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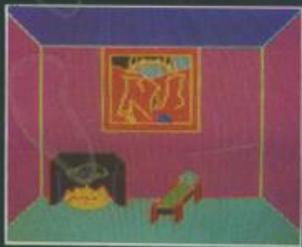
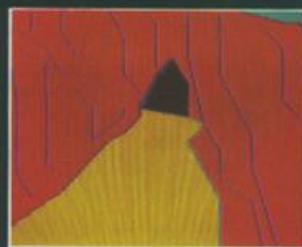
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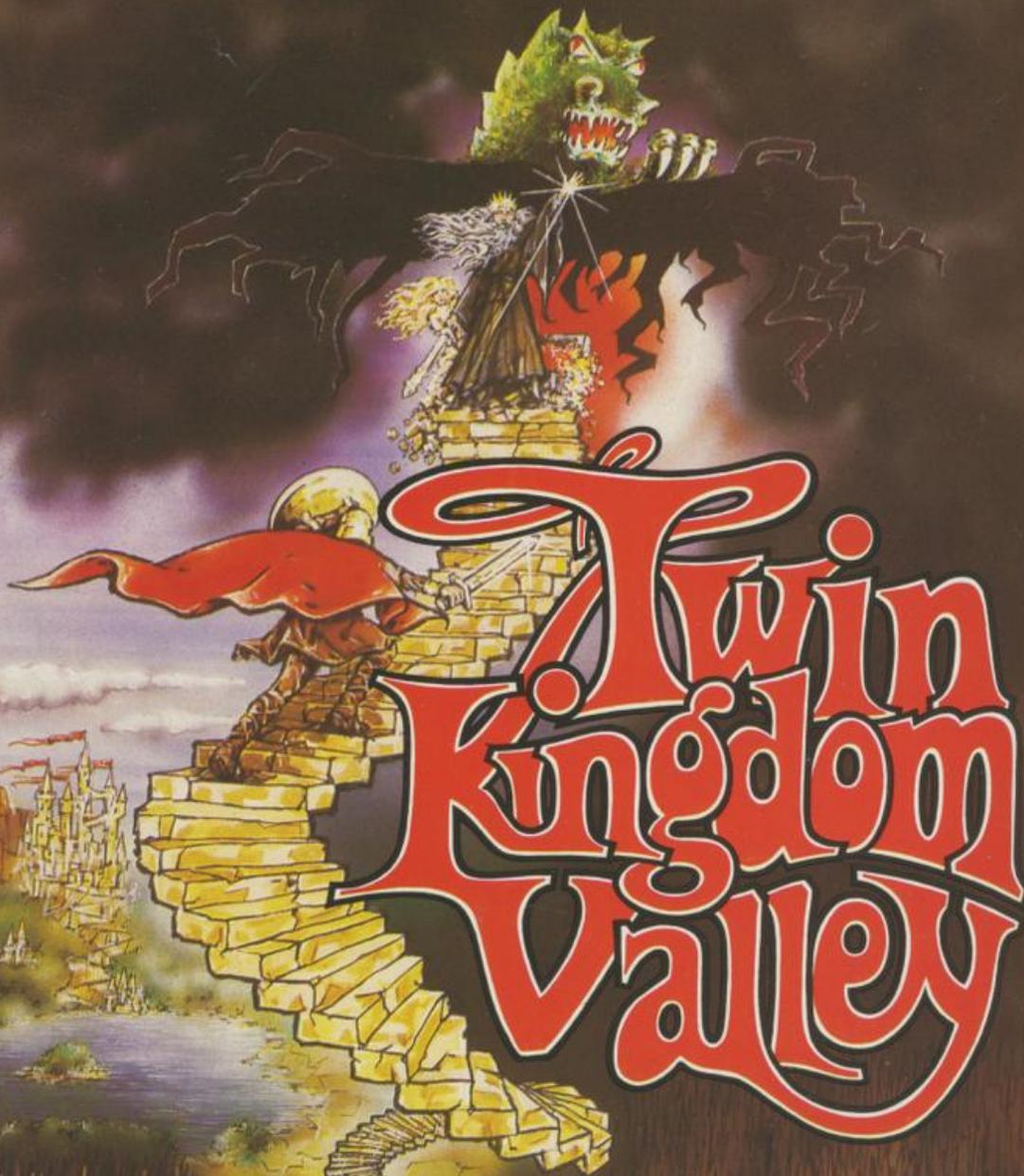
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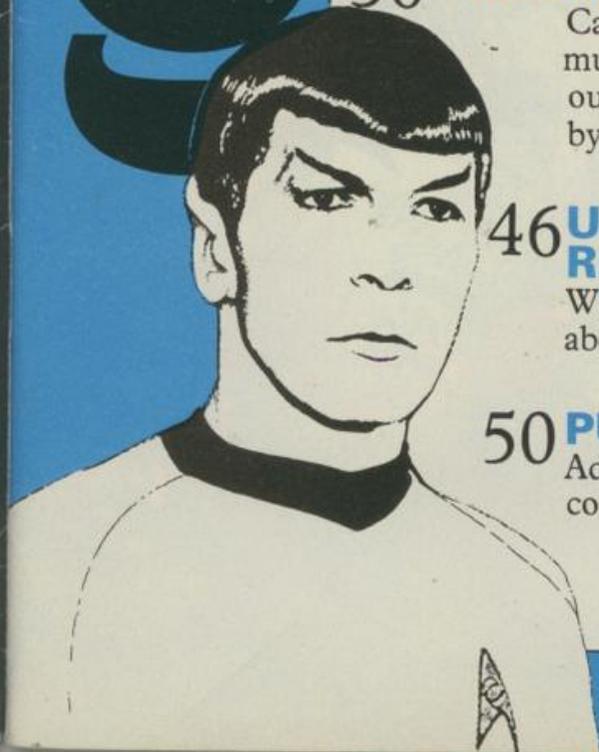
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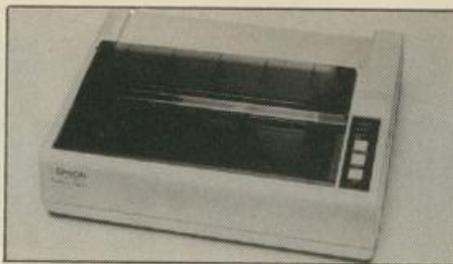
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I AM sure that most readers will have been bored silly by all the material around telling us how much computers will change our lives. If another Sunday paper tells me that a little chip of silicon is going to alter the way in which I work, I shall give them up for ever — papers that is, not computers.

True, computers will do all this, but so what? I would much rather hear about the ways in which these clever little beasts can make our lives more fun. And they do. Everywhere there are computers beavering away at work, I don't object, I even wish them luck, but I am more interested in the computers that play.

If you turn up at the large Computer Fairs, what is the first thing you do after you transfer money from your grubby hand to that of the man on the turnstile? Why, make for the stands with the brightest graphics and loudest noises of course. And are these stands ever selling serious computers? Are they heck, they are selling computer games of course.

Maybe in one of your weaker moments you might happen upon a stand where "real" computers and "real" software can be found. The people here, customers and salespeople alike are about as happy as undertakers. Probably because they are jealous of their pals next door who spend all day ridding the galaxy of the alien menace.

I have a pet theory that it is software that sell computers — it's not a very original theory. But it is rarely the serious software that does this selling. Spectrums are sold because of Manic Miners, Vics find homes thanks to Wacky Waiters and Ataris are embraced by fans of Donkey Kong.

That is why we look at the available software in our hardware reviews. After all, I wouldn't buy a record player that didn't accept records by The Jam, or a TV set that couldn't pick up Match of the Day.

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NEWS

THIS bunch look like they might be the next British entry for the Eurovision Song Contest, in fact they are the top brass at Visions Software Factory. They are, at the back, Roz Evitts — who isn't tall, she is standing on a box. From left to right, Martin Parmiter, Sean de Bray and Jon Burnham.

All the VisionVolk can be seen at computer shows and other trendy places sporting the latest in flashing tee-shirts, which seem to be their contribution to this winter's computer chic.



Scoring
with
Commodore



Price Cuts

TANSOFT is now selling 16K Orics for a mere £79.95, but you will have to hurry because it is a limited offer. The asking price includes a £40 voucher which can be put towards an Oric printer, making this British designed micro look a very attractive proposition.

The cheap Orics can only be purchased via Mail Order, and only from Tansoft — which is the company responsible for designing the beast. In order to make it an even more attractive buy, Tansoft offer an upgrade from the 16K version to the 48K version for £50. This explained a Tansoft spokesman will cover the cost of replacing the main circuit board inside the machine.

For details contact Tansoft on 02205 2261.

Match of the Day

BEING only human, the staff at *Computer Choice* are interested in anything that might make money. So imagine the scene when two innocent looking Spectrum cassettes appeared in the office, containing the key to a fortune. Spectadraw 2 and Spectasort may look like ordinary cassettes, but they form the basis of a sophisticated football pools calculating program.

The program "looks" at the recent form of the teams playing in each week's matches, and then refers to a database — which is filled with information about similar draws in the

past. On the basis of this information, combined with the leagues current position, the program then assigns a number to each match. This is then used to identify the games most likely to result in a draw.

Spectasort is an additional program that converts this number into all those x's that you fill the coupon in with. Brian McAlley is the mastermind behind this fiendish plot to milk the pools companies of their millions, and he charges £12.95 for the main cassette and £4.95 for the sort.

SPORT and computers mix well. Elsewhere in this issue you can read how Acorn Computers have got involved in motor racing, earlier this year Atari sponsored a very exciting football tournament, and now Commodore are sponsoring basketball.

Why basketball? Well, it appears that the game has an immensely complicated scoring system, and humans are hard pressed to keep pace with all the action that unfurls over the forty minutes of a game. So Commodore are going to design a program to report match statistics to spectators and TV viewers alike. If any computer company wants to score maximum brownie points, the MCC is looking for someone to sponsor Test Matches. How about it Sir Clive?

More software releases

THIS month sees a whole pile of new software releases just in time for Christmas. All the major software houses have new titles, and from what we have seen so far, it is looking good.

Virgin have four new titles in the snappy and distinctive pink and blue stripe packs that liven up computerist's software libraries. The first game is called "The Island", and is a treasure hunt, next is "Angler", a game which puts you behind the wheel of a trawler and prints out a certificate of merit when you get a good score...

"Ghost Town" is a graphic adventure set in a town abandoned after the California Gold Rush, which should make a welcome change from watching repeats of Bonanza.

Lastly is "Rider", especially for the leather jacket and Yamaha brigade. In this game you are parachuted behind enemy lines and have to motorbike around uncovering mines...

Arcade is one of the smaller software stables around, with only a handful of software so far. Among these is "Raiders of the Cursed Mine", which is packaged to look like a movie poster — no prizes for guessing which film...

"Chequered Flag" is the latest offering from Sinclair Research. It is a "fast-paced" motor racing simulation game that features five of the world's most famous racing circuits. The game also simulates skidding when the car loses its grip on the road...

"My name is Uncle Groucho you win a fat cigar" is the program with the weirdest name ever. It comes from Automata, the crazed Portsmouth-based software house also responsible for Pimania and The Bible. Basically the game is a "tribute" to Hollywood, but like everything else from Automata, it is a send-up of life, the universe, and everything. There is a mad piece of music on the flip side, which is embarrassing to listen to — make sure there is no one else around when you do. Purchasing the program also entitles you to enter a competition, first prize; a trip to Hollywood on Concord...

Also appearing in time for the Yuletide rush is a whole series of games from Blaby Computer Games, a total of eleven programs. Among them is "Barmy Burgers", which will probably put you off MacDonalds for life. In this game you have to construct hamburgers while being chased by a fried egg and a sausage!



Shoot with Light

MOST computer games require the player to input his or her contribution to the game via the micro's keyboard, or in some cases by using a joystick, but a range of new games from Stack of Liverpool use a light rifle.

What is a light rifle? Basically a toy rifle that shoots light instead of nasty dangerous bullets. It works with the Vic-20, the Commodore 64 and the Sinclair Spectrum computers and is an ideal Christmas present for the more warlike computer user.

To support the rifle comes a range of six cassette based games, with names like titles of films; Escape from Alcatraz and High Noon are but two. Three games come on a cassette with the rifle to get you started and the makers reckon that there is a "flood" of other games on the way.

The Light Rifle costs £29.95 and looks fairly real so you will be able to scare the daylight out of people as they see you taking potshots at your telly. Stack Computers, Tel. 051-933 5511.

Cartridges for the Spectrum

INTERFACE 2 allows Spectrum users to plug-in "official" Sinclair software in cartridge form. The unit costs £20 but for your money you also get a couple of joystick ports. The interface accepts software on special little cartridges, that for now are only available from Sinclair Research. So far there is nothing very wonderful available on these cartridges, but give them time and who knows?

Elsewhere, software giant Imagine of Liverpool, is developing its own cartridge software that doesn't require a special interface. A number of

the company's most popular games will shortly be released on the cartridges that simply plug-in to the rear of the Spectrum. Dave Lawson of Imagine told Computer Choice "we expect to sell existing games at under £10, and larger, as yet unpublished programs for under £20."

Cartridge software consists of a circuit board with some read-only memory (ROM) on it. The ROM holds the program in a form that is half-way between hardware and software. It is faster to load than a cassette — almost instant, and is less prone to damage.



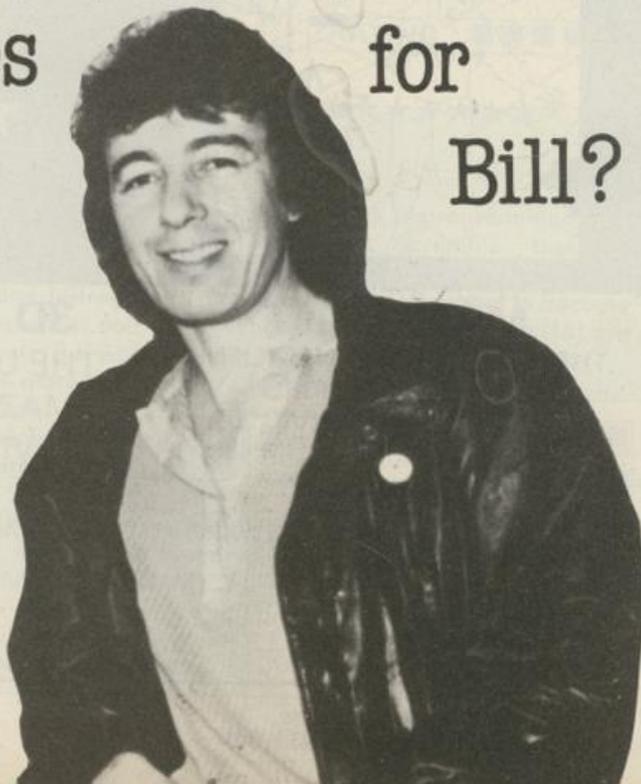
Adventures

for

Bill?

ROLLING Stone Bill Wyman is one of the more famous home computer enthusiasts amongst us, he has an Apple computer with a complete history of his band stored on discs. When he isn't jetting around the Cosmos, filling baseball stadiums with screaming, ageing fans (like my Mum and Dad — Ed) he sits and plays computer games.

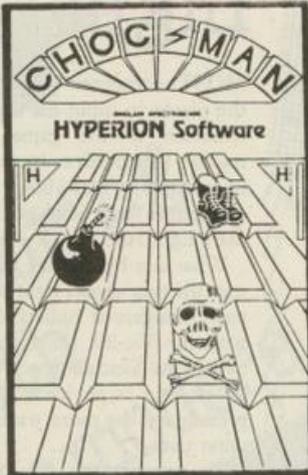
There is a story that Bill and Mick Jagger used to play adventure games while waiting to go on stage on their last tour. Recently Bill was the special guest of The Virgin Games Gang, where he gave away prizes to lucky winners of a competition open to Gang members. Another competition is underway now, but to enter you have to buy a Virgin Game, and fill-in the coupon on the back.



SUPER SPECTRUM GAMES

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Franklin's Tomb

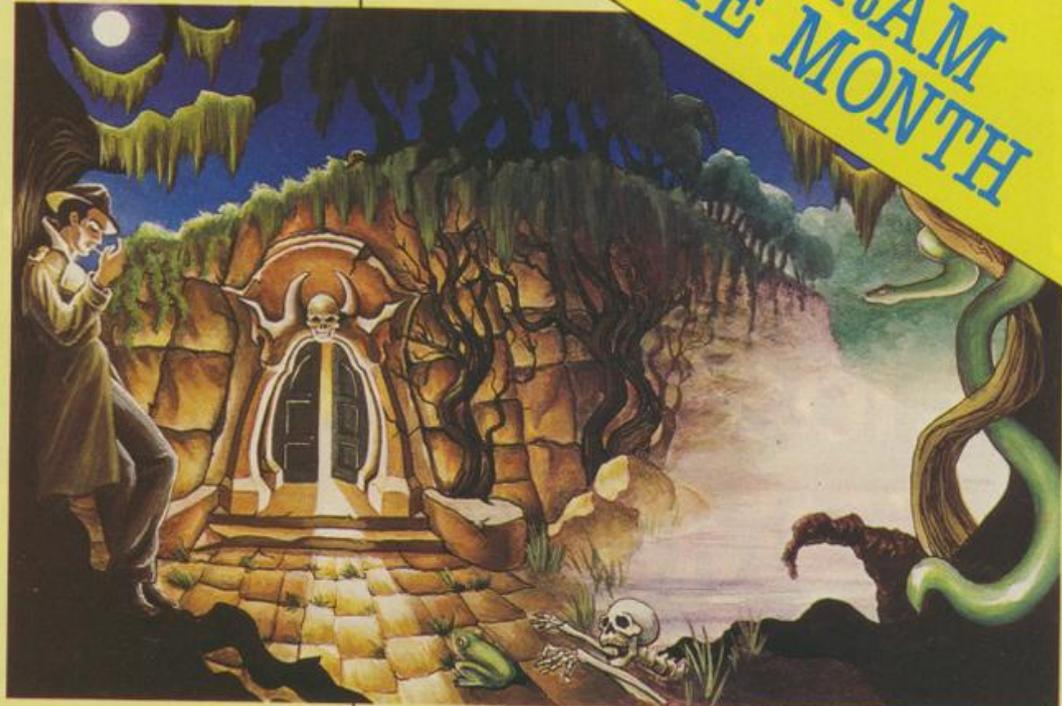
PROGRAM OF THE MONTH

Salamander (Dragon)

AT LAST — an adventure game that seeks to go beyond the usual tiresome conventions of the genre. I for one am sick of zapping zombies, hobnobbing with hobbits and slaying shoggoths (i.e. living out the old hippie nightmare). Franklin's Tomb should be titled "Escape from Middle Earth." Franklin's Tomb is the first in a range of adventures from Salamander Software, and contains clues which will be helpful in their next game (shrewd marketing ploy!).

The documentation is a lot of fun, and lavish by current standards. It consists of a 20 page booklet containing instructions and copious illustrations of the rooms. It opens with a truly cringe-making mock-Chandler preamble: "It was a muggy Monday morning, the sort of day that just lies there like a dead fish, staring at you." Aaargh! It emerges that you are cast in the role of Dan Diamond, ex-cop and all-round loser (a change from Gumroth the Barbarian!).

If you survive page one, you're given two very sane pages of tips and explanations — for those who've never played an Adventure before, this should make all the difference. The illustrations which follow are good enough



to compensate for any lack of computer graphics. They offer clues, sometimes blind alleys, but best of all they give you something apart from a TV screen to look at.

The game itself takes the form of a standard text adventure. Salamander have taken a bit more trouble than usual — the screen doesn't scroll for one thing. The screen is divided into three panels: one contains a list of the things you're carrying, which eliminates the tedious INVENTORY command. One contains a room description; and last the input com-

mands and responses. It takes so little trouble to lay out a screen like this — why isn't it done more often?

Once in the game, you're faced with the usual adventure game issue — which objects to keep and which to drop — except some of the objects are decidedly odd — a bunch of carrots? . . . an old rug? It's not a huge maze by the standards of many games, but there were enough problems to keep me at it for a few days — and I still hadn't finished . . .

Franklin's Tomb gets away from the usual adventure

stereotype by using those rare commodities, humour and imagination. It's vividly realised and really does create a sense of imminent drama. It must be the most consistently enjoyable adventure game I've played. The only complaint I have is that it tastes of more. The good news from Salamander is that Lost in Space, the sequel, is coming soon — I hope I can last that long!

Fin Fahey

RATING



Four go mad in computerland

FOUR bright young sparks are about to make their mark in programming with four games based on popular arcade favourites. Skramble, Hexpert, Moonbuggy and Kong will all be out for Christmas from Anirog Software.

Brothers David (17) and Jeffrey (16) Gamon have both left school to become freelance programmers whilst Bob Grey (16) and Darrell Etherington (16) are studying for their A levels, but with a career in computing firmly in mind.

None of the four has more than a year's programming experience although David and Bob have already two adventure games, Zok's Kingdom and Pharaoh's Tomb, for the Vic-20 to their credit.

With all of this do they have any spare time? Well most of it is spent on arcade games and girls . . . and not necessarily in that order we gather!

Look out for their games on the Commodore 64 and Vic-20 from Anirog Software.

BRILLIANT	■ ■ ■ ■ ■
EXCITING	■ ■ ■ ■
WORTHWHILE	■ ■ ■
MEDIOCRE	■ ■
BORING	■
DULLSVILLE	

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June's PCW review of Compilers raved about our previous Super C but put a new product from 'Wye Valley Software' top of its list of recommendations. Softek are proud to announce that their new Integer Compiler was commissioned from Martin Lewis of Wye Valley, having gained exclusive rights to their Integer Compiler.

The Softek IS Compiler is the ultimate in Integer Compilers for the ZX Spectrum. Following the immense success of our Super C Integer Compiler (it is still the only utility to have made it into the 'Top Ten' charts), the IS Compiler is even better. It has full string handling and string slicing capabilities (unlike its competitors) and full INPUT facilities, exactly as you enjoy in BASIC. Our famous 'REM' statement enhancements to BASIC are in the IS Compiler too, allowing such features as Hi-Res graphics and the entry of Machine Code subroutines. Like the FP Compiler the IS compiler will compile subroutines, can be used easily alongside BASIC, and can compile code to virtually any given start address in RAM. Unlike Super C, both of our new Compilers will allow up to 16K of BASIC to be compiled in a 48K ZX Spectrum.

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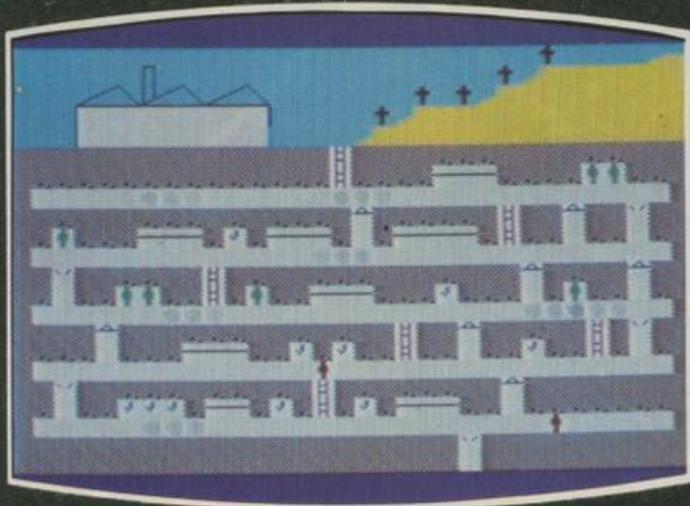
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CC12



Pitman Seven

Pitman Seven

Visions

ONCE again we have a nicely packaged and well-designed program from Visions. Like the other Visions tapes there was never any problem loading this cassette. And the programming is very professional too, especially considering it was written by 13 year old Simon Oliver.

The game is about a coal-miner's nightmare; a pit disaster, I wonder what Arthur Scargill would say. Your mission is to rescue the miners. I like that, I'm all for humanitarian games where the object is not to blast the living pixels out of high resolution beasties from beyond Betelgeux. But it is pretty difficult.

I can't help but like this game, but I'm not sure how long it would be before I got fed up with rescuing souls from the

pits of the earth. Still it makes a change to grope about underground without the continual "Go North — get Lamp" of Adventure games.

Bill Bennett

RATING

Xadom

Quicksilva

XADOM is an adventure game and an arcade game rolled into one amazing package. The Empire — boo, hiss — has sent you on a suicide mission against the alien base. Whilst the Empire might be nasty, the aliens are downright evil, and out to get you. All you really do is survive, but if you manage to find the "Aartifact" — which they captured from the Empire, you may be able to return home.

This may sound like an adventure scenario, and it is, the difference being that this adventure is fought out in "real"

time. That means that if you dither, you get attacked. Not only do you have to fend off the aliens, some of whom look like snakes and dole out poison bites, but you have to watch your energy supply.

Some rooms are full of aliens and you feel like an away supporter at a Leeds United match as you battle your way to an exit. If you are lucky you may have your trusty laser gun to help out. This, and a number of other helpful items can be found at various points in the maze.

Quicksilva obviously have Buddhist tendencies, because if you die you are reincarnated on the spot. Maybe the game ought to be called Dahli Llamas. This is pretty useful though, as die you will sooner or later. The nastiest way of snuffing it is when old blue-eyes the snake gets his fangs into

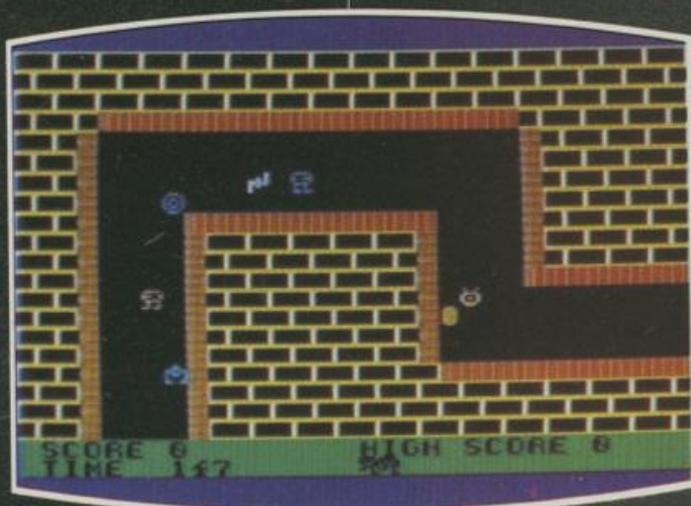
It isn't bad either. But it didn't strike me as being very original either. The idea is that you move around a maze, zapping everything that moves. Finally you have to defuse a bomb before it explodes and destroys the planet Lattica — hence the title.

After a few days of playing this sort of game I found myself getting "zap-happy". Before long I couldn't sit behind the wheel of my car without reaching for a — thankfully non-existent — fire button every time a little old lady crossed the road in front of me.

Like most of these games the graphics are good. But I did find the game began to get dull after not too many plays. If you don't have a lot of shoot-em-up games in your collection then this might be worthwhile.

BB

RATING



Last Sunset For Lattica

you. You only have 500 steps to find the serum before you become an ex-person.

My only real criticism is that I always run out of power before I get my paws on the Aartifact. The feeling of smugness when I was promoted to Psy Pilot came as some consolation. £6.95 BB

RATING

Last Sunset for Lattica

Arcade

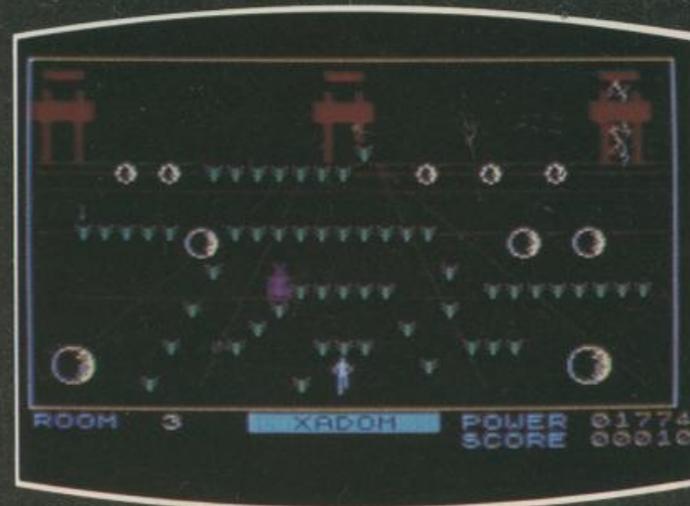
THE TITLE of this program reminds me of those epic weepy made-for-television films that show up just how bad at acting some "stars" are. In fact it is nothing of the sort, Last Sunset is a shoot-em-up action game set in a maze.

Sheer Panic

Visions

SPACE Panic by any other name is just as good. For make no mistake that is what we have here. Nicely packaged, from the picture on the cassette cover, to the crazed sleeve notes inside, right through to the actual implementation of the game. It is all very slick.

Why then does Space Panic — sorry, Sheer Panic not merit one of *Computer Choice's* prestigious five blob ratings? Mainly because it isn't new, but partly because the joystickless version of the game is difficult to play. If you want a version of Space Panic on your Spectrum, then this is obviously the one to get, but I found it too hard ham-



Xadom

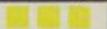


Manic Miner

mering rubber keys. Maybe I'm just getting old, passed my alien-blasting prime, but I don't feel ready to retire to Adventure games yet.

BB

RATING



Manic Miner

Bug Byte £5.95

LAST year everyone was writing games about aliens, zapping little green men from the solar system around the corner became a national pastime. Now it seems there is a desire to get underground. Manic Miner is the latest cult game and involves moving miner Willy through a set of caverns to the... well I never did find out what.

This is because there are 20 caves, each one presenting young Willy with a different problem. Each one is in effect a

separate arcade-style game. The object in each case is the same, first you have to collect all the keys, then you have to make your way to the exit door without getting attacked by whatever nasties happen to be in that particular cavern.

Each cavern has a name, and a particular geometry and a collection of horrors out to grab you and bring your mission to a premature end. Some caverns are obviously satires of other computer games and have titles such as "Return of the Kong Beast" and "Attack of the Mutant Telephones". Most of the scenes would not look out of place in the movie "Yellow Submarine".

Other caverns are jibes at other software houses, all in good humour though. I like Manic Miner very much, but that damn music drove me wild. After a few hours of pain, it dawned on me, the music was "In the Hall of the Mountain King" from the Peer Gynt suite.

BB

RATING



Snooker

Snooker

Visions

WHEN I was little our family saved up and bought (one memorable Christmas) a half-size snooker table. Dad then introduced my brothers and me to the wonderful world of snooker. Needless to say, he always won.

Now I have a chance to get my revenge. By staying up late every night and practising, I might just get good enough at the computer version in time to beat him next Christmas.

Just like real snooker, beginner's games are usually marked by the high penalty scores



Aquaplane

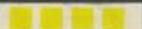
against players rather than points scored by players.

It isn't easy to judge angles and distances on a computer screen, but I expect that will come with practice. The only major flaw is that a game can take hours — but then there is a quick game option. You have to watch the balls closely because they can sometimes appear in the wrong colour.

While this is almost definitely a game for Dad and the boys, it is a very good example of what can be done with the Spectrum. As such it is wonderful, as far as playability is concerned, it is merely OK.

BB

RATING



Aquaplane

Quicksilva

WATERSKIING is a strange thing to turn into a computer game, but that is what John Hollis has done in Aquaplane. The idea is that your boat and skier must make their way through a whole heap of water and you score points the further you get.

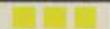
Simple eh? Well, not really as there are obstacles that throw themselves in your way with an annoying regularity. Among these are rocks, logs, and cruisers.

Graphically the game is interesting and the sound isn't

bad, it can be played in conjunction with a Kempston joystick which makes it even more like a real arcade game. I don't know how long you could go on playing this game before you got tired of it. I suspect not long. But it will probably find a lot of fans amongst the very young. £6.95

BB

RATING



Spectrum

AT LAST, A HOME COMPUTER THAT IMPROVES WITH AGE.



It's surprising how many first-time relationships with a home computer go sour with age.

You buy an attractive, discounted little machine so that you and the children can learn about computers.

Instead, you learn about its limitations: the dull graphics. The plugs that fall out. The cheap power supply. The unalterable "beginners" language. The stiff, fragile keys. No provision for future developments. If only you'd looked around a bit in the beginning... "Quality costs a little more, but it's usually worth paying for" (Personal Computer News - CGL M5 Review, June '83.)

The CGL M5 is designed and built by Sord, one of Japan's leading computer specialists, with three main ideas in mind.

First, to be easy and fun to learn and operate.

Second, to be rugged enough to last through hours and hours of operation.

And third, to form the basis of a powerful, versatile home computer system that won't need replacing until you're ready for a dedicated business system.

Built to learn

The CGL M5 is designed to be easy for non-geniuses to use.

"On the M5, most of the work is done for you, and all that is left is the need to work out what to do next, rather than how to do it." (Personal Computer News, June '83.)

If you make a mistake, you can correct it with a simple movement of the cursor. So you only correct that mistake, not a whole line; nor do you have to indulge in complex edit commands.

Budding video game designers and computer artists will love to get their hands on the 16 colour graphics and 32 moveable images called "sprites."

"The M5 makes professional graphic

effects very simple for even the beginner to achieve." (Personal Computer World, Aug. '83.)

Built to last

"It works first time, doesn't need a lot of mollycoddling and jiggery-pokery to persuade it to continue to do so, and what's even better, it continues to work well. You don't have to balance cold cartons of milk on the top, shove matches in the back to keep the plugs in, or press the keys with several pounds force to make them respond." (Personal Computer News, June '83.)

Being able to build things that work and carry on working without endless maintenance is something at which the Japanese seem to excel.

Built to grow

To be truly versatile, a home computer has to understand very different things.

So you need different "languages," which the M5 provides by supplying part of its memory in plug-in cartridges.

"The M5 eliminates the worst limitations on machines at this level, which is that they tend to be stuck with whatever language is provided by the management." (Personal Computer News, June '83.)

