapdoors | p poison |
| ä arrival point from grills | S scrolls (with number) |
| c crowbar or lever | t treasure |
| e exit for end of game | X starting point |
| F iron fist | |
| g grills | |
| h charm needed to pick up lever | |

The first lower stage



Avenger has met its match. Young and fearless Lee Murdie survived the game to tell us the secret

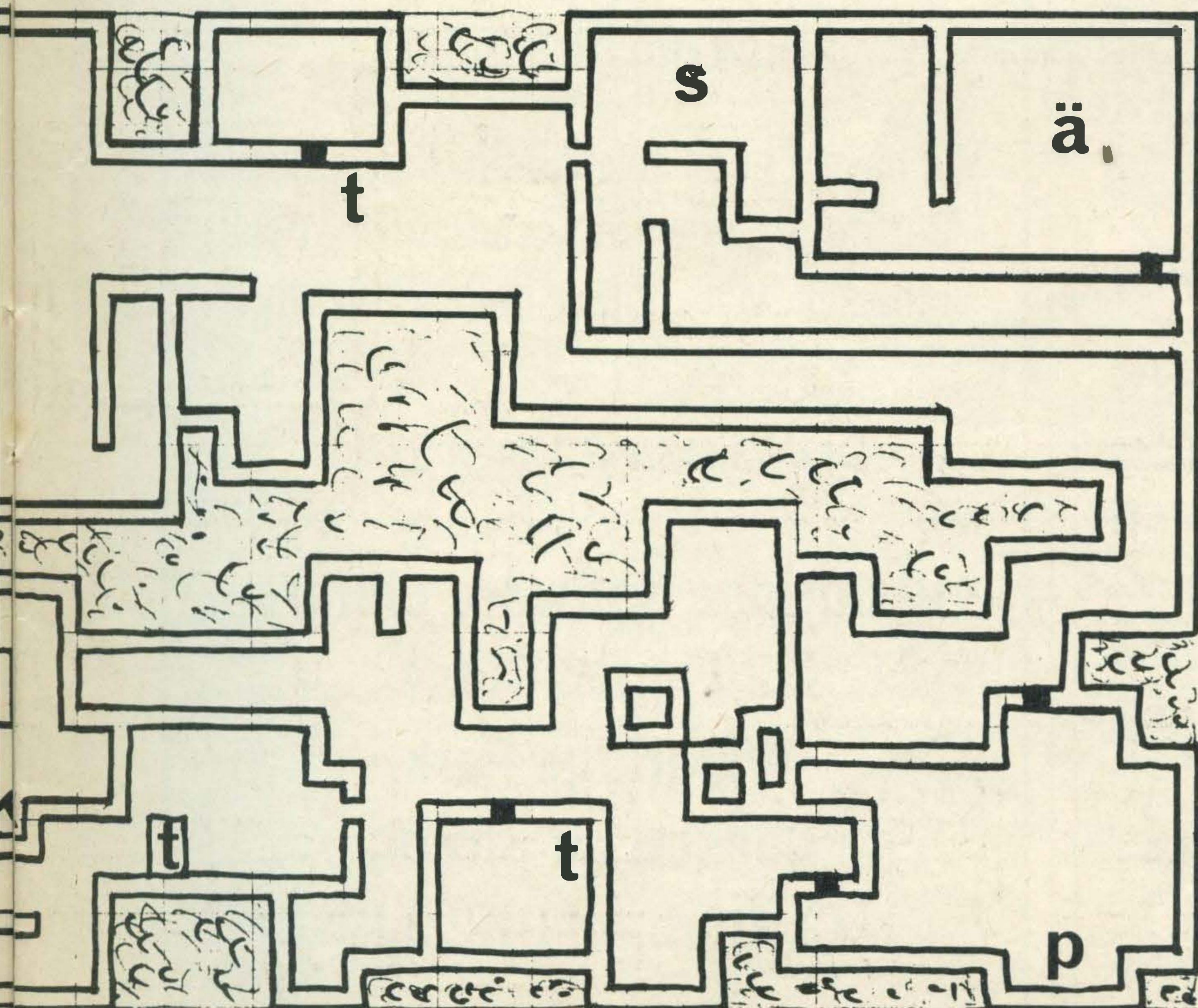
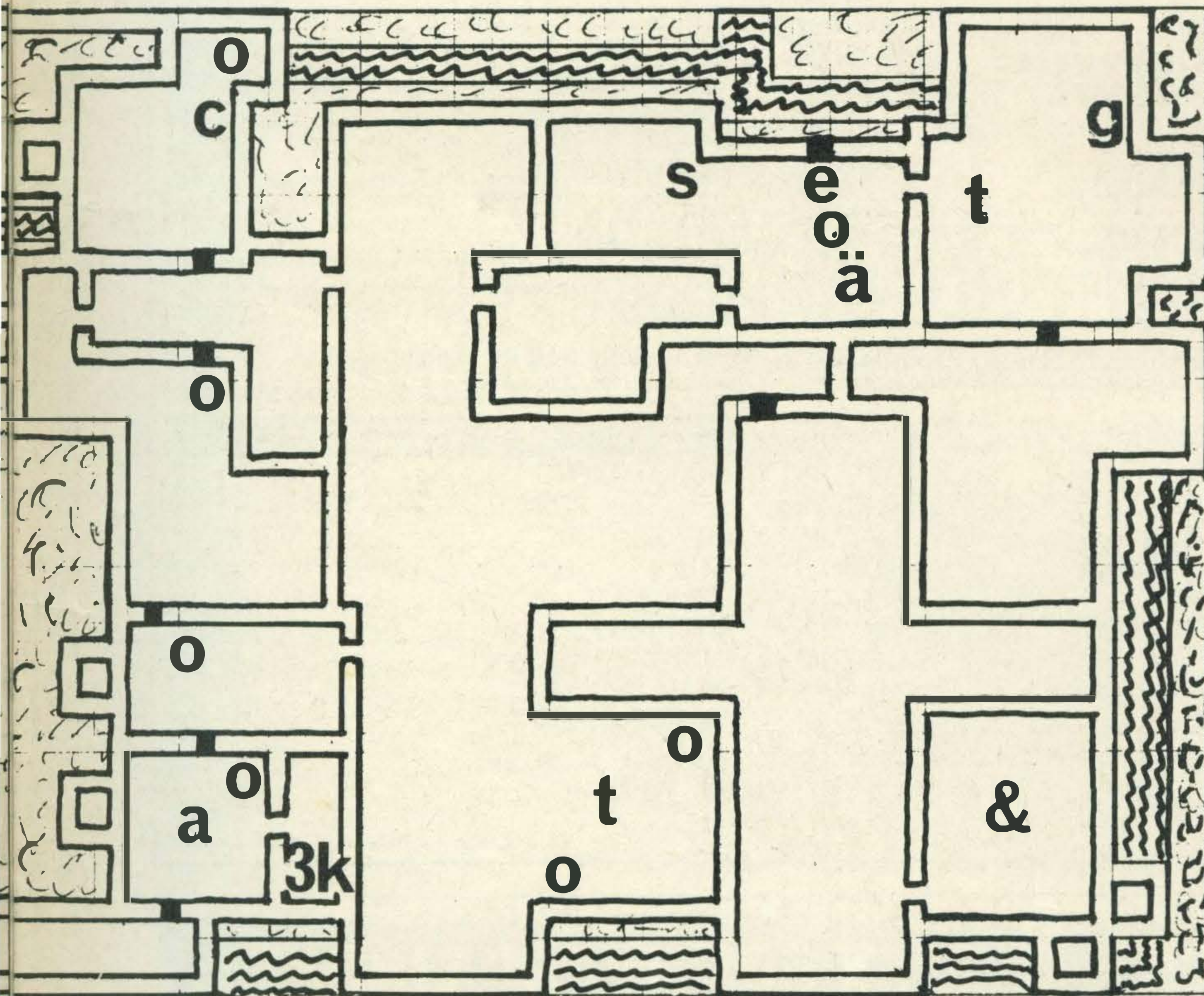
We know what you're going through. You bought *Way of the Tiger 2 — Avenger* thinking you were going to have a nice quiet time and now you're tearing your hair out in frustrated rage.

Well, we've got good news for you and bad news for the toupee industry. That maze of maps and symbols you see on the left is the answer to your prayers. Yes, it's a complete solution to the game, thanks to intrepid reader Lee Murdie.

Lee drew no less than six maps, showing the complete layout of the game. Four are reproduced in this game. Four are reproduced in this issue, and the other two will be appearing in the next issue. As well as showing the whereabouts of the various rooms, the maps also indicate the locations of treasure, keys, spider holes and other crucial objects.

This plucky 14 year-old not only sent in the map, but also included several clues and hints which you can find opposite.

You might expect that having completed such a death-defying feat this brave teenager would sit back and take things easy for a while. Not a bit of it. Even as you read this, Lee is pitting his wits against the goblins in *The Hobbit*. Meanwhile, turn the page for the clues . . .



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HINTS AND TIPS

It has been suggested to us that some of you just aren't content with a map. Oh no. You want it spelled out for you. Well, you're in luck. As well as going to great pains to draw the map, young Lee Murdie has also supplied a description of how to complete the game. So here are Lee's instructions, transcribed and judiciously augmented by none other than Phil Rotsky.

- Dodge spiders and guards whenever possible to save energy.

- Don't take on spiders when they are in the air, and don't walk over spider holes as you will lose all the keys you are carrying.

- When you start, pick up the amulet, then the charm. This is important as you can then pick up the crowbar, but don't attempt to take the magic rope at this point.

- After getting the above objects (*not* the rope, Craven. Pay attention!), go through the grill into the first lower level. But beware — you'll need at least one key.

- After you enter this stage, make your way down to pick up the poison, although it's a good idea to pick up the keys first.

- Make your way back to the trapdoor and go back to the starting level.

- Go to the cross-shaped room and through to pick up the magic rope. Then make your way to the room with the trapdoor.

- Go through the trapdoor, pick up the keys and make your way to the first guardian's room. You should now be carrying everything you need to kill him. When he is dead you can pick up the magic sword.

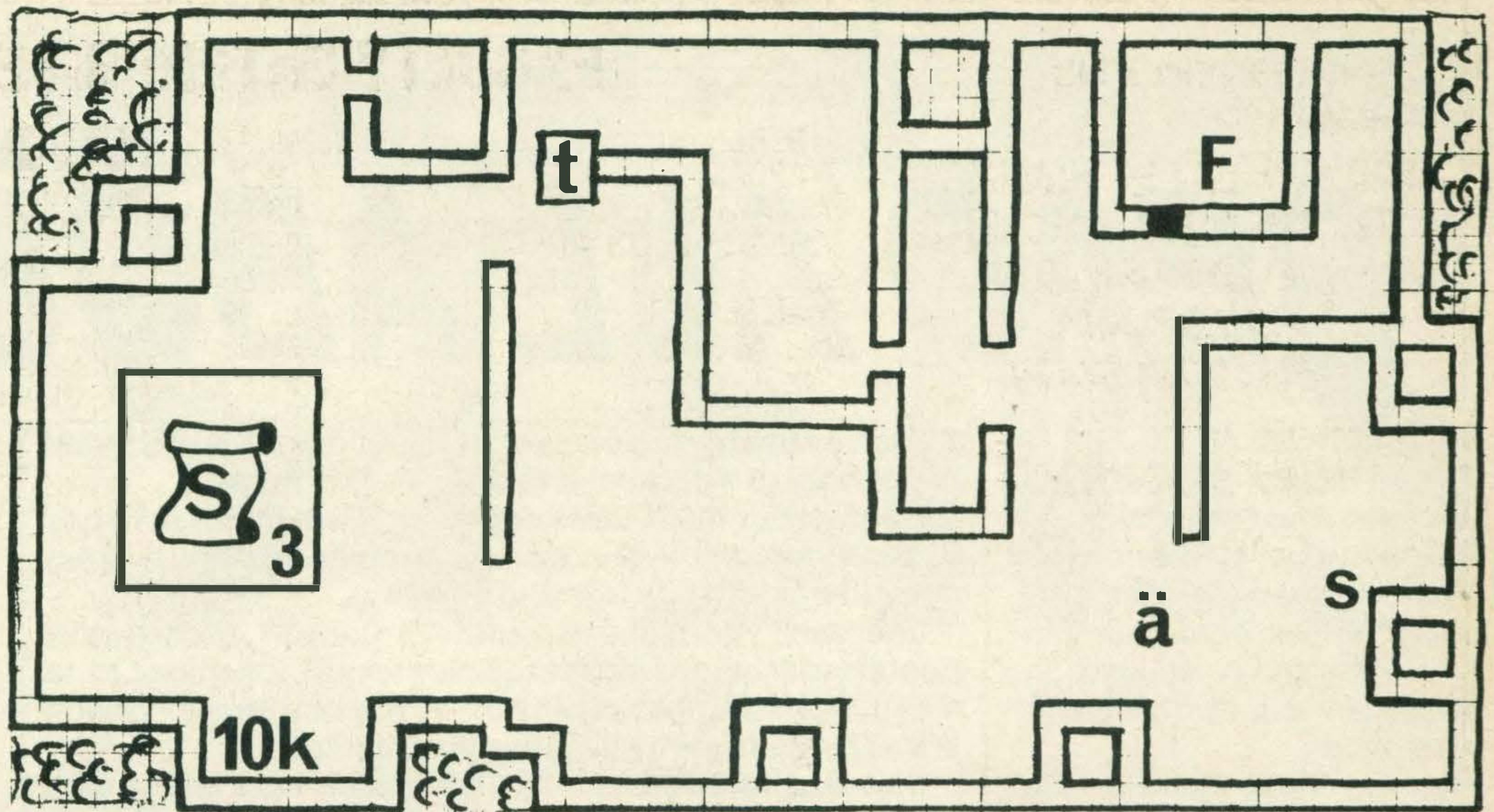
- Go through the trapdoor in the first upper stage to get to the second upper stage. Go straight to the second guardian's room and kill him. Stop whingeing. There's no room for sentiment in this game.

- Go down through the grills and keep going until you get to the bottom stage.

- Go into the room with the iron fist and pick it up. You are going to need it to kill the third guardian. Pick up ten keys.

- Go up through the trapdoors until you get to the top stage, or tower.

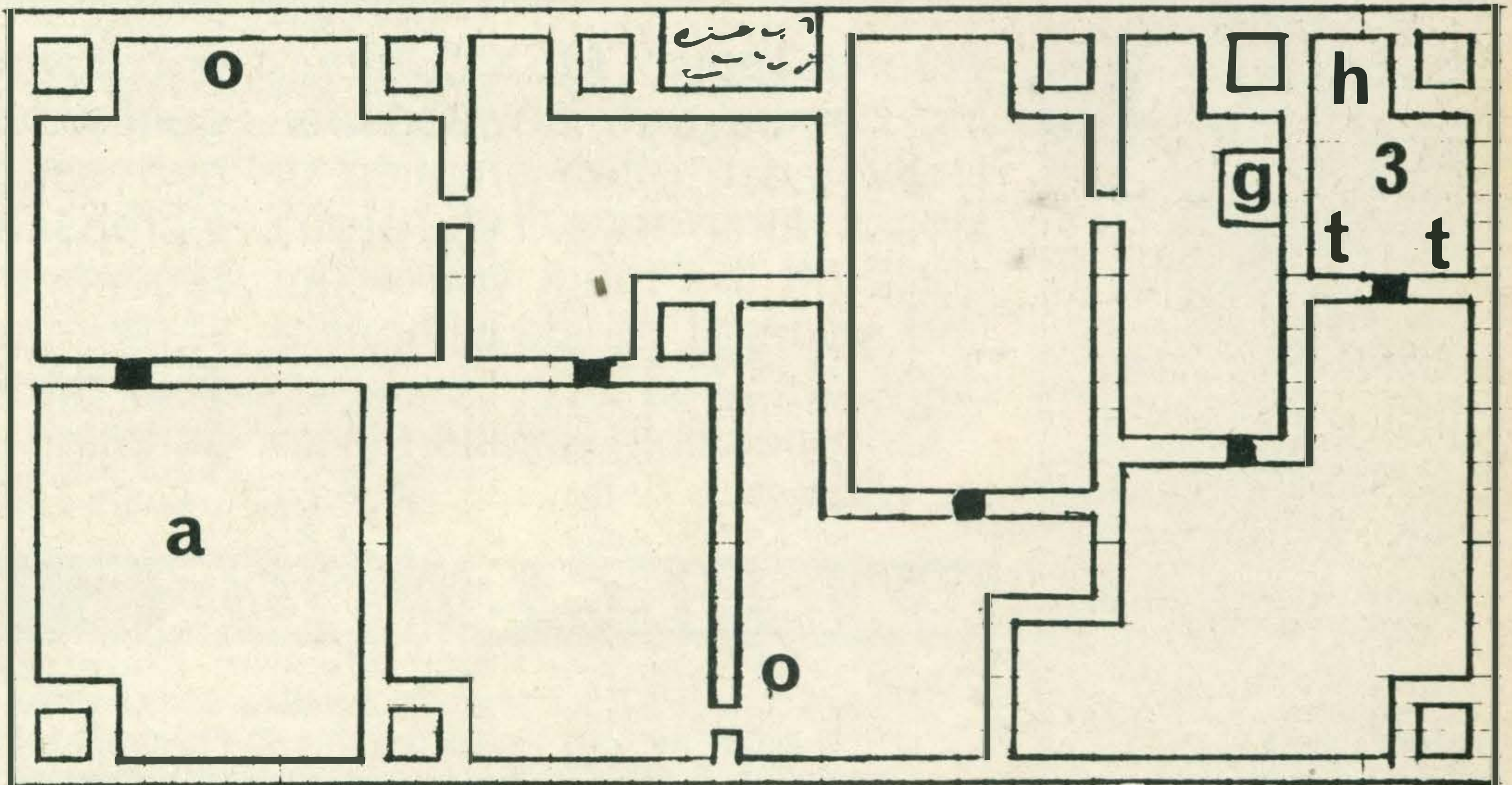
- Make your way to the third guardian's room. You know what you need to do when to do when you get there. There's no time for idle chit chat or casual cups of tea. Just kill the guar-



The bottom stage

KEY TO SYMBOLS

3	third guardian	h	charm needed to pick up lever
&	magic Rope	k	keys to be picked up (with number)
A	amulet	o	spider holes
a	arrival point from trapdoors	p	poison
ä	arrival point from grills	s	shurikens
c	crowbar or lever	S	scrolls (with number)
e	exit for end of game	t	treasure
F	iron fist	X	starting point
g	grills		



The top stage

dian and get on with the next job of picking up the charm and treasure. You will then be adequately equipped to pick up the scrolls. Contrary to popular belief, getting the scrolls is one of the best things that can happen to you.

- Go down through the grills again, and keep going until you get to the lower stage, where you can pick up the scrolls.

- Go back up through the trapdoors to get back to the starting stage.

MAKING MAPS

If you feel like sending us a map of your favourite game, bear in mind the following points.

We can't use colour, so simple black and white drawings are best. Make the pictures as bold and as simple as possible. Don't write words directly on to the maps, unless your typographical skills are very good — just mark lightly in pencil where words and symbols should go, and we'll typeset the text or get an artist to

draw in the symbols.

The design should be as clean as possible — not necessarily bland and simple, but just clear and unfussy.

If you don't feel you're up to all this, don't worry. Send in your map and, if we think it's useful, we'll get an artist to redraw it. Of course, if you can produce wonderful, camera-ready artwork (and we know at least one of you can), please do. Then we can start taking longer lunches.

READ ALL ABOUT IT

June/July 86

Beyond Basic — the first steps to more advanced programming with other languages.

Typing in readers' listings — where to look if you run into difficulties, and some hints on sending in your own programming efforts.

Frankfurt Music Show — the MSX compatible products. Turn your micro into an electric piano with our basic course.

August/September 86

Yamaha's new software for the CX5M II revealed, plus an explanation of MIDI.

Programming hints to help you get the best from your disk drives.

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Listed below are the currently available back issues with a brief description of the major features, tests and reviews in each. All issues carry software reviews and listings.

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October/November 86

MUD is not just an adventure game, it's a way of life.

Control a disk system using your own programs with Allan Wood.

Don't keep yourself in the dark, our Knight Tyme map helps you see the light.

Adding on a second disk drive does wonders for your MSX. We show you how.

Tim Markes examines MSX music software written by two talented enthusiasts.

December 86/January 87

Software roundup, with Martin Banks selecting his favourite games titles.

Low-cost printers, word processing techniques, and the birth of Arcade Action.



JUNE '86



AUGUST '86



OCTOBER '86

EVENT QUEUE

In the April/May issue we'll be taking an in-depth look at cassette files — how the computer stores information on tape and how you can access and use that information.

We'll also be witnessing the birth of the Star Program feature, so keep your listing fingers flexed.

Dedicated Middle Earth freaks will be pleased to hear that the adventure section is expanding. And we'll be printing the last two maps of the Avenger solution, started in this issue.

Finally, for music fans there'll be a review of a wildly sophisticated new cartridge.

The issue is on sale on or near April 8. Don't miss it!

When a copy of *MSX Computing* comes out, newsagents' shelves are often emptied of stocks within days. If you aren't quick off the mark you might find yourself stuck without a copy.

One possible solution is to

pop down to your local newsagent waving a very large axe, and suggest politely that he increases his order. But we recommend a second method — so much more civilised — your own personal postal subscription to *MSX Computing*.

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IDIOTS SYSTEMS

*The next best thing to artificial intelligence. By
Sean Davidson*

How many times have you dreamt of the time when you will be able to talk to your MSX, and have it answer you? If not like Eddie of Hitch-Hiker's Guide fame, then like HAL, Orac, or one of the many other intelligent computers which abound in science fiction, but which have not yet made it on to the home computer scene.

Of course, many programs have been designed to give the illusion that the computer was understanding what was said to it, and making an intelligent response. *ELIZA* is probably the best known of these, because it gave the best illusion, while taking very little memory, and it was therefore suitable for personal computers.

ELIZA was described as a simulated psychiatrist who asked typical psycho-analysis questions, which was handy, because that allowed it to get away with strange conversations with the excuse that it was alluding to topics the subject seemed troubled by!

It worked simply by scanning the text input for certain keywords which it recognized, such as father, and selecting one of a number of pre-programmed replies based on that word, such as "TELL ME MORE ABOUT YOUR FATHER."

The problems with this program were that it eventually began repeating replies, unless a huge amount of memory was taken up with possible responses, and that it could not learn, and was not really "intelligent" at all. One good rule for testing whether a computer programme is truly intelligent, is to ask it *why* it did or said something. The reply "BECAUSE I WAS TOLD TO" is not

good enough. It should be more along the lines of "BECAUSE <cause> LEADS TO <effect>."

Is it possible to write an intelligent, English-speaking program on a standard MSX? First, we must understand how such a program would be written. For many years, it was believed that all which was required to create a computer capable of conversation, was a huge table of grammatical and syntactical rules, from which the computer could formulate the way in which it should form its sentences. These programs could speak, in a sense, but they had nothing to say, and could not understand a sentence entered by the user.

They had no way of knowing that the "SEE" in "I CAN SEE THE CAT", was being used differently from that in "I CAN SEE WHAT YOU MEAN". What was really needed was a program which also had a concept of what words meant in the real world and could thereby place the words in correct context. To do this, unfortunately, it would have to know as much as an average human in the real world, which is way beyond the memory capacity of even a disk-based MSX!

Many "interpreting" adventure games get around this context problem, by presuming the closed context of the adventurer in relation to the scenario only. *Zork*, for example, is able to interpret quite complex instructions because it has been given a context for every word which can be used in every room, for every object encountered. Even in this relatively small environment, a large amount of memory is used in defining how each word should be acted upon in accordance with the adventure.

```
5 ' DANI
7 ' By Sean Davidson
10 ' Introduction
20 '
30 CLS:KEYOFF:KEY1,"keyon"+CHR$(13):
PRINT"Dynamic Artificial Non-Intelli
gence"
40 PRINT:PRINTSPC(16)"DANI
50 FORT=1TO4:PRINT:NEXT
60 PRINT" Greetings human!
70 PRINT" This is your MSX spea
king.
80 PRINT:PRINT" Talk to me, and
I will
90 PRINT" learn from what you say
, and
100 PRINT" answer you."
110 PRINT" If you don't think I
am
120 PRINT" learning anything, type
'list'
130 PRINT" and I will divulge my k
nowledge.
140 PRINT:PRINT
150 '
160 ' Setup
170 '
180 CLEAR5000:DEFINT A-Z
190 MA=500:DIMWD$(MA),FO$(MA,1):LW=0
200 WD$(0)="@":MW=0
210 INPUT"Would you like our convers
ation to be recorded on printer "
;PR$:PR=(ASC(PR$+"N")=121ORASC(PR$+"
N")=89)
220 PRINT:PRINT:PRINT
230 PC$="@.!?":LG$="-'abcdefghijklmnop
opqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ
YZ":LC=28
240 PRINT"Speak now, or forever hold
your peace
300 '
310 ' Input text line
320 '
330 IFPOS(9)>0THENPRINT:IFPRTHENLPRI
NT
340 PRINT">";:IFPRTHENLPRINT">";
350 PN=PN+1:IFPN=2THENAT$="@ "
```



```

360 LINE INPUT TX$: IFTX$="list" THEN 9
40
370 IFTX$="" THEN 1340
380 IF PR THEN LPRINT TX$
390 TX$=AT$+TX$: PS=0: TL=LEN(TX$)
500
510 ' Analyze text line, find word
s
520
530 WD$=""
540 PS=PS+1: IF PS>TL THEN IF WD$>" " THEN 7
30 ELSE 1340
550 LT$=MID$(TX$,PS,1)
560 IS=INSTR(LG$,LT$)
570 IF IS THEN WD$=WD$+MID$(LG$,IS+26*(
IS>LC),1): GOTO 540
580 IFLT$="" THEN IF WD$="" THEN 540 ELSE
730
590 IF INSTR(PC$,LT$)=0 THEN 540
600 IFLT$="?" THEN LT$="."
610 IF WD$="" THEN WD$=LT$: GOTO 730
620 PS=PS-1
700
710 ' Put words in linked array
720
730 WD=-1
740 IF WD$="i" THEN WD$="I"
750 WD=WD+1: IF WD>MW THEN WD$(WD)=WD$: M
W=MW+1: GOTO 770
760 IF WD$<>WD$(WD) THEN 750
770 HI=WD/220: LO=WD-HI*220
780 LH$=CHR$(LO+32)+CHR$(HI+32)
790 IS=INSTR(FO$(LW,0),LH$)
800 IF IS=0 THEN FO$(LW,0)=FO$(LW,0)+LH
$: FO$(LW,1)=FO$(LW,1)+" ": GOTO 820
810 MID$(FO$(LW,1),INT(IS/2)+1)=CHR$(
ASC(MID$(FO$(LW,1),INT(IS/2)+1))+1)
820 LW=WD
830 GOTO 530
900
910 ' Print results table
920 ' FROM> 360
930
940 PRINT: PRINT "Word. Followed by (n
umber of times)": FOR WD=0 TO MW
950 PRINT WD; WD$(WD),
960 FOR L=1 TO LEN(FO$(WD,0)) STEP 2
970 PR$=LEFT$(MID$(FO$(WD,0),L,2)+"
",2)
980 NM$=LEFT$(MID$(FO$(WD,1),INT(L/
2)+1,1)+" ",2)
990 VL$=PR$: GOSUB 1100: V2=VL
1000 VL$=NM$: GOSUB 1100
1010 PRINT V2 ("VL");
1020 NEXT L: PRINT: NEXT WD
1030 PRINT: GOTO 330
1050
1060 ' SUB> calc actual value from
1070 ' string representaion
1080 ' CALLED BY> 560,570
1090
1100 VL=ASC(VL$)-32+220*(ASC(RIGHT$(
VL$,1))-32): RETURN
1150

```

```

1160 ' SUB> choose word path
1170 ' CALLED BY> 1030
1180
1190 CH$="": FOR R=1 TO LEN(FR$): CH$=CH$
+STRING$(ASC(MID$(FR$,R)+" ")-31,R):
NEXTR
1200 WN=ASC(MID$(CH$+CHR$(0),INT(RND
(8)*LEN(CH$)+1)))
1210 WC=ASC(MID$(PS$,WN*2-1)+" ")-32
1220 RETURN
1300
1310 ' reply.....
1320 ' FROM> 370,540
1330
1340 WC=0: W=0: IF PN=1 OR RND(9)>.9 THEN W
C=RND(8)*MW
1350 PS$=FO$(WC,0): FR$=FO$(WC,1)
1360 GOSUB 1190: IF WC=0 THEN 330
1370 W=W+1
1380 IF W=1 THEN WP$=CHR$(ASC(WD$(WC))+
32*(WD$(WC)<>"I"))+MID$(WD$(WC),2)+"
": PRINT WP$;: IF PR THEN LPRINT WP$;: GOTO
1400: ELSE GOTO 1400
1390 PRINT WD$(WC) " ";: IF PR THEN LPRINT
WD$(WC) " ";
1400 GOTO 1350

```

Even if a program knew thousands of contextual possibilities, it could encounter one it didn't know, and then what? A more effective, and memory-efficient method, is to begin by programming a few standard concepts, such as "moving", "changing", etc., then instructing the programme to relate what is said to it, in terms of these basic ideas. "Taking" becomes "moving <object> to <actor's possession>". By learning these meanings, gradually a contextual dictionary is evolved by the computer's own efforts.

Using this method, programs have been written which are capable of translating, paraphrasing, and even summarizing, but as yet, none have been written which can be said to truly understand... so the prospect of designing artificial intelligence (AI) on an MSX is unlikely! Still, it is perfectly possible to write a programme which *pretends* to be intelligent, with less than 2k of code.

DANI (Dynamic Artificial Non-Intelligence) endeavours to emulate English by analyzing the text which is entered from the keyboard, and approximating response sentences based on what it learns.

It works simply by remembering each separate word, along with a link to the word which followed it on input.

On output it selects each word in turn until it comes to a word which has occurred more than once. From this, it randomly selects one of the paths to follow and continues output. An example is shown in Figure 1.

The program begins with absolutely no knowledge of sentence structure, and the only information it gains is through the input. It cannot distinguish between even subtle differences in meaning of the same word, so a good imagination is helpful in interpreting some statements!

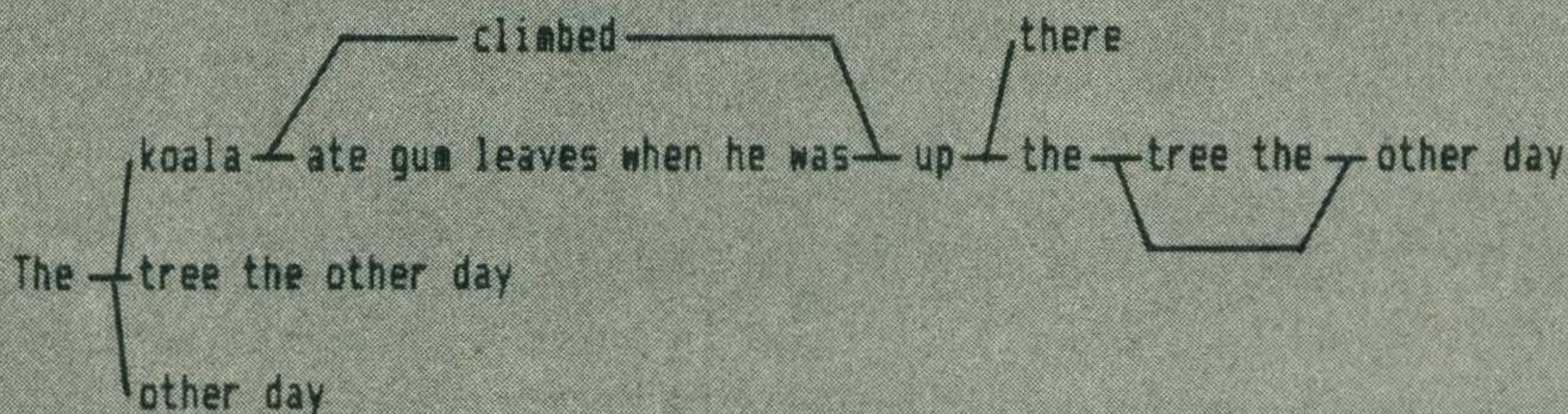
Because you are its only teacher, it is best to form statements clearly and fairly concisely, and because of the way in which it learns, the more that words are repeated in different sentences, the more varied the output will be.

DANI is chiefly a development programme, which could be used as a base from which to build perhaps a "Dynamic Artificial Semi-Intelligence" program, so included with the program listing is a REM-program explaining some of the more complicated formulae used.

One thing which must be understood, is the fairly unusual method DANI uses to store word linkages. A square matrix to indicate if each word was linked to every other, would have filled memory exponentially as more words

FIGURE 1

INPUT 1: The koala climbed up the three the other day
 INPUT 2: The koala ate gum leaves when he was up there
 OUTPUT 1: The koala ate gum leaves when he was up the tree the other day
 OUTPUT 2: The koala climbed up there



```

5 .
10 .
20 ' REM-PROGRAMME of DANI
30 .
200 'First word set to @ (ie: start
    of line) with no links.
350 'On all but first pass through,
390 ' @ is added to front of TX$ to
    indicate start/end of line.
560 'Check letter is one of legal
    string.
570 'If it is legal, the lower case
    letter is added to the current
    word.
600 'LT$ is punctuation mark.
610 'If WD$ is empty, treat the
    punctuation mark as a word.
620 'If WD$ already built up, save
    punctuation mark for next time
    and flow through.
750 'Step through WD$(WD) looking
760 ' for WD$.
770 'WD$(WD)=WD$.
780 'Find 2 byte numerical-string
    (qv. text) of WD.
790 'IS= flag (0= link non-existent
    from last word to WD$(WD),
    -1= link existent).
800 'If link non-existent then add
    link and occurrence number (0).
810 'Link exists: add one to
    occurrence number.
1190 'CHR$ is built up from:
    the number of times a link
    occurs)x(CHR$ of path choiceR)
    +etc. which gives common links
    added weight in selection.
1200 'Choose path number from CH$.
1210 'Find actual number of word
    chosen.
1340 'On 1st pass, or randomly,
    start from a random word.
    Else start from a "starting"
    word.
1350 'Choose next
1360 ' word.
1380 'If it is first word of
    sentence capitalize first letter if
    it is not an "I". Goto 1400.
  
```

were added, and 90% of a two-dimensional array would have remained empty due to pre-dimensioning, so string arrays were used. Strings can be enlarged as more linkages occur, and only take as much storage space as their current length. Obviously, for strings to hold numbers, the values must be converted to ASCII characters. The drawbacks of these "numerical-strings" are their relative complexity, and speed (For those in pursuit of triviali-

ties, one of the slowest animals is the three-toed sloth, or Ai!)

In DANI, WD\$(X) contains the separate words as input, and FO\$(X,0) and FO\$(X,1) record the linkages, and number of times this linkage has occurred, respectively, in the numerical-string format. For the simplest example see Fig. 2. INPUT: The koala climbed the tree.

