

MSX

COMPUTING

JUKE BOX JURY

**We pick our
TOP 20
games
of the year**



TESTED: Yamaha's MSX printer put through its paces

COMPETITION: Win yourself a versatile mouse

PLUS: 25 pages of software reviews and games listings

All MSX computers are built to the same standard.

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Phone 01-200 0200 for your nearest PX-7 dealer.

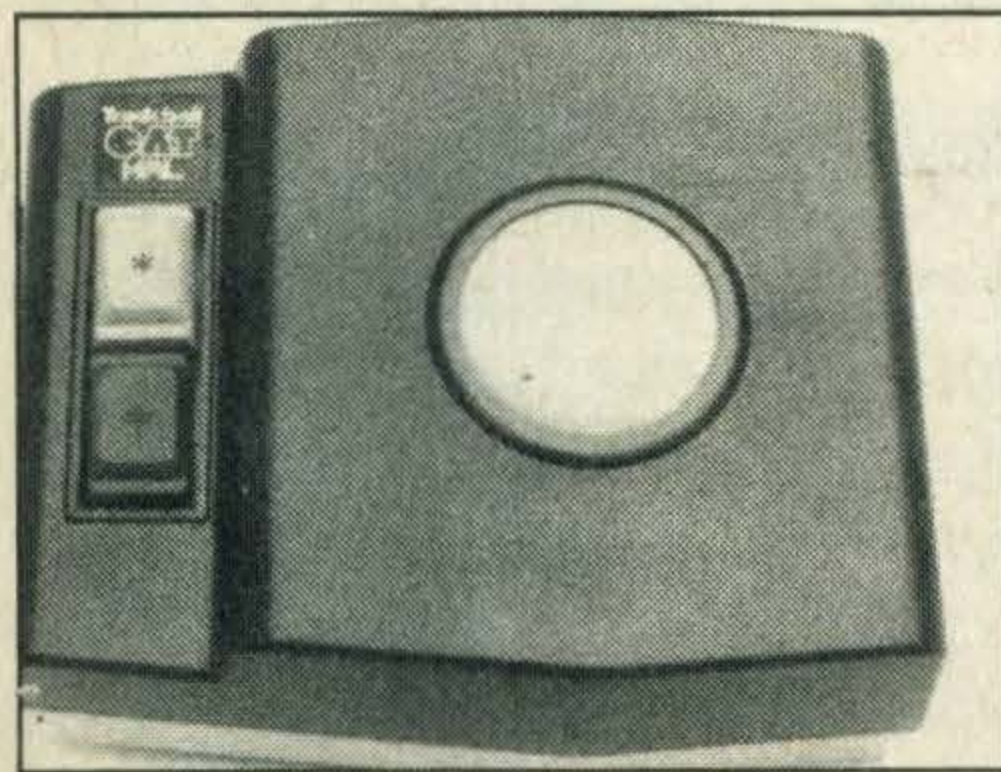
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REGULARS

4 NEWS. Catch up on the latest news — Konami's new cartridge games, low cost printers, a graphics tool from Japan plus information on new books, hardware, software and companies.



13 LETTERS. Here's your chance to let off steam, offer programming tips or give constructive advice to fellow gamers. Go on, put pen to paper now.

33 READER INFO. Missing an issue? Then find out what we've covered throughout the year and reserve your copy by taking out a subscription now.

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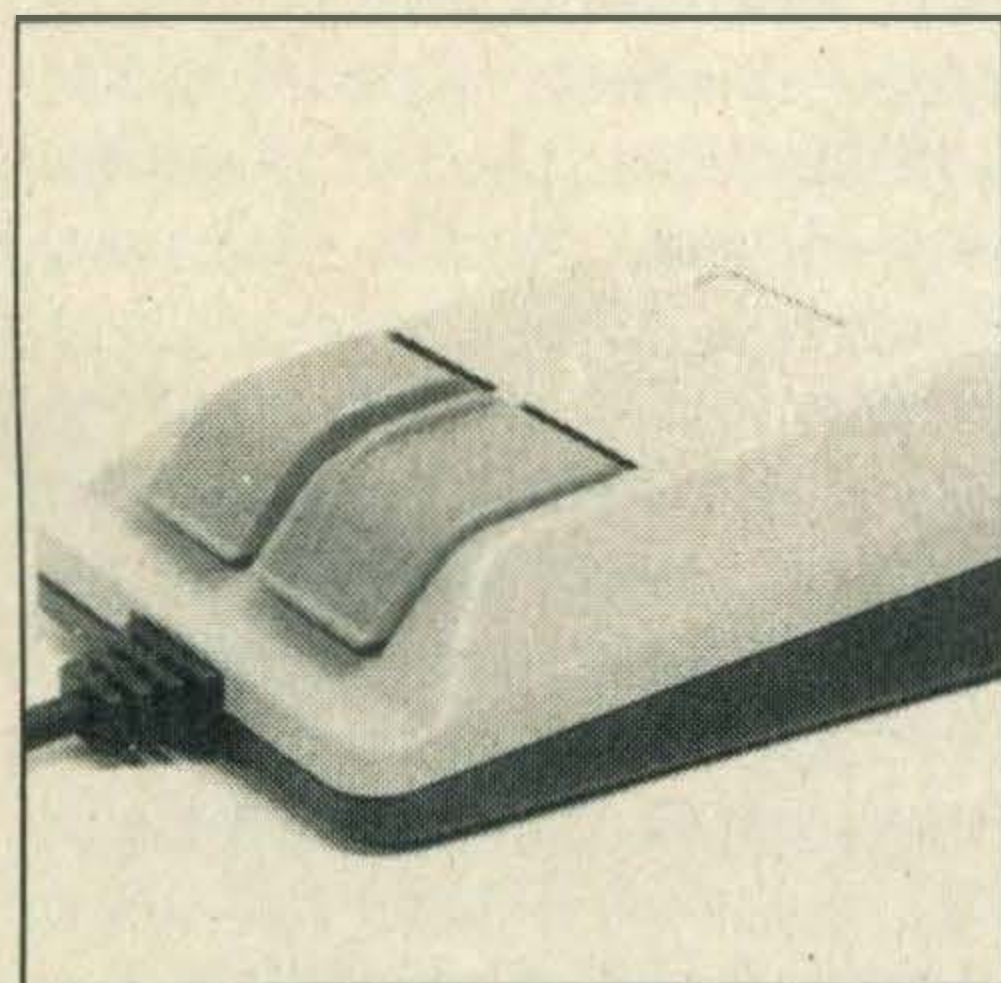
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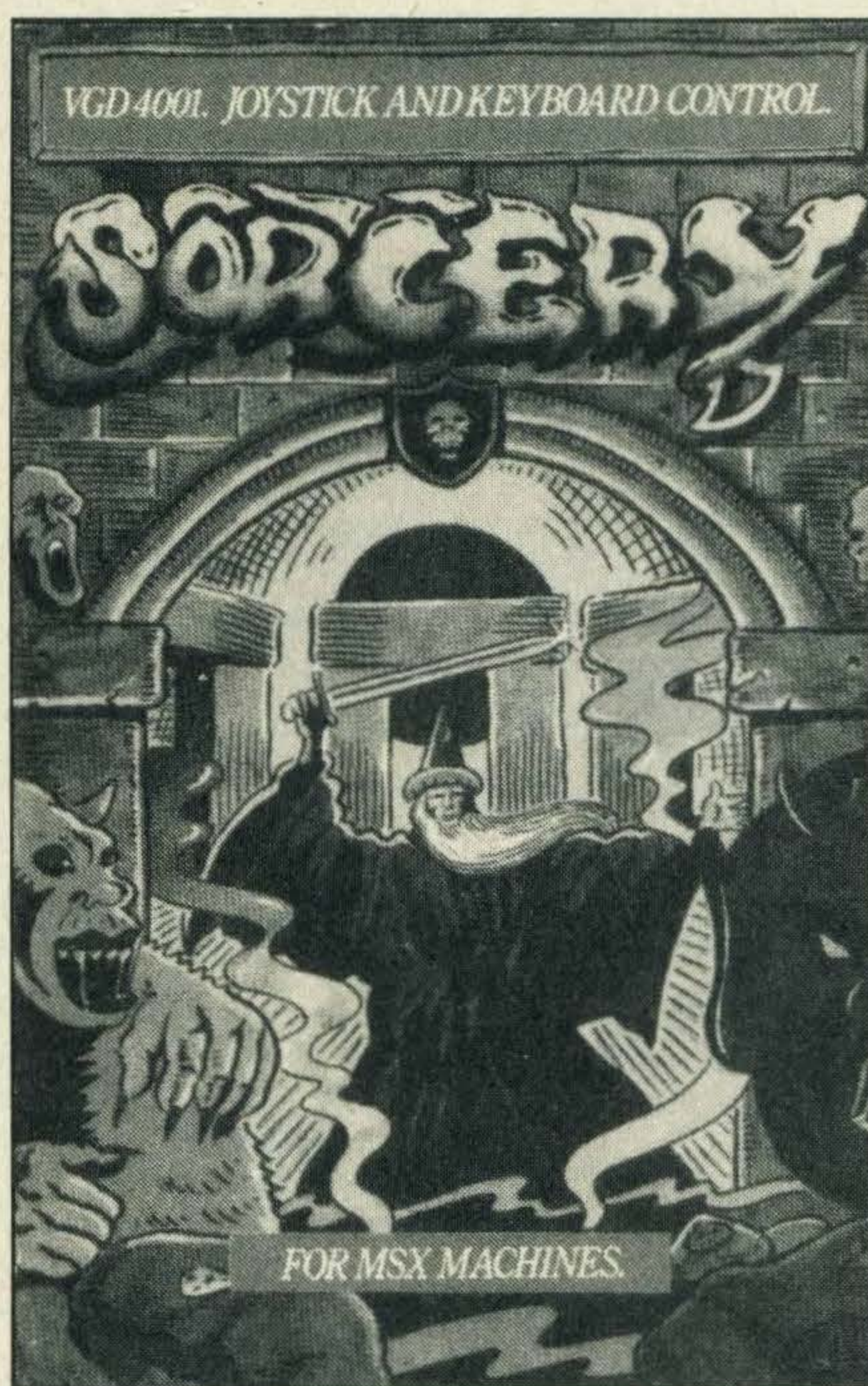
49 COMPETITION. Win yourself one of three MS2000 mice we're giving away in this month's easy-to-enter competition.



MSX COMPUTING

December 1985/January 1986

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38 TOP 20 GAMES To help you make an informed choice when selecting your software this Christmas, we've compiled what we consider to be the top 20 MSX hits of the year.

Making the selection was difficult because there's so much excellent software about, but after much thought (and argument!) we've put together our list, with Konami's *Road Fighter* just pipping Virgin's *Sorcery* to the top.

We've tried to please everyone and have been careful to include programs from all of the major game categories; arcade, adventure and strategy.

Some of you are bound to disagree with the order or even the choice, but we guarantee that the games mentioned are some of the best in their class and are all excellent value for money.

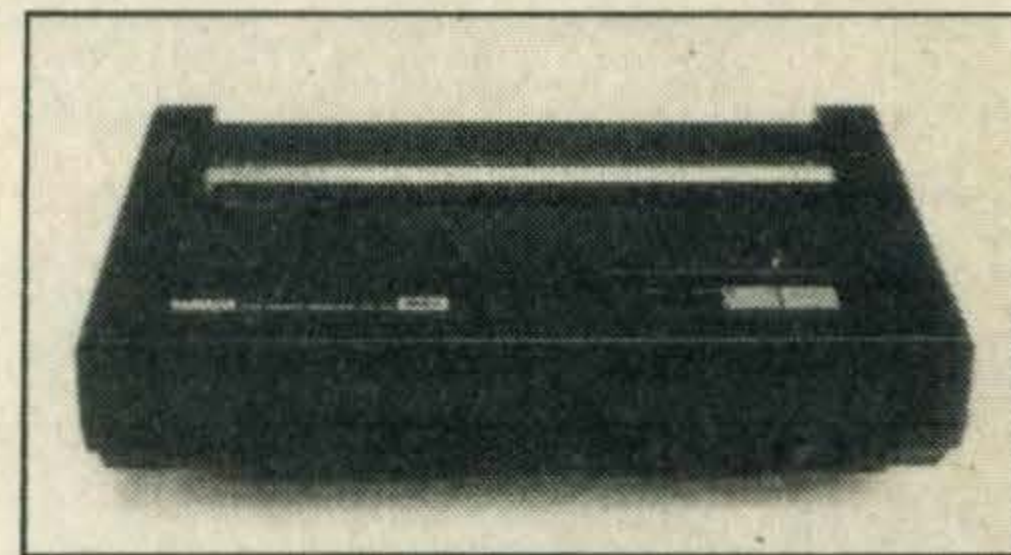
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DEPTS

16 MUSIC. Steve Mansfield tinkles the ivories with the aid of the latest music cartridge from Digital Music Systems.

27 BUSINESS. We put Toshiba's latest cartridge word processor, *Bank Street Writer*, through its paces.

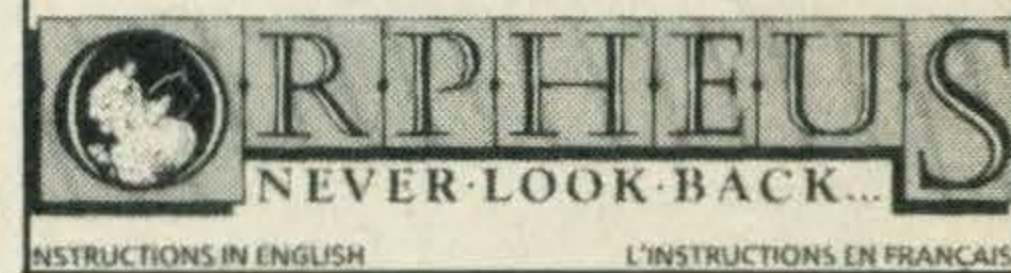
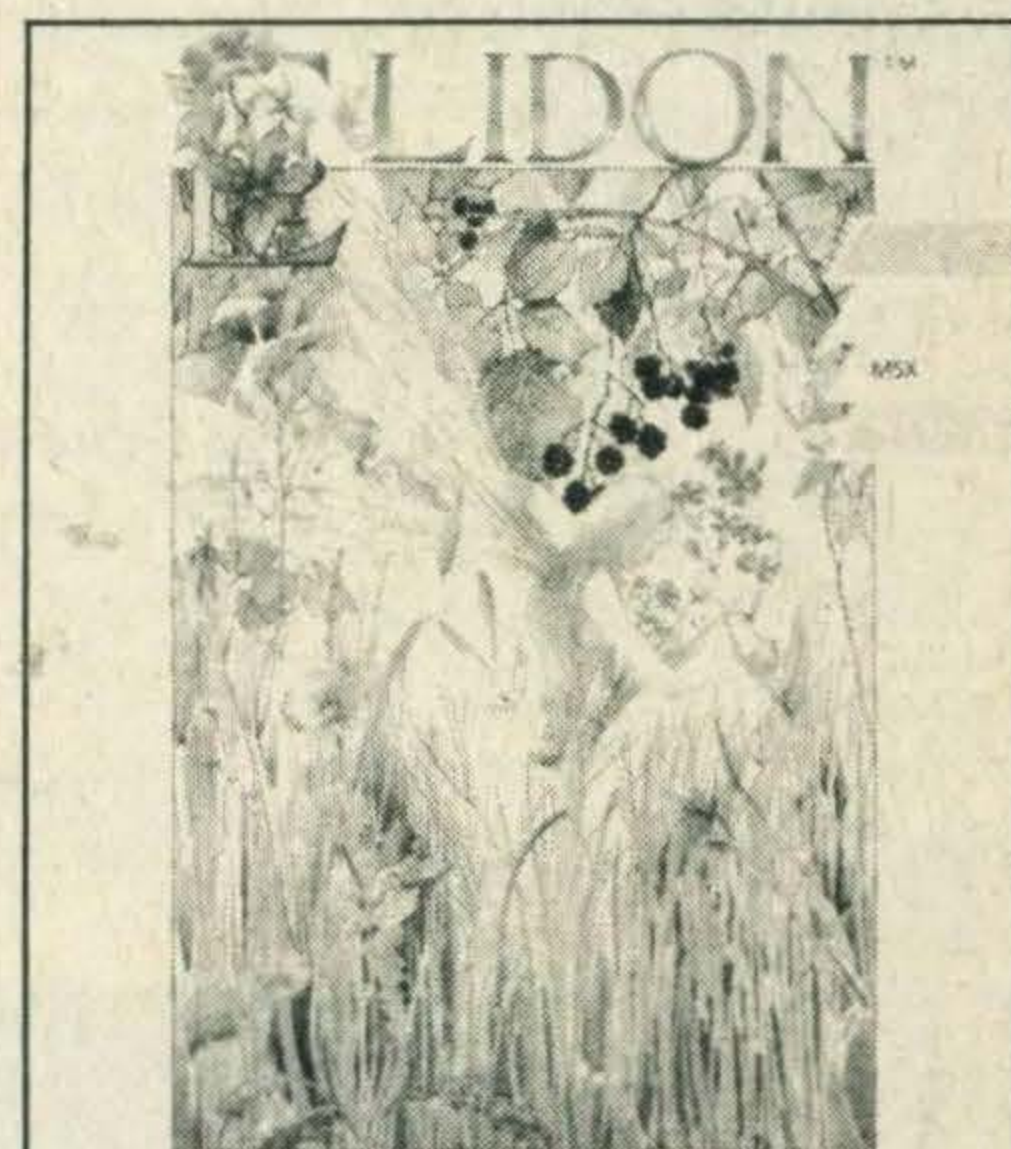
TESTING



30 CHARACTER BUILDER. Yamaha claims its very latest MSX printer can reproduce the entire MSX special character set. We set up the system and see for ourselves whether they're right.

REVIEWS

50 PRINTOUT. Six new books this month, including an MSX introductory text and a dictionary of microcomputing terms.



53 SOFTWARE SCENE. We've ten pages of the latest software releases this month, including *Ping Pong*, *Jet Set Willy II* and *Minder*. Plus our game of the month, *Elidon* from Orpheus Software.