The computer is supplied complete with a Basic-I cartridge, a standard integer BASIC language and a simple learning text.

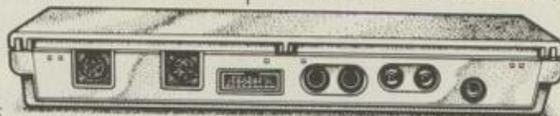
Plug in the Basic-G cartridge, and you can access the M5's incredibly sophisticated graphic and sound capabilities which are far in advance of similarly-priced computers.

Move on to the Basic-F cartridge, and you have scientific, technological and statistical computing power usually available only

on big computers with equally big price tags.

The FALC cartridge provides a tailor-made language for data management, spreadsheet accounts and business problems. Combine FALC with a disc and you could "turn the M5 into a small business machine." (Personal Computer Magazine, August '83.)

Now, take a look at the back of the M5.



Notice the sockets (usually an extra) for a standard

Centronics-type printer, the separate video monitor and hi-fi sound output.

Even the language cartridge socket has hidden potential:

"Unlike most such sockets, this one has 56 internal lines connected to it giving access to just about every function in the computer. This means that just about everything you can think of can be added onto the computer, ranging from a Prestel interface to second processor to use as an intelligent terminal on a timesharing computer..." (Electronics - The Maplin Magazine, March '83.)

Take a look at the home computer that will improve with age.

For a full technical specification of the CGL M5, details of the wide range of supporting software and to find out where to see a complete demonstration, send the coupon to: CGL, CGL House, Goldings Hill, Loughton, Essex IG10 2RR. Telephone number: 01-508 5600.

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HOME COMPUTER

BUILT TO LEARN. BUILT TO LAST. BUILT TO GROW.

Frogger

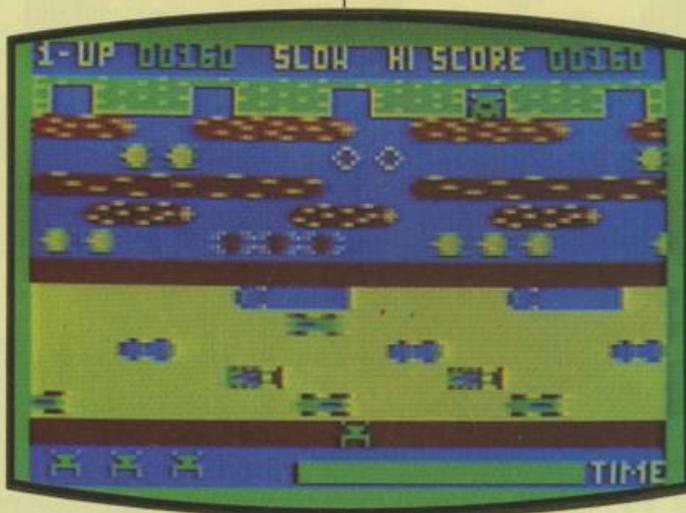
Microdeal

FROGGER is to arcade games what Mull of Kintyre is to the music industry. Both are enormously popular, both are no longer new and both are repetitive.

Nobody could pretend that seeing heaps of frogs dodge traffic and hopping about on logs is their idea of Saturday night fun, but Frogger from Microdeal is one of the best arcade games I have seen on the Dragon.

This particular version of the game is "official", in that it is endorsed by the company responsible for the original arcade game, this gives it some credibility, which it deserves for being the best use of the limited Dragon graphics. It also makes good use of the sound facility, and after a while the tune drives you round the bend.

The game gets harder as you pro-



Frogger

gress, with things moving faster, and more unpredictability creeping in. The game would be improved if there was a hall-of-fame feature to display the highest scores, but "thumbs-up" to Frogger.

Bill Bennett

RATING ■ ■ ■ ■

Mined Out

Quicksilver

MINED Out is a disarmingly simple game, in which you must thread your way through a minefield and — eventually — rescue old Bill the worm. Easy? Well, not really because the mines

are invisible. All is not lost though because a display at the top of the screen tells you how many mines there are in the area around you. From the information given it should be possible to find a route.

Life can be hard, and to demonstrate this fact, there is only one "life" per game. Step on a mine and

looks like it might be a really good game. It is similar in concept to the board game Cluedo, being set on an ocean liner where you have to find the evil Mr Sinister who is going to blow the ship up. By a process of elimination you can solve the mystery and save the ship.

Unfortunately the software and the documentation of the review copy are somewhat at odds. For a start the manual quotes five decks, but there are only four. Rooms that it claims exist, do not, and names documented in their complete form are used in the program in abbreviated forms that are hard to guess at.

What makes this intolerable is that you only have a limited number of commands during the course of the game and each time

you make what the program assumes to be a mistake you are deducted a command. It seems the program is punishing you for its shortcomings. Sometimes this is very silly, someone can be standing in the same room as you, but when you suspect them the computer replies; so and so is not in the room. Still, it's a good idea.

BB

RATING ■ ■

Mission Empire

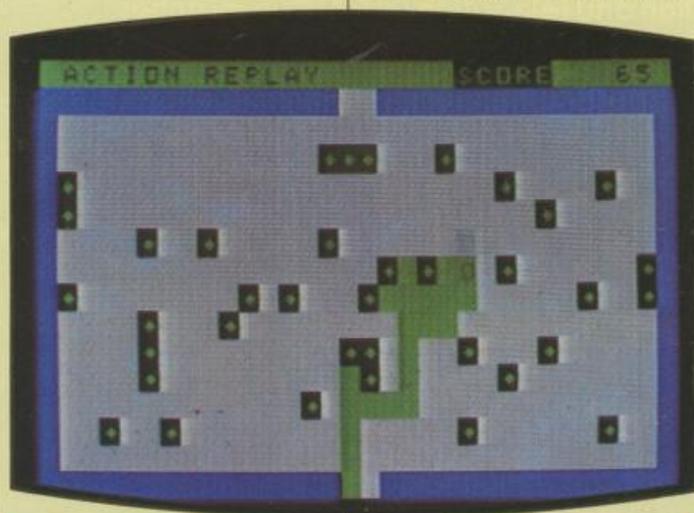
Hornet Software

IN this game, you are a war-lord, bent on galactic conquest. The main original idea is that this takes place at slower-than-light speeds hence arranging for all your space marines and naval units to arrive at a given system at the right time from the industrialised planets of your empire is quite tricky. Average flight times are around ten years. The displays are fairly simple — the system generates a new galactic map each time you play, and you can get long-and-short-range scans of this, plus information on your troop dispositions.

I felt compelled to play this one right to the end, but having conquered the galaxy, I didn't really feel like repeating the experience.

Fin Fahey

RATING ■ ■



Mined Out

that it buddy, you have blown it. Mined Out worries me because it is addictive without being very wonderful. The packaging is good and Quicksilver has thoughtfully included a routine at the start to check that your television is tuned in properly.

The thing about Mined Out is that you really do have to keep playing it to discover if there really is a worm at the seventh level. I don't know yet, perhaps just one more try...

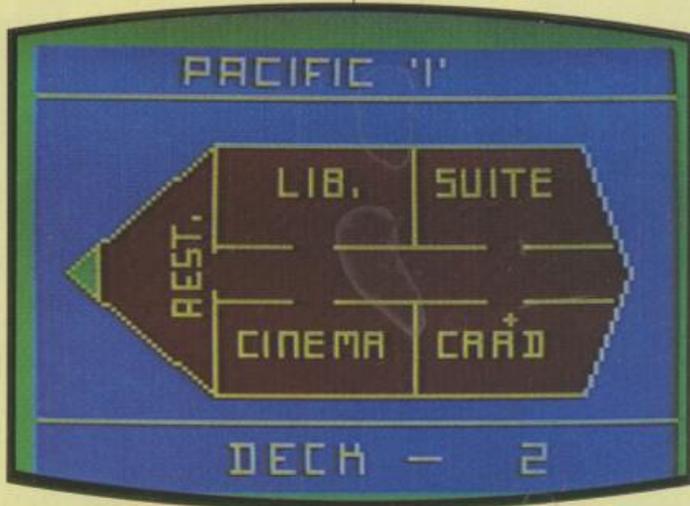
BB

RATING ■ ■ ■

Death Cruise

Virgin Games

AT FIRST sight Death Cruise



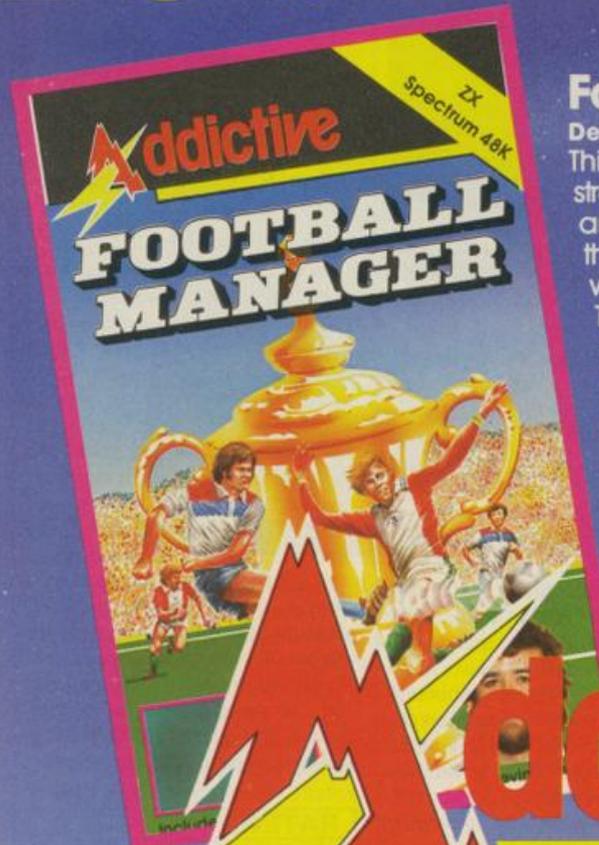
Death Cruise

DRAGON



The No.1 Football Game

ZX81 16K-
ZX Spectrum 48K
BBC and Oric versions coming soon!



Football Manager

Designed by Kevin Toms

This outstanding game of skill and strategy is now widely available and you can join the many thousands of satisfied customers who have purchased the game. This is no five minute wonder – you will be playing this game for hours over many weeks (we know – our customers tell us!).



Kevin Toms

Some of the features of the game:-

- ★ Matches in 3D graphics
- ★ Transfer market
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- ★ Save game facility

Addictive

*ZX81 Chart, Home Computing Weekly 16.8.83

Comments about the game from press and our customers

"FOOTBALL MANAGER is the best game I have yet seen on the Spectrum and my personal favourite of all the games on any micro ... To the ordinary person it is an excellent view of what can be done in the field of computer games ... The crowning glory of this game is the short set pieces of match highlights which show little stick men running around a pitch, shooting, defending and scoring ... It is a compulsive game but people who cannot take game sessions of 9 hours or so, which happened on one happy Sunday, will be grateful to know that there is a 'save to tape' option. FOOTBALL MANAGER has everything it could ... The

originator, Addictive Games, certainly deserve the name." Rating: 19/20 (Practical Computing – August 1983).

"When I first received this game I spent the best part of the weekend playing it. Since then I have returned to it more often than any other. The truly addictive quality of this game is the remarkable way it mirrors the real football manager's problems ... (Personal Computer Games – Summer 1983)

"It's my own fault you *did* warn me – I am totally and completely hooked on FOOTBALL MANAGER." (Mr. A. Wright – Lancashire.)

"It is by far the best software game that I have seen for the Spectrum." (Mr. N. Lincoln – Surrey.)

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Super Meteors

Super Meteors

Softek

SOFTEK HAVE opened their line of ORIC software with this version of Asteroids. They've made few changes to the original arcade format. One addition I like is that while the energy lasts, you now have a force field to protect your ship — you need it!

A good version too for beginners — frame one is a push-over, although the saucers which appear occasionally seem to me to be more deadly than in the original arcade game. The Hyperspace key is not included, I for one don't miss it, I always felt that a random game move was a bit of a cop-out.

I have a stylistic niggles about the asteroids — they're solid rather than the original outline versions, but maybe I'm a purist.

The sound effects really are not too spectacular either. The instructions supplied are entirely adequate

and the program's pretty compulsive so minor quibbles apart, I feel this does justice to a classic game.

Fin Fahey

RATING

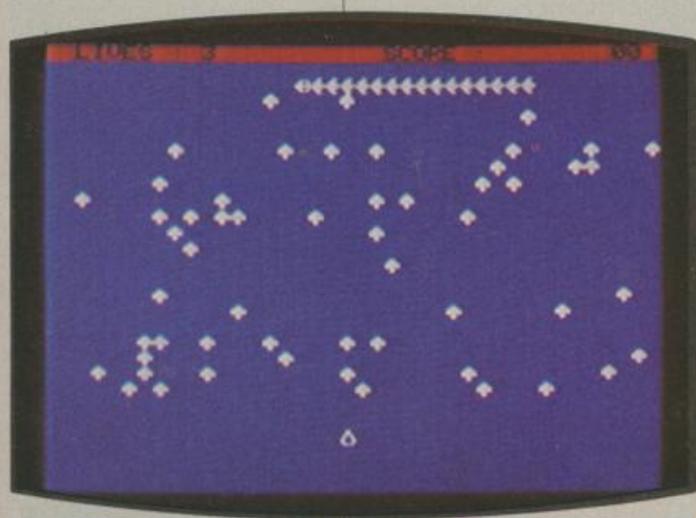
Centipede

P.S.S.

I'VE ALWAYS found this game irresistible in arcades — anything to get away from space technology. There's not much point in explaining the game too much — it's very similar to the arcade original, which is its strength.

Basically it's a matter of zapping the creature as it comes at you through a field of mushrooms — of course, the problem is that it tends to break into segments as you hit it. Chuck in deadly spiders and mushroom laying bugs (a strange biology this) and you've got your hands full.

P.S.S. have gone to some trouble with this version, the bugs are



Centipede

suitably wriggly and loathsome, sound effects are adequate and there's an arcade-style Hall of Fame. The best thing is that you can feel that the ORIC's resources are really being used. This one will run and run.

FF

RATING

Hopper

P.S.S.

SOMETIMES I wonder just how many versions of this game are floating around. So far this is the only ORIC one I've seen. The game of course is Frogger, and in it you are faced with helping a little frog find its place in the sun on a waiting lily-pad. Cutesville, huh? But, of course, in the process you must avoid getting Kermit squashed by a lorry, bitten by a snake, or

to make coffee in mid-game. You can even turn off the incessant manic musical background — it's cute at first, but a threat to sanity if prolonged. All in all a very tasty little package.

FF

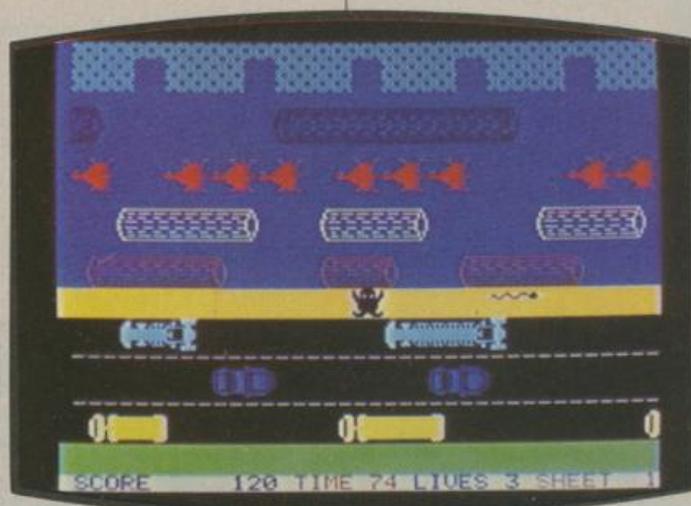
RATING

Starfighter

Durell Software

IT SEEMS to me that this is a good idea that hasn't quite come off.

Basically you move from one galactic sector to another, zapping three alien ships (presumably Klingons) in each. The game allows you a choice of methods. You normally have the rather diagrammatic display which lets you fire photon torpedoes, or you can switch to a cock-pit display where you use



Hopper

drowned...

P.S.S.'s rendering of this immortal tale is a little pared-down — there are no alligators or otters in the river, which makes it a bit too safe in my opinion. Well you can't have everything. Having said that, I must admit that this program had me glued to the screen — it's smooth, responsive and colourful. The makers have gone to the trouble of allowing you to configure the keyboard for left- or right-handed people — a rare spot of consideration.

There's a Hall of Fame, and a Pause function, which allows you

phasers in dogfight mode. This gives you a game, which is a good idea, even if a little simple.

I found it a bit boring finding the enemy in the first place, and having made my Sector Kill Quota, even more boring trying to find a Star-gate to get out of the Sector. A very niggling point is that the ORIC's key-click is enabled throughout, which can cause insanity if you're using a lot of keys on auto-repeat. I felt there was something missing in this game — it didn't hook me at all.

FF

RATING

ORIC-1

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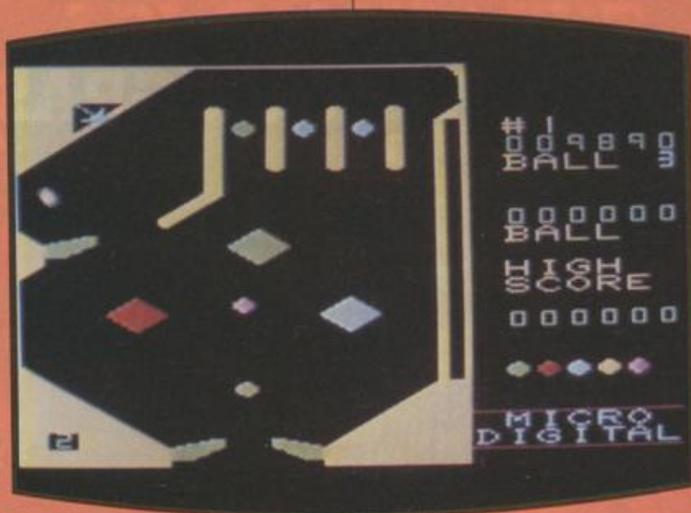
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Pinball Wizard

Terminal Software

IF EVER you were a pinball freak, then this one is for you. Actually I don't play pinball, but I enjoyed this, or rather I admired the animation of the game. You pull back the plunger as far as you like (f5) and release it (f7) and out shoots the ball into the table. You operate three flippers to keep the ball in play, just like the real thing. The ball can go through a series of gates hitting rollovers, bumpers or a jackpot. Hitting a bumper can make the ball ricochet against the side like a machine gun, just like in the fair-ground.

Despite odd bouts of quickfire, the ball gives the impression of travelling through a light syrup, which anyway probably gives the less experienced more time to react. There is also a nudge facility which according to instructions, if you



Pinball Wizard

gobble up all the eggs before a snake gobbles you up instead. The animation is excellent with the snakes coiling round on themselves or gliding with realistic menace. All this is accompanied by a rhythmic hissing sound that makes you instinctively feel this is no game but for real.

Perilous post

Impact Software

THIS is quite fun, and works in the same way as Hopper, but has been made more elaborate. Instead of being a frog (as in Hopper) you are the postman in your van which is moved by joystick or by the keypad. You have to cross two railway tracks avoiding the shunting trains, and then cross two rivers by leaping on passing boats. Next there is a housing estate through which the van must be taken to deliver a parcel.

The roads are patrolled by traffic

wardens, not unlike demented mosquitoes. However, by driving over a red sunflower which makes sporadic appearances, you can then liquidate the traffic wardens with much fanfare from the sound section — very satisfying. Having delivered the parcel (hopefully) it is back again to the other side of the railway tracks to pick up a new parcel. Everything is performed against the clock, and on the second and subsequent parcels, everything is speeded up too. Graphics are good with reasonable overall sounds. £6.50.

LS

RATING

Creepers

Virgin Games

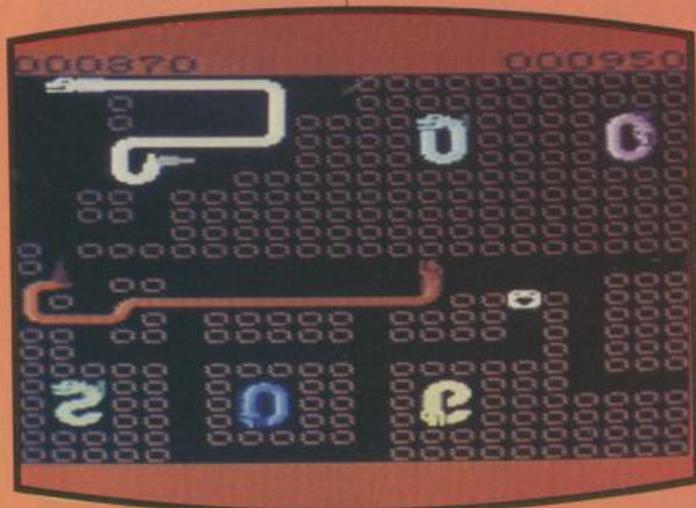
ANOTHER moderate zap-zap game. This time you control a fighter defending an underground city's energy blocks. Aliens swoop down from the roof above and you have to zap them before they steal your blocks.

Shooting from the fighter gives more the impression of using a precision rifle. Should an alien elude the shots and steal all the blocks beneath him, he turns into a mutant and attacks you. These attacks are rapid and vicious, and are more reminiscent of a missile homing in on its prey.

Sound effects are good, but overall, the game lacks lustre.

LS

RATING



Snake pit

over-use, it causes the table to tilt, in other words the flippers go dead so you can lose the ball. In my program it always tilted when I pressed the nudge key — shame.

With this one you have to admire the animation, although it's more slick than rivetting. There is a one and two player game system. £7.95.

Lance Sucharov

RATING

Snake pit

Postern

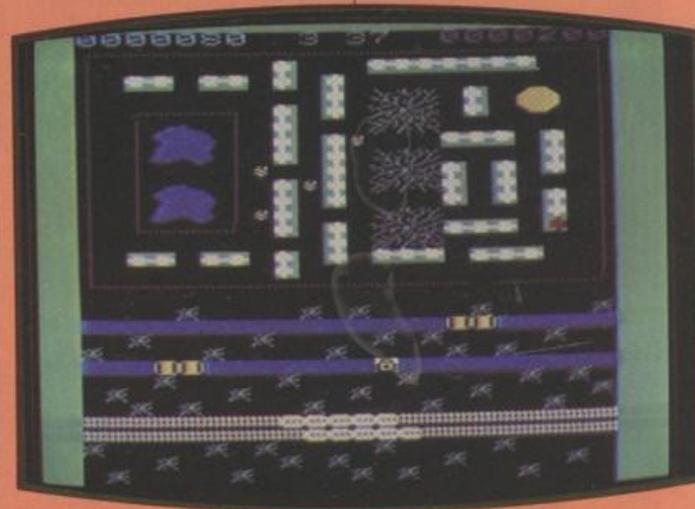
ONE of the greats. You're a little gobbler with six snakes in a pit and acres of eggs (snakes' eggs presumably). The object is simply to

There are rules, however, such as the eggs themselves are a barrier to the snakes, so you can leave the snakes walled up to near the end. Unfortunately, one snake (the red one) is able to gobble up eggs too and sometimes release all his mates to hound you about the screen.

After several hours you may be lucky enough to consume all the eggs (with some help from the red one). Then you are able to turn the tables and consume the snakes. The gobbler has to touch a tail and then dementedly chews the snake to bits, with good sound effects. If you eat all the snakes the game starts again. Its only detraction in the long term is that there is not much built-in variety in the game. £6.95.

LS

RATING



Perilous post

VIC-20

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All games 16K unless otherwise stated

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TRIPLE TEST

ALTHOUGH it is now more than a year old, the popularity of the Sinclair Spectrum is still increasing. There are a number of machines that come close to rivalling it on both price and performance, but nothing approaches it either on the wide variety of software available, or on the number of machines sold.

The nearest rival to the Spectrum is the Oric, it too is available in 16K and 48K versions, and for a few pounds more it offers a number of improvements over the Spectrum. The Sord M5 is the closest the Japanese have come to producing a mass market home micro cast in the Spectrum mould. It costs a fair bit more than the Spectrum, but does offer the user a number of interesting features that may tempt a potential Spectrum purchaser to find the extra money.

DISPLAY AND GRAPHICS

SORD	████████
SPECTRUM	██████
ORIC	███

One of the best features of the Sord M5 is the sprite graphics. Sprites are sections of the graphic display which can move smoothly around the screen independently of anything else that the computer happens to be dealing with at any one moment. There are 32 sprites available on the Sord, which means that an awful lot can be happening on the screen at any one moment.

It is sprite graphics which make the real arcade games that one sees so visually attractive. Unfortunately the Sord M5 is let down because these wonderful graphics are difficult, if not impossible, to use from the Basic which is supplied with the micro, you need Basic-G which costs an extra £30.

Any of 16 colours can be used on the screen at any one point which compares with eight colours on the Spectrum and eight true colours on the Oric. The



BASIC

SPECTRUM ■■■■

ORIC ■■■■

SORD ■■

Basic-I was supplied with the Sord as standard and is fairly primitive, however, a better version of the language may be purchased on cartridge, like Basic-I. There are currently two other versions, Basic-G which is for graphics programming and a floating-point Basic for mathematicians and financial users.

Language cartridges can be a good idea, but they tend to add to the cost of a micro, the optional Basics for the Sord both weigh-in at around £30. Basic-I itself is a beginner's version of Basic, which is supposed to be a beginner's language anyway. The manual is none too clever either being an especially difficult nettle for beginners to grasp. Basic-I also suffers from being non-standard, that is it differs from Basic on other machines by a greater degree than is usual.

Maybe the biggest disappointment about the Sord is the low amount of Ram. This is the memory which programs and data are stored in and the more there is of it the bigger and better the programs that can be run on the machine. To some extent this may not be too important as the Sord has a range of games available on plug-in cartridges which do not require much RAM.

Sinclair Basic is possibly the most widely used variant of any programming language anywhere. There are in excess of a million Sinclair users in the world all using a similar dialect

to program their micros. The Spectrum version is better than that of the ZX81 because more can be done with it.

Sinclair Basic is easy to learn and incredibly well documented. In minutes a programmer can be getting to grips with the workings of the micro. It contains commands to make the most of the micro's hardware such as INK and PAPER which define the colours to be used on the screen, and CAT and OPEN which work with the microdrives.

Oric Basic could be better than Sinclair Basic but it still contains one or two small bugs or errors. Again it is easy to learn and easy to use and it also makes the most of the micro's hardware. The sound commands are especially good but unfortunately the graphics commands although comprehensive are not as straightforward as they might appear at first sight.

MANUALS

SPECTRUM ■■■■

SORD ■■

ORIC ■■

There are two manuals supplied with the Spectrum, and both are very well thought out. The first is an introduction to computing and programming written for the beginner in a very clear style. A lot of simple examples are provided in both books and between them there are more words than in any other manual provided with a home computer.

A number of appendices are included to make life easier still, together with some longer example programs to get the user started. The index is com-

prehensive and the chapters are arranged in a logical order that provide the Sinclair owner with a complete programming course. It is the documentation standard by which other micros can be judged.

Also included with the Spectrum is a very good introductory cassette which includes a number of programs specifically chosen for their demonstration value and their simplicity. A demonstration cassette including a games program is supplied with both the other micros, but they are nothing like as good as the free Horizons cassette supplied with the Spectrum.

The documentation with the Oric is awful, though to be fair, there are worse. In a number of places it is actually wrong, but more important it leaves a lot of important information out. Some times the manual is trivial and patronising and at other times it launches into really difficult areas without so much as a by-your-leave.

Sord's documentation is fine if you happen to be a computer expert with a degree in reading translated Japanese. Some of the time being psychic helps too, especially if you are a beginner.

EXPANSION

SPECTRUM ■■■■

SORD ■■■■

ORIC ■■

Recent developments have added two interfaces to the Spectrum making it a very expandable micro. There are also a great deal of independently produced items to make the ZX Spectrum the thinking heart of

HOW THEY LINE UP

Oric

For: Brilliant sound, nice price, elegant looks.

Against: Manual is awful, not much software yet, early models had trouble with video display.

Sord M5

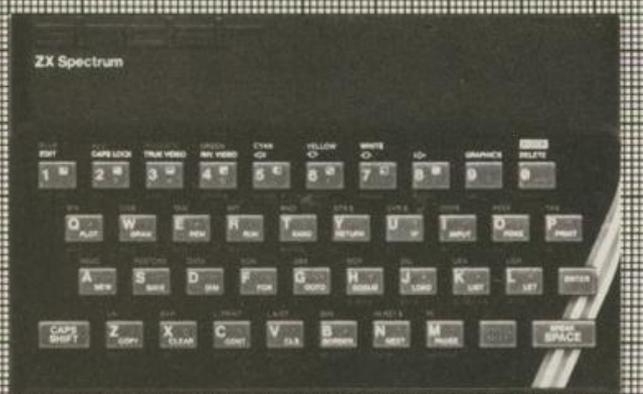
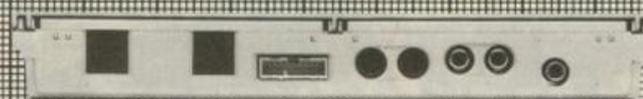
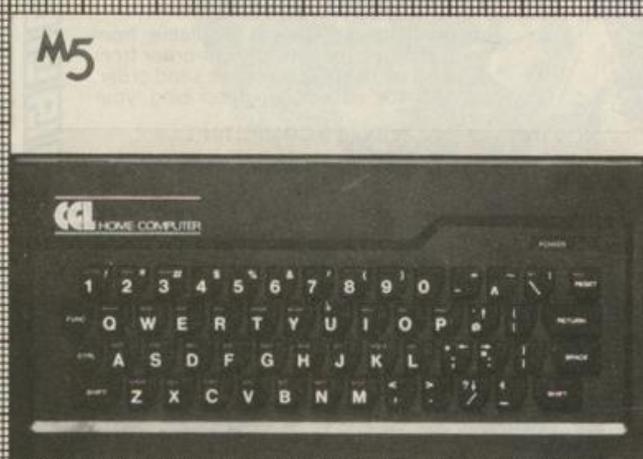
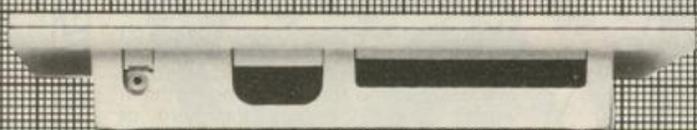
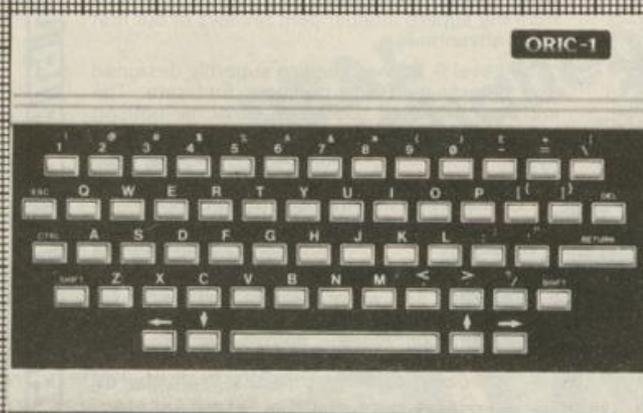
For: Sprite graphics, cartridge and joystick ports as standard.

Against: Keyboard weak Basic, expensive alternative to Spectrum or Oric. Poor software range.

Spectrum

For: Excellent software available, wide range of add-ons, fast becoming the standard by which others are judged.

Against: Keyboard feels like dead flesh, sound very quiet.



a highly sophisticated computer system. The microdrives are maybe the most important of all. These are small devices which use cartridges of video tape to store data in a form that is quickly retrieved. Software can also be purchased on microdrive cartridges.

The two interfaces provide the Spectrum user with access to cartridge software, joysticks, communications facilities, printers and the microdrives. There is also a Sinclair ZX printer which is a low cost way of getting permanent copy out of the machine.

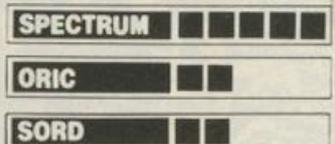
Independently produced items include various speech synthesisers, music synthesisers, control devices and even a graphics input device.

To date there is not a great deal of Oric add-ons on the market. There is an excellent printer and there will shortly be some real floppy discs that offer a much better form of storage than the Sinclair microdrives.

Oric Products intend to keep the flow of new peripherals coming, and amongst the products lined up for the future is a teletext adaptor which will enable Oric users to connect up with Prestel.

Joypads are supplied as standard with the Sord, they are hand-held controllers which perform the same function as the more conventional joysticks, but by touch. The machine is also supplied with a cartridge port as standard which enables the quick loading of software.

SOFTWARE



It is early days yet for the Oric and Sord, but it is unlikely that either micros will have as great

a variety of software produced for it as the Spectrum. The software available for the Spectrum is fantastic. Each month there are literally hundreds of new programs released for the Spectrum and among them a reasonable percentage of good ones.

New developments such as the microdrive and the cartridge slot will help add to the wide range of programs available. It seems that the Spectrum has brought out the best in the computer programmer.

Oric software is beginning to appear, but it is of very variable quality. As more machines are sold the Oric software range will increase as more and more software houses decide to start catering for the Oric owner.

To date there has not been much independent software produced for the Sord. And most of what has appeared is in cartridge form and fairly expensive. That is not to say that it is not good.

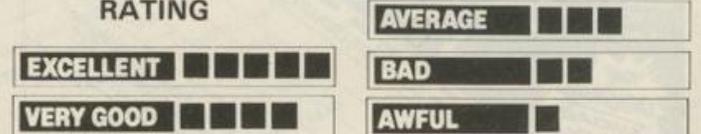
VALUE FOR MONEY



The Spectrum is about the best value micro on the market today at slightly under £130 for the 48K model and £100 for the 16K model. What is more, Spectrum software and add-ons tend to be cheap too.