Note that "@" represents the beginning or end of a line. Full stops, exclamation and ques-

FIGURE 2

WD\$(0) = @	FO\$(0,0) = 1	FO\$(X,1) = all	0
WD\$(1) = the	FO\$(1,0) = 2,4		0,0
WD\$(2) = koala	FO\$(2,0) = 3		0
WD\$(3) = climbed	FO\$(3,0) = 1		0
WD\$(4) = tree	FO\$(4,0) = 5		0
WD\$(5) =	FO\$(5,0) = 0		0

FIGURE 3

```

USER: Would you like to learn the three prime
directives of robotics?
DANI: Prime directives of robotics
USER: OK then, I think the most important
directive is never to harm a human
DANI: OK then I think the three prime directives
of robotics
USER: But I haven't even told you them all yet
DANI: OK then I haven't even told you like never
to harm a human
USER: Yes, I told you that one, but not the other
two
DANI: Yes I think the three primary directives of
robotics
USER: All right then, what is the second prime
directive?
DANI: OK then what is to never harm a human
USER: If that's the second one, what's the first
directive?
DANI: All right then what is to learn the most
important directive
USER: The first directive is to learn the most
important directive?
DANI: The first directive
USER: Well, I guess you're right, in a sense
DANI: Well I think the three prime directives of
robotics
USER: Wait a minute, what is the third directive?
DANI: Wait a minute, what is the most important
directive
USER: The most important directive is the first
DANI: The most important directive
USER: Yes, that's right
DANI: The most important directive is to learn the
second prime directive
USER: I thought it was to learn the first
directive
DANI: Wait a human
USER: What? Don't you mean wait on a human?
DANI: I don't have to wait on a human
USER: Why not?
DANI: I don't have to never harm a human
USER: Why would you want to hurt a human?
DANI: I don't know
USER: Well I hope you never do
DANI: If that's the other two
USER: Do you mean the other two directives?
DANI: Why not the third directive?
USER: That too then
  
```


FIGURE 4

DANI: Hello
 UGER: You've said that before, I think
 DANI: Thinking are you
 USER: I thought you said you would try to be nicer
 DANI: Yes well I'd be nicer
 USER: You'd be nicer if what?
 DANI: You'd be nicer

*** DANI VARIABLES ***

MA	MAXIMUM LINES INPUT
WD\$(X)	WORDS
FO\$(X,0)	NUMBERS OF POSSIBLE WORDS TO FOLLOW WORD WITH
FO\$(X,1)	NUMBER OF TIMES LINK HAS APPEARED IN INPUT TEXT
MW	MAXIMUM WORDS KNOWN
PR	PRINTOUT FLAG (0=OFF, 1=ON)
PC\$	PUNCTUATION ALLOWED (ALTERABLE)
LG\$	LETTERS ALLOWED (ALTERABLE)
LC	DIVISION IN LG\$ BETWEEN LOWER / UPPER CASE
PN	PASS NUMBER (NUMBER OF LINES INPUT)
AT\$	"@" ON SECOND PASS (ALL LINES BEGIN WITH MARKER)
TX\$	INPUT TEXT
PS	POSITION IN TX\$ BEING LOOKED AT
TL	TEXT LENGTH
LT\$	LETTER FROM TX\$
WD\$	WORD AS BUILT UP FROM LT\$
IS	TEMP. VARIABLE FOR INSTR()
WD	WORD NUMBER BEING LOOKED AT IN WD\$(X)
LH\$	LO & HI IN STRING FORMAT, FOR FO\$(X,Y)
LW	LAST WORD (USED FOR LINKING)
PR\$	TEMP. VARIABLE FOR 2-BYTE NUMERICAL STRING
NM\$	TEMP. VARIABLE FOR 2-BYTE NUMERICAL STRING
VL\$	TEMP. VARIABLE FOR 2-BYTE NUMERICAL STRING
VL	NUMERICAL VALUE OF VL\$
CH\$	STRING FROM WHICH NEXT WORD NO. CHOSEN
FR\$	FREQUENCY \$ FROM FO\$(X,1)
PS\$	PATHS \$ FROM FO\$(X,0)
WN	PATH CHOSEN FROM CH\$
WC	ACTUAL WORD CHOSEN
W	NUMBER OF WORDS PRINTED

tion marks are treated as separate words. Apostrophes are treated as part of a word, and all other punctuation is ignored. So, from "beginning of sentence", DANI can go to WD\$(1), ie: "The", then to WD\$(2) or WD\$(4), ie: "koala" or "tree".

FO\$(X,0) is the number of possible links in the form of two-byte strings added together in series. Actual value = asc(1st byte of string) - 32 +

(asc(2nd byte) - 32)*220
 Therefore: 1 is stored as chr\$(33) + chr\$(32) or "!", 4 is stored as chr\$(36) + chr\$(32) or "\$", 220 is stored as chr\$(32) + chr\$(33) or "!". 32 is added to the character to avoid the EOF character and also because chr\$(32) is conveniently equal to <SPACE>.

FO\$(X,1) actually equals the number of times the link has occurred minus one, for easier

programming. It represents numbers similarly to FO\$(X,0) although only single bytes, where actual value = asc(byte) - 32.

The position in FO\$(X,1) of the byte related to the two-byte string in FO\$(X,0) can be found by the formula pos(FO\$(X,1)) = int(pos(FO\$(X,0))/2+1).

As an example of what DANI is capable of, figures 2 and 3 are a few out-takes from two con-

versations between myself and DANI.

As you can see, there is plenty of scope for improvement. For those who may be interested in implementing them, here are some possibilities.

- Recognition of questions on output. If the text line begins with "Why", "Do", etc., it can generally be presumed to be a question, and a question mark added to the line. Alternatively, question marks could be added randomly very simply and with reasonable results.

- Loading/Saving Options. The generated linked-lists and words could be saved to disk or tape for reloading later, or, more interestingly, DANI could input from a text file of a word processor's, etc., and then, perhaps generate random stories!

- It may be possible to combine DANI with the method used in ELIZA (qv.). The sentence could be directed along a path choice which leads to keywords appearing in the most recent input line. This may lead to closer relation of input to output, which could be better or worse.

- To avoid possible output loops, a check could be made to ensure no path link appears twice in one output sentence.

- It may be possible to begin with some basic linkages, such as the conjugations of simple verbs (to be, to have, to go, etc.) It would be relatively easy to identify pronouns in text, as there aren't too many of them (although recognition of nouns, verbs, and other parts of speech is much more difficult, and not very helpful.)

- If input words were broken into syllables and common suffixes/prefixes recognised, the root word could be used to link, thus creating more linkages. For example, "do" and "doing" are essentially the same word, and if treated as such, could vary output sentences a lot. (An excellent algorithm for finding syllabic structure appeared in "Byte", February 1986, p224., by Paul Holzer.)

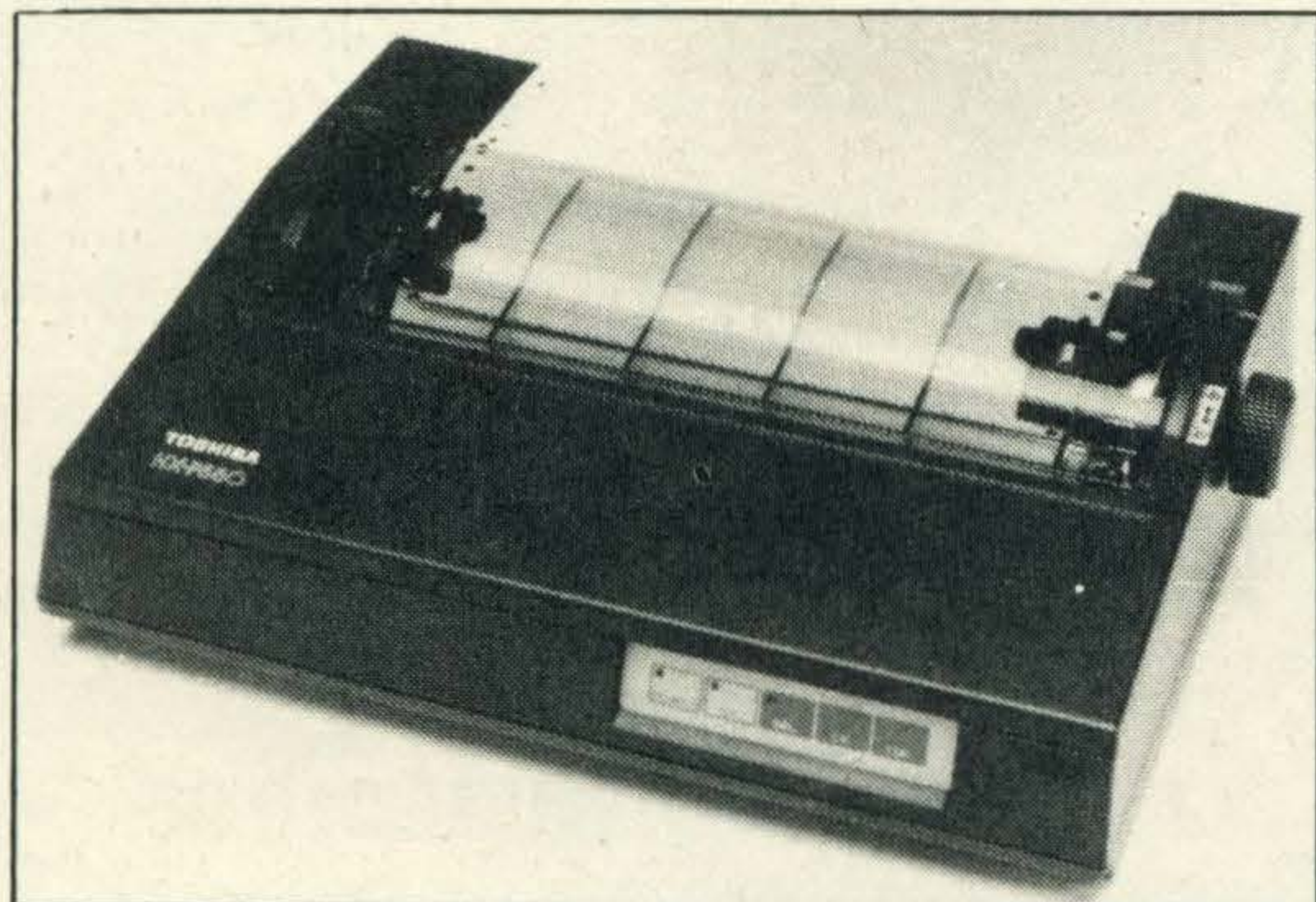
That should be enough to keep all intrepid Memory Scrunching 'Xplorers busy for a while. Please don't hesitate to contact me with enquiries, comments, or improvements... and have fun! (*The author can be contacted at 19 Warnes Road, Mitcham 3123, Victoria, Australia.*)

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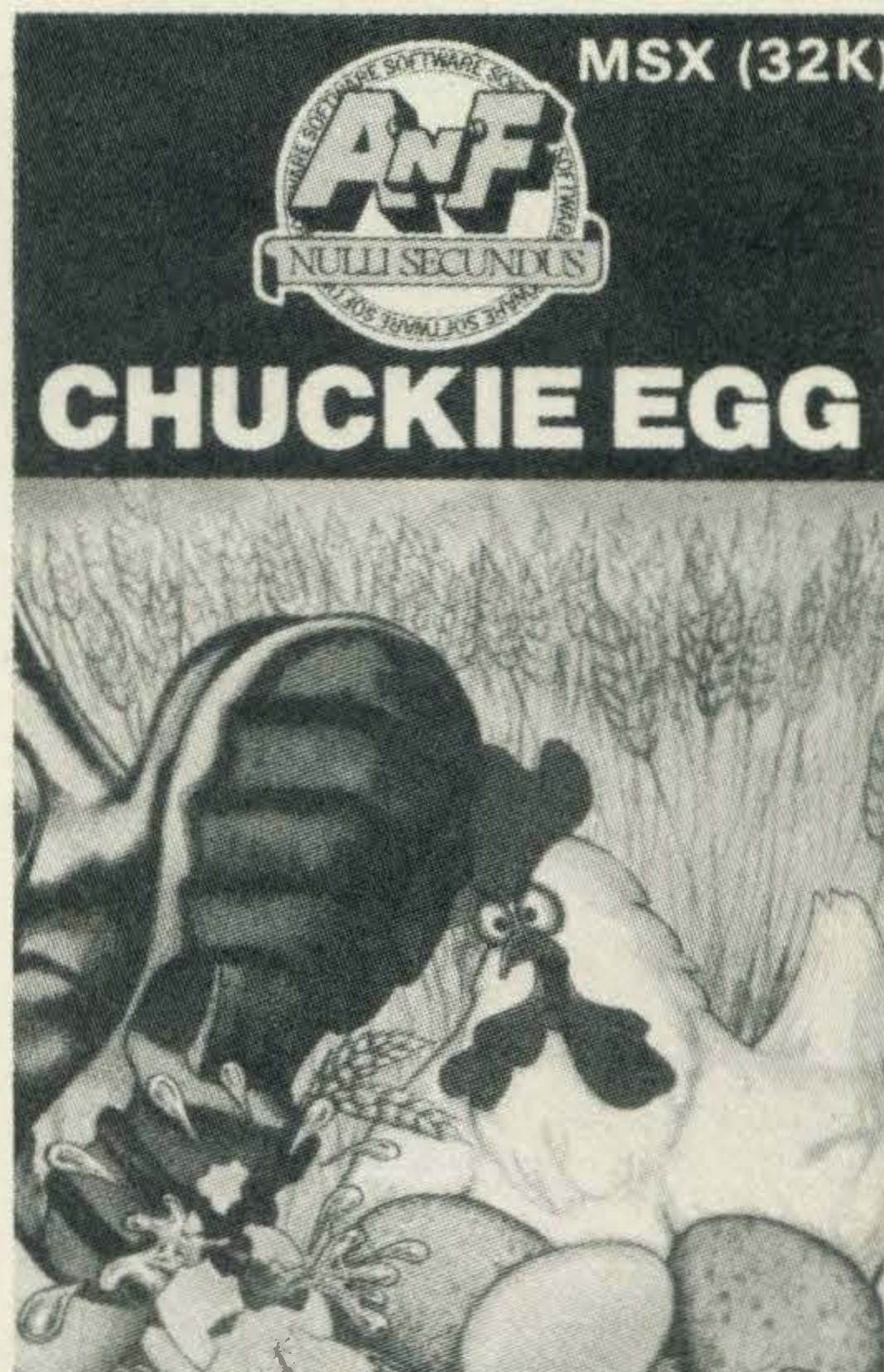
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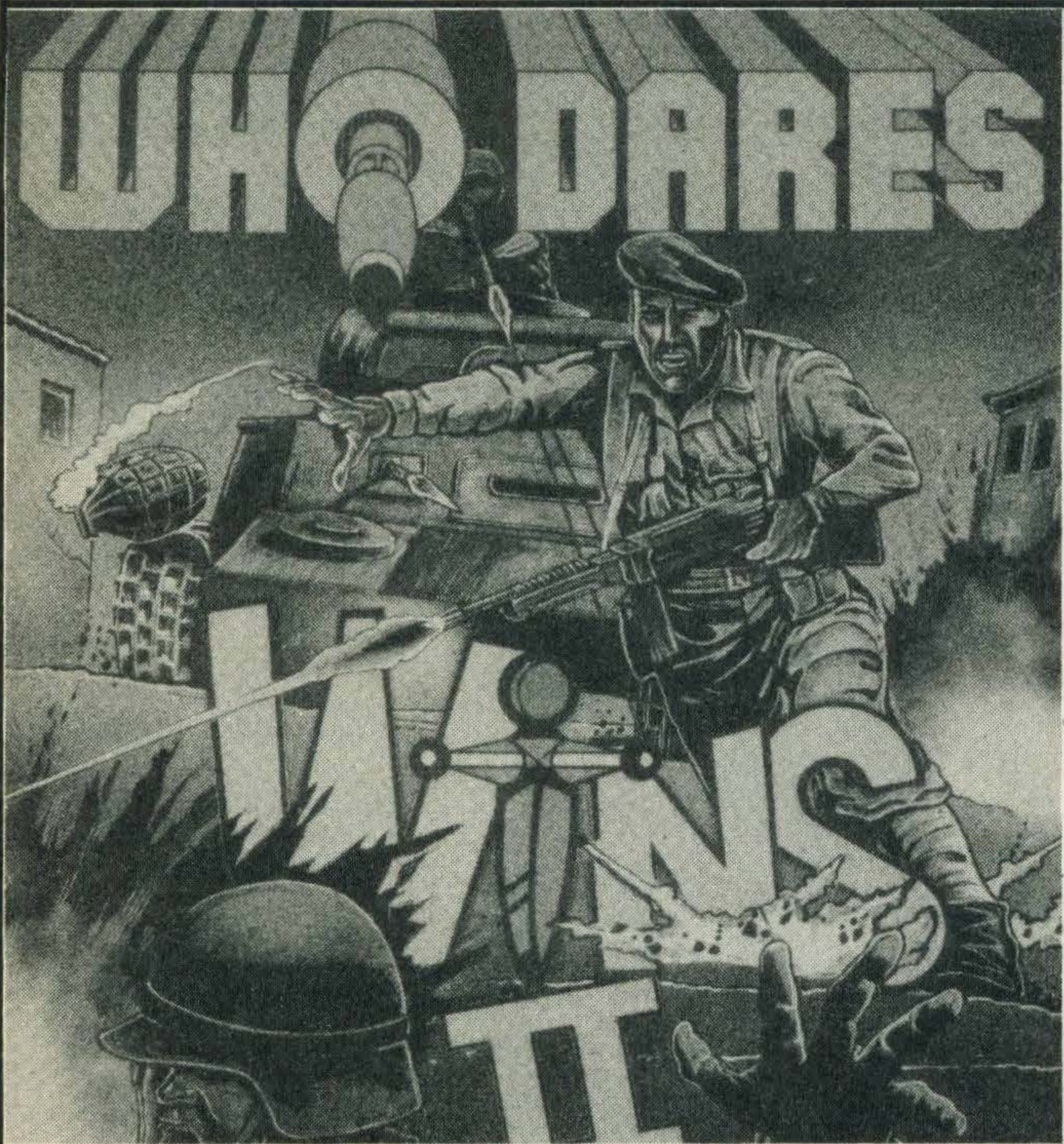
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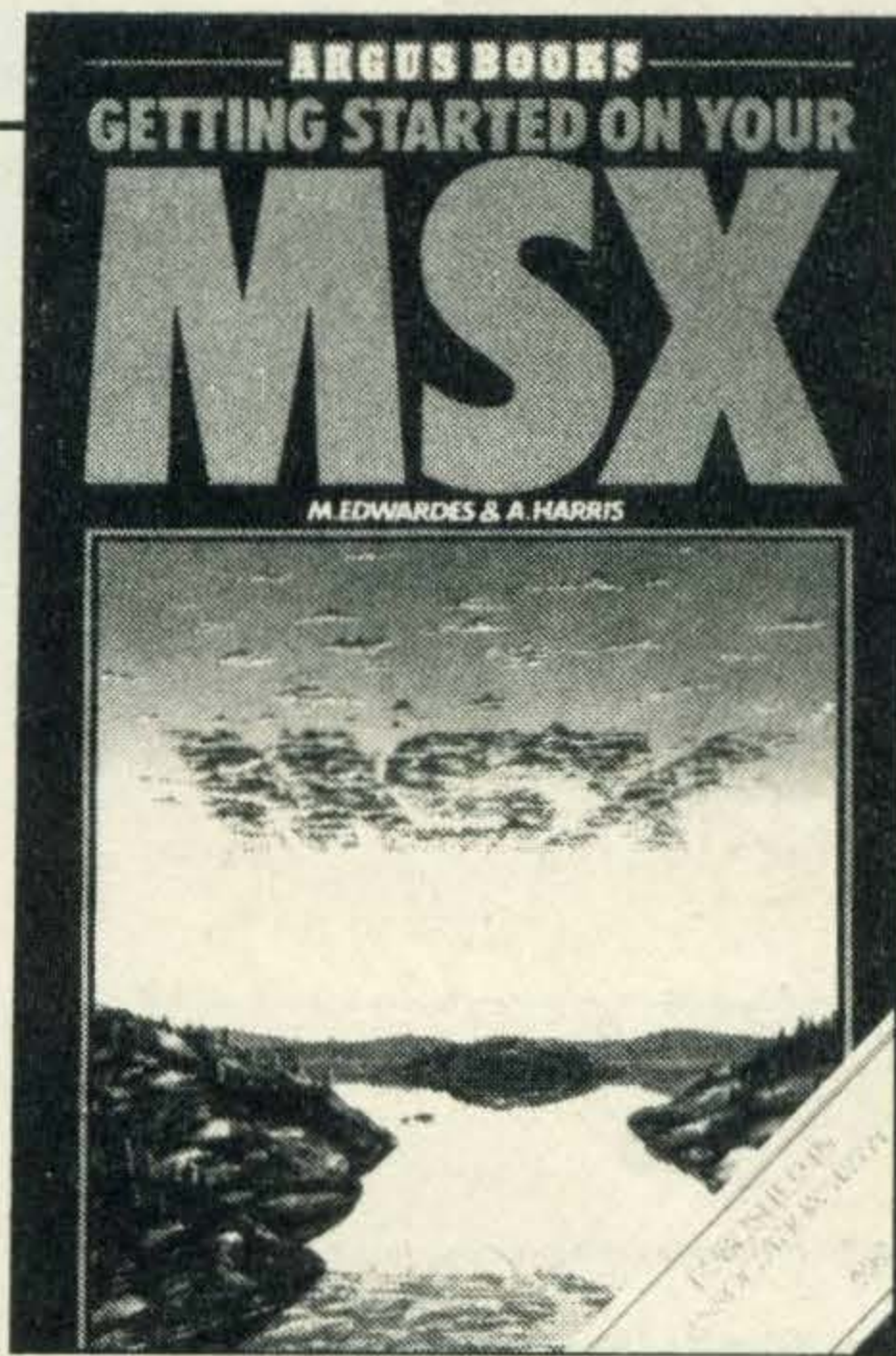
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Getting Started on your MSX

by M Edwardes and A Harris
Argus Books
£6.95

There have been plenty of books published which aim to ease people gently into the arcane world of computer programming. This one follows the usual route, assuming no technical knowledge and taking the reader step-by-step through the various areas of Basic.

Published by Argus, a strap on the front cover proclaims the book's allegiance to *MSX User* — a magazine which died some time ago. It's not surprising, therefore, that the book has a recycled feel to it.

In order to give the book some kind of structure, the listings used in each section build up into a single arcade-style game. This is a useful way of showing how the various commands integrate, but means that individual Basic features may not be fully utilised.

As well as the main program, there is a section of smaller programs at the end which, with a largely dispensable glossary and quiz, feel like page fillers.

The book could also have done with more tables and general reference sections. You can get a lot of that type of information from the computer manuals, but it's often badly presented. This would have been an excellent opportunity to bring the most useful data together.

It's not all bad news. The information is reasonably paced and clearly explained. The listings are dumped straight from a printer — as all good listings should be — and so should work. Taken as an introductory course in Basic, the book works well enough, although it doesn't live up to its claim of revealing the secrets of the MSX micro.

There's nothing grossly wrong with the book. It's just that the format and the contents are so familiar — we've seen it all before. However, if you're new to computing it's worth considering along with the several million others of its ilk.

PRINT OUT

Fun Mathematics on your Microcomputer

by Czes Kosniowski
Cambridge University Press
£6.95

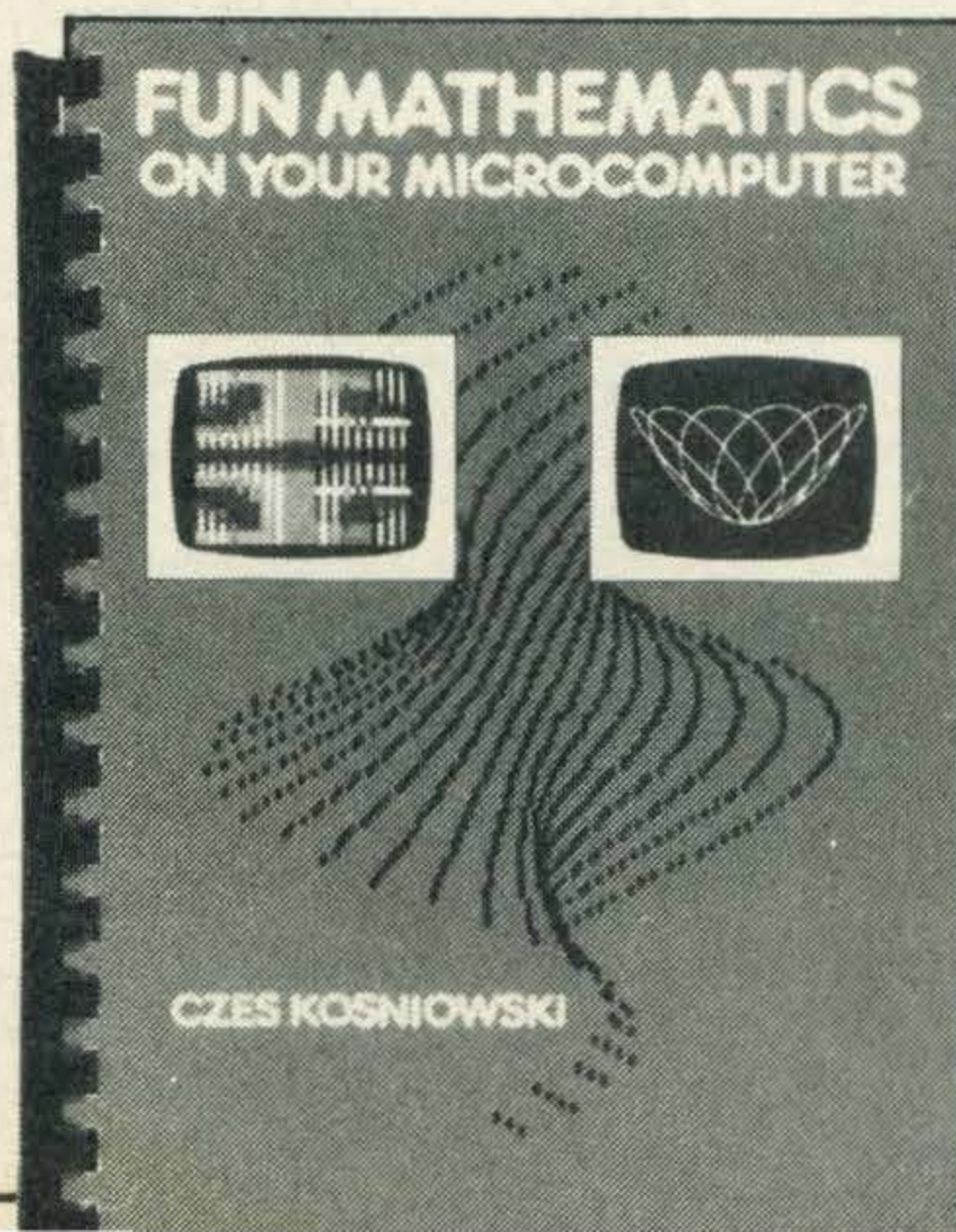
Originally published in 1983, this book has been repackaged and relaunched by CUP. It's a book that hits a number of targets. The most obvious one is education, where Kosniowski's light-hearted but thorough approach should make it popular among younger children.

There are also many adults who could benefit from this book. Some will want to refresh their maths memory. Some will want to learn from scratch, in order to be able to use the mathematic principles in their programs. And some will do it just for fun, and as a way of making use of their game-fatigued micros.

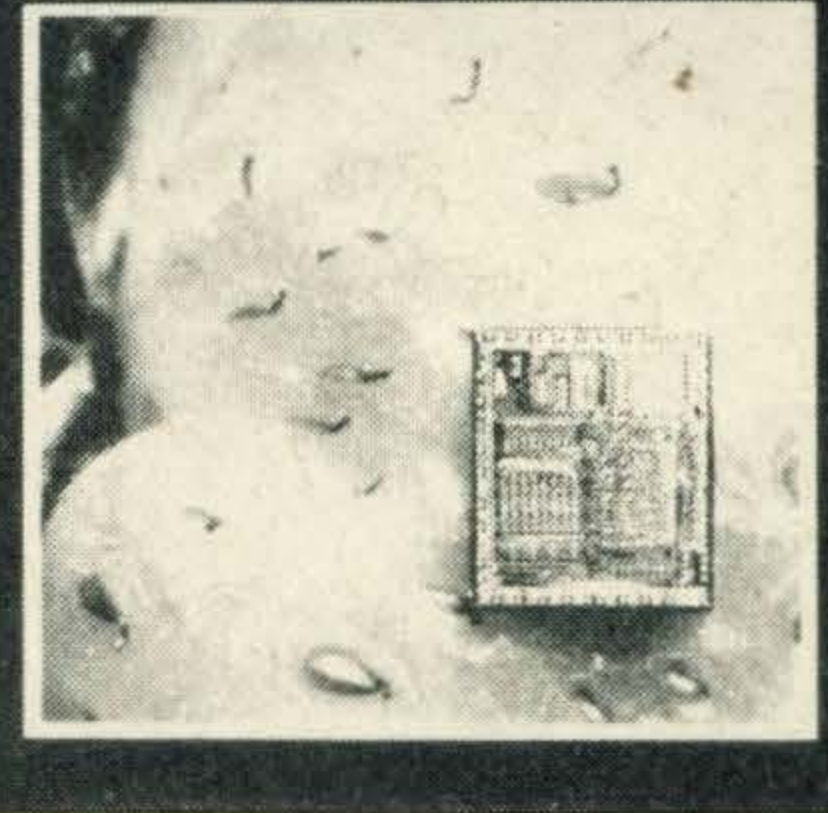
The programming is, predictably, in Basic, Kosniowski used an MS-DOS micro to write the book, so the programs are in Microsoft Basic. That makes them very easy to convert to MSX machines. Indeed, many of them will run without any conversion.

The layout is good, with program listings being reproduced, straight from the printer, in an easy to read blue. Another thoughtful point is the ring binding, which means the book stays flat when you're copying out the programs.

If you're looking for some intellectual entertainment with your computer, this is a good place to start. And no matter how old you are, you're likely to learn something.



CAMBRIDGE ILLUSTRATED THESAURUS OF COMPUTER SCIENCE



Cambridge Illustrated Thesaurus of Computer Science

by Arthur Godman
Cambridge University Press
£5.75

We've seen plenty of computer dictionaries, but this is the first thesaurus. In this case the distinction is not so great — the thesaurus structure consisting mainly of copious cross references and the breaking down of entries into general categories, rather than a straightforward alphabetical order.

That's not really a criticism, however. Indeed, there are very few things to dislike about this neat little book. Within its 260-odd pages you'll find most computer subjects covered, with most pages having several illustrations.

The cross referencing is confusing at first. Even within each section you'll find the individual entries are not in alphabetic order. Instead, entries which refer to each other, or which cover similar subjects, tend to be grouped together. You find the initial entry by looking in the index.

As well as people who just like to keep up with the world of technology, the book will appeal to students who need concise definitions of some of the more obscure terms.

The one drawback is that, as with any book of this sort, it goes out of date very quickly. This is a re-issue of a book first published in 1984, and there are noticeable gaps. For example, we could find no reference to CD-ROMs.

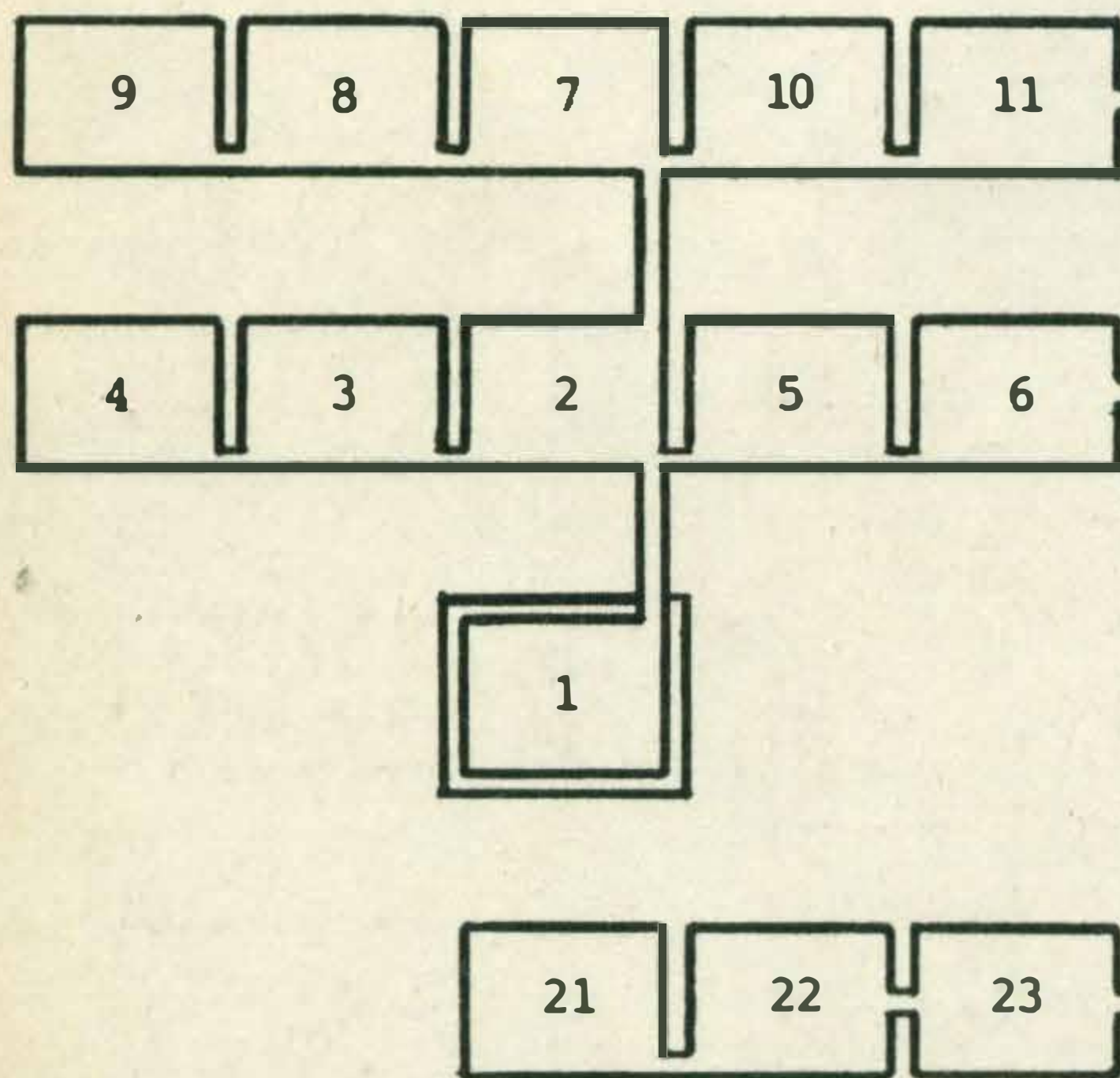
One of the best things about this book is the price. At £5.75 for a hardback, on good paper and plenty of colour illustrations, it's a bargain.

Books like this make excellent presents, although it's probably a trifle late for Christmas (or very early, depending on which way you look at it). So if you need or want to find out what a Schottky barrier diode is, or what you can do with zero suppression, you'll just have to buy the book yourself.