LISTINGS

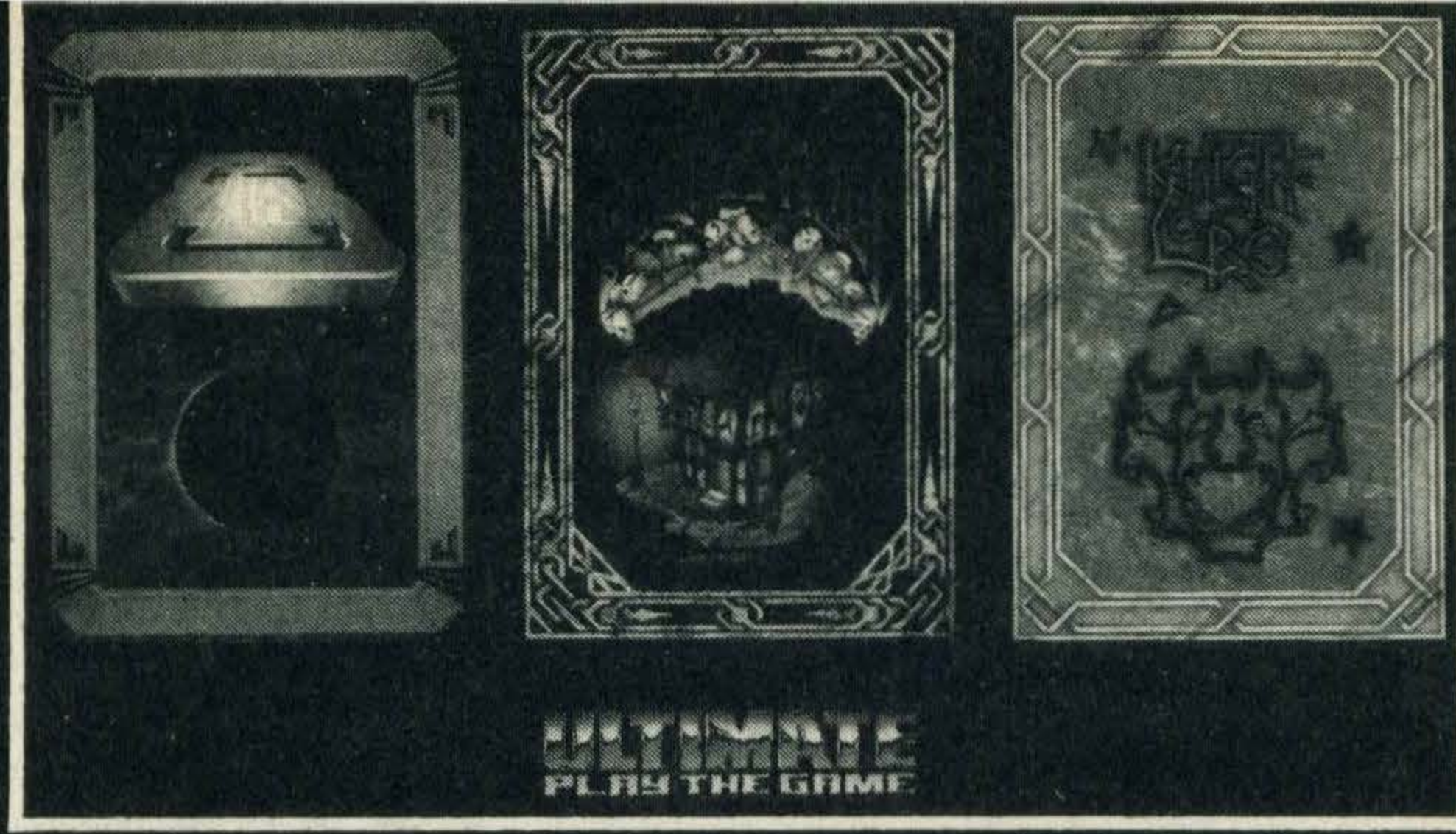
65. Fourteen pages of games for you to type in over your Christmas hols, including that old chestnut, *Biorhythms*. Plus all the latest high scores from alien zapping readers everywhere.

Talk to me

If you want your computer to talk to you then the Speechmaster synthesiser unit from Nemesis could be just the ticket.

It costs £49.95 and comes in the form of a ROM cartridge. Nemesis's Christian Allwood claims, 'Speechmaster is a true text to speech package'.

Speechmaster can be obtained from Nemesis, 2 Iffley Road, Hammersmith, London W6 or telephone them on 01-846 9701.



Adventures Galore!

Three MSX adventure titles are shortly being released by software house Ultimate.

The three games are *Knightlore*, *Alien 8* and *Nightshade* and each will sell for around £9. They contain all the features of the original Spectrum versions. Watch out for our reviews in the next issue of *MSX Computing*.

Computer Hits competition winners

Entries arrived by the sackload following our Beau Jolly competition in the October/November issue of *MSX Computing*.

The aim of the competition was to name the six publishers of the games included on Beau Jolly's *Computer Hits* tape. It was fairly easy and this was reflected in the entries — nearly all of you got the answers right.

The correct answers were Martech, Alligata, Bubble Bus, A & F Software, Personal Software Services (PSS) and MC Lothlorien.

Fifty copies of *Computer Hits* are now winging their way to the following winners: Peter Cullen, Peterhead; Elizabeth Waters, Havant; Gavin McNair, Renfrew; Ronan Mason, Greystones; Barrie Fleming, Glasgow; Graeme Webb, Marlborough; Ian Bucklow, Whitwell; J. Love, Liburn; S.F. Wain, Stockport; N.G. Parsons, Cardiff; W. Bucklow, Retford; Jonathan Sinfield, Ampthill; Craig Scott, Livingston; Vicki Hanley, Stockport; S. Webster, Rotherham; Martin Sweeney, Sunderland; Paul Sargent, Birmingham; Matthew Gee, Solihull; P.S. Gill, Newcastle; K.T. Davy, Dereham; C.J. Greenhough, Chesterfield; James McMurray, Cumbernauld; J.R. Robson, Stratford; Ian Wriglesworth, Darlington; R. Yasmin, Manchester; Keith Rendel, Kenton; J. Fletcher, Eastleigh; David and Mark Salathiel, Rickmansworth; Mark White, Arbroath; Simon Quirk, Douglas; D. Brown, London; N.W. Whitlock, Southampton; B. Strzelecki, Tewkesbury; Andrew Carlyle, Southam; Paul and Barry Grave, Wick; Neresh Kumar, Wolverhampton; Jamie Garnett, Felixstowe; Andre Bougard, Eastleigh; D.M. Jones, Caernarfon; E.T. Dewhurst, Preston; Ian Fillingham, Arnold; Raja Quadeer, Bingley; Gerald Owen, Inverness; Khon Dang, Oldham; Joseph Gleeson, Bray; Jim Cameron, New Elgin; Kevin Lee, Coventry; Mark Wallar, Danbury; K. O'Rourke, Ruskington; A.H. Jambol, Bristol.

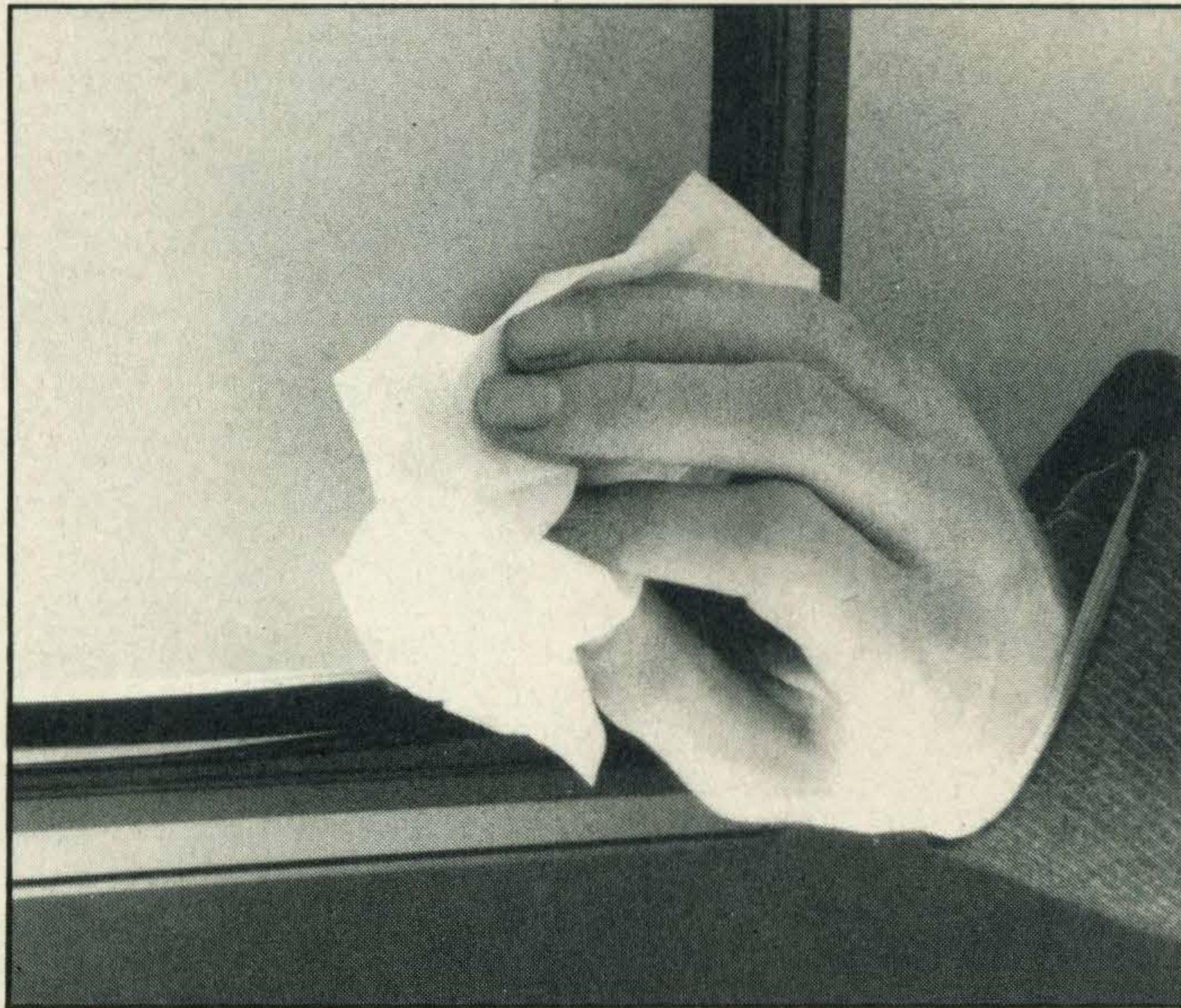
Keeping the dust well under control

Monitors and televisions are prone to dust build-up through static electricity but the Process Control Company has come up with a handy solution.

The company is selling multi-purpose antistatic cleaning 'Procostat' wipes for £1.48 for a pack of ten.

Each wipe is impregnated with a static-eliminating solution that can not only be used to keep your screen clean, but your keyboard and printer as well.

The packs can be bought from most local computer dealers. More information can be obtained from The Process Control Company, Griffin Lane, Aylesbury, Buckinghamshire HP19 3BP. Telephone (0296) 34877.



Procostat wipes come in packs of ten



Anti-static wipes can help you gain a clearer perspective

Brighter sprites

Newly-formed software house Anglosoft has released its first graphics software for MSX.

The package is called *The Anglosoft Sprite Designer* and costs £5. The program is menu driven and there's two sprite modes to choose from. The 8x8 mode allows up to 254 sprites to be created and the 16x16 mode can be used to create up to 62 sprites. The 8x8 mode also contains a Font Generator which allows you to redefine the MSX character set.

Other features include a colour palette, a sprite design grid and a mirroring function which allows you to produce a mirror image of the sprite you've just created, and rotate it through 90 degrees.

Anglosoft's *Sprite Editor* is available by mail order only from Anglosoft, P.O. Box 60, Coventry, West Midlands CV1 5SX.

Fast printers are on the way

Samleco, manufacturer of low cost dot matrix printers, is planning to add a variety of high speed printers to its existing range by the middle of 1986.

Although John Stephenson, managing director of Samleco, is unsure of which models the company will be receiving, he tells us that they will all have print speeds of 200 characters per second (cps) and will incorporate international character sets, dot graphics and a variety of print modes including enlarged and near letter quality. Prices will range from £299 for the 80-column to £499 for the 132 column models.

More news from Samleco is that it has just appointed Mills Associates as its distributors 'because of their serious commitment to this (the printer) market and their proven track record in offering next day delivery to customers', says Stephenson.

Samleco Ltd can be contacted at 9 Fairacres Industrial Estate, Dedworth Road, Windsor, Berks SL4 4LE. Tel: (0753) 854717.



Panacea's sight and sound packs

A company called Panacea Software has entered the MSX arena with two new software packages — a sound generator and a graphics package.

The graphics package is a sprite generator which enables you to store and draw up to four 16 x 16 sprites on your screen.

The sound generator enables the sound registers of your micro to be altered and displayed on the screen.

Both the packages cost £5.95 and are available by mail order only from Panacea Software at 105 Gainsborough Drive, Westcliff-On-Sea, Essex. Telephone (0702) 333476.

Konami on course

We've great news for cartridge fans — Konami has brought out four new games including *Hyper Rally*, the *Pole Position* look-a-like, all selling for £14.95.

In *Hyper Rally*, you control a rally roadster and have to complete each stage of the race within a time limit.

Martial arts addicts will love *Yie Ar Kung Fu II*. It's like the first version except that Lee, the hero, is up against a different set of opponents.

'These include', says Luther de Gale, Konami's product manager, 'some horrible little midgets that come flying through the air trying to bite your ankles'.

Beating the life out of your opponent is the aim of Konami's *Boxing* and each time you succeed, a nastier one comes on. Finally, Konami's *Soccer* displays a match between two football teams.

Incidentally, Konami has put together a special offer for *Track and Field* fans for Christmas. For £22.95 you can buy either the two *Track and Field* titles or one of them together with the Hypershot controller.

For more information contact Konami on 01-429 2446.

Philips adds a touch of colour to monitors

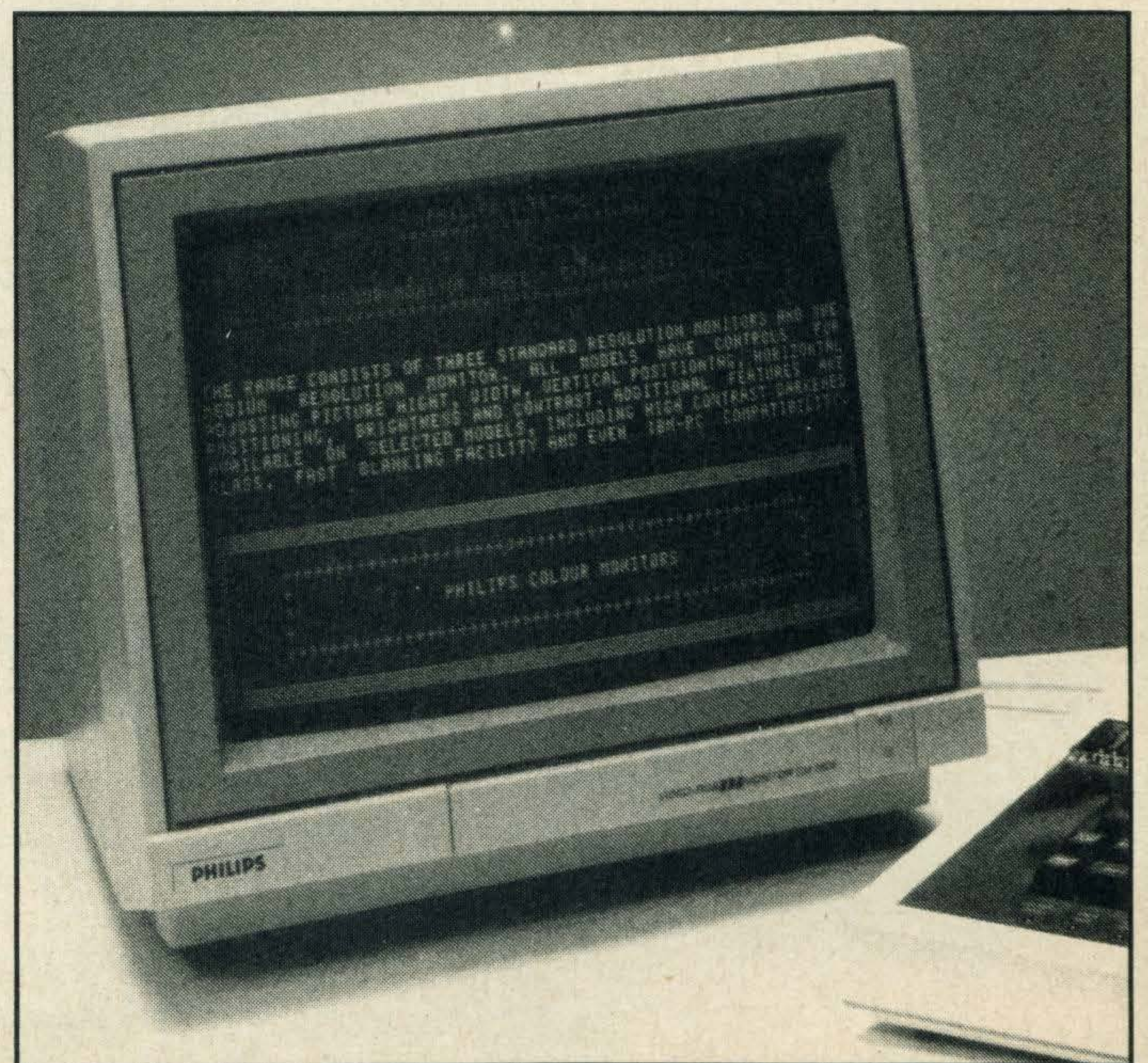
Philips has updated its product line with three colour standard resolution monitors and one medium resolution model.

Prices start at around £220 for the CM8500 model which has a composite video input and a horizontal resolution of 300 pixels.

The top of the range model, the CM8533, costs £315 and has both composite video and RGB inputs and a horizontal resolution of 600 pixels.

The introduction of the colour monitors follows hot on the heels of the company's green-, amber- and white-screened monitors launched earlier this year.

Further details can be obtained from Philips Consumer Electronics, City House, 420/430 London Road, Croydon, Surrey CR9 3QR.



At £280 the CM8524 lies in the middle of Philips new range

LET
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3D

KNOCKOUT



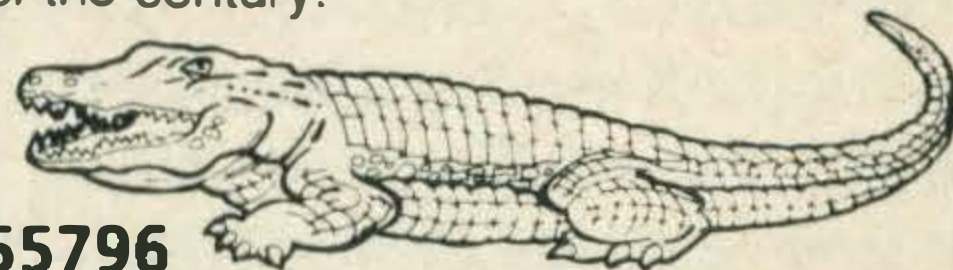
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RAM and ROM on the cards

The popular word processing package for home and small business users, *Pocket Wordstar*, will be available on the Astron ROM card for MSX early next year.

Micropro, which developed the package, together with Cumana, the company which markets it, are also planning the launch of a high speed RAM card giving up to one megabyte of memory.

According to Robin Oliver, managing director of Micropro, 'The importance of ROM and RAM card technology hasn't yet been appreciated — until now they have only been suitable for games. But, with 64K and upwards, professional software is about to become available.'

Astron cards look like credit cards, and encapsulate the chips in tough plastic. In use, a card is slotted into a small adapter which in turn plugs directly into the I/O port of your computer.

Members wanted

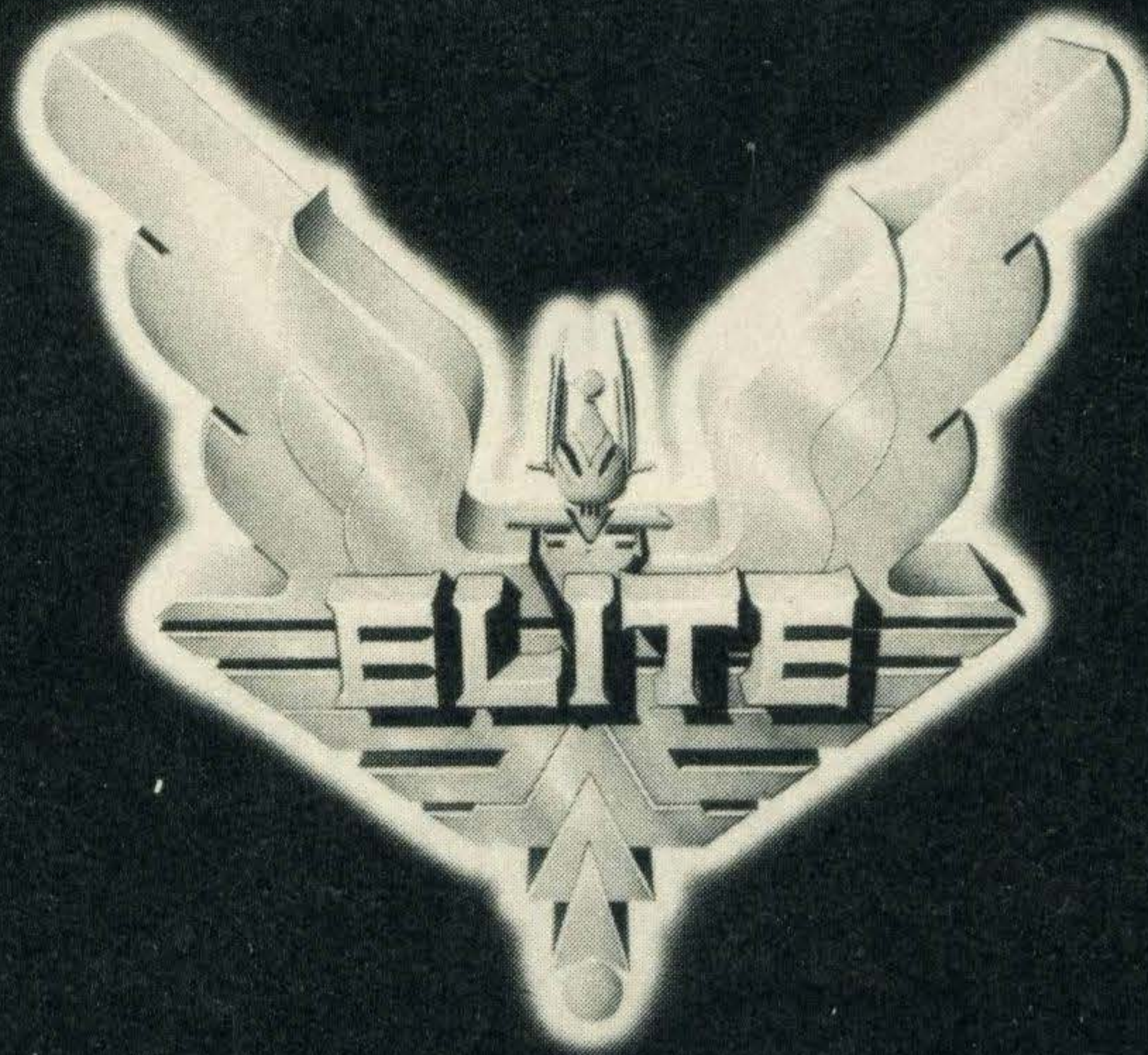
The Nottingham-based MSX Club is offering members up to 10 per cent off the price of software from many leading software houses including PSS, Alligata and Activision.