Not far behind the Spectrum is the Oric which has a better specification for slightly more money. On value it is difficult to fault either machine, however, the Sord does lag behind here slightly. For the extra £20 you get joypads thrown in, together with a few significant improvements over the Oric and Spectrum, but the lack of memory and the software availability may tell against it.

RATING



THE triple test ratings match those in the hardware buyers guide. They vary between a single block, which means that the micro in question is seriously lacking in the department under investigation, to five blocks, which means that in this area the micro is one of the best.

LEVEL 9 ADVENTURES

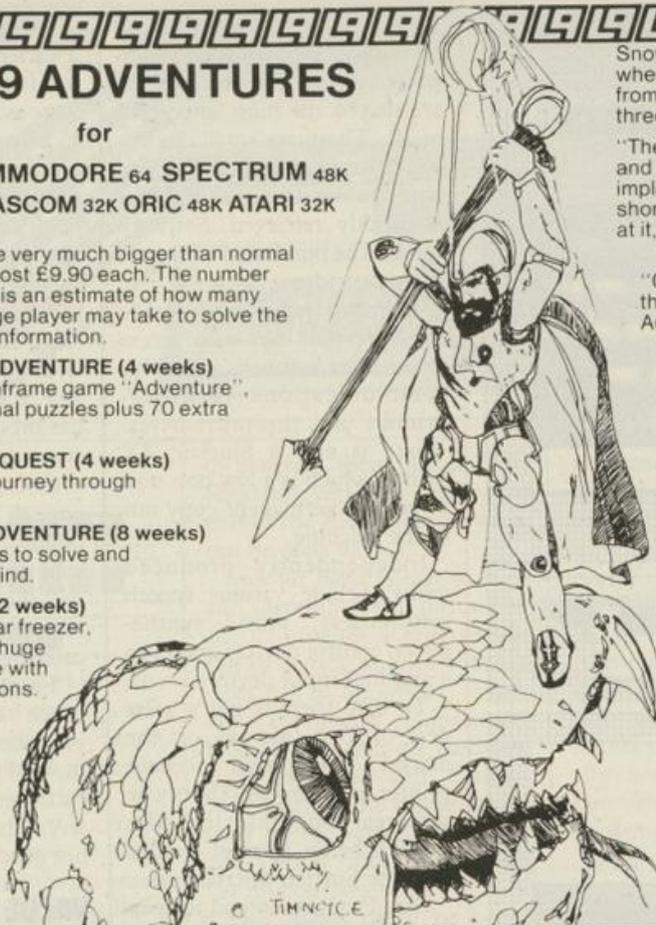
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Save the interstar freezer, Snowball 9, in a huge space adventure with over 7000 locations.

Note: a lot of players take much longer than the times above. Don't be discouraged if you are one of them!



Snowball was too new to have been reviewed when this ad. was placed, but here is a sample from the superb independent reviews of our first three adventures:

"The Level 9 Adventures are superbly designed and programmed, the contents first rate. The implementation of Colossal Cave is nothing short of brilliant; rush out and buy it. While you're at it, buy their others too. Simply smashing!"
-SOFT, September 83

"Of the programs reviewed here, the only one that is wholly admirable is Level 9's Colossal Adventure."
- Your Computer, September 83

"I found Dungeon exceedingly well planned and written, with a fast response. There are well over 200 locations and the description are both lengthy and interesting."
- Computer & Video Games, September 83

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"There are three excellent adventures on offer from Level 9... the descriptions are so good that few players could fail to be ensnared by the realism of the mythical worlds where they are the hero or heroine... great fun to play."
- Which Micro?, August 83

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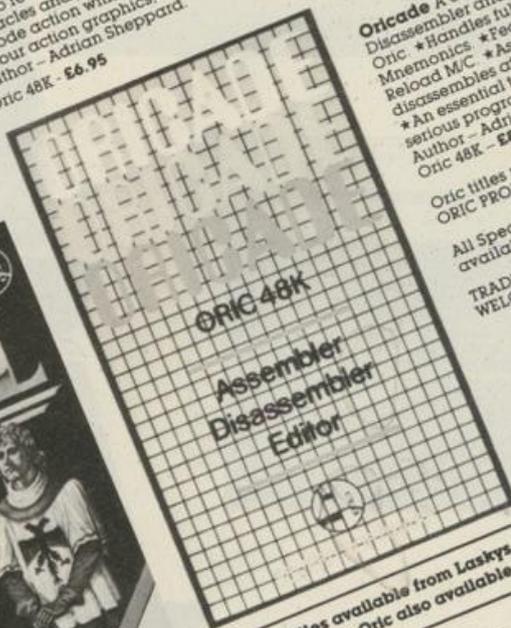


Dinky Kong Attempt to rescue your lovely girlfriend who is held captive by the angry gorilla. As you climb the connecting ladders and move along the gangways, the gorilla will be throwing barrels and fireballs at you! The only way to reach her is to leap over these obstacles and progress to the top. Miccode action with sound effects, full colour action graphics, skill levels etc.
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Grail You have been chosen to seek and recover the Holy Grail from the Castle Perilous. Throughout the course of your task you will have to use your skill, intelligence and logic (along with a little luck) as you encounter many foes. You will have the opportunity to gather weapons and armour to fight with, but if you are wounded your strength will drain away - many other features such as warp, jewels etc.
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Oricade A combined assembler/disassembler and editor for the Oric. *Handles full 6502 Mnemonics *Features Save and Reload M/C *Assembles and disassembles at any address. *An essential tool for any serious programmer.
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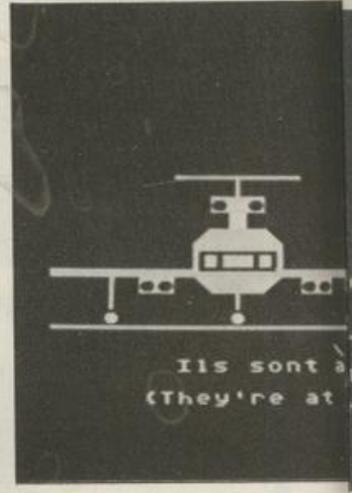
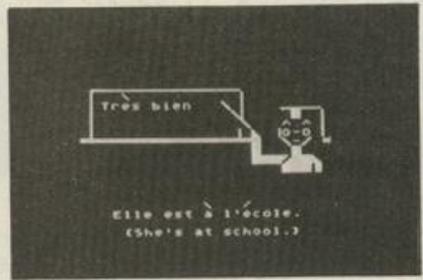
Je suis de Londres et je suis anglaise. Comment allez vous? Ça va? Ou est-ce que vous allez à une fête. J'ai du chocolat, j'ai du vin blanc. Je voudrais une chambre à Paris avec Atari.

"Je m'appelle Kirstie et je suis de Londres. Je suis Anglaise."

All double Dutch (or rather French) to you? Obviously you need to take a look at Atari's Conversational French program.

Qui est aller Chantal et Anne? Elles sont aller à l'aéroport. Ils sont aller à une fête.

à Paris avec Atari



FOR £39.99 you get a set of five cassettes and a handbook in a sturdy plastic folder, add the Atari Basic cartridge and a cassette player to your Atari 400 and away you go, over the Channel, first stop Boulogne.

Each cassette has two units, one on each side. These are split up again into two or three sections each of which loads separately. The initial loading takes three or four minutes and is remarkably trouble free, I only had loading errors with one unit, which disappeared on a second go.

Unit one, About You, launches you straight into conversational French. Forget about traditional grammar, declining verbs and everything that used to put you off, this is a very easy and practical look and listen method. This first section takes you through introductions, who are you, where do you come from.

The units build up an overall picture of places to go to, things to buy, how to ask questions, get a hotel room, order a meal, a survival kit of French for holidays or casual conversations, letters.

There are, of course, some drawbacks. The program was originally written for the American market. Words and phrases are Americanised; le garage is translated as gas station, l'essence as gasoline, place names are American in the main. This can grate rather and it seems odd that it wasn't adapted for the English market as only a few changes would make things a lot more authentic for the learner.

You can follow each unit in the handbook; they have a very basic outline of the lesson and a series of questions and puzzles to test you after each tape. The book provides a very useful back-up with a vocabulary list and basic grammar section at the back.

A typical unit is in two parts. The initial section sets out the task and gives examples. You leave the play button on the recorder down as the program runs and the correct pronunciation of each word or phrase is fed through the television speaker. There is a lot of watch, listen then repeat; you do feel rather silly talking to yourself at first, but it soon passes.

From there you move on to question and answer sections, pressing one or two for yes or no. Sometimes you must indicate the right

Où est allés Chantal et Anne? Elles sont allées à l'aéroport. Ils sont allés à une fête.

answer out of one or two, sometimes there is a multichoice where you have to string the right sentence together out of several elements.

On the later type the instructions are often not very clear but with a little practice you realise what to do. The machine plays a tune for a correct answer and a tune for your name. As you progress, the multichoice questions bring together all the elements from the previous units.

The basic aim of the program is to teach you enough French to hold a reasonable conversation. And it does succeed. By the end you could confidently set out for a weekend in Paris or a day trip to Boulogne and be able to buy what you wanted, order a meal and a room in an hotel and get a lot more out of the trip.

At the end of each unit you get a percentage score, so you can keep improving until you are confident and accurate in spoken French.

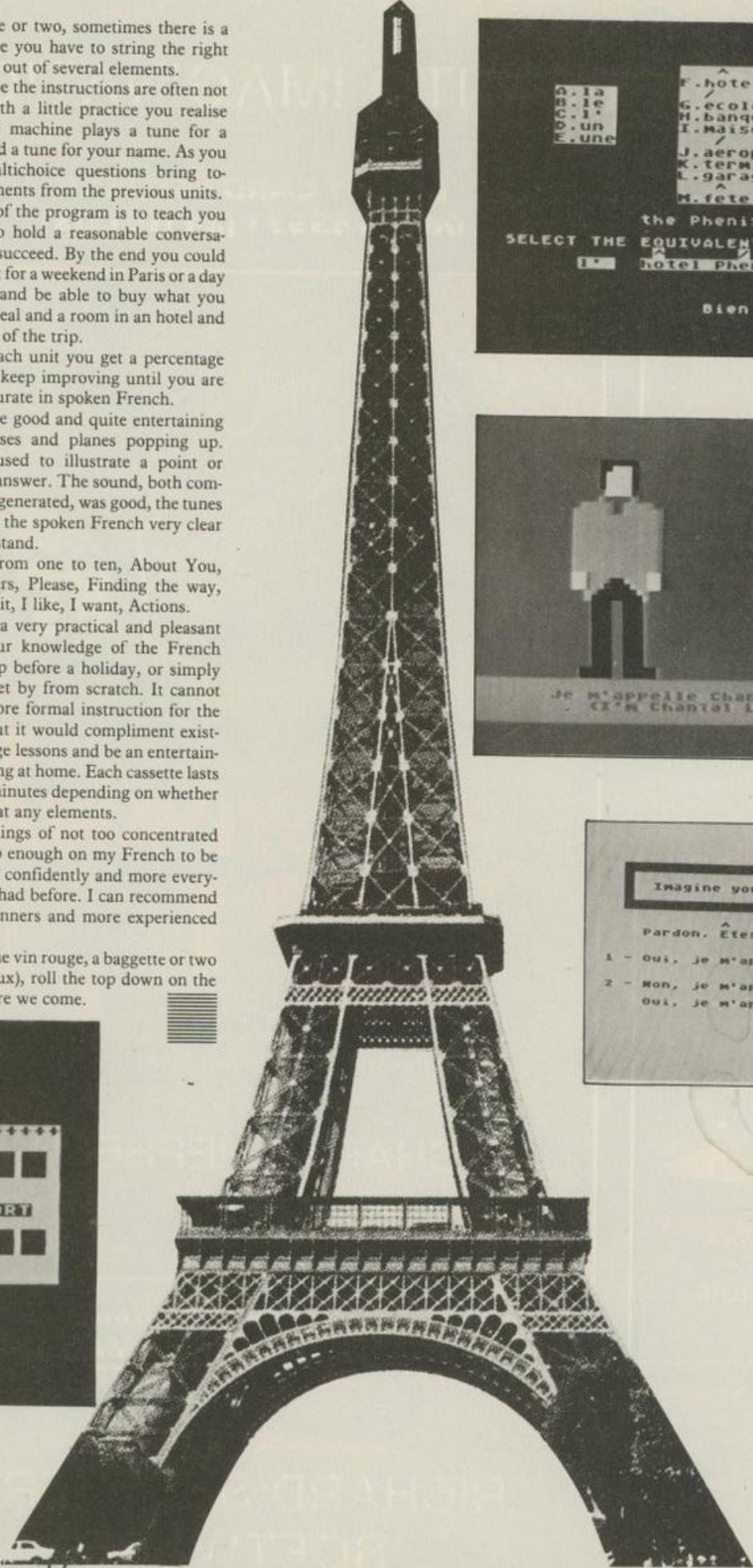
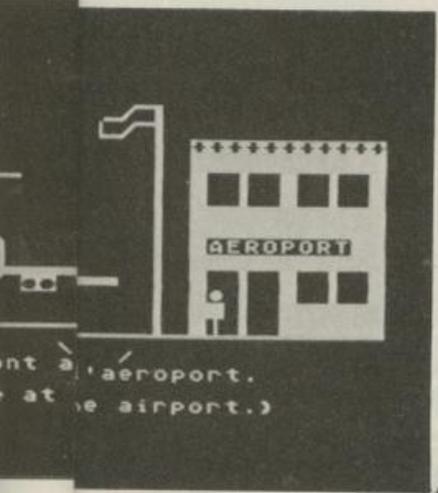
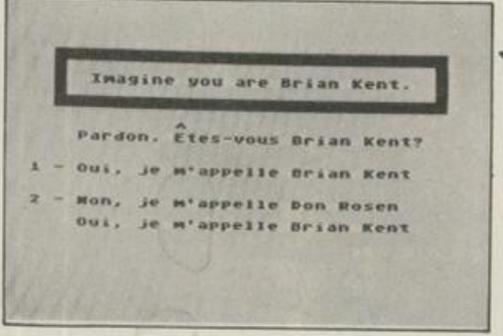
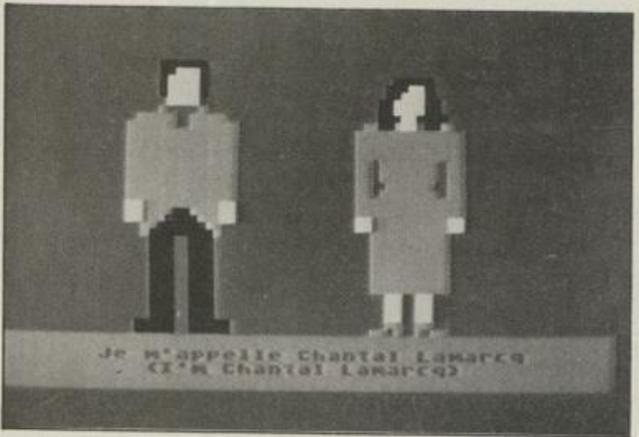
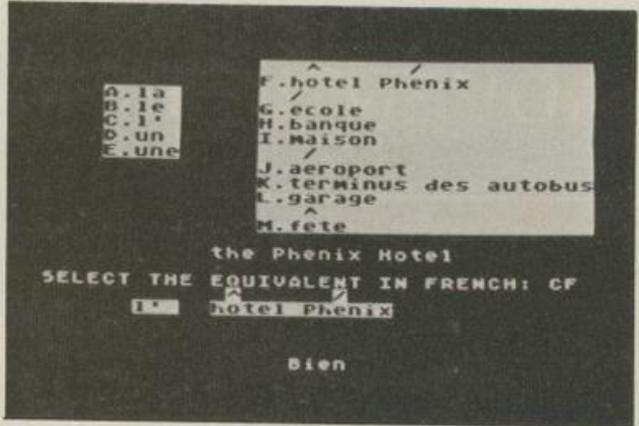
The graphics are good and quite entertaining with people, houses and planes popping up. Colour is often used to illustrate a point or indicate a correct answer. The sound, both computer and cassette generated, was good, the tunes were amusing and the spoken French very clear and easy to understand.

The units are from one to ten, About You, Yourself and others, Please, Finding the way, Where?, Describe it, I like, I want, Actions.

Atari French is a very practical and pleasant way to renew your knowledge of the French language, brush up before a holiday, or simply learn enough to get by from scratch. It cannot substitute for a more formal instruction for the serious student, but it would compliment existing school or college lessons and be an entertaining way of practicing at home. Each cassette lasts for around 20-30 minutes depending on whether you decide to repeat any elements.

Over a few evenings of not too concentrated study I brushed up enough on my French to be able to speak more confidently and more everyday French than I had before. I can recommend this course to beginners and more experienced francophiles alike.

So it's out with the vin rouge, a baggette or two (or should it be deux), roll the top down on the 2CV and Calais here we come.



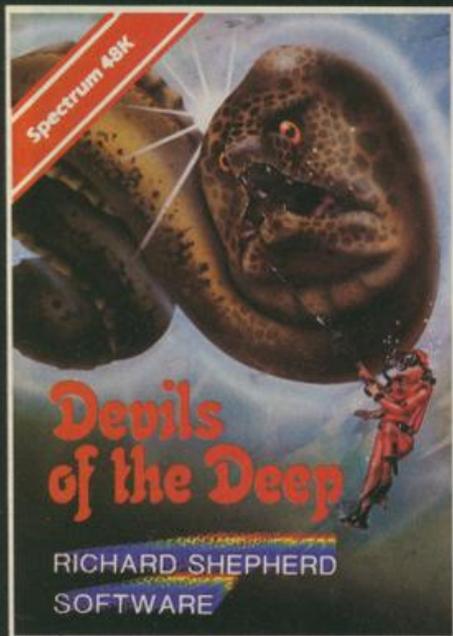
elles a une fête. J'ai du chocolat, j'ai du vin blanc. Je voudrais une chambre.

avec Je suis de Londres et de bus anglaise. Comment allez vous? Ça va.

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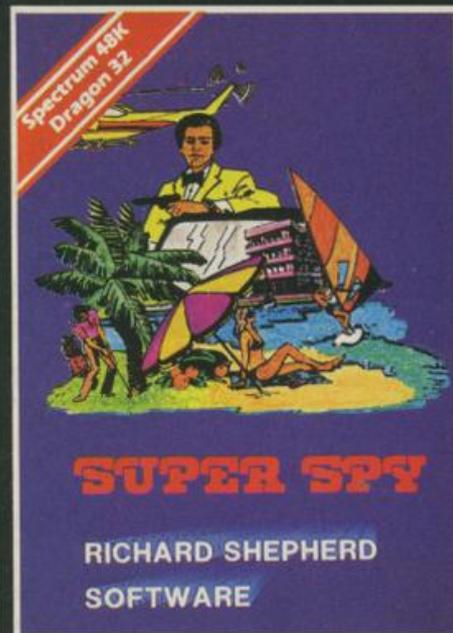


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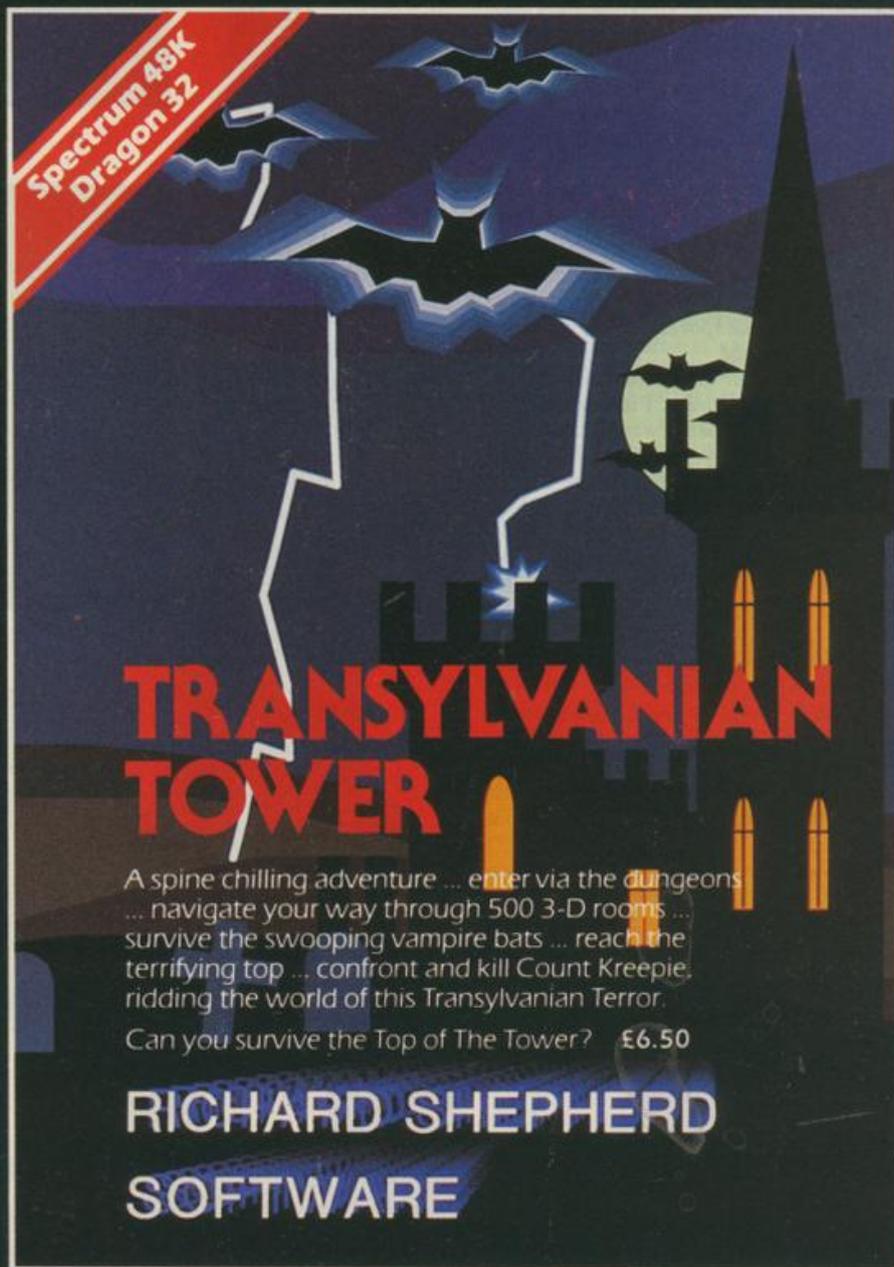


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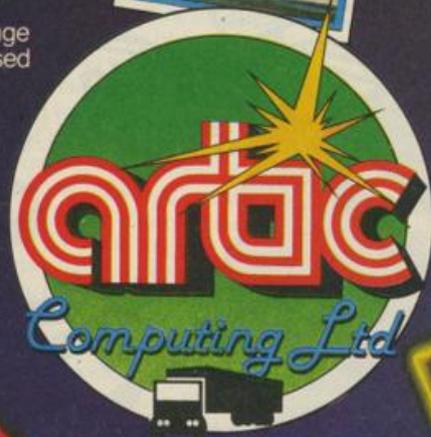
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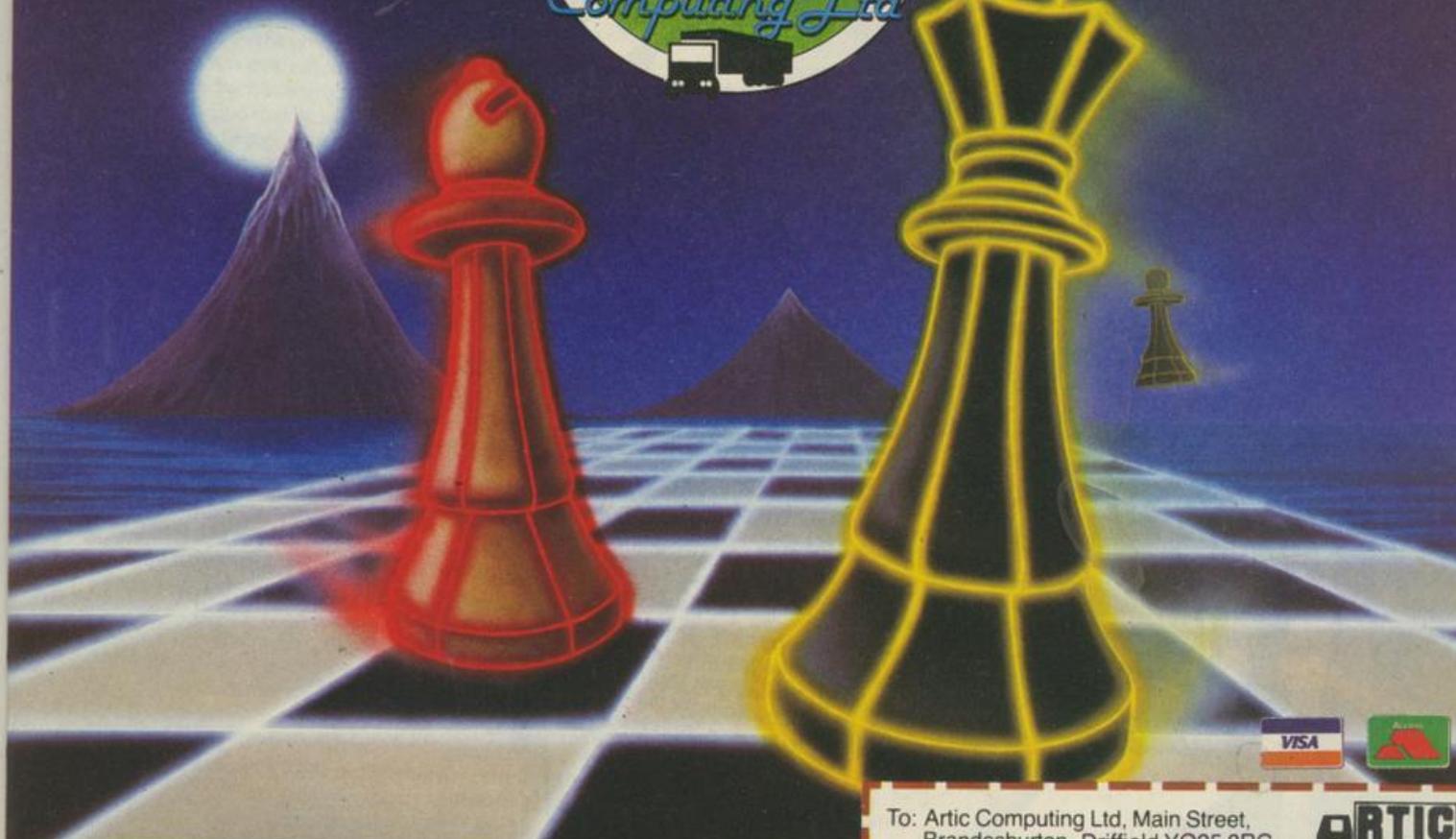


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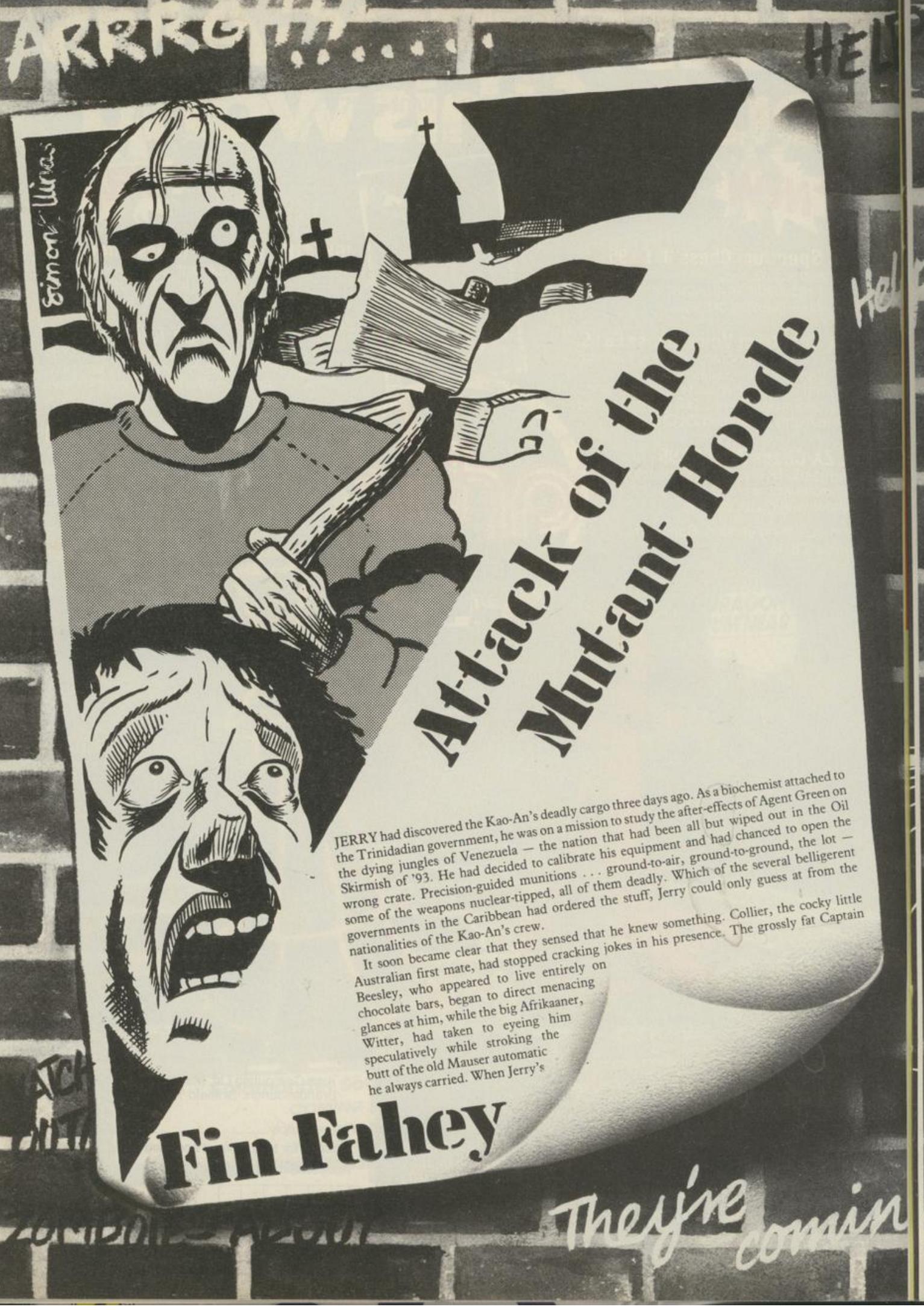
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Simon Uiras

Attack of the Mutant Horde

JERRY had discovered the Kao-An's deadly cargo three days ago. As a biochemist attached to the Trinidadian government, he was on a mission to study the after-effects of Agent Green on the dying jungles of Venezuela — the nation that had been all but wiped out in the Oil Skirmish of '93. He had decided to calibrate his equipment and had chanced to open the wrong crate. Precision-guided munitions . . . ground-to-air, ground-to-ground, the lot — some of the weapons nuclear-tipped, all of them deadly. Which of the several belligerent governments in the Caribbean had ordered the stuff, Jerry could only guess at from the nationalities of the Kao-An's crew.

It soon became clear that they sensed that he knew something. Collier, the cocky little Australian first mate, had stopped cracking jokes in his presence. The grossly fat Captain Beesley, who appeared to live entirely on chocolate bars, began to direct menacing glances at him, while the big Afrikaaner, Witter, had taken to eyeing him speculatively while stroking the butt of the old Mauser automatic he always carried. When Jerry's

Fin Fahey

They're coming

HIDE

carefully placed bugs revealed the extent of their plans for him, he moved fast. He felt no bitterness towards the crew — after all few people in this last decade of the millenium were not involved in the War, but he'd seen enough eco-destruction not to wish any more on an already devastated continent.

After setting the shaped charges, and collecting equipment and provisions, he'd slipped overboard in a small dinghy, to make for one of the small tropical islands visible on the horizon. The old tramp steamer had gone up when he was little more than half-way. From the violence of the detonations, it seemed likely that the crew had never had a chance. Jerry shook his head pityingly. He was thankful that none of the nukes had seen fit to go off.

He turned away and, bending his back to the oars, continued to appraise the island looming up ahead. Like most of the once lush tropical land in the region, it had suffered. Something had removed most of the tree cover, the pathetic remnants of which stood out as tufts silhouetted against the sky. Jerry patted the Geiger counter at his side with a worried look. The black polymer radiation suit he wore was proof against most things, but not for ever. He was hoping that his radio signals were picked up within the week — and then — well, almost everyone needs biochemists, and that was only one of his skills.

After what seemed an eternity of rowing he staggered ashore and dragged out his detector kit. Neither the air nor earth in his immediate vicinity contained any of the agents of death currently fashionable, so Jerry ripped off his mask and collapsed gratefully onto the pebbly beach. The stress of the last few days, coupled with his recent exertions, had told, for he slept deeply and woke to find a swollen sun rising balefully through smoggy clouds.

There was no sign of the Kao-An — she'd evidently gone down during the night. Jerry activated the automatic distress transmitter and began to evaluate his surroundings. The tide lapping at his feet bore a chemical scum, the detritus of industry and war. The air was acrid with a faint hint of decay. No birds sang, no insects buzzed. Sniffing, he gazed inland. The scraggy abused-looking tree-line hardly seemed inviting, still he would have to check it out.

Jerry wandered through the scarred palm trees, warily checking his detectors, nerves on edge. Huge areas of jungle had been replaced by patches of barren, wind-stirred dust. Like a corpse, he thought, the bones protruding through the decaying flesh. Here and there shrubby vegetation sought to regain a foothold — in time, perhaps, the island would recover. If left alone, he thought bitterly. The Geiger emitted an agonised squawk. Checking the read-out, Jerry found the background radiation count increasing as he moved inland. Abruptly the trees gave way to a sheet of lucent green glass, shimmering in the morning sun. The soil itself had been fused by thermonuclear heat. A test? he wondered . . . or had there been fighting here, and if so what over? Shrugging, he moved on, skirting the zone of worst radiation.