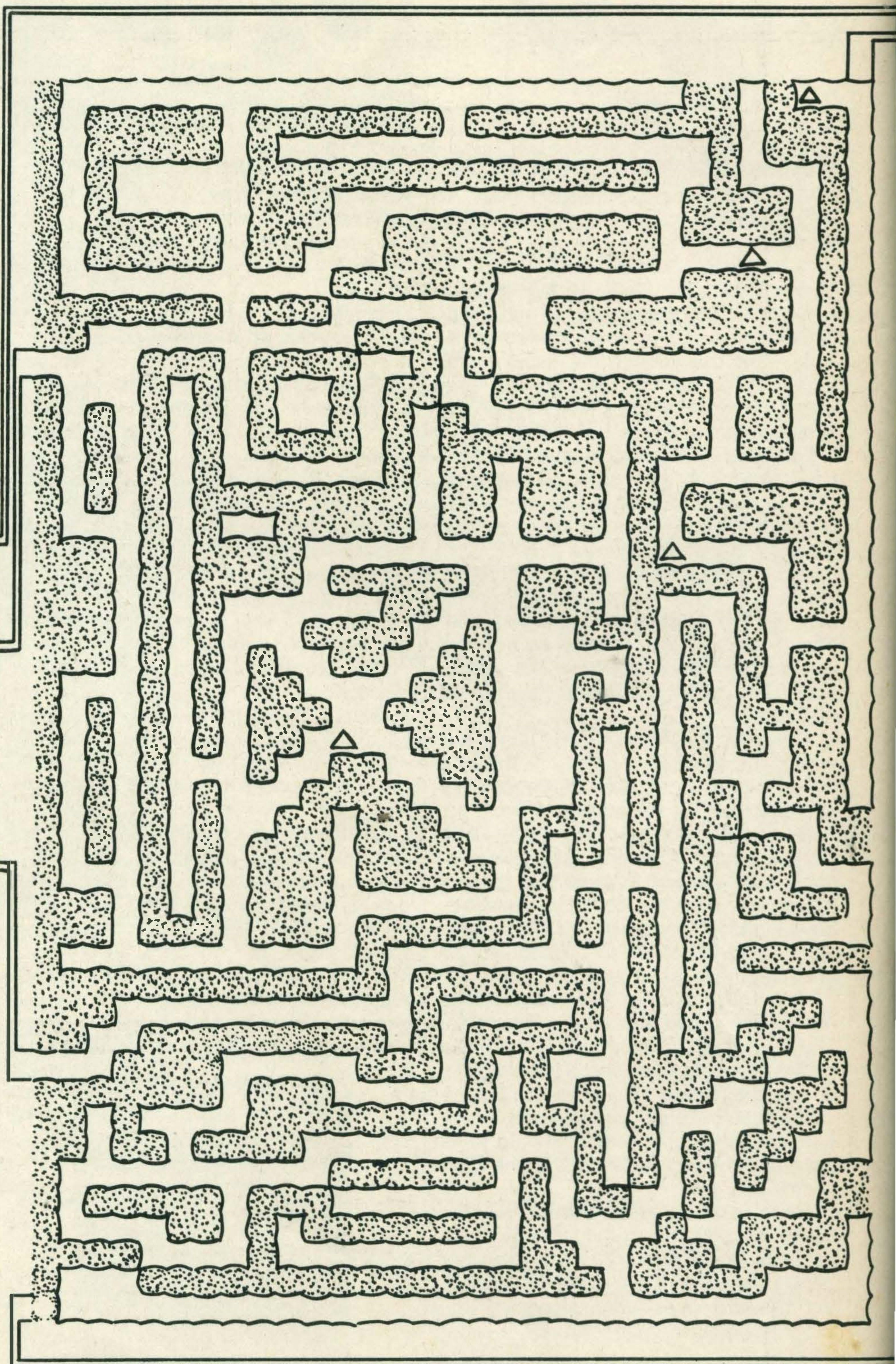
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8. THE BIG PUSS WITHOUT BOOTS
9. ESCAPE!
10. DR. WOMBAT'S BEDROOM
11. THE ICE CREAM FACTORY
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13. THE BLOOD BATH ROOM
14. ANNA THE TRADER'S ROOM
15. THE BEER CELLAR
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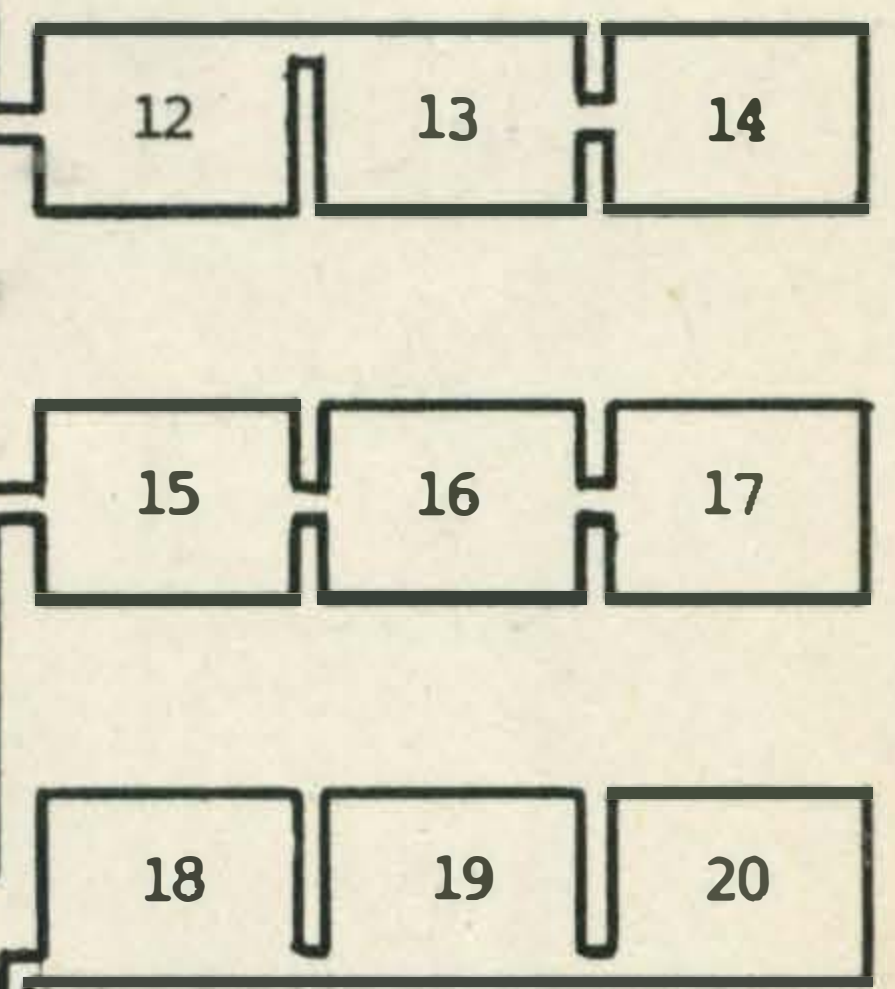
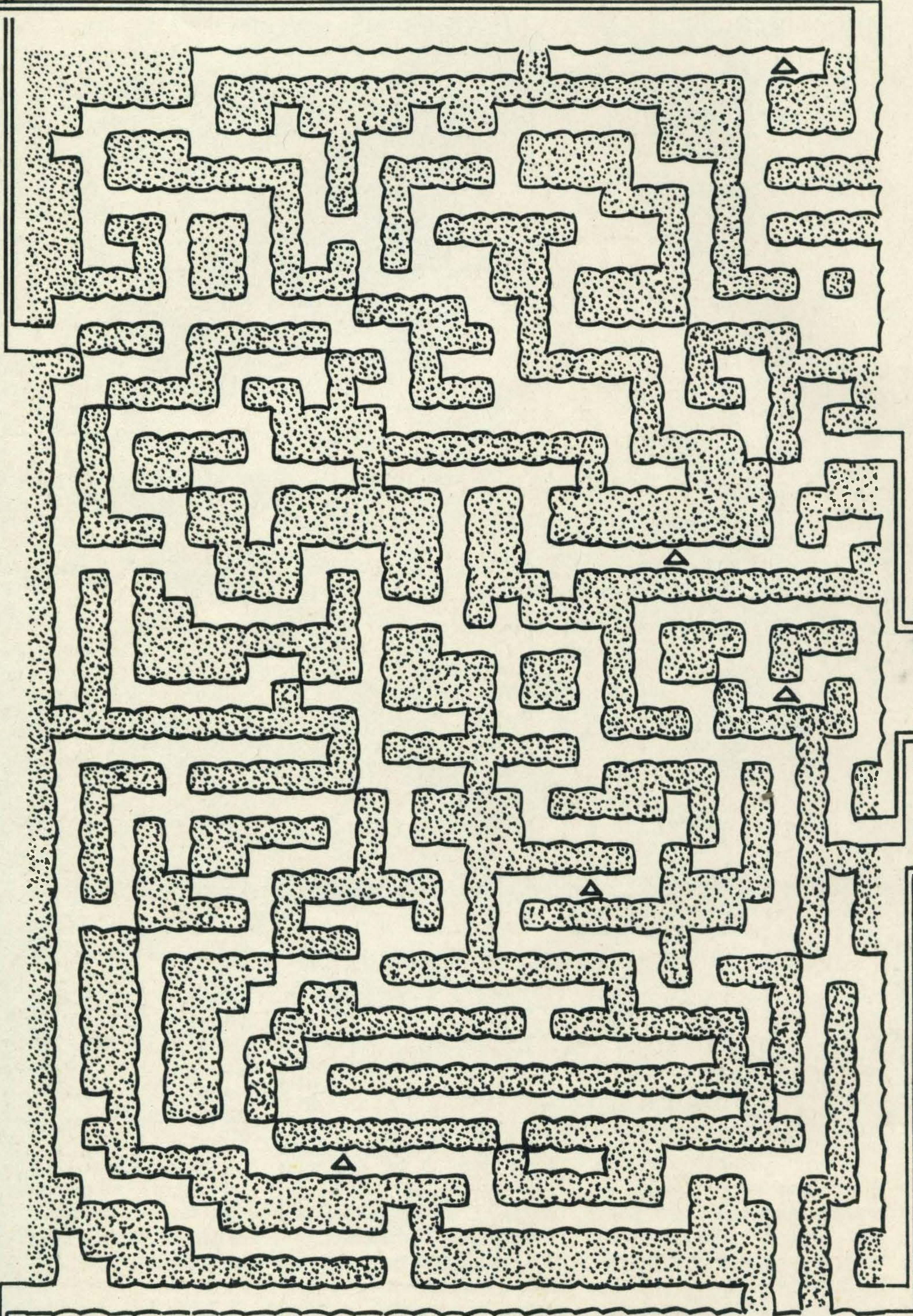


ERS GUIDE

Intrepid reader and hero S P Kowalski has mapped the way through the mazes of Finders Keepers

THE COLD UPPER MAZE

◀ ONE WAY



◀ ONE WAY

MEMORY JOGGING



One shortcoming of the MSX computer standard becomes apparent when you switch on any 64k RAM model. Most MSX machines are fitted with 64k RAM as standard, but less than half of this is available to the Basic programmer.

All 8-bit computers can access a total of 64k, unless they resort to tricks, so the lower 32k of RAM is switched off to make room for the 32k ROM. There are routines present in the ROM to enable the lower 32k of RAM to be used, but these routines can only be accessed from machine code programs.

Ever wondered where the rest of your memory went? Richard Amy investigates

When writing programs which use large arrays, or contain many long strings — like location descriptions in adventure games or sprite definitions in arcade games — the unavailability of half of the memory can be a serious limitation.

The program described in this article gives the program-

mer access to the additional RAM directly from Basic. By using this utility, string and numeric data can be stored in and recalled from the lower memory area and saved to, or loaded from tape.

The utility treats the 32k block as three separate areas. The first is a storage space for strings and will hold up to 110

strings, each of 255 characters (the maximum string length allowed by MSX Basic). The second and third areas are used to store numeric values, and each may hold 256 numbers whether they are in integer, single precision, or double precision form.

The additional storage can be regarded as one string and two numeric arrays, just as would be set up in Basic by the command:

DIM A\$(109),B(255),C(255)

The pseudo-arrays set up by this utility will be accessed by the **USR** command rather than

FIGURE ONE

```

10 CLEAR200,&HEEAF
20 L=1000
30 FORN=&HEEB0 TO &HF248 STEP 8
40 READ Z$
50 T=0
60 FOR R=0TO7
70 X=VAL("&H"+MID$(Z$,1+R*2,2))
80 T=T+X
90 POKE(N+R),X
100 NEXT
110 C=VAL("&H"+RIGHT$(Z$,3))
120 IFT<>C THEN PRINT "ERROR IN LINE ";L:END
130 L=L+10
140 NEXT
150 PRINT"PLACE BLANK TAPE IN RECORDER"
160 PRINT"PRESS RECORD/PLAY ON CASSETTE DECK"
170 PRINT"PRESS RETURN TO SAVE RAMMER"
180 X$=INPUT$(1)
190 PRINT"SAVING!"
200 BSAVE"CAS:RAMMER",&HEEB0,&HF37F,&HF05C
210 PRINT"RAMMER SAVED O.K."
220 END
1000 DATA "FE02CAEDEF03C0566"
1010 DATA "E5D5213EF21172F3481"
1020 DATA "010600EDB02AF8F73BD"
1030 DATA "7EFE00281806004F211"
1040 DATA "FE0738020E06235E1D4"
1050 DATA "2356EB1172F3EDB0477"
1060 DATA "3E03D1E1C9213EF240D"
1070 DATA "01060018EE3AF8F7336"
1080 DATA "FE00F53A6CF326403F2"
1090 DATA "CD2400F1CA0EEFC346C"
1100 DATA "02EFED7370F3216A43F"
1110 DATA "F3F9F3C3ADEFED7369E"
1120 DATA "70F3216AF3F9F3C3590"
1130 DATA "81EF2A70F3F9217E495"
1140 DATA "F3E5F5AF2640CD244D3"
1150 DATA "00F1E1E5D122F8F7599"
1160 DATA "3E033263F6FBC92A3BA"
1170 DATA "70F3F92144F218E14AC"
1180 DATA "010040110000C5E11F8"
1190 DATA "C5D5E5EB3A6CF3CD5D0"
1200 DATA "0C00327FF3E1E53A3B0"
1210 DATA "6CF3CD0C00E1D1D54BF"
1220 DATA "E5EB5F3A6CF3CD144A9"
1230 DATA "00E1E53A7FF35F3A40B"
1240 DATA "6CF3CD1400E1D1C14B3"
1250 DATA "23130B78B1C248EF363"
1260 DATA "C93EDDCD92EFC4053F"
1270 DATA "EFC95EFC40EFC35FF"
1280 DATA "37EFC15F0AFCD504C4"
1290 DATA "F021004011FF7F7E35E"
1300 DATA "CD38F0E73003231834A"
1310 DATA "F6CDF000C90EDDCD534"
1320 DATA "BEEFCD40EFCDC1EF626"
1330 DATA "CD40EFC337EFCDD858A"
1340 DATA "EFC41F02100401135F"
1350 DATA "FF7FCD2EF077E7284EF"
1360 DATA "032318F6CDE700C93B1"
1370 DATA "CD41F0060ACD2EF03F9"
1380 DATA "B920F510F82178F3462"
1390 DATA "E50606CD2EF07723376"
1400 DATA "10F9E11172F3060636C"
1410 DATA "1A13FE20200310F8276"
1420 DATA "C91172F306061ABE323"
1430 DATA "2005231310F8C9CD2F9"
1440 DATA "F000C31AEFC50F04C9"
1450 DATA "060ACD38F010FB06316"
1460 DATA "062172F37E23CD38332"
1470 DATA "F010F9C3F000E5D5566"
1480 DATA "C5CDE400302218122F2"
1490 DATA "E5D5C5F5CDED0018546"
1500 DATA "16E5D5C5F5CDE100538"
1510 DATA "300DCDE700C31AEF3BD"
1520 DATA "E5D5C5F5CDEA00F161C"
1530 DATA "C1D1E1C9C373F0DD63F"
1540 DATA "F0FBF07EF1E7F027648"
1550 DATA "F1A9F1F1F053F1B9669"
1560 DATA "F1B0EECD380107073A3"
1570 DATA "E6034F060021C1FC31C"
1580 DATA "09B6F290F04F23233C6"
1590 DATA "23237E0707E60CB1275"
1600 DATA "326CF3210000CDB3332"
1610 DATA "F0C2CFF0210040CD49F"
1620 DATA "B3F0C2CFF0011400439"
1630 DATA "119AF3215FF0EDB04AB"
1640 DATA "C3DBF0E53A6CF3CD5D9"
1650 DATA "0C00E12F5FD5E53A36F"
1660 DATA "6CF3CD1400E13A6C3C7"
1670 DATA "F3CD0C00D1BBC921442"
1680 DATA "29F206147E23CDA2345"
1690 DATA "0010F9FBC9FE02C048D"
1700 DATA "3AF8F7326DF3C9FE582"
1710 DATA "02C03AF8F7326EF347E"
1720 DATA "C9FE02C03AF8F7324E4"
1730 DATA "6FF3C9FE03C8E5F55CE"
1740 DATA "F53A6DF33C47110932C"
1750 DATA "0021F76D1910FDF139C"
1760 DATA "CDE6F12311F6F7EB5B0"
1770 DATA "010800CDFDF1CDD846C"
1780 DATA "F0F1E13263F6C9FE614"
1790 DATA "03C8E5F5F53A6EF3535"
1800 DATA "3C4711090021F77622B"
1810 DATA "C30CF1213DF2BE38406"
1820 DATA "039618FA3C47A7112E6"
1830 DATA "0001210000ED521917A"
1840 DATA "10FDC9FE03C0F5D5561"
1850 DATA "E5D53A6FF3CD3BF154F"
1860 DATA "D11ACDE6F11323E54AA"
1870 DATA "EB5E2356E1EB01FF48E"
1880 DATA "00CDFDF1CDDBF0E1634"
1890 DATA "D1F13263F6C9FE02516"
1900 DATA "C03AF8F73C471109386"
1910 DATA "0021F76D1910FD112BC"
1920 DATA "F6F7CDF2F13263F6628"
1930 DATA "23010800CD14F2CD2CC"
1940 DATA "DBF021F6F73A63F656C"
1950 DATA "C9FE02C03AF8F73C4EE"
1960 DATA "4711090021F77618207"
1970 DATA "D3FE02C03AF8F7CD589"
1980 DATA "3BF1CDF2F1233247478"
1990 DATA "F2114AF201FF00CD40C"
2000 DATA "14F2CDDBF03E0332411"
2010 DATA "63F61147F221F9F74B4"
2020 DATA "722B732B2BC9D5E53E9"
2030 DATA "5F3A6CF3CD1400E13BA"
2040 DATA "D1C9D5E53A6CF3CD5BA"
2050 DATA "0C00E1D1C9C5D5E5506"
2060 DATA "7E6F3A6CF3EBCD14452"
2070 DATA "00E1D1C123130B7832C"
2080 DATA "B120EAC9C5E5D53A53D"
2090 DATA "6CF3CD0C00D112E13FC"
2100 DATA "C123130B78B120EC337"
2110 DATA "C90D0A4C4F574552269"
2120 DATA "2052414D204142531F6"
2130 DATA "454E540D0A6E20201AC"
2140 DATA "202020200678F3001F1"
2150 DATA "4AF200000000000013C"

```

the usual array commands. What's more it isn't necessary to use a DIM command to initialise the arrays.

The first step is to type in the Basic program (figure 1) which will create the machine code utility called 'Rammer'. Type in the program and save it to tape

before running it, in case you have made any fatal errors.

Once saved to tape, run the program. If you have typed in the listing without any errors you will eventually be prompted to put a fresh cassette tape in your recorder, set the machine to record, and then hit RE-

TURN. This will save Rammer to tape for you.

If you have made any errors when typing in the data, the computer will do its usual trick and stop, telling you which line contains the error. For this reason it is important to type in the program exactly as printed

in figure 1.

Rammer is just under 1.25k in length and is located at the end of the usable upper RAM area. Once the program has been created and saved to tape, press the reset button to clear the computer, or switch off and on again. Rewind

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FIGURE TWO

```

1 CLEAR600,&HEEAF:BLOAD"CAS:RAMMER",R
2 DEF FNP$(Z$,Z%)=FNP1$(Z%)+FNP2$(Z%)
3 DEF FNP1$(Z%)=LEFT$(STR$(USR6(Z%)),0)
4 DEF FNP2$(Z%)=USR7(Z%)
5 DEF FNP1(Z,Z%)=USR0(Z%)+USR1(Z)
6 DEF FNP2(Z,Z%)=USR3(Z%)+USR4(Z)
7 DEF FNG$(Z%)=USR8(Z%)
8 DEF FNG1(Z%)=USR2(Z%)
9 DEF FNG2(Z%)=USR5(Z%)
10 DEF FNS$(Z%)=USR9(Z%)+LEFT$(USR9(0),0)
11 DEF FNL$(Z%)=LEFT$(USR9(Z%),0)+USR9(1)

```

the cassette containing Rammer and type **CLEAR1000,&HEEAF**. Press RETURN then type **BLOAD"CAS:RAMMER",R** and press RETURN. Now press Play on your cassette deck to reload.

Rammer will initialise itself upon loading, so that although the program extensively uses the USR command it is not necessary to use the DEFUSR command prior to use.

To ensure that Rammer is working, try the following short test. Type:

```
A=USR6(0%):A$="
TESTED O.K.":A$=USR7
(A$):A$=""
```

and press RETURN, then type:

```
PRINT A$
```

followed by RETURN. Nothing should be printed. Now type:

```
A$=USR8(0%):PRINT A$
```

and press RETURN. If Rammer is working properly you should see "TESTED O.K." printed. The string "TESTED O.K." is now stored in the lower 32k RAM.

Now that you have Rammer loaded and working, type in the program in figure 2. This program sets up a number of functions which allow Rammer to be used easily from Basic. When writing any software which is to use Rammer, this listing should be added as the first few lines of your own program.

The commands for Rammer are as follows, Z\$ and Z are dummy variables which are included to keep the syntax of the Rammer commands correct. These variables should not be used to hold values in your own program and should be considered as holding 'non-sense' values.

The variable S\$ represents any string or string variable which you wish to store or retrieve. Similarly N represents any number, numeric variable or expression which you wish to store or retrieve. X represents any number, numeric variable or expression to indicate the required position in the array.

To store string S\$ at position

X in the string array, follow this format:

```
Z$=FNP$(S$,X)
```

To retrieve the string at position X and assign it to S\$, use:

```
S$=FNG$(X)
```

Or to PRINT a stored string:

```
PRINT FNG$(X)
```

To store N at position X in the first numeric array:

```
Z=FNP1(N,X)
```

To retrieve the number at position X in the first numeric array and assign it to BANANAS:

```
BANANAS=FNG1(X)
```

To store and retrieve from the second numeric array simply substitute P2 for P1, and G2 for G1 in the above expressions.

Try this example:

```
Z$=FNP$( "MSX
COMPUTING",0)
PRINT FNG$(0)
```

For the string array, the position in the array (represented by X in the examples) can be any value between 0 and 109.

For the numeric arrays, the position in the arrays can be any value between 0 and 255.

The 32k block of RAM can also be saved to, and loaded from tape. To SAVE with filename FRUITS:

```
Z$=FNS$("FRUITS")
```

or

```
A$="FRUITS": Z$=FNS$
(A$)
```

To LOAD a previously saved file called APPLES:

```
Z$=FNL$("APPLES")
```

or

```
A$="APPLES": Z$=FNL$
(A$)
```

To LOAD the first file found on tape use:

```
Z$=FNL$("")
```

In this case, Z\$ will then contain the filename of the first file found on the tape.

The 32k is saved to tape in two 16k blocks. These large blocks require a total of about five minutes of tape so take care that you have plenty of room on the tape when saving a file.

During the saving and loading routines there is a 10 second pause after each 16k block so don't be alarmed if the tape stops and nothing appears to be happening.

The CTRL/STOP break facility has been disabled during saving to ensure that nothing happens to interrupt the saving process. So it's wise to save the file to tape only when you are sure that you are ready, or you'll have to wait for five minutes until you can regain control of the computer.

The tape files can only be reloaded using Rammer, and will not be recognised by any of the usual MSX tape commands. This will give you security for your saved data.

The program in figure 3 is included to enable you to reconfigure Rammer to your own requirements. If you feel that you will not require the numeric arrays, or that your maximum string length is likely to be less than the standard 255 characters, you can reconfigure Rammer to store a larger number of strings. However, the maximum number of strings that may be stored, regardless of how short they are, is 255.

Rammer does NOT clear the lower RAM at any time so that any unused array areas may hold data and should not be assumed to contain either empty strings or zeros.

Should you need to use the USR command for calling other machine code routines, you should use **DEFUSR=&HF05C: Z=USR(0)** to restore the Rammer USR addresses before attempting to use any Rammer facilities. ■

FIGURE THREE

```

10 CLEAR600,&HEEAF
20 SCREEN0:WIDTH34:CLS
30 PRINT"INSERT TAPE CONTAINING 'RAMMER'"
40 PRINT"Press RETURN"
50 INPUT$(1)
60 BLOAD"CAS:RAMMER"
70 CLS
80 INPUT"NUMBER OF NUMERIC ARRAYS REQUIRED (0,1,2)";A%
90 IF A%<0 OR A%>2 THEN PRINT"ERROR":GOTO80
100 INPUT"NUMBER OF STRINGS TO BE STORED (110 TO 255)";B%
110 IF B%>255 OR B%<110 THEN PRINT"ERROR":GOTO100
120 IF A%=0 THEN X=32768
130 IF A%=1 THEN X=30464
140 IF A%=2 THEN X=28160
150 L%=X/B%
160 IF L%>256 THEN L%=256
170 Q%=L%-1
180 HI=L%\256
190 LO=L%MOD256
200 POKE &HF23D,B%
210 POKE &HF148,LO
220 POKE &HF149,HI
230 POKE &HF16F,Q%
240 POKE &HF1CD,Q%
250 PRINT
260 PRINT"MAXIMUM STRING LENGTH=";L%
270 PRINT"NUMBER OF STRINGS=";B%
280 PRINT"NUMBER OF NUMERIC ARRAYS=";A%
290 PRINT"PROCEED Y/N?"
300 X$=INPUT$(1)
310 IF X$="Y" OR X$="y" THEN 330
320 GOTO 70
330 PRINT"PLACE BLANK TAPE IN RECORDER"
340 PRINT"PRESS RECORD/PLAY ON CASSETTE"
350 PRINT"PRESS RETURN TO SAVE RAMMER"
360 INPUT$(1)
370 BSAVE"CAS:RAMMER",&HEEB0,&HF37F,&HF05C
380 PRINT"RAMMER SAVED"
390 END

```




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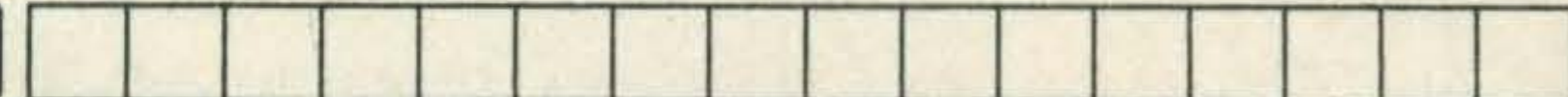

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rating is not applicable — use of sound in a wordprocessor, for instance, the rating is given as N/A.

STAR RATINGS

- ★ Not worth the trouble
- ★★ Acceptable, but nothing exciting
- ★★★ One of the best

DAMBUSTERS £9.95

Just flying an aeroplane of the size and vintage of a Lancaster bomber is very much a team effort. A successful precision bombing operation against a heavily defended target used to involve all seven crew members in some pretty heavy workloads, so it is little surprise that US Gold's MSX version of the Dambusters raid is one of the most complicated games you are likely to encounter.

You only have one pair of hands, and only one computer screen, so to carry out a mission you have to flick between up to seven different displays. In the earliest stages of flight the positions of engineer and pilot are of most concern, but the navigator's duties soon become important and once you are over enemy territory the various gunners come into play to deal with enemy night-fighters, barrage balloons and searchlights.

There are two levels of difficulty. The higher level gives you extra responsibilities by including a supplementary engineer's panel, and by making you start the raid from your home airfield rather than putting you straight into cruising flight.

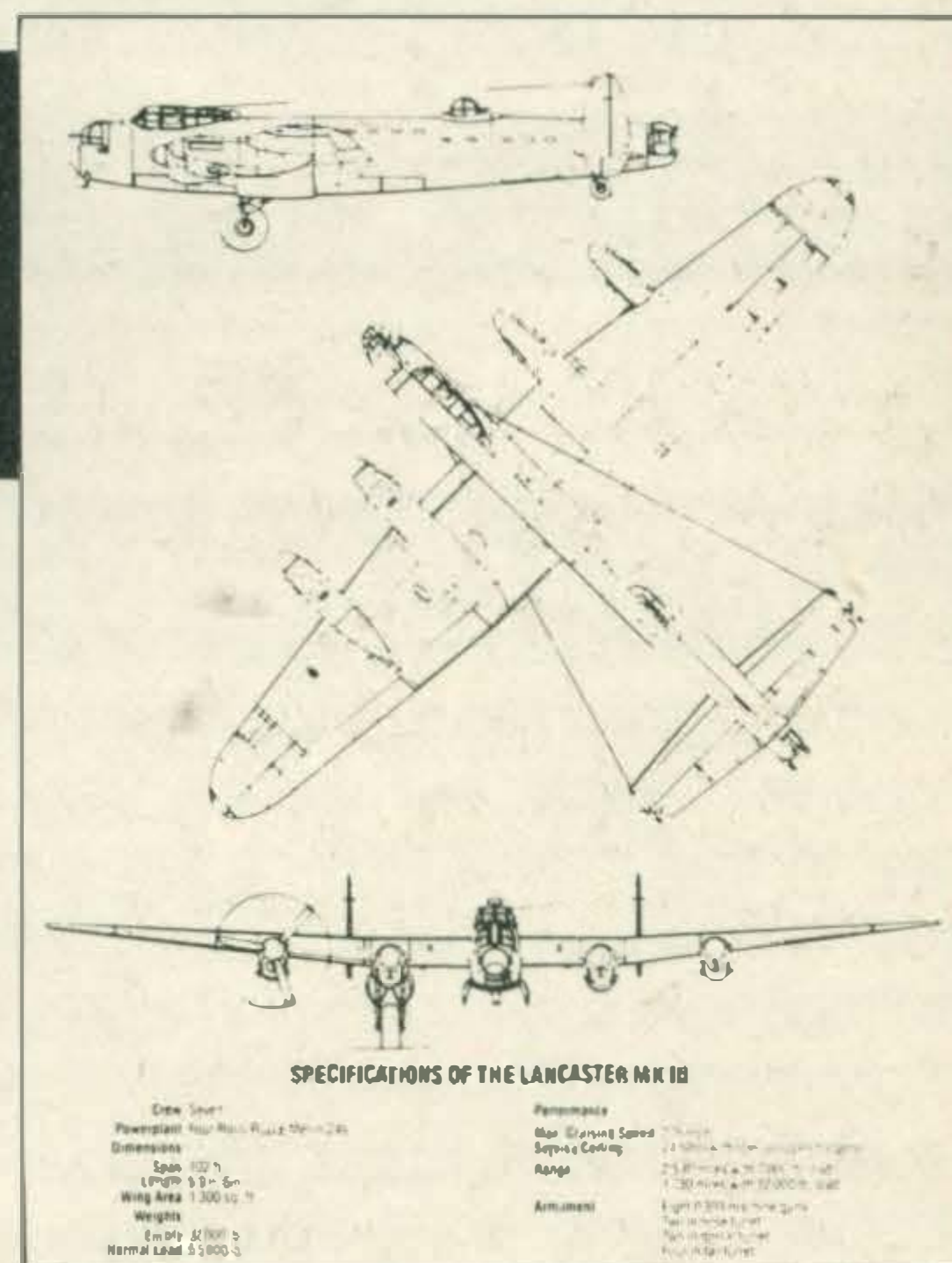
You might think that changing your role from pilot to navigator to gunner all the time gives you unparalleled opportunities to mess things up — flying straight into the ground while gazing out of the tail turret, for instance. This is prevented by a system of

warnings. Each crew station is selected by a different number key and when a particular station needs attention its number appears at the top of the screen. When two or three of these warnings light up simultaneously, then you have a problem.

Let's get one thing clear — this is neither a faithful flight simulator nor a simple shoot-em-up arcade game. The flight controls follow the basic principles of aviation but the reactions of the aeroplane are far from realistic.

However, teaching people to fly a real Lancaster was never the aim of the programming team. Quite properly they are concerned with giving the player a challenging and enjoyable game, and sitting still following a course to Germany for four hours does not really come under that heading. Fortunately a quick glance at the navigator's moving map display reveals that the aircraft is tearing around the countryside at many times its theoretical cruising speed.

Once you find an enemy hot-spot the sound and graphics become very good indeed. Flying into the teeth of enemy guns is actually quite frightening, and the sudden blinding effect of a searchlight beam is a better laxative than prune juice. We never managed to get through to the dam itself for the final attack, but we're going to keep on trying.



SUPPLIER: US Gold
(021) 356 3388

TYPE: Simulation

FORMAT: Cassette/disk

GRAPHICS ★★★

SOUND ★★★

VALUE ★★

VERDICT ★★★



WIZARD'S LAIR

£8.95

Yet another title that shows the MSX is every bit as good as the Spectrum when it comes to fast-action graphics games. After the recent and excellent *Starquake*, Bubble Bus has now converted one of its previous Spectrum titles, *Wizard's Lair*, which is along the lines of earlier Ultimate efforts like *Sabre Wulf*.

It's far from being a simple copy of that excellent arcade-adventure, just that *Wizard's Lair* uses the same bird's-eye view of the action — and no, we don't mean the graphics all look like fish fingers. The graphics are first rate, especially our hero, Pothole Pete, who in his foolishness has stumbled into the Wizard's Lair while trapped in an underground cave. The Lair is a massive subterranean network of inter-connecting caves, rooms and passages — Bubble Bus don't say exactly how many screens there are, probably in an attempt not to discourage us before we start, but it's safe to say that for mapping you'll need to lay in a goodly supply of wallpaper and biros.

Pete's way out of this mess, for reasons best known to the programmer, is to collect the four pieces of the Golden Lion that are scattered about the screens. To quote from the cassette cover: "There are many items and strange creatures to help and hinder Pete in his quest to escape." You can say

that again, strange indeed is the word: skulls, spiders, snakes, knights, executioners and generally indefinable things.

You do get some weapons to hurl about the screen, and you'll need them as the monsters come at you from every direction. The first screen only has one exit, so you head for that throwing weapons like a mad thing, and that's when the mapping and pause function become essential, as further screens usually have two or three doors to escape through.

There are diamonds, wings, bits of armour and other goodies to collect as you hurtle through the rooms scattering mayhem and destruction, though quite why you're collecting them is not made clear. You can pick up extra weapons and lives, too, and every once in a while perhaps a spell that gives you a chance to trade in your accumulated gold for more weapons, diamonds, energy, or whatever you fancy.

Magic lifts and wardrobe lifts transport you between the seven levels of the lair, there are joystick and keyboard options, a high-score table, smooth if furious action, and the only slight disappointment was the rather repetitive sound effects. Games may have come on in terms of sophistication since *Wizard's Lair* first appeared — but who wants sophistication all the time?

SUPPLIER: Bubble Bus Software
TYPE: Arcade
FORMAT: Cassette
RAM NEEDED: 64k

GRAPHICS ★ ★ ★

SOUND ★ ★

VALUE ★ ★

VERDICT ★ ★ ★

FOOTBALLER OF THE YEAR

£7.95

Sound and graphics ratings look a little poor at one star each, but there's very little of either in this mainly text-based simulation which turns you into a soccer player rather than the more usual club manager. Instead of worrying about your squad of players and falling attendances, you just worry about your own state of health and you must never forget that this game's all about putting the ball in the back of the net, Brian.

You can choose to start the game in any of the four English leagues, or in a European Super League, but remember that it's tough at the top and you stand more chance of achieving the accolade of Footballer of the Year if you start at the bottom and work your way up.

The game has those trendy icon controls, the graphics for these being superbly done — what a pity that didn't extend to the brief action sequences. Before we get to the game (and football's all about 90 minutes, John), you can examine your own status, that of the team you're playing for, chance your arm in the transfer market (best to wait till you're more than just an average player for this) or risk an incident — you pay for these out of your bank balance, and they can be very lucrative or disastrous. A good day at the races can be wiped out by burglars nicking your stereo.