Until January 15th, *MSX Computing* readers can join the club for £2.50 instead of the normal £5, and take advantage of the software offer. Just send them a stamped addressed envelope and you will receive a complete list of software available.

Lee Simpson, the club's founder, tells us that negotiations are underway for a merger with MSX clubs in Europe and Australia. Watch this space for more details.

All membership enquiries should be addressed to: Lee Simpson, The MSX Club, 3 Mayfair Place, Tuxford, Nr Newark, Nottingham NG22 0JD or telephone Tuxford 870 485.

SPACE TRADERS FLIGHT TRAINING MANUAL



FIREBIRD

Joining the Elite

Elite, Firebird's famous space trading game, is being converted for MSX micros and should be available in January 1986 for £14.99.

Ever since it was first produced, *Elite* has alternately fired and frustrated its players' imaginations and its release on MSX signifies that many software manufacturers are getting increasingly confident that the MSX standard is here to stay.

Billed as a strategy/arcade/adventure game, *Elite* is a space trading game and involves the player in the complex world of making money — lots of it!

By flying from planet to planet, the player buys goods in one location, for example food and textiles from an agricultural planet, and moves onto an industrial planet to sell them and buy more.

On the way to these planets, heat seeking missiles and other enemy aliens have to be zapped. *Elite* also features 3-D graphics and great sound effects.

Tony Beckwith, Firebird's software evaluator believes, 'The MSX conversion is as good as all of the other converted versions if not better'.

At last... the one we've all been waiting for!

At long last we can honestly say with our hands on our hearts that Toshiba's long-heralded HX-22 computer is now definitely on sale.

Costing £249, the machine's features include a built-in RS232C interface, 80K RAM and 64K ROM, part of which is taken up by a built-in word processor.

The HX-22 should originally have been launched early in September — Toshiba's product manager, Chris Greet, tells us that the delay was due to an 'unexpected shortage of machine manuals'.



Toshiba's much heralded HX-22, better late than never

Books on schedule

Two MSX titles are scheduled for release from Babani books at the beginning of February.

The titles are *Easy Add On Projects for MSX* by O Bishop at £2.95 and *More Advanced MSX Programming* by RA & JW Penfold at £2.95. The last title follows on from the author's previous book *An Introduction To MSX BASIC*.

Babani prints a host of other titles for MSX owners and some general introductory books. A catalogue is available from Babani Books, The Grampians, Shepherds Bush Road, London W6 7NF.

Socket to me

If like us you're fed up with the vast array of bulky and cumbersome adapters running under your desk, then look no further.

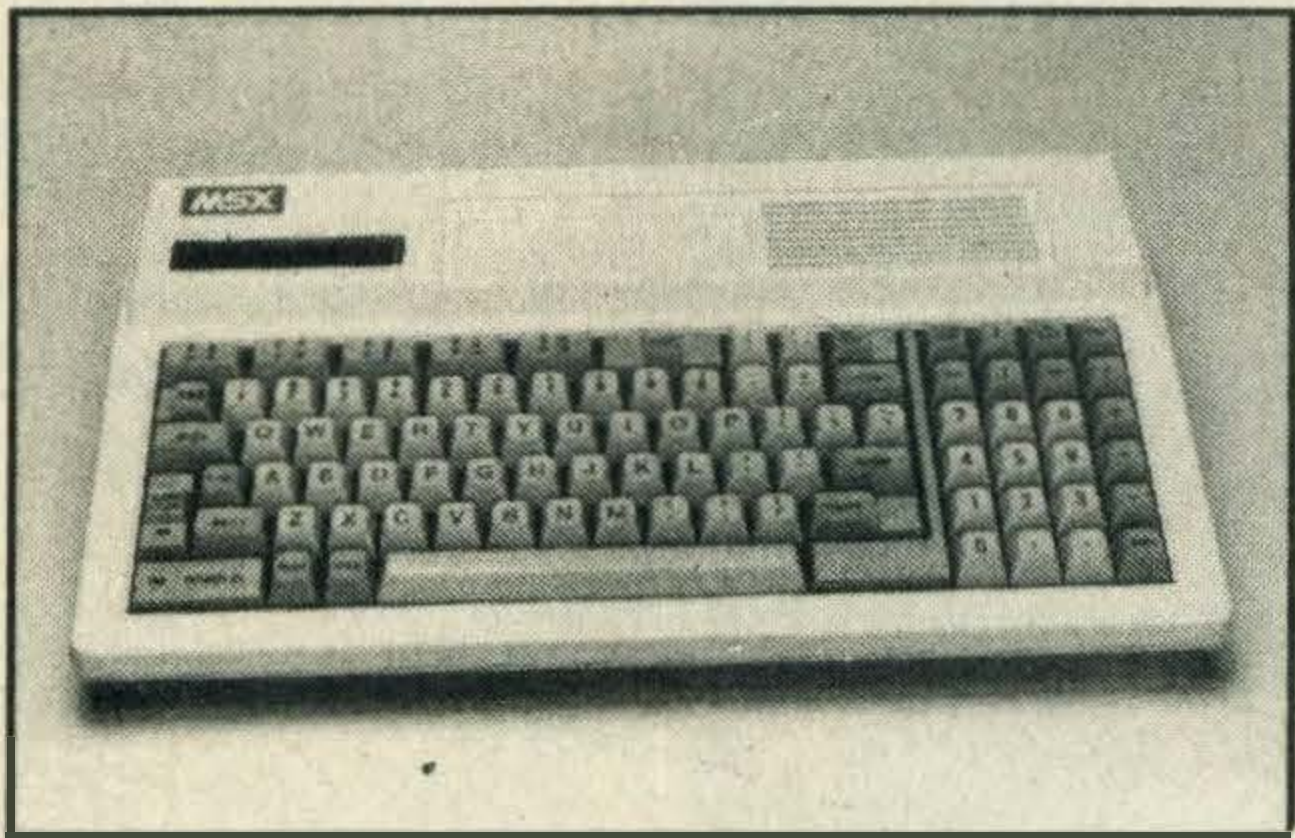
Conblock Electrical has developed two adapters designed to be much neater and more compact than the conventional three-way and six-line block adapters.

Its six-way Masterplug adapter has a full 13 amp capacity and comes with six round-pin plugs, each having a maximum 6 amp capacity.

The second adapter is a four square wallplug also capable of simple connection to any 13 amp outlet.

Both the adapters are available through most high street electrical retailers and cost between £10 and £15.

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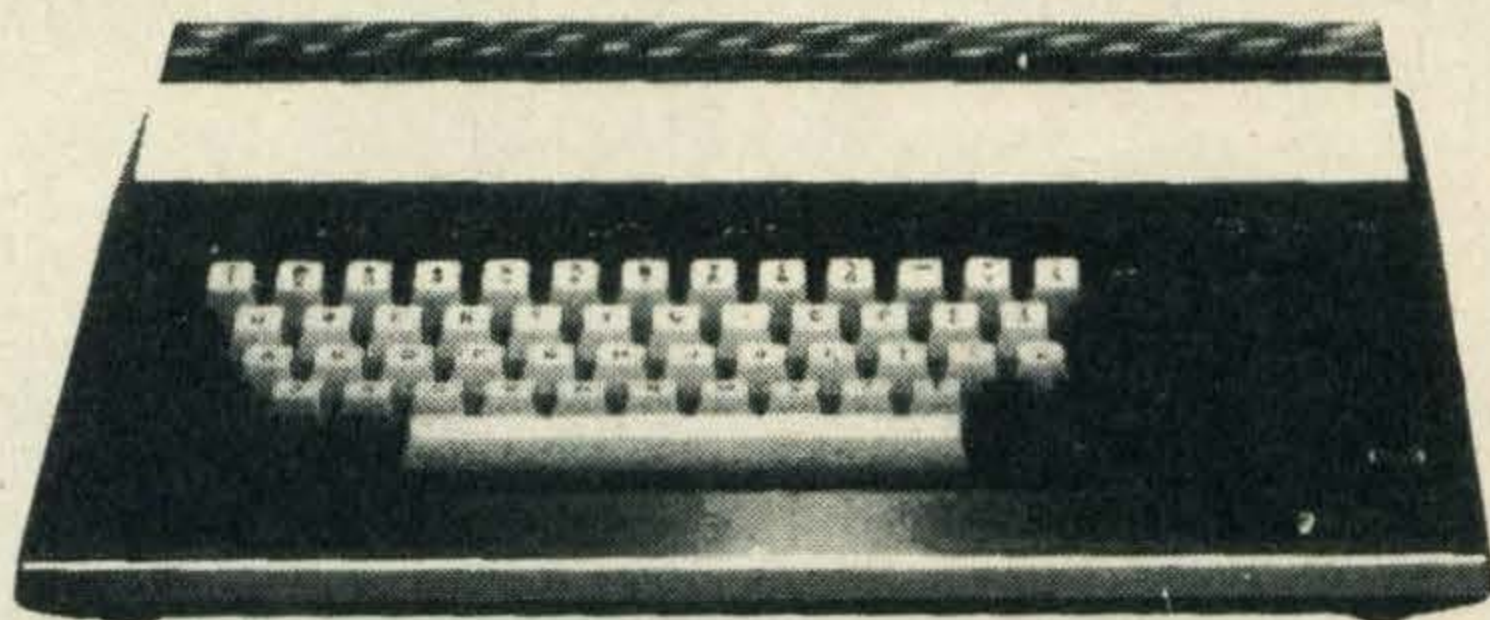
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Hemel Hempstead, Herts HP3 8ER. Tel: 0442 51809

Bargain Epson printers from Tiger Software

Tiger Software is celebrating the Christmas period by making considerable reductions on its Epson printer prices.

Printer bargains include two of Epson's thermal dot matrix printers, the £60 P-40 and the £184 P-80, which Tiger Software is selling for £50.75 and £150 respectively.

Also included in the sale are the £460 Epson Hi-80 plotter/printer which it is selling for £370 and the £653 Epson JX-80 colour dot matrix which is going for £499.95. Tiger Software is also selling one of Epson's recently launched printer, the £293 LX-80 dot matrix for £229.95.

Terry Gilbert, Tiger Software's software systems manager stresses, 'These offers will probably only last for the Christmas and new year period'. He continues, 'There is no way we could carry these offers for any longer — and make a profit'.

For your printer bargains get in touch with Tiger Software at 6 North Hill Way, Bridport, Dorset DT6 4JT. Tel: (0308) 23655.

Slugger Sam V Italian Joe

Knockout, the first MSX game to incorporate 3-D graphics, has been released by Alligata and costs £7.95 on cassette.

Not surprisingly it features a large boxing ring and two aggressive boxers called Slugger Sam and Italian Joe. Alligata's Mike Mahoney is excited about the game and explains, 'The two fighters can actually move around the ring throwing punches from any direction or angle due to the incorporation of 3-D graphics'.

He adds, '3-D graphics has a lot of potential uses in computer games and can be used to create a variety of action packed games'. *Knockout* is available through your local dealer or direct from Alligata Software, 1 Orange Street, Sheffield S1 4DW. Tel: (0742) 755796.



More a cat than a mouse

Would-be Leonardos may be interested in a new graphics tool due here from Japan in early 1986.

Called the Cat, it is a tracker ball device very similar in appearance and behaviour to Marconi's RB2 model.

The Cat will be distributed in the UK by Proteus Computing, which plans to sell the device together with either of two software packages for £79.95, slightly more than the RB2.

You will have a choice of either the *Eddy II* graphics package or the *Mue* music editor. These can also be bought separately for use with the RB2 or Wigmore House's mouse, at a cost of £24.95.

Proteus is also handling a new cassette-based chess game from Dutch software house Aackosoft. Called *Ultra Chess*, it is expected to cost £14.95.

Let's get more serious

Serious machine code programmers will be interested to know that a company called Rossula has developed an EPROM programmer for MSX computers.

It's simply a cartridge that plugs into the cartridge slot of your MSX micro and allows you to directly program the EPROM (Eraseable Programmable Read Only Memory).

The product costs £50, a

price which the company's Robert Field tries to justify: 'This sort of programming is a highly specialised area and only of interest to machine coders wishing to use their MSX as a development tool.'

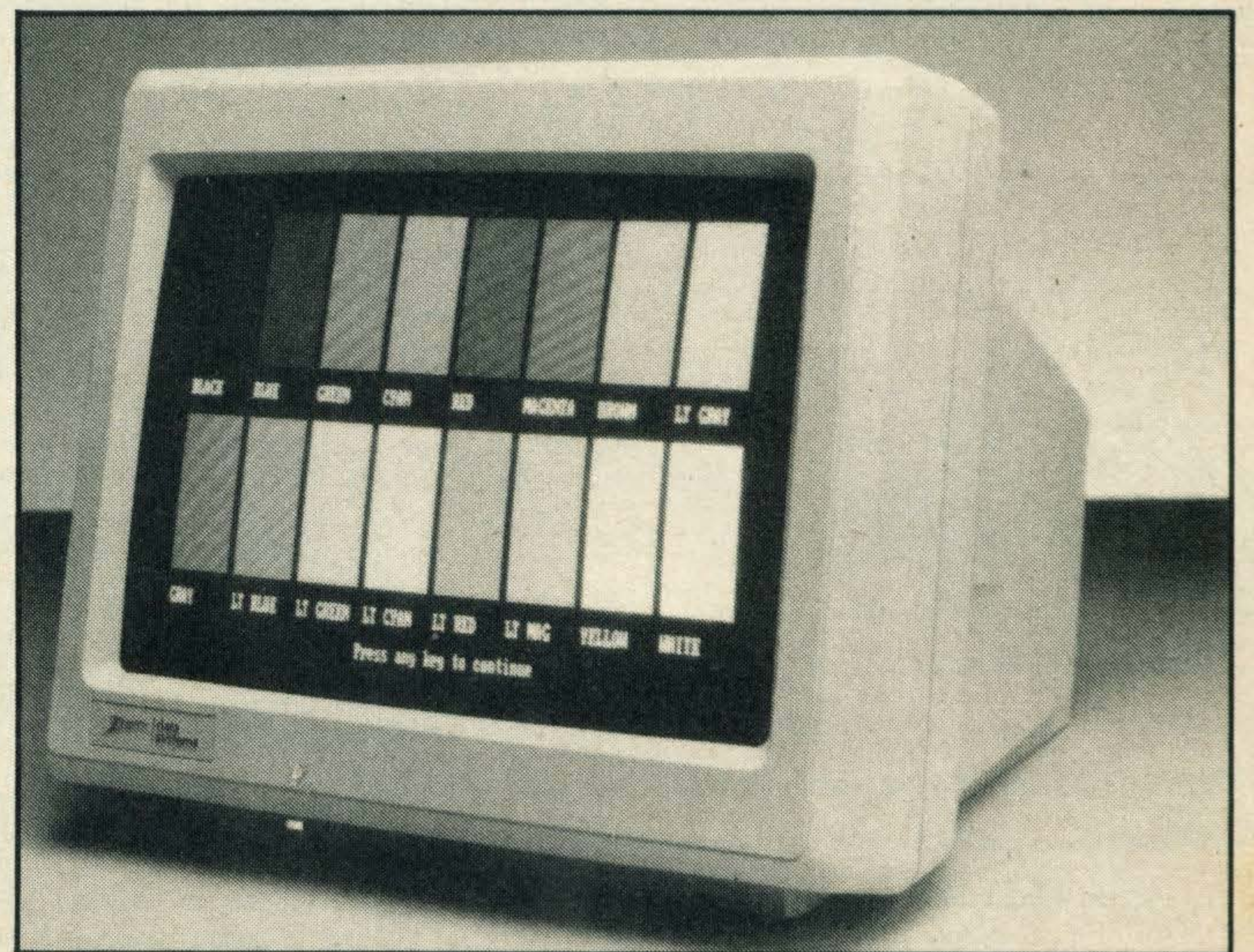
Further information can be obtained from Rossula Limited, 11 Fairway Drive, Fairway Drive Industrial Estate, Greenford, Middlesex. Telephone 01-575 2288.

Zenith launches two low cost FST monitors

Home micro owners now have access to the superior display qualities of FST (flat square tube) monitors, thanks to the introduction of two new low-cost additions to peripheral manufacturer Zenith's range of screens.

The ZVM-1220, an amber screen monitor, costs just under £100 and a green screen version is available for £10 less. Both can display up to 25 lines of 80 characters and are eminently suitable for word processing applications.

Zenith can be contacted for more details at: St Johns Court, Easton Street, High Wycombe, Bucks HP11 1JX. Telephone (0494) 448781.



Advantages of the FST include a brighter, bigger picture

Star Gazer

There aren't many MSX programs around for astrology enthusiasts, but we've come across one from Astrocalc.

Called *Astrology*, it costs £11.50 and comes in a pack which contains the program to calculate your horoscope, an introductory booklet and two self-teaching programs designed to help you interpret horoscopes.

Astrocalc also has other astrological titles, aimed more at the experienced astrologer.

For more details contact Astrocalc, 67 Peascroft Road, Hemel Hempstead, Hertfordshire HP3 8ER. Telephone (0442) 51809.

Fast Loader

Fed up with waiting for your cassette-based programs to load? John Saunders of Luton certainly is and has developed *Express*, a program intended to speed up the process, as a result. It costs £6.95.

Saunders claims *Express* is a program that will take in software and bump it out at a faster rate. It will load both commercial and personal programs and can save them in a choice of four speeds.

The *Express* package includes a tape head reader and full operational instructions.

More information can be obtained from John Saunders, 23 Derby Road, Luton, Bedfordshire.