He became aware of a distant throbbing — drum beat — heart beat? Remembering old Caribbean voodoo tales, he told himself his imagination was playing tricks. He shook his head and certainly the sinister pulsation seemed to have stopped. No one after all could have survived in this place of death. Breasting a shallow rise, he found himself on the edge of a plain packed with many shallow depressions each about ten feet in diameter. About to return to the beach he froze in his tracks — the throbbing bass note had returned. It seemed to be emitted by the depressions. Investigating he found that each one was inhabited, not by shadow but by a glistening, oily black mass, which simmered and boiled with a furious activity. Every now and then the puddles would pulsate in unison, producing the strange drum beat. Jerry squatted by a particularly large hole towards the centre of the plain.

The air was steamy, chemical-laced. He took samples and checked the temperature of the stuff — about blood heat. Oil probably, he thought, released by the nearby nuclear detonation. Presumably some sort of low-level volcanic heat had also been released, and this was stimulating the activity. But . . . the crude oil shouldn't boil at blood temperature! As he contemplated the enigmatic pool, he realised that its matt surface had altered — it was now reflecting his features. He blinked, and felt a shock of fear — it was no reflection. A human face was emerging from the fluid!

Jerry drew back in horror as an entire human head appeared above the surface, to fix him with an unblinking oily gaze. Panicking, he swivelled to run, only to find that by many of the black pools stood human shapes. Or perhaps humanoid — he hastily corrected himself. For examining the nearest of the beings, Jerry realised that it was a caricature of his own form, right down to the detector kit clutched in the right hand. Only — the equipment and the hand formed a seamless whole. Mimesis! thought Jerry — he grasped at the word, needing an explanation to bolster his sanity — the ability of some living things to imitate their surroundings.

The massbeat intensified until Jerry felt his head would burst, and then, as though activated by a common signal, the creatures began to shuffle towards him, faces writhing in an obscene travesty of human expression. Zombies! Jerry thought, remembering his voodoo — he half expected the monstrous Baron Samedi, Lord of the Undead, to come leaping and cavorting across the plain to reap his soul.

With a cry Jerry unfroze. He ran, twisting and turning between the puddles in a deadly game of tag. He was fast, but the zombies had numbers on their side. Sweating and panting, he found himself hemmed in, a puddle behind, three of the things approaching from different directions. It suddenly seemed, however, that there were fewer zombies than before. As he watched, one of them disappeared into a puddle. There was a series of sickening gurgling sounds and the puddle boiled furiously finally lying still as though satiated.

Straight lines! he thought — they only travel in straight lines! Like heat-seeking missiles, the mutants' only imperative was to home on Jerry, their prototype. Jerry dodged around the nearest puddle and began to move towards the edge of the desolate plain, keeping puddles between himself and the zombies. He had one or two close shaves, but by the time he reached the jungle edge, all the things had disappeared. He stopped to catch his breath, and seeing no further signs of life, trudged back to the beach.

He spent a fitful night there, his dreams haunted by monstrous mutant beings, but the next day was picked up by a Panamanian hydrofoil. The crew laughed at his story — they were a hard-headed lot, returning from a search and destroy sweep against pirates, now enjoying a come-back in the Caribbean. They were happy to put him ashore at Panama City — since the demise of the Northern Hemisphere, technical expertise was in short supply. Only then did Jerry seek to understand his experience in depth.

When analysed, the samples he had taken proved to be full of chemical structures resembling RNA, the 'memory molecule' of living cells. There were, however, no cell membranes. Whatever was on the island resembled a giant amoeba — one huge living cell, permeating the geological structure of the whole island. What hellish interaction of hard radiation, war chemicals, and Caribbean crude had spawned the monster, it was impossible to guess, but there was no opportunity for further study.

By the time Jerry had convinced the Panamanians of the need for an expedition, the island, and in fact the entire northern seaboard of South America, had disappeared when the Indonesians demonstrated the Earthquake Bomb, thereby ending The War. For a while Jerry was glum — he'd thought of a thousand industrial uses for a mimetic life-form. Finally calmed by the tranquillities of post-war life, he found other matters to divert him.



ng!

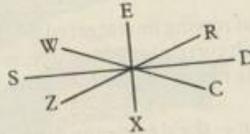
terand

SPECTRUM

```
10 REM ATTACK OF THE MUTANT HORDE
20 REM AUTHOR FIN FAHEY
30 REM SEPT 1983
40 REM
50 REM
60 REM RANDOMISING LOOP
70 REM
90 CLS
95 GO SUB 2000: REM INITIALISE
100 PRINT "ENTER RANDOMISING FACTOR (1-
1000) ";
120 INPUT I
130 LET R=2
140 FOR N=0 TO I
150 GO SUB 200
160 NEXT N
170 GO TO 600
180 REM
185 REM
190 REM RANDOM NUMBER ROUTINE
195 REM
200 LET RN=1+INT (RND*R)
210 IF RN<RM THEN GO TO 200
220 RETURN
260 REM
270 REM
280 REM GEN PURPOSE PRINT S/R$
290 REM
300 PRINT AT 15,6;"
";
305 PRINT AT 15,6;M$;
310 BEEP .25,12
315 PAUSE 60
320 RETURN
330 REM
340 PRINT AT PY,PX;M$;
350 RETURN
360 REM
370 REM
380 REM KEYBOARD ROUTINE
390 REM
400 LET I$=INKEY$
410 IF I$="" THEN GO TO 400
420 RETURN
560 REM
570 REM
580 REM START A NEW GAME
590 REM
600 CLS
605 REM PRINT SCORES
610 LET PX=0: LET PY=0: LET M$="YOUR":
GO SUB 340
630 LET PX=26: LET PY=0: LET M$="MUTANT
": GO SUB 340
640 LET PX=0: LET PY=1: LET M$="SCORE":
GO SUB 340
650 LET PX=26: LET PY=1: LET M$="SCORE"
: GO SUB 340
660 LET PX=0: LET PY=2: LET M$=STR$ (YS
): GO SUB 340
670 LET PX=26: LET PY=2: LET M$=STR$ (M
S): GO SUB 340
675 REM PLOT ISLAND
680 LET PX=5: LET PY=0: LET M$=A$: GO S
UB 340
690 LET PX=5: LET PY=14: LET M$=A$: GO
SUB 340
700 FOR N=1 TO 13
710 LET PX=5: LET PY=N: LET M$=B$: GO S
UB 340
720 LET PX=24: LET PY=N: LET M$=B$: GO
SUB 340
730 NEXT N
735 REM
740 REM PLOT PUDDLES
```

GAME INSTRUCTIONS

TO PLAY Mutant Horde you must first enter a number to randomise the game, always ensuring it's different. You can then start the game. Within the square island, Mutants are shown as "M", Puddles as "O" and you, Jerry Cornwall as "*". To move you must use the following keys:



When you have moved, it is the Mutants turn. You may be killed by falling into the ocean or puddle or encounter with a Mutant. You win when all the Mutants have fallen, and you now may go onto another game. Good luck.

```
745 REM
750 LET R=30: LET RM=15
760 GO SUB 200
770 LET NP=RN
775 LET M$="O"
780 FOR N=1 TO NP
790 LET R=13: LET RM=0
800 GO SUB 200: LET PY=RN
810 LET R=23: LET RM=6
820 GO SUB 200: LET PX=RN
830 GO SUB 340
840 NEXT N
850 REM
860 REM PLOT MUTANTS & STORE
CO-ORDINATES
870 REM
880 REM
900 LET R=15: LET RM=5
910 GO SUB 200: LET NM=RN
920 FOR N=1 TO NM
930 LET R=13: LET RM=0
940 GO SUB 200: LET Y(N)=RN
950 LET R=23: LET RM=6
960 GO SUB 200: LET X(N)=RN
970 LET PX=X(N): LET PY=Y(N)
975 LET M$="M": GO SUB 340
980 NEXT N
985 LET LM=NM
990 REM
1000 REM PLOT YOUR START POSN
1010 REM
1020 LET R=13: LET RM=0
1030 GO SUB 200: LET YY=RN
1040 LET R=23: LET RM=6
1050 GO SUB 200: LET YX=RN
1055 LET S$=SCREEN$ (YY,YX): IF S$<>" "
THEN GO TO 1020
1060 LET PX=YX: LET PY=YY
1065 LET M$="*": GO SUB 340
```

They're coming

```

1070 REM
1080 REM
1085 REM MAIN GAME LOOP
1090 REM
1100 LET M$="YOUR MOVE!"
1110 GO SUB 300
1120 GO SUB 400: REM SCAN KYBRD
1125 LET PX=YX: LET PY=YY: LET M$="" ": G
0 SUB 340
1130 IF I$="R" OR I$="D" OR I$="C" THEN
LET YX=YX+1
1140 IF I$="W" OR I$="S" OR I$="Z" THEN
LET YX=YX-1
1150 IF I$="W" OR I$="E" OR I$="R" THEN
LET YY=YY-1
1160 IF I$="Z" OR I$="X" OR I$="C" THEN
LET YY=YY+1
1170 REM
1180 REM LETHAL MOVE?
1190 REM
1200 LET S$=SCREEN$(YY,YX)
1210 IF S$="." THEN GO TO 1265
1220 IF S$="O" THEN LET M$="YOU FELL IN
A PUDDLE!"
1230 IF S$="M" THEN LET M$="RIGHT INTO A
MUTANT!"
1240 IF S$="B" THEN LET M$="YOU FELL IN T
HE OCEAN!"
1250 GO SUB 300
1260 GO TO 1800
1265 LET PX=YX: LET PY=YY: LET M$="*": G
0 SUB 340
1270 REM
1280 REM MOVE MUTANTS
1290 REM
1300 LET M$="HERE COME THE MUTANTS!"
1310 GO SUB 300
1320 FOR N=1 TO NM
1330 IF X(N)=99 THEN GO TO 1500
1340 LET PX=X(N): LET PY=Y(N)
1345 LET M$="" ": GO SUB 340
1350 IF X(N)<YX THEN LET X(N)=X(N)+1
1360 IF X(N)>YX THEN LET X(N)=X(N)-1
1370 IF Y(N)<YY THEN LET Y(N)=Y(N)+1
1380 IF Y(N)>YY THEN LET Y(N)=Y(N)-1
1390 LET S$=SCREEN$(Y(N),X(N))
1400 IF S$="O" THEN LET M$="SPLASH GOES
A MUTANT!": LET X(N)=99: LET LM=LM-1: GO
SUB 300
1410 IF S$="*" THEN LET M$="A MUTANT CAT
CHES YOU!": GO SUB 300: GO TO 1800
1415 LET PX=X(N): LET PY=Y(N): LET M$="M
"
1420 IF S$=" " THEN GO SUB 340
1500 NEXT N
1505 REM GO TO START OF LOOP
1510 IF LM>0 THEN GO TO 1100
1520 REM
1530 REM YOU WIN!!!
1540 REM
1550 LET M$="O.K - YOU WIN!!!"
1555 LET YS=YS+1
1560 GO SUB 300
1570 GO TO 1900
1770 REM
1780 REM MUTANTS WIN
1790 REM
1800 LET M$="YOU'RE DEAD!!!"

```

```

1810 GO SUB 300
1820 LET MS=MS+1
1870 REM
1880 REM ANOTHER GAME?
1890 REM
1900 PRINT
1910 PRINT "ANOTHER GAME(Y/N)";
1920 INPUT I$
1930 IF I$="Y" THEN GO TO 600
1940 IF I$<>"N" THEN GO TO 1920
1950 PRINT "GOOD-BYE!";: STOP
1960 REM
1970 REM
1980 REM INITIALISE ROUTINE
1990 REM
2000 DIM X(50): DIM Y(50)
2005 LET N=0: LET A$=""
2007 LET B$="f"
2010 FOR N=1 TO 20
2020 LET A$=A$+B$
2030 NEXT N
2040 LET MS=0: LET YS=0
2050 LET RM=0
2100 RETURN

```

ATTACK OF THE MUTANT HORDE Program Documentation

Line Numbers and Sub-Routines:

95-170	Randomise to make each game unique.
S/R 200	Generate a random number RN between limits R (Maximum) and RM (Minimum) inclusive.
S/R 300	Print a string M\$ at the bottom of the screen.
S/R 340	Print a string M\$ (usually one character) at co-ordinates PX,PY on the screen. (In Spectrum parlance, PX will be column no, PY line no.)
S/R 400	Scan keyboard to get string I\$. (The routine is only left when something is found).
600	Start of a game.
600-730	Print scores; set up island border.
750-840	Plot puddles. Maximum and minimum number of puddles are set in line 750 to 30 and 15 respectively, you can change this to make the game easier if you wish.
900-985	Plot mutants and store the co-ordinates in arrays X() and Y(). Maximum and minimum number of mutants are set in line 900 to 15 and 5 respectively.
1020-1065	Set and plot player position.
1100	Start of game loop.
1100-1160	Analyse key input to give player's move.
1200-1260	Check if player's move is lethal.

HIDE

1265 Plot player position on non-lethal move.
 1300-1500 Loop to move all the mutants and check if: (i) They've fallen in a puddle. (ii) They've caught the player.
 1510 Check if any mutants left (LM=0).
 1550-1570 Print a "you win" message; increment (add one to) player score.
 1800-1820 Print "you're dead" message; increment mutant score.
 1900-1950 Check if another game wanted.
 S/R 2000 Dimension arrays; declare constants; set up graphics strings.

VARIABLES AND STRINGS

BS: One character ("@") string to define island border.
 AS: 20 characters ("@") string to define island border.
 N: General purpose variable.
 MS: Mutant score.
 YS: Your score.
 R: Random number upper limit.
 RM: Random number lower limit.
 RN: Random number returned by S/R 200.
 I: Input Variable (used S/R 100).
 IS: Input string. (S/R 400).
 MS: Output string (S/Rs 300 and 340).
 PX, PY: (1) Screen co-ordinates for string MS.
 (2) Puddle X,Y co-ordinates.
 NP: Total number of puddles.
 NM: Total number of mutants.
 LM: Number of mutants still "live"
 YX, YY: Players X,Y co-ordinates.
 SS: Character on screen at a given position (or on some machines S is ASCII number of character on screen at a given position).

Arrays:
 X: Mutants X co-ordinates (set to 99 when the mutant is "dead").
 Y: Mutants Y co-ordinate.

Readers may wish to alter the number of puddles or zombies to make the game harder or easier. The number of puddles NP is changed by altering the Upper and Lower limits R and RM in line 750, the number of mutants by changing the same variables in line 900. (Be careful not to make RM greater than R.)

Oric

Mutant Horde can be easily converted to run on the Oric-1 micro. Simply type in the listing as shown for the Spectrum and amend the lines shown here. The Oric doesn't need the LET command, so you needn't keep typing it in. Remember to put 20 spaces between the two sets of quotes in line 300. Zap is used in line 310 because it is a more interesting sound, and the WAIT in line 315 can be adjusted to suit your own requirements.

```

200 RN=1+INT(RND(1)*R)
300 PLOT 6,15,*(20 spaces)*
305 PLOT 6,15,M#
310 ZAP
315 WAIT 100
340 PLOT PX,PY,M#
400 I#=KEY#
1055 S = SCRNX(X,Y): S# = CHR$(S): IF
S# <> " " THEN GOTO 1020
1200 S=SCRNY(YX,YY): S#=CHR$(S)
1390 S=SCRNX(XN),Y(N):S#=CHR$(S)

```

Dragon 32

To play the Mutant Horde game on the Dragon 32 micro, simply type in the Spectrum listing given, and amend the lines shown here. Remember that it is not necessary to keep typing in the Basic command LET, as the Dragon assumes that you mean this whenever it finds an equals sign.
 In line 300, there are 20 spaces between the two sets of quotes. Line 2006 sets the address for the start of the screen memory. The best symbol to use in line 2007 is the hash symbol, which is got by hitting Shift-3, it doesn't appear here because line printers will not print it.

```

90 CLS: CLEAR 1000
200 RN=RND(R)
300 PRINT @ 486,*(20 spaces)*;
305 PRINT @ 486,M#;
310 PLAY "L106"
315 FOR W=1 TO 40: NEXT
340 PRINT @ PX+PY*32,M#;
1055 S=PEEK(SS+YX+YY*32): S#=CHR$(X):
IF S# <> " " THEN GOTO 1020
1065 M#="*" GOSUB 340
1200 S= PEEK (SS+YX+YY*32): S#=CHR$(S)
1210 IF S=96 THEN GOTO 1265
1390 S=PEEK(SS+X(N)+X(N)*32):
S#=CHR$(S)
2006 LET SS=1024
2007 LET B#="S"

```

Vic, Atari and Other Micros

MUTANT Horde will run on other micros, provided a number of changes are made. The main things that will need adjustment are those parts of the program which are machine dependent. For example, the noise that needs making whenever something is printed, in line 310. You will have to look this up in your manual.

The same applies to the random number routine that begins in line 190, though here there is not so much variation between different machines. The PRINT AT command available on the Spectrum, appears a number of times in the program. Some machines have different ways of achieving this, others don't allow it at all. On the Vic-20, you will have to perform programming gymnastics.

The PAUSE or WAIT routine can be replaced by a simple FOR ... NEXT loop in line 315. You will have to adjust the length to suit your own tastes.

Maybe the most difficult part of the program to deal with is the bit where the program reads the characters off the screen. The Spectrum uses SCREEN\$, and the Dragon uses a PEEK to that area of memory. Most other machines will have to do something similar, remember to set the beginning of screen memory address correctly as in line 2006 in the Dragon version.

All that remains to be done then is to alter the keyboard scanning routine in line 400. Though it is quite likely that one or other of the alternatives presented above will work on your micro.



serena you

sinclair special

5



*Inside...
New Interface 2
and ROM cartridges!
New Software!*

TAKING NEW SOFTWARE IN NEW DIRECTIONS

You'll see that this issue of Sinclair Special devotes considerable space to software. Why, when we've so much to say about hardware and peripherals? Simply because at Sinclair we believe in supporting first-class hardware with first-class software.

This month sees the start of a new commitment to education in our catalogue, both for adults and children.

In the field of micro theory, we've programs like Beyond BASIC and Make-a-Chip, which take you from the creation of simple ZX assembler subsets to simulated circuit design projects.

There's Musicmaster, to teach you music terminology, note values and composition.

And if you're keen to beat your Spectrum at chess (which can be hard), you'll certainly want to try Chess Tutor 1, the first program in a complete chess masterclass.

Coming soon...

In the pipeline are many new releases, some of which break completely new ground. LOGO and micro-PROLOG for instance. They're fifth generation languages which will take you and your Spectrum closer than ever before to the creation and application of artificial intelligence.

A formal agreement between Sinclair and Macmillan Education has been announced, the first results of which will be published this autumn. These consist of five programs in a complete early reading course plus the first four of a series of programs based on Macmillan's top selling Science Horizons Scheme. All programs are designed for use in schools or the home.

And with Blackboard software, we're publishing six more home education programs for primary school children. Covering alphabet, spelling and punctuation, each of these programs is a true gem, unlike any other education software, and fascinating to run. Even for adults!

I believe that these new titles represent a major advance in educational software for the home.

New ROM software too!

You may well have heard news of ZX Interface 2 and ROM cartridge programs. You'll find full details of the Interface and its software on the facing page (and there's an order form on the back page too!). These offer an instant games playing facility at unbeatable prices, and expand the possibilities of using your Spectrum in yet another direction.

SOFTWARE UPDATE

The latest cassette software for ZX Computers



Chess Tutor 1

For 48K RAM Spectrum. £9.95.

Chess Tutor is a new way of learning all about chess - using your ZX Spectrum.

It starts from the beginning by teaching you about the chess pieces and the way they move - including castling, en passant, promotion, check, checkmate, stalemate and perpetual check.

Then it teaches you the basic tactics - pins, forks, double attacks and skewers.

There are over 120 exercises and over 200 questions for you to answer - with demonstrations and hints from your ZX Spectrum when you want them.

You can choose which parts of the course you want - and even experienced players may be surprised at what they can learn from Chess Tutor.

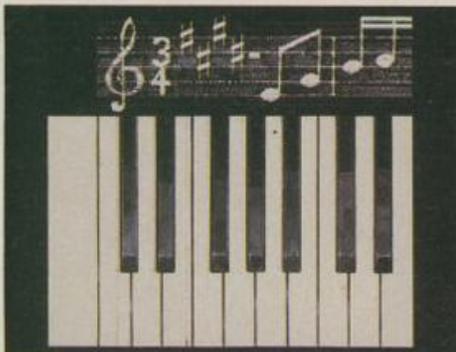
Musicmaster

For 48K RAM Spectrum. £9.95.

Musicmaster turns your ZX Spectrum into a musical instrument which will not only play tunes, but will also demonstrate key signatures, durations of notes, and scales.

You can write your own tunes - in any key - play them over and over again, save them on tape, modify them.

You can either write your music on a staff, or place a simple overlay on your Spectrum for a 17-note keyboard.



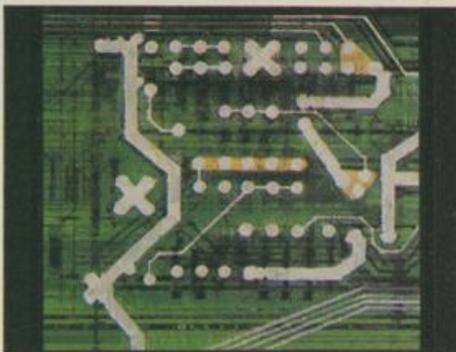
Make-a-Chip

For 48K RAM Spectrum. £9.95.

Make-a-Chip teaches you the basic elements of circuit design, shows you how they fit together, and then lets you design and test your own circuits.

When you have designed a circuit, you can give it inputs and outputs and your ZX Spectrum will check it for you. Then it will run it, or tell you what's wrong so that you can modify it.

Make-a-Chip is a fascinating way of finding out how computer logic works.



Print Utilities

For 16K and 48K RAM Spectrum. £9.95.

Increase the printing and display facilities of your ZX Spectrum with the Print Utilities program.

Print Utilities enables you to enhance your programs by generating characters of eight different sizes which you can place anywhere on your screen.



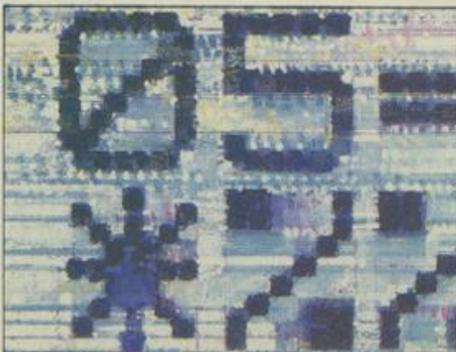
Beyond BASIC

For 48K RAM Spectrum. £9.95.

Takes the agony out of assembler. Takes the mystery out of machine code.

Beyond BASIC gives you a deeper insight into the workings of your ZX Spectrum. It explains what happens inside your micro when you run a program, and it teaches you simple Z80 machine code programming.

A major feature of Beyond BASIC is that it enables you to write your own Z80 assembler programs - then you can actually see on your screen how they affect the ZX Spectrum memory and registers.



Alison Maguire

Alison Maguire
Applications Software Manager

ZX INTERFACE 2

The New ROM Cartridge/Joystick Interface

**Loads programs instantly!
Takes two joysticks!
Just plug-in and play!**

The ZX Interface 2 is the latest new peripheral for the ZX Spectrum system. It enables you to use new ZX ROM cartridge software: plug-in programs that load instantly. It allows you to use two standard joysticks, without the need for separate, special interfaces.

To use new ZX ROM cartridge programs, just connect Interface 2 to the rear of your Spectrum or Interface 1 and plug in the cartridge of your choice. The program is then loaded, ready to run!

You can use any joystick that has a 9-way D plug. Use one or two of them for extra fun with ZX ROM cartridge or Sinclair cassette programs – or with dozens of other Spectrum-compatible programs!



...AND BRAND NEW ROM CARTRIDGE SOFTWARE!

There's already plenty of choice of ZX ROM cartridge programs for your Spectrum. Some are old favourites, in an exciting new form. Others are new.

And now, thanks to ROM cartridge technology, you can run them *all* on a 16K RAM Spectrum, even if they were originally written only for 48K machines!

Every ROM cartridge program loads fast and faultlessly. No wires, no waiting, no worries about loading errors! All of them are affordably priced too, at £14.95.

New! PSSST



Robbie the Robot sits in his garden. Help him fetch compost to cultivate his prize Thyrgodian Megga Chrysanthodil. Help

him make the right choice of pesticide, to ward off devilish insects. Stop the insects breeding to overwhelming numbers before Robbie's plant has bloomed. PSSST is horticulture with a horrendous twist!

One and two player option, with a host of features including sound effects.

Chess



This sophisticated program does everything you'd expect at board game level, and much more besides.

The high-resolution chessboard and pieces are arranged in a row and column system, so it's easy to key in your moves.

At any stage of the game you can request the computer to suggest a move, reverse roles or change the level of skill.

Full-colour high-resolution graphics.

Backgammon



Everything you need to play the famous and deceptively simple board game. Board, stones, rolling dice and doubling dice are shown in full colour and high resolution. Choose from four levels of skill to suit experts and beginners alike – full rules are included.

Space Raiders



Your skill is all that's stopping successive waves of aliens from destroying Earth. Use your gun base to attack. Shelter behind buildings... move out and blast the passing alien soaceship! Full-colour high-resolution graphics with sound.

Planetoids



Dodge and swerve using your thrust button, turn on a planetoid... fire! But beware – the alien ship moves fast to destroy you with cluster bombs. And when it comes to the crunch, use your hyperspace button!

Full-colour high-resolution graphics with sound.

Hungry Horace



Horace is forever being chased around the park by guards. He steals their lunch, eats pathway flowers and creates chaos in the park by ringing the alarm!

You'll have to be quick to keep Horace out of trouble!

Full-colour high-resolution graphics with sound.

New! Tranz Am



Set in a future time ruled by cars and trophies, in a land where petrol replaces gold, and status is possession of the 8 Great Cups of Ultimate.

Driving your Super Blown Red Racer, use your skill to outwit and crash the Deadly Black Turbos. Use your instruments to locate and collect the trophies – before you overheat or run out of fuel.

A program with outstanding multi-directional movement, graphic features, and a playing area equivalent to more than 600 times actual screen area.

Horace and the Spiders



Guide Horace on the hazardous journey to the cobwebbed house full of poisonous spiders.

Safely in the house, you must move along cobwebs, choose a spot... and jump on it! The spiders will be in a frenzy – scuttling to repair their precious web.

And when a spider is spinning a new section, you're safe to attack and destroy it!

Kill all the spiders, and a new web appears... with even more spiders to catch.

Full-colour high-resolution graphics.

New! Cookie



You're Charlie the Chef, who keeps his ingredients locked in the larder. But if the ingredients escape, they

bring the inedible Nasties with them!

You must daze the escaping ingredients with flour bombs, and knock them into the mixing bowl. Stop them getting into the dustbin, at all costs! And beware of Nasties that get into the mixing bowl!

Cookie is fast-moving panic in the pantry, with a cast of real characters. A program to make you smile – and sweat!

New! Jet Pac



As Chief Test Pilot of the Acme Interstellar Transport Company, your task is to deliver and assemble spaceship

kits. On your way round the galaxy, you're free to collect precious stones and gold.

The catch? Rocket fuel is precious and scarce. And the aliens don't take kindly to the theft of their valuables. You'll need your wits and your lasers!

With a host of features, including multi-directional movement, explosions, sound effects and one and two player option.

ZX MICRODRIVE



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ORDER FORM

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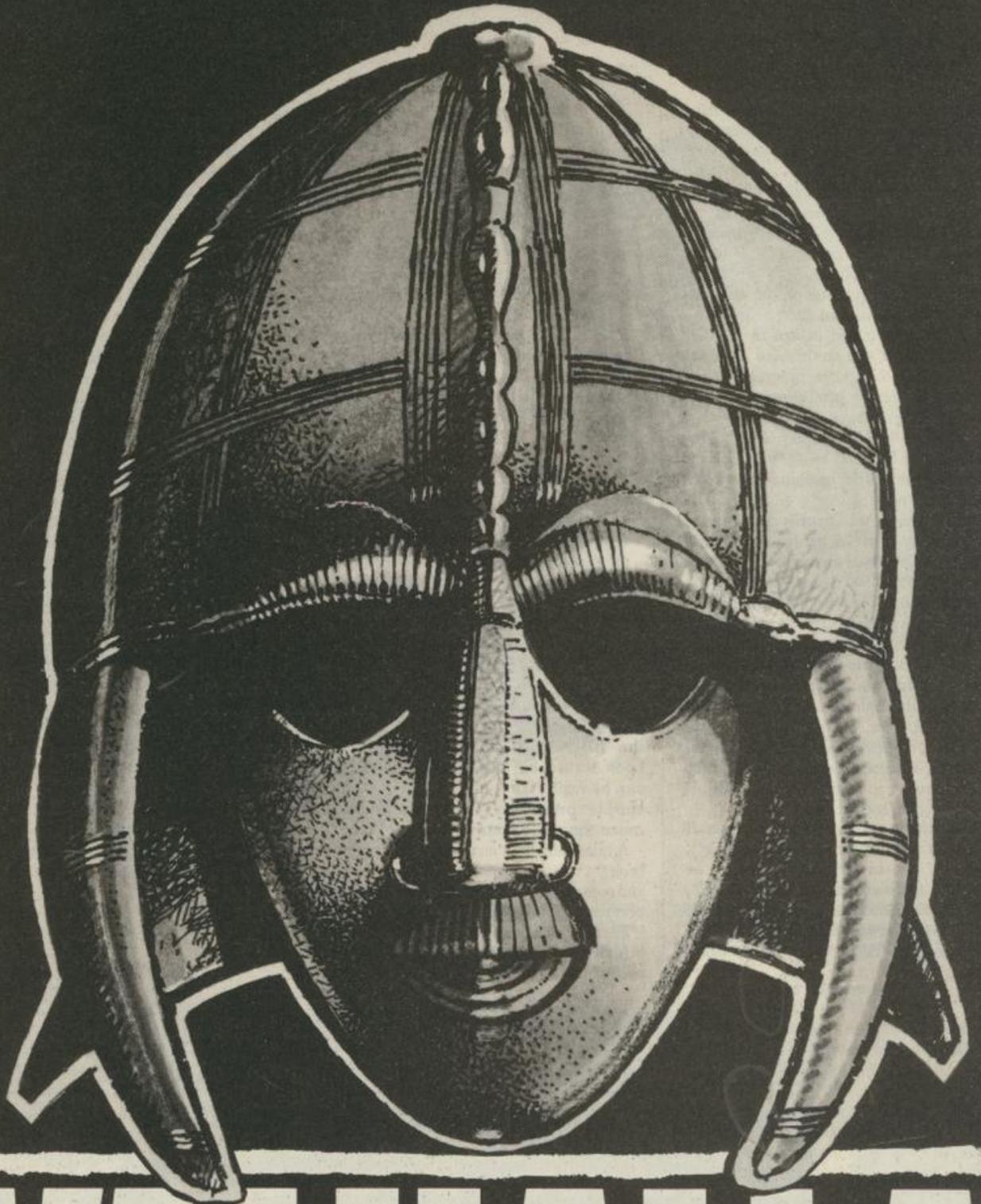
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VALHALLA

ORIC USERS REPORT

WHENEVER you meet someone who has a home computer you will find that they are only too willing to discuss the pet likes and dislikes of their machine at length.

This is often a very useful way of finding out about problems or features that might not appear in the glossy adverts for the computers. *Computer Choice* asked a group of Oric users to tell us about their machines. The replies are varied, sometimes contradictory, but all take a look at what it's like to own and use an Oric.

Our eight users ranged in age from 16-52 years and included two students, a doctor, a teacher, a trainee computer programmer, an electronics engineer, a professional engineer and a radio/TV retailer.

They all own a 48K Oric with prices ranging from the lowest at £130 to £169.99 for the majority and have had the machine for between three and seven months.

On why they chose the Oric the response was varied. "Ability to write on Hi-Resolution screen", "... a colour computer with 48K memory.", "The 6502 processor tilted the balance towards the Oric", "appeared to give good value for money", "half the price of the BBC, better keyboard than Spectrum", "facilities... such as colour graphics, sound, reasonable keyboard".

Only one of the eight had not had previous computing experience, with several having used one of the BBC models. Most used their Oric for a combination of games, education and work, all were programming in Basic, some in FORTH and machine code, and for the future —

"Learn machine code, would be better if Oric had an assembler to aid learning", "I plan to try to program games or educational software in machine code", "hope to update it as children get older. If it won't cope then will change computer, probably to BBC B", "want to try word processing".

As for hardware to add-on, what had they bought or looked to for the future.

"I am awaiting the arrival of the 3 inch mini disc drives", "I would like to see a machine-code Assembler/Disassembler, Editor, Monitor book for the Oric", "better printer", "ROM packs for say word processors and spreadsheets".

On the Oric printer the response was largely negative most thought it was too expensive and not a true printer.

"I feel the price is high relative to the device. I intend in the future to make use of the Centronics interface by purchasing a standard printer", "Who needs a colour plotter. What I and most people want is a printer that will do listings and the occasional high quality output, i.e. Epson quality but not its speed at about £200", "For the infrequent use I will buy a Sinclair printer and rewrite software", "Too slow and 80 col. printing too small".

On Sound and Graphics most of our eight seemed fairly satisfied. On graphics: "The attributes were originally difficult to handle", "It could do with a FILL command like the BBC or Spectrum, the FILL it has doesn't work properly — however, many cells you tell it to fill, it switches on the attribute colour for the rest of the line". On sound: "easier than the BBC ENVELOPE command", "A book would be useful so the sound chip can be exploited to the full", "None of the simple programs I've seen operate in more than one channel at once".