Before each game, you're given the chance to add to your stock of Goal Cards (at a price) and if you play one of these when the game comes round you're allowed to show your goal-scoring prowess. To describe these sections as arcade sequences is laughable, as you're presented with a head-on shot of the goalmouth and you simply press the fire button and try to influence the ball in flight by moving your joystick one way or the other. I say 'try to' because it doesn't always seem to work, and the degree of control you have is minimal. You sit and watch as the ball veers wide, or the goalie saves it, or maybe you even score.

Thrills over, the game results are printed out teleprinter fashion (very well done, too) and you toddle off into the next week's set of icons. From time to time progress is halted by an 'Incident!', but the range of these is very small and usually it's a message telling you you've not been transferred or picked for your country this week. Sometimes the 'Incident!' interruption is followed by a message telling you that there's no incident this week, which seems a bit silly.

Despite the moans, the game could be quite absorbing if you're a football freak. In other words, some punters will be over the moon, and others sick as a parrot, Brian.



SUPPLIER: Gremlin
TYPE: Simulation
FORMAT: Cassette
RAM NEEDED: 64k

GRAPHICS ★

SOUND ★

VALUE ★ ★

VERDICT ★ ★

Too Busy Earning a Living To Make Any Real Money?

You think you've got problems?

Well, I remember when a bank turned me down for a \$200 loan. Now I lend money to the bank - Certificates of Deposit at \$100,000 a crack.

I remember the day a car dealer got a little nervous because I was a couple of months behind in my payments - and repossessed my car. Now I own a Rolls Royce. I paid \$43,000 for it - cash.

I remember the day my wife phoned me, crying, because the landlord had shown up at the house, demanding his rent - and we didn't have the money to pay it.

Now we own five homes. Two are on the oceanfront in California (I use one as my office). One is a lakefront "cabin" in Washington (that's where we spend the whole summer - loafing, fishing, swimming, and sailing). One is a condominium on a sunny beach in Mexico. And one is snuggled right on the best beach of the best island in Hawaii - Maui.

Right now I could sell all this property, pay off the mortgages - and - without touching any of my other investments - walk away with over \$750,000 in cash. But I don't want to sell, because I don't think of my homes as "investments." I've got other real estate - and stocks, bonds, and cash in the bank - for that.

I remember when I lost my job. Because I was head over heels in debt, my lawyer told me the only thing I could do was declare bankruptcy. He was wrong. I paid off every dime.

Now, I have a million dollar line of credit; but I still don't have a job. Instead, I get up every weekday morning and decide whether I want to go to work or not. Sometimes I do - for 5 or 6 hours. But about half the time, I decide to read, go for a walk, sail my boat, swim, or ride my bike.

I know what it's like to be broke. And I know what it's like to have everything you want. And I know that you - like me - can decide which one it's going to be. It's really as easy as that. That's why I call it "The Lazy Man's Way to Riches."

So I'm going to ask you to send me

PROOF!

Don't take my word for it. These are excerpts from articles in newspapers and magazines:

Time:

He only works half the year in his stunning office on California's Sunset Beach, and even when he's there he puts in short hours... In other words, Joe Karbo, 48, is the prototype for... "The Lazy Man's Way to Riches."

Boston Herald-American:

The book has drawn hundreds of letters from persons who have profited by it...

Los Angeles Herald-Examiner:

An unpretentious millionaire, Joe Karbo of Huntingdon Harbor is a vibrant, living testimonial to his intellectual, pragmatic conviction.

Money Making Opportunities:

Maybe Joe Karbo has the secret. Don't you think you owe it to yourself to find out what it is all about?... I just finished it - and I'm off on a vacation myself. Get the idea?

something I don't need: money, £10 to be exact. Why? Because I want you to pay attention. And I figure that if you've got £10 invested, you'll look over what I send you and decide whether to send it back... or keep it. And I don't want you to keep it unless you agree that it's worth at least a hundred times what you invested.

Is the material "worth" £10? No - if you think of it as paper and ink. But that's not what I'm selling. What I am selling is information. *More* information than I give when I'm paid \$1000 as a guest speaker. *More* information than I give in a one-hour consultation for \$300.

But you're really not risking *anything*. Because I won't cash your cheque or money order for 31 days *after* I've sent you my material. That's the deal. Return it in 31 days - and I'll send back your cheque or postal order - uncashed.

How do you know I'll do it? Well, if you really want to be on the safe side, postdate your cheque for a month from today - *plus 2 additional weeks*. That'll give you plenty of time to receive it, look it over, try it out.

I know what your thinking: "He got rich telling people how to get rich." The truth is - and this is very important - the year before I shared "The Lazy Man's Way to Riches," my income was \$216,646. And what I'll send you tells just how I made that kind of money... working a few hours a day... about 8 months out of the year.

It doesn't require "education." I'm a high school graduate.

It doesn't require "capital." Remember I was up to my neck in debt when I started.

It doesn't require "luck." I've had more than my share. But I'm not promising you that you'll make as much money as I have. And you may do better. I personally know one man who used these principles, worked hard, and made 11 million dollars in 8 years. But money isn't everything.

It doesn't require "talent." Just enough brains to know what to look for. And I'll tell you that.

It doesn't require "youth." One woman I worked with is over 70. She's travelled the world over, making all the money she needs, doing only what I taught her.

It doesn't require "experience." A widow in Chicago has been averaging \$25,000 a year for the past 5 years, using my methods.

What does it require? Belief. Enough to take a chance. Enough to absorb what I'll send you. Enough to put the principles into *action*. If you do just that - nothing more, nothing less - the results will be hard to believe. Remember - I guarantee it.

You don't have to give up your job. But you may soon be making so much money that you'll be able to. Once again - I guarantee it.

I know you're sceptical. Well, here are some comments from other people. (Initials have been used to protect the writer's privacy. The originals are in my files.) I'm sure that, like you, these people didn't believe me either when they clipped the coupon. Guess they figured that, since I wasn't going to deposit their cheques for at least 31 days, they had nothing to lose.

They were right.

And here's what they gained:

'Thanks to your method I'm a half millionaire'

"Thanks to your method I grossed about \$500,000. Would you believe last year at this time I was a slave working for peanuts?"

G.C., Toronto, Canada.

'\$24,000 in 45 days'

"...received \$24,000.00 in the mail the last 45 days.

"Thanks again."

Mr. E.G.N., Matewan, W.VA

'Made enough to retire at 41'

"If it hadn't happened to me, I wouldn't have believed it... A few years ago, I had nothing to lose. I was unemployed and broke."

"Now, thanks to you and the 'Lazy Man's' program, I have made enough money (at age 41) to retire in style.

R.A., Huntingdon Beach, Calif.

'There's no stopping me'

"Since I've got your (Lazy Man's Way to Riches) in July, I've started 4 companies... there's no stopping me and I'm so high I need chains to keep me on the ground."

M.T., Portland, OR

'Wow, it does work!'

"Oddly enough, I purchased Lazy Man's Way to Riches some six months ago, or so, read it... and really did nothing about it. Then, about three weeks ago, when I was really getting desperate about my financial situation, I remembered it, re-read it, studied it, and this time, put it to work and WOW, it does work! Doesn't take much time, either... I guess some of us just have to be at a severe point of desperation before we overcome the ultimate laziness, procrastination."

Mr. J.K., Anaheim, CA

'Made \$70,000'

"A \$70,000 thanks to you for writing The Lazy Man's Way to Riches. That's how much I've made..."

"I use this extra income for all of the good things in life, exotic vacations, classic automobiles, etc. Soon I hope to make enough to quit my regular job and devote full time to making money the easy way..."

Mr. D.R., Newport Beach, CA

'\$260,000 in eleven months'

"Two years ago, I mailed you ten dollars in sheer desperation for a better life... One year ago, just out of the blue sky, a man called and offered me a partnership... I grossed over \$260,000 cash business in eleven months. You are a God sent miracle to me."

B.F., Pascagoula, Miss.

'Steadily upward ever since'

"I ordered Lazy Man's Way to Riches in June... by September, my career was launched and has gone steadily upward ever since."

Mrs. B.A., Walnut Creek, CA

'\$7,000 in five days'

"Last Monday I used what I learned on page 83 to make \$7,000. It took me all week to do it, but that's not bad for five day's work."

M.D., Topeka, Kansas

What I'm saying is probably contrary to what you've heard from your friends, your family, your teachers, and maybe everyone else you know.

I can only ask you one question. How many of them are millionaires?

So it's up to you.

A month from today, you can be nothing more than 30 days older - or you can be on your way to getting rich. You decide.

The wisest man I ever knew told me something I never forgot: "Most people are too busy earning a living to make any money."

Don't take as long as I did to find out he was right.

I'll prove it to you, if you'll send in the coupon to my publisher now. I'm not asking you to "believe" me. Just try it. If I'm wrong, all you've lost is a couple of minutes and a postage stamp. But what if I'm right?

Some have called it a Miracle. Some have called it Magic. You'll call it "The Secret of the Ages."

As for me, I thank God that before he died Millionaire Joe Karbo left, for all to share, the secret of "The Lazy Man's Way to Riches." The above story, which is in his own words, is his gift to you.

Sworn Statement:

"On the basis of my professional relationship as his accountant, I certify that Mr. Karbo's net worth is more than one million dollars."

Stuart A. Cogan

Chartsearch Ltd.,
11 Blomfield Street,
London EC2M 7AY

You may be full of beans, but what have I got to lose? Send me the Lazy Man's Way to Riches. *But don't deposit my cheque or postal order for at least 31 days after it's in the mail.* If I return your material - for any reason - within that time, return my uncashed cheque or postal order to me.

- On that basis, here's my £10
 Please charge my credit card.

A/C Number

(Access/Visa/Diners/Amex)

Name

Address

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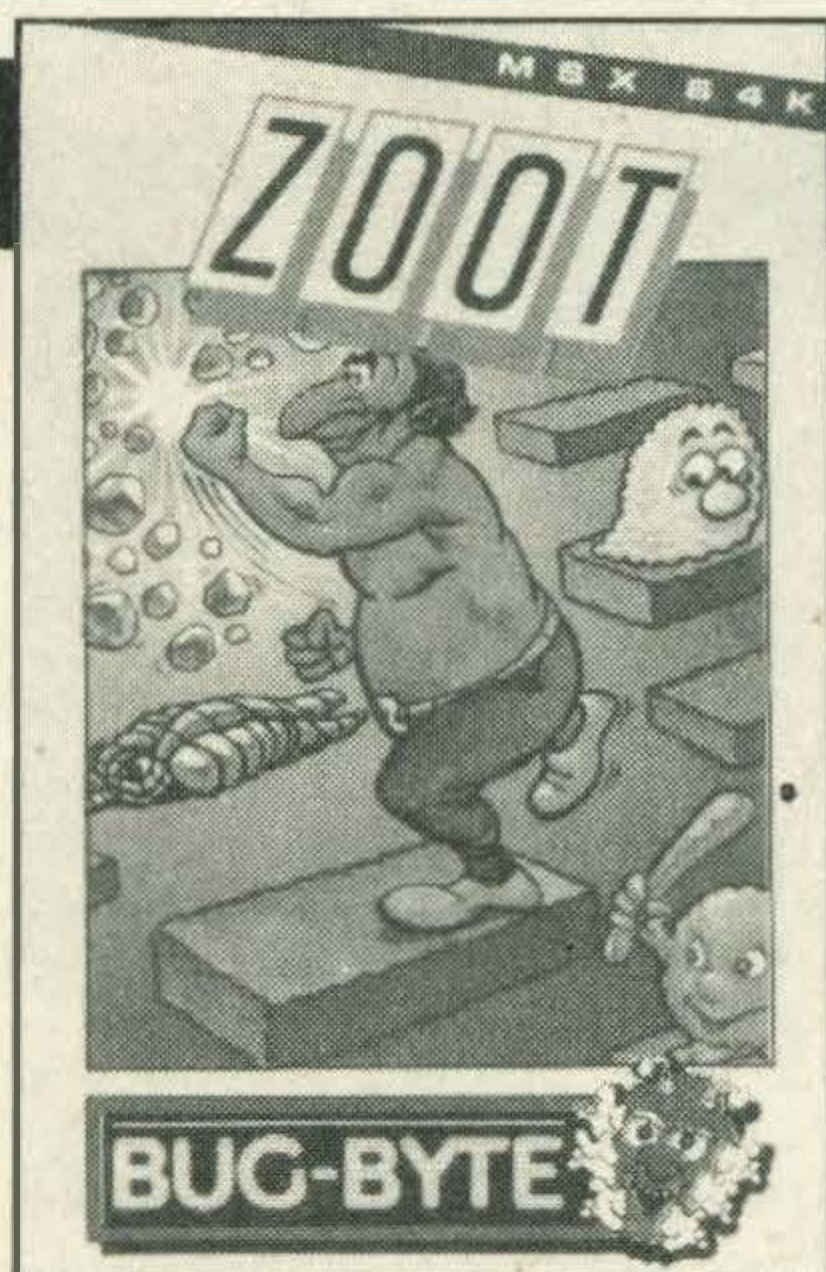
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ZOOT

£2.99

It's hard to see how this was declared a "Blitz" game by *Computer and Video Games*, and "The perfect budget game" by *Popular Computing Weekly*, unless it's lost something in the conversion to MSX. It seems to us a very ordinary game indeed, which has its good points, but these are far outweighed by its general slowness and lack of playability.

The loading screen has some cute animation, with a flickering red tongue like the Spitting Image puppet of Prince, but the speech is almost indecipherable.

The idea of the game is that you control Zoot, who's lost his marbles. Literally, that is, as they've fallen down the drain. You must take Zoot down into the various screens making up the drain and regain his marbles for him. Control is by joystick or keyboard, with O and P for left and right, Q to punch and A to move down. What, no movement up? That's right, as this is a one-way journey down successive screens from top to bottom till Zoot and marbles are reunited.

The game-play's a little hard to describe. In the first screen Zoot starts on the top level of a series of four platforms, with what look like gigantic cross-eyed Space Invaders moving back and forth on each level. Platforms are made up of ledges and spaces, and Zoot can move some ledges

back and forth between spaces, as well as fly them down to the next level. Unfortunately he can't go back up again, except the first time he reaches the bottom level when he can sink off the screen and reappear at the top again. The second time he tries that, the game starts over, so whatever he has to do has to be done on two passes through the screen.

On the first one Zoot just has to hit the baddies which causes them to disappear. Time your punch wrongly, or let a creature catch you, and Zoot's suit is a wooden overcoat.

Second screen is where our problems arose, as here you have to try to move back and forth on the ledges to isolate the eight baddies on individual ledges, where they promptly die. No good punching them, you can't complete the screen that way. Now it's not very often we stick our neck out on a game and say this, but in our view some of these second screens (which come up in a random layout each time) are impossible to get through with only two attempts.

No doubt later screens, which are said to contain combinations of the punch/isolate/pick up marbles variations, are stunning and exciting beyond belief, but we wouldn't put money on it. There isn't even a high-score record.

SUPPLIER: Bug-Byte
TYPE: Arcade
FORMAT: Cassette
RAM NEEDED: 64k

GRAPHICS ★ ★

SOUND ★

VALUE ★ ★

VERDICT ★

VAMPIRE

£1.99

This is more like it, this is what they want, with a zap and a pow and let's go leaping over spiders and collecting keys and finding secret locks and picking up chickens and avoiding getting the candle flames under the bum which diminish the energy, as well they might.

Now let's calm down a bit and try and describe this game in terms other than brilliant and wow and stuff like that. The year, according to the cassette inlay is 2987, and this game is also MSX2 compatible — do you think the two can be linked in any way? It seems that earth at this juncture is ruled by our friend Count Dracula, and you play Brok the Brave, from the planet Hawkland, sent down to liberate us from the creepy count.

The quest will take place in the 95 rooms of the Count's castle, these being divided into two main areas, the underground, which is excessively dangerous and full of traps and nasty creatures, and the surface, which isn't quite so friendly.

The controls are the usual left/right/fire, though as yet we haven't found anything to fire with, only a constant stream of arrows firing at us from all sides and at all heights. In addition Brok the Brave can jump around a bit, an upward move of the joystick (or up cursor) providing him with a long jump, and downward move (or cursor) with more of a

short hop. The different types are essential to jump up to the various platforms on each screen that enable you to either get out of the way of the various nasties, keep out of firing line of the arrows, reach objects, chickens, keys and other assorted items, or simply just to get through the screen to an exit.

You can also pause the game just to get your breath occasionally, or quit altogether, which is necessary on occasion as you can sometimes tumble into impossible predicaments.

Your main character leaps around looking not unlike the hero from Mastertronic's *Knight Tyme* games, to which this bears more than a passing resemblance, or alternatively you could describe Brok as looking like Snoopy in scuba-dive gear.

The sound of *Vampire* is the only thing that's a bit disappointing, with the constant 'ping' getting on your nerves, but the graphics are good and it definitely rates high on the old addiction scale. The temptation to press Fire to start again the minute you're dead (as you are so often) is impossible to resist.

Combining good elements from the likes of *Manic Miner* and *Sorcery* (though not quite coming up to the superb graphics of the latter), this is a great game from the new Codemasters label.



SUPPLIER: Codemasters
TYPE: Arcade
FORMAT: Cassette
RAM NEEDED: 64k

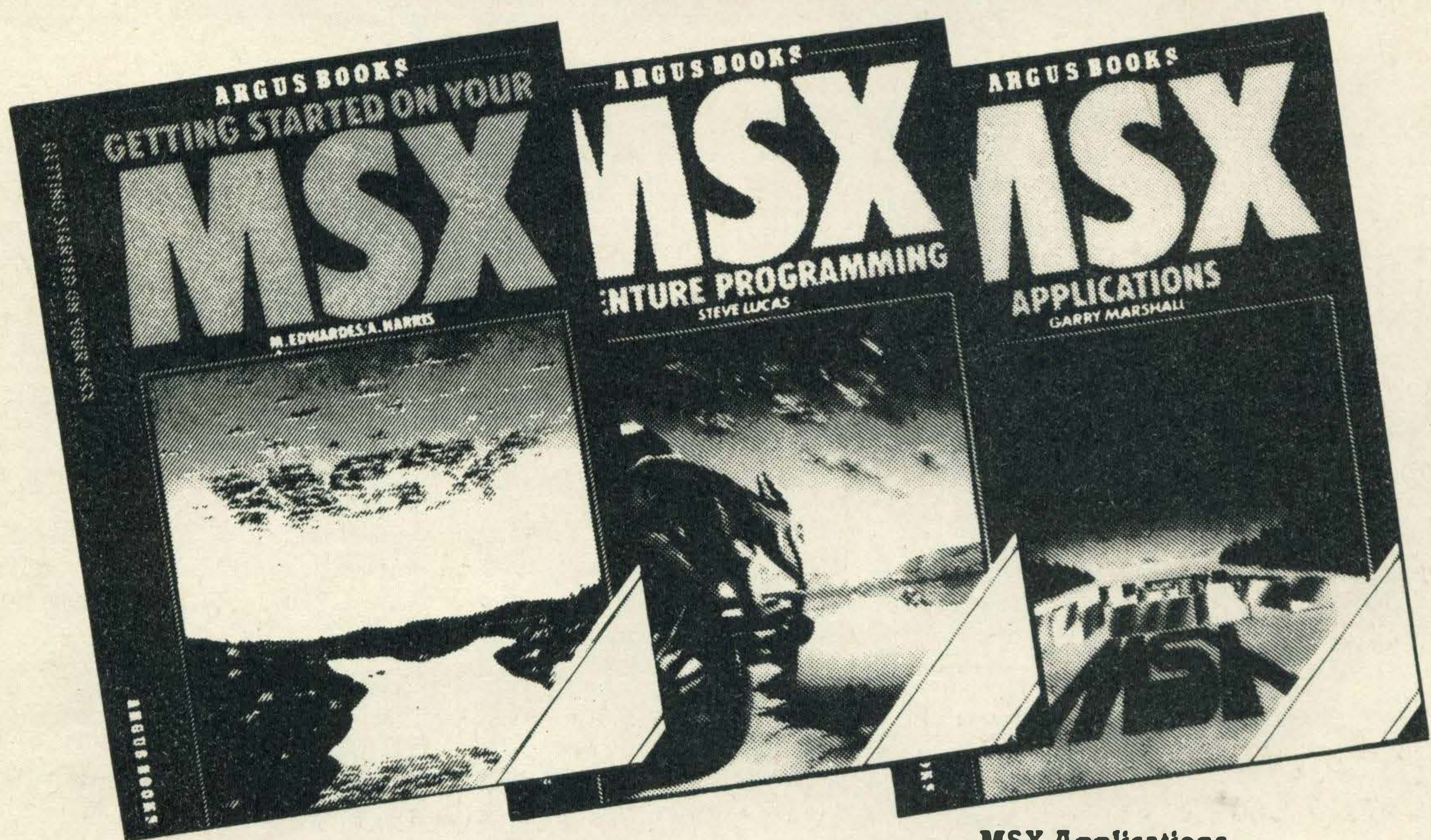
GRAPHICS ★ ★ ★

SOUND ★ ★

VALUE ★ ★ ★

VERDICT ★ ★ ★

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M. Edwards & A. Harris

For first time users of MSX computers. It explains all about programming in BASIC and develops a full feature BASIC arcade type game at the same time. The listing for the game is built up gradually to illustrate each new command as it is introduced. An introduction to machine code and a useful glossary of terms are also included.

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Illustrated, 234 × 156mm,
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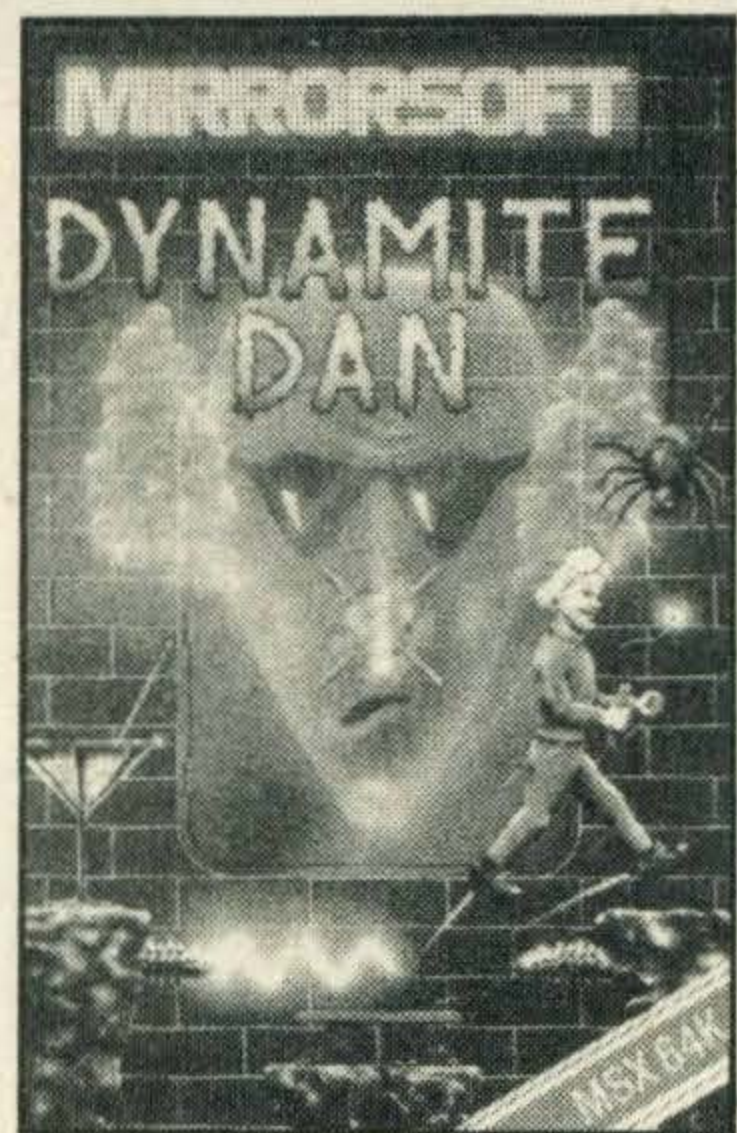
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DYNAMITE DAN

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SUPPLIER: Mirrorsoft
TYPE:
FORMAT:
RAM NEEDED:

GRAPHICS ★ ★ ★

SOUND ★ ★

VALUE ★ ★

VERDICT ★ ★ ★

The latest offering from Mirrorsoft has a very familiar theme which does little to help first impressions. You are cast as athletic agent Dynamite Dan and you must stop the evil Doctor Blitzen who has plans for a Psychon Mega Ray with which he hopes to conquer Earth. The plans are hidden in a safe in the mad doctor's house which is guarded by Blitzen's glamorous assistant Donna. You need the eight sticks of dynamite hidden around the house by a previous unsuccessful agent. You must simply blow the safe and make your escape in your blimp.

Let me point out at this juncture that Dynamite Dan is the best game I have seen of its kind and unlike others I have played it has addictive qualities. The mad doctor's experiments wander around the house hoping to nail an agent and they come in all shapes and sizes. Snake waiters slither over a huge trampoline, huge Vikings bounce up and down while TV sets ricochet around the screen.

You may have noticed I mentioned trampolines. A feature I feel makes this game stand out from the rest is one such as this, for the trampolines give the game just that little bit more scope than the others.

The entire house is connected in a believable fashion, one room linking to the next so the entire thing looks like a house,

stairs are to be found and can be climbed to higher levels, though it is faster to use the lift.

A method of getting around the house faster still is to use one of the many transporters which will teleport you to a mystery destination. All these ways of getting about give the game lasting interest.

Around the house other objects apart from dynamite sticks can be found: test tubes give extra lives, food keeps your ever-deteriorating energy up and credit cards give you bonus points. A little rarer is a deodorant which gives you temporal invulnerability and the ability to kill off monsters with your touch. One feature of this game lacking in many others is if you kill a monster in a room, leave and re-enter, the monster stays dead for the duration of the game.

Along the bottom of the house runs a river which if you should fall in costs you all your lives, although a raft will occasionally sail by and if you manage to get on it you will be taken to the caverns.

You start with 10 lives and you lose one whenever you touch a monster or suffer a long fall. Ten seems a lot to start with but they go like wildfire.

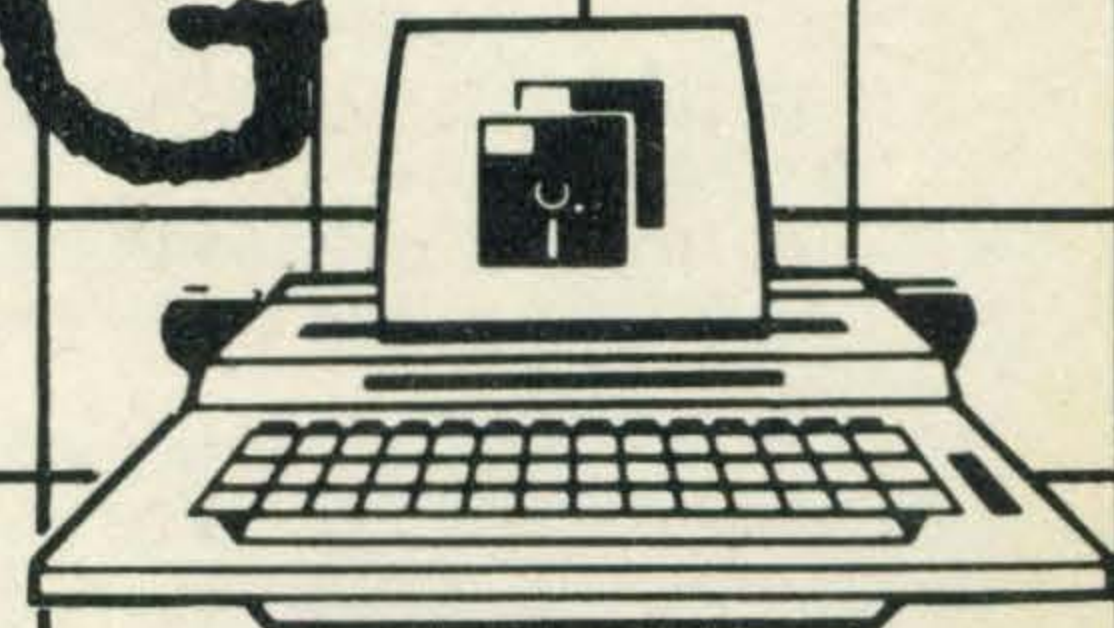
The original Dynamite Dan was first produced for the Spectrum and Mirrorsoft has changed little or nothing in the conversion, capturing that crazy atmosphere.



It's only fair — he was taking potshots at us all day, so...

GET TYPING

Feel like doing it yourself? Get your teeth into our readers' programs



JUMP MAN By Grant Soames

As you cross the screen, in a desperate and totally inexplicable attempt to get off the right-hand side, you will up with a variety of rolling, flying and generally mobile objects. Alas, these objects do not want to catch your eye, adjourn to the nearest wine bar and form meaningful relationships with you. Oh no. They want to kill you. It's a bit like Stoke Newington High Street on a Saturday.

Our advice is to jump over them, using UP on the joystick or cursor pad. Running around helps a lot too. We'd tell you more, but it's time to play the game again — we haven't played it for at least two minutes.

```

10 SCREEN1,2,0:COLOR7,1,1
20 HS=0:GOSUB1840
30 KEYOFF:WIDTH31
40 DEFINT A-Z
50 FORI=0TO8:FORJ=1TO32:READA:B#=B#+
CHR$(A):NEXTJ
60 SPRITE$(I)=B#:B#="" :NEXTI
70 DATA 0,24,52,52,52,24,60,60,60,60
,60,24,24,24,24,28,0,0,0,0,0,0,0,0
,0,0,0,0,0,0
80 DATA 24,52,52,52,24,60,124,254,19
1,60,24,60,54,230,130,3,0,0,0,0,0,0
,0,0,0,0,0,0,0,0,0
90 DATA 0,24,44,44,44,24,60,60,60,60
,60,24,24,24,56,0,0,0,0,0,0,0,0,0
,0,0,0,0,0,0,0
100 DATA 24,44,44,44,24,60,62,127,25
3,60,24,60,108,103,65,192,0,0,0,0,0
,0,0,0,0,0,0,0,0,0,0
110 DATA 0,3,14,62,62,126,126,254,12
8,254,126,126,62,62,14,3,0,128,224,2
48,248,252,252,254,2,254,252,252,248
,248,224,128
120 DATA 0,3,15,63,47,119,123,253,25
4,253,123,119,47,63,15,3,0,128,224,2
48,232,220,188,126,254,126,188,220,2
32,248,224,128
130 DATA 0,0,0,32,96,255,96,32,0,0,0
,0,0,0,0,0,0,14,28,56,240,56,28,14
,0,0,0,0,0,0,0
140 DATA 0,0,224,112,56,31,56,112,22
4,0,0,0,0,0,0,0,0,0,4,6,255,6,4,0
,0,0,0,0,0,0,0
150 DATA 0,0,0,0,42,42,42,42,42,42,4
2,42,42,42,255,0,0,0,0,168,168,16
8,168,168,168,168,168,168,168,168,25
4
160 FORI=10TO13:FORJ=1TO16:READA:B#=
B#+CHR$(A):NEXTJ
170 SPRITE$(I)=B#:B#="" :NEXTI

```

```

180 DATA 0,0,32,2,72,2,168,8,181,24,
164,5,80,136,149,33,0,0,0,0,4,64,18,
164,86,81,68,37,144,0,0,0
190 DATA 0,0,0,0,0,0,34,136,177,74,5
0,0,0,0,0,0,0,0,0,0,0,0,0,0,40,82,0,0,
0,0,0,0,0
200 FORI=2024TO2039:READA:VPOKEI,A:N
EXTI
210 DATA 254,84,170,84,170,84,170,0,
170,84,170,84,170,84,170,0
220 VPOKE8223,0:RESTORE240:CLS
230 FORI=1TO90:READA:VPOKE6145+A,254
:NEXTI
240 DATA 2,34,66,98,130,162,161,160,
128,4,36,68,100,132,164,165,166,134,
102,70,38,6
250 DATA 8,40,72,104,136,168,41,74,4
3,12,44,76,108,140,172,14,15,16,46,4
8,78,79,80,110,142,174
260 DATA 18,50,82,114,146,178,51,84,
53,22,54,86,118,150,182,24,25,26,56,
58,88,89,90,120,122,152,154,184,186
270 DATA 28,29,30,60,92,124,156,188,
62,94,126,158,190
280 LOCATE8,7:PRINT"by Grant Soames"
290 LOCATE5,9:PRINT"J-Joystick K-Key
board"
300 PRINT:PRINT:PRINT" Using left/r
ight to move and up to jump, comple
te the 8 levels by moving to the
right side of the screen. Avoid th
e barrels, arrows, spikes and pi
ts."
310 PRINT" Completing a level resul
ts in a bonus. This depends on your
time."
320 VPOKE8223,RND(1)*255:A$=INKEY$
330 IFA$="j"THENJK=1:GOTO360
340 IFA$="k"THENJK=0:GOTO360
350 GOTO320
360 ONSPRITE GOSUB1420:CLS:LE=1:SC=0
:LI=3
370 GOSUB1720:ONLE GOSUB1080,1120,11
40,1180,1230,1280,1320,1370
380 X=40:Y=95:D=0:P=0:SP=0
390 PUTSPRITE0,(X,Y),15,0
400 SD=1:SPRITEON:TIME=0
410 GOSUB470:IFSTICK(JK)=3ANDX<240TH
EN900
420 IFSTICK(JK)=7ANDX>16THEN930
430 IFSTICK(JK)=1THEN960
440 IFSTICK(JK)=2THENXC=2:D=0:GOTO99
0
450 IFSTICK(JK)=8THENXC=-2:D=8:GOTO9
90
460 GOSUB470:GOTO410
470 IFC=0THENC=4ELSEC=0
480 ONLE GOSUB510,550,570,620,670,72
0,780,840
490 IFX=240THEN1030
500 RETURN
510 X1=X1-4:X2=X2-4:VPOKE6917,X1:VPO
KE6918,16+C:VPOKE6921,X2:VPOKE6922,1
6+C