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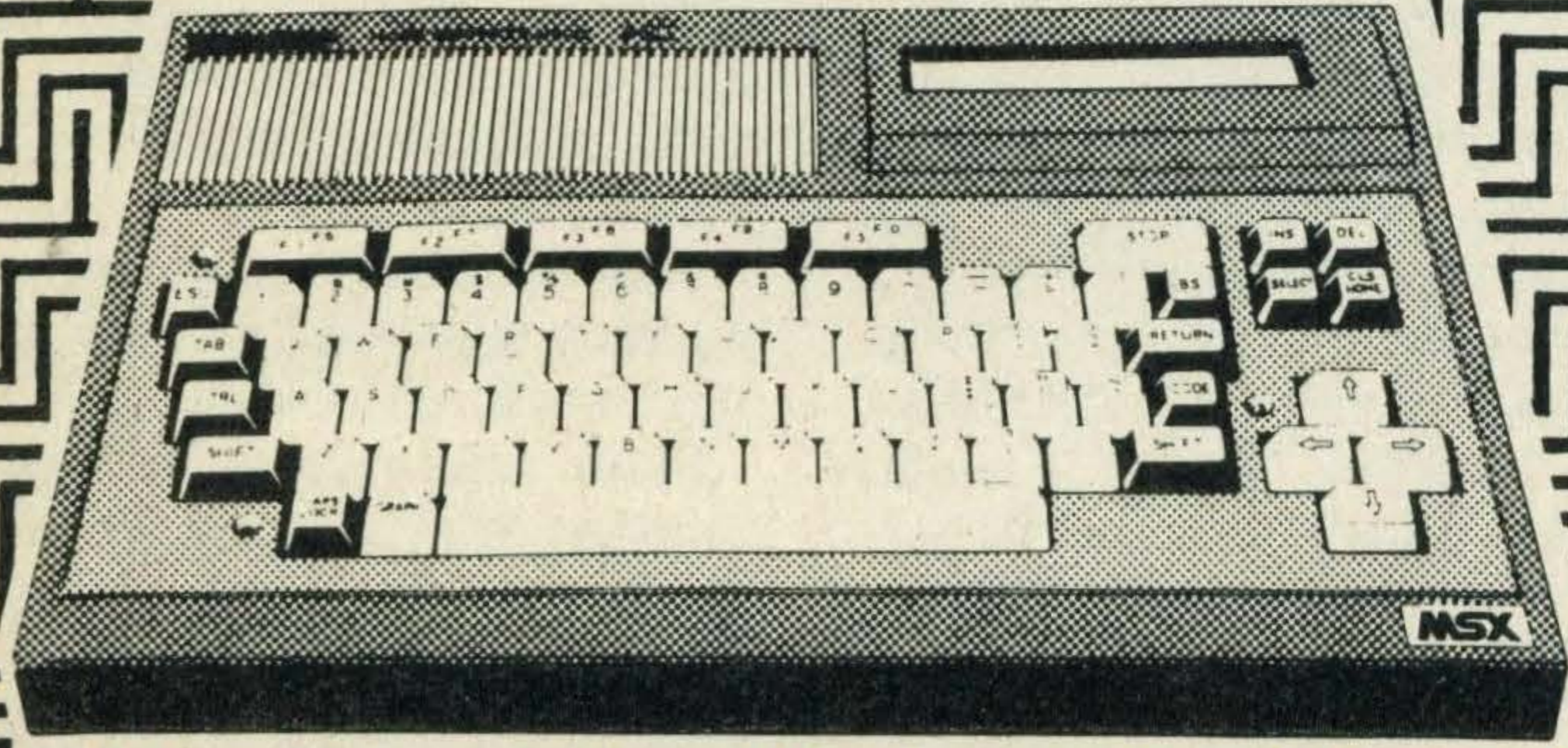
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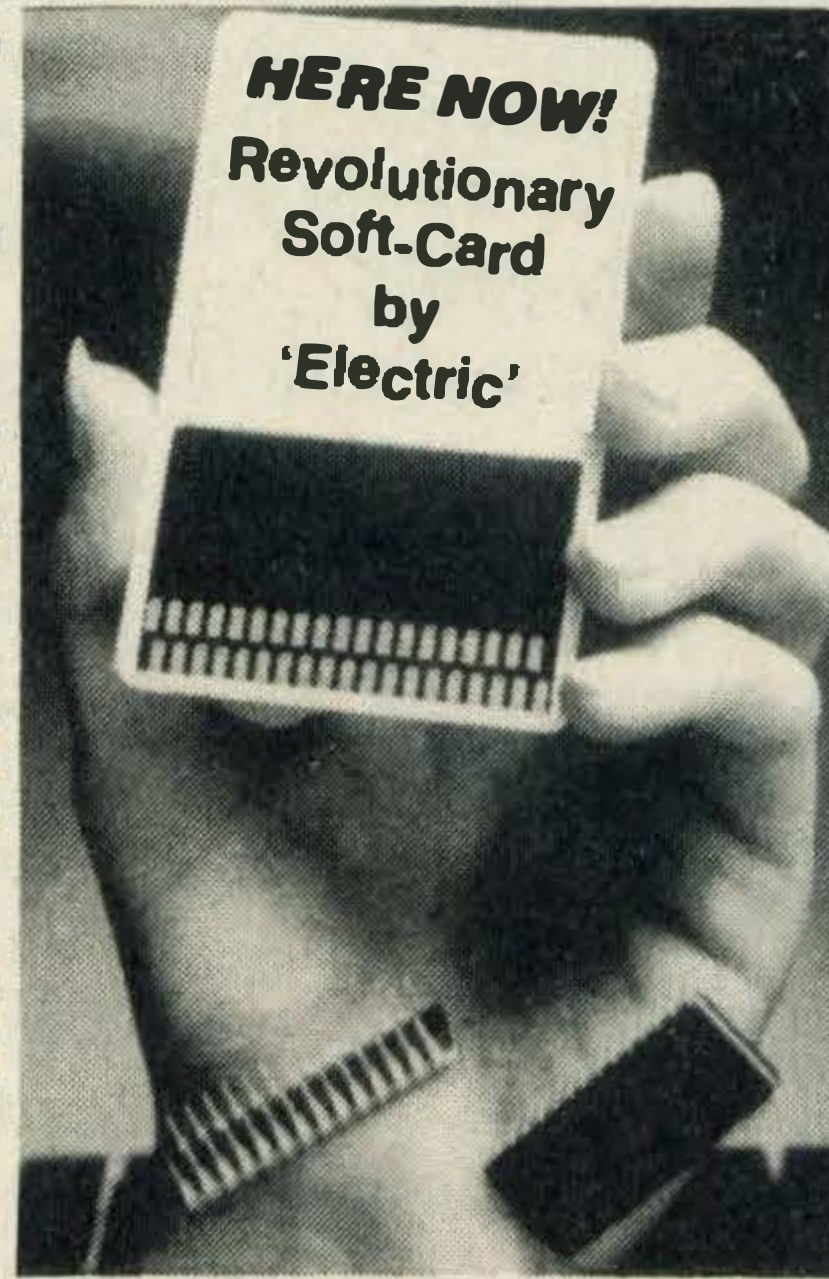
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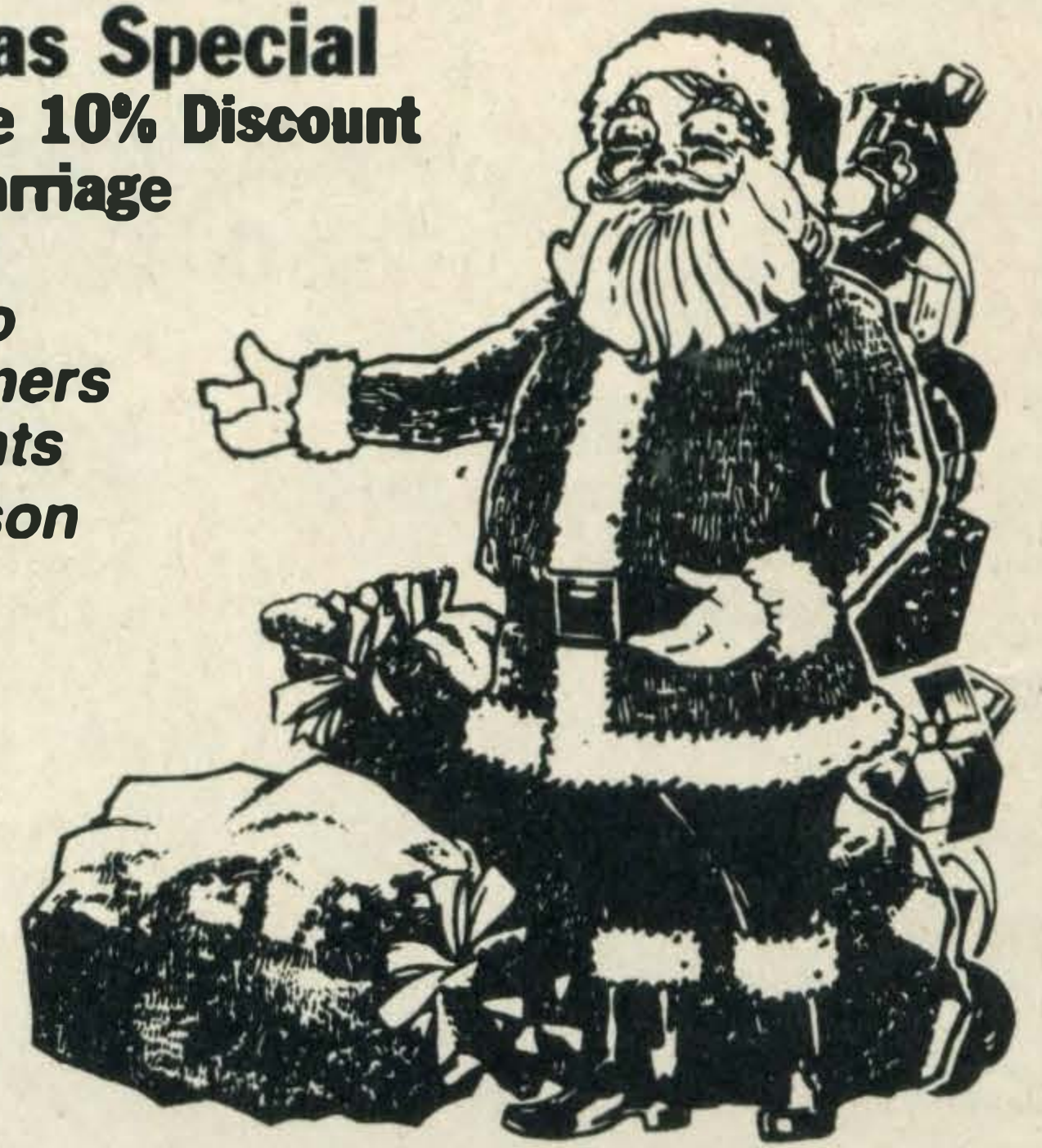
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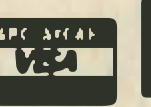
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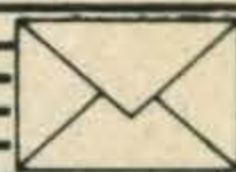


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What's wrong with MSX?

I am writing to ask why the MSX micros are not being advertised like the Spectrum, Commodore and Atari machines?

All you ever see in the high street dealers are games and books for all these machines and very little for MSX.

Also, at the moment many of the MSX machines are being sold at very low prices (£79.95 for the Toshiba HX-10) and I reckon it's because no-one is buying MSX and there isn't enough advertising.

I am not picking on MSX — it's a great machine - but why it is so poorly supported?

*Paul Sargent
Birmingham*

Initially all the participating members of the MSX working party were going to have an advertising campaign throughout the Christmas period in 1984. However, for reasons best known to themselves the campaign didn't take place.

Since then, many of the MSX manufacturers have been advertising in the trade press. At the moment, Toshiba is running its own Christmas advertising campaign on Channel 4 and ITV.

As for software, when a new micro is launched it does take time for software houses to get organised, produce software titles and set up distributors.

Many of the micro prices have been reduced to attract attention and stimulate more interest in MSX — not because they aren't selling. It's good news for you, the consumer, as it means that MSX is now within the range of most people's pockets.

Which Modem?

I have been reading your magazine since Christmas 1984 when I purchased my Sanyo MPC-100. I also have a Sanyo lightpen.

What I would like to know is if you could possibly tell me how to set a modem up so that I can contact other MSX users as well as public databases and

DOS7 BAG

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

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



Mr Sofocli can expand his system with a variety of comms packages

bulletin boards.
*Sofocli
Herts*

Setting up a communications system with a modem is easy once you have the necessary software and equipment.

Two of the best communication packages cur-

rently on sale are Electric Software's *MT-Prestel* costing about £49.95 and the *Communications* package from Computer Mates which includes an excellent database program, retailing at £229. They are both on cartridge.

These two packages include everything you need to

link up to a database system such as Prestel — except the modem and telephone. Take care when buying a modem; the 1200/75 baud model seems to be standard, but if you can afford it, get one with changeable baud rates.

Frustration!

Recently I purchased the game *Finders Keepers* and as a result I am nearly in tears because I can't get through it!

When reaching the room called Big Puss Without Boots there is a sign saying 'EXIT' but I can't find a way out. Please can you help me?

*Ian Scott
Yarm*

Many people have written in to say that they too are having problems solving *Finders Keepers*. We've also had quite a few letters from readers who have drawn detailed maps and given us tips and clues to pass on.

But, so that we don't spoil the fun for those of you who are still struggling, we'll only give you a few clues. Look out for the charcoal and sulphur. The blacksmith and the broken sword should come in useful too.

Improvements wanted

I would like to congratulate you on your magazine and make a few suggestions.

How about adding more colour pages, more reviews and lots more listings.

A high score table would also be a good idea as would giving away free software to the highest scorer each month.

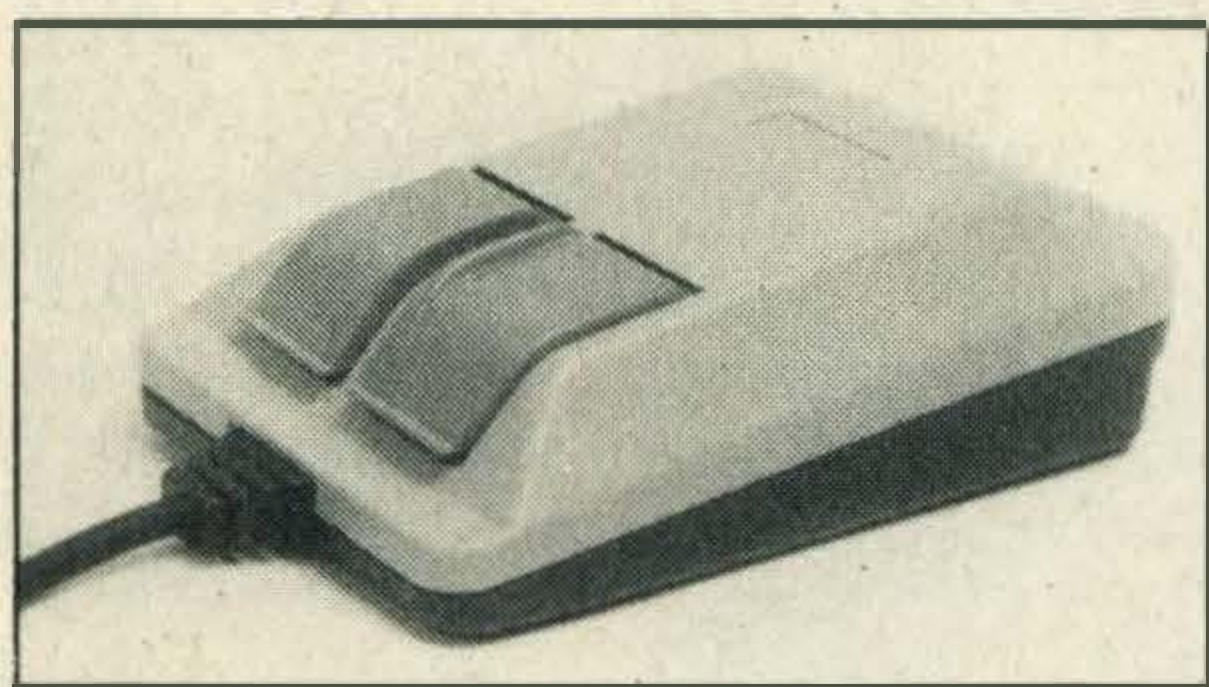
*Neresh Kumar
Wolverhampton*

We're glad to hear that you enjoy reading *MSX Computing*. As for your suggestions, we'd love to have more colour pages, but that costs money and would mean an increase in the cover price of the magazine.

A high score table was in fact started in the August/September issue. As for your suggestion of free software to the top scorer... it hasn't fallen on deaf ears!

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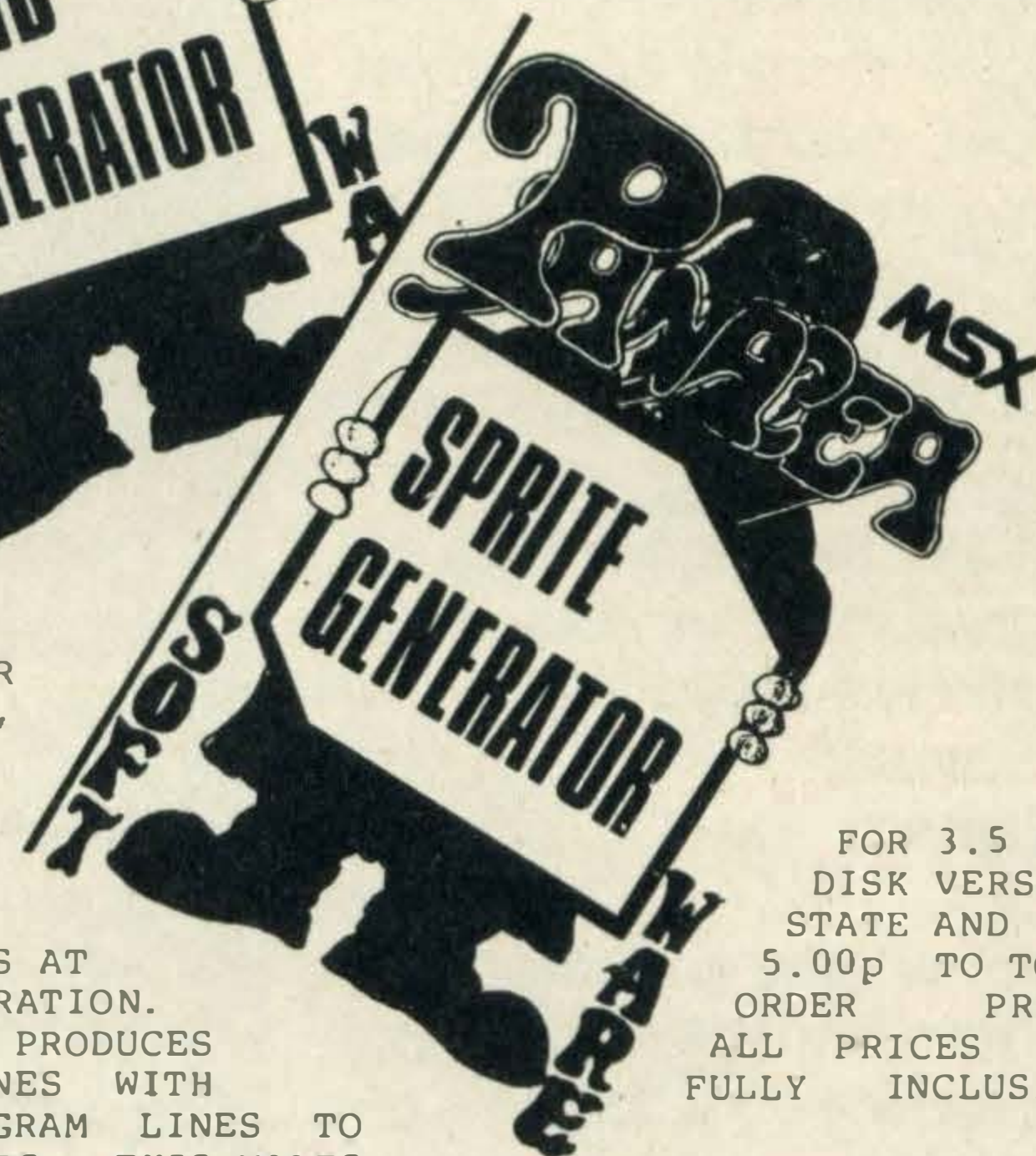
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Can I upgrade my micro?

I am the happy owner of a Sony Hit Bit but after reading your article on MSX 2 I have the following questions.

Will I be able to upgrade my Hit Bit to the MSX 2 capabilities, eg 128K VRAM, 512x512 graphic resolution, 256 colours etc.