A question about any problems encountered brought a varied response. Some had had none and seemed satisfied with the machine's overall performance but others had much to say:

"The only minor problem was when I first bought the machine I couldn't tune the colour in. But it was soon solved by

inserting a screwdriver"

(One wonders where)

"No colour on arrival. total fail after 1/2 hour. Field function doesn't work properly, and TAB is wrong. Oric produce a sheet to get round some of the shortcomings. Machine returned to Oric, not impressed with time it took for repair or having to pay return postage". "The display is very unstable. I have changed the machine once but the problem is inherent. Can tune it in to get a perfect picture but five minutes later it is waving around again. The shop swapped the machine with no problem". "The VERIFY command is not available as advertised — however, I find this not required as SAVE and LOAD are extremely reliable. TAB is very annoying, IF/THEN/ELSE — always needs extra thought, input and output with single 6522 chip difficult", "There is no back-up available not even a detailed circuit diagram or ROM source listings".

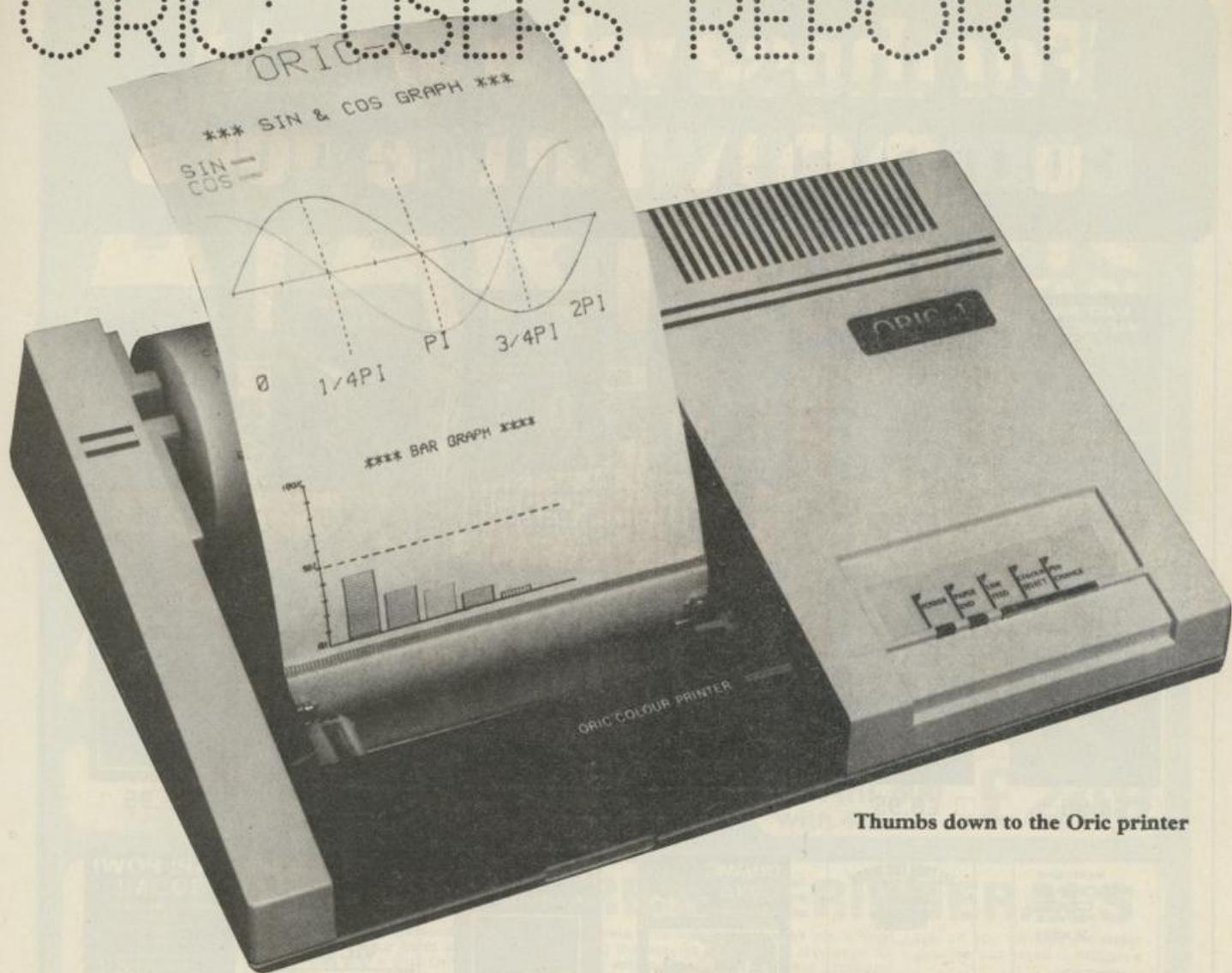
A big problem often seemed to be with loading. There was a variety of tape recorders used, some dedicated, some not. Most had some problem with loading at 2400 baud although one enterprising soul has built a cassette conditioner to solve his problems.

There has been a lot of criticism on the availability of Oric software. Although there is a growing number of software houses who are beginning to recognise the need for pre-recorded software for this machine, the quality is still very variable and the range is not nearly as wide as for, say, the Spectrum or Vic-20.

Some of the eight bought software, some



ORIC USERS REPORT



Thumbs down to the Oric printer

purely wrote their own or copied friends' software. A couple commented on poor availability locally to their homes.

Arcade games are popular, with one favourite program being Painter. Some comments on the software: 'I bought OricAid but took it back as it was rubbish, Xenon 1 is the best, Chess is too slow and misses very obvious moves, Flight is boring once you get the knack, I'm still working on Zodiac'.

"My most recent piece of software was Martech's Harrier Attack which is only recorded at slow speed a fact not mentioned in any reviews or on the instructions. My favourite programs are, as a game Arcadia's Mushroom Mania, as a utility FORTH the free package by Oric Products International". (This user gave the following games marks out of 10). "Tansoft's Zodiac 8, Oric Products FORTH 10, Arcadia's Mushroom Mania 9, Severn Software's Holy Grail 5, Dinkey Kong 6, Martech's Harrier Attack 1 (loading difficulties)".

Documentation is described elsewhere in this magazine as awful (see our Triple Test), so what did the users think of it.

"The manual is reasonable although too much bias is put on the inexperienced programmer, the machine code section is very weak and there is no mention of cassette handling . . ."

"Misleading for a newcomer and then inadequate for everyone. I purchased Ian Sinclair's book and found it interesting for the BASIC but again no follow-up when you get the hang of it".

"Manual isn't very good. There are some mistakes in the listings of 6502 codes which is unforgivable".

"The manual was alright but a bit sketchy in places such as the so called 'Secret System Variables' and POKE and PEEK locations".

"As I had previous experience the manual proved satisfactory. I would have thought it was a poor instructor for the newcomer".

"Manual generally ok though not detailed enough".

And would they recommend buying an Oric in the light of their experiences?

"Not now. I would probably buy the Electron if it had a printer port. If the Oric had a proper keyboard, the TAB function and comma worked properly, it was able to create files and SAVE on tape (without having to enter a machine code program to do it), and I was able to merge programs, it would be a good machine".

"Yes, even with its inherent ROM and input/output problems. I find it much easier to transfer to the Oric keyboard than a full keyboard with the confusion of

similar layout but different syntax".

"Yes, with reservations. I don't think it's keyboard (like the Spectrum's) is made to last".

"That would depend on the buyer's requirements".

"Yes, if you were restricted by price. If not then I would recommend the BBCB".

So overall what did the eight think of their Orics.

There were surprisingly few complaints about the keyboard as many magazine reviewers have found that, with use, keys stick and repeat annoyingly. The FORTH that used to be supplied free with the Oric when it was first launched seemed very popular and the machine came out generally as a good one on which to learn FORTH. Most found Loading and Saving good but there are some bugs that are annoying like the TAB problem.

It seems to be a fairly good machine to start programming on but not so good if you want a games machine as there is a lack of good commercial software. Generally most felt that they had got what they paid for, and that it is value for money.

Thanks to the eight who patiently answered our questions: D. A. Hancock, W. Midlands; A. W. Coyne, Cleveland; S. C. Lu, Colchester; P. W. Bradshaw, W. Sussex; Dr S. Mayne, Derby; E. Thackeray, Hull; M. Halford, Carlisle; P. Beckett, Cheshire.

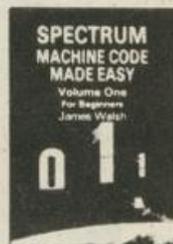
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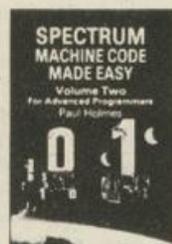
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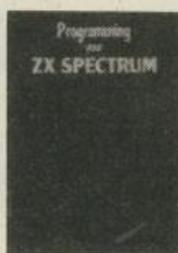
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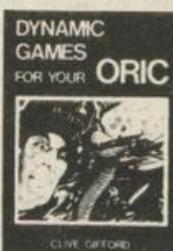
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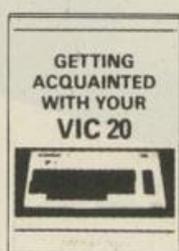
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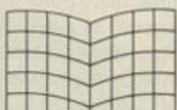
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COMPUTER CHOICE

PRINTER

A **PRINTER** provides the computer user with a permanent copy of either text or graphics, and can often copy the display on the screen.



MONITOR

MOST people use a television set as their monitor, though you can buy special ones. They tend to give a sharper picture, especially when using high-resolution colour graphics.

THE IN



CASSETTE RECORDER

PROGRAM tapes are loaded using either a specially designed dedicated recorder or in most cases an ordinary audio unit. It is also useful for storing your own programs and data.



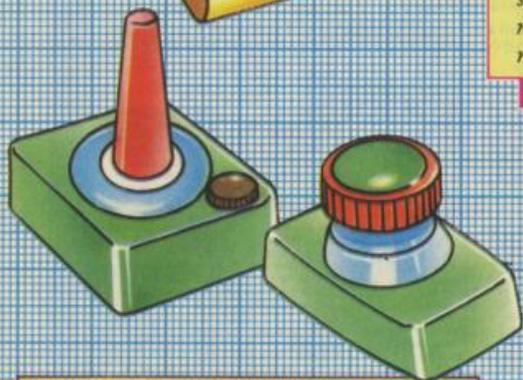
KEYBOARD

MOST computer keyboards look like those on typewriters, but are often not as good. If you can type it is worth investing in a better one.



SPEECH UNIT

AT present the majority of low-cost speech units sound like Daleks, though the newer ones are remarkably like BBC newsreaders.



GAMES CONTROLLERS

JOYSTICKS, Paddles and Trackballs all make arcade action games that extra bit more exciting to play. They usually improve people's scores too.

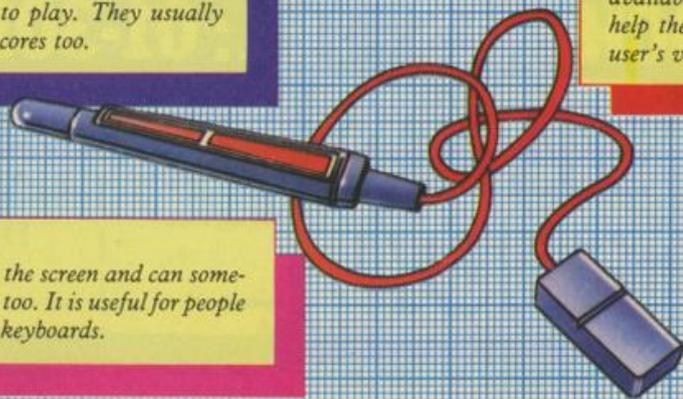
SPEECH INPUT

THIS is still at the experimental stage, however, there are systems commercially available. Clever software is needed to help the computer learn to recognise the user's voice.



LIGHT PEN

THIS points at the screen and can sometimes write on it too. It is useful for people who do not like keyboards.

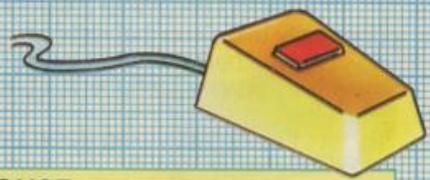


MICRODRIVES

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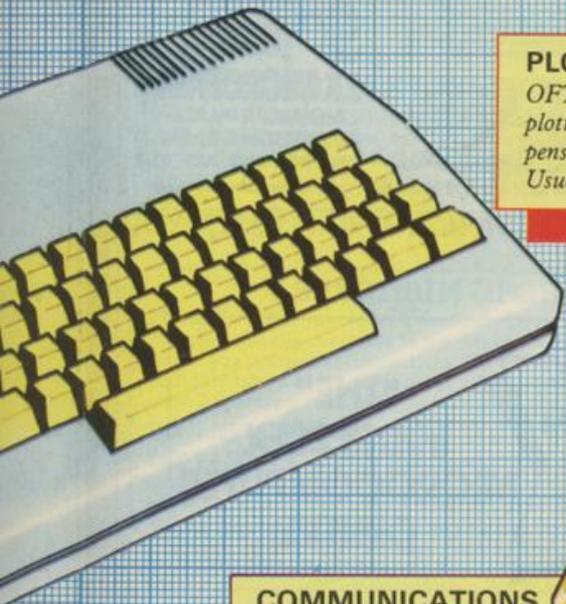
INS AND OUTS OF A MICRO



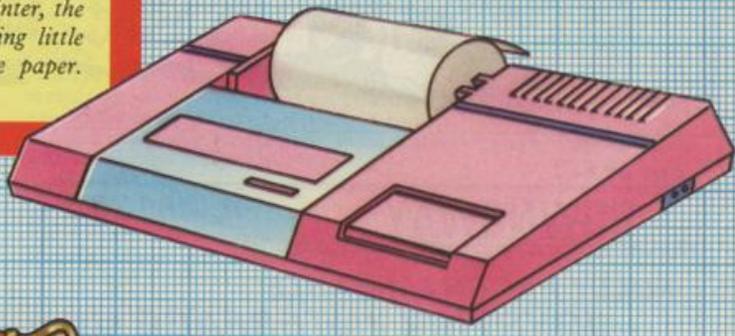
MOUSE
THIS is a device which is used to "point" at items on the screen. It is held in the hand and moved across a table. A pointer on the screen mimics this movement. When something is to be done with the item on the screen you press the button on the back of the mouse.



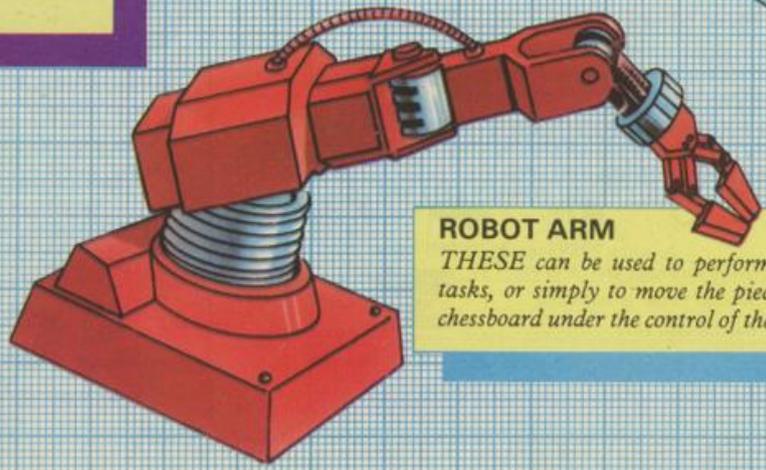
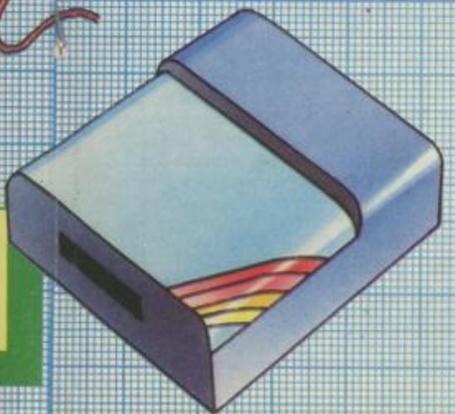
FLOPPY DISCS
ALTHOUGH often relatively expensive, floppy-disc units are a popular way of storing large amounts of data or software. The advantages are that they are both fast and reliable.



PLOTTER
OFTEN an alternative to a printer, the plotter works by actually moving little pens across the surface of the paper. Usually preferred by scientists.



COMMUNICATIONS ADAPTOR
ALTHOUGH not popular in the UK yet, communication between micros and other devices such as other micros or Prestel is gaining ground. To use these services you need a telephone with a jack socket.



ROBOT ARM
THESE can be used to perform useful tasks, or simply to move the pieces on a chessboard under the control of the micro.

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PANDA

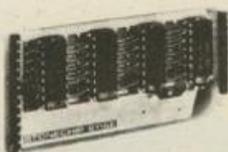
The famous Panda Expandable Ram Pack. Massive 16K add-on memory which can easily be expanded to 32K with an optional plug-in module. Supplied in... no-wobble design, rugged, injection moulded case, contoured to fit the ZX81 snugly. Compatible with other add-ons (printer, etc). LED on/off indicator. No additional power needed just plug in and go. British designed and made from top quality components throughout, guaranteed 12 months.

£19.95 inc.

EXPANSION MODULE

The 16K 'Panda' is easily expanded from 16K to 32K by adding this expansion module as and when you need it.

£14.50 inc.



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NOW AVAILABLE FROM AFDEC

Outstanding Features

- Self centring stick.
- Super strong nylon and steel construction, built to last.
- A total of 8 directions plus 2 large fire buttons
- Arcade proven moulded leaf switches ensure incredible reliability.



PROGRAMMABLE JOYSTICK INTERFACE

New! Use any game suitable for SPECTRUM and simply program any keys you choose for control and fire. Several keys may be used for same function if desired. Useable with any Joystick having the standard nine pin socket. Particularly good with the KEMPSTON Joystick as available from us.

JOYSTICK £14.50; INTERFACE £24.95; BOTH £39.00

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THE KIT — Fit it yourself, a beautifully packed and presented kit with complete (Really complete in the detail you need if you've never seen inside you computer) instructions. No soldering — no wire bending — no fiddly bits. Thousands in use. Everything you need to upgrade your issue 2 Spectrum from 16K to a full-blown 48K.

£23.00 inc.

The really economical upgrade — in stock for swift despatch.

THE PACK — A sturdily packaged 16K to 48K upgrade pack that simply plugs on to the user port and works immediately. Throughport so any other accessories may be fitted as before. No need to open the case, no unscrewing, no soldering, no need to invalidate your guarantee. Designed and built in Britain. Guaranteed. Supplied in handsome carton suitable for gift wrapping.

£39.95 inc.

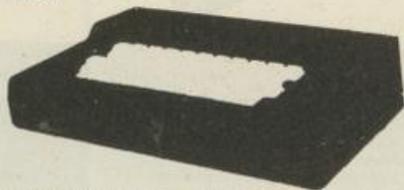
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MODELS FOR ZX81 OR SPECTRUM

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MORE MEMORY FOR YOUR JUPITER ACE

PACER 16K EXPANDABLE RAM

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16K EXPANSION MODULE

Increase your Pacer potential to 32K with the plug-in 16K Expansion Module for

£14.50

Give your VIC-20 a new DIMENSION

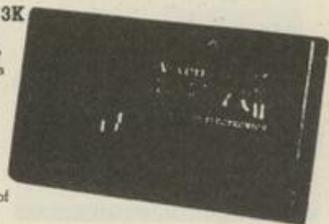
Vixen RAM Cartridge

£34.95 inc.

Switchable between 16K or 8K+3K

Gives you the option of full 16K RAM or 8K and 3K RAM in one package. When added to a standard VIC-20 gives 16384 bytes of extra memory in memory blocks 1 and 2 or 3092 bytes of extra memory into the 3K memory block and 8192 bytes of extra memory switchable between memory blocks 1 and 3.

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- Simply plugs into the rear expansion port of computer.
- No re-addressing of existing BASIC programs needed.



THE VIXEN MOTHERBOARD

THE EXPANDABLE EXPANSION SYSTEM — Providing 4 additional cartridge slots PLUS ROM socket. The slots are switchable, enabling cartridges to be left in place and selected as needed by switching, thus avoiding constant handling and the danger of breakage. Having one socket at the rear enables further expansion. Used in conjunction with one or more Vixen Rams full expansion can be achieved. ROM socket enables ROMs and Eproms to be fitted for future software programs, toolkits, etc.

A range of ROM based software will soon be available from the manufacturers. Industry standard Eproms, 2716, 2732, etc., are readily available and easily programmed and copied.

A sound investment for the serious user and serious games player which will not become obsolete.

£29.95 inc.

GIANT PANDA

Giant Panda, the two together. Buy the Panda and the Expansion Module at the same time for a gigantic 32K bytes and save. Complete at a special price of

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THE ULTIMATE GAMES UNIT. This provides all the requirements of the serious games enthusiast. The speech unit uses the Allophone system based on the GI-SPO256 voice synthesiser. Directly accessible in BASIC it is able to create any words in all languages, this combined with the three channel sound generator allows you to program your own music, explosions, zaps, chimes, whistles and an infinite range of other sounds.

Other features include: Built-in Sound Amplifier working well with all Spectrum programs — Joystick port compatible with all commercially available Joysticks — Duplicate user port for use with other accessories INCLUDING THE MICRODRIVES — Cassette interface, a variable audio output which may be connected directly to a HI-FI system.

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Supplied complete with full documentation and a demo tape which includes the type of Speech and Sound you can achieve.

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BUYERS GUIDE TO COMPUTERS



Dragon 32

DISPLAY AND GRAPHICS:

Notorious, the Dragon's display limits the machine.

SOUND:

Single channel played through TV speaker, easily programmed.

KEYBOARD:

Although a real typewriter-like keyboard it doesn't feel as good as many others.

PROGRAMMABILITY:

Quite good, uses the same Basic as the IBM micro.

MANUALS:

Patronising and badly thought out.

EXPANSION:

Joysticks are tacky and disc drives expensive, but there is a wide range.

AVAILABILITY:

Should be plenty around.

RECOMMENDED PRICE/MEMORY:

32K £179

SOFTWARE:

On the whole Dragon software is pretty naff. But there are one or two good packages.



Tandy MC-10

DISPLAY AND GRAPHICS:

Similar to Dragon.

SOUND:

Single channel through TV speaker.

KEYBOARD:

Like Spectrum but with space bar.

PROGRAMMABILITY:

OK, but lacks any editing facility.

MANUALS:

Confusing.

EXPANSION:

Cheapo printer; £80, and communications modem coming, uses standard outputs so other gear can easily be connected.

AVAILABILITY:

Through Tandy stores nationwide.

RECOMMENDED PRICE/MEMORY:

3K £99.95



Oric 1

DISPLAY AND GRAPHICS:

In theory as good as the Spectrum, though actual use is difficult.

SOUND:

Wonderful, especially effects like ZAP and PING.

KEYBOARD:

Rubbery, fiddley and annoying, but does resemble a typewriter slightly.

PROGRAMMABILITY:

Oric Basic is good—though there are one or two "bugs".

MANUALS:

Very naff — example of how not to do it.

EXPANSION:

Terrific little printer available, discs and communications promised soon.

AVAILABILITY:

In some high street stores and many specialist shops.

RECOMMENDED PRICE/MEMORY:

16K £79 (mail order only).

48K £129.

SOFTWARE:

Still early days, though signs are that Oric software will only be average.



Acorn Electron

DISPLAY AND GRAPHICS:

Very good — nice stable picture on screen and a choice of graphics modes.

SOUND:

A single channel output through a little internal speaker, easy to program.

KEYBOARD:

Very nice.

PROGRAMMABILITY:

Use BBC Basic — arguably the best around.

MANUALS:

Patronising, but helpful to the beginner and more experienced user alike.

EXPANSION:

Not good.

AVAILABILITY:

Will not be available in large quantities this side of Christmas.

RECOMMENDED PRICE/MEMORY:

32K £199.

SOFTWARE:

As yet not much, in theory BBC Micro software should run, in practice it doesn't. Expect some good educational programs.



Atari 400

DISPLAY AND GRAPHICS:

Amongst the best.

SOUND:

Internal synthesiser output through TV.

KEYBOARD:

Horrid, unlike the ZX81, though, there is a space-bar.

PROGRAMMABILITY:

Need to buy Basic as a plug-in extra.

MANUALS:

OK.

EXPANSION:

Discs and printers are easy to add, but not cheap.

AVAILABILITY:

Soon to be replaced by the 600XL, so look for discounts.

RECOMMENDED PRICE/MEMORY:

16K £149.99.

SOFTWARE:

The best, but also the most expensive. Cartridges feature real, not copied, arcade games like Donkey Kong.



Sinclair Spectrum

DISPLAY AND GRAPHICS:

Limited in scope, but easy to program, very good results are possible.

SOUND:

Feeble, though easily programmed.

KEYBOARD:

The original "dead flesh", uses single key entry of Basic words — i.e. saves time. No space bar.

PROGRAMMABILITY:

Sinclair Basic is idiosyncratic, but easy to use, and extensive.

MANUALS:

An example to us all.

EXPANSION:

Just about everything you can imagine can be connected.

AVAILABILITY:

Just about everywhere.

RECOMMENDED PRICE/MEMORY:

16K £99 48K £129.

SOFTWARE:

A wide range of just about every type of imaginable program. Some of the best software around.



Vic 20

DISPLAY AND GRAPHICS:

Limited screen width of 22 characters is not much good for serious use.

SOUND:

Three voices, but difficult to program.

KEYBOARD:

Good real keyboard.

PROGRAMMABILITY:

OK, but to make the most of the machine, Simon's Basic is essential. Not much memory.

MANUALS:

Not too good, but a good programming course is available at extra cost.

EXPANSION:

Discs, printers and joysticks are easy to add.

AVAILABILITY:

Commodore are experiencing distribution difficulties.

RECOMMENDED PRICE/MEMORY:

3K £129 (includes cassette unit).

SOFTWARE:

Varies from good to awful, cheap to expensive. Some good cartridge games, but many cassettes require extra memory.



Colour Genie

DISPLAY AND GRAPHICS:

Not bad, but rather dullish colours.

SOUND:

Three voices through TV, like the Vic only easier to program.

KEYBOARD:

Real keyboard.

PROGRAMMABILITY:

Has extended Basic, fairly standard. Easy to use graphics and sound.

MANUALS:

n/a.

EXPANSION:

The Colour Genie has holes for every conceivable expansion, all standard interfaces.

AVAILABILITY:

In some specialist shops, should be plenty around for Christmas.

RECOMMENDED PRICE/MEMORY:

32K (16K version is £99).

SOFTWARE:

Lower Electronics have a user group with a fairly large software list.

CHOOSING a home computer is not an easy task, so to make it easier we have looked at most of them for you. This list does not include every machine available, but it does include the most important ones. Of course, they are all less than £200, even though one or two might have higher recommended prices, they can all be found for less in the shops.

Microcomputing is a fast-moving hobby, some of the prices mentioned may change from those printed, however, they were all up-to-date when we went to press. Sometimes certain retailers offer special deals, including software or some other enticement to add to the value of a system, so it is always worth shopping around before you buy.

If you can, get the shop assistant to demonstrate a machine to you before you part with any cash, then at least you know what you are letting yourself in for. Also, it is worth insisting that they show you how to connect the various bits together and load a tape, it might save a lot of time and effort later.



Jupiter Ace

DISPLAY AND GRAPHICS:
Black and White only. Low resolution.

SOUND:
Built-in beeper.

KEYBOARD:
Similar to Spectrum.

PROGRAMMABILITY:
Uses Forth language, which makes it a machine for the specialist user. Best version of Forth around.

MANUALS:
Excellent, maybe the best introduction to Forth available.

EXPANSION:
The Ace is particularly good at controlling things, i.e. robots, model railways, power stations.

AVAILABILITY:
Can be found in the specialist shops, should be plenty around.

RECOMMENDED PRICE/MEMORY:
19K £89.95.

SOFTWARE:
There is some software for the Ace, but it is really a machine for programmers.



Commodore 64

DISPLAY AND GRAPHICS:
Good, Sprite graphics, but hard to use.

SOUND:
A full synthesiser.

KEYBOARD:
Good typewriter-like keyboard with four function keys.

PROGRAMMABILITY:
To make the most of the 64 you really need to spend some money on a better Basic. Though simple programs can be written.

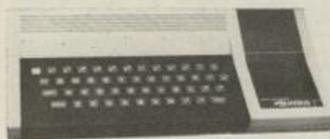
MANUALS:
Commodore Manuals always leave much to be desired. This one helps neither beginner nor expert.

EXPANSION:
A cartridge slot for software. Disc and printers available, dedicated tape recorder is an extra purchase.

AVAILABILITY:
Some difficulties.

RECOMMENDED PRICE/MEMORY: 64K

SOFTWARE:
A lot of good 64 software is being imported from the US, though it tends to be expensive. Cartridges can be excellent.



Aquarius

DISPLAY AND GRAPHICS:
Good, especially with games.

SOUND:
Output through TV.

KEYBOARD:
Maybe the worst ever.

PROGRAMMABILITY:
n/a.

MANUALS:
Written for the American market.

EXPANSION:
Good possibilities, but prohibitively expensive.

AVAILABILITY:
Might be difficult to find.

RECOMMENDED PRICE/MEMORY:
4K £79 (can be found for around £50).

SOFTWARE:
Some from manufacturers, very expensive.



Atari 600XL

DISPLAY AND GRAPHICS:
Very good, includes sprite graphics.

SOUND:
Three voices output through TV.

KEYBOARD:
Real keyboard.

PROGRAMMABILITY:
Fairly simple, improved version of existing Atari Basic.

MANUALS:
Great if you are an American.

EXPANSION:
Not cheap, but can be done fairly easily.

AVAILABILITY:
Hard to find.

RECOMMENDED PRICE/MEMORY:
16K £159.99.

SOFTWARE:
Runs all Atari computer software, very wide range, though can be expensive.



TI 99/4

DISPLAY AND GRAPHICS:
Adequate. Colours are quite good.

SOUND:
Three voices.

KEYBOARD:
Real Keyboard.

PROGRAMMABILITY:
Fairly good, though non-standard Basic.

MANUALS:
OK.

EXPANSION:
Very expensive.

AVAILABILITY:
All over the place and in large numbers.

RECOMMENDED PRICE/MEMORY:
16K £109.95.

MANUFACTURERS:
Texas Instruments.

SOFTWARE:
Good range but indifferent quality, the educational software is too American to be useful.



Enterprise

DISPLAY AND GRAPHICS:
Wonderful — very high resolution with almost infinite range of colours, nice text too.

SOUND:
Features stereo, will amuse enthusiasts.

KEYBOARD:
Very nice, includes a rather tacky joystick which looks like an afterthought.

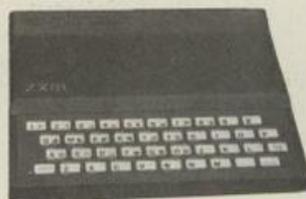
PROGRAMMABILITY:
Still an unknown quality.

EXPANSION:
The Enterprise is built for expansion. Discs and huge piles of memory will come first.

AVAILABILITY:
That's the catch — it won't be here until around Easter.

RECOMMENDED PRICE/MEMORY:
64K £199.

SOFTWARE:
Terrific if you like chess, otherwise you will just have to wait and see. There is a built-in word processor.



ZX81

DISPLAY AND GRAPHICS:
Black and White only, low resolution.

SOUND:
No sound.

KEYBOARD:
Pressure sensitive.

PROGRAMMABILITY:
Easy, but it can't do much, and is slow.

MANUALS:
Excellent — it is worth considering buying a ZX81 to teach yourself Basic.

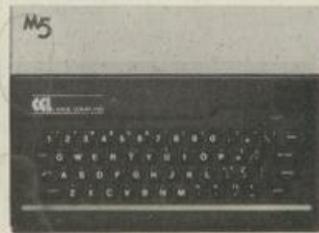
EXPANSION:
A wide range of bits and pieces available.

AVAILABILITY:
Will still be around for Christmas.

RECOMMENDED PRICE/MEMORY:
1k £49.95.

MANUFACTURERS:
Sinclair Research.

SOFTWARE:
A very wide range, some is surprisingly good.



Sord M5

DISPLAY AND GRAPHICS:
Very good, sprite graphics nice, but can be hard to use.

SOUND:
Three channels, output through TV, not easy to use from Basic.

KEYBOARD:
Poor, and difficult to use. No space bar.

PROGRAMMABILITY:
You really need to pay extra for a decent version of Basic.

MANUALS:
Fine if you are an expert, otherwise a bit "iffy".

EXPANSION:
Not a great deal of choice because everything comes from manufacturers.

AVAILABILITY:
Difficult to find in shops, but stockists have plenty.

RECOMMENDED PRICE/MEMORY:
16K £149.

SOFTWARE:
Not much.

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Leapin' Lancelot

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Can Lancelot reach the fair young Princess before the evil Warlord has his way. Brilliant Graphics—Multi-level strategy

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Can YOU help Jake become rich, help him peg his claim, dodge the arrows, avoid the tomahawks, and plant the Dynamite in just the right place? . . . YOU CAN!!!