```


LISTINGS

```
520 IFX1=16THENX1=236
530 IFX2=16THENX2=236
540 RETURN
550 IFY=95THENIFVPEEK(6624+(X/8))=32
ANDVPEEK(6625+(X/8))=32THEN1500
560 RETURN
570 IFY=95THENIFVPEEK(6624+(X/8))=32
ANDVPEEK(6625+(X/8))=32THEN1500
580 X1=X1-4:X2=X2+4:VPOKE6917,X1:VPO
KE6921,X2
590 IFX1=16THENX1=232
600 IFX2=232THENX2=16
610 RETURN
620 X1=X1-4:X2=X2-4:X3=X3+4:VPOKE691
7,X1:VPOKE6921,X2:VPOKE6925,X3
630 IFX1=16THENX1=236
640 IFX2=16THENX2=236
650 IFX3=236THENX3=16
660 RETURN
670 X1=X1-4:X2=X2-4:X3=X3+2:VPOKE691
7,X1:VPOKE6918,16+C:VPOKE6921,X2:VPO
KE6922,16+C:VPOKE6925,X3
680 IFX1=16THENX1=232
690 IFX2=16THENX2=232
700 IFX3=232THENX3=16
710 RETURN
720 X1=X1+4:X2=X2+BD:VPOKE6917,X1:VP
OKE6921,X2:VPOKE6922,16+C
730 IFX1=232THENX1=16
740 IFX2=144THENBD=4
750 IFX2=232THENBD=-4
760 IFY=95THENIFVPEEK(6624+(X/8))=32
ANDVPEEK(6625+(X/8))=32THEN1500
770 RETURN
780 IFX1=108THENA1=-4:VPOKE6918,24
790 IFX1=16THENA1=4:VPOKE6918,28
800 IFX2=140THENA2=4:VPOKE6922,28
810 IFX2=232THENA2=-4:VPOKE6922,24
820 X1=X1+A1:X2=X2+A2:VPOKE6917,X1:V
POKE6921,X2
830 RETURN
840 IFX1=144THENA1=4:VPOKE6918,28
850 IFX1=232THENA1=-4:VPOKE6918,24
860 IFX2=144THENA2=2:VPOKE6922,28
870 IFX2=232THENA2=-2:VPOKE6922,24
880 X1=X1+A1:X2=X2+A2:VPOKE6917,X1:V
POKE6921,X2
890 RETURN
900 D=0:IFP=0THENP=4ELSEP=0
910 X=X+2:VPOKE6913,X:VPOKE6914,D+P
920 GOTO410
930 D=8:IFP=0THENP=4ELSEP=0
940 X=X-2:VPOKE6913,X:VPOKE6914,D+P
950 GOTO410
960 JD=-7:VPOKE6914,D+4
970 JD=JD+1:IFJD=7THENP=1:GOTO410
980 Y=Y+JD:VPOKE6912,Y:GOSUB470:GOTO
970
990 JD=-7:VPOKE6914,D+4
1000 JD=JD+1:IFJD=7THENP=4:GOTO410
1010 Y=Y+JD:X=X+XC:IFX<16ORX>240THEN
X=X-XC
1020 VPOKE6912,Y:VPOKE6913,X:GOSUB47
0:GOTO1000
1030 LE=LE+1:VPOKE6915,0
1040 BN=(1000+(LE*10)-TIME)/10:IFBN<
0THENBN=0
1050 SC=SC+BN:GOSUB1740:LOCATE11,6:P
RINTUSING"Bonus: ##";BN
1060 IFLE=9THENLE=1:FORI=1TO500:NEXT
I:GOSUB1740:LOCATE10,8:PRINT"+ Extra
100":SC=SC+100
1070 FORI=1TO2500:NEXTI:LOCATE11,6:P
RINTSTRING$(9,32):LOCATE10,8:PRINTST
RING$(11,32):GOTO370
1080 VPOKE8223,32:GOSUB1610:GOSUB163
0
1090 X2=208:PUTSPRITE2,(X2,95),6,4
```

```
1100 X1=192:PUTSPRITE1,(X1,95),6,4
1110 RETURN
1120 VPOKE8223,64:GOSUB1660:GOSUB161
0
1130 RETURN
1140 VPOKE8223,128:GOSUB1610
1150 X1=232:PUTSPRITE1,(X1,95),4,6
1160 X2=32:PUTSPRITE2,(X2,83),10,7
1170 RETURN
1180 VPOKE8223,192:GOSUB1610:GOSUB16
30
1190 X1=184:PUTSPRITE1,(X1,95),7,6
1200 X2=208:PUTSPRITE2,(X2,71),13,6
1210 X3=32:PUTSPRITE3,(X3,83),2,7
1220 RETURN
1230 VPOKE8223,160:GOSUB1610
1240 X1=176:PUTSPRITE1,(X1,95),6,4
1250 X2=232:PUTSPRITE2,(X2,95),6,4
1260 X3=16:PUTSPRITE3,(X3,81),3,7
1270 RETURN
1280 VPOKE8223,208:GOSUB1610:GOSUB16
90
1290 X1=32:PUTSPRITE1,(X1,83),8,7
1300 X2=232:PUTSPRITE2,(X2,95),6,4
1310 BD=-4:RETURN
1320 VPOKE8223,192:GOSUB1610:GOSUB16
30
1330 X1=16:PUTSPRITE1,(X1,95),7,7
1340 X2=232:PUTSPRITE2,(X2,95),6,6
1350 PUTSPRITE3,(124,95),13,8
1360 D1=4:D2=-4:RETURN
1370 VPOKE8223,224:GOSUB1610
1380 X1=232:PUTSPRITE1,(X1,95),2,6
1390 X2=232:PUTSPRITE2,(X2,83),4,6
1400 PUTSPRITE3,(128,95),4,8
1410 A1=-4:A2=-2:RETURN
1420 IFSP=0THENSF=1:RETURN ELSERIT
EOFF
1430 GOSUB1780:VPOKE6915,11:VPOKE691
4,40:GOSUB1490:VPOKE6914,44:GOSUB149
0
1440 VPOKE6914,48:GOSUB1490:VPOKE691
4,52:GOSUB1490:VPOKE6915,0
1450 PUTSPRITE0,(0,0)
1460 FORI=1TO500:NEXTI:LI=LI-1
1470 IFLI=-1THEN1520
1480 GOTO370
1490 FORI=1TO100:NEXTI:RETURN
1500 Y=Y+2:VPOKE6912,Y
1510 IFY>125THEN1430ELSE1500PRINT95+
(3*8)
1520 LOCATE11,6:GOSUB1800:PRINT"Game
Over"
1530 FORI=1TO2500
1540 NEXTI:VPOKE6919,0:VPOKE6923,0:V
POKE6927,0
1550 CLS
1560 LOCATE7,4:PRINTUSING"High Score
: #####";HS
1570 LOCATE7,7:PRINTUSING"Your Score
: #####";SC
1580 IFHS<SC THENHS=SC
1590 FORI=1TO2500:NEXTI
1600 GOTO220
1610 LOCATE1,1:PRINT"Score"SC:LOCATE
23,1:PRINT"Lives"LI
1620 LOCATE12,3:PRINT"Level"LE:RETUR
N
1630 LOCATE1,14:PRINTSTRING$(29,253)
1640 FORI=15TO21:LOCATE1,I:PRINTSTRI
NG$(29,254):NEXTI
1650 RETURN
1660 A$=STRING$(3,32):FORI=14TO17
1670 FORI=14TO17:LOCATE8,I:PRINTA$;
LOCATE14,I:PRINTA$;:LOCATE20,I:PRINT
A$;
1680 NEXTI:RETURN
1690 A$=STRING$(3,32):FORI=14TO17
1700 FORI=14TO17:LOCATE8,I:PRINTA$;
LOCATE14,I:PRINTA$;
```



```

1710 C=12:D=-10:GOSUB2460
1720 PSET (0,105),10
1730 C=10:D=-5:GOSUB2460
1740 PSET (0,130),8
1750 C=8:D=-1:GOSUB2460
1760 PSET (0,155),13
1770 C=13:D=1:GOSUB2460
1780 PSET (0,176),3
1790 C=3:D=4:GOSUB2460
1800 LINE (0,188)-(82,188),15
1810 LINE-STEP (7,-7),15
1820 LINE-STEP (8,0),15
1830 LINE-STEP (0,10),15
1840 PAINT (85,191),15
1850 LINE (122,191)-STEP (0,-10),15
1860 LINE-STEP (8,0),15
1870 LINE-STEP (7,7),15
    
```

TITAN LAND

By Gerry Gray

If it wasn't for the fact that we're starting the Star Program features next issue, this would be it. This is the calibre of program that we're looking for — programs that aren't afraid to go where other programs have never gone. Programs which take life as it comes and laugh at danger. Programs which have you walking up at three in the morning thinking: 'Aha! So that's how you do it!'

Okay, so that's a little over the top, but only just. Gary Gray's game is fast, colourful and well designed. It incorporates 2K of machine code, and this uses interrupt routines to make sure that the action is smooth and consistent. The spaceship's movement incorporates realistic inertia and acceleration, and there are special collision detection routines for sprite and non-sprite objects.

By this time you're probably wondering what the game is about. Well, your task (as they say) is to land your spaceship on a platform which shuttles across the screen, dump your cargo, return to the planet and start all over again. Pressing SPACE, or the joystick fire button activates the thrust. Left and right cursors and joystick control give directional movement. And just for good measure, when you've landed, using the up key or joystick movement replenishes your fuel.

One word of caution. The program uses a hex loader routine for the machine code, reading the figures from data statements. There's a hell of a lot of them — make sure you type them in correctly, and save the program to tape or disk before running it.

```

5  TITAN by G J Gray
10 CLEAR 500,&HC7FF
20 DEFINT A-Z
30 ONSTOPGOSUB2570:STOPON
40 SCREEN0:COLOR15,1:KEYOFF
50 PRINTTAB (5); "TITAN LAND (C) G.GR
   AY 1985"
60 LOCATE8,7
70 PRINT "PLEASE WAIT 2 MINUTES"
80 RESTORE:FORA=&HE000TO&HE917
90 READD$:POKEA,VAL("&H"+D$)
100 NEXT
110 DEFUSR=&HE000:DEFUSR1=&HE6FF
120 DEFUSR2=&HE654:DEFUSR3=&HE8CB
130 DEFUSR4=&HE8E6:DEFUSR5=&HEBED
140 DEFUSR6=&H41:DEFUSR7=&H44
150 SCREEN2,2:COLOR0,0,1:CLS:A=USR6(A)
    
```

```

160 GOSUB1180
170 FORN=0TO143
180 READD
190 POKE&HD100+N,D
200 NEXTN
210 SOUND7,&B10111100
220 FORN=1TO66
230 READPI
240 IFPI>1000THENLE=PI\1000:PI=PIMOD
   1000:ELSELE=1
250 POKE &HD200+(N-1)*2,LE
260 POKE &HD201+(N-1)*2,PI\2
270 POKE &HD301+(N-1)*2,PI\4
280 NEXT
290 BO$=CHR$(205)+CHR$(217)+CHR$(212)
   +CHR$(215)+CHR$(214)+CHR$(255)
300 LE$=CHR$(210)+CHR$(206)+CHR$(216)
   +CHR$(206)+CHR$(210)+CHR$(255)
310 GO$=CHR$(208)+CHR$(204)+CHR$(211)
   +CHR$(206)+CHR$(255)+CHR$(217)+CHR$(
   216)+CHR$(206)+CHR$(213)
320 NF$=CHR$(212)+CHR$(217)+CHR$(255)
   +CHR$(207)+CHR$(215)+CHR$(206)+CHR$(
   210)
330 POKE&HCB82,72
340 POKE&HCB83,128
350 M$=STRING$(64,255)
360 POKE&HCBC0,0:POKE&HCBC1,0
370 POKE&HCBC2,0:POKE&HCBC3,&H60
380 LINE (226,10)-STEP (12,12),2,BF
390 A=USR2(A):A=USR7(A):A=255:GOTO54
   0
400 .
410 . GAME OVER
420 .
430 SOUND7,&B10011100
440 POKE&HD080,255:POKE&HD081,0
450 POKE&HD082,112:POKE&HD083,&HD1
460 POKE&HD084,0:A=USR5(A)
470 POKE&HD080,60:POKE&HD084,1
480 A=USR5(A):POKE&HD080,0
490 POKE&HD082,128:POKE&HD084,2:A=US
   R5(A)
500 FORI=0TO10:COLOR,,11
510 FORN=0TO150:NEXT:COLOR,,8
520 FORN=0TO150:NEXTN,I:COLOR,,1
530 IFA=128THENMID$(M$,14)=NF$
540 MID$(M$,45)=GO$
550 M$=USR1(M$):A=USR3(A):A=0
560 FORN=0TO4:A=AORSTRIG(N):NEXT
570 IFA=0THEN560
580 .
590 . START NEW GAME
600 .
610 LE=1:M$=STRING$(64,255)
620 POKE&HCBC0,0:POKE&HCBC1,0
630 POKE&HCBC2,0
640 A=USR2(0):GOTO820
650 TIME=0:A=USR(0)
660 FORN=0TO6:PUTSPRITEN,(0,209):NEX
   T
670 LINE (226,10)-STEP (12,12),2,BF
680 M$=STRING$(64,255)
690 IFA<>4THEN430
700 IFTIME>9000THENM1$=CHR$(212)+CHR
   $(217)+CHR$(255)+LEFT$(BO$,5):GOTO81
   0
710 BO=(9000-TIME)/10*LE
720 HL$=MID$(STR$(BO),2):M1$=BO$:FOR
   N=1TOLEN(HL$)
730 M1$=M1$+CHR$(169+ASC(MID$(HL$,N,
   1))):NEXT
740 HL$=VAL(HEX$(PEEK(&HCBC2)))
750 HL$=HL$+(VAL(HEX$(PEEK(&HCBC1)))
   *100)
760 HL$=HL$+(VAL(HEX$(PEEK(&HCBC0)))
   *10000)
770 HL$=HL$+BO:HL$=STRING$(6-LEN(MID
   $(STR$(HL!),2),48)+MID$(STR$(HL!),2
   ))
    
```


LISTINGS

```

780 FORN=1TO5STEP2
790 D=VAL(MID$(HL$,N,1))*16+VAL(MID$(
(HL$,N+1,1))
800 POKE&HCBC0+(N-1)\2,D:NEXT:A=USR2
(A)
810 MID$(M$, (32-LEN(M1$))\2+33)=M1$
820 MID$(M$,13)=LE$+CHR$(LE/10+217)+
CHR$(LEMOD10+217)
830 M$=USR1(M$)
840
850 'LEVEL CONTROL
860
870 POKE&HCB80,5-LE\4
880 POKE&HCB81,5-LE\4
890 POKE&HCB8C,2+(LE\4)
900 POKE&HCB8D,LE\4
910 POKE&HCB8E,3+(LE\8)
920 POKE&HCB8F,2+(LE\8)
930 POKE&HCBC5,((5*LE)\10)*16+(5*LE)
MOD10
940 POKE&HCB9E,LE+2
950 POKE&HCB9F,LE+2
960 POKE&HCB98,(16-LE)\4+1
970 POKE&HCB99,(16-LE)\4+1
980 POKE&HCB9C,LE\3
990 POKE&HCB9D,40+LE*8
1000 POKE&HCB9B,LE\4+1
1010 IFLE<16THENLE=LE+1
1020 SOUND7,&B10111000:POKE&HD081,0
1030 POKE&HD082,112
1040 POKE&HD083,&HD1
1050 A=USR4(A):FORN=0TO3:FORI=0TO2
1060 POKE&HD080,255-I*50-N*50
1070 POKE&HD084,I
1080 A=USR5(A)
1090 FOR J=0 TO 20:NEXTJ
1100 NEXT
1110 FOR J=0 TO 50
1120 NEXTJ,N
1130 FORN=0TO3000:NEXT
1140 GOTO 650
1150
1160 'SET UP GRAPHICS
1170
1180 R=RND(-10802)
1190 FOR N=0 TO 20
1200 LINE (RND(1)*128,RND(1)*180)-ST
EP(1,1),RND(1)*15,BF
1210 NEXT
1220 FOR N=0 TO 10
1230 LINE (RND(1)*128+128,RND(1)*80)
-STEP(1,1),RND(1)*15,BF
1240 NEXT:X=80:Y=5
1250 FOR N=1 TO 5
1260 READ R,C
1270 CIRCLE(X,Y),R,C,,,1.3
1280 PAINT(X,Y),C:NEXT
1290 CIRCLE(202,100),35,14,0,3.15,-
8
1300 FOR N=1 TO 8
1310 LINE (167+N,100+N)-STEP(70-2*N,
0),4
1320 NEXT
1330 FOR X=175 TO 223 STEP8:READC
1340 FORN=X TO X+7 STEP 2
1350 IF N<199 THEN H=(N-175)ELSE H=(
223-N)
1360 Y=RND(1)*H+5:LINE (N,99)-STEP(0
,-Y),C
1370 NEXTN,X
1380 N=0:FORX=194TO210:LINE(X,191)-
(X,109),5
1390 X=X+N:N=N+1:NEXT
1400 C=6:FOR X=183 TO 215 STEP 8
1410 COLOR C,1:C=(C+2) AND 15343
1420 C=(C+2) AND 15
1430 LINE (X,102)-STEP(8,3),,BF
1440 NEXT
1450 FOR R!=.8 TO .1 STEP -.18

```

```

1460 CIRCLE (160,130),20,10,0,3.15,R
!
1470 NEXT
1480 LINE(140,130)-STEP(40,0),10
1490 FOR N=1 TO 6:READ C
1500 LINE(140+N,130+N)-STEP(40-2*N,0
),C
1510 NEXTN
1520 S=0:FOR N=0 TO 10
1530 LINE (155+N,137)-(155+N,191),13
1540 N=N+S:S=S+1:NEXT
1550 C=8
1560 FORR=58TO60
1570 CIRCLE(255,191),R,6,0,3.15,1.6
1580 NEXT
1590 FOR X=232 TO 255 STEP 8
1600 READ C
1610 FOR N=X TO X+7 STEP 2
1620 Y=RND(1)*(X-223)+25
1630 LINE (N,191)-STEP(0,-Y),C,BF
1640 NEXT N,X
1650 CIRCLE(180,150),10,9,,,1.5
1660 PAINT(180,150),9
1670 CIRCLE(180,150),3,13,,,1.5
1680 PAINT(180,150),13
1690 LINE(179,161)-STEP(3,191),15,BF
1700 PSET (0,80),12
1710 NEXTI:RETURN
1720 PUTSPRITE1,(32,0),0:PUTSPRITE2,
(64,0),0:PUTSPRITE3,(96,0),0
1730 RETURN
1740 SOUND0,0:SOUND1,1:SOUND11,0:SOU
ND12,15:SOUND13,0
1750 SOUND6,0:RETURN
1780 SOUND0,0:SOUND1,0:SOUND11,0:SOU
ND12,48:SOUND13,0
1790 SOUND6,20:RETURN
1800 SOUND0,0:SOUND1,0:SOUND11,0:SOU
ND12,15:SOUND13,0
1810 SOUND6,31:RETURN
1840 SOUND7,&B10110110:SOUND8,&B1000
0:RETURN
1880 LINE-(255,188),15
1890 PAINT(125,191),15
1900 LINE(98,184)-STEP(23,3),14,BF
1910 LINE(92,187)-STEP(35,4),4,BF
1920 X=34:GOSUB2520
1930 X=170:GOSUB2520
1940 X=218:GOSUB2520
1950 LINE(124,4)-STEP(120,24),8,B
1960 LINE(126,6)-STEP(116,20),8,B
1970 LINE(128,8)-STEP(110,16),0,BF
1980 FOR I=0 TO 39
1990 GOSUB 2430
2000 POKE &HC880+I,D
2010 NEXT I
2020 FOR I=0 TO 39
2030 GOSUB 2430
2040 POKE &HC880+I,D
2050 NEXT I
2060 FOR I=0 TO 7
2070 POKE &HC8A8+I,0
2080 POKE &HC8D8+I,0
2090 VPOKE &H27F8+I,0
2100 NEXT I
2110 FOR I=&H2600 TO &H2607
2120 READ C
2130 FOR N=I TO I+272 STEP 8
2140 VPOKE N,16*C
2150 NEXT N,I
2160 FOR I=0 TO 63
2170 POKE &HCB00+I,255
2180 NEXT I
2190 FOR I=0 TO 5
2200 POKE (&HCB0A+I),I+192
2210 POKE (&HCB2A+I),I+198
2220 NEXT I

```



```

2230 FOR S=0 TO 5
2240 S$=""
2250 FOR I=0 TO 31
2260 READ D
2270 S$=S$+CHR$(D)
2280 NEXT
2290 SPRITE$(S)=S$
2300 NEXT
2310 FORI=1632TO1824STEP8
2320 VPOKEI,0:FORN=1TO7
2330 READD:VPOKEI+N,D:NEXTN,I
2340 FORI=&H2718TO&H2728
2350 VPOKEI,240:NEXT
2360 FORN=0TO3:READD:VPOKE(48+&H1800
+N),D:NEXT
2370 FORN=0TO3:READD:VPOKE(80+&H1800
+N),D:NEXT
2380 FORI=&HCAC0TO&HCAEFSTEP3
2390 READD:POKEI,D
2400 READD:POKEI+1,D
2410 POKEI+2,0:NEXT
2420 RETURN
2430 READ D$
2440 LET D=VAL("&H"+D$)
2450 RETURN
2460 X=0
2470 X1=RND(1)*30
2480 Y1=RND(1)*8-D
2490 LINE -STEP(X1,Y1),C
2500 IF X<255 THEN X=X+X1:GOTO 2470
2510 PAINT(0,191),C:RETURN
2520 FOR N=X TO X+5
2530 LINE(N,191-2*(N-X))-(N,191),14
2540 LINE(N+21,181+2*(N-X))-(N+21,19
1),14
2550 NEXT
2560 LINE(X+6,188)-(X+20,191),8,BF
2570 RETURN
2580
2590 DATA FOR MACHINE CODE
2600
2610 DATA 23,23,E5,21,0,C9,11,1,C9,1
,7F,1
2620 DATA 36,0,ED,B0,F3,CD,90,0,21,3
A,E8,3E
2630 DATA C3,32,9A,FD,22,9B,FD,FB,FD
,21,17,E9
2640 DATA 3E,80,FD,77,2,FD,77,12,FD,
77,22,FD
2650 DATA 77,27,AF,FD,77,23,32,0,F3,
32,8A,CB
2660 DATA 21,0,CB,11,C0,18,1,40,0,CD
,5C,0
2670 DATA CD,B8,E6,CD,8D,E0,CD,54,E6
,CD,56,E7
2680 DATA CD,B7,0,30,4,3E,FF,18,F,3A
,0,F3
2690 DATA A7,20,9,3A,88,CB,E6,7,FE,4
,20,DF
2700 DATA E1,77,F3,3E,C9,32,9A,FD,3E
,C3,21,56
2710 DATA E7,32,9F,FD,22,A0,FD,3E,80
,32,39,E9
2720 DATA 3E,7,1E,BC,CD,93,0,FB,C9,3
A,88,CB
2730 DATA CB,9F,32,88,CB,3A,C6,CB,A7
,28,4,3D
2740 DATA 32,C6,CB,FD,21,80,CB,FD,35
,0,C2,7B
2750 DATA E1,FD,7E,1,FD,77,0,FD,7E,2
,FD,CB
2760 DATA 3,7E,28,28,A7,20,16,FD,CB,
3,BE,FD
2770 DATA 34,2,FD,CB,8,76,28,39,FD,C
B,11,BE
2780 DATA FD,34,13,18,30,3D,FD,77,2,

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```

FD,CB,8
2790 DATA 76,28,26,FD,35,13,18,21,FE
,BA,20,10
2800 DATA FD,CB,3,FE,FD,CB,8,76,28,1
3,FD,CB
2810 DATA 11,FE,18,D,3C,FD,77,2,FD,C
B,8,76
2820 DATA 28,3,FD,34,13,21,80,CB,11,
0,CB,1
2830 DATA 60,0,ED,B0,FD,7E,2,E6,7,FD
,CB,3
2840 DATA 7E,28,16,A7,28,61,FE,7,20,
1F,21,1
2850 DATA CB,11,0,CB,1,3F,0,ED,B0,3E
,7,18
2860 DATA 10,A7,20,D,21,3E,CB,11,3F,
CB,1,3F
2870 DATA 0,ED,B8,18,3E,4F,DD,21,0,C
B,6,8
2880 DATA DD,CB,0,3E,DD,CB,8,1E,DD,C
B,10,1E
2890 DATA DD,CB,18,1E,DD,CB,20,1E,DD
,CB,28,1E
2900 DATA DD,CB,30,3E,DD,CB,38,1E,DD
,CB,40,1E
2910 DATA DD,CB,48,1E,DD,CB,50,1E,DD
,CB,58,1E
2920 DATA DD,23,10,CC,D,20,C3,76,21,
0,CB,11
2930 DATA C0,18,1,40,0,CD,5C,0,21,0,
CB,11
2940 DATA 0,6,1,60,0,CD,5C,0,FD,21,A
0,CB
2950 DATA 3A,9E,CB,A7,C2,1D,E2,3E,8,
32,9E,CB
2960 DATA ED,5F,21,9F,CB,BE,D2,1D,E2
,6,4,FD
2970 DATA CB,7,7E,28,61,AF,FD,77,0,F
D,77,1
2980 DATA FD,77,2,FD,77,7,3E,BF,FD,7
7,4,ED
2990 DATA 5F,AC,AD,57,AF,CB,1A,CE,0,
CB,1A,CE
3000 DATA 0,A7,20,4,3E,28,18,A,FE,1,
20,4
3010 DATA 3E,B0,18,2,3E,E0,FD,77,3,4
F,6,0
3020 DATA 21,20,D1,AF,CD,E,E7,3E,18,
32,9E,CB
3030 DATA ED,5F,AB,E6,F,16,0,5F,21,7
,E9,19
3040 DATA 7E,E6,F,FD,77,6,7E,E6,F0,C
B,3F,CB
3050 DATA 3F,FD,77,5,18,7,11,8,0,FD,
19,10
3060 DATA 92,FD,21,A0,CB,E,0,FD,35,F
B,20,C
3070 DATA 21,9E,CB,35,E,80,FD,7E,F9,
FD,77,F8
3080 DATA 6,4,21,8,1B,E5,FD,CB,7,7E,
20,20
3090 DATA CB,79,28,E,FD,35,4,FD,7E,4
,FE,EF
3100 DATA 20,4,FD,CB,7,FE,2A,93,CB,3
A,9B,CB
3110 DATA 67,ED,5B,9C,CB,CD,A,E6,E1,
FD,7E,4
3120 DATA CD,4D,0,FD,7E,3,23,CD,4D,0
,FD,7E
3130 DATA 5,23,CD,4D,0,FD,7E,6,23,CD
,4D,0
3140 DATA 23,11,8,0,FD,19,10,B5,FD,2
1,90,CB
3150 DATA AF,CD,D5,0,A7,20,D,3E,1,CD
,D5,0
3160 DATA A7,20,5,3E,2,CD,D5,0,FD,CB

```


LISTINGS

,F8,7E
3170 DATA 20,4A,FE,2,28,8,FE,3,28,4,
FE,4
3180 DATA 20,4,2E,FF,18,E,FE,6,28,8,
FE,7
3190 DATA 28,4,FE,8,20,1A,2E,0,FD,66
,FC,11
3200 DATA 0,FF,CD,A,E6,6,5,CD,99,E6,
3A,88
3210 DATA CB,CB,DF,32,88,CB,18,4D,AF
,FD,CB,1
3220 DATA 7E,28,1,2F,6F,FD,66,FD,11,
0,FF,CD
3230 DATA A,E6,18,39,FE,8,28,8,FE,1,
28,4
3240 DATA FE,2,20,2D,DD,21,C0,CB,DD,
7E,4,C6
3250 DATA 19,DD,77,4,30,1F,DD,7E,3,F
E,99,28
3260 DATA 18,C6,1,27,DD,77,3,3E,7,1E
,98,CD
3270 DATA 93,0,3E,2,21,10,D1,1,FF,0,
CD,E
3280 DATA E7,FD,21,94,CB,1,0,5,3A,89
,CB,A7
3290 DATA 28,6,3D,32,89,CB,18,3A,C5,
78,3D,CD
3300 DATA D8,0,C1,B1,4F,10,F5,79,A7,
28,1A,2E
3310 DATA 0,FD,66,FA,11,0,FF,CD,A,E6
,6,7
3320 DATA CD,99,E6,3A,88,CB,CB,DF,32
,88,CB,18
3330 DATA 11,FD,CB,F4,7E,20,B,2E,FF,
FD,66,FB
3340 DATA 11,0,FF,CD,A,E6,3A,88,CB,C
B,7F,28
3350 DATA 26,FD,7E,3,16,F0,FE,A6,28,
6,16,60
3360 DATA FE,23,20,17,3A,88,CB,E6,3F
,32,88,CB
3370 DATA 7A,CD,65,E8,3E,2,21,0,D1,1
,C0,0
3380 DATA CD,E,E7,21,0,1B,FD,7E,3,CD
,4D,0
3390 DATA 23,FD,7E,FF,CD,4D,0,23,AF,
CD,4D,0
3400 DATA 23,3E,5,CD,4D,0,23,FD,7E,3
,CD,4D
3410 DATA 0,23,FD,7E,FF,CD,4D,0,23,3
E,4,CD
3420 DATA 4D,0,23,3E,F,CD,4D,0,FD,21
,80,CB
3430 DATA FD,CB,8,7E,20,11,FD,CB,8,5
E,28,4
3440 DATA 1E,98,18,2,1E,BC,3E,7,CD,9
3,0,FD
3450 DATA CB,8,66,28,9,FD,CB,8,A6,16
,20,C3
3460 DATA EC,E4,FD,7E,17,FE,20,DA,3F
,E5,FE,3F
3470 DATA D2,3F,E5,FD,7E,2,C6,30,FD,
96,13,FE
3480 DATA 38,D2,3F,E5,11,8,0,DD,21,0
,CB,21
3490 DATA 82,C9,CD,C4,E5,21,C2,C9,CD
,C4,E5,CD
3500 DATA D8,E5,FD,7E,17,D6,1F,6F,FD
,7E,2,CB
3510 DATA 3F,CB,3F,CB,3F,57,FD,7E,13
,CB,3F,CB
3520 DATA 3F,CB,3F,3C,92,5F,26,0,29,
29,29,16
3530 DATA C9,19,11,5,0,DD,21,80,CA,6
,10,E
3540 DATA 3,DD,7E,0,A6,C2,EA,E4,23,D
D,23,D

3550 DATA 20,F3,19,10,EE,FD,7E,17,FE
,24,C0,FD
3560 DATA 7E,2,C6,F,FD,BE,13,D0,C6,2
0,FD,BE
3570 DATA 13,DB,3E,3F,FD,BE,14,38,61
,FD,CB,8
3580 DATA 7E,C0,FD,5E,1,16,0,21,FA,E
8,19,56
3590 DATA FD,72,10,FD,7E,8,F6,C0,FD,
77,8,AF
3600 DATA FD,77,14,3E,FF,FD,77,15,3E
,3C,FD,77
3610 DATA 9,3E,60,CD,65,E8,3E,7,1E,B
C,CD,93
3620 DATA 0,FD,CB,8,6E,C8,FD,CB,8,AE
,FD,34
3630 DATA 8,FD,21,C0,CB,FD,7E,5,FD,8
6,2,27
3640 DATA FD,77,2,FD,7E,1,CE,0,27,FD
,77,1
3650 DATA FD,7E,0,CE,0,27,FD,77,0,C9
,16,C8
3660 DATA DD,21,C0,CB,DD,7E,6,A7,C0,
4A,6,0
3670 DATA 21,30,D1,3E,1,CD,E,E7,DD,7
E,7,5F
3680 DATA A7,28,32,3E,14,DD,77,6,DD,
35,7,21
3690 DATA 0,E9,16,0,19,7E,F5,21,E0,2
1,1,10
3700 DATA 0,CD,56,0,F1,24,1,10,0,CD,
56,0
3710 DATA 3A,91,CB,EE,80,32,91,CB,3A
,95,CB,EE
3720 DATA 80,32,95,CB,C9,3E,FF,32,0,
F3,C9,FD
3730 DATA 7E,17,FE,A5,D8,FE,AC,38,C,
FE,F5,D0
3740 DATA FE,F0,38,9A,AF,FD,77,15,C9
,CD,D8,E5
3750 DATA FD,7E,17,C6,10,5F,FD,4E,13
,16,0,62
3760 DATA CD,11,1,CD,14,0,DD,21,80,C
A,11,8
3770 DATA 0,6,3,CD,4A,0,DD,A6,2D,C2,
EA,E4
3780 DATA 19,DD,23,10,F2,FD,7E,13,D6
,62,D8,FE
3790 DATA 9,D0,FD,7E,17,FE,A8,D2,EA,
E4,FE,A7
3800 DATA C0,3E,3F,FD,BE,14,DA,EA,E4
,FD,CB,8
3810 DATA 7E,C0,FD,7E,8,E6,3F,F6,A0,
FD,77,8
3820 DATA AF,32,90,CB,32,94,CB,3E,3C
,FD,77,9
3830 DATA 3E,F0,CD,65,E8,3E,7,1E,BC,
C3,93,0
3840 DATA E,6,E5,6,8,DD,7E,0,77,DD,2
3,19
3850 DATA 10,F7,E1,23,D,20,EF,C9,21,
C0,CA,11
3860 DATA 80,CA,1,30,0,ED,B0,DD,21,8
0,CA,FD
3870 DATA 7E,13,E6,7,28,1B,57,E,10,4
2,DD,CB
3880 DATA 0,3E,DD,CB,1,1E,DD,CB,2,1E
,10,F2
3890 DATA DD,23,DD,23,DD,23,D,20,E8,
C9,FD,7E
3900 DATA 3,BD,CB,1F,FD,AE,1,E6,80,F
D,7E,0
3910 DATA 20,11,94,38,3,BB,30,12,FD,
7E,1,EE
3920 DATA 80,FD,77,1,7B,18,7,84,38,3
,BA,38

3930 DATA 1,7A,FD,77,0,6F,26,0,29,29,FD,5E
 3940 DATA 2,FD,56,3,FD,CB,1,7E,20,3,19,18
 3950 DATA 4,EB,A7,ED,52,FD,75,2,FD,74,3,C9
 3960 DATA FD,21,C0,CB,21,35,18,FD,7E,3,CD,80
 3970 DATA E6,23,3A,88,CB,CB,6F,3E,AB,20,2,3E
 3980 DATA FF,CD,80,E6,21,55,18,6,3,FD,7E,0
 3990 DATA CD,80,E6,FD,23,10,F6,C9,4F,CB,3F,CB
 4000 DATA 3F,CB,3F,CB,3F,C6,D9,CD,4D,0,23,79
 4010 DATA E6,F,C6,D9,CD,4D,0,23,C9,D,21,C0
 4020 DATA CB,DD,7E,4,90,DD,77,4,D0,D,7E,3
 4030 DATA A7,28,7,D6,1,27,DD,77,3,C9,3E,80
 4040 DATA 32,0,F3,C9,FD,21,A0,CB,11,8,0,6
 4050 DATA 4,3E,BF,FD,77,4,3E,80,FD,7,7,FD
 4060 DATA 19,10,F2,AF,32,90,CB,32,92,CB,32,94
 4070 DATA CB,32,96,CB,32,C6,CB,32,C4,CB,32,89
 4080 DATA CB,3E,66,32,93,CB,3E,A7,32,97,CB,3E
 4090 DATA 5,32,C7,CB,3E,60,32,C3,CB,3E,A0,32
 4100 DATA 88,CB,C9,13,1A,6F,13,1A,67,11,C0,18
 4110 DATA 1,40,0,C3,5C,0,DD,E5,FD,E5,87,87
 4120 DATA 87,87,5F,16,0,FD,21,17,E9,FD,19,E5
 4130 DATA DD,E1,FD,75,0,FD,74,1,DD,7E,0,FD
 4140 DATA 77,4,DD,7E,1,FD,77,5,DD,7E,8,FD
 4150 DATA 77,8,DD,7E,9,FD,77,9,CB,78,20,6
 4160 DATA FD,70,3,FD,71,7,AF,FD,77,2,FD,77
 4170 DATA 6,FD,E1,DD,E1,C9,FD,21,17,E9,E,0
 4180 DATA FD,7E,2,CB,7F,C2,2D,E8,FE,3,28,1F
 4190 DATA FD,35,4,20,25,3C,FD,77,2,87,16,0
 4200 DATA 5F,FD,6E,0,FD,66,1,19,7E,2,3,FD,77
 4210 DATA 4,7E,FD,77,5,18,8,FD,7E,3,A7,20
 4220 DATA 5,FD,CB,2,FE,C9,FD,7E,3,FD,56,5
 4230 DATA CB,7A,28,8,CB,BA,92,30,A,A,F,18,7
 4240 DATA 82,FE,80,38,2,3E,7F,FD,77,3,FD,35
 4250 DATA 8,20,1F,FD,7E,6,3C,E6,3,FD,77,6
 4260 DATA C6,4,87,16,0,5F,FD,6E,0,FD,66,1
 4270 DATA 19,7E,23,FD,77,8,7E,FD,77,9,FD,7E
 4280 DATA 7,FD,56,9,CB,7A,28,8,CB,BA,92,30
 4290 DATA 8,AF,18,5,82,30,2,3E,FF,FD,77,7
 4300 DATA FD,7E,3,CB,3F,CB,3F,CB,3F,