If I cannot upgrade my Hit Bit will I be able to trade it in for an MSX 2?

Michael Baker
Co Galway

Unfortunately, the answer to both your questions is no.

Upgrading the Sony Hit Bit is impossible, as among other things, the sound and graphic chips are different.

It is also unlikely that any of the MSX computer manufacturers are planning to arrange trade-in deals — the majority of them are still concentrating their efforts on selling the first generation of MSX micros.

Disk drives

I have bought an MSX computer for my son and I would like some information on disk drives.

What disk drives are available, are they very expensive and where can I buy the floppy disks for them?

The good news is that Toshiba, JVC, Yamaha, Sony, Mitsubishi and Spectravideo all sell disk drives. But the bad news is that they are rather expensive, costing between £250 and £399.

Floppy disks can be obtained from most high street computer dealers and many computer stationery stockists.

Express post

In your May issue of MSX Computing there was a short article on the Spectravideo X'Press. After reading the article it seems that if could be just the machine I am looking for.

Unfortunately, having chased around several computer dealers in central London, I still haven't found anyone who stocks it — let alone heard of it!



Can you let me know where I can buy the Express or failing that, a machine that could give me a CP/M operating system?

J Mercer
London NW1

We contacted Spectravideo with your query and the company's Keith Newman assures us the X'Press is now available in the UK.

However, it can only be purchased directly from Spectravideo as there is a delay in distribution.

So if you are interested in buying an X'Press, you should get in touch with Spectravideo at 165 Garth Road, Morden, Surrey SM4 4LH. Tel: 01-330 0101.

Spoilt for choice

I am interested in buying an MSX computer and would be grateful if you could assist me on the following matters.

What is the best database and word processing package on the market (cassette/cartridge) irrespective of cost.

Will a 32K MSX computer be able to handle these packages given that I cannot afford a disk drive?

K Loh
London NW2

Computer Mates is one of the best manufacturers of MSX business-oriented software

and its database and word processing packages — *Cards* and *Word Processor* both costing £39.95 on cartridge, are definitely worth considering, especially as they will load onto a 32K micro.

Apart from these packages, there are quite a few on the market worth looking at including Silversoft's *Aackobase* and *Aackotext* costing £39.95 on cassette.

Unfortunately these are both 64K.



Expansion

I recently purchased a Yamaha CX-5M music computer and was most impressed with its performance.

However, I find the 32K RAM proves to be insufficient for the cassette-based software that I wish to run.

I would be most grateful if you would advise me of a relevant RAM pack add-on (with the exception of Yamaha's own UDC-01 data cartridge which I find a little expensive) if, indeed, such an item exists.

James Meehan
Middlesex

Spectravideo sells a 64K RAM pack which will boost the memory of your Yamaha.

But it, too, is pricey at £110. Computers are relatively cheap but buying-in extra memory is expensive!

Is it compatible

At present I have a Dragon 32 computer and Dragon disk drive and DOS controller.

Having tried an MSX machine I was very impressed with its performance and keyboard layout.

But, can I link an MSX up with my Dragon drive?

Malcom Drummond
Lancashire

The answer is unfortunately no, you cannot use a Dragon disk drive with an MSX micro as the interfaces are totally different.



Spectravideo's X'press MSX computer comes complete with CP/M

In perfect harmony

Turn your Yamaha microcomputer into a sophisticated composing instrument with the new DMSI music cartridge

Imagine banks of digital electronic instruments playing separate parts in perfect unison, all under your strict control — with the help of your friendly MSX computer, of course.

A new piece of software makes this kind of thing possible. It is a real time sequencer and composer, aimed at owners of the Yamaha computer. With it you can write phrases of music, edit them, add them together, play them back with different voices in perfect synchronisation, and even get them to play along with a drum machine beat.

The software, which comes in cartridge form, is aimed at keen musicians who are already well supported by the MSX system.

First of all there was, and is, the Yamaha CX-5M micro, with its built-in FM synthesiser and MIDI interface. Then software packages began to appear, most notably from Rittor Music. Now Toshiba and JVC have entered the arena with sophisticated keyboards and supporting software.

The Yamaha computer is still what most people think of when MSX and music are mentioned in the same breath. And this new cartridge, from Digital Music Systems Ltd, is designed specifically for that machine.

This begs an interesting question which is worth dealing with now — what happened to MSX compatibility? After all, software portability between machines bearing the MSX logo has always been claimed as the major inspiration behind the system.

In reality, right from the start the Yamaha was the odd-micro-out. The CX-5M was sold as a musical instrument or tool rather than a computer. Instead of going through the normal micro dealers, Yamaha chose to sell it via its normal high tech musical instrument retailers. So it's not too surprising that the Yamaha micro has attracted unique software.

Yamaha

Presumably the DMSI program operates through the MIDI interface and FM synth. We haven't had the opportunity to test it with other micro/keyboard systems, but for the time being we'll assume that the Yamaha is the only one it will work with.

The first surprise with this piece of software, considering how complex it is, is the manual. Those people new to digital music-making often come to something like this in trepidation, afraid of the technology and its jargon.

To its credit the manual does

attempt to alleviate this possible problem by making the instructions as simple as possible. Unfortunately they overdo it.

The manual isn't going to frighten anyone — it's far too small for that. But it uses valuable space explaining the most obvious things while leaving you in the dark about what exactly is going on. A larger booklet with illustrations and diagrams would be a real improvement, but for the time being this is a program you will largely learn about by actually using it.

So much for the introductions, what about using it? Well, working your way through the program is quite easy as the whole thing is menu-driven. To show you what we mean, let's look at how you go about recording one part.

Having inserted the cartridge and switched on the micro you are faced with the main menu. Most options throughout the program are selected by pressing the appropriate function key. And in each case this takes you to another menu.

There are both advantages and drawbacks with this approach. The main benefit is that the system is easy to understand, with all your choices laid out in front of you. The biggest problem is that the

function you want can be several menus away.

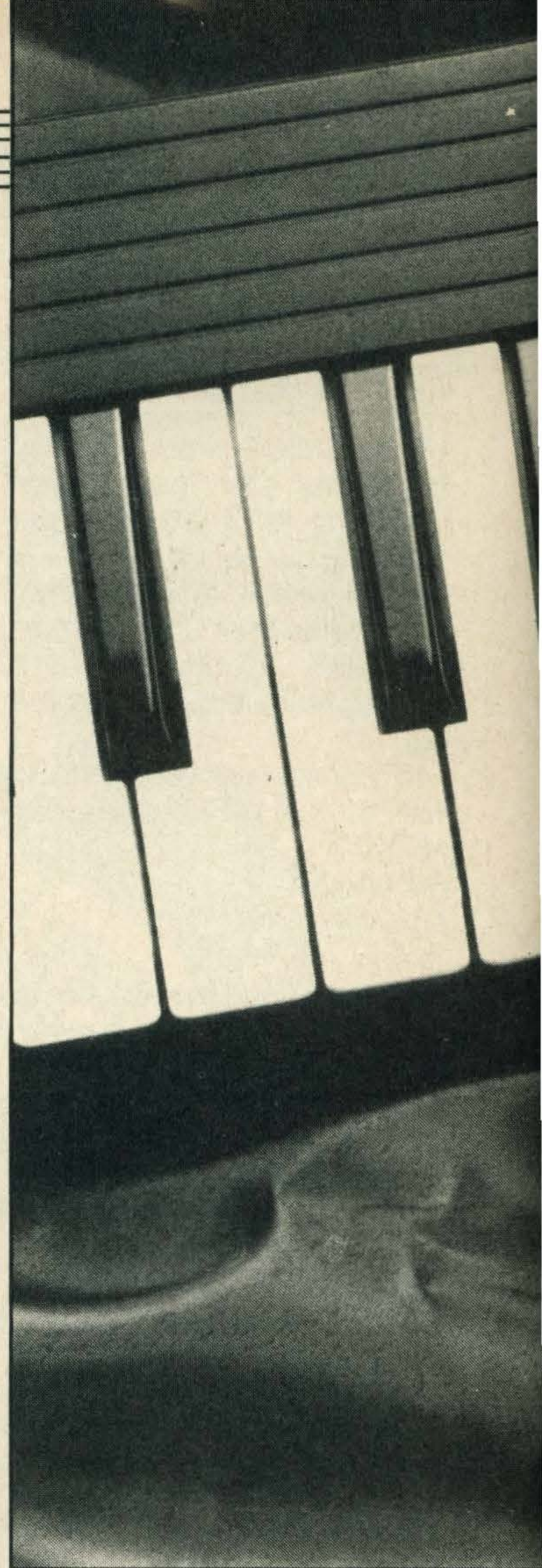
Our example is a case in point. You have to wade through three menus to get to the screen showing the voicing set-up of the part we are programming. Experienced computer users tend to prefer the use of commands which take you straight to the required screen.

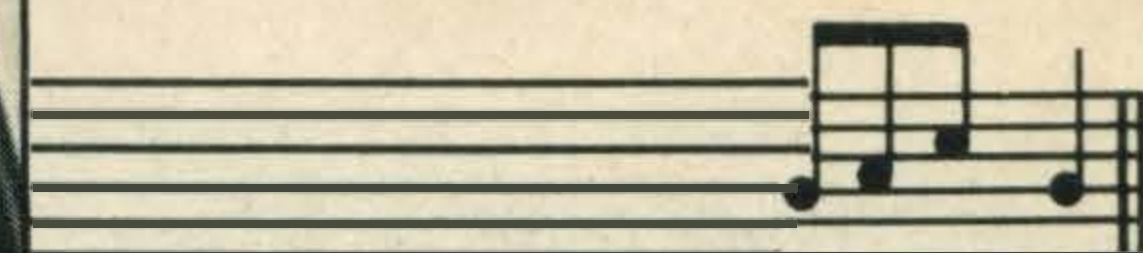
When you do get to the screen, however, using it couldn't be easier. You can choose your input device from any of the onboard sounds, played via the usual Yamaha keyboard, or an external device linked through one of the 16 MIDI channels.

To start with it's probably easiest to select the onboard option — which defaults to the Brass 1 sound. If you want another sound then all you have to do is enter the appropriate number.

The polyphony (that is, the number of notes you can play at the same time), the volume of the voice and the sustain, can all be set from this menu.

Now that you've decided which sound to use, you can





record the phrase — again by following the appropriate menus. When you're ready to start you simply hit R and the computer counts you in, like a digitised André Previn. Then it's down to you to play the notes — hopefully in the right order.

If you make a mistake it's not fatal. The phrase can be re-recorded as many times as you like. In this way you build up a collection of phrases — as many as 254, all numbered — which can then be combined to form a continuous piece of music. But what is perhaps more important is that you can have not just one part, or sound, but up to eight, which can all play simultaneously. So with this software you can easily create your own group inside the computer.

The length of each phrase is decided by you. This is particularly important when it comes to rests. The manual suggests that you set aside a certain number of phrases which you leave empty and use as rests when required. It's useful, then, to have a range of rests of different lengths.

When choosing the voices

you want the eight parts to use, you're not restricted to the ones we know and love from the Yamaha FM Voicing Program. The DMSI program actually gives you a choice of 100 preset voices available instantly. The first 46 are the normal Yamaha ones, and there are a further 54 programmed into the cartridge, including close encounters and the inevitable tubular bells!

Unlimited

In addition to that lot there's space for 48 more voices, which are sounds you've created yourself using the FM voicing program. So the range of sounds is unlimited.

The standard voices should be the same as found in Yamaha's voicing program, but somehow they don't sound quite as good. The extra presets, however, are terrific. As well as extra string, brass and bass sounds there are a number of superb effects, and even simulations of the dear old analogue synthesiser sounds (anyone remember the Mini Moog?) — which actually sound more like a synthesiser than the instruments they're

supposed to be emulating. These extra voices are worth the cost of the package (which is, incidentally, £84.95) by themselves.

Once a phrase is recorded you can play it back or edit. The editing facility is quite powerful. For example, you can change any note, and this is done using the musical keyboard which makes life easy. And you can alter the timing. The edit mode can even be used to clean up any sloppiness on your part. If you were to select a 'quantise' value of $\frac{1}{8}$ for instance, the program will space the notes accordingly, putting each one on the nearest eighth note boundary.

It's then time to string the phrases together, to form a complete part, and then move on to the next part. It's a time consuming process, but with the computer handling the synchronisation of the tracks, the results can be very impressive when you finally get around to listening to the completed opus.

As the computer plays back the music it produces a clock signal at the MIDI interface, and

it's this which can be linked to a drum machine. Alternatively, you may select an external clock option, in which case the playback of any music you've created will be driven by the drum machine. However, the recording part is still timed using the internal clock.

At any time, what you've created in the way of phrases and sequences can be saved, to be played or worked on later. People who have forked out a small fortune for a disk drive will be pleased to know that this program is disk compatible.

Of course, all saving and loading is done via menus, which give you the option of tape or disk, and of saving or loading individual phrases or the complete song. Unfortunately, the only way of finding out what's already on a disk is to leave the program, go into disk BASIC and enter the appropriate command. There's no way of doing it from within the program, which is strange and a little disappointing.

Versatile

All this really just gives the flavour of what is possible with this versatile package. It isn't something you can pick up and be using in five minutes. It's a tool for musicians with a purpose, rather than those who like to play around with a new toy.

And it's also a product for people already interested in digital instruments, MIDI interfaces and the like. If your interest lies more in simple music making — and many people will have bought the Yamaha CX-5M just for its superb built-in voices — then the DMSI sequencer is likely to baffle you.

To get the most out of this program you have to be prepared to put in a little work, and it's essential that you have the piece you're working on carefully mapped out beforehand. But if you do this, you'll find the sequencer a valuable, and enjoyable, aid.

Contact details

If you want more information about the DMSI package, contact Digital Music Systems Ltd, 182 Wilmslow Road, Heald Green, Cheshire SK8 3BG. Tel: 061-437 4788.

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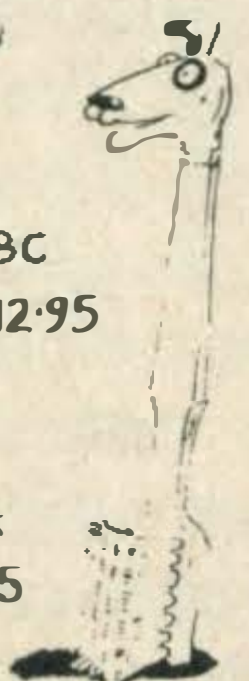
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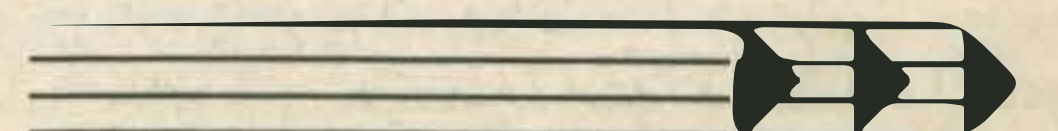


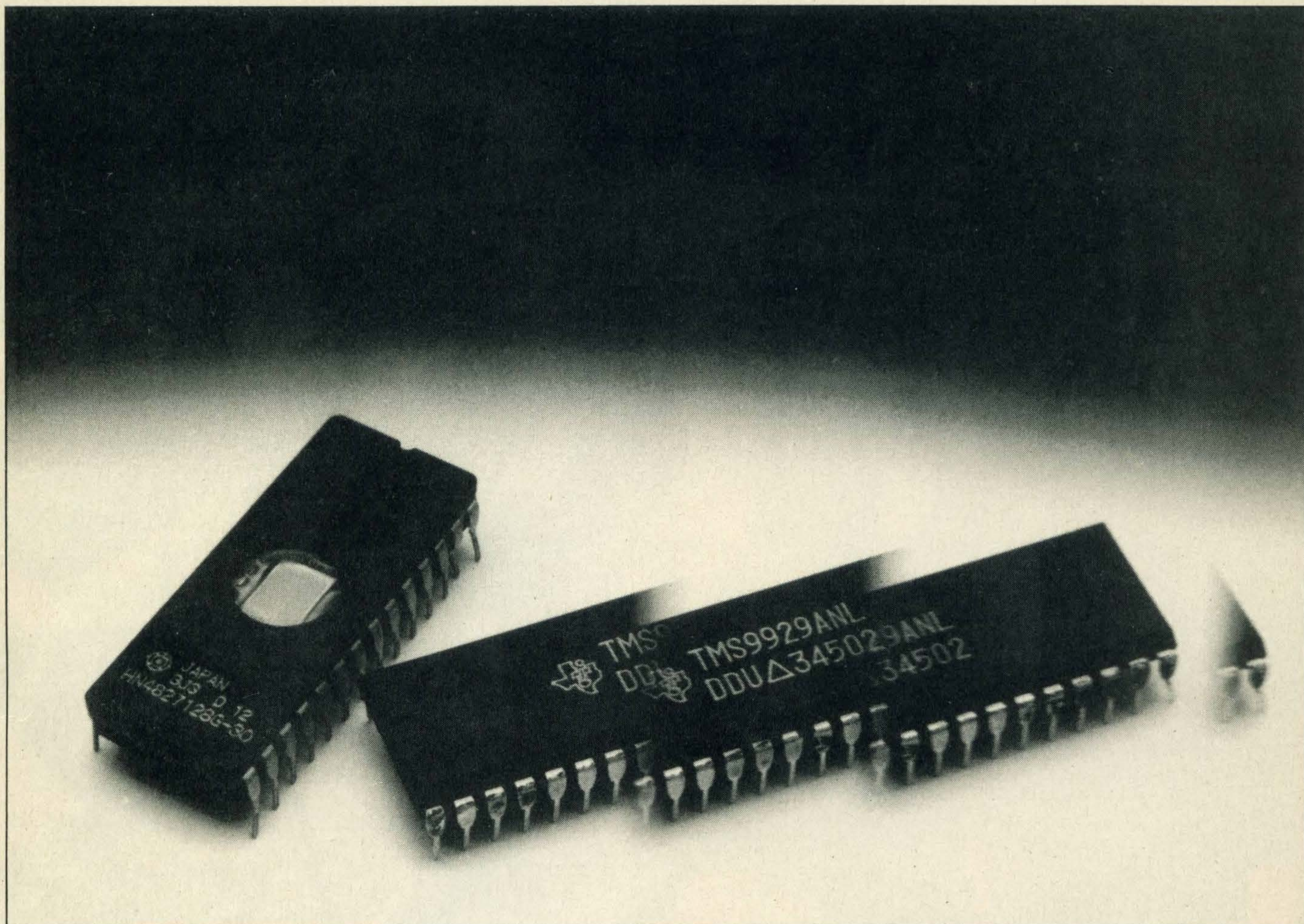
MEMORY MANAGEMENT

Graham Bland gives some useful hints and words of advice to help you make the most of the memory in your 64K MSX micro

By far the most popular MSX computers currently available in the UK and Europe proudly boast a 'massive' 64K of Random Access Memory (RAM). What many people find surprising is that a mere 28K or so of this is available to the BASIC programmer.

In fact, if you own a Mitsubishi ML-F48 or Yamaha CX-5M (both 32K systems) you will have *exactly* the same amount of memory available to you for BASIC programs and data as is found on the 64K computer systems.





Owners of 64K computers may feel that they have been diddled into paying for a non-existent block of memory. However, the missing 32K of RAM is present in the box, but it is not the easiest thing in the world to access for your own use.

BASIC does not normally recognise the additional 32K of RAM in 64K MSX systems, so if you want to use this extra storage space the only way to do it is by taking a brief excursion into machine code programming.

Some 32K machine owners may already have noticed that a number of machines code games will only run on 64K systems, and a 64K system is a must for disk drives.

The mechanism by which you release the 'missing' 32K is quite complex and really requires a very sound understanding of both the operation of the hardware and of Z80 machine code.

Instead, it is worthwhile looking at the standard way that the memory is laid out in all MSX

computers. The Zilog Z80 microprocessor is limited to addressing a maximum of 64K of memory *at anyone time*. 32K of the total area that may be addressed is taken up with the MSX-BASIC ROM chip. The MSX-BASIC ROM is said to *overlay* the system's main memory in this case.