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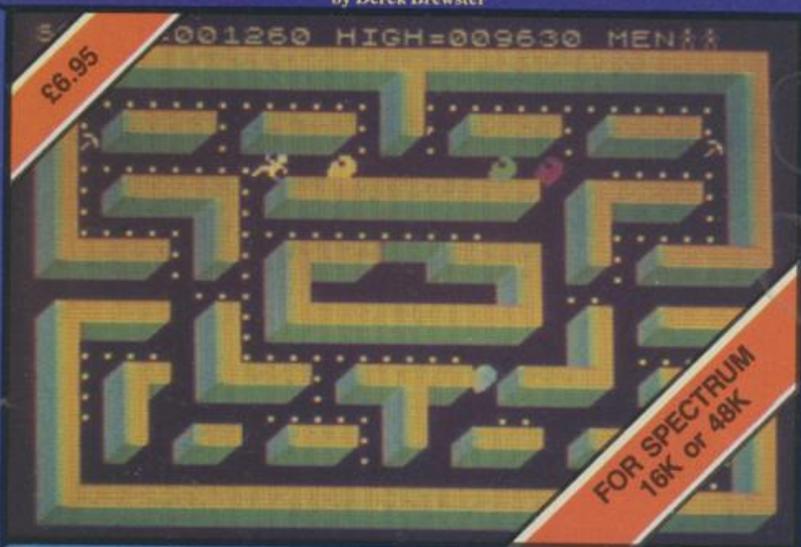
by M J Estcourt

NEW SOFTWARE FOR A NEW DIMENSION
The Graphics Tell The Story

HAUNTED HEDGES

by Derek Brewster

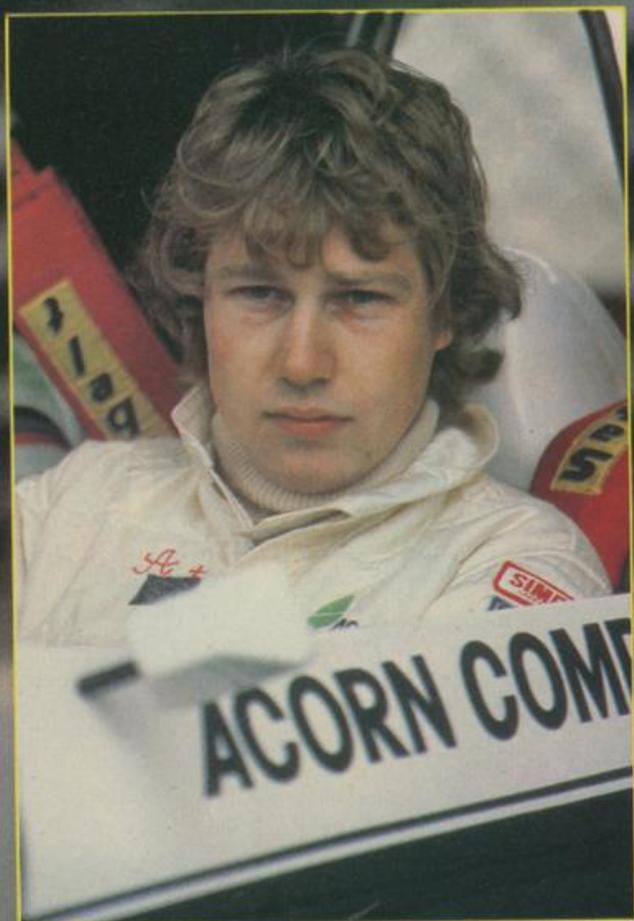
3D



3D

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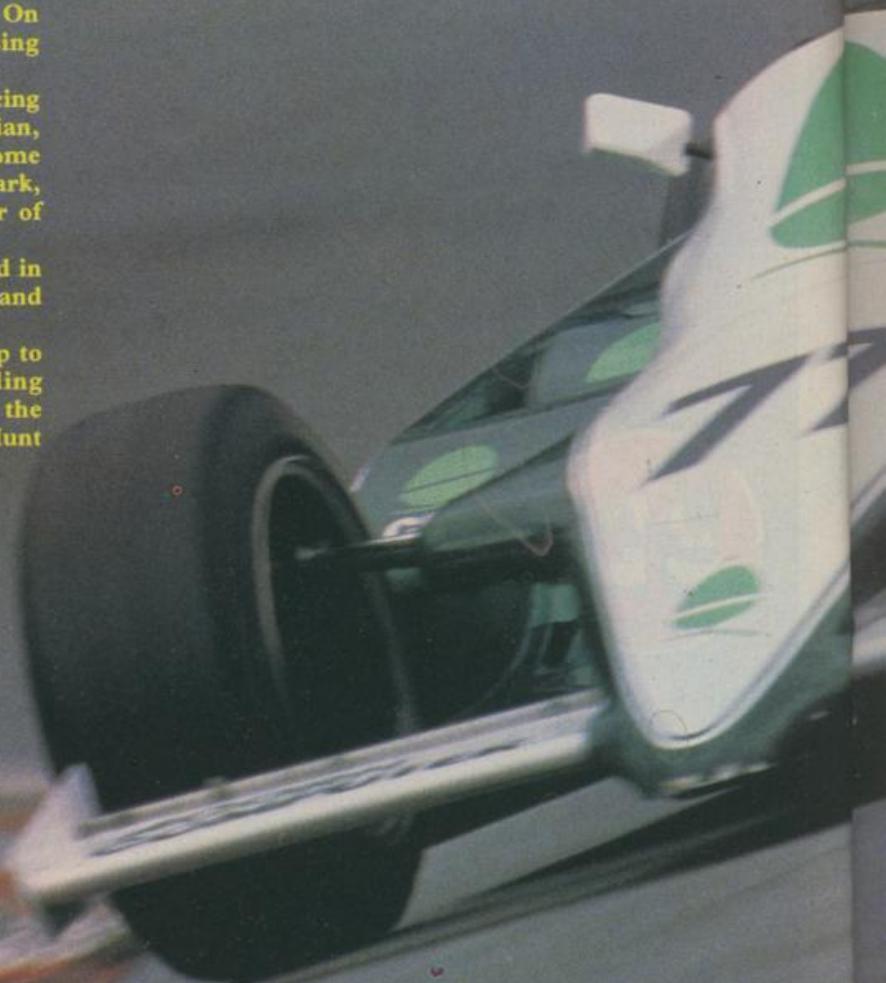
IN 1976, at the age of 16, David Hunt started 100cc kart-racing in his spare time from school. On leaving school he turned down a promising academic career for his love of racing.

Moving up to Formula Ford required financing and he had several jobs including electrician, painter, mechanic and milkman. He found some backing and in 1981 began to make his mark, winning a race in the Dunlop/Autosport "Star of Tomorrow" series.

1982 was a good year as he was placed second in the P&O Ferries Formula Ford Championship and seventh in the RAC British Championship.

Following this success he decided to move up to Formula Three for the '83 season, finding sponsorship from Acorn Computers, driving the Acorn sponsored Ralt RT3. Still only 23, David Hunt is going places.

TO THE



CHEQUERED FLAG



NEXT to flying, fast driving must be one of our strongest and most enduring fantasies. Fortunately we are hedged around with serious rules on the road, so for speed we look to the race-track for heroics and content ourselves with a little lunatic destruction derby on the dodgems every time the funfair comes around. Another way of flying as you drive and participating at no expense or danger to life and limb is on a simulator. Time was when simulators were as rare as white elephants and much more heavily guarded, restricted to military personnel. Now you can sit in an approximation of an aircraft or a Formula One cockpit in an arcade.

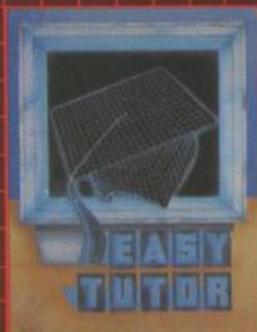
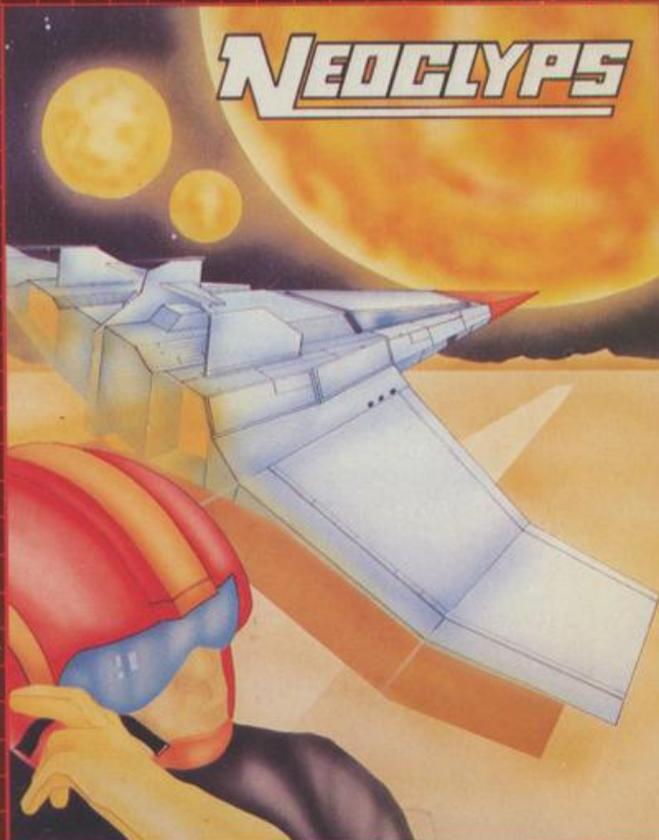
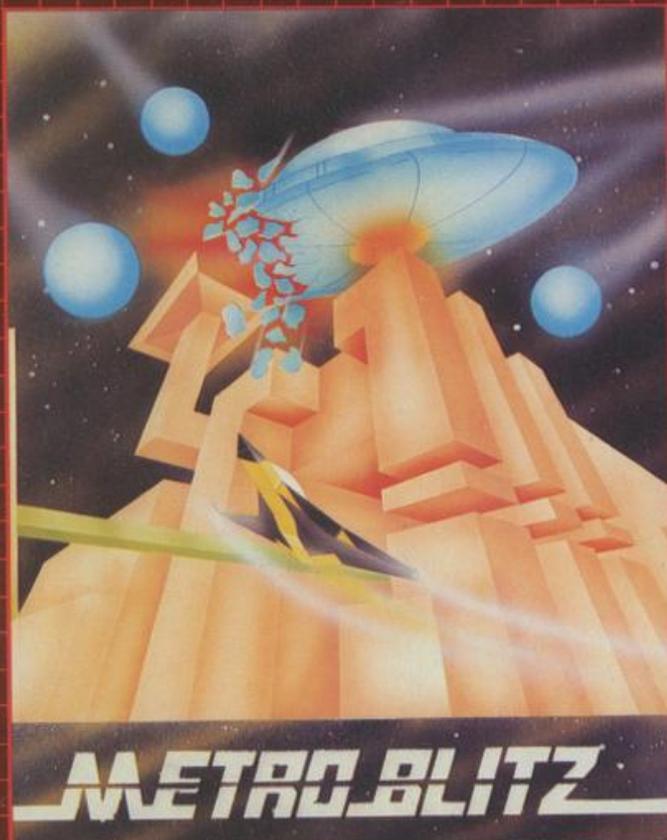
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To launch our new range of Software we have selected the finest arcade action and adventure from the U.S.A. Canada and the U.K.



METROBLITZ

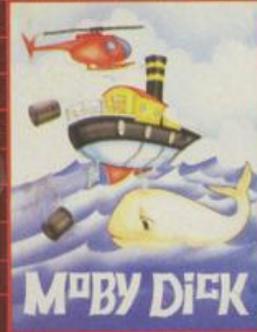
The object of this game is to defend your city against an onslaught of suicidal aliens. Six different types of aliens bombard the player's city without mercy, having no respect for their own lives.

£7.95

NEOCLYPS

You are the GOOD GUY, Freedom Fighter and renowned star pilot. The BAD GUYS, an alien race from distant solar system have invaded NEOCLYPS, one of your colonial planets. Being the good guy that you are, you set off to liberate the Common Folk of Neoclyps from the oppression of the Bad Guys. The Bad Guys have populated Neoclyps with several radar towers which reveal your position to them.

£7.95



EASY TUTOR

For the computer programming novice, a ten-lesson tutorial in the basic language, comprehensive coverage from data statements, to loops and sub-routines, to arrays and matrices. Program examples with line by line explanations, multiple choice questions, "Homework" assignments.

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You are caught in a vicious jungle of giant insects. Centipedes are attacking you from all sides. Killer fleas are dropping from the sky, and to top things off there's a venomous spider lurking in the background.

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Your object is to overcome various obstacles and overpower creatures intent on stopping you as you progress on your quest for the Krystals of Zong. Quick reactions will be necessary if you are to succeed clues will guide you.

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MOBYDICK

The object of this game is to blow up submarines, destroy the helicopter and catch the falling pilot, but do not kill the whale.

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*Selected titles only



It's an ideal way to go for microprocessors, turning your inputs into a process which closely approximates the visual sensation of driving. I say visual, because there's a long way to go before your average arcade action gives you the "seat of the pants" feel which every driver looks for to tell him (or her) how well he's doing. Driving is a process involving more than the evidence of the eyes.

Yet the human senses are surprisingly easily fooled. I recall some people visiting the huge simulator used for pilot instruction at Gatwick. On the "flight deck" they braced themselves for take-off and as the "pilot" built the engines up to full power. When he let the brakes off, everyone in the party leaned forwards to counter the expected g-force as the plane accelerated down the runway. As it happened, the g-force simulator was not in action . . .

Admittedly you don't get that sort of total environment with the average "Lander" program, but even so it can be only a matter of time, money and memory before tenpence can

well-trodden route from karting through Formula Ford and on to Formula Three. Yes, he is the brother of our last Formula One champion, James Hunt, and that's where he hopes to be headed.

Thirteen years younger than James, he is at least not in competition with his illustrious brother, who of course has now retired. David admits that it's a hard act to follow, and owns that it puts the pressure on him to succeed — comparing his situation with that of the younger McEnroe, who was a big draw at Wimbledon this year. People wanted to see if he was really as bad as his big brother.

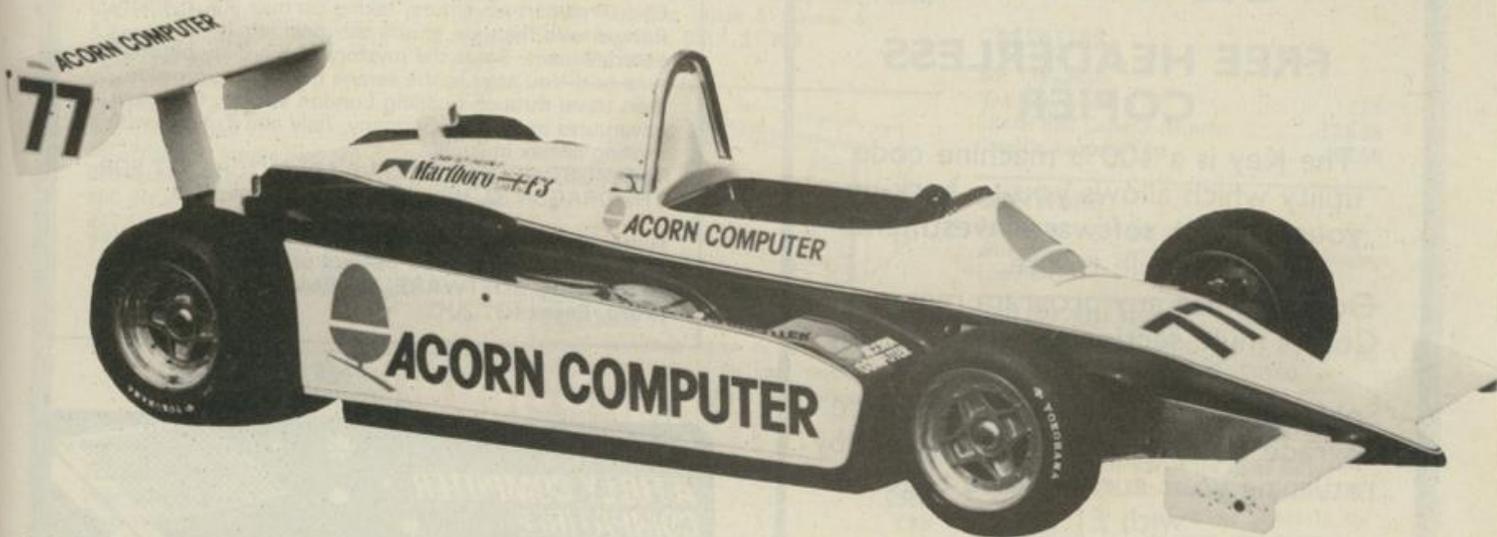
Driving a racing car, says David Hunt, is all about balance. "Most jockeys and most skiers would make good drivers too. They're all activities where you have only the minimum time to make decisions . . . in a car it's all about balance, side to side and front to rear. It's a balancing act, making sure that the tyres have the greatest possible grip on the road at all times."

The process is one of optimisation of all the

enthusiasm of long standing, to fund him his place in Eddie Jordan's Formula Three team. Though a handful of superb drivers are hired — and paid — by racing teams in Formula One, for the most part in other formulas, a driver is expected to raise his own sponsorship money and bring it to the team — rather in the way that an officer would once have been expected to raise a troop in order to get a commission in the Army.

Raising sponsorship was no new game to Hunt, who had spent 18 months at it before landing a deal with hairspray people Cossack to start him off in Formula Ford, so the mere three months it took to reel in Acorn's thousands seemed comparatively snappy.

Acorn's managing director Chris Curry is something of a motoring enthusiast himself and for more than a decade has owned a Lotus Seven — bought at a time when he could ill-afford it on his wages. Since Acorn's burgeoning success has made him a wealthy man, he has been able to indulge in rather more grandiose tastes like an Aston Martin Volante — nothing foreign, mind



buy a really scary ride. The expensive bit is to provide a convincing input/output side, but whatever that costs, it will soon be cheaper than the phenomenal cost of a real airframe or racing car. The shell of a Formula 1 car is now built largely of carbon fibre and Kevlar, ferociously expensive materials but lighter and stronger than the alloy fabrications which they supersede. Only trouble is, it doesn't bend, so you can't repair it if you have even a glancing blow with the scenery.

For this reason it can be very expensive to let amateurs and hotheads loose on real machinery, where they are a threat to themselves, to others and to their sponsors' cash. This is where simulators can play their part as training aids, where they may be used to approximate as closely as possible to the real conditions on a race track, thus improving the driver's judgement and skill.

This much is quite well-known. But as the power of the microprocessor increases, it is now being used to "tune" the car itself and — in experimental work by Lotus — to direct the suspension itself. The results have raised interesting questions about the relationship between man, with his "seat of the pants" judgement derived from experience, and machines, whose ability to process mind-boggling millions of instructions per second is putting them increasingly beyond the reach of our human understanding.

So what is it like, driving a racing car? What are the necessary skills? We turned to David Hunt, an up-and-coming driver who has followed the

"Driving a racing car, is all about balance . . . It's a balancing act, making sure that the tyres have the greatest possible grip . . ."

relevant factors. In a crude arcade simulation, important factors like tyre temperature, coefficient of friction of the road surface, camber angle and so on are all thrown together as a constant. All your input comes in a visual form. But in real life, the driver's role is to optimise many other variables which may be felt rather than seen. How then to quantify such variables and take the guesswork out of this particular balancing act?

Hunt is at the centre of an enthusiastic programme by Acorn Computers to study exactly this topic. He it was who by his single-handed efforts persuaded Acorn's Chris Curry, a car

you.

As a matter of fact, Chris Curry's tanacious patriotism, which extends even to the commercial sphere, has caused the only sticking point between him and David Hunt. In order to raise the wind for his own activities (the sponsorship is not supposed to buy groceries) David Hunt runs a car brokerage — dealing exclusively in Ferraris. From the changing rooms of a squash court in the grounds of a house lost in the lanes of Surrey, David runs Compute-a-Ferrari, which — for 2½% commission from both sides — introduces owners to sellers of that marque, and vice versa.

Hunt admits that the name came first. He has no knowledge of computers, but the title sounded snappy and the card-index had become unwieldy. Now the Apple computer is being moved on and in its place will appear a BBC Micro made, of course, by Acorn. If the cars are Italian, at least the computer which stores and sorts them will be British.

Meanwhile, Acorn Computers is running the David Hunt program for all the publicity he's worth. Four out of five of Acorn's Cambridge-based personnel are following the F3 racing avidly and it has proved a happy social focus for the Acornies. It remains to be seen whether the Acorn symbol on a British racing green and white Ralt RT3 will prove as effective a symbol of the company's technical expertise — and of its newfound financial muscle. If the racing sponsorship does the same for Acorn as it did for Marlboro, then nobody need worry about cowboys.

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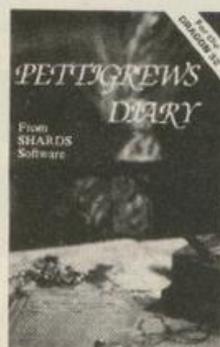
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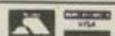
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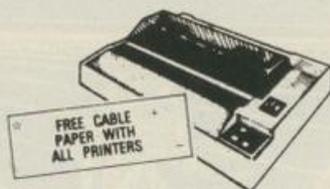
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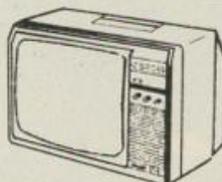
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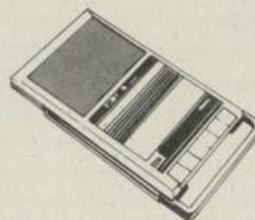
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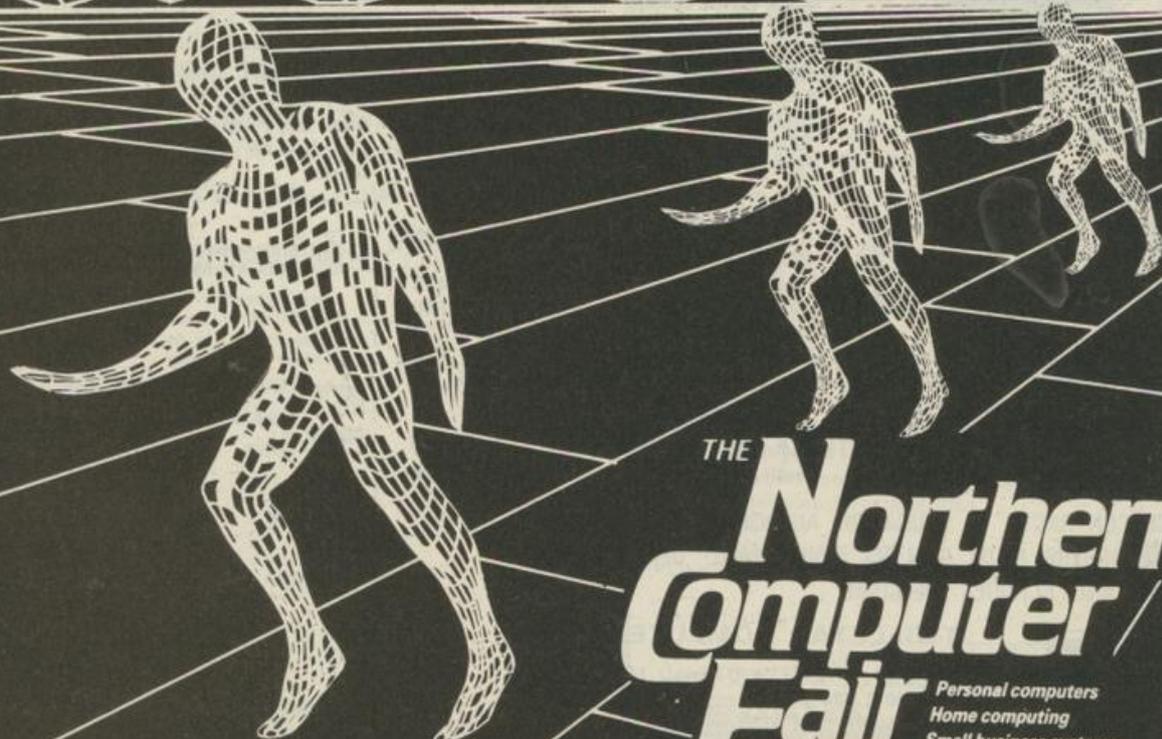
Travelling to the show is also easy as the organisers have arranged special reduced-price tickets with British Rail which include the cost of admission. For further information ring British Rail Enquiry Bureau on 061-832-8353 before November 11.

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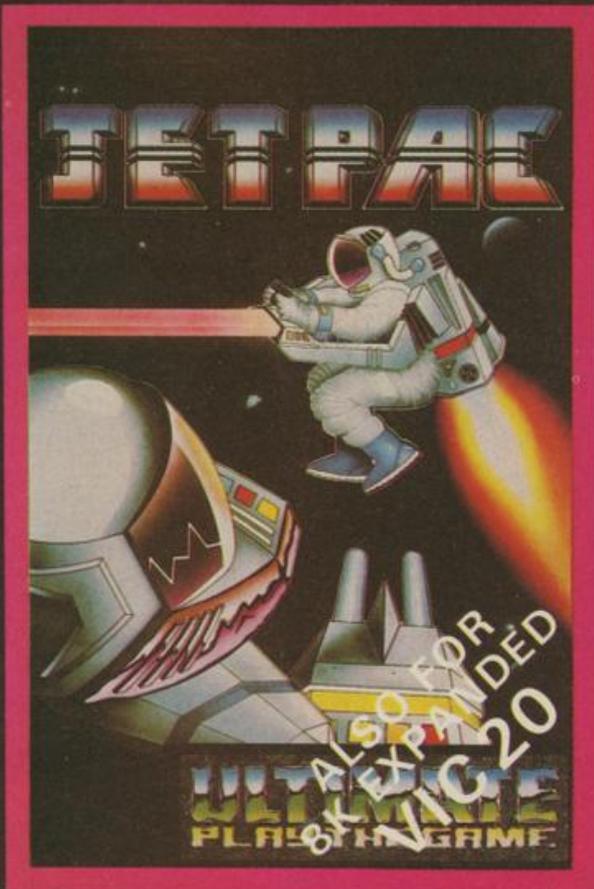
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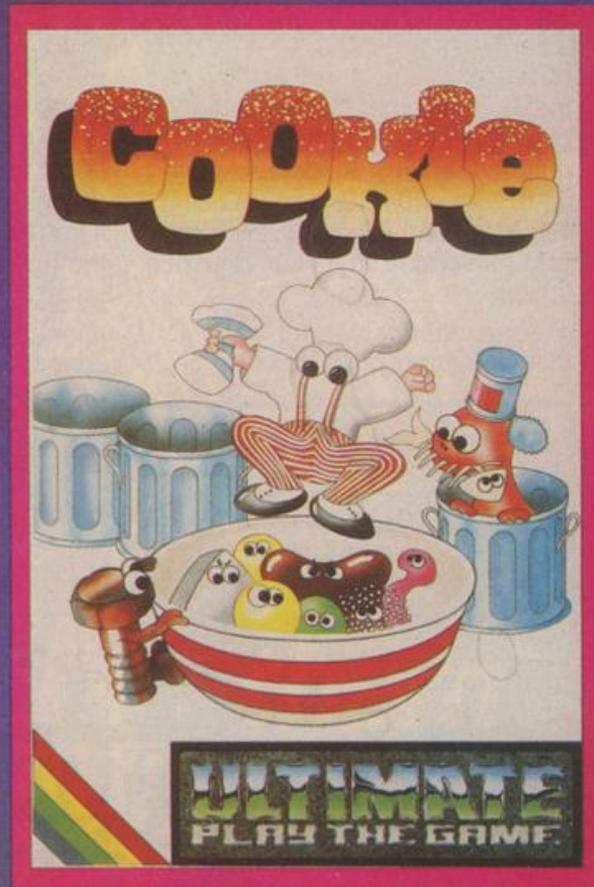
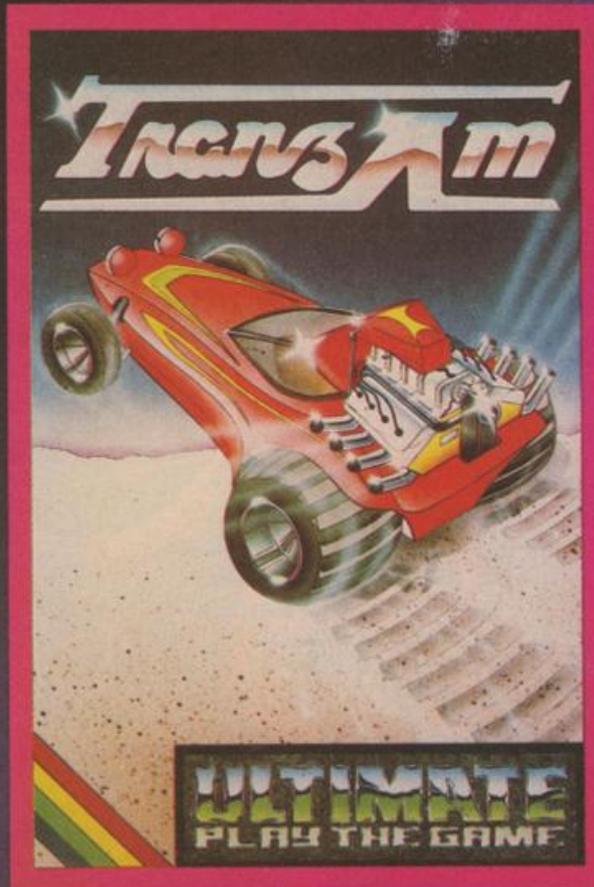
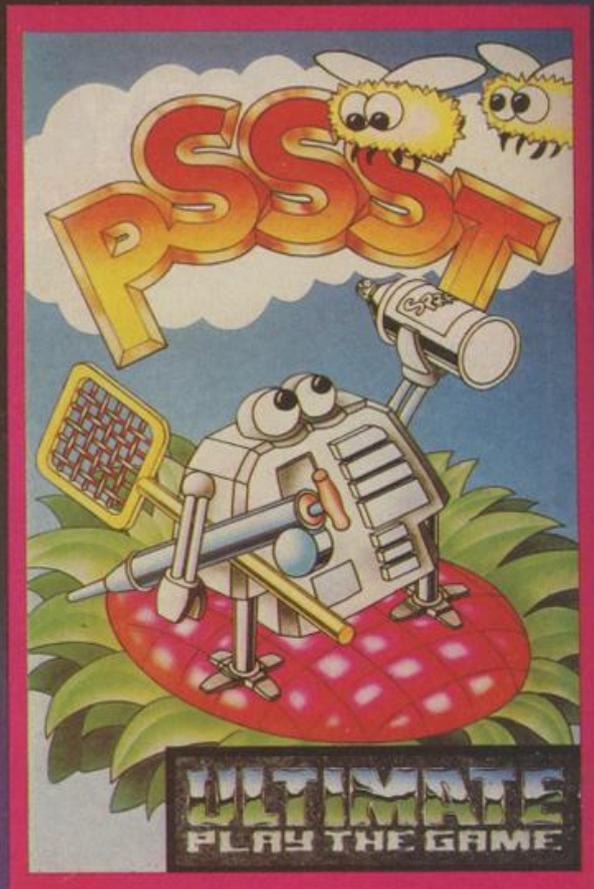
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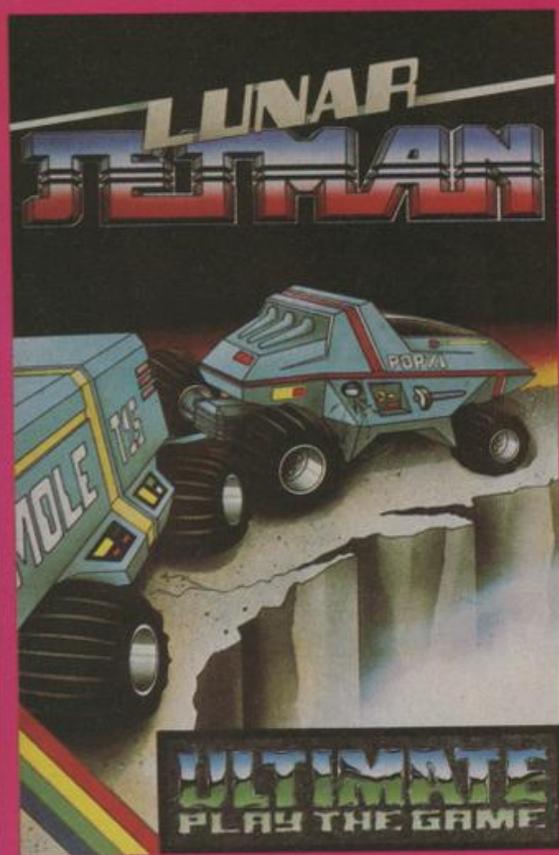
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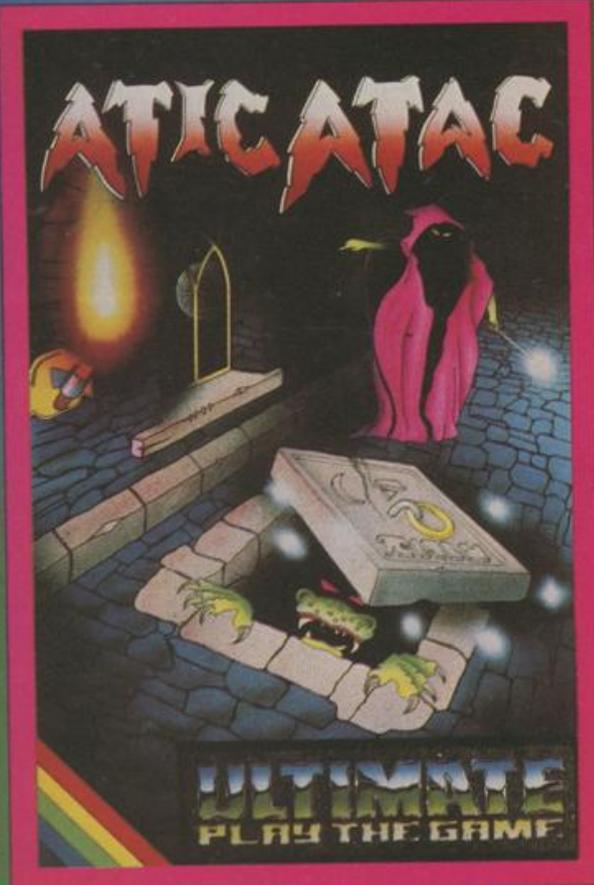
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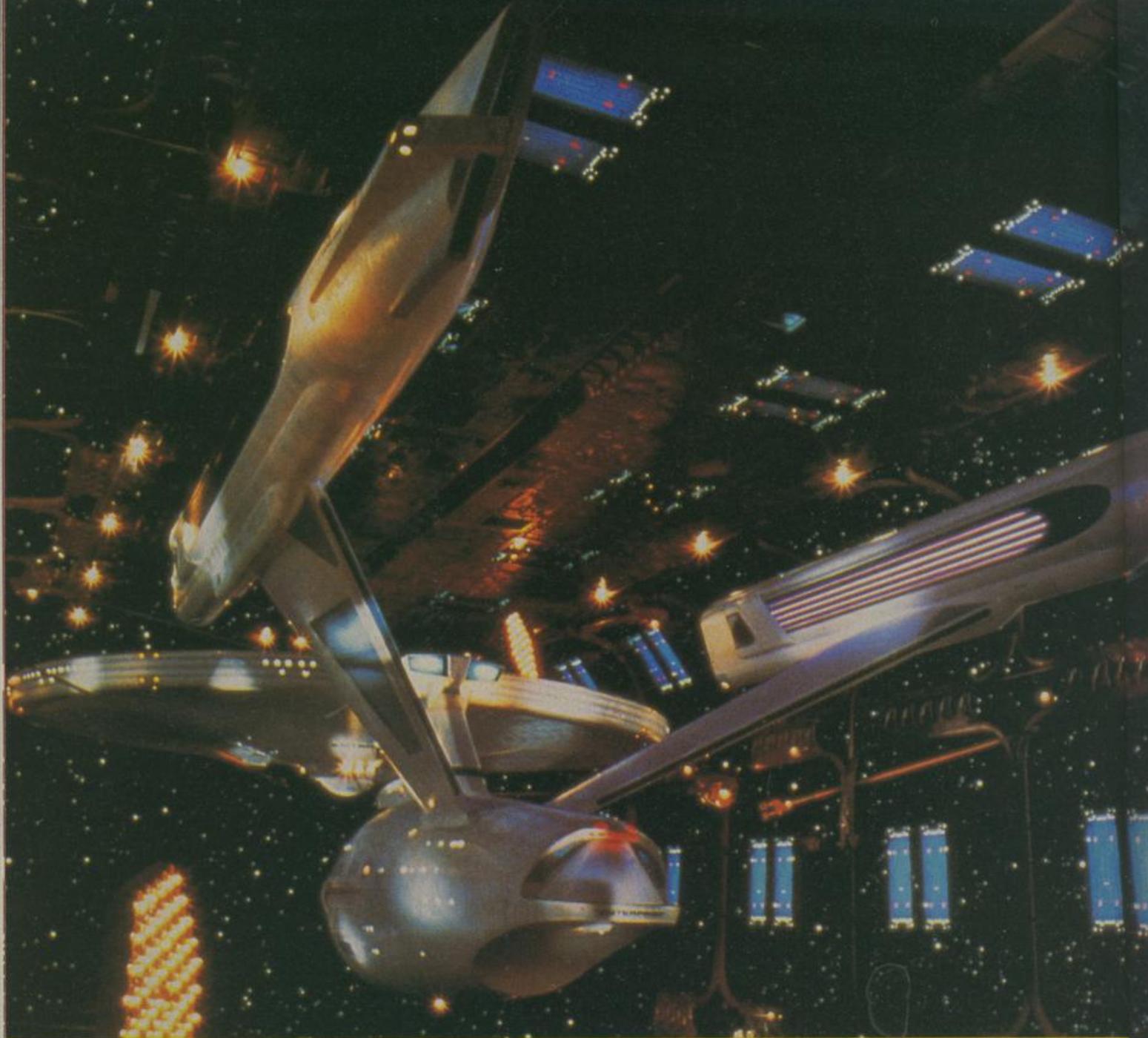
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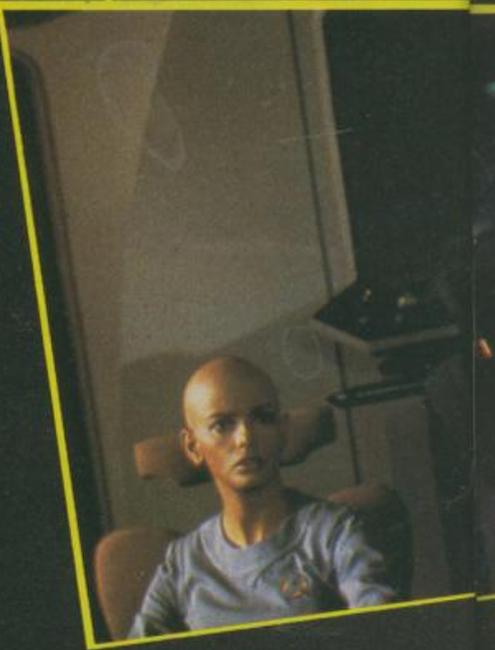
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However that may be, the scenario greeting you at the opening of Silversoft's Starship Enterprise is a million light years away from producer Gene Roddenberry's analysis of the success of his original Star Trek TV programme: "It suggests that there is a tomorrow, that there is challenge and romance in the world, besides suggesting that it's not all over." It will soon be over, not just for you but the entire human race and Tony Blackburn, if you don't get your act together, so with sweaty hands you reach for the operations manual.