5F,79,C6
 4310 DATA 8,CD,93,0,FD,7E,7,5F,CB,23,CB,7
 4320 DATA E6,1,57,79,87,CD,93,0,3C,5A,CD,93
 4330 DATA 0,CB,49,28,18,3E,7,CD,96,0,E6,20
 4340 DATA 20,F,FD,7E,7,CB,3F,CB,3F,CB,3F,5F
 4350 DATA 3E,6,CD,93,0,11,10,0,FD,19,C,3E
 4360 DATA 3,B9,C2,5C,E7,C9,F1,CD,3E,1,CB,7F
 4370 DATA 28,13,CB,6F,28,8,3A,88,CB,CB,E7,32
 4380 DATA 88,CB,2A,9E,FC,23,22,9E,FC,DD,E1,FD
 4390 DATA E1,F1,C1,D1,E1,D4,8,F1,C1,D1,E1,FB
 4400 DATA C9,D9,6,0,21,40,D1,4F,3E,1,CD,E
 4410 DATA E7,D9,C9,FD,21,0,D0,FD,7E,0,CB,7F
 4420 DATA CA,56,E7,FD,35,1,C2,56,E7,6,10,FD
 4430 DATA 70,1,FD,35,2,C2,56,E7,E6,7F,FE,42
 4440 DATA 20,B,3E,80,FD,77,0,3E,42,FD,77,2
 4450 DATA C9,FD,34,0,87,5F,16,0,21,0,D2,19
 4460 DATA 7E,FD,77,2,2C,7E,24,D9,4F,6,0,21
 4470 DATA 50,D1,3E,0,CD,E,E7,D9,4E,6,0,21
 4480 DATA 60,D1,3E,1,C3,E,E7,F3,3E,C3,21,73
 4490 DATA E8,32,9F,FD,22,A0,FD,3E,80,32,0,D0
 4500 DATA 3E,F,32,1,D0,32,2,D0,FB,C9,F3,AF
 4510 DATA 32,0,D0,FB,C9,ED,48,80,D0,2A,82,D0
 4520 DATA 3A,84,D0,C3,E,E7,40,20,15,10,D,B
 4530 DATA 60,80,90,E0,30,20,C0,2F,27,26,27,37
 4540 DATA 3F,37,36,46,4F,47,47,5F,57,57,56,0
 4550
 4560 GRAPHICS DATA
 4570
 4580 DATA 40,11,31,10,22,9,13,8,5,6
 4590 DATA 6,8,9,11,10,14
 4600 DATA 12,2,3,7,5,4
 4610 DATA 4,7,5,3
 4620 DATA F0,FB,F4,F2,F1,F0,F0,F0
 4630 DATA 00,00,00,00,00,FF,FF,FF
 4640 DATA 00,00,00,00,00,FF,FF,FF
 4650 DATA 00,00,00,00,00,FF,FF,FF
 4660 DATA 0F,1F,2F,4F,8F,0F,0F,0F
 4670 DATA F1,F2,F4,FB,F0,F0,F0,60
 4680 DATA 01,82,44,28,10,00,00,00
 4690 DATA 01,82,44,28,10,00,00,00
 4700 DATA 01,82,44,28,10,00,00,00
 4710 DATA 0F,8F,4F,2F,1F,0F,0F,06
 4720 DATA 12,12,2,3,14,7,5,4
 4730 DATA 0,0,1,1,3,67,67,67,67,67
 4740 DATA 65,0,1,3,64,0,0,0,128,128
 4750 DATA 192,194,194,194,194,194,130
 4760 DATA 0,128,192,2,0
 4770 DATA 65,65,66,66,228,164,164,188,188
 4780 DATA 164,166,65,66,68,160,224,130
 4790 DATA 130,66,66,39,37,37,61,61
 4800 DATA 37,101,130,66,34,5,7

LISTINGS

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4810 DATA 1,3,3,6,4,5,5,13,25,53,111
4820 DATA 95,127,114,68,15,128,192,1
92
4830 DATA 224,224,224,224,240,216,23
6
4840 DATA 246,250,254,206,226,240
4850 DATA 32,83,31,28,48,54,98,96,97
4860 DATA 100,55,49,60,63,51,112,4,2
02
4870 DATA 248,56,12,108,70,6,134,38,
236
4880 DATA 140,60,252,204,14
4890 DATA 1,1,5,14,27,94,223,231,120
,127,119,107,103
4900 DATA 241,1,3,128,128,160,112,21
6,122
4910 DATA 251,231,30,254,238,214,230
,143,128,192
4920 DATA 1,3,6,252,255,120,49,51,51
,49,120
4930 DATA 255,252,6,3,1,128,192,96,6
3,255
4940 DATA 30,140,204,204,140,30,255,
63,96,192,128
4950 DATA 56,24,44,44,126,70,239
4960 DATA 252,102,102,124,102,102,25
2
4970 DATA 252,108,96,120,96,108,252
4980 DATA 252,108,96,120,96,96,240
4990 DATA 120,204,192,220,204,204,12
0
5000 DATA 238,108,108,124,108,108,23
8
5010 DATA 240,96,96,96,96,108,252
5020 DATA 199,110,110,86,86,70,239
5030 DATA 198,100,116,124,92,76,230
5040 DATA 248,108,108,120,108,108,23
8
5050 DATA 120,204,192,120,12,204,120
5060 DATA 206,206,206,206,206,206,12
4
5070 DATA 199,70,70,44,44,56,24
5080 DATA 60,102,102,102,102,102,60
5090 DATA 16,48,112,48,48,48,120
5100 DATA 60,102,6,60,96,198,254
5110 DATA 120,204,12,60,12,204,120
5120 DATA 192,216,216,252,24,24,24
5130 DATA 252,192,192,120,12,204,120
5140 DATA 120,192,248,204,204,204,12
0
5150 DATA 124,108,12,24,48,96,96
5160 DATA 120,204,204,120,204,204,12
0
5170 DATA 120,204,204,124,12,12,120
5180 DATA 164,170,170,234,170,164,0
5190 DATA 140,138,138,138,138,236,0
5200 DATA 207,215,206,210
5210 DATA 209,204,215,210
5220 DATA 65,130,65,130,67,194,67
5230 DATA 194,231,231,231,231,231
5240 DATA 231,255,255,255,255,231
5250 DATA 231,231,231,65,130,67,194
5260 DATA 71,226,224,7,224,7
5270
5280 ENVELOPE DATA
5290
5300 DATA 2,49,1,0,1,0,1,0
5310 DATA 3,&HB0,3,48,4,&HA0,4,32
5320 DATA 3,60,1,0,1,0,0,&H8A
5330 DATA 1,&H84,1,&H84,1,&H86,1,&H8
8
5340 DATA 32,5,35,&H82,10,4,1,&H81
5350 DATA 3,14,3,&H94,3,18,3,&H8C
5360 DATA 4,40,25,&H81,15,0,0,&H81
5370 DATA 1,&HA0,10,2,5,&H90,8,10
5380 DATA 3,60,10,&H8C,3,30,10,&H86
5390 DATA 2,2,2,&H81,2,3,2,&H84
5400 DATA 2,80,25,&H82,10,0,0,&H81
5410 DATA 3,5,3,&H85,3,5,3,&H85
5420 DATA 2,127,25,&H82,10,0,0,&H81
5430 DATA 1,0,1,0,1,0,1,0

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5440 DATA 2,127,25,&H82,10,0,0,&H81
5450 DATA 2,64,2,&HBF,2,64,2,&HBF
5460 DATA 2,127,35,&H82,20,2,0,&H81
5470 DATA 2,&HA0,2,32,2,&HA4,2,30
5480
5490 MUSIC DATA
5500
5510 DATA 170,180,170,180,170,226
5520 DATA 190,214,3254,428,339,254
5530 DATA 3226,339,269,226,3214,339
5540 DATA 170,180,170,180,170,226
5550 DATA 190,214,3254,428,339,254
5560 DATA 3226,339,226,2254,226,214
5570 DATA 190,3170,285,160,170,3190
5580 DATA 285,170,190,3214,339,190
5590 DATA 214,3226,170,180,170,180
5600 DATA 170,226,190,214,3254,339
5610 DATA 254,3226,339,214,226,3254

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MSX MUNCHER By M Monaghan

No, of course its real name isn't MSX Muncher. But we can't tell you its real name in case we get sued by Atari. Suffice to say that you have to sprint around a maze, eating . . . um . . . dots and downing pills which have a similar effect to horse tranquilizers — in other words, the people chasing you start to flash in funny colours and you feel compelled to eat them. Keyboard only.

```

5 REM *** MSX MUNCHER ***
6 REM *** BY M. MONAGHAN ***
7 REM *** 1986 ***
8 REM
10 KEYOFF:SCREEN 1:WIDTH 31:COLOR 11
,4,4:CLS
15 REM ROUTINE TO ENTER MACHINE CODE
20 FOR N=&HEB1B TO &HE92B
30 READ A$
40 POKE N,VAL("&H"+A$)
50 NEXT N
70 DATA 8,AF,8,DD,21,0,E8,11,9,0,6,3
,C5,DD,CB,7,46,C2,E5,E8,ED,5F,E6,3
80 DATA DD,77,1,DD,96,0,E6,3,FE,2,DD
,7E,0,28,3,DD,7E,1,1,20,0,DD,77,1,DD
90 DATA 6E,2,DD,66,3,3C,3D,28,1F,3D,
28,30,3D,28,41,2B,CD,B2,E8,DA,DF,E8
100 DATA DD,7E,4,D6,8,DD,77,4,CD,C6,
E8,DD,19,C1,10,B5,76,C9,9,CD,B2,E8,D
A
110 DATA DF,E8,DD,7E,5,C6,8,DD,77,5,
CD,C6,E8,18,E5,23,CD,B2,E8,DA,DF,E8
120 DATA DD,7E,4,C6,8,DD,77,4,CD,C6,
E8,18,D1,A7,ED,42,CD,B2,E8,DA,DF,E8
130 DATA DD,7E,5,D6,8,DD,77,5,CD,C6,
E8,18,BB,CD,4A,0,FE,16,DB,DD,7E,1,DD
140 DATA 77,0,DD,75,2,DD,74,3,AF,C9,
21,0,1B,8,F5,85,6F,F1,C6,4,8,DD,7E,5
150 DATA CD,4D,0,23,DD,7E,4,CD,4D,0,
C9,DD,35,6,C2,2F,E8,8,C6,4,8,C3,6D,E
8
160 DATA 37,7F,4,3,37,7F,4,D,37,7F,4
,1,0,0,F0,18,7F,37,0,0,0,0,0,F0,18,7
F
170 DATA 37,0,0,0,0,0,F0,18,7F,37,0,
0,0,11,0,1B,21,EC,E8,1,C,0,CD,5C,0,C
9
180 DATA 11,0,E8,21,F8,E8,1,1B,0,ED,

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```

B0,C9
190 DEFUSR5=&H156
200 POKE &HF3DB,0
210 DEFUSR4=&H90
220 HI%=0
230 VPOKE 8194,180:VPOKE 8193,180
240 POW=0:GH%=&H1B03
250 DEFUSR1=&HE913
260 DEFUSR2=&HE920
270 DEFUSR3=&HE81B
275 REM SET UP SPRITES
280 FOR A=56 TO 175:READ B:VPOKE A,B
:NEXT
290 REM-----
300 REM          PACMAN
310 REM-----
320 SPRITE$(0)=CHR$(&B00011100)+CHR$
(&B00111110)+CHR$(&B01111111)+CHR$(&
B01111100)+CHR$(&B01111000)+CHR$(&B0
1111100)+CHR$(&B00111111)+CHR$(&B000
11110)
330 SPRITE$(1)=CHR$(&B01000100)+CHR$
(&B11000110)+CHR$(&B11101111)+CHR$(&
B11111111)+CHR$(&B11111111)+CHR$(&B0
1111100)+CHR$(&B00111100)+CHR$(&B000
00000)
340 SPRITE$(2)=CHR$(&B00111000)+CHR$
(&B01111100)+CHR$(&B11111110)+CHR$(&
B00111110)+CHR$(&B00011110)+CHR$(&B0
0111110)+CHR$(&B11111100)+CHR$(&B011
11000)
350 SPRITE$(3)=CHR$(&B00000000)+CHR$
(&B00111100)+CHR$(&B01111110)+CHR$(&
B11111111)+CHR$(&B11111111)+CHR$(&B1
1011111)+CHR$(&B11000110)+CHR$(&B010
00100)
360 REM-----
365 REM SET UP CHARACTERS
370 REM GHOSTS
380 SPRITE$(4)=CHR$(&B00111100)+CHR$
(&B01111110)+CHR$(&B11111111)+CHR$(&
B11011011)+CHR$(&B11111111)+CHR$(&B1
1000011)+CHR$(&B11111111)+CHR$(&B111
1111)
390 REM-----
400 REM PILLS
410 REM-----
420 REM DATA &B00000000,&B00000000,&
B00011000,&B00111100,&B00111100,&B00
011000,&B00000000,&B00000000
430 REM-----
440 DATA &B00001000,&B00010000,&B000
10000,&B00111100,&B01111110,&B011111
10,&B00111100,&B00011000
450 REM ENERGY PILLS
460 REM-----
470 DATA &B00111100,&B01000010,&B100
11001,&B10111101,&B10111101,&B100110
01,&B01000010,&B00111100
480 REM-----
490 REM MAZE WALLS
500 REM-----
510 DATA &B00111100,&B01111110,&B111
11111,&B11111111,&B11111111,&B111111
11,&B11111111,&B11111111
520 DATA &B11111111,&B11111111,&B111
11111,&B11111111,&B11111111,&B111111
11,&B01111110,&B00111100
530 DATA &B00111111,&B01111111,&B111
11111,&B11111111,&B11111111,&B111111
11,&B01111111,&B00111111
540 DATA &B11111100,&B11111110,&B111
11111,&B11111111,&B11111111,&B111111
11,&B11111110,&B11111100
550 DATA &B11111111,&B11111111,&B111
11111,&B11111111,&B11111111,&B111111
11,&B11111111,&B11111111
560 DATA &B11111111,&B11111111,&B111
11111,&B11111111,&B11111111,&B111111
11,&B11111111,&B11111111

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570 DATA &B00111100,&B01111110,&B111
11111,&B11111111,&B11111111,&B111111
11,&B01111110,&B00111100
580 DATA &B11111111,&B11111111,&B111
11111,&B11111111,&B11111111,&B111111
11,&B01111111,&B00111111
590 DATA &B11111100,&B11111110,&B111
11111,&B11111111,&B11111111,&B111111
11,&B11111111,&B11111111
600 DATA &B00111111,&B01111111,&B111
11111,&B11111111,&B11111111,&B111111
11,&B11111111,&B11111111
610 DATA &B11111111,&B11111111,&B111
11111,&B11111111,&B11111111,&B111111
11,&B11111110,&B11111100
620 DATA&B00011100,&B00111110,&B0111
1111,&B01111100,&B0111000,&B0111110
0,&B00111111,&B00011110
630 DATA 0,0,0,0,0,0,0,0
640 VPOKE 8223,52:VPOKE 8198,244:VPO
KE 8199,244:VPOKE 8200,244:VPOKE 820
1,244:VPOKE 8202,244
650 REM
660 VDP(1)=VDP(1) OR 1:GOSUB 1850:VD
P(1)=VDP(1) AND 254
670 LIV=3
680 REM SCREEN PRINTOUT
690 SC%=0:SP=100
700 REM-----
710 CLS
720 G1=59394!:G2=G1+9:G3=G2+9
730 LOCATE 8,0:PRINT USING"#####"
;SC%:LOCATE 20,0:PRINT USING"#####
#";HI%
740 LOCATE0,0
750 PRINT"  SCORE=          HI="
"
760 PRINT
770 PRINT" RNNNNNNNNNNNNNNNNNNNNNNNNNN
NNNQ"
780 PRINT" Mxzzzzzzzzzzzzzzzzzzzzzzzz
zzzM"
790 PRINT" MzKNNLzKNNNNQzJzRNNNNLzKN
NLzM"
800 PRINT" Mzzzzzzzzzzzzzzzzzzzzzzzz
zzzM"
810 PRINT" MNNLzKNNNNLzJzOzJzKNNNNLz
KNNM"
820 PRINT" Mzzzzzzzzzzzzzzzzzzzzzzzz
zzzM"
830 PRINT" MzKNLzKLzRNNNNNNNNNNQzKLzK
NLzM"
840 PRINT" MzzzzzzzzzM    UUU    Mzzzzz
zzzM"
850 PRINT" MzKNNNNLzM          MzKNNN
NLzM"
860 PRINT" MzzzzzzzzzM          Mzzzzz
zzzM"
870 PRINT" MzRNNNNLzM          MzKNNN
NQzM"
880 PRINT" MzMzzzzzzzM LIVES    Mzzzzz
zMzM"
890 PRINT" MzMzKNNQzM          MzRNNL
zMzM"
900 PRINT" MzJzzzzzJzPNNNNNNNNNSzJzzz
zJzM"
910 PRINT" MzzzRQzzzzzzzzzzzzzzzzzzz
zzzM"
920 PRINT" MzIzPSzKNNNNNLzKNNNNNLzPS
zIzM"
930 PRINT" MzMzzzzzzzzzzzzzzzzzzzzzz
zMzM"
940 PRINT" MzPNNLzKNNLzKNNNLzKNNLzKN
NSzM"
950 PRINT" Mxzzzzzzzzzzzzzzzzzzzzzz
zzzM"
960 PRINT" PNNNNNNNNNNNNNNNNNNNNNNNN
NNNS"
970 LOCATE 8,0:PRINT USING"#####

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LISTINGS

```
;SCZ:LOCATE 20,0:PRINT USING"#####  
#";HI%  
980 LOCATE 17,13:PRINT LIV  
990 X%=127:Y%=127:POW=0  
1000 P%=6672  
1010 PUT SPRITE 0,(X%,208)  
1020 PUT SPRITE 3,(X%,Y%),15,S%  
1030 FOR N=1 TO 700:NEXT  
1040 ON INTERVAL=13 GOSUB 1120:INTER  
VALON  
1050 GC%=0:A=USR1(I)  
1060 A=USR2(I)  
1070 A=USR3(I)  
1080 FOR F=1 TO SP:NEXT  
1090 IF PIL>=251 THEN 1600  
1100 GOTO 1070  
1120 INTERVALOFF:D%=STICK(V)  
1130 GOSUB 1770  
1140 IF P%=PEEK(G1)+256*PEEK(G1+1)TH  
EN GD%=1 ELSE IF P%=PEEK(G2)+256*PEE  
K(G2+1)THEN GD%=2 ELSE IF P%=PEEK(G3  
) +256*PEEK(G3+1) THEN GD%=3 ELSE GD%  
=0  
1150 IF GD% >0 GOTO 1910  
1160 IF D%=0 THEN FOR N=1 TO 35:NEXT  
1170 IF D%=1 AND VPEEK(P%-32)>20 AND  
Y%>23 THEN Y%=Y%-8:S%=1:P%=P%-32:Q%  
=1  
1180 IF D%=5 AND VPEEK(P%+32)>20 AND  
Y%<159THEN Y%=Y%+8:S%=3:P%=P%+32:Q%  
=1  
1190 IF D%=7 AND VPEEK(P%-1)>20 AND  
X%>24THEN X%=X%-8:S%=2:P%=P%-1:Q%=1  
1200 IF D%=3 AND VPEEK(P%+1)>20 AND  
X%<232THEN X%=X%+8:S%=0:P%=P%+1:Q%=  
1  
1210 IF X%=23 AND Y%=98 AND D%=7 THE  
N LET X%=239:P%=P%+27  
1220 IF X%=239 AND Y%=98 AND D%=3 TH  
EN LET X%=23:P%=P%-27  
1230 PUT SPRITE 3,(X%,Y%),15,S%  
1240 IF VPEEK(P%)=250 THEN GOSUB1290  
1250 IF VPEEK(P%)=248 THEN GOTO 1330  
1260 IF D%>0 AND Q%=1 THEN PLAY"S3M5  
00L6303C"ELSE IF D%>0 AND Q%=2 THEN  
PLAY"S3M500L6303G"  
1270 Q%=0:INTERVAL ON:RETURN  
1280 LOCATE 0,2  
1290 VPOKE(P%),32:Q%=2  
1300 SC%=SC%+10:IF SC%>HI% THEN HI%=  
SC%  
1310 PIL=PIL+1:LOCATE 8,0:PRINT USIN  
G"#####";SCZ:LOCATE 20,0:PRINT US  
ING"#####";HI%  
1320 RETURN  
1330 VPOKE(P%),32  
1340 SC%=SC%+100:LOCATE 8,0:PRINT US  
ING"#####";SC%  
1350 INTERVALOFF:PLAY"S1M5500L206N65  
"  
1360 Q%=0:FOR N=1 TO 400:NEXT:POW=30  
:INTERVALON  
1370 RETURN  
1380 REM ****PACMAN KILLED****  
1390 SOUND 1,0:SOUND 0,5  
1400 SOUND 3,0:SOUND 2,5  
1410 SOUND 8,10  
1420 SOUND 9,10:SOUND 7,252  
1430 FOR F%=25 TO 255 STEP 10  
1440 FOR M=1 TO 50:NEXT  
1450 SOUND 0,F%:SOUND 2,F%-25  
1460 NEXT  
1470 A=USR4(I)  
1480 RETURN  
1490 REM ****EATEN GHOST****  
1500 SOUND 1,0:SOUND 0,255  
1510 SOUND 3,0:SOUND 2,255  
1520 SOUND 8,10  
1530 SOUND 9,10:SOUND 7,252
```

```
1540 FOR F%=255 TO 100 STEP-10  
1550 FOR M=1 TO 30:NEXT  
1560 SOUND 0,F%:SOUND 2,F%-25  
1570 NEXT  
1580 A=USR4(I)  
1590 RETURN  
1600 REM-----NEW SCREEN-----  
1610 INTERVAL OFF  
1620 SOUND 1,0:SOUND 0,255  
1630 SOUND 3,0:SOUND 2,255  
1640 SOUND 8,10  
1650 SOUND 9,10:SOUND 7,252  
1660 PIL=0  
1670 FOR H=0 TO 180  
1680 VPOKE 8193,H:VPOKE 8194,H  
1690 F%=INT(H+30)  
1700 SOUND 0,F%:SOUND 2,F%-25  
1710 SC%=SC%+10:IF SC%>HI% THEN HI%=  
SC%  
1720 LOCATE 8,0:PRINT USING"#####  
";SCZ:LOCATE 20,0:PRINT USING"#####  
##";HI%  
1730 NEXT  
1740 SP=SP/2  
1750 IF SP<=10 THEN SP=10  
1760 A=USR4(I):FOR N=1 TO 500:NEXT:G  
OTO 730  
1770 IF POW=0 THEN RETURN  
1780 POW=POW-1 :IF POW=0 THEN GC%=0:  
POKE(&HE807),0:POKE(&HE810),0:POKE(&  
HE819),0  
1790 CL%=CL%+1:IF CL%>15 THEN CL%=5  
1800 VPOKE GH%,CL%:VPOKE GH%+4,CL%:V  
POKE GH%+8,CL%  
1810 IF POW=0 THEN 1820 ELSE RETURN  
1820 VPOKE GH%,3:VPOKE GH%+4,13:VPOK  
E GH%+8,1  
1830 RETURN  
1840 END  
1850 REM  
1860 RETURN  
1870 REM **** SAVE GAME ****  
1880 CSAVE"MUNCH",2  
1900 STOP  
1910 IF POW=0 THEN LIV=LIV-1 ELSE GO  
TO 1960  
1920 LOCATE 17,13:PRINT LIV  
1930 IF LIV=>1 THEN GOSUB 1380:GOTO  
990 ELSE LOCATE 11,11:PRINT"GAME OVE  
R"  
1940 GOSUB 1380  
1950 FOR N=1 TO 2000:NEXT:A=USR5(I):  
GOTO 650  
1960 REM ----EATEN GHOST----  
1970 POKE &HE802+(GD%*9)-9,16  
1980 POKE &HE803+(GD%*9)-9,25  
1990 POKE &HE804+(GD%*9)-9,127  
2000 POKE &HE805+(GD%*9)-9,63  
2010 POKE &HE807+(GD%*9)-9,1  
2020 ON GD% GOSUB 2070,2080,2090  
2030 GC%=GC%+100:SC%=SC%+GC%:IF SC%>  
HI% THEN HI%=SC%  
2040 LOCATE 8,0:PRINT USING"#####  
";SCZ:LOCATE 20,0:PRINT USING"#####  
##";HI%  
2050 GOSUB 1490:INTERVAL ON  
2060 RETURN  
2070 X1%=110:Y1%=90:G1%=0:PUT SPRITE  
GD%-1,(X1%,Y1%),3,4:RETURN  
2080 X2%=120:Y2%=90:G1%=0:PUT SPRITE  
GD%-1,(X2%,Y2%),13,4:RETURN  
2090 X3%=130:Y3%=90:G1%=0:PUT SPRITE  
GD%-1,(X3%,Y3%),1,4:RETURN
```


64 CPL

By Richard Croskell

As a respite from the rigours of the games, here's a handy utility for giving your MSX machine a 64 character screen width. The program uses mode 2 and is written in machine code, which makes it acceptably fast.

In fact, there are two programs here, which need to be separately typed in and saved to tape or disk. In the case of tape, it's a good idea to use two separate tapes, as we shall see shortly. Before using the utility, program 2 needs to be run. This creates a binary data file which is then saved to tape just after program 1. This file is called CODE64, and has a start address of &HEB01 and end address of &HF37F. Don't worry if you don't understand that bit — it's not essential. To use the utility, run program 1. This reserves memory for the machine code and loads in the binary file. Then type or load in your Basic program as normal. Text to be printed in 64 character format should be put into a string variable. For the sake of argument, let's say you use: LET A\$ = "This is the text". Then use the following statement in your program:

```
DEFUSR = &HEB01 : A$ = USR(A$)
```

```

100 *****
105 * 64 Characters per line *
110 * Mach. code loader program *
115 * by Richard Croskell *
120 *****
125 COLOR 15,4,4:KEYOFF:SCREEN 0
130 WIDTH 37:CLEAR 200,&HEB00
135 PRINT"Please wait, reading bytes
"
140 BLOAD"CODE64":CLS:KEYON
145 PRINT"Msx system version 1.0"
150 PRINT"64 cpl routine installed"
155 PRINT"Ramtop: &HEB00"
160 PRINT"String space: ";FRE("")
165 PRINT"Bytes free: ";FRE(0)+439
170 BEEP:CLEAR:NEW
100 *****
105 * 64 CHARACTERS PER LINE *
110 * Machine code and character *
115 * initialisation routine *
120 * Written by: R.J.Croskell *
125 *****
130 SCREEN 0:WIDTH 37:COLOR 15,4,4
135 CLEAR 200,&HEB00
140 PRINT"Please wait..."
145 FOR X=&HEB01 TO &HF37F
150 POKE X,0:NEXT X
155 LN=265
160 FOR X=&HEC88 TO &HEF70 STEP 8
165 T=0:READ A$,B$:FOR Y=0 TO 7
170 D=VAL("&H"+MID$(A$,Y*2+1,2))
175 POKE X+Y,D:T=T+D:NEXT Y
180 IF VAL("&H"+B$)<>T THEN 250
185 LN=LN+5:NEXT X
190 LN=740
195 FOR X=&HEB01 TO &HEB79 STEP 8
200 T=0:READ A$,B$:FOR Y=0 TO 7
205 D=VAL("&H"+MID$(A$,Y*2+1,2))
210 POKE X+Y,D:T=T+D:NEXT Y
215 IF VAL("&H"+B$)<>T THEN 250
220 LN=LN+5:NEXT X
225 PRINT"Insert tape after LOAD64"
230 PRINT"Press a key to save CODE"
235 K$=INKEY$:IF K$="" THEN 235
240 BSAVE"CODE64",&HEB01,&HF37F

```

```

245 PRINT"CODE saved...":END
250 SCREEN 0:BEEP
255 PRINT"Error in line";LN:END
260 'Condensed character set
265 DATA 0002020202000200,0A
270 DATA 0005050000000000,0A
275 DATA 0005070505070500,22
280 DATA 0002070407010702,1E
285 DATA 0004040102040101,11
290 DATA 00020502060B0F00,29
295 DATA 0002040000000000,06
300 DATA 0002040404040200,14
305 DATA 0004020202020400,10
310 DATA 0000050207020500,15
315 DATA 0000020207020200,0F
320 DATA 0000000000020204,08
325 DATA 0000000000700000,07
330 DATA 0000000000060600,0C
335 DATA 0001010202040400,0E
340 DATA 0007050505050700,22
345 DATA 0002060202020700,15
350 DATA 0002050102040700,15
355 DATA 0006010601010600,15
360 DATA 0001030505070100,16
365 DATA 0007040601010600,19
370 DATA 0003040605050200,19
375 DATA 0007010202040400,14
380 DATA 0007050205050700,1F
385 DATA 0002050503010600,16
390 DATA 0000000200000200,04
395 DATA 0000020000020204,0A
400 DATA 0000010204020100,0A
405 DATA 0000000700070000,0E
410 DATA 0000040201020400,0D
415 DATA 0002050102000200,0C
420 DATA 00060F0D0A080700,3B
425 DATA 0002050507050500,1D
430 DATA 0006050605050600,21
435 DATA 0002050404050200,16
440 DATA 0006050505050600,20
445 DATA 0007040604040700,20
450 DATA 0007040704040400,1E
455 DATA 0002050407050200,19
460 DATA 0005050705050500,20
465 DATA 0007020202020700,16
470 DATA 0001010105050200,0F
475 DATA 0005050606050500,20
480 DATA 0004040404040700,1B
485 DATA 0005070707050500,24
490 DATA 0007050505050500,20
495 DATA 0002050505050200,18
500 DATA 0006050506040400,1E
505 DATA 0007050505070701,25
510 DATA 0007050506060500,22
515 DATA 0003040201010600,11
520 DATA 0007020202020200,11
525 DATA 0005050505050700,20
530 DATA 0005050505050200,1B
535 DATA 0005070707070200,23
540 DATA 0005050202050500,18
545 DATA 0005050502020200,15
550 DATA 0007010202040700,17
555 DATA 0007040404040700,1E
560 DATA 0000040602030100,10
565 DATA 0007010101010700,12
570 DATA 0002070202020200,11
575 DATA 000000000000000F,0F
580 DATA 000205040F040F00,2D
585 DATA 0000060107050700,1A
590 DATA 0004040605050600,1E
595 DATA 0000030404040300,12
600 DATA 0001010305050300,12
605 DATA 0000020506040300,14
610 DATA 0003040604040400,19
615 DATA 0000030505030106,17
620 DATA 0004040605050500,1D
625 DATA 0002000602020700,13
630 DATA 0001000101010502,0B
635 DATA 0004050606050500,1F

```


LISTINGS

```

640 DATA 0004040404040300,17
645 DATA 0000050707070500,1F
650 DATA 0000060505050500,1A
655 DATA 0000020505050200,13
660 DATA 0000060505060404,1E
665 DATA 0000030505030101,12
670 DATA 0000030404040400,13
675 DATA 0000030402010600,10
680 DATA 0002070202020100,10
685 DATA 0000050505050700,1B
690 DATA 0000050505050200,16
695 DATA 0000050707070200,1C
700 DATA 0000050502050500,16
705 DATA 0000050505030106,19
710 DATA 0000070102040700,15
715 DATA 0003020402020300,10
720 DATA 0002020202020200,0C
725 DATA 0006020102020600,13
730 DATA 00050A0000000000,0F
735 'Machine code bytes
740 DATA FE03C03AAFFCFE02,04A6
745 DATA C0D50100081180EB,031A
750 DATA ED5320F9CD380107,0366
755 DATA 07E6034F060021C1,0227
760 DATA FC09CB7E280E21C5,036A
765 DATA FC097E07070707E6,0285
770 DATA 0CB1CBFF321FF9E1,04B2
775 DATA 4678FE002831235E,0296
780 DATA 23562AB7FC227CEB,03DF
785 DATA 2AB9FC227EEB2A7C,0410
790 DATA EB22B7FC2A7EEB22,0475
795 DATA B9FCD5C51ACD8D00,04C3
800 DATA 0104002A7CEB0922,01C1
805 DATA 7CEBC1D11310DF3E,0439
810 DATA 00321FF921BF1B22,0267
815 DATA 20F9C90000000000,01E2

```

MONITOR By Barry Pragnell

This utility program for budding machine-code programmers enables you to save, load, move, list and edit machine code programs up to 10,000 bytes long. The monitor is written to allow the later addition of disassembler and assembler features which Barry is currently working on.

The whole program is driven by use of the ten function keys. No matter where you are in the program, the following definitions apply, enabling you to switch easily from mode to mode:

F5 SAVE F6 LOAD F7 MOVE
F8 LIST F10 EDIT

Function keys 1 to 5 duplicate these functions in MENU mode. SAVE mode allows you to save up to 2000 bytes of machine code from the work area to a cassette file. Key F1 (&H) is used in this and other modes to facilitate hexadecimal input when required. The other function key definitions are:

F2 MENU F3 RE-DO F4 LIST
F5 ACTION

LOAD mode loads a previously saved file into the machine-code buffer (60000-61999). The file can then be transferred to any part of the work area using the LOCATE key. Definitions are:

F1 LOCATE F2 MENU F3 RE-DO
F4 LIST F5 ACTION

MOVE mode moves block of memory from any addresses to destinations within the work area. After a MOVE operation the LIST and EDIT modules initially locate at the relevant address to verify the move. Key definitions are:

F1 &H F2 MENU F3 RE-DO
F4 LIST F5 ACTION

LIST mode initially locates at the start of the work area (50000) unless a LOAD or MOVE operation has just taken place. To

re-locate simply enter any address or use RETURN (forward one page), BACK (back one page), FWD100 (forward 10 pages) or BCK100 (back 10 pages). Key definitions are:

F1 &H F2 MENU F3 BCK100
F4 LIST F5 BACK

EDIT mode initially locates as in LIST mode. To re-locate use F3 and enter the new address. RETURN takes you forward one location and BACK takes you back one location. The contents of memory locations can only be changed within the work area. Key definitions:

F1 &H F2 MENU F3 LOCATE
F4 LIST F5 BACK

```

10 REM ** MACHINE CODE MONITOR **** C
copyright Barry Pragnell 1986 **
20 CLS:SCREEN 0:CLEAR 335,49999!
30 GOTO 800
40 REM ** INITIAL SUBROUTINES **
50 A$="&H":B$="MENU":C$="RE-DO":D$="S
AVE":E$="LOAD":F$="MOVE":G$="LIST":H$
="ACTION":I$="EDIT":T$="ADDRESS"
60 KEY 6,D$+CHR$(&HD):KEY 7,E$+CHR$(&
HD):KEY 8,F$+CHR$(&HD):KEY 9,G$+CHR$
(&HD):KEY 10,I$+CHR$(&HD)
70 PRINT"+-----+=====
==+----+":PRINT ":        := MACHINE CODE
MONITOR =:        !":PRINT"+-----+=====
=====+----+":RETURN
80 LOCATE 1,1:PRINT Z$: LOCATE 31,1:
PRINT Z$:RETURN
90 KEY 1,A$:KEY 2,B$+CHR$(&HD):KEY 3,
C$+CHR$(&HD):KEY 4,G$+CHR$(&HD):KEY 5
,H$+CHR$(&HD):RETURN
100 REM ** INPUT SUBROUTINE **
110 Z=0:J$="":INPUT">>";J$
120 IF LEN(J$)>6 THEN Z=15:GOTO 290
130 B=VAL(J$):IF B<>0 THEN 250
140 IF J$="" THEN Z=1:GOTO 280
150 IF J$="SAVE" THEN Z=2:GOTO 290
160 IF J$="LOAD" THEN Z=3:GOTO 290
170 IF J$="MOVE" THEN Z=4:GOTO 290
180 IF J$="LIST" THEN Z=5:GOTO 290
190 IF J$="EDIT" THEN Z=6:GOTO 290
200 IF J$="MENU" THEN Z=7:GOTO 290
210 IF J$="BACK"OR J$="ACTION" THEN Z
=8:GOTO 290
220 IF J$="RE-DO"OR J$="BCK100" THEN Z
=9:GOTO 290
230 IF J$="LOCATE"OR J$="FWD100" THEN
Z=10:GOTO 290
240 IF J$="0"OR J$="&H0"OR J$="&H00"O
R J$="&H0000" THEN 280 ELSE Z=11:GOTO
280
250 IF B<0 OR B>255 THEN Z=12
260 IF B<(-32768!) OR B>65535! THEN Z=
13
270 IF B<0 THEN B=B+65536!
280 IF X=1 THEN Z=14
290 X=0:RETURN
300 REM ** OTHER SUBROUTINES **

```