The remaining address space is given over to 32K of RAM, and so, in theory, this is the amount of 'free' memory you should have for your BASIC programs and variables.

So why, when you first switch on the system, does BASIC

proclaim 28815 bytes of free memory (just over 3K less than you might expect)? This, fortunately, is very easily explained.

The MSX interpreter requires a small piece of RAM to use as a 'scratchpad' area to store various vital pieces of information that it needs while programs are executed or otherwise manipulated (edited, saved, printed etc.).

This section of memory may be thought of as a special *system variable* area, which, unlike the extra 32K present on 64K systems, needs only a knowledge of BASIC PEEK and POKE commands and perhaps a very little machine code before you can make some use of it.

System variables denote things like the current foreground, background and border colours, the default baud rate at which programs are saved and a host of other useful snippets of information.

The following simple BASIC program produces a 'status' list of some of this system information by PEEKing relevant mem-

ory locations. The table in figure 1 gives the addresses of some of the most useful system variables.

Program 1 merely reads the current values of the specific system variables indicated. By using the POKE command we can, of course, change the contents of the variables if we wish.

The alphabetic information printed out relates to the data types for each of the variables. By default, all the variables are thought of as numeric and with a precision of up to 14 digits. By using the variable declaration characters, % for integer, \$ for string etc, you can change data type on a variable by variable basis.

You may also set the data type for a whole group of variables using DEFINT, DEFSTR, DEFSNG and DEFDBL commands. If the command DEFINT A-H were given, all variables beginning with any of the letters A through to H would automatically be considered to be integers.

The 26 memory locations

**'The MSX
interpreter
requires a small
piece of RAM to
use as a
scratchpad area to
store information'**

```

100 REM *
110 REM * Status Program
120 REM *
130 CLEAR 400
140 SCREEN 0 : WIDTH 38
150 KEY OFF
160 REM *
170 REM * Define System Variable
180 REM * Addresses
190 REM *
200 FCL = &HF3E9 : ' Fore colour
210 BCL = &HF3EA : ' Back colour
220 BDR = &HF3EB : ' Border
230 K = &HF3DB : ' Key click
240 TYP = &HF6CA : ' Variable type
250
260 PRINT:PRINT "Default Status"
270 PRINT STRING$(14,195)
280 PRINT
290 PRINT "Foreground Colour:";
300 PRINT TAB(20);PEEK(FCL)
310 PRINT "Background Colour:";
320 PRINT TAB(20);PEEK(BCL)
330 PRINT "Border Colour:";
340 PRINT TAB(20);PEEK(BDR)
350 PRINT
360 REM *
370 REM * Print all data type
380 REM * for each letter of the
390 REM * alphabet
400 REM *

```

```

410 ITG$ = "" : ' integer list
420 STT$ = "" : ' string list
430 SPR$ = "" : ' single precision
440 DBP$ = "" : ' double precision
450 FOR I = 0 TO 25
460 T = PEEK (TYP+I)
470 IF T=2 THEN ITG$=ITG$+CHR$(65+I)
480 IF T=3 THEN STT$=STT$+CHR$(65+I)
490 IF T=4 THEN SPR$=SPR$+CHR$(65+I)
500 IF T=8 THEN DBP$=DBP$+CHR$(65+I)
510 NEXT
520 IF LEN(ITG$)=0 THEN ITG$="None"
530 IF LEN(SPR$)=0 THEN SPR$="None"
540 IF LEN(STT$)=0 THEN STT$="None"
550 IF LEN(DBP$)=0 THEN DBP$="None"
560 REM *
570 REM * print results
580 REM *
590 PRINT "Default Data Types"
600 PRINT STRING$(18,195)
610 PRINT "Integers      ";ITG$
620 PRINT "Strings         ";STT$
630 PRINT "S. Precision:    ";SPR$
640 PRINT "D. Precision:    ";DBP$
650 PRINT
660 PRINT "Key Click: ";
670 IF PEEK(K)≠0 CSAVE@PRINT "OFF":END
680 PRINT "ON "

```

starting at Hex F6CA define the default data type for each of the letters of the alphabet. If all variables whose names start with A are defined as integers, then the memory location given by Hex F6CA would contain 2.

The scratchpad area of RAM contains much more information than indicated in the table, but much of it is concerned with the technique the interpreter uses to translate and run your BASIC programs, and is consequently of no use to the general BASIC programmer.

For example, the graphics commands CIRCLE and PAINT require a fairly large

number of temporary values to be stored, not to mention all the various parameters that are set for each of the Music Macro Language's voices (tempo, note length, envelope). Also, some of the information stored in the scratchpad can more easily be retrieved using an existing BASIC function, for example BASE and VDP.

In addition to system variables, the scratchpad area also contains a number of very short machine code routines that are known as 'hooks'.

These may be used to hold simple jump instructions to various routines, and so allow you to customise the way the MSX ROM works. For example, consider the case where you are developing a piece of programming where both the LPRINT and PRINT statements are to be used.

Instead of printing out reams of test data on paper, you could make LPRINT behave just like the common-or-garden PRINT statement, with the result that data originally destined for the printer would turn up on the

System Variables

F3DC	X cursor position	FCAF	Current screen mode
F3DD	Y cursor position		0 — 40 x 24
FCA9	Cursor display switch		Text
	0 — cursor off		1 — 32 x 24
	255 — cursor on		Text
F3DB	Key click		2 — 256 x 192
	0 — click off		Graphic
	255 — click on	F6CA + 25	3 — 64 x 48
F3E9	Current foreground colour		Graphic
F3EA	Current background colour		Data Type defaults
F3EB	Current border colour		2 — integer
			3 — string
			4 — Single precision
			8 — Double precision

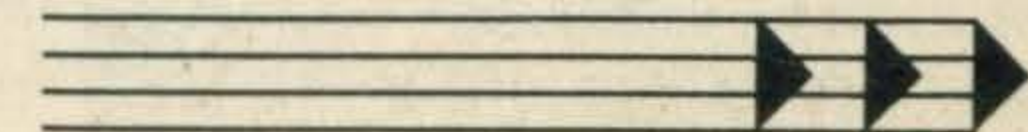
Figure 1. The above table gives the addresses of some of the most useful system variables. The left column shows the Hex addresses and the descriptions are on the right hand side

screen instead.

The example cited above is quite complex, but could be achieved quite easily by the more adventurous machine

code programmer armed with a set of decent manuals. A simpler example is a little security

'With reasonable technical information, you could adapt your MSX system to your exact requirements'



system to stop people LISTing your programs on the screen or otherwise giving unwanted attention to your beloved system.

A ROM routine called CHPUT (at Hex Address ??a2) calls a hook at location FDA4. Normally, this hook would do nothing. By writing a short machine code program, we can cause the computer to reset itself when a character is written to the screen.

The machine code required looks like this when written as assembler:

FDA4 CRASH: JP 0000

If a key is pressed then the system will automatically reset itself. This simple program sets up an automatic 'crash' mechanism. A message warns a potential busybody not to touch the system. If they try to type anything, the system should reset and give the meddler quite a shock. Remember to save this program to tape BEFORE you run it!

10 ROM ★ Hooks

20 PRINT "DO NOT TOUCH THIS!!"

30 REM ★ set up machine code

40 FOR I = 0 TO 2

50 READ X

60 POKE &HFDA4+I, X

70 NEXT I

80 DATA 195,0,0

90 END

A suitable program sequence for restoring the normal screen printing, (provided of course, that no commands like LIST, PRINT, INPUT etc have been used) is as follows:

300 FOR I = 0 TO 2

310 POKE &HFDA4,201

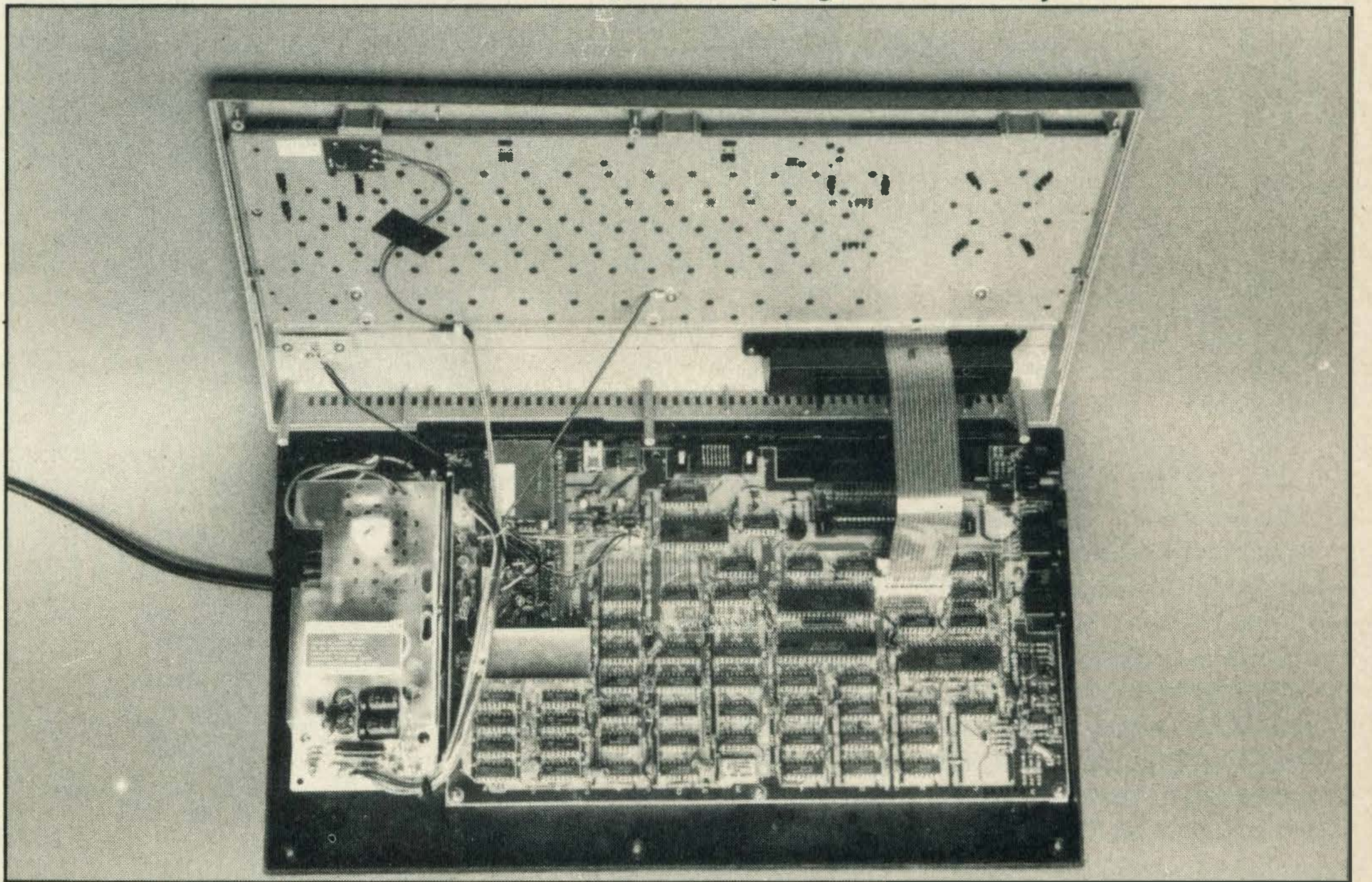
320 NEXT

There are far too many of these useful books to detail here. A good guide to the hooks, as well as the ROM routines associated with them, can be found in Melbourne House's expensive, but comprehensive *The Complete MSX Programmer*.

All the system variables addresses in the scratchpad are also given, but unfortunately their purpose is not described. If you are keen enough and have a number of years to spare, you might be lucky enough to discover what they all do.



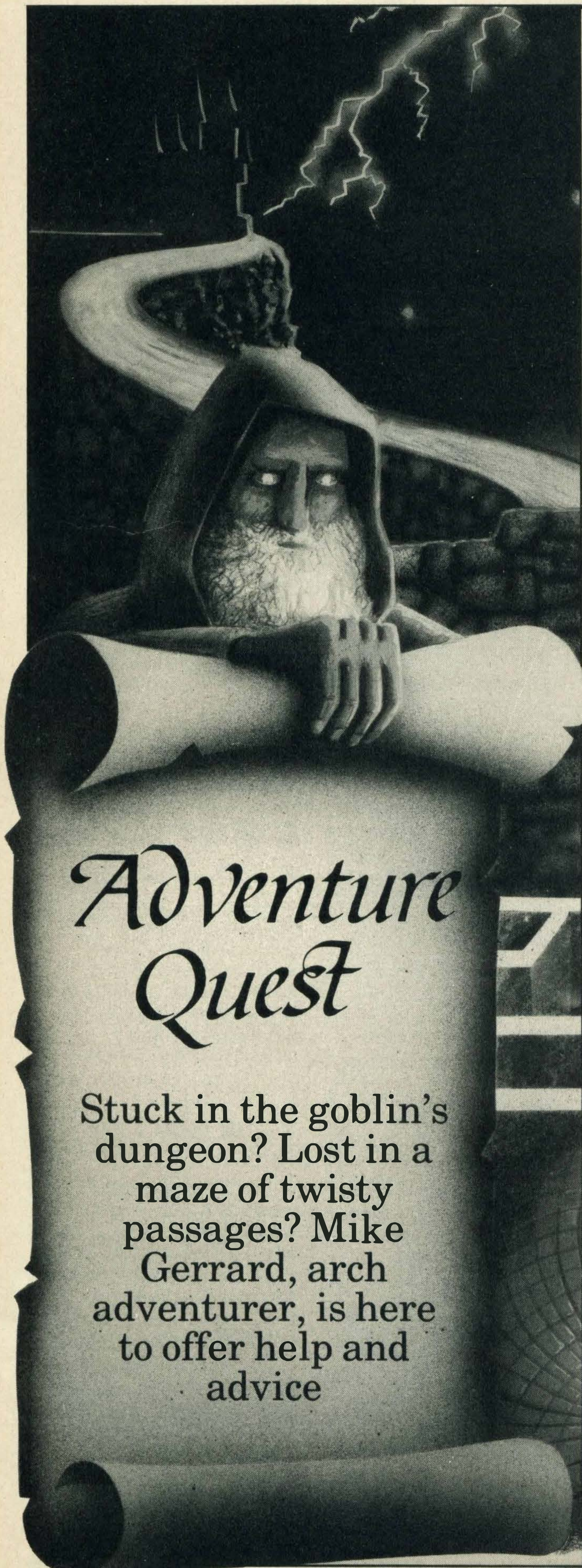
A 32K Mitsubishi ML-F48 has the same memory for BASIC programs as a 64K system



Some machine code is essential to make use of extra storage space in a 64K micro



Spectravideo makes a £11064K RAM cartridge enabling MSX-DOS to be run on the CX-5M



Adventure Quest

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

It seems from the letters that are starting to come in to the adventure page that many MSX users are both new to computers and new to adventure games.

Last time I had a quick look at the most common inputs required by adventure games (i.e. the commands that you enter in order to progress through the game), and as many people seemed to find this useful I thought I'd deal this time with the mapping of an adventure, which is essential if you're to have any hope of knowing where you are. A few readers have also said they find it difficult to get started in some adventures, so in addition I'll take a look at the openings of some popular MSX adventures.

One of the golden rules of adventure playing is that you should always keep a map. I must admit, though, that the first time I load up a new adventure I forget the golden rules and just go blundering in to see what the game looks like, frequently not even reading the instructions. But that's only on the first occasion to get a feel for the game, and next time round I'm out with the pen and paper, as you should be too.

For this I like to use one of those blank A4-size student's notepads, starting in the middle of the first sheet with the opening location. For each location you should just use a small box, with one or two words in it that are sufficient to identify it, such as OUTSIDE BUILDING or SHADY GLADE.

If there are any objects to be found at that location, write them down either inside or alongside the box and in an ink of contrasting colour — I use red, making it easy to spot objects.

You might think this is a bit of a waste of time at first, but when you get well into a game you're bound to discover at some point that painful response, YOU CAN'T CARRY ANY MORE. With a map, you'll be able to see quickly where to return to pick up any objects you've left behind.

As a contrast from a Golden Rule, let's have a Sod's Law of adventure playing, which is that the objects you leave behind are always the ones that you're

going to need. If you can pick them out in red on your map, you'll know exactly — and speedily — where you'll have to go to find what you want.

Ah-ha, I hear you say, but what happens when you move objects and drop them in other locations? Well, you should then write them down in pencil at the location where you've left them. Never drop an object and assume that you'll remember where it is: you're bound to forget some time. Pencil you can rub out, leaving ink for anything that's permanent.

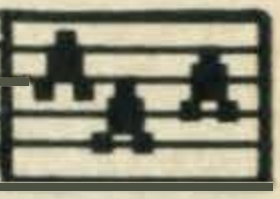
'Never drop an object and assume that you will remember where it is: you're bound to forget some time'

Even where you've used an object and have left it behind because you think it's served its purpose in the game, make a pencil note of where that object is. Devious programmers like to make people assume (falsely) that an object's used once and once only, so you've got to become a devious player, too.

Alongside the locations I also find it useful to make a note of any special commands that are needed in order to achieve results, such as DROP MOUSE, SCARES ELEPHANT, ALLOWS MOVE NORTH. If you've got several adventures on the go at once, it's surprising how you can forget these commands, which are probably less obvious than the one in the example.

Back to our first location, then. Most adventures give you a note of the directions in which you can move. Before you move off in any of them (having had a good look round at the location) draw a line leaving the box for each of the exits that exists. The advantage of a box is that the four corners can represent NE, NW, SE and SW, while exits to N, S, E and W can be drawn from the centre of each of the four sides.

The only complication is



when you also have exits UP or DOWN, but these can usually be fitted in somehow and as it's only the occasional location which has as many as 10 possible exits. You needn't spend too much time practising drawing octagons, boxes will usually suffice.

It's because a location can have a great number of possible exits that you need to mark them all before you move off. You can only go in one direction at a time, and your second location will probably also have several possible exits, so you're pretty soon going to get lost.

If you reach a dead end, it helps to look at your map and see whether you can go back and explore in another direction, or whether you've explored all the available locations and therefore have to look for a way past the dead end or any other obstacles impeding your progress.

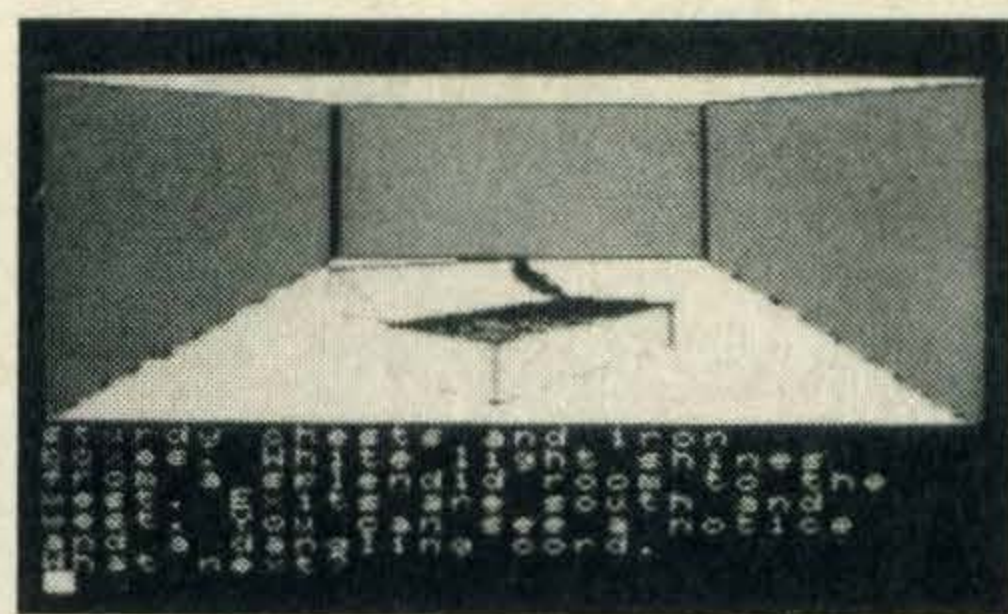
Don't forget, either, that there may be exits other than the ones the program tells you about, so try them all unless the instructions specifically tell you that you can only go in the directions marked. Programs can be misleading, but you can usually rely on instructions to be truthful. Usually.