The Star Trek phenomenon is well-documented: cancelled by NBC in 1969 after only three years, the series gathered a following of fans known as Trekkies who hold space parties, art exhibitions, publish newsletters and other socially useful activities.

The rise of the computer game based on Star Trek itself is less well-documented. My first close encounter with the game was in 1977 at the IBM research complex at Hursley in Hampshire — initiated perhaps by some knowing tab-collar who had tired of the Dungeons and Dragons-inspired text-orientated games that people played when their section supervisor wasn't looking. That was certainly a far more cerebral, less visually-exciting game than is on offer today for the home computer owner today — more like a kind of three-dimensional chess.

Nowadays you can actually get to see the



Klingons, not just as disembodied asterisks on a green and black grid, but in full frontal technicolour, photon torpedoes, phaser blasts coming at you — the lot. And for considerably less than buying a slot on the next European Space Agency Ariane launch. But to qualify as a Star Trek game, the program must provide you with, at the bare minimum, some kind of long-range scan, a short-range scan, and weapons and damage status. The fun comes from deducing successfully from the map where the objects of your mission are, and, if you encounter Klingons, making sure that you are in a position to engage them.

Documentation — the bits telling you which button to press — is vital in any Star Trek game, otherwise it is like trying to drive a car when you can't tell the handbrake from the windshield wiper. Silversoft has certainly delivered the goods here with a manual comprehensive enough to give the humans a chance, and compact enough to fit into the cassette case, so that you don't lose it under a pile of 2000 AD backnumbers at a crucial moment.

Like most Star Trek games, this one uses a good deal of memory, nearly 30K of Basic and machine-code in your 48K Spectrum. Machine-code, as you will probably already have grasped even if you are new to micros, is the magic word. It is the language the machine speaks, so it wastes less time and memory translating from Basic which is a high-level language, closer to what you speak. The game has to be loaded in three blocks, but the screen instructions are explicit. As the ship jumps to its initial position in the galaxy, there is a three-dimensional rush of stars.

The screen display representing the main command computer is split into three sections. The top section tells you about the ship's status and its position in the galaxy. The middle section is used to display messages and damage reports and the bottom section displays the available commands.

Apart from the commands accessed via the "main computer", all the crucial Star Trek paraphernalia are here. The short-range scan tells you about the quadrant in which the Enterprise is currently cruising — all the Klingons, Tholians, Romulans and starbases which persist in cluttering up the spaceways are clearly delineated. If you decide to hassle a Klingon you just key in the co-ordinates, make the jump — this is where the three-dimensional rush of stars appears — then line him up in your sights. This is where you realise how useful a joystick is — even Captain Kirk would have had trouble graduating from Starfleet Academy if he had had to press the Z and X keys to move left and right, K and M to move up and down and L to fire. Maybe this is why his predecessor, Captain Pike, ended up in that funny hoverchair.

This is a well-implemented version, and you almost believe the final transmission from Starfleet before they send you over the top: "You must be clever, ruthless, efficient and above all careful. The enemy will show you no mercy, their only wish is to totally eradicate all forms of humanoid life. Good Luck; you will need more than courage or will to survive".

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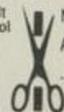
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It has been said that if it were not for space all matter would be jammed together in one lump and that lump wouldn't take up any room. This is certainly something that Trojan's programmers, responsible for perpetrating Space Trek on the principle that a tribble by any other name would be as furry, have failed to realise. It gives the sort of screen display that might have been exciting in 1966 to someone playing around with a mainframe, but which I found frankly depressing. You, as commander of the Federation flagship USS Dragon — named for the computer on which it is implemented — must destroy all the Trojans in the galaxy. I and most other sentient beings must wish you success in your mission because it is clear that the Trojans are part of some evil plan to bore the universe to death.

Always beware of games that have instructions that read "This may seem a little difficult at first but it will take only a few minutes to get used to it". This is what they told Number Six when he woke in the Village. In all fairness, the main elements are there: battle computer, navigation, range scanner, shield energy readout, even dilithium crystals, but the documentation is sketchy and does very little to redeem a game that could give space travel a bad name.

Also for the Dragon 32 microcomputer is Salamander's Dragon Trek. This has much more promise, never mind the fact that Mr Spock is doing an impression of Bryan Ferry on the glossy cassette cover. A big yellow flight manual tells you that this is a real time game. This apparently means that if you go off to make a cup of tea, there may be no ship left when you get back. Sound advice for all starship commanders — always have your tea brought to you on the bridge, especially during contact with hostile aliens.

Further on in the manual we discover that should you so wish, the USS Enterprise can alternatively be known as the USS Faerie Queene. One suspects that the crew of the latter vessel would be a very disgruntled and aggressive lot who would probably start an intergalactic war because someone said "Hello sailor" to them on shore leave. However, Lieutenant Uhura remains as attractive as she can when she is represented by a green U which flashes red when she wishes to communicate with you.

The tactical/status display is not a bad bit of work for the Dragon. The top half shows you the various stars, starbases and Klingons who are mooching around the galaxy. The lower half of the screen is a feast for trekkies with readings for stardate, galactic coordinates, photo torpedoes, docking indicator, impulse engines, weapon fault indicator, shield status, energy status, and, of course, the shapely Lieutenant Uhura, even if she is U-shaped.

More full marks for realism go to Salamander for their inclusion of various inanimate hazards like black holes and supernovae. A lot of space cadets have read too much Arthur C. Clarke, and are all too ready to quote the statistical improbability of being hit by a meteorite. They are consequently under the impression that you can hare around the galaxy at sub-light

speeds without running into a traffic warden, much less a black hole.

My downfall was putting a photon torpedo into an unstable star which went nova on me. The black holes are undetectable on the long range scanners and are, says the manual, a completely unknown phenomenon. Of great interest to Einsteinians is the fact that in the Salamander scenario a large energy shield surrounds the galaxy and has never yet been penetrated by a Federation starship. So space really is finite but unbounded, eh, Albert?

Anirog's 3D Time Trek is available for both the Vic-20 and the CBM-64. As usual, you are the only survivor of the planet Corillian and you have vowed to destroy, etc, etc. Have these people seen one Clint Eastwood too many? When I played the CBM-64 version I found it as hard to penetrate the documentation as to get through the Galactic Barrier.

A lot of people lose heart when they press D to get a damage report and nothing happens because it is not made clear that you have to press the control key simultaneously. Strangely, instructions on the Vic-20 version seem to be more concise. You do get visual acquisition of Klingons flying towards you as in the Silversoft game. A competent implementation.

You would have to go a long way — about eleven light years — to find a Star Trek type game as good as Quicksilva's Timegate.

"Good luck; you will need more than courage or will to survive."

This program for the 48K Spectrum necessitates destroying all the Enemy in any given sector of the galaxy so that you are free to travel through the Timegates, enigmas which only lightly brush at the edges of reality. Your mission, rather than boldly going where no man has gone before, is to travel back in time in order to strangle the Enemy, as it were, at birth.

Having got the scenario out of the way, the game itself calls for a fair amount of flying skill. The representation of travelling through space is better than in Silversoft's Enterprise — there are no fixed stars — and at warp speed the stars in front of you fuse into a blue cone. Landing on planets is very easy — just press P — and the screen fills with a hemisphere dotted with craters, or pyramids, or, very occasionally, spherical structures.

Engaging the enemy demands co-ordination worthy of the crew of the Millennium Falcon, and maybe even Han Solo would get a kick out of the target computer display shown on the bottom left hand side of the screen. There are four vertical columns which indicate horizontal and vertical orientation, approach speed and distance, all controlled in the non-joystick version by the movement control keys 5 to 9.

Although this is by far and away the best Star Trek implementation available on the Spectrum, it strangely pales beside Atari's Star Raiders, playable on the Atari 400 or 800 computers. Strange, because the Atari's program was written as long ago as

1979 and in a very small amount of memory; only 8K, compared to the 20 or 30K in the other games looked at.

There are four levels of play: novice, pilot, warrior and commander. A technical state of war exists between the Atarian Federation and the Zylon Empire. Presumably the Zylons are no relation to those nasty Cylons that the Battlestar Galactica had so many problems with. The Zylons aim is to surround your starbases, while engaging you in battle. Once they have taken over a starbase, they start to multiply. But because this is a real time game and travelling long distances uses up bigger amounts of energy and takes longer, you have to plan your strategy very carefully.

When you have visual acquisition of the Zylons, you can view fore and aft. This is useful: at Warrior Level, the Zylons attack from behind, as well as in front — but at Commander level they operate in pairs fore and aft throwing off your tracking system and rendering themselves invisible. Some idea of the tension of the game is conveyed by the fact that, even at novice, level, you would have to destroy something like 27 ships in four minutes to get a good score. I personally made captain of a garbage scow.

What is surprising about this game is the level of detail. When you dock at a starbase — a large orange saucer — a little man floats out to refuel you. When your sub-space radio is destroyed during an engagement your onboard computer can no longer update the galaxy map, so you have no idea of what is going on until you get it repaired. You can even indulge in Stalinist tactics like destroying your own starbase when surrounded, just to stop the procreation of Zylons.

The Atari game is practically an industry standard by which you would have to judge all comers, and, out of the games reviewed, none really threatens to displace it. But no one would advise you to buy a micro-computer just to play one game. You have to decide for yourself what other purposes you might use your machine for, and what the overall standard of software is like.

It is true that what these games lack is the "optimum effect" of Star Trek as a TV series. It was never assumed that all life-forms were hostile — that was the province of the woodenheaded Space 1999. Captain Kirk's voice-over did not say that the USS Enterprise's five-year mission was to explore new worlds, to seek out new life and new civilisations and boldly reduce them to piles of glowing radioactive cinders.

Where these games could benefit from the original mainframe implementations would be in the creation of more positive trade and knowledge goals as well as, or instead of, trying to stay alive in the face of ever-increasing waves of increasingly hostile alien attack vessels.

TIMEGATE Spectrum 48K Quicksilva.
STARSHIP ENTERPRISE Spectrum 48K Silversoft.
SPACE TREK Dragon Trojan.
DRAGON TREK Dragon Salamander.
STAR RAIDERS Atari.
3D TIME TREK Vic-20 16K Anirog.

BUYERS GUIDE

TO

DRAGON SOFT

CHOOSING software for any machine is a difficult task. For the Dragon it is more so, because the standard is so variable. On the whole, arcade action games for the Dragon are less than wonderful, but there are excellent strategy games and some of the best text adventures around.

Some games require joysticks, where this is the case we have marked a J against the entry. It is wise to check first to see if they are a necessity or if they are just an option. Other programs are supplied on cartridge and likely to be more expensive. The advantage of cartridge software is that it is quick to load and harder to damage, these programs are marked with a C.

While this list is fairly long — it proves that there is more Dragon software than many people suspect — it may not be complete. So if you supply Dragon software get in touch and we shall include you next time.

Adventures

Alien Odyssey	Bamby Software	£9.95	
Black Sanctum	Dragon Data	£7.99	C
Calixto Island	Dragon Data	£7.99	C
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Dragon Mountain	Dragon Data	£7.99	C
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Arcade Games

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Beserk	Dragon Data	£19.99	
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Castle Attack	M & D Systems	£7.50	
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City Defence	Shards Software	£5.75	J
Cosmic Invaders	Dragon Data	£19.95	J
Cruising On Broadway	Sunshine	£6.95	J
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Defense	Microdeal	£7.99	

Drone	Cable	£8.75	
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Pacdroids	Programmer's Guild	£8.99	
Scanner 13	Bamby	£8.45	
Scarfman	Microdeal	£7.99	
Smash	Wizard	£7.00	
Snakebite	Diand	£7.95	
Storm Arrows	Dragon Data	£7.95	J
Splash	Abacus	£6.50	
UXB	Virgin Games	£6.95	
Wizard War	Salamander	£7.95	J
Wormtube	Hornet	£6.99	J
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Puzzles

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Mined Out	Quicksilva	£5.95	
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Space War	Microdeal	£7.99
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Particular care has been paid to the keyboard. It is electric typewriter style: robustly constructed with a good, solid 'feel'. It has a space bar, and single entry keys for key commands.

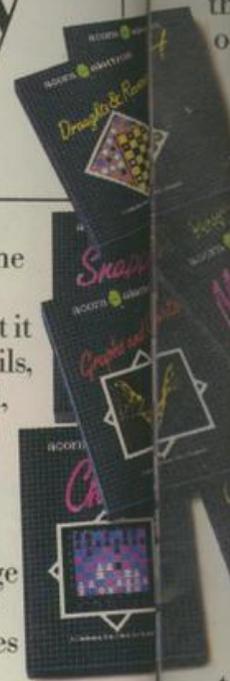
In other words it's comfortable and easy to use, avoiding the need for the manual gymnastics sometimes associated with calculator style keyboards.

And it will grow with you via expansion modules, that Acorn are developing, to take peripheral additions such as printers and disc drives. So as your knowledge, interest and ambitions develop, the Electron can develop with you.

Additionally, to give you all the support you'll need to generate your own applications software, we've established a phone-in service attended by specialists to give advice, encouragement and practical help.

A gentle teacher.

The Electron plugs straight into virtually any TV set and cassette player so you will be



ready to go as soon as you get it home.

It comes not only with a comprehensive user guide, which describes the machine and its functions, but also with a book that takes you step by step through the basic principles of programming.

A free taste of its versatility.

You will also receive an "Introductory" cassette which will put the Electron through its paces showing you a little of what it can do with its 64k of memory (32k ROM, 32k RAM).

The cassette will give you a taste of those exceptional colour graphics we mentioned earlier; of its ability to play and notate music, and show you how it might help in home accounting. It will challenge you to a few games and will, if you ask it, do your whole family's biorhythms in a matter of seconds.

You will in short, through the 15 separate programs it contains, get a glimpse of the Electron's potential. But only a glimpse, for that potential is as limitless as your own interest and imagination.

A widening range of software.

To help you realise some of that potential, Electron software already ranges from "Personal

Money Management" through "Starship Command" to "Creative Graphics" (which, incidentally, includes some spectacular three-dimensional rotating shapes). Naturally, with its strong educational links, educational software will be extremely

EXPERTS LIKE 'WHAT MICRO?' AND ME RATE THE ELECTRON HIGHER THAN ANY OF THE COMPETITION.



important for the Electron and even now O and A Level revision papers are being processed for Electron users.

How to get your Electron.

The Electron is available from selected WHSmith and local Acorn stockists. However, if you would like to order one with your credit card, or if you would like the address of your nearest supplier, just phone 01-200 0200.



Technical Specifications

Hardware.

2MHz 6502.
32K ROM 32K RAM (64K total).
High resolution graphics 640 x 256 max.
Seven display modes.
8 colours and 8 flashing colours.
1200 baud CUTS tape interface with motor control.
Expansion bus for add-on interface modules.
Internal loudspeaker.
PAL UHF output to colour or black and white domestic TV.
RGB output for colour monitor.
56 key full travel QWERTY keyboard with spacebar.

Software.

BBC BASIC.
Extensions include integer, floating point and string variables, multi dimensional arrays: IF... THEN... ELSE, REPEAT... UNTIL, procedures with local variables.
Operating system allows plot, draw and fill commands.
Event timing.
Built-in assembler.
6502 assembly language can be mixed with BASIC.

The Acorn  Electron.

Memo:
From: Editor, *Computer Choice*
To: Readers.

LONG ago there was a knock on my door. I opened it cautiously expecting to find an Encyclopedia Galactica salesman and was amazed to find a bunch of Jawas, who had double parked their sand-crawler in my street.

They were selling second-hand robots. I wanted to get rid of them fast because my favourite program had defeated me twice that evening and I wanted my revenge before bedtime. So I suppose they could have sold me anything; unfortunately I ended up with SiRob. He cost me £39 plus an old ZX80 which I had traded in.

Because he thinks he knows it all, I've put him to work answering your problems — at least it keeps him away from the telephone, last year he rang up £2 million phoning his pal Marvin and his girlfriend, a Dalek.

Send your problems to: **SiRob, Computer Choice, Quadrant House, The Quadrant, Sutton, Surrey.**

SiRob



I WAS being bored by my friend Marvin, the paranoid android, he's very good at that — being boring and bad-tempered, I mean — but sometimes he's about as much use as an Oric manual.

"What," he says, "are the dirtiest computers?"

What a question to ask a super-brain. Marvin may think he's got a brain as big as a planet, but I know better. The planet is a little known asteroid on the back of a cornflakes packet.

He told me the answer. "The ones that Dragon the floor." Excitement? I yawned so much that my chin fell off.

The boring editor of this magazine (he's the one with the bolt in his neck) has provided me with some questions. Why I bother answering such petty little things I don't know, it's such a waste of my galactic mind — why don't they ask Marje Proops?

IMMENSELY TEDIOUS AND BORING QUESTION 2 from Jim of Sale, who asks, "What is a 'sprite'? I have seen adverts for games with sprites, and also a games designer which mentions sprites."

A sprite is Marvin when he's had too big a boost of electricity, or bolt-neck on pay day, or me when I finish answering these stupid questions . . . zzzzzz (EDITOR: we had to wake SiRob up at this point).

A sprite is a shape which acts as if it were painted onto a transparent screen. The screen can move left and right, and go up or down. As the screen moves, the sprite covers what is behind it at that moment, later to uncover the background when the sprite has gone past.

Marv reckons that if you painted a picture of him on a window (and the window didn't crack), he would hide part of the scenery. If you moved, his picture would hide a different part of the scenery. Marvin reckons his picture is a beautiful sprite, so I've promised to introduce him to some (lethal) space invaders I know.

If there is more than one transparent screen, each with its sprite, some sprites will cover other sprites. One sprite will be nearer to the person watching than any other, and one sprite will always be covered by other sprites. Their movement of each sprite is always

independent of the movement of every other sprite.

Some computers are specially designed to produce sprites (like the TI 99/4a, or the Commodore 64). Other machines (such as the Spectrum) can have what people pretend are sprites, but they are not really sprites.

I think (and, when I think, galaxies quake) you can only have sprites when the computer hardware is designed to produce them. Otherwise sprites are no more than a posh name for ordinary (bigger) user-defined shapes. Both the TI and Commodore have special chips to control sprites.

This brings us to the **NEXT RIDICULOUS QUESTION 3, from Les of High Wycombe, "What is the difference between 'hardware' and 'software'?"**

Bolt-neck thinks that hardware are his tight jeans, and Marvin thinks software is a woolly jumper — can't they take you imbeciles seriously?

When you buy a computer (assuming that it did not fall off the back of a galactic transport) you have bought a piece of hardware. The introductory cassette is a piece of software.

Anything you can touch (or vapourise) is hardware. A computer is an item of hardware, as is a printer. The TV and cassette recorder you connect to your computer are also pieces of hardware. The program you load from the cassette recorder is a piece of software.

You cannot touch a program, you cannot vapourise it. You can vapourise the cassette, you can vapourise the computer running a program, but the 'program' lives (somebody somewhere will have taken a copy). Software are the ideas in computing — though some programs are very low on ideas. Given some of the immensely tedious programs I have seen, it hardly seems worth getting out of bed.

Sprites, for example, can be produced by the machinery (hardware) or by the programs (software), and hardware sprites tend to be superior to software copies.

BORING QUESTION 1 from Margaret of Huddersfield: "How does the keyboard work?"

Marv reckons the answer to that is "You push the keys", but bolt-neck said to give more details. Why bother? I ask myself.

So you push a key, and make an electrical connection. The stupid computer doesn't know that you have pressed a key until it asks the keyboard. So it says, "Oi keebie, has someone pressed a key?", and the keyboard might reply "Ouch! That one!"

Clever clogs call the computer asking the keyboard "scanning the keyboard". Every so often the computer stops thinking for a while

about other things, and examines (scans) the keyboard.

Every so often the computer also has to think about the TV picture. ZX81s are so slow at thinking that, in FAST mode they forget there is a TV, and all you get is interference. A ZX81 is like some people I know (hiya bolt-neck) who cannot concentrate on walking and chewing gum at the same time.

Marv can walk and sleep and talk all at the same time — he never does anything else.

If two keys are pressed at once, a slightly more than sub-moronic computer can work out that more than one key is being pressed, because it can get the keyboard to ask each separate key.



CORRIDORS OF GENON

**ONLY
£5.95**

By the flick of a switch you could unleash the power of Genon in your own living room! But by thoughtful strategic play you could overcome Genon.

The only way this can be done is by destroying the powerful computer that controls all things.

After being transported to the Corridors of Genon you'll need your wits about you to master the door codes and venture through the corridors to locate the computer. While this is going on the computer will know your exact whereabouts and try to force you into a mistake by closing doors around you.

The computer also controls Bogul – the guardian of the corridors who can reduce your thought power (ESP) every time it finds and bogulises you, so you'd better listen out for its approaching footsteps!

Should you locate the computer and should your ESP be sufficient you'll have to pull on all your energy to try and master the 3 digit self destruct code.

With this done, now is the time to escape from the corridors. No door codes to worry about this time. But its no easy task as Bogul will have cloned – how many times though? Well that depends on how long you took to crack the self destruct code. There could be as many as

eight! And you'd better be careful as only one Bogulisation and you've had it!

Full colour graphics, sound effects and, of course, 3D machine code action as you would expect from Malcolm Evans 'the 3D expert'*, to push your 48K Spectrum to its limits. 'Corridors of Genon' is supplied with a keyboard overlay and is also compatible with the Kempston joystick.

If you survive this you could try . . .

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* Computer & Video Games



S T A R T I N G O U T

Programming your computer can be a very rewarding pastime. Here Piers Letcher shows you how to begin and take the first few steps towards writing a Basic program. This month he looks at how to get information out of the computer.

YOUR computer is on and waiting, and you want to program. Before you start, you ought to find out what the machine is expecting from you. Most micros make life that much easier for the Basic programmer by expecting you to type in Basic from the moment that you switch on. If your micro is one of the very few that doesn't, you can usually tell because machines expecting Basic tend to have "Ready", or "Basic" written somewhere on the opening screen, then find out how to get into Basic.

You're now ready to start programming. Remember that anything you type in has to be followed by the RETURN key (it could be ENTER on your micro), otherwise the machine doesn't know you've finished typing. Again there are exceptions to this rule, but for the time being type RETURN every time you want to tell the computer that you've finished.

Now try typing the following:
PRINT "HELLO, I AM YOUR NEW COMPUTER"

You have to type in the quotation marks. Computers are incredibly fussy when it comes to punctuation. Something like half of your future problems with programs will be directly attributable to typing errors! If you typed in the message correctly, and pressed RETURN then the computer will respond, immediately, with:
HELLO, I AM YOUR NEW COMPUTER
— as you would probably expect. Congratulations! You have just used the PRINT statement, one of many available in the Basic programming language.

You have also utilised one of the machine's more interesting features. You have run a program (yes, one statement, like the one you have just tried, counts as a whole program) in *immediate mode*. This means several things. The first is that the computer didn't bother to memorise your program at all, it just ran it when you pressed the RETURN key, and then forgot about it. It also means that the whole program had to go on one line, as typing RETURN to get on to another line automatically runs the program.

Immediate mode allows you to use your micro

to do simple tasks without going to the bother of writing programs and then running them. A typical example shows itself when you use your computer as a calculator. It is remarkably difficult without immediate mode.

If you do want to use your computer as a giant pocket calculator then it is in fact very easy. Try typing in $5+4$ and then press the RETURN key. Not much happened did it? Well, the micro did the sum for you, but as you didn't tell it that you wanted to know the answer it didn't bother telling you. It's like asking someone if they know the time. "Yes," could be a perfectly viable answer, but it's not very helpful. To tell the micro that you want it to tell you the answer use the PRINT statement. Try
PRINT $5+4$

The machine will instantly reply by printing 9. You can now try more complicated sums. Try typing in
 $((16*5)+1)/27$

The computer works out the bit inside the brackets first. So this would be done as;
 $16*5=80$
 $80+1=81$
 $81/27=3$

you will soon get used to the way in which a computer performs calculations.

Did you forget the PRINT in front of it? If you did, don't worry, you probably won't next time. You will find you have to use alternatives to the standard signs for division and multiplication.

Enough of the immediate mode. Try typing in the following line:

10 PRINT "ANYONE KNOWS THAT $2*2$ IS", $2*2$ (and press RETURN)

You'll now see that nothing much has happened — you may have got another READY message. If you now type RUN, and press RETURN, then you should get:
ANYONE KNOWS THAT $2*2$ IS 4

This illustrates several ideas. The first is that if you put a line number in front of the instruction that you want the computer to execute, then it won't execute it until you ask it to RUN the program. The next is that if you want two or more things printed in the same instruction — in this case a message and an algebraic expression — then you have to separate them in some way. Check your own version of Basic for the sort of separators you can use to get different effects. Common types are: Commas, to make the computer print the next bit at the next TAB marker, and Semi-colons, to make the computer print at the next character on the screen. In the above example the space between IS and 4 could be reduced (to nothing) by using a semi-colon instead of a comma. The computer is now also keeping a track of your program. You can see what it is by typing LIST. This should give you the original:

10 PRINT "ANYONE KNOWS THAT $2*2$ IS", $2*2$

You can also now run this program as often as you wish by simply typing RUN.

The point of the number at the beginning is to let the computer know where that line fits into the rest of the program. Why 10? Well, although it might appear to be more obvious to make the first line, line number 1, etc, this causes problems when you start writing a longer program.

If you want to add a line into the program before 1 for some reason, on some computers you would be saved as they allow you to number a line with zero, but on most you would now have to retype line number 1 as line number 2 and then insert line number 1.

Generally, it is quite a good idea to number the lines in your programs in tens, or more, as that way you can save yourself the effort of retyping. Most machines offer you the useful option of being able to renumber lines, but watch out, as not all do. Check before you start typing in pages of program lines.

Now that you've typed something in to your machine, what is to become of it? If you switch off your micro the program will disappear with the picture on your screen, and that's the last you'll see of it. Unless, that is, you've saved the program first.

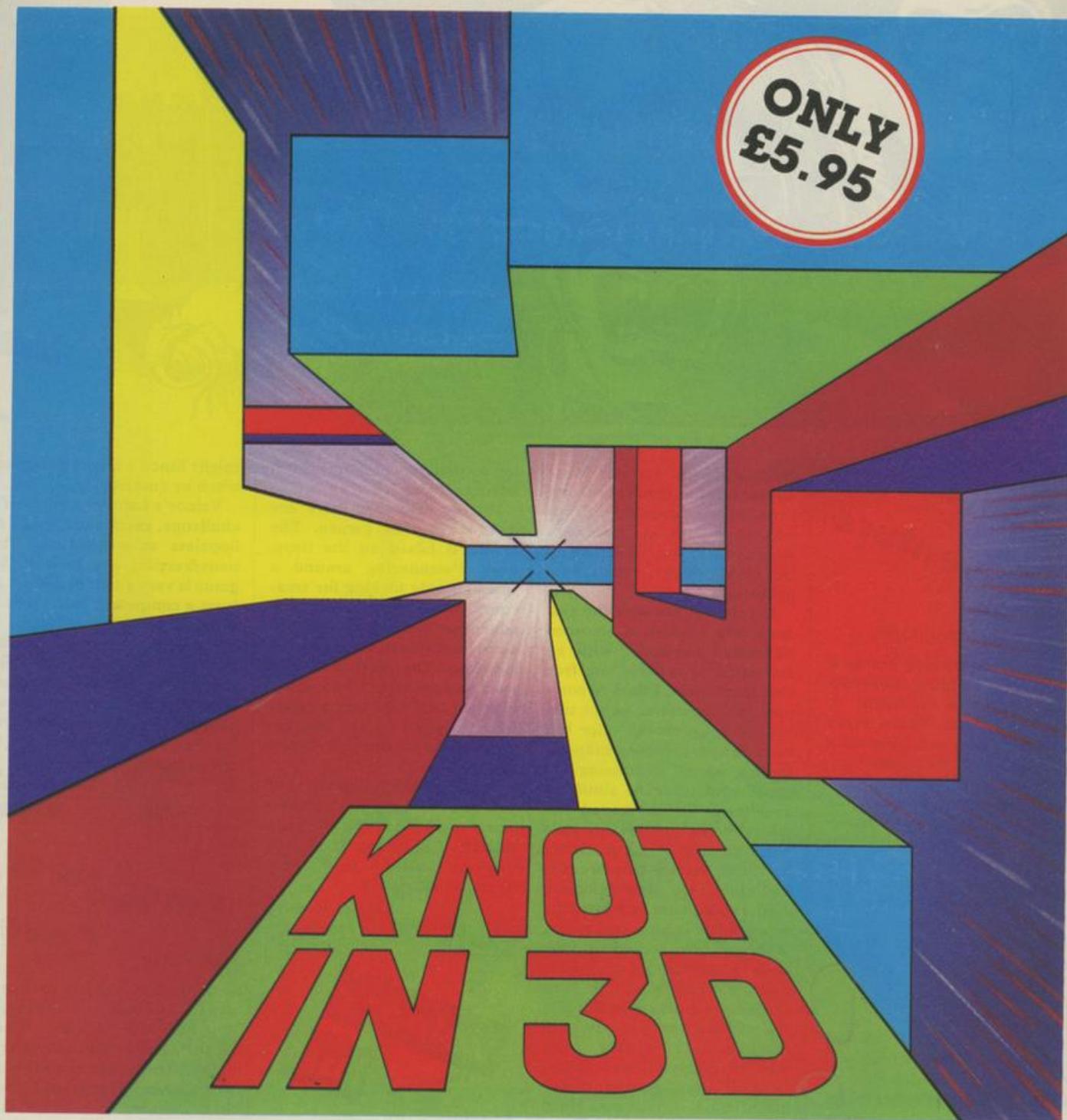
Saving, and its counterpart loading, to and from cassette tape is one of the most important features of the computer. If you've got a Basic program, and you're happy with it as it stands, then it's worth saving it. The frustrations of power cuts, fuse failures, playful friends and relatives switching your micro off, etc, are easily avoided by saving the program. Assuming you're using tape it's as simple as typing
SAVE "PROG"

and pressing the PLAY and RECORD buttons on your cassette machine. Check that the recorder is working before pressing RETURN, otherwise you will lose it.