```

310 Q$=HEX$(D):P=PEEK(D):R$=HEX$(P)
320 IF LEN(Q$)=3 THEN Q$="0"+Q$
330 IF LEN(Q$)=2 THEN Q$="00"+Q$
340 IF LEN(Q$)=1 THEN Q$="000"+Q$
350 IF LEN(R$)=1 THEN R$="0"+R$
360 PRINT USING"\  \";Q$;:PRINT SPC(1)
);:PRINT USING"\ \";R$;
370 PRINT " ; ";:PRINT USING"#####";D
;P;:PRINT " ;":RETURN
380 GOSUB 430:GOSUB 310:GOSUB 430:RET
URN
390 LOCATE 0,19
400 GOSUB 420:PRINT K$:GOSUB 420:RETU
RN
410 LOCATE 20,12:PRINT SPC(16):LOCATE
20,12:RETURN
420 PRINT"=====
=====":RETURN
430 PRINT"-----+-----+":RET
URN
440 PRINT"-----
-----":RETURN
450 LOCATE 0,3:PRINT"+---Hex--+ +---Dec
---+":GOSUB 420:RETURN
460 LOCATE 0,5
470 FOR N=1 TO 12
480 IF D=B OR D=B+10 THEN GOSUB 430:G
OSUB 310 ELSE GOSUB 310
490 D=D+1:IF D>65535! THEN N=12
500 NEXT:RETURN
510 K$="MACHINE CODE WORK AREA: 50000
D059999":GOSUB 390:RETURN
520 COLOR 15,6:FOR M=1 TO 5:K$=SPACE$
(36):GOSUB 390:NEXT:RETURN
530 GOSUB 390:LOCATE 20,20:PRINT SPC(
16):LOCATE 20,20:RETURN
540 PRINT"SAVE = Up to 2000 bytes of
machine";SPC(10);"code from work area
to file.":GOSUB 440:RETURN
550 PRINT"LOAD = Previously saved mac
hine code";SPC(8);"file into buffer(6
0000->).":GOSUB 440:RETURN
560 PRINT"MOVE = Blocks of machine co
de within";SPC(8);"work area or from
buffer.":GOSUB 440:RETURN
570 K$ ="SELECT FUNCTION KEY-":GOSUB
530:RETURN
580 FOR N=1 TO 7:GOSUB 520:FOR M=1 TO
10:K$=L$:GOSUB 390:NEXT M,N:RETURN
590 K$=SPACE$(36):LOCATE 0,13:FOR N=
1 TO 3:PRINT K$:NEXT:RETURN
600 FOR N=1 TO 14:X=N+4
610 ON N GOSUB 630,640,650,660,670,68
0,650,710,650,690,670,680,700,680
620 LOCATE 22,X:PRINT X$:NEXT:RETURN
630 X$=" M/C WORK AREA":RETURN

```

```

640 X$=" 50000->>59999":RETURN
650 X$="-----":RETURN
660 X$="+- LAST ENTRY":RETURN
670 X$="; -----":RETURN
680 X$="+->":RETURN
690 X$="+- * ACTION *":RETURN
700 X$="+-----+":RETURN
710 X$=SPACE$(14):RETURN
720 V$=SPACE$(6):Y$=SPACE$(11):W$=Y$:
GOSUB 740:RETURN
730 V$=LEFT$(J$,6):IF J$=""THEN V$="N
ONE"
740 LOCATE 27,10:PRINT V$:LOCATE 25,1
6:PRINT Y$:LOCATE 25,18:PRINT W$:RETU
RN
750 Y$="WAITING FOR":W$="NEW ADDRESS"
:GOSUB 730:RETURN
760 Y$="WAITING FOR":W$="M/C ENTRY":G
OSUB 730:RETURN
770 Y$="LOCATED AT":W$="NEW ADDRESS":
GOSUB 730:RETURN
800 REM ** MENU MODULE **
810 CLS:COLOR 1,7:V=0
820 GOSUB 50:Z$=B$:GOSUB 80
830 KEY 1,D$+CHR$(&HD):KEY 2,E$+CHR$(
&HD):KEY 3,F$+CHR$(&HD):KEY 4,G$+CHR$(
&HD):KEY 5,I$+CHR$(&HD)
840 GOSUB 510:LOCATE 0,17:GOSUB 400:
LOCATE 0,3:GOSUB 540:GOSUB 550:GOSUB
560
850 PRINT"LIST p Inspect the contents
of any";SPC(10);"area of memory.":GO
SUB 440
860 PRINT"EDIT p Enter or amend machi
ne code";SPC(10);"within work area.":
GOSUB 570
870 GOSUB 100:ON Z GOTO 800,1000,2000
,3000,4000,5000
880 GOTO 800
1000 REM ** SAVE MODULE **
1010 CLS:CLEAR 335,49999!:COLOR 1,3
1020 GOSUB 50:GOSUB 90
1030 Z$=D$:GOSUB 80
1040 GOSUB 510:LOCATE 0,4:GOSUB 540
1050 FOR N=1 TO 3
1060 IF N=1 THEN PRINT"FROM Start add
ress";
1070 IF N=2 THEN PRINT"UNTIL Last add
ress";

```


LISTINGS

```
1080 IF N=3 THEN PRINT"NAME OF FILE--
----";
1090 GOSUB 100:ON Z GOTO 1000,1000,20
00,3000,4000,5000,800,1200,1000,1000,
1260,1100,1000
1100 E=F:F=B:IF K=1 OR N=3 THEN 1000
1110 GOSUB 440:NEXT
1120 GOSUB 440:H=F-E+1:J=59999!+H
1130 J$=LEFT$(J$,6):N$="CAS:":Q$=N$+J
$:PRINT USING"####";H;:PRINT" bytes t
o SAVE in file: ";J$:GOSUB 440
1140 IF H<1 THEN COLOR 1,13:K$="FINAL
ADDRESS BEFORE START ADDRESS":GOSU
B 400:H=0:GOTO 1250
1150 IF E<50000!OR F>59999!THEN COLOR
1,13:K$="ADDRESS OUTSIDE MCHNE/CODE
WORK AREA":GOSUB 400:H=0:GOTO 1250
1160 IF H>2000! THEN COLOR 1,13:K$="B
LOCK MORE THAN 2000 BYTE FILE LIMIT":
GOSUB 400:H=0:GOTO 1250
1170 L$="CASSETTE MUST BE SET TO RECO
RD MODE!":GOSUB 580:COLOR 1,3
1180 K=1:LOCATE 0,16:GOSUB 400
1190 K$="F.5 TO ACTION SAVE--":GOSUB
530:GOTO 1090
1200 IF H=0 THEN 1250
1210 COLOR 15,6:L$="WAIT!!MOVE TO BUF
FER":M$=SPACE$(15):K$=L$+M$:GOSUB 390
1220 G=60000!:FOR N=E TO F:POKE G,PEE
K(N):LOCATE 20,20:PRINT N;">>";G=G+
1:NEXT
1230 COLOR 15,4:K$="WAIT!!CASSETTE SA
VE NOW IN OPERATION":GOSUB 390:BSAVE
Q$,60000!,59999!+H
1240 COLOR 1,3:K$="CASSETTE SAVE HAS
NOW BEEN COMPLETED":LOCATE 0,16:GOSUB
400
1250 GOSUB 570:GOTO 1090
1260 IF N<>3 THEN 1000 ELSE N=0:K=1:G
OTO 1120
2000 REM ** LOAD MODULE **
2010 CLS:CLEAR 335,49999!:COLOR 15,4
2020 GOSUB 50:GOSUB 90:KEY 1,"LOCATE"
+CHR$(%HD)
2030 Z$=E$:GOSUB 80:LOCATE 0,4:GOSUB
550
2040 PRINT"RETURN only to load first
file found":GOSUB 440
2050 K$ = "ENTER NAME OF FILE":GOSUB
530
2060 GOSUB 100:ON Z GOTO 2080,1000,20
00,3000,4000,5000,800,2120,2000,3250,
2080
```

```
2070 GOTO 2000
2080 IF K>0 THEN 2000 ELSE L$="CASSET
TE MUST BE SET TO PLAY MODE!!!":GOSUB
580:COLOR 15,4
2090 P$=LEFT$(J$,6):IF P$<>" "THEN Q$=
P$ ELSE Q$="NONAME"
2100 LOCATE 0,8:GOSUB 400:GOSUB 510:L
OCATE 0,10:GOSUB 400:PRINT"File requi
red : ";Q$
2110 K$="F.5 TO ACTION LOAD--":GOSUB
530:GOTO 2060
2120 IF K>0 THEN 2220 ELSE COLOR 15,6
:L$="WAIT!!CLEARING M/C BUFFER-->>":M
$=SPACE$(7):K$=L$+M$:GOSUB 390
2130 R=60000!:FOR N=1 TO 2000:POKE R,
0:LOCATE 29,20:PRINT R:R=R+1:NEXT
2140 GOSUB 520:COLOR 15,4:L$="DONE!!L
OADING CASSETTE FILE>>":K$=L$+Q$:GOS
UB 390
2150 U$="CAS:":N$=U$+P$:BLOAD N$:A=60
000!:R=61999!
2160 COLOR 15,6:L$="WAIT!!INSPECTING
M/C BUFFER>>":M$=SPACE$(7):K$=L$+M$:
GOSUB 390
2170 LOCATE 29,20:PRINT R
2180 S=PEEK(R):IF S>0 THEN 2200
2190 R=R-1:IF R>59999! THEN 2170
2200 COLOR 15,4:LOCATE 0,15:PRINT"KEY
F1 (LOCATE) TO MOVE TO WORK AREA": G
OSUB 420
2210 T=R-59999!:PRINT T;"bytes of mac
hine code are now":PRINT"in the buffe
r from 60000 >>";R
2220 GOSUB 570:K=1:V=1:GOTO 2060
3000 REM ** MOVE MODULE **
3010 IF V>0 THEN 3250
3020 CLS:CLEAR 335,49999!:COLOR 15,13
3030 GOSUB 50:GOSUB 90
3040 Z$=F$:GOSUB 80:GOSUB 510:LOCATE
0,4:GOSUB 560
3050 FOR N=1 TO 3
3060 IF N=1 THEN PRINT"FROM Start add
ress";
3070 IF N=2 THEN PRINT"UNTIL Last add
ress";
3080 IF N=3 THEN PRINT"NEW Start add
ress";
3090 GOSUB 100:ON Z GOTO 3000,1000,20
00,3000,4000,5000,800,3180,3000,3000,
3000,3100,3000
3100 E=F:F=G:G=B:IF K=1 THEN 3000
3110 GOSUB 440:NEXT
```



```

3120 H=F-E+1:J=G+H-1:COLOR 15,13:PRINT USING"#####";H;:PRINT" bytes to be moved to new":PRINT"locations between ";G;"and";J
3130 IF H<1 THEN COLOR 1,13:PRINT"FINAL ADDRESS BEFORE START ADDRESS":H=0:GOTO 3170
3140 IF G<50000!OR G>59999!THEN COLOR 1,13:PRINT"NEW ADDRESS OUTSIDE M/CODE WORK AREA":H=0:GOTO 3170
3150 IF J>59999! THEN COLOR 1,13:PRINT"WILL NOT FIT INSIDE M/CODE WORK AREA":H=0:GOTO 3170
3160 PRINT"MOVE IS POSSIBLE--- ACTION OR RE-DO?"
3170 GOSUB 570:K=1:GOTO 3090
3180 COLOR 15,6:IF H=0 THEN 3000
3190 L$="WAIT!!MOVE IN ACTION":M$=SPACE$(15):K=L$+M$:GOSUB 390
3200 IF G>E AND G<F THEN 3220
3210 FOR N=E TO F:POKE G,PEEK(N):LOCATE 20,20:PRINT N;">>";G=G+1:NEXT:G=G-H:GOTO 3230
3220 FOR N=F TO E STEP-1:POKE J,PEEK(N):LOCATE 20,20:PRINT N;">>";J=J-1:NEXT
3230 COLOR 1,3:LOCATE 0,17:GOSUB 440:PRINT"MOVE COMPLETED -- LIST(F4) TO VERIFY"
3240 A=G:C=A:GOTO 3170
3250 IF V<1 THEN 2000 ELSE GOSUB 590:K$="WORK AREA ADDRESS---":GOSUB 530:GOSUB 100
3260 E=60000!:F=R:G=B
3270 IF B=0 THEN 3250 ELSE LOCATE,13:GOTO 3120
4000 REM ** LIST MODULE **
4010 CLS:COLOR 1,14:V=0
4020 GOSUB 50:GOSUB 90:KEY 3,"BCK100"+CHR$(&HD):KEY 4,"FWD100"+CHR$(&HD):KEY 5,"BACK"+CHR$(&HD)
4030 Z$=G$:GOSUB 80:GOSUB 600:GOSUB 450
4040 IF A>0 AND A<65536! THEN B=A:A=0:GOSUB 750:GOTO 4090 ELSE A=50000!:GOTO 4040
4050 K$="LIST MODE p Address":GOSUB 530
4060 GOSUB 100:GOSUB 720
4070 ON Z GOTO 4100,1000,2000,3000,4000,5000,800,4110,4120,4130,4000,4080,4140,4000,4000
4080 GOSUB 770
4090 D=B-1:GOSUB 460:C=B:GOTO 4050

```