Where programs are frequently misleading is in the way that locations connect together. If you see a review of an adventure which says that all movements are logical, this means that if you move NORTH

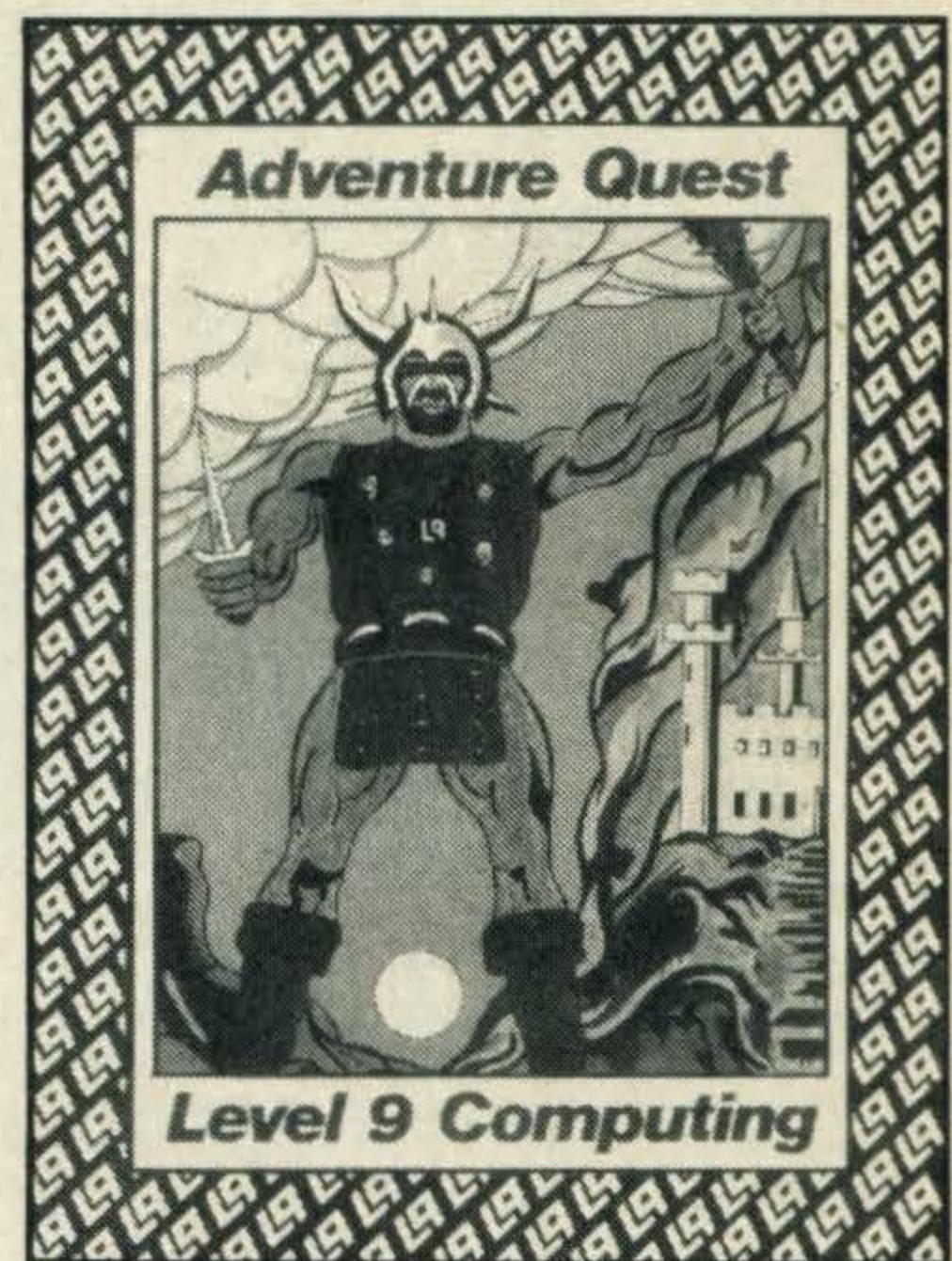
'Programs can occasionally be misleading, but you can usually rely on instructions to be correct. Usually'

from location one to location two, then a movement SOUTH from location two will take you back to location one.

Not all programs are as straightforward as this. Many make use of one-way movements, meaning in the example given that once you've reached



LEFT Getting started on *Snowball* can be difficult. **ABOVE** The graphics in *Emerald Isle* live up to the adventure locations. **RIGHT** There are plenty of underground caverns in *Adventure Quest*



location two, there will be no movement SOUTH to location one. You've gone down a one-way street. There should usually be some logical reason for this, such as being able to scramble down a cliff but not able to climb back up again, though frequently this little feature occurs just at the programmer's whim.

If locations are connected logically, location two will be a new box drawn on the end of the NORTH exit from location one, the straight line between them showing you the connection. If a movement proves to be one-way, turn the straight line into an arrow pointing in the direction of movement. This reminds you for the future that if you take that exit then there may be no coming back.

The apparent one-way movement might be more straightforward than this, in that the programmer's decided that a particular movement turns a corner (it may be a twisty passage, for instance), and so you'll discover that instead of going SOUTH from location two back to one, perhaps the EAST exit returns you there.

This is simply dealt with. Either alter your NORTH exit from location one so that it curves round and enters location two from the EAST side rather than the SOUTH side, or alternatively make a one-way exit NORTH from one to two, and a one-way exit EAST from two to one. It doesn't matter where one-way connections join the box for a particular location, as you can't take that route out again. Just join it on wherever's convenient.

If you start mapping like this, you'll soon find that you reach the edge of your first sheet of

paper so simply sellotape another one onto it to continue. Large maps are easier to follow than small ones, so don't be stingy by trying to make use of every available inch to squeeze on locations wherever they'll fit. Keep it logical.

If you're untidy or lazy then there are ready-made maps

'Large maps are easier to use than small ones, so don't be stingy by trying to use every available inch'

available, and naturally I can heartily recommend *The Adventurer's Notebook* by Mike Gerrard (absolutely no relation), published by Duckworth at £3.95.

Now it's all very well being able to draw maps, but it's solving problems that beginners really have to learn how to deal with, and some MSX adventures are proving pretty tough challenges to some of you. There's just room for a few clues on the opening sections of one or two popular titles, but I shall print these backwards and broken up into small groups of letters so that anyone who doesn't want to know the answers won't inadvertently see them.

The Hobbit is no trouble to get started on, but an early problem seems to be the map that you're given. How to read it? DNOR LEOT TIEVIG. What you're told might not seem all that vital, but don't be tempted

to skip doing it on future occasions, as the information you're given isn't created in the program until you've read the map.

In *Colossal Cave Adventure*, a few people have asked similar questions to do with getting the bird in the cage, i.e. how to do it, what to do with it when you have, and should you have done it in the first place? The answer to that is: !DRIB EHTF ODER ACSS IEKA NSEH TTUB DORK CALB EHTF ODER ACSS IDRI BEHT.

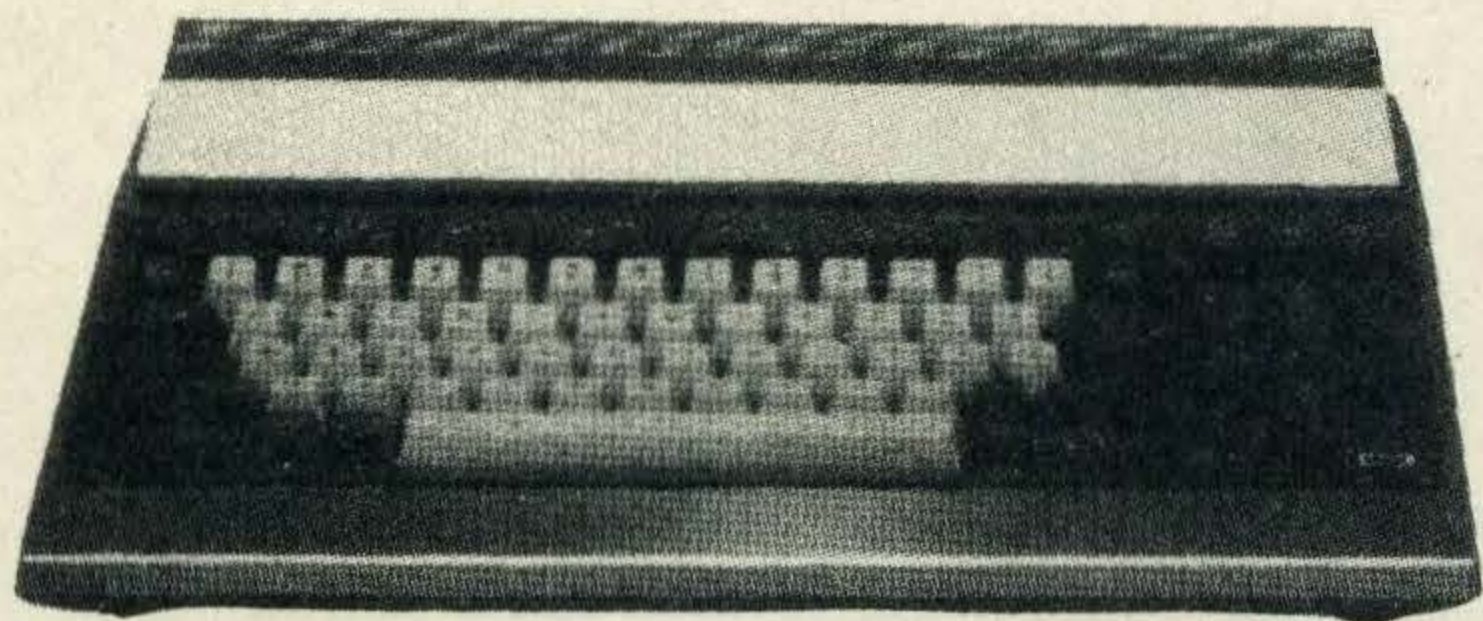
John Dyas of London NW6 has said that he can't get started on *Snowball*, because no matter what he types in at the start of the game he's told: IT IS DARK, YOU CANNOT SEE. John wasn't paying attention to the last column; as I have already mentioned there's something you should do at every location — no, not PRAY, but: ENIMAXED LUOH SUOY.

In this case it doesn't really matter what the second word is, it's the first that matters, and using it will tell you exactly where you are and why you cannot see. And if you're having trouble with the first location, John, all I can say is the best of luck with the other 6,999!

As I mentioned last time, we're here to answer your questions, though if you want a quick response don't forget to enclose a stamped addressed envelope. The letter will otherwise be dealt with in the column and, because of the inevitable production delays, you'll probably have solved the problem before it appears. And if you have done, don't forget to send your hints in for other readers, too. Adventure playing isn't a one-way street!



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EASY WRITER

Anyone interested in word processing but without access to a disk drive will be interested in this cartridge from Toshiba, as tape-based word processors are inevitably clumsy to use and also limit the size of your documents because of the memory space they take up.

You either get a sophisticated word processor leaving you just enough space to prepare a shopping list, or a rough and ready program which is only a marginal improvement on using stone tablets. A disk drive is a really necessary addition if you're going to be doing any lengthy word processing, but not everyone can afford them, or you may only want to word process occasionally, and even if you have a drive you might still be attracted by the easy-to-use and reasonably comprehensive *Bank Street Writer*.

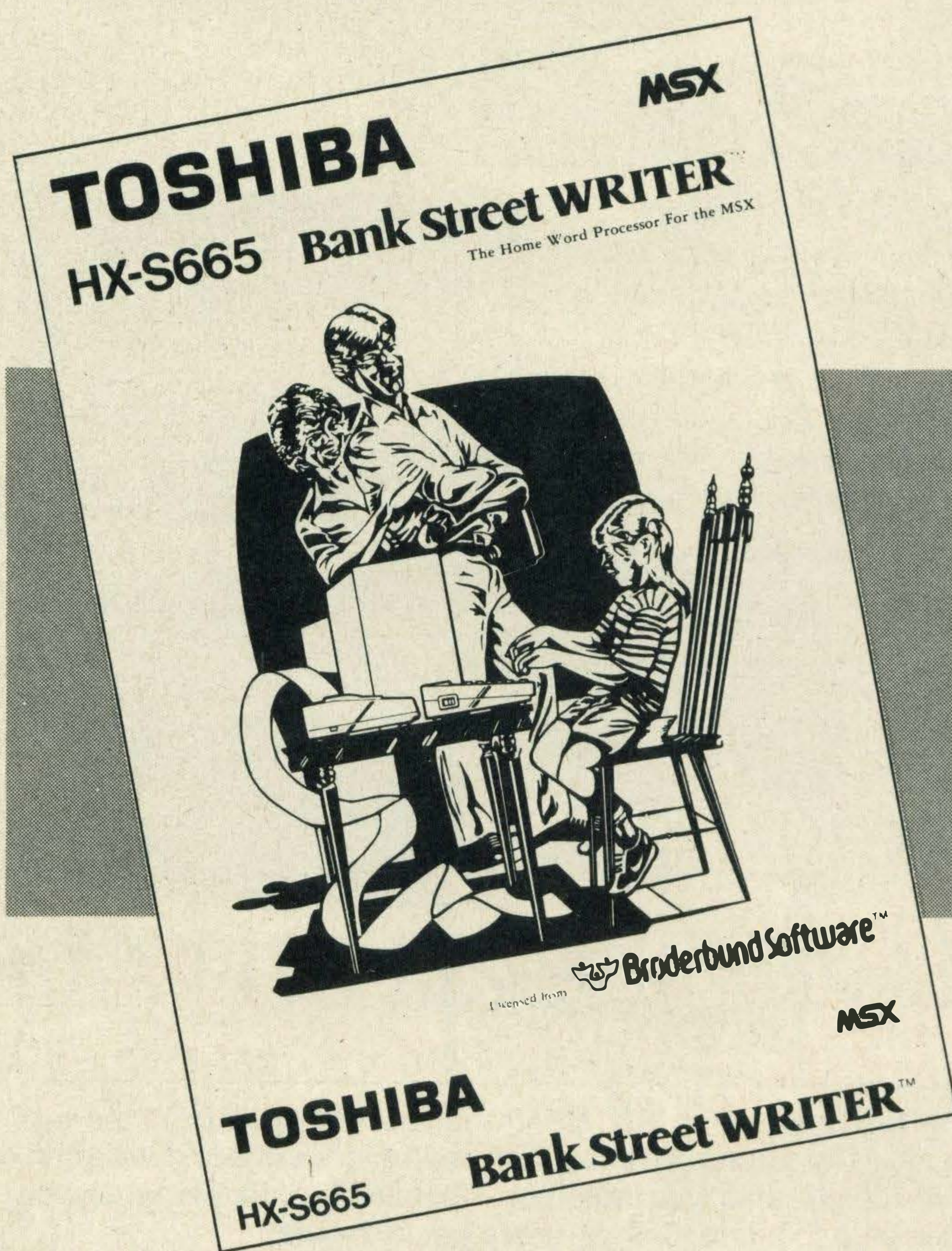
How much memory this program leaves you available for your documents obviously varies from machine to machine. To give you a guideline, using *BSW* on a 64K Toshiba meant 20,478 bytes were free before starting a document, and this allows you anything from about 10 to 20

'Disk drives are necessary for lengthy wp'

A4-size pages of text, depending on lay-out, double- or single-spacing and so on.

One useful feature among many on *BSW* is that pressing CTRL 'S' while editing a document will tell you at the top of the screen how many bytes are still free, and once you're down to your last 100 bytes a prompt will appear to warn you that you'd

Mike Gerrard tries out Bank Street Writer, a cartridge-based word processor, and likes it



better start thinking about saving, and starting on a new file.

But to begin at the beginning, you first enter *BSW* when it is in WRITE mode, the other modes being EDIT and TRANSFER. WRITE mode presents you with an uncluttered screen which, like all others, lists across the top only those commands currently available to you. When actually writing your text you can only use ESC to switch to EDIT mode, or use the DELETE and BACK-SPACE keys.

At first this seems very limiting, as most word processors

allow you when writing, to skip about the text and make corrections as and when they occur to you. However, you soon get used to pressing ESC, which leaves the text untouched but allows you access to the cursor keys and other options. Another press of ESC takes you back to WRITE mode.

Your writing screen gives you 38 characters across and 16 lines down, and when you reach the bottom line it automatically scrolls up by nine lines. I think this is preferable to either continuing to write at the very foot of the screen or losing

sight of your preceding text by switching to a new page.

The limit of 38 characters doesn't mean you have to print out in this format — you can set your column width for anything from 40 to 126 characters. Obviously, though, you have to be absolutely sure of what's going to happen to your text

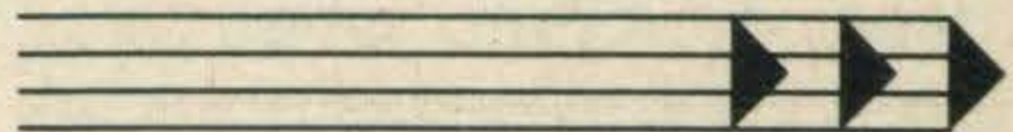
'BSW will tell you how many bytes are still free'

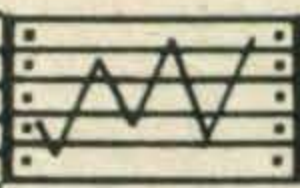
when it is printed out in a different format, because what you see isn't what you're going to get on the page, that's for sure!

If you're only doing solid blocks of text that doesn't matter too much, but if you want to prepare anything that incorporates columns of figures, for instance, then you may experience some problems. *BSW* does incorporate an automatic word-wrap facility, however, and one that readjusts itself when you come to shift your text around.

The WRITE mode doesn't affect your SHIFT and CAPS keys, but one serious drawback is the lack of a proper TAB facility. If you press the TAB key you get an INDENT marker which takes you eight characters into the line, and further pressings of TAB will take you 16, 24 or 32 characters in. But, and it's a big but, this indent will apply until you next press the RETURN key.

In other words, if you don't press RETURN every line will be indented by the selected number of characters until you do press RETURN. The manual advises that for simple paragraph indents it's easier to press the space bar several





times, but it's certainly something to think about, whether this lack of a proper TAB facility will affect your work very much. On the plus side, the WRITE mode will accept commands to centre text or to start a new page at any point in the document.

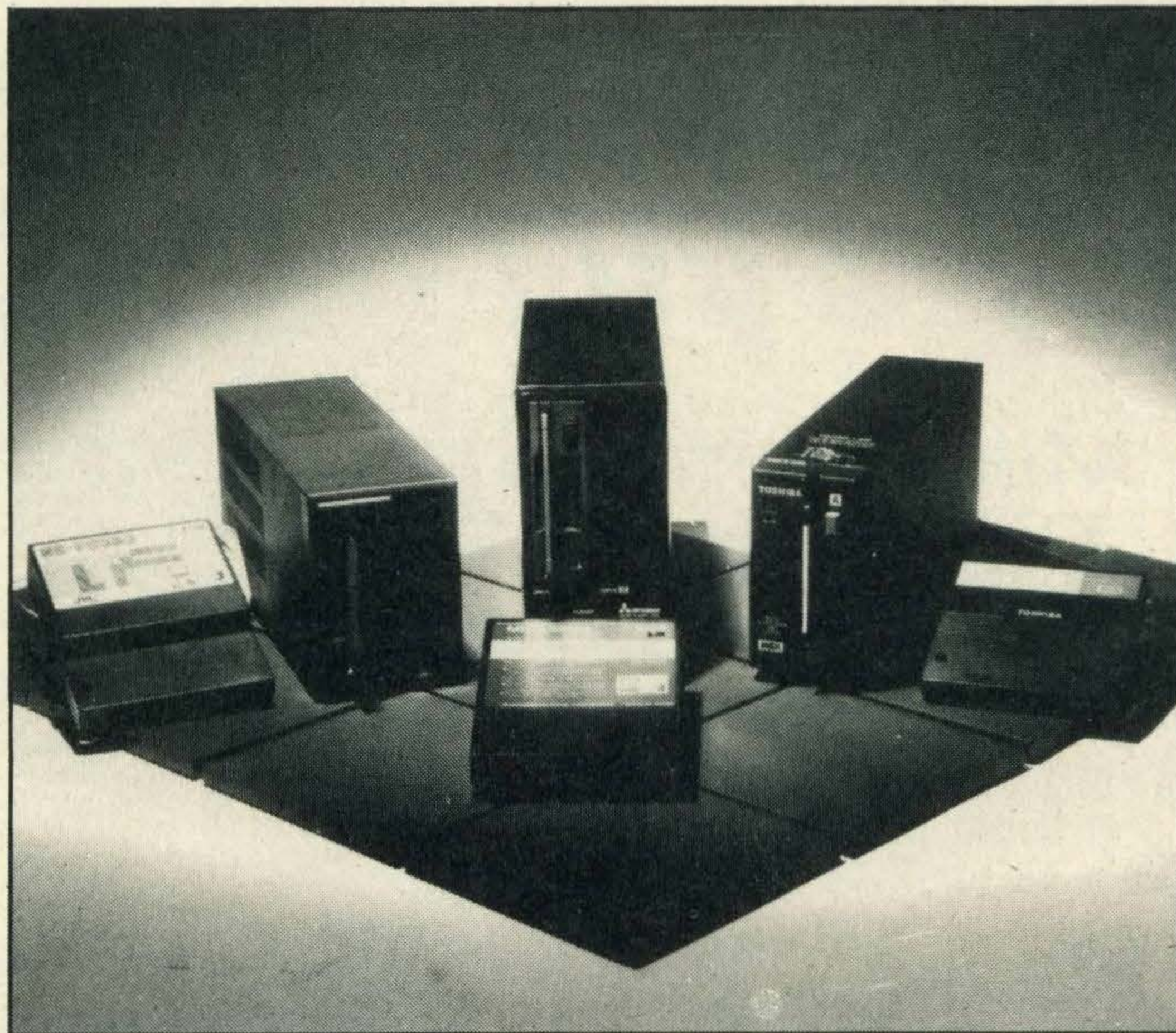
Moving into EDIT mode, you can no longer write directly to your document, but if you want to insert a word, say, you can now move the cursor with the cursor keys to the appropriate place, switch back to WRITE mode and type in the addition. This sounds a little clumsy, and it is when compared to a word processor where there is no distinction between writing and editing, but in fact it's very quick and easy once you've done it a few times. In addition to the cursor keys you can use 'B' to move you to the beginning of the document, 'E' to take you to the end, and 'U' or 'D' to move you up or down 12 lines at a time. All these functions are very quick in operation, almost instantaneous even with a long document typed in.

Apart from the cursor keys, these options aren't listed at the top of the screen but it should hardly take you long to remember them. All other choices are listed, and selected by moving the cursor around. There are the almost obligatory FIND and REPLACE options, but these aren't global — in other words

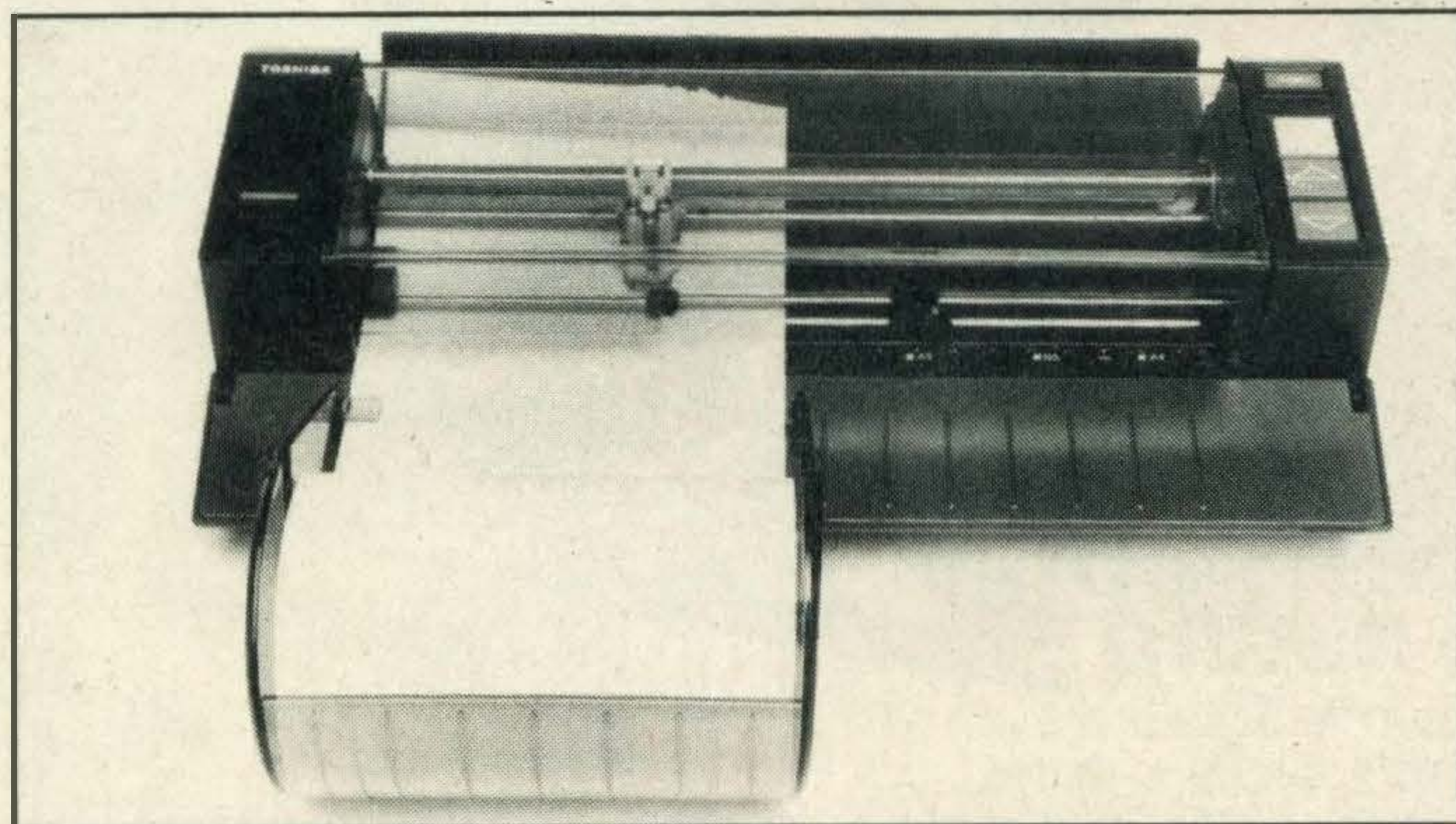
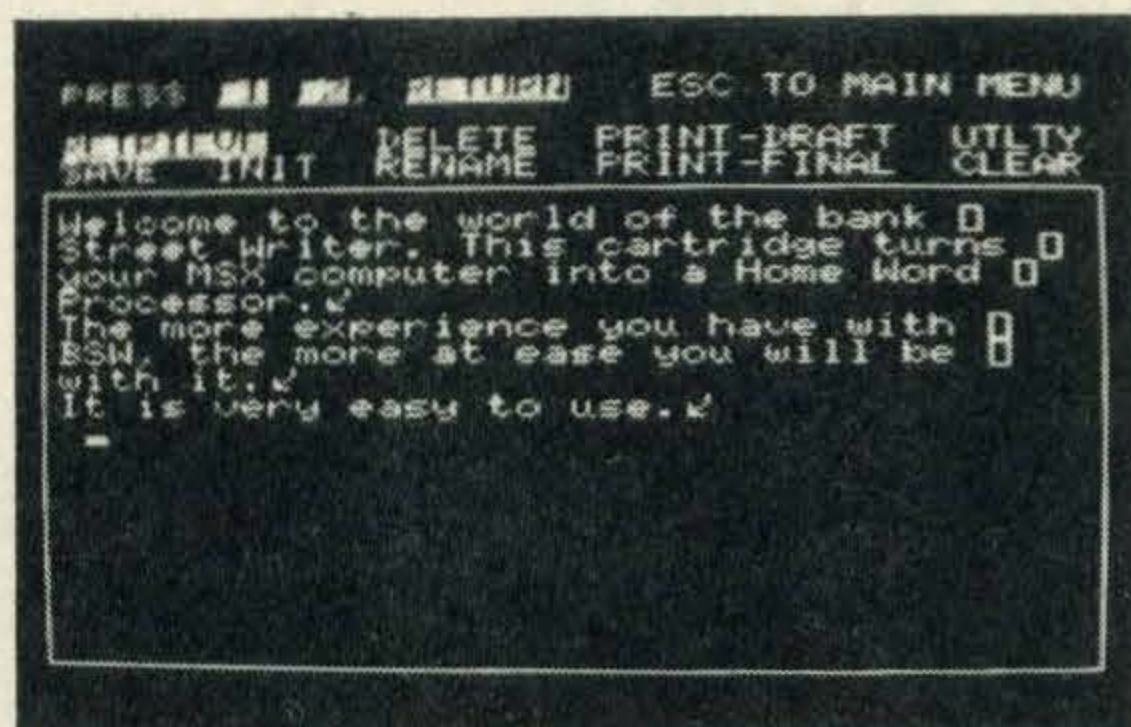
'The manual is very easy to follow if you're a newcomer'

BSW will take you to each occurrence of a word and ask you if you want it replaced, rather than doing it automatically. Having this safeguard is fine, but you should also be able to over-ride it if you wish.

The final two editing options are ERASE and MOVE, along with their quaintly named opposites, UNERASE and MOVEBACK. Both options will ask you to place the cursor at the start of the text you want to erase or move, press RETURN, then move to the end of



ABOVE: Disk drives are essential for handling large amounts of word processing. RIGHT: Typing text with Bank Street Writer is so easy. BELOW: A word processor is virtually useless without a printer



the text and press RETURN again. The appropriate text is highlighted and you will be asked to confirm before the operation is carried out. If your confirmation proves to be wrong, you can use the opposite commands to retrieve the text, but only if you do it very quickly as the text is wiped out next time you press RETURN. The highlighting of the text and the built-in safeguard (which applies throughout BSW) should ensure that you don't need to resort to UNERASE and MOVEBACK too often.

From EDIT mode you can move to TRANSFER mode, which mainly covers tape, disk and printer operations, though you can also use it to clear the screen and wipe a document from memory (useful for those

letters where you call the tax-man every name under the sun, then think better of it when you get to the end!).

As well as saving and loading files from tape or disk, you can delete a file from disk, rename a file, or format an unformatted disk — useful if you're ready to SAVE and then discover your disk is full or you've forgotten to format (initialise) a disk in readiness. Incorporated into the SAVE command is a password option, should your document be for your eyes only.

There are also two PRINT commands, one headed 'draft' and the other 'final.' The draft command prints the text out just as you see it on screen, while the final command prints out according to the settings you make from the 'Utility' screen,

also accessed in TRANSFER mode.

The main options included here are line spacing, left margin, characters per line, right justification, top and bottom margins, page numbering and form feeds. This sounds quite comprehensive, but there are limitations on some of these.

Maximum page number allowed is 255, though if you're planning to write documents with more pages than this you ought to be looking at a much more expensive word processing package.

You can only have the page number at either the top or bottom of the page, not both. In addition, you can incorporate some additional text at the top of the page (such as an identifier or 'The Great British Novel') but not at the foot of the page, where many types of document would want to include something along the lines of 'more...' or 'continues...'

Inevitable

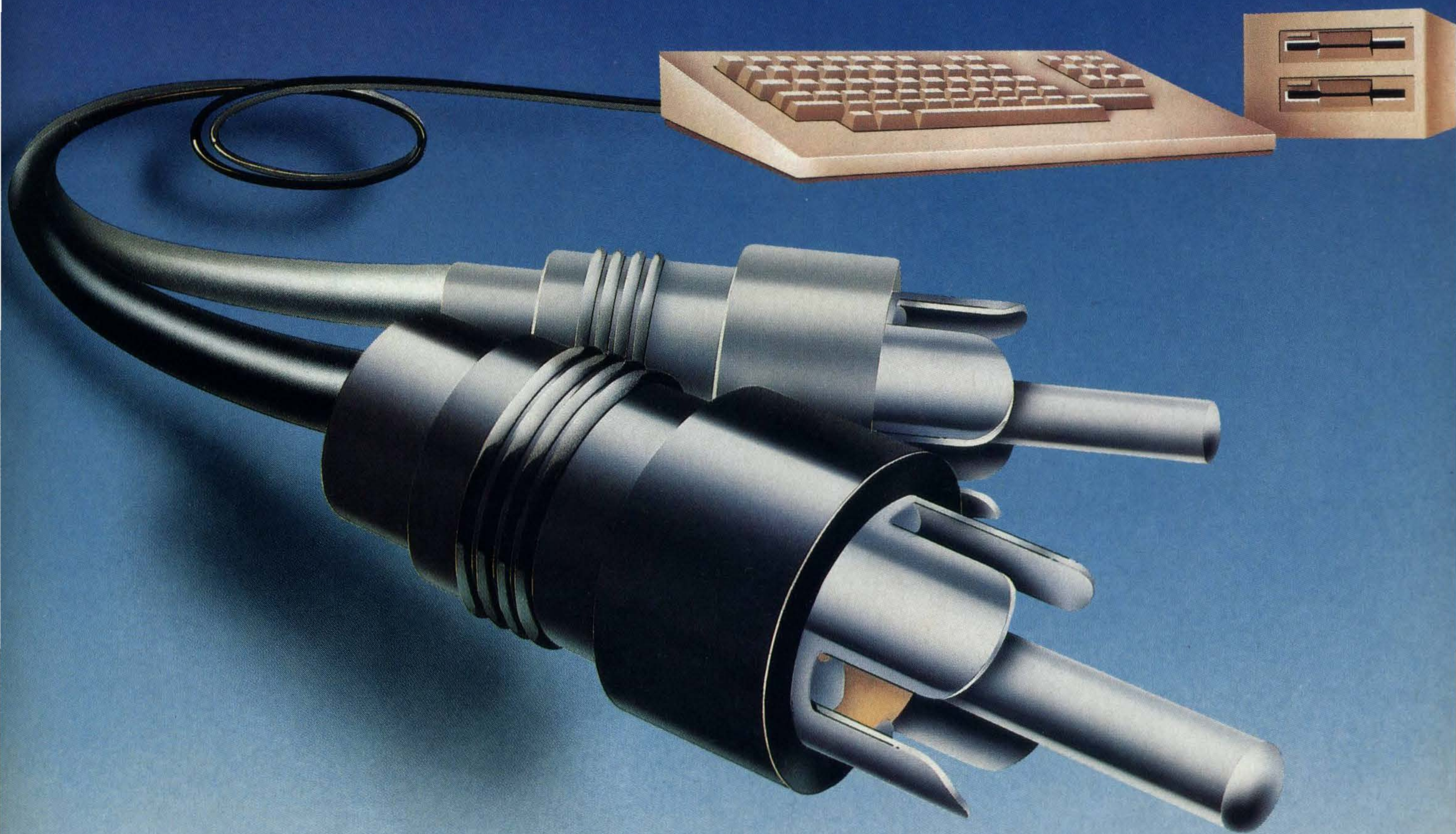
You may also discover the inevitable problem of not being able to use the '£' sign, the key for this being disabled on the Toshiba keyboard. Depending on the model type though, your printer may accept a '\$' or '#' symbol instead.

The manual that comes with BSW is only 40 pages long, and is very easy to follow if you're new to word processing. The program itself can certainly be called 'user friendly', and within its limitations it certainly performs well.

If you only want a program to do 'lightweight' word processing, such as letters, short reports, articles etc, then BSW should more than satisfy your needs. But if you really expect to be bashing the keyboard day-in and day-out then you'd be better advised to lash out a little extra for a slightly more sophisticated piece of word processing software

DISTRIBUTOR
Bank Street Writer
Price: £49.95
Supplier: Toshiba (UK) Ltd
Toshiba House
Frimley Road, Frimley
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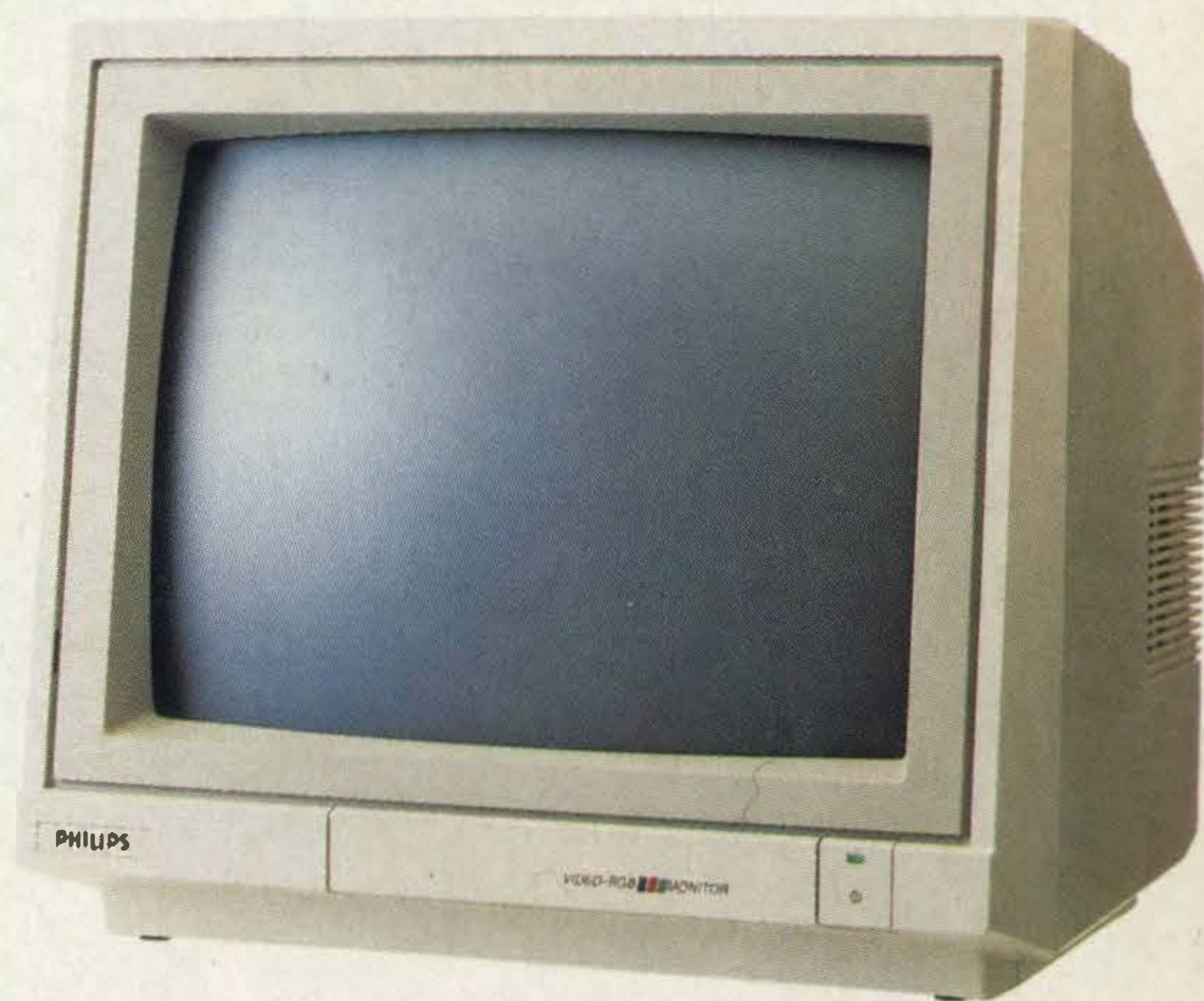


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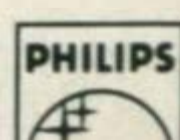
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