Some machines use another word for SAVE — on the Dragon 32 it is CSAVE, but the process is the same. You can call your programs anything you like and people often do! But it's worth calling them something meaningful, as otherwise when you come back to it you may have no idea what the program was for.

Once you've got a program saved onto tape you can safely switch off your machine and go to bed. When you get up you can try loading your program in again, ready for another day slaving over a hot micro. Type
LOAD "PROG"
and press the PLAY on your cassette recorder. Soon the machine should give some indication that it is getting your program back for you. Once you get READY, or similar, then you can carry on from where you left off.

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£5.95**



KNOT IN 3D

Known by some as 'getting knotted'. You won't find a game for the 48K Spectrum quite like this anywhere else!

Imagine yourself in a capsule hurtling through a void while leaving a trail behind you. The only manoeuvres possible are up, down, forward, left and right. How long can you survive without crashing into your own trail? As the trails build up so your reactions will need to sharpen up. To make the game that little bit more interesting we've added the complication of up to four rogue chasers that attempt to block your path. The challenge is not only to avoid the chasers

and score points but to try and work out a playing strategy - you won't find this easy!

Naturally you'll be terminated when you out manoeuvre yourself and get caught in 'the knot'!

Don't just take our word for it - 'A highly original, professional and exciting game and one that I could play all night - very highly recommended' - ZX Computing.

'Knot in 3D must be one of the most beautiful, graphically, games to be seen on the Spectrum' - Popular Computing Weekly.

'Even 3D maze games can get repetitive but Knot in 3D contrives to be an interesting and innovative game by standing the 3D maze concept on its head'.

- Personal Computer News.

'Most 3D games have either a graphic display or an addictive playable game - but not both, this is one of the few that combine these qualities' - Computer & Video Games. But that's not all...

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Colossal Adventure

Level 9 Software (Oric)

"YOU ARE standing beside a small brick building at the end of a road from the north. A river flows south. To the north is open country and all around is dense forest. What now?"

That is the description of the first of over 200 locations in this version of the classic mainframe "Adventure". The main game is, by all accounts, a very faithful implementation of the original, but added to that is a completely new end game, itself containing more than 70 locations.

The booklet which accompanies Colossal Adventure sets a scene inviting you to locate and explore Colossal Cavern and escape with its treasure. Points are awarded for entering the Cavern in the first place and for finding the various treasures, although full points are given only when the treasures are successfully carried out of the Cavern. It is not possible to reach the end game and achieve truly high scores until all the treasures have been found.

Colossal Adventure contains detailed descriptions of its varied locations. There are two large mazes, both of which must be explored; the bearded pirate with his annoying habit of leaping out of the shadows chortling "Har, har" and stealing all your treasure keeps his chest deep inside one of them, and if you want your diamonds, silver bars and rare spices back you must discover his lair. Evil

little dwarves are for ever appearing and throwing sharp little knives at you. If you dropped your Axe in the Giant Room so that you could pick up the Golden Eggs, you have a problem!

Level 9 supply with the cassette and booklet, a stamped addressed envelope, with an invitation to request one free clue from them. I showed commendable restraint in not taking them up on the offer but then, in a moment of weakness, finding myself discussing the game with someone similarly caught up in it, traded the whereabouts of the pirate's chest for that of the platinum pyramid, the one treasure that had eluded me after extensive exploration. I am now puzzling my way through the end game, trying to free the elves, "for their plight is an abomination". Unfortunately, I keep getting drowned in the flood.

For once here's a program that lives up to its name. Using text compression techniques, Level 9 have packed a full mainframe Adventure into 48K, a masterful feat. Thoroughly recommended, and, in my opinion, excellent value for money.

Colin Curtis

RATING

The Castle

Bug-Byte (Spectrum)

YOU either get on with adventure games or you don't. If you give up on a game because you can't get out of the first or second room then you are miss-

ing something fundamental in adventure gaming.

Having said that there are wide variety of games. The Castle is based on the time-worn "wandering around a spooky castle looking for treasure" theme. It is a text only adventure and is quite good for a novice adventurer. The start is encouraging, there are lots of exits and objects to find and a nice set of clues and puzzles from the word go. The descriptions of the rooms and objects are good.

The response is a bit slow but you can build up a reasonable start to the adventure quite quickly. The setting is less than original but its a good introduction to the field.

Kirstie Rogers

RATING

Velnor's Lair

Quicksilva (Spectrum)

I PERSONALLY judge text adventures by the following criteria; is it original, or at least different, is it full of challenges, is the "housekeeping" easy, is it logical and finally, is it amusing?

Velnor's Lair is certainly not original in concept. It seems only the other week that I was in another similar set of dungeons. I would almost go as far as to say "seen one Labyrinth, seen them all". However, there is one slightly different idea, you have to chose whether you are a priest, warrior or wizard at the start and are given appropriate characteristics. This rather leaves out the girls who

might fancy being a priestess, witch or amazon.

Velnor's Lair isn't much of a challenge, even to me, and I'm hopeless at adventures. The housekeeping and logic of the game is very good, making it at least a competent game, but it didn't once make me laugh.

I do like the magic spells, they come in handy. I also like the state of health indication, where the border colour changes like a mood ring showing just how near you are to becoming an ex-person.

Bill Bennett

RATING

Smugglers Cove

Quicksilva

Smugglers Cove is an interesting variation on adventuring, you are hunting Black Beard's treasure in smuggler's caves. There are graphics as well as text. The graphics are fairly crude, only black and white, but still add to the entertainment value. If you throw a rope or span a trench the graphics change accordingly.

The computer communicated in an endearing Cornish dialect with various salty terms thrown in, "Right me lubber" and "Now don't ee be silly" were two of its favourite phrases.

There is a nice mixture of objects, clues and scenarios, all with the theme firmly in mind. It is quite an encouraging game, although I did get eaten twice and my birthdate was never propitious!

RATING

Step into the third dimension



Take a giant step closer to reality with New Generation Software. The 3D Graphics of New Generation programs bring the screen alive and makes other games look as flat as snakes and ladders.

Spectrum owners will find that seeing is believing when they open the door on 'THE CORRIDORS OF GENON', the latest creation from New Generation. You will be saving the Universe from the evil that now controls all things. But beware – the sound of footsteps approaching could be Bogul!

Corridors of Genon for 48K Spectrum £5.95
 Knot in 3D for 48K Spectrum £5.95
'Addictive, playable game' Computer & Video Games.
 3D Tunnel for 16K/48K Spectrum £5.95
'A masterpiece of programming' Computer and Video Games

Hurtle into a void leaving a trail for your unseen pursuers in 'KNOT IN 3D'. Weave your way through up to five trails but be careful, you could get knotted! Or travel through the depths of a moving tunnel full of bats, rats, spiders and toads in '3D TUNNEL', with a special surprise in the 48K version.

Stamina is the vital ingredient of 'ESCAPE', as you'll be venturing into the maze pursued by walking and flying dinosaurs.

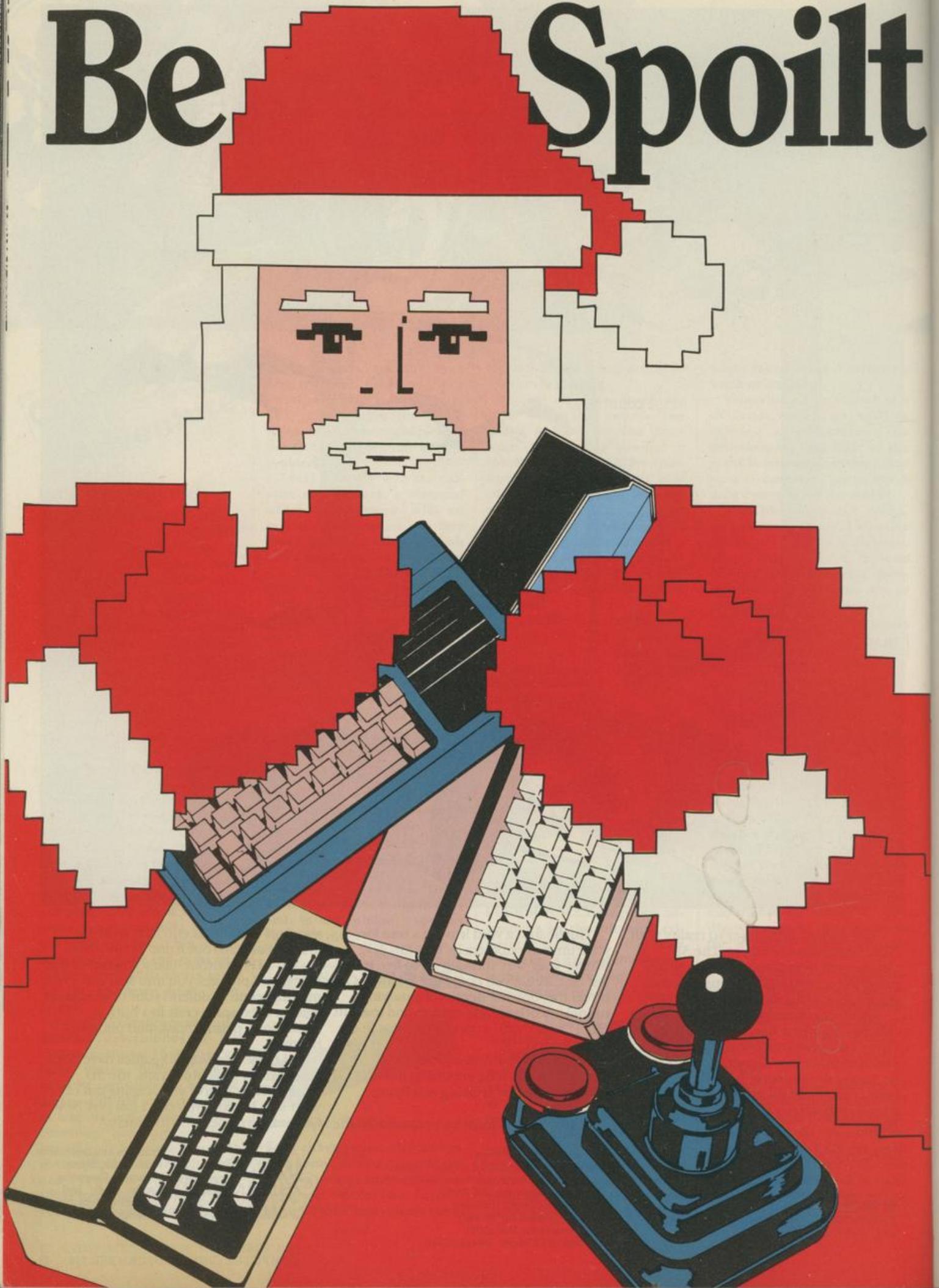
ZX81 owners must be prepared for the shock of coming face to face with the T. Rex that leaps out from '3D MONSTER MAZE'. '3D DEFENDER' takes you out of this world and plunges you into space in a fast moving game to defend your home planet against alien spacecraft in a blitz of explosions, plasma blasts and photon beams.
 All these exciting 3D games have been designed by Malcolm Evans, the 3D expert. They'll have you leaping out of your seat because you don't just play New Generation games, you live them.

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'Brilliant, Brilliant, Brilliant...'
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'Another 3D Winner' Sinclair User

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New Generation Software

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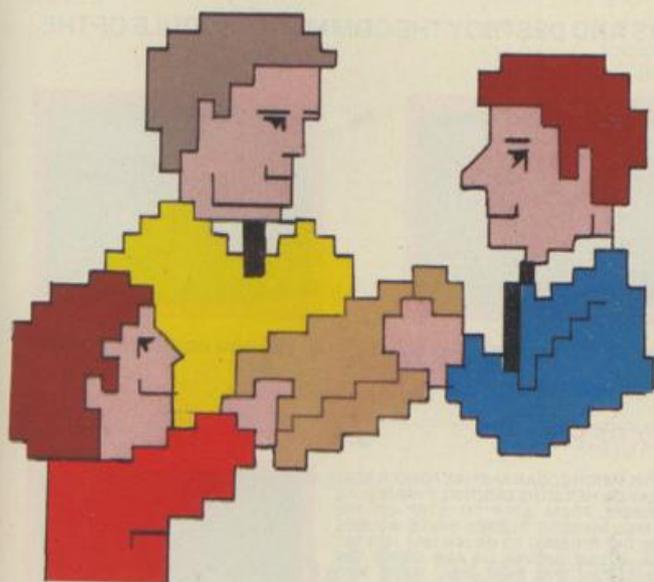
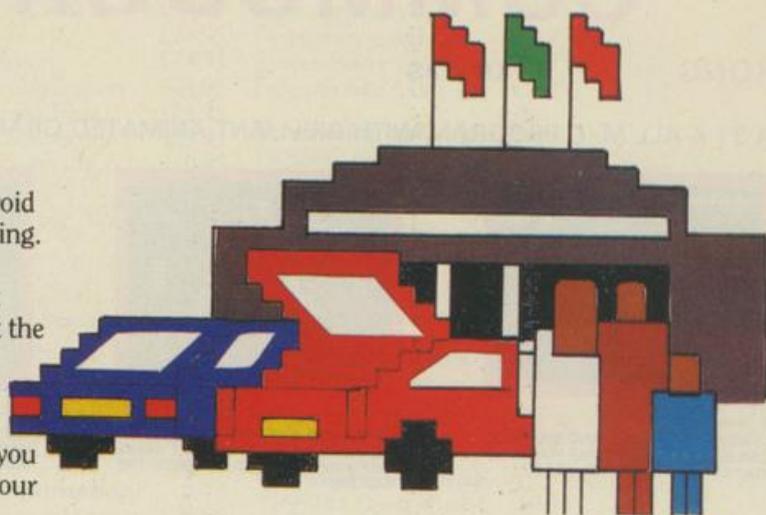
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t For Choice...

Why not be spoilt for choice this Christmas and avoid all the usual rush, hassle and frustration of present buying. By visiting the first Your Computer Christmas Fair (December 15-18) you can be sure of seeing a truly vast range of microcomputer products, all under one roof at the Wembley Conference Centre, the most modern and comfortable exhibition venue in the country.

Whether you're interested in choosing a micro for home management, child education or games playing, you can see everything demonstrated at the show, with all your



questions answered by expert sales staff from the manufacturers, dealers and software houses. Huge amounts of software and hardware, add-ons like joysticks and printers, plus a special Sinclair Village, will be at the show, so you can purchase the system you really want.

Large product stocks held on site mean no one will be disappointed and, because most exhibitors will accept major credit cards, you can try and buy in comfort, at the show.

As Wembley Conference Centre has parking for a staggering 5,000 cars you will be able to take away all the purchases you make on the day. The Conference Centre, with its excellent and economical catering facilities, is the ideal pre Christmas treat for the whole family, away from the high street crush.

Opening times are from 10 am to 6 pm every day except Friday - Special late night 8 pm closing. Because the exhibition remains open until 6 pm on the last Sunday before Christmas you can be assured of buying all your micro goodies.

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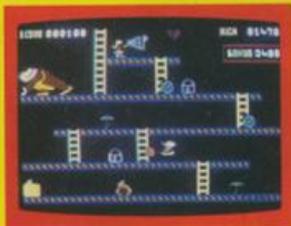
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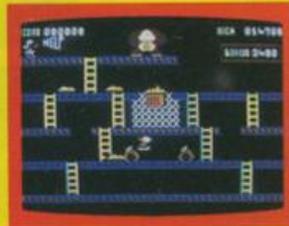
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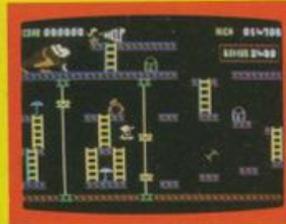
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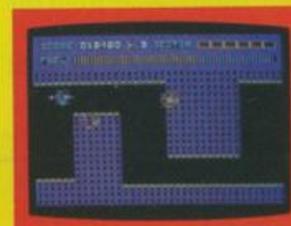
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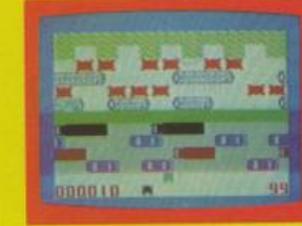
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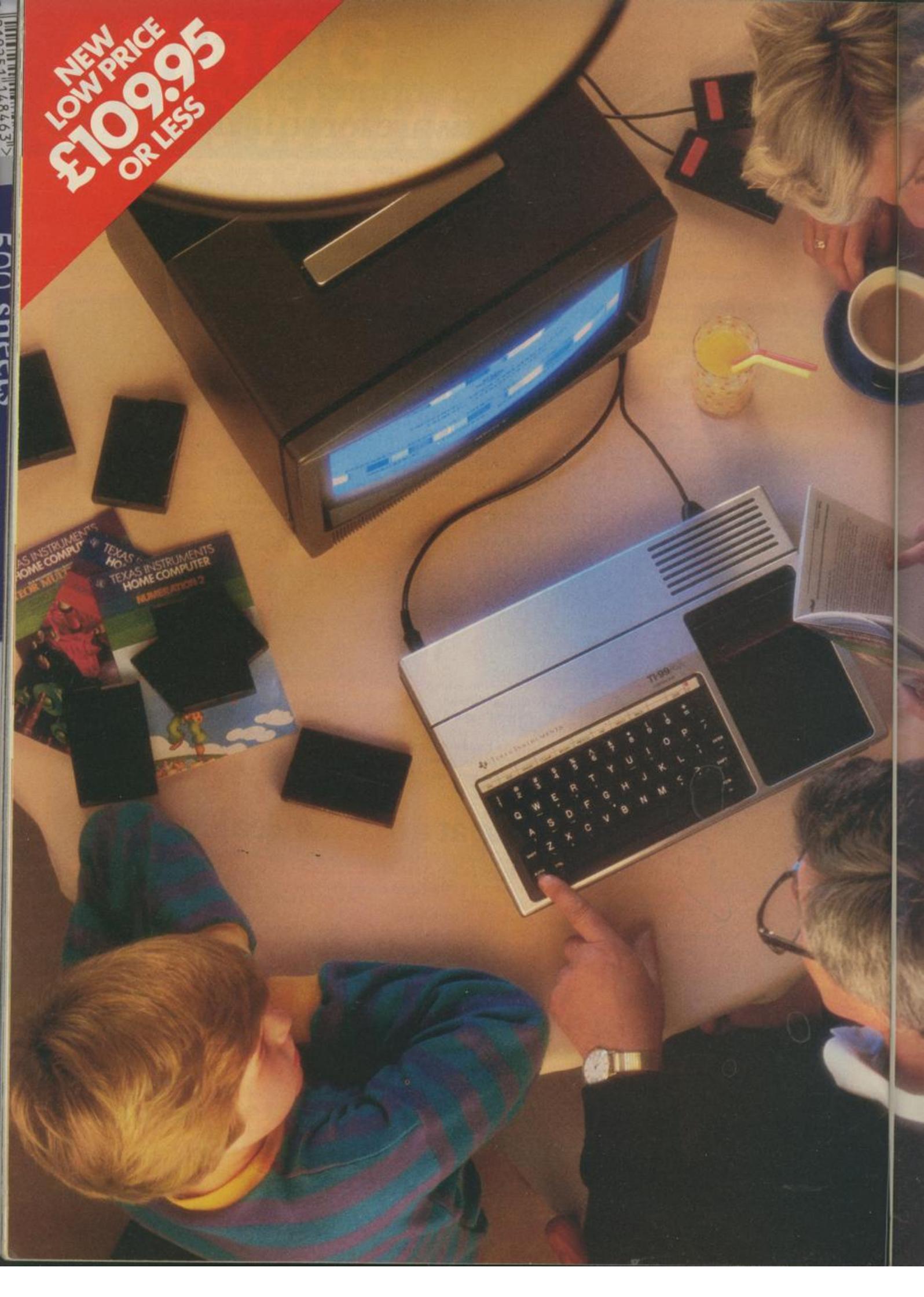
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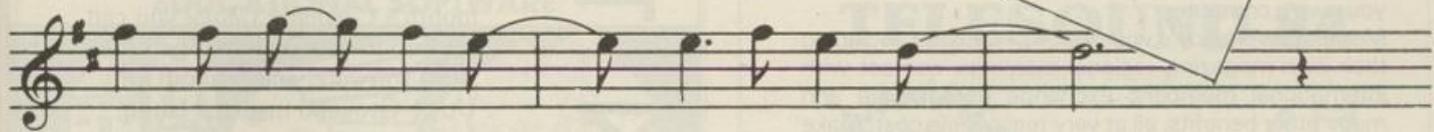
THIS short Dragon program will play the theme music from a well-known TV programme. If it sounds a little odd at times, that's due to a fault in the Dragon, which seems to drift out of tune occasionally.

The method used in the program is a good way of transcribing your favourite music to the computer whether it be "Anarchy in the UK" or "Moonlight Serenade". The loop started in line 150 simply repeats the main part of the tune. The first few lines set up various parameters — values which remain constant throughout the music.

You could try entering the tune on the Oric, using the program elsewhere in Software City. This program also runs on the IBM personal computer.

```

10 REM SONG FROM M*A*S*H
*
20 REM
30 REM
100 PLAY "T4" . SET TEMPO
110 PLAY "O3" . SET OCTA
VE
120 PLAY "V16" . SET VOLU
ME
130 PLAY "L4" . SET TO C
ROTCHET
133 REM
135 REM
R LINE TUNE - 1 BAR PE
137 REM E 4/4 TIM
139 REM
140 PLAY "C"
150 FOR N=1 TO 2
160 PLAY "L4B-A8-A"
170 PLAY "B-AL2G"
180 PLAY "L4AGAG"
190 PLAY "AGL4.FL8A"
200 PLAY "L4GFGF"
210 PLAY "GFL4.EL8G"
220 PLAY "L4FEFE"
230 PLAY "FGL2A"
240 PLAY "LIA"
250 PLAY "L2.AL4C"
260 PLAY "DCDC"
270 PLAY "DL2CL4C"
280 PLAY "DCDC"
290 PLAY "DL2CL4C"
300 PLAY "ACDF"
310 PLAY "GFDC"
320 PLAY "L1D"
330 PLAY "L2.L4C"
340 NEXT N
350 PLAY "L1D"
360 PLAY "L2.L4C"
370 PLAY "ACDF"
380 PLAY "GFDC"
390 PLAY "L2DL4DD"
400 PLAY "L2.D"
1000 GOTO 100
    
```

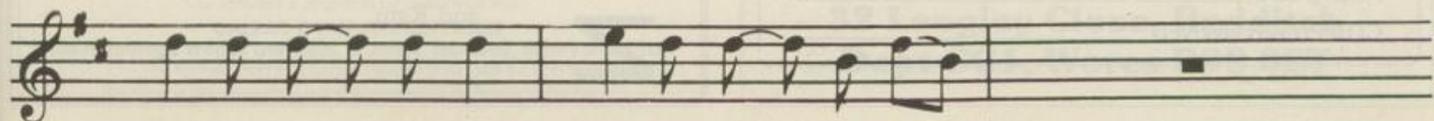


SPECTRUM RANDOM TUNES

```

>LIST
100 REM random tunes
200 DIM a(8): REM array to store notes in
    key of G
300 FOR i=1 to 8
400 READ a(i)
500 NEXT i
600 LET time=INT (RND*4+1)
700 BEEP (time*0.2),a(INT (RND*7+1))
800 GOTO 600
900 DATA 5,7,9,10,14,16,17
    
```

THIS program will play a tune in the key of G. The notes which make up the key are read in from the DATA statements in line 400 and stored in array a, which is DIMensioned in line 200. Line 700 picks up one of these notes at random, and plays it for a random amount of time, which is defined in Line 600.





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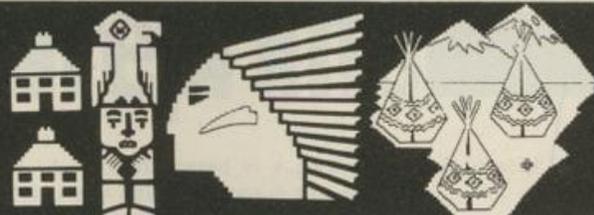
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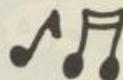
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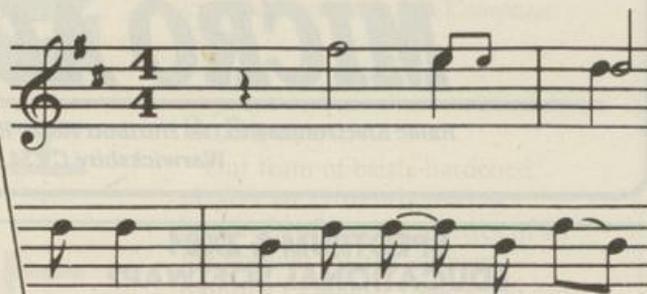
SPECTRUM — THE ENTERTAINER

```
>LIST
100 REM THE ENTERTAINER
200 REM COMPUTER CHOICE
300 REM
400 READ note,time
500 IF note=999 AND time=999 T
HEN STOP
550 IF note=100 THEN PAUSE (ti
me*10):GOTO 400
600 BEEP time*0.2,note
700 GOTO 400
800 DATA 26,1,28,1,24,1,21,2,2
3,1,19,2,14,1,16,1,12,1,9,2
810 DATA 11,1,7,2,2,1,4,1,0,1,
-3,2,-1,1,-3,1,-2,1,-5,2
820 DATA 100,2,11,2,2,1,3,1,4,
1,12,2,4,1,12,2,4,1,12,6
830 DATA 16,1,17,1,18,1,19,1,1
6,1,17,1,19,2,14,1,17,2,16,6,2,1
,3,1,4,1
840 DATA 12,2,4,1,12,2,4,1,12,
7,12,1,12,1,6,1,9,1,12,1,16,2,14
,1,12,1,9,1,14,6
850 DATA 2,1,3,1,4,1,12,2,4,1,
12,2,4,1,12,6,16,1,17,1,18,1,19,
1,16,1,17,1,19,2
860 DATA 14,1,17,2,16,6,12,1,1
4,1,16,1,12,1,14,1,16,2,12,1,14,
1,12,1
870 DATA 16,1,12,1,14,1,16,2,1
2,1,14,1,12,1,19,1,16,1,17,1,19,
2,14,1,17,1,16,6,2,1,3,1,16,4,12
,4,999,999
```

THIS program plays the old ragtime tune, "The Entertainer", by reading in the notes from DATA statements. Line 500 is a special piece of code which will recognise the end of the tune, which is flagged by the number 999 appearing twice at the end of the DATA statements. 999 is chosen because there is no note corresponding to the number.

Line 550 will recognise a note with value 100, this is interpreted as a rest in the music, the length of the rest being determined by the time variable. The note is then played — when required, in line 600.

This Basic program can be used to play any music you wish, all you have to do is enter the required DATA statements in lines 800 upwards.



SPECTRUM — NOISE

THIS short routine makes sound by changing the number held in the area of memory which controls the Spectrum's beeper. The same area of memory controls the BORDER colour, which is why you see it change to black. If you choose a different value for the variable a, the border will change to a different colour.

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```
>>LIST
100 LET a=200
200 FOR i=1 TO 100
300 OUT 254,a-16
400 OUT 254,a
500 NEXT i
```





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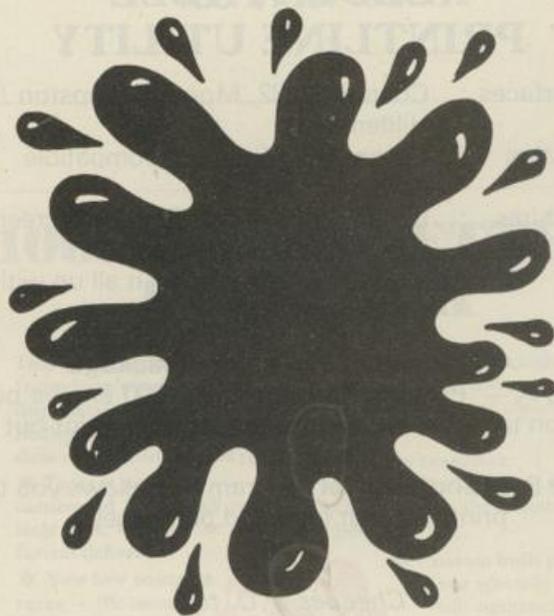
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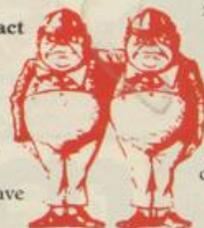
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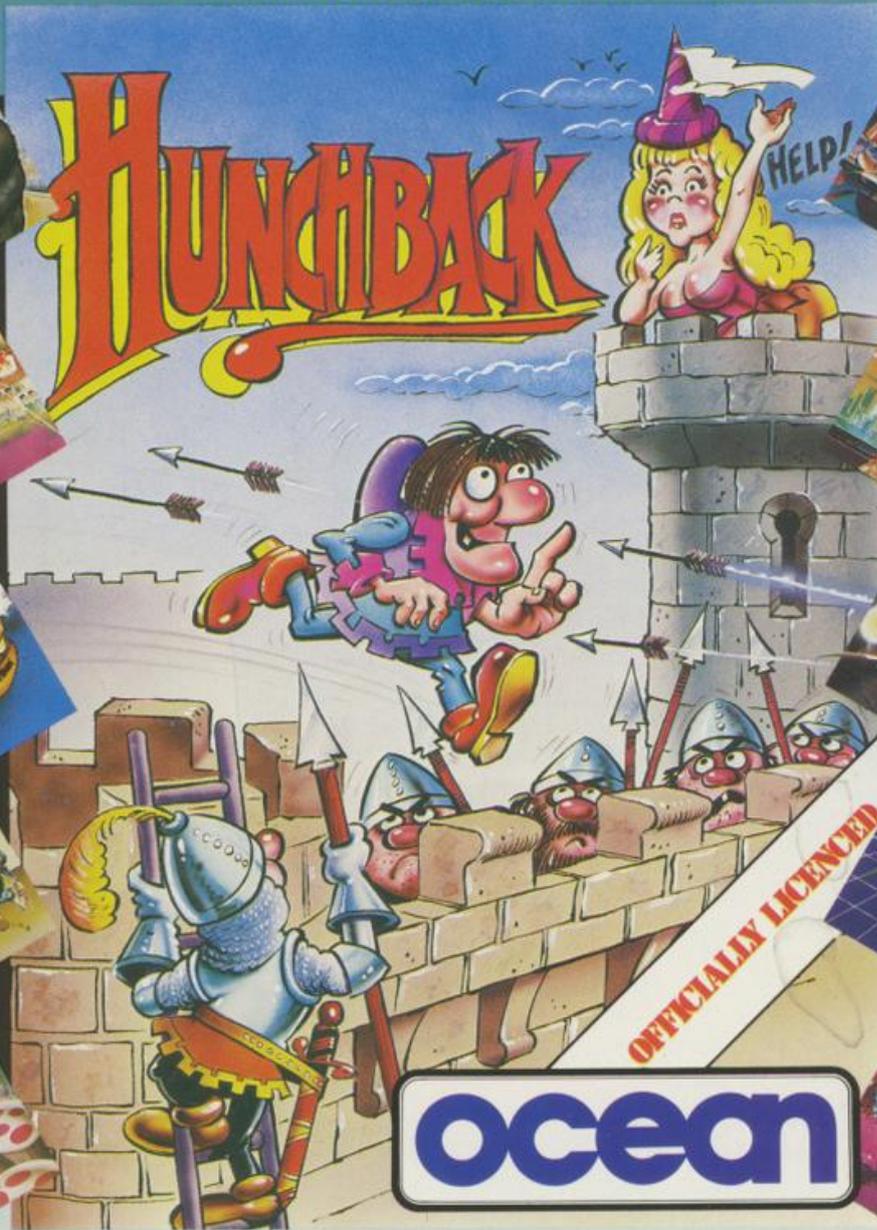
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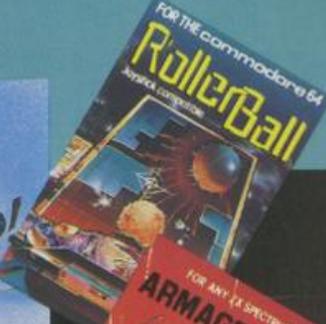
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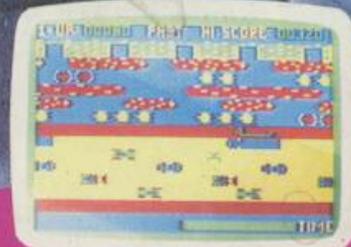
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