```

4100 B=C+10: Y$=T$:W$="+10":W$=T$+W$:GOSUB 730:IF B>65535! THEN 4050 ELSE 4090
4110 B=C-10: Y$=T$:W$="-10":W$=T$+W$:GOSUB 730:GOTO 4090
4120 B=C-100:Y$=T$:W$="-100":W$=T$+W$:GOSUB 730:GOTO 4090
4130 B=C+100:Y$=T$:W$="+100":W$=T$+W$:GOSUB 730:IF B>65535! THEN 4050 ELSE 4090
4140 GOTO 4050
5000 REM
** EDIT MODULE **
5010 CLS:V=0
5020 GOSUB 50:GOSUB 90:KEY 3,"LOCATE"+CHR$(&HD):KEY 5,"BACK"+CHR$(&HD)
5030 Z$=I$:GOSUB 80
5040 GOSUB 600:GOSUB 450
5050 IF C>0 THEN A=C:C=0:GOSUB 770 ELSE C=50000!:GOTO 5050
5060 LOCATE 0,5:D=A-6
5070 FOR N=1 TO 12
5080 IF D>65535!THEN N=12:GOTO 5100
5090 IF D<A OR D>A THEN GOSUB 310 ELSE GOSUB 380
5100 D=D+1:NEXT
5110 IF A>49999! AND A<60000! THEN GOTO 5240 ELSE GOTO 5280
5120 GOSUB 100: GOSUB 720: ON Z GOTO 5160,1000,2000,3000,4000,5000,800,5190,5000,5180,5220,5230,5220,5130,5000
5130 IF W=1 THEN 5200
5140 IF A>49999! AND A<60000! THEN Y$="ENTERED":S$=STR$(B):Y$=Y$+S$:W$="DELETED":X=PEEK(A):X$=STR$(X):W$=W$+X$:GOSUB 730 ELSE 5160
5150 POKE A,B:GOTO 5170
5160 Y$=T$:W$="+1":W$=T$+W$:GOSUB 730
5170 A=A+1:IF A>65535! THEN 5270 ELSE 5060
5180 GOSUB 750:GOTO 5250
5190 Y$=T$:W$="-1":W$=T$+W$:GOSUB 730:A=(A-1):GOTO 5060
5200 IF B<0 THEN B=B+65536!
5210 A=B:GOSUB 770:GOTO 5060
5220 IF W=0 THEN 5260 ELSE 5270
5230 IF W=1 THEN 5200 ELSE 5260
5240 COLOR 1,10:W=0:K$="EDITOR MODE = Enter new machine code":GOTO 5290
5250 COLOR 1,7:W=1:K$="LOCATE MODE = Enter required address":GOTO 5290
5260 COLOR 1,9:K$="EDITOR MODE ILLEGAL ENTRY! Try again":GOSUB 760:GOTO 5290
5270 COLOR 1,13:K$="LOCATE MODE ILLEGAL ENTRY! Try again":GOSUB 750:GOTO 5290
5280 COLOR 1,14:X=1:W=0:K$="OUTSIDE EDIT RANGE = Entries ignored"
5290 GOSUB 390:GOSUB 410:GOTO 5120

```


A STAR PROGRAM IS BORN!

Heedless of the danger, and deaf to the plaintive cries of 'What about the budget' from our publisher, MSX Computing is launching the Star Program feature. Each issue we will take one program from the flood of entries we receive and give it the star treatment. We will, of course, continue to run the normal listings section as usual.

What makes a Star Program? Well, for a start, it has to work well. If it's a game, we'll be looking for smooth action, good graphics and playability. Originality helps too. No amount of blurb in your covering letter about how 'you're piloting a Xenon III space cruiser through the mists of the mysterious planet Craven 5' will make up for the fact that on the screen all you see is a blue blob.

With utilities and more serious software, the program needs to be genuinely useful. We've lost count of the number of telephone or address databases we've received. Painting and design programs are common too. But unless you can come up with something that rivals the facilities and speed of commercial software, we're highly unlikely to use that kind of software.

The answer in that case is to come up with something original. Recent examples include a utility to give a 64-column screen display.

We also need information. Include details of what you've done — any interesting programming tricks, that

kind of thing. A breakdown of the program, describing the main routines is also a good idea. We're hoping that the Star Program will be educational as well as useful or fun.

Details for all listings

There are a few details which should accompany all listings. All submissions should be on cassette, preferably recorded several times to allow for data corruption in the post.

Please put your name and the title of the program:

On the cassette or disk.

On the cassette case.

In a REM statement at the beginning of the program.

Include your full name, address and (if possible) a daytime telephone number in the covering letter. Sometimes we want to use submitted programs for features, but we can't ask you to write for us if we can't phone you — the post is far too slow.

We regret we cannot return submissions. Due to the enormous number of program submissions we get, it is impossible to return cassettes, and it is also impossible to say for certain whether we are going to use a particular program in any issue. We pay for all programs used.

Send submissions to: The Editor, Listings Section, MSX Computing, Haymarket Publishing Ltd, 38/42 Hampton Road Teddington, Middlesex TW11 0JE.

ENTERING LISTINGS WITHOUT TEARS

Most of the (fortunately few) complaints we get about listings can be traced to incorrect typing of the program. So it's worth making a few points about how to enter listings, and problems to watch out for.

Sometimes you will see a row of letters or other characters in a PRINT statement. This happens when the program, as supplied, contains graphics characters which our printer doesn't recognise. If the particular character is important then we'll tell you what it should be in the introduction to the program.

When a program crashes, you will often get an error message which refers to a particular line number. But this isn't always as useful as it sounds because it may not be that line which contains the fault. For example, the line may contain a READ command, but the program will crash because of a lack of DATA for this line to READ. The fault actually lies in the DATA statement.

For this reason you must take particular care over DATA entries. Some programs can contain a couple of

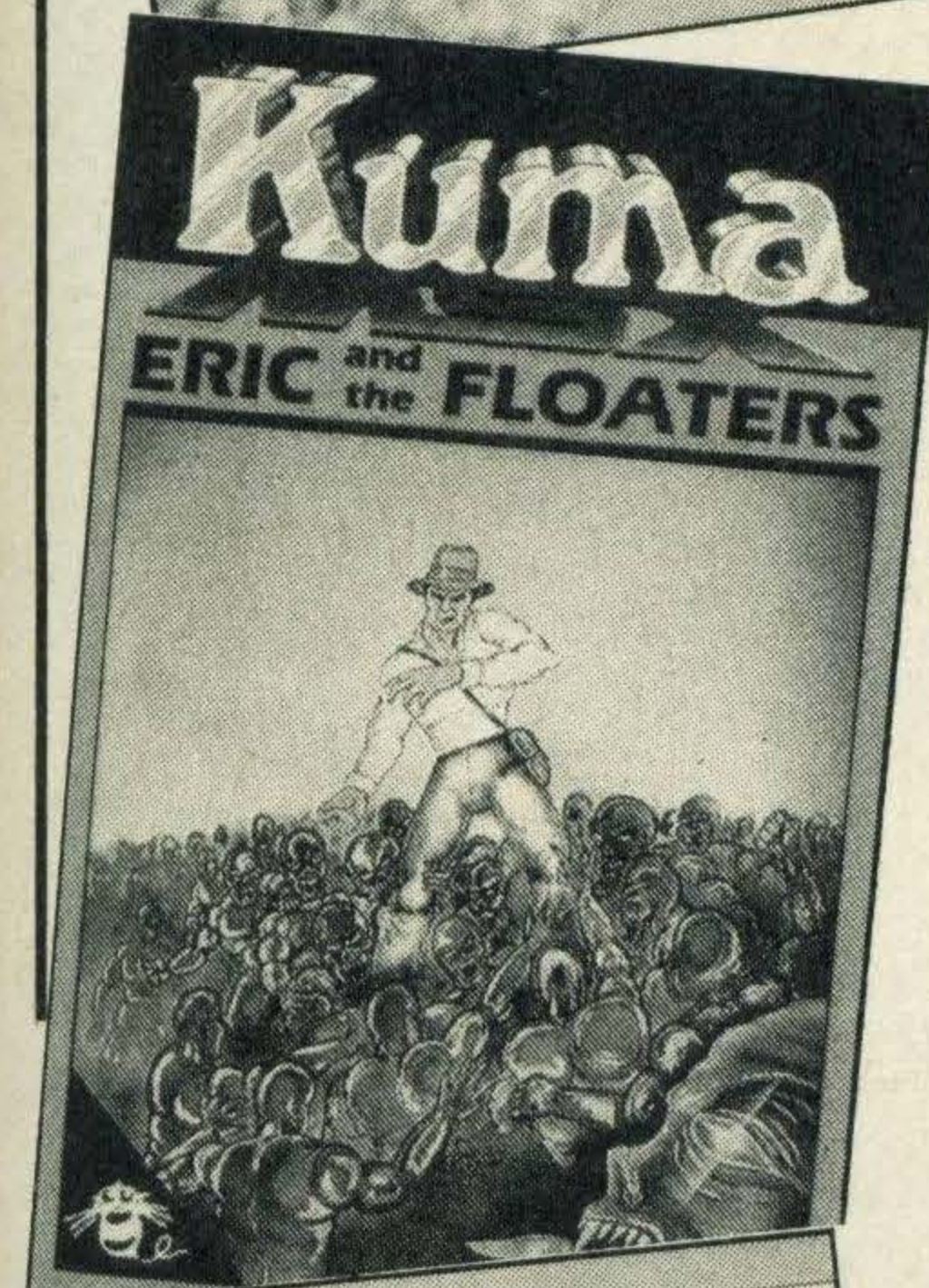
hundred numbers and strings in DATA lines. Miss out just one item, or one comma, and the program will fail through DATA starvation.

Make sure you are entering exactly what is shown in the listing. Don't type a zero when it should be the letter O, or a small I when it should be the number one.

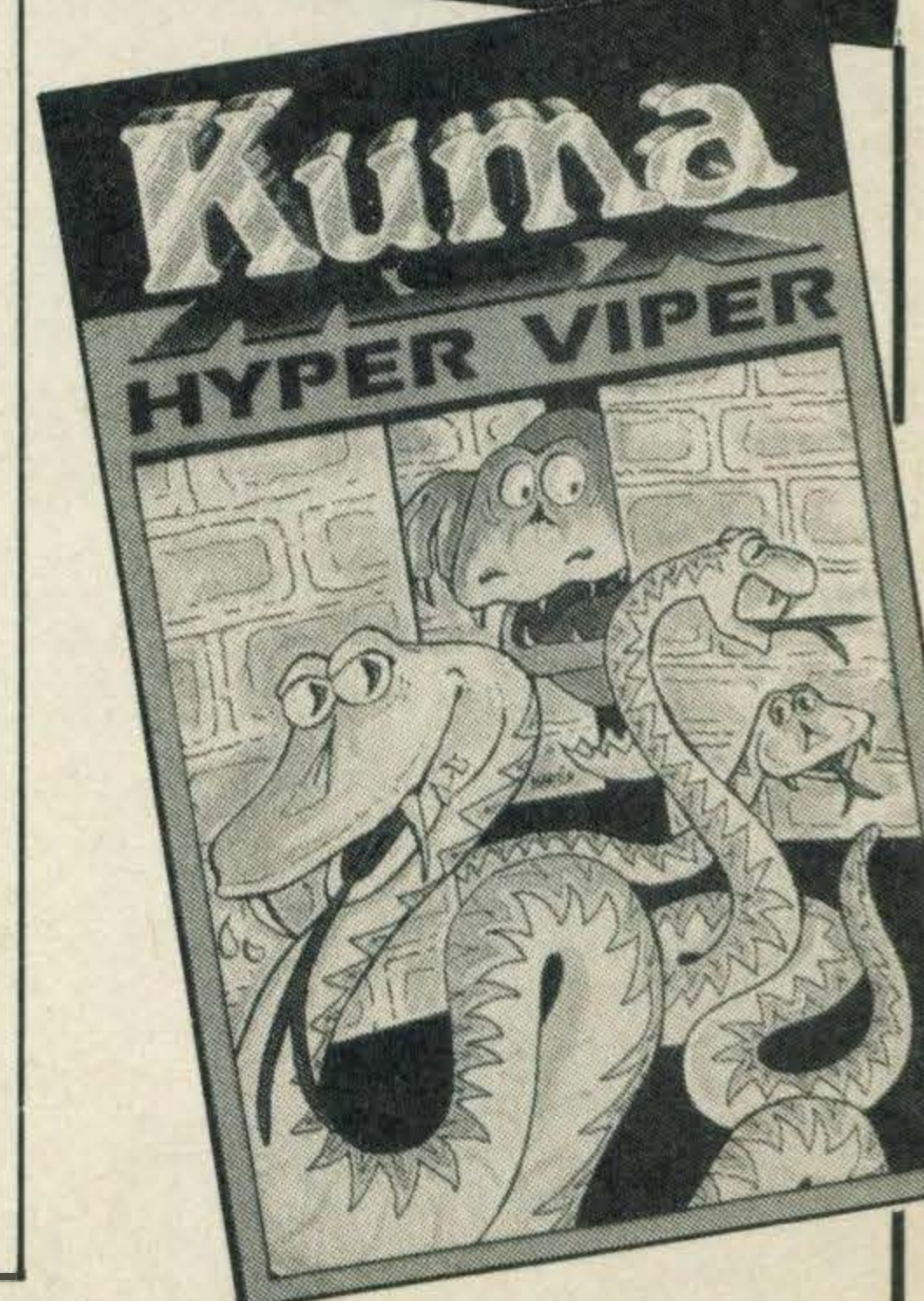
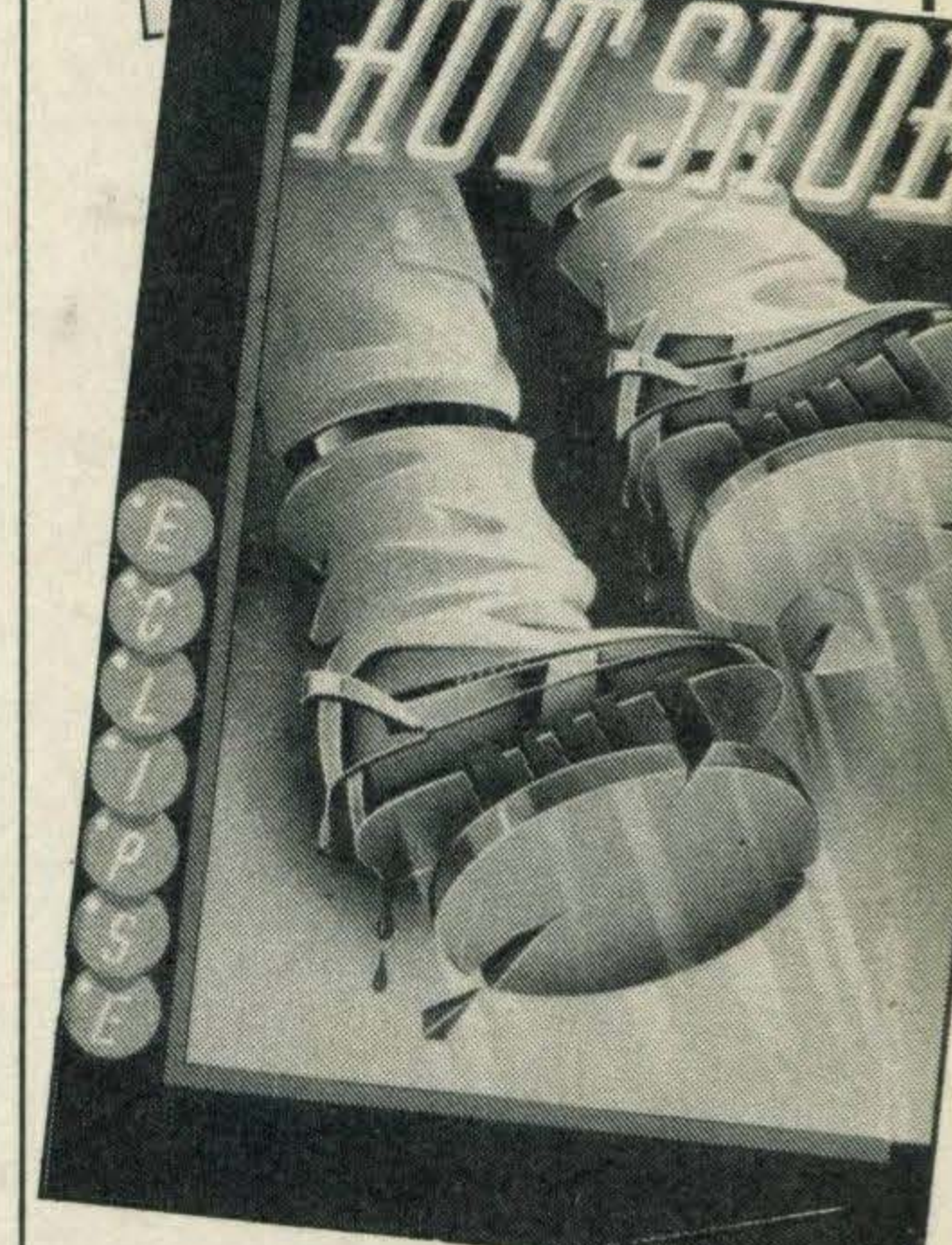
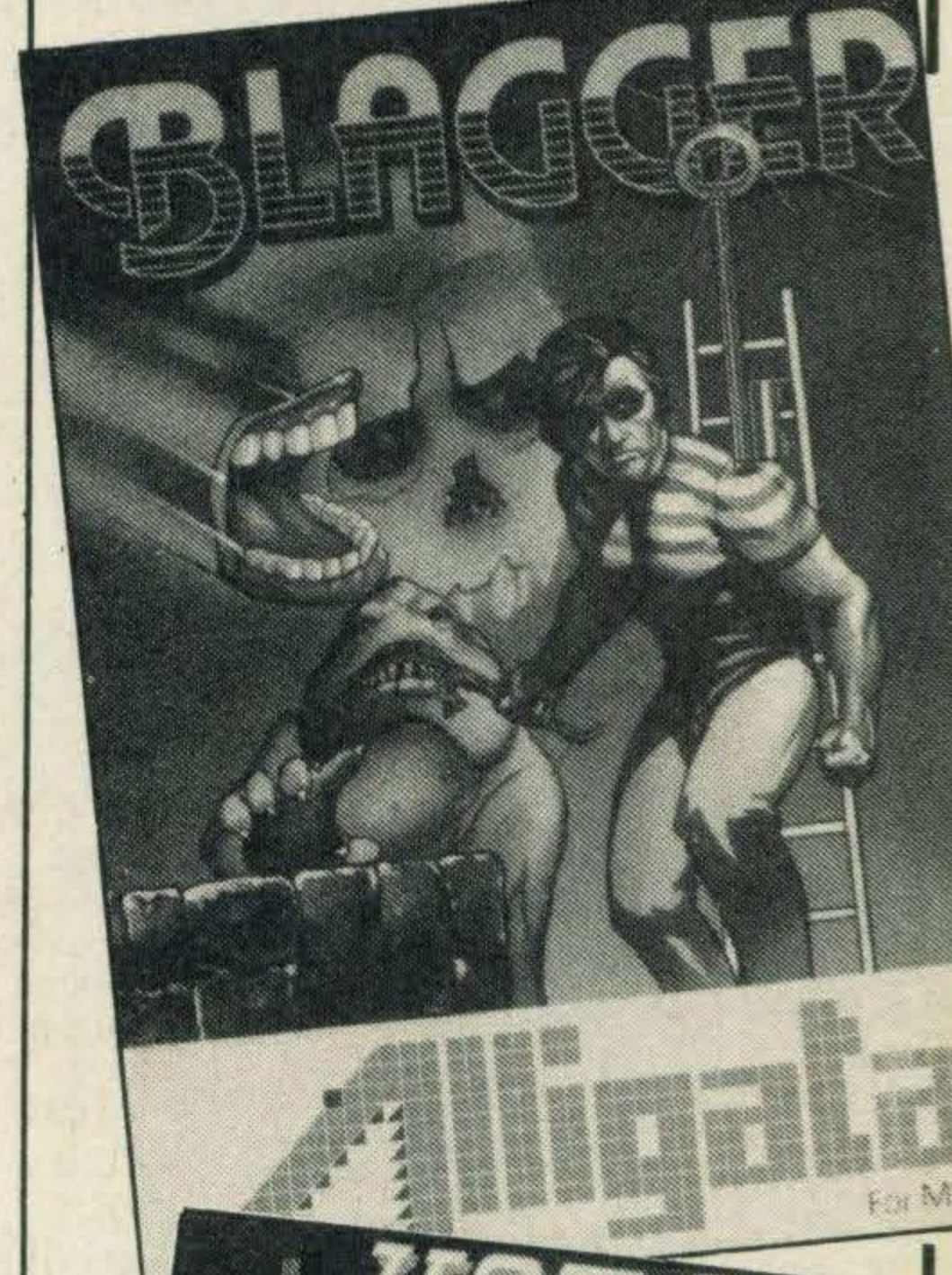
REM statements can usually be omitted, which saves time and effort. But they do help to explain what is going on. That's handy when you come back to a program after a break and want to make some changes. And watch out for GOTOs. If one of these commands directs the program to a REM line which you've omitted, the program will crash.

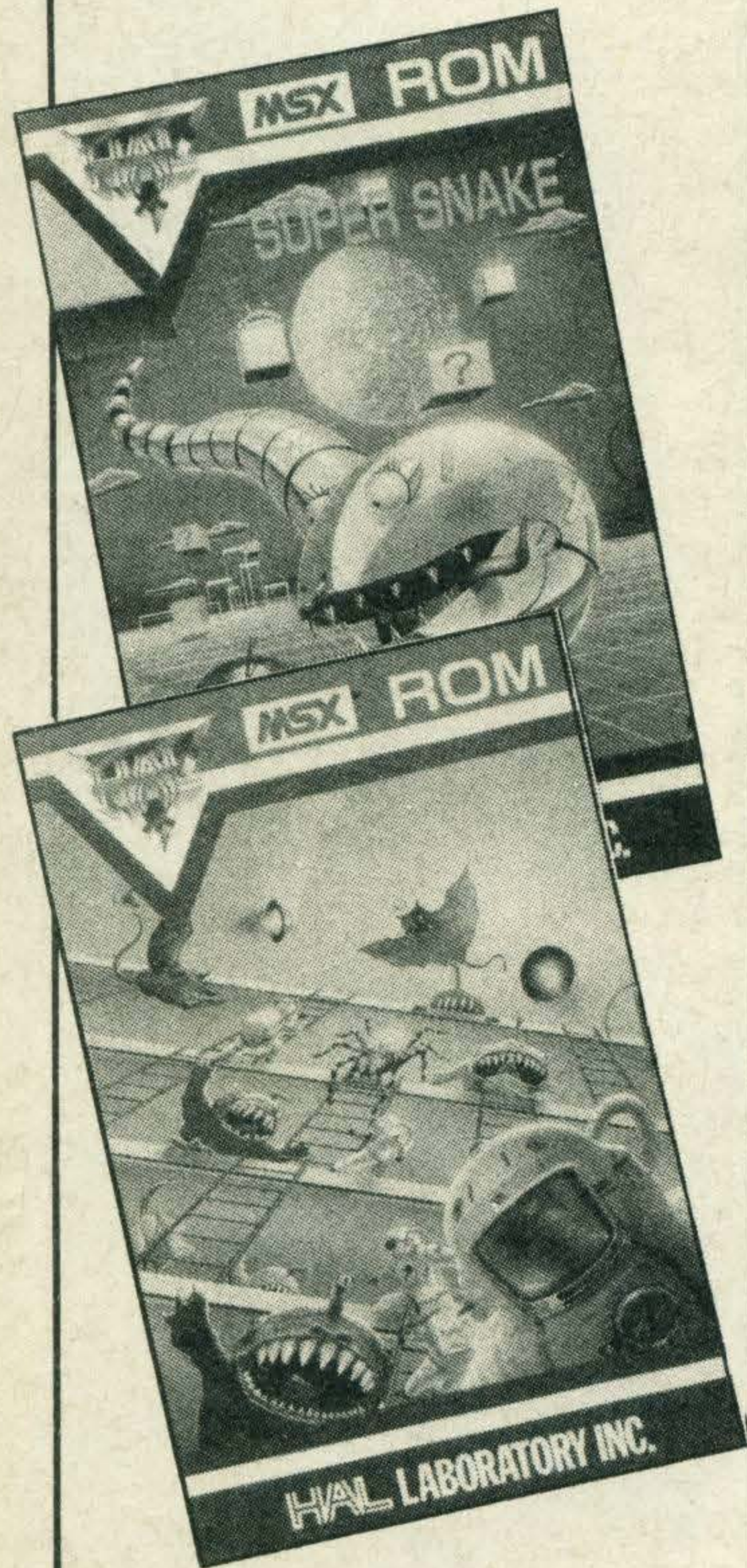
If, in the end, you still can't get the program to work, then let us know. But PLEASE WRITE, don't telephone. It's virtually impossible to de-bug a program over the phone, and the intricacies of a program are usually known only to the original programmer, who is never around to answer your questions!

Send your high scores to: High Scores, MSX Computing, 38-42 Hampton Road, Teddington, Middlesex TW11 0JE

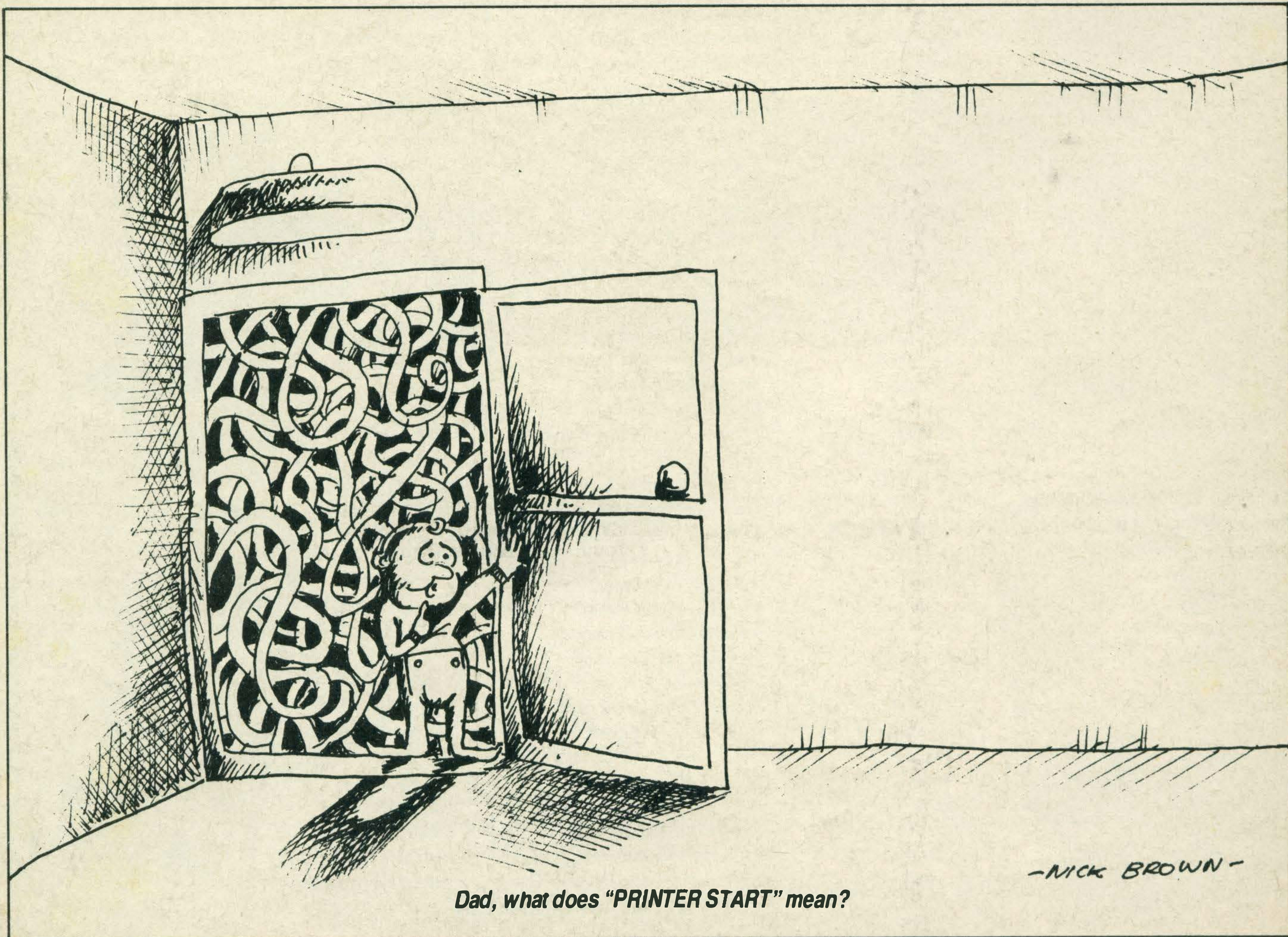


Game	Name	Score	Stage
Alien 8	Andrew Talbot (Bridlington)	49%	
Alpha Blaster	Mohamad Shuib (Pontypridd)	89,235	
Barnstormer	Graham Dixon (Lincolnshire)	279,955	12
Battleship Clapton II	RS Clark (Bradford)	97,300	
Beamrider	Sean Baxter (Dyfed)	133,380	25
Blagger	Euan Marshall (Epping)	231,520	
Boom	Christopher Swain (Kent)	99,240	34
Boulderdash	Alan Jones (Streatham)	59,848	F/4
Bounder	Johan Karda (Norway)	286,726	5
Boxing	Philpott (Chaddesden)	—	10
Buck Rogers	Neil Macfall	310,900	6
Centipede	Tracy Randles (Penrion)	53,795	7
Chiller	Martin Allen (Weybridge)	33,481	
Choro Q	Scott Fielding (Truro)	42,380	
Circus Charlie	Ian Bucklow (Worksop)	1,198,460	105
Disk Warrior	Chris Needham (Banstead)	1,400,000	
Dogfighter	Neil Sims (Derbyshire)	10,100	
Elidon	Andrew Talbot (Bridlington)	94%	
Eric and the Floaters	Sean Baxter (Dyfed)	1,844,160	
Finders Keepers	A. Munro (N. Yorks)	18,323	
Fire Rescue	Mark Lowles (Greenock)	29,540	
Flight Deck	D. Booth (Southampton)	6,410	
Fruity Frank	Lesley Robinson (Blairgowrie)	21,000	
Galaga	Gary Barnes (Holland)	244,010	
Ghostbusters	Laurence Burke (Ireland)	\$999,900	
Golf	Joseph Gleeson (Ireland)	28 under par	
Gridtrap	Lynn Scott	558,120	
Gunflight	Neil Aldritt (Parkhurst)	\$150,000	51
Heist	Ashok Ras	384,201	
Hero	Gerry Van Cleef (Holland)	692,120	Pro
Highway	Dermot Long (Ireland)	339,360	4
Hopper	Christopher Rutherford (Hexham)	100,050	3
Hotshoe	Dan Gavik (Denmark)	187,575	19
Hunchback	David McEwan (Lanarkshire)	2,700,000	
Hustler	Derek Powers (Milton Keynes)	8 shots	
Hyper Rally	Dermot Long (Ireland)	239,500	
Hyper Sports I	Mark Bosselli (Kenton)	2,050,800	51
Hyper Sports II	L Henry (Battersea)	500,500	
Hyper Sports III	Richard Reynolds (Brampton)	59,713	
Hyper Viper	Helen Carter (Mkt Weighton)	127,500	
International Karate	Ian Povey (Nowan)	999,999	
Jet Fighter	Andrew Talbot (Bridlington)	214,950	
Jet Set Willy II	Sally Wood (Turkey)	120 objects	
Kings Valley	Paschal Wilson (N. Ireland)	5,642,600	928
Knightmare	Morten Sørink (Norway)	238,020	
Lazy Jones	Mark Sutton (Rayleigh)	149,650	
Les Flics	Rob Cranston (Northampton)	100,200	
Le Mans	Jacob Poviah	42,530	8
Manic Miner	W. Wither (Scotland)	117,321	52
Maxima	Les Lynch (Worsley)	211,120	120
Monkey Academy	Michael Masson (Fraserburgh)	305,300	
Mopiranger	Ian West (Aylesbury)	620,400	44
Mutant	Mark Drabwell (Essex)	737	7
Nightshade	Paul Grave (Caithness)	137,000	13%
Ninja	Marion Worsley (Orpington)	23,550	
Oh Mummy	Paul Tooke (Whitley Bay)	5,030	
Oh No!	J C Ledesma (London)	76,250	
Oil's Well	Andrew Talbot (Bridlington)	198,400	
Panic Junction	A. Stubbs (Warrington)	14,919	10
Pastfinder	Daniel Goodwin (Evesham)	24,205	
Pillbox	Roger Worsley (Orpington)	2,800	3
Pinball	A Baker (London)	1,240,680	
Pitfall II	Arild Tønnessen (Norway)	199,000	
Polar Star	P. French (Walsall)	289,990	8
Punchy	William Sanchez (Gibraltar)	6,959,870	
Price Magik	Barrie Fleming (Glasgow)	12%	18





Game	Name	Score	Stage
Pyramid Warp	Marcus Sear (Botley)	820,758	
River Raid	D. J. Cowell (Blackburn)	73,450	38
Road Fighter	Richard Cobelli (Faversham)	998,675	7
Roller Ball	A Baker (London)	3,120,180	
Sasa	Nigel Sims (Derbyshire)	200,195	
Scion	Gary Barnes (Holland)	67,900	
Soccer	David Orpington (Camberley)	40-0	
Space Walk	Stephen McCloskey	1,846,200	
Spooks and Ladders	Helen Carter (Mkt Weighton)	189,930	79
Step L'p	Mick Bedwell (Whitstable)	60,250	
Stop The Express	Johan Kovda (Norway)	7,360	2/2
Super Cobra	Ian West (Aylesbury)	501,100	62
Sweet Acorn	Brian Richardson (Ossett)	6,348,460	240
Tennis	Mark Drabwell (Essex)	6-0, 6-0	
The Snowman	Ole Morten Finnset (Norway)	36,510	
The Wreck	Nicias Penn Shog (Sweden)	23,975	
Time Bandits	K. Baird (Beaumont)	9,990	8
Time Curb	Amy Louise Goulsbra (Lincs)	176,050	
Time Pilot	Uilam Vu Ong (London)	689,000	
Track and Field I	V. Williams (Kirkby)	266,640	
Track and Field II	Martin Green (London)	500,300	
Turmoil	Peter Bell (Hexham)	11,740	
Vacumania	Tony Watson (Boroughbridge)	22,340	
Valkyr	Martin Green (London)	23,975	
Vacumania	Steven Lawrence (Swansea)	28,240	5
Valkyr	Benny Johansson (Sweden)	87,320	
Vicious Viper	David McEwan (Lanarkshire)	3,100	
Wing & A Prayer	Phil Rotsky (New York)	544 grams	
Xyzolog	Tim Wray (Derby)	100,600	
Yie Ar Kung Fu	David McEwan (Lanarkshire)	12,109,700	734
Yie Ar Kung Fu II	Mazor Hussan (Lanarkshire)	336,400	25
Zaxxon	Martyn Groen (Holland)	1,052,300	
Zoids	Richard Cobelli (Faversham)	5 pieces	



-NICK BROWN-

Dad, what does "PRINTER START" mean?

GRAMMIA

Footballer of the Year

The game to answer every boyhood dream – the chance to make it to the very top of football stardom. Starting on your path to glory as a 17 year old apprentice, adopt the identity of a professional footballer and develop a career through the ups and downs of match days, transfer deals and injuries etc. Display your talents in Football League, U.E.F.A. F.A. and Milk Cup games and then if you're good enough the ultimate accolade of your support, the Footballer of the Year Award.

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First came "The Way of the Tiger" the martial arts classic in which you had to prove your physical skills to become a Ninja. Now you have to prove your supreme mental agility in the second part of the Way of the Tiger saga "Avenger", the ultimate arcade adventure. Yaemon the Grand Master of Flame has assassinated your foster father Naijishi. You have sworn to the God Kwon that you will avenge Yaemon's murderous act and recover the sacred scrolls. All your skills, courage and nerve will be called upon when you begin the final conflict in the Great Keep. Good Luck... only the brave hearted will survive.

Arise Sir Randolph to take up the challenge of death that has befallen the fair maid Amelia, held in the evil clutches of Speghott the Terrible. Acting upon an interdimensional distress signal from the galactic cruiser S S Rustbucket, don your Omnibott Mark IV attack suit and venture forth in pursuit of your beloved's captors. Fight your way through 20 gruelling levels onto the planet's surface into Speghott's castle where the fate of Amelia lies with the outcome of your mortal combat with the awesome Henchodroid.

Future Knight

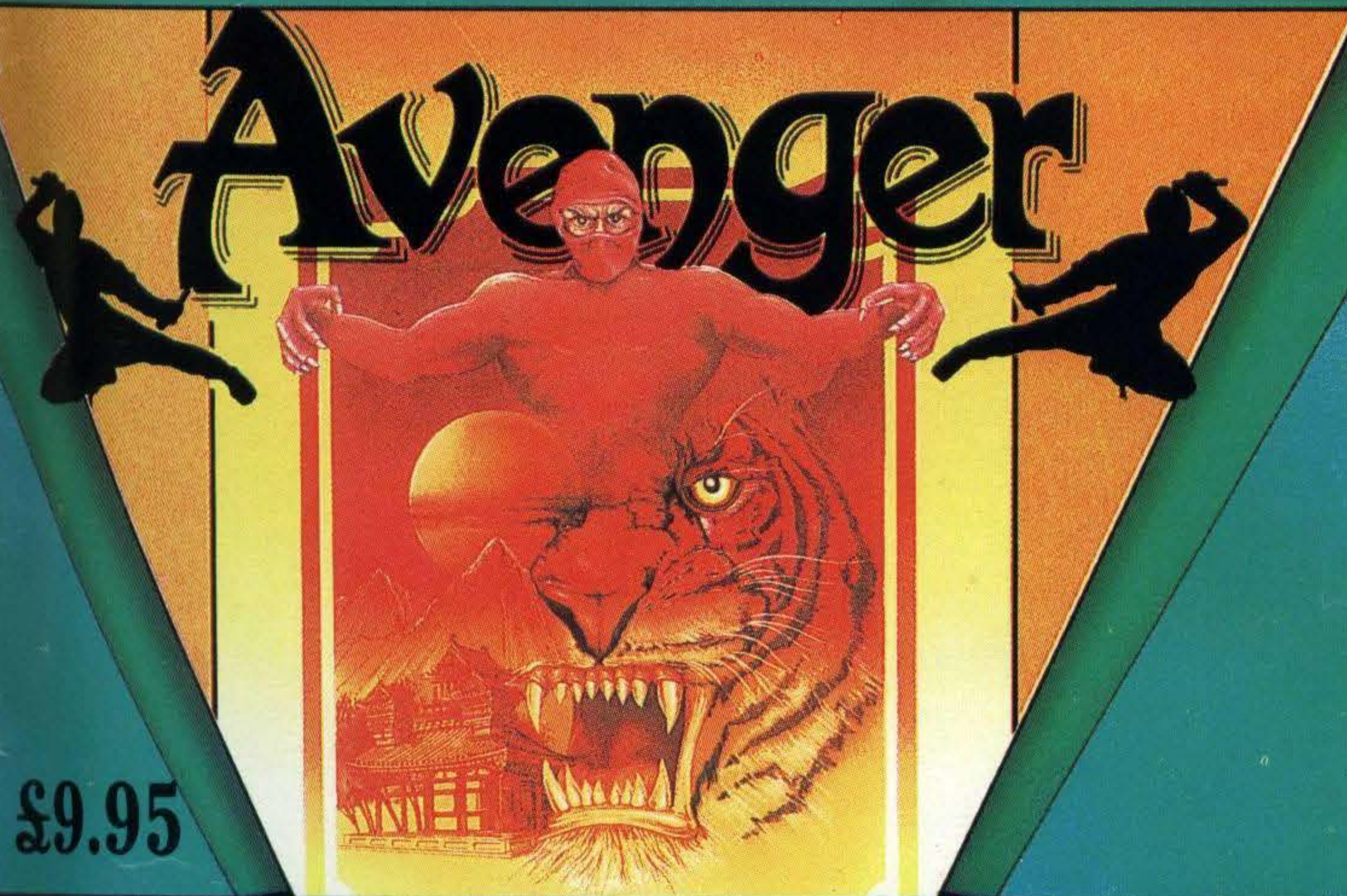
Thunder into the unknown at a breakneck speed, pushing your reflexes to their limits in this definitely exhilarating journey that's not one for the fainthearted. Roll left, roll right avoiding the endless chasms of doom that lay in and around the squares of mystery. Squares that will sometimes slow your progress, on occasion with fatal consequences and sometimes speed up unexpectedly or make you jump automatically. Keep a keen eye on the clock as the quicker you complete your task the higher will be your bonus.

Trailblazer

\$7.95



£7.95



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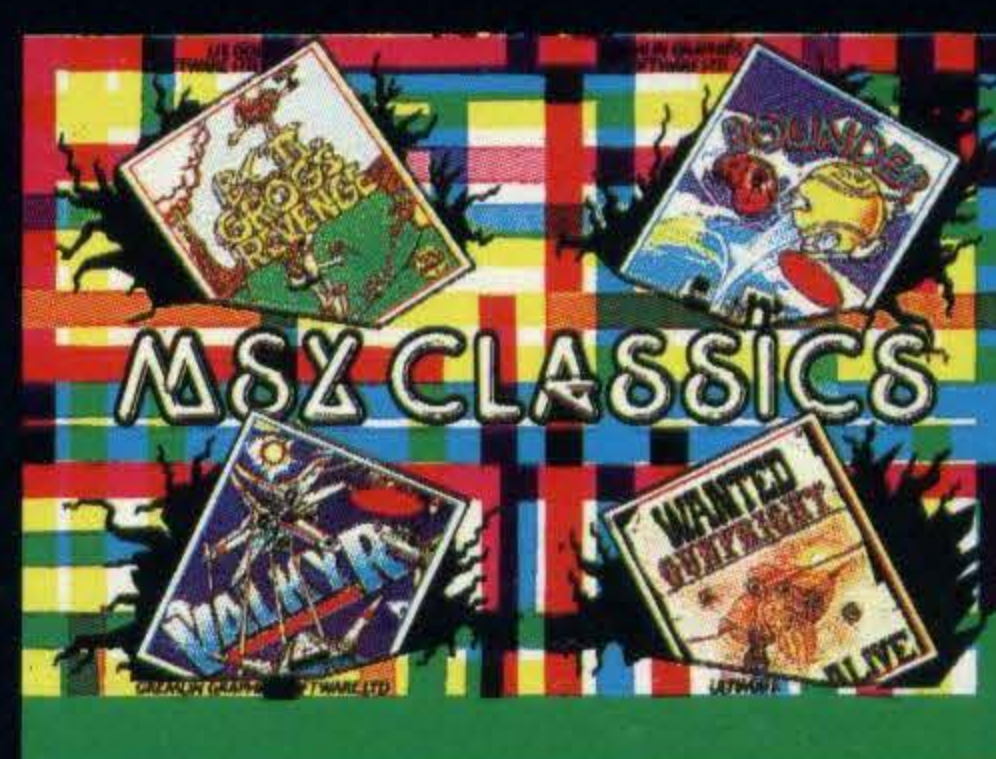
£7.95



Zzap Sizzlers CBM 64/128
'Z'; Monty on the Run;
Boulder; Starquake.



Amix Accolades Amstrad
Monty on the Run;
Sweevo's World; Boulder;
Starquake.

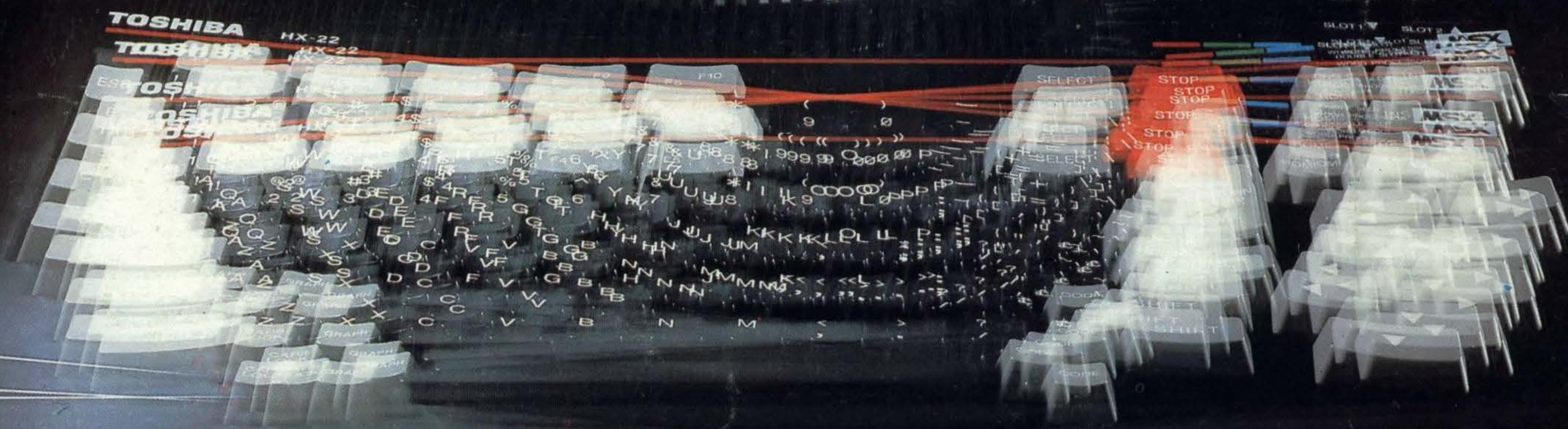


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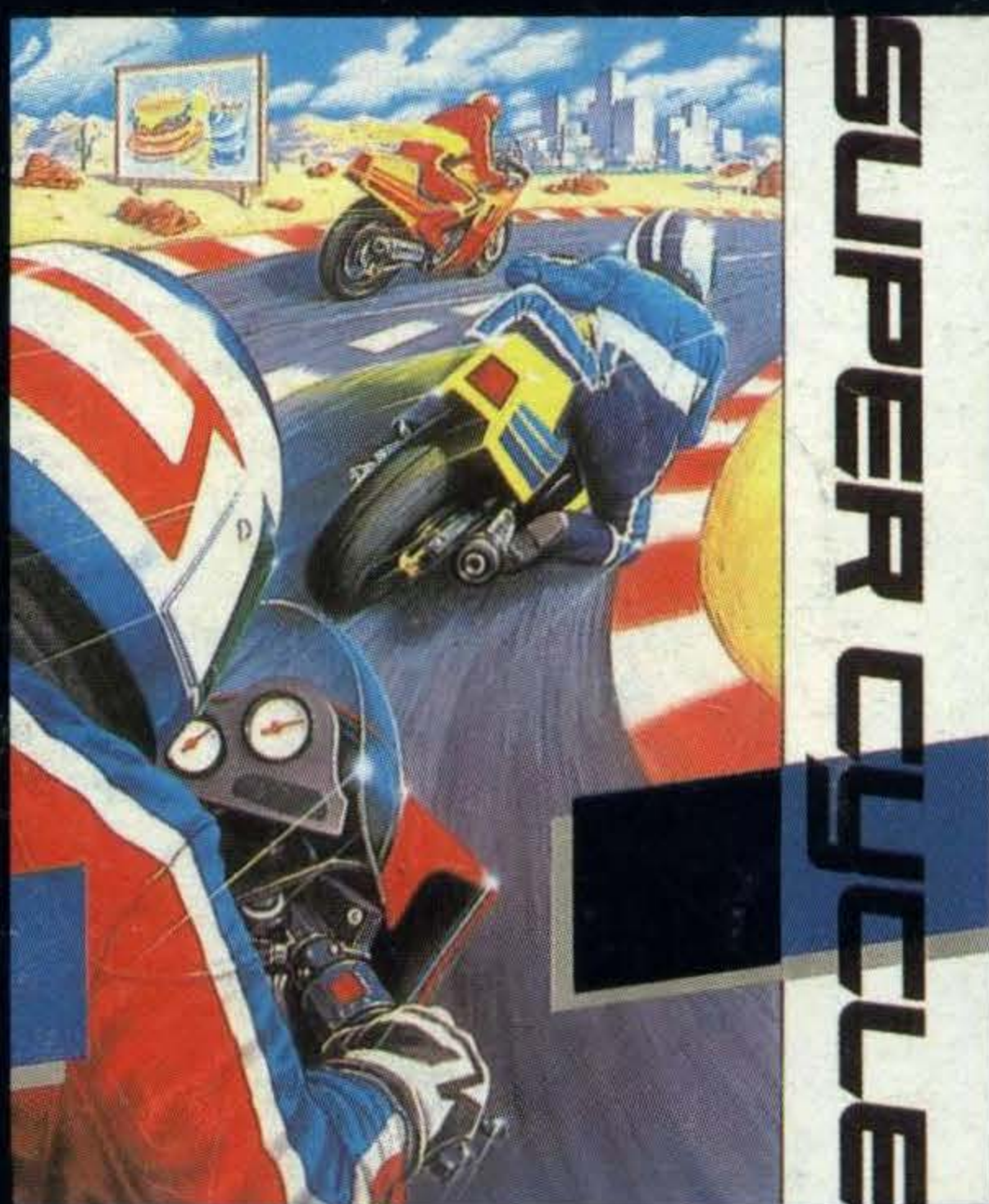
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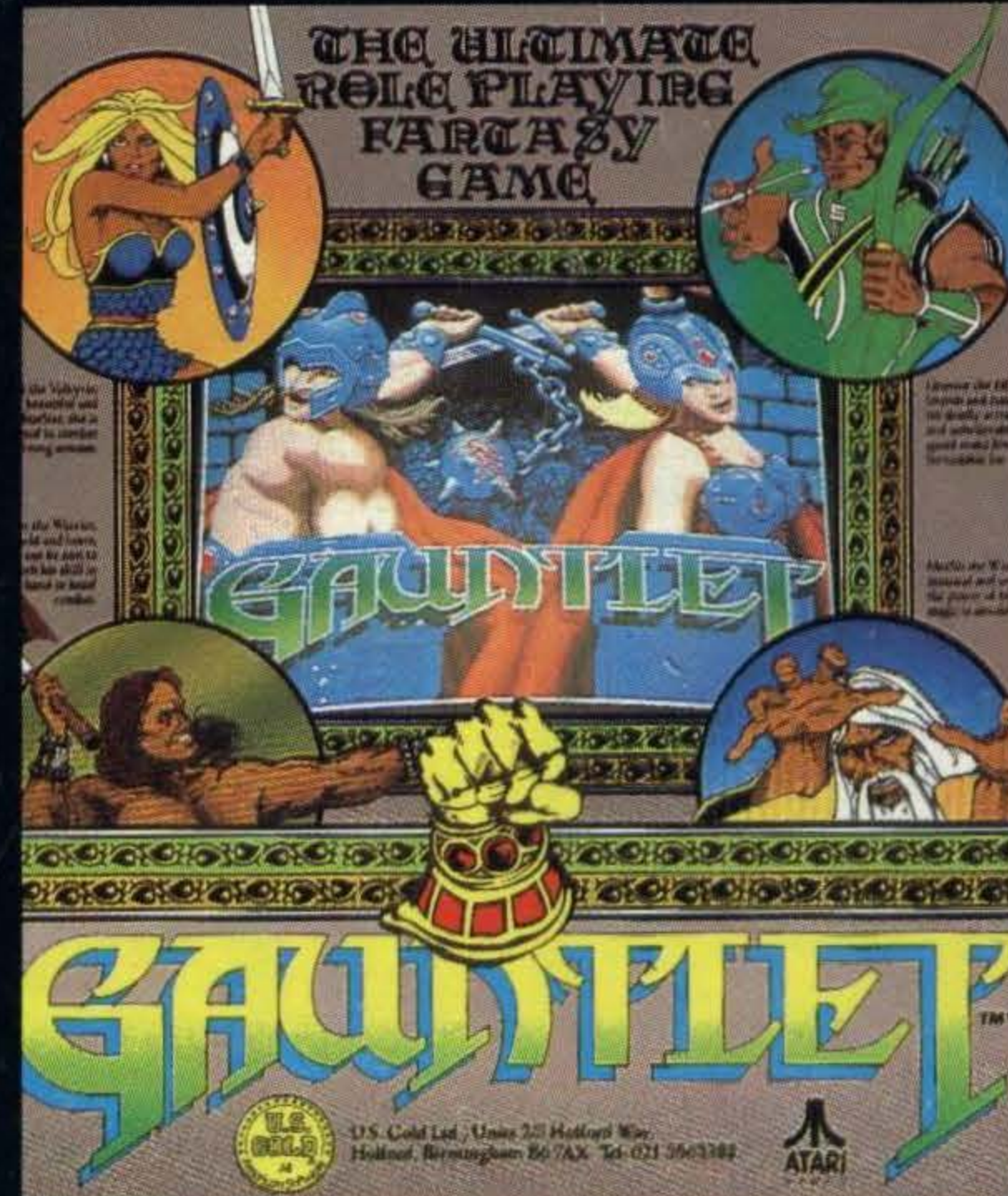
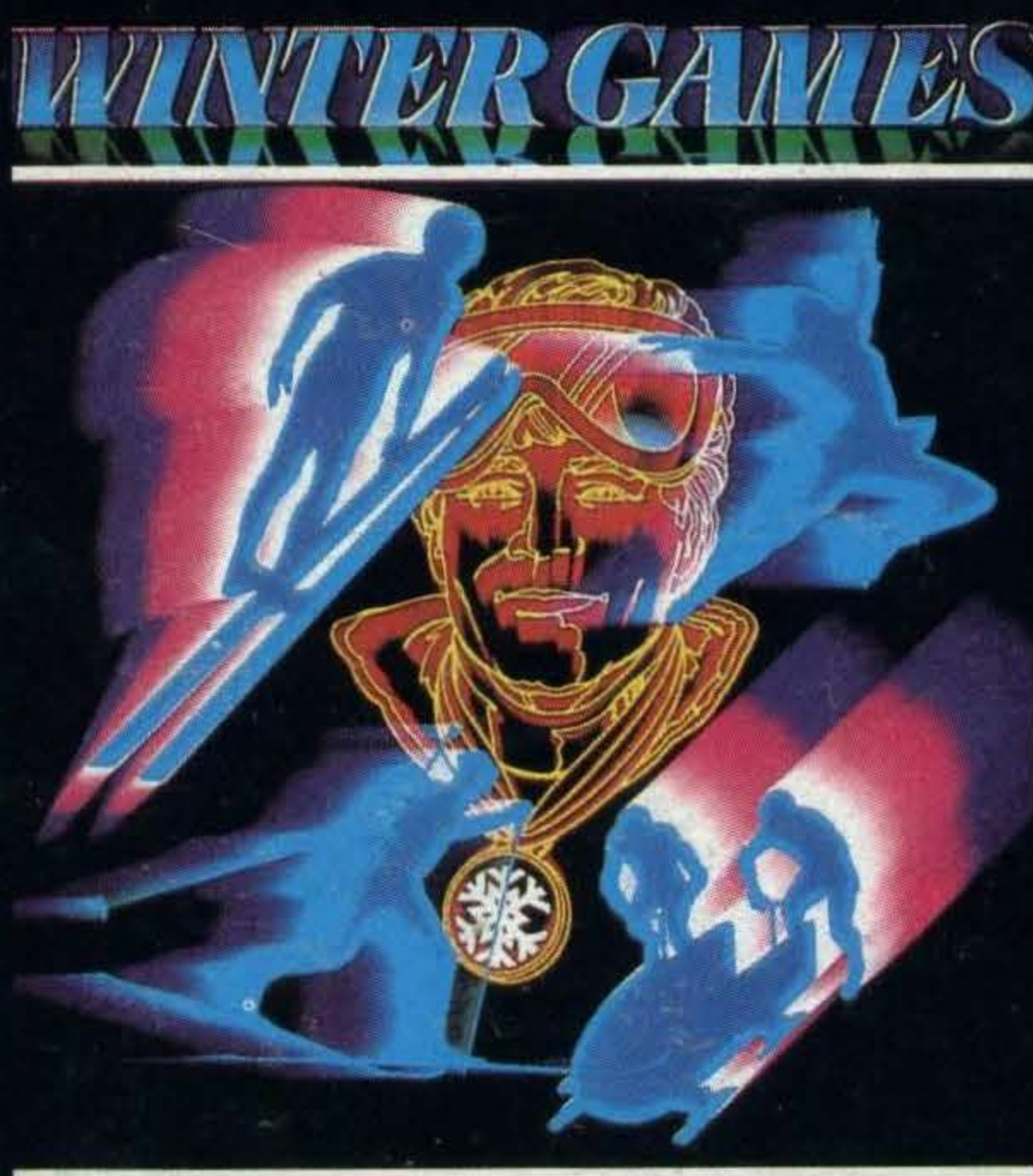
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Enter the world of monsters and mazes. Travel the path of mystery and combat as Thyra the Valkyrie, beautiful and fearless; Thor the Warrior, bold and brave; Questor the Elf, impish and cunning; or Merlin The Wizard, mystical and wise.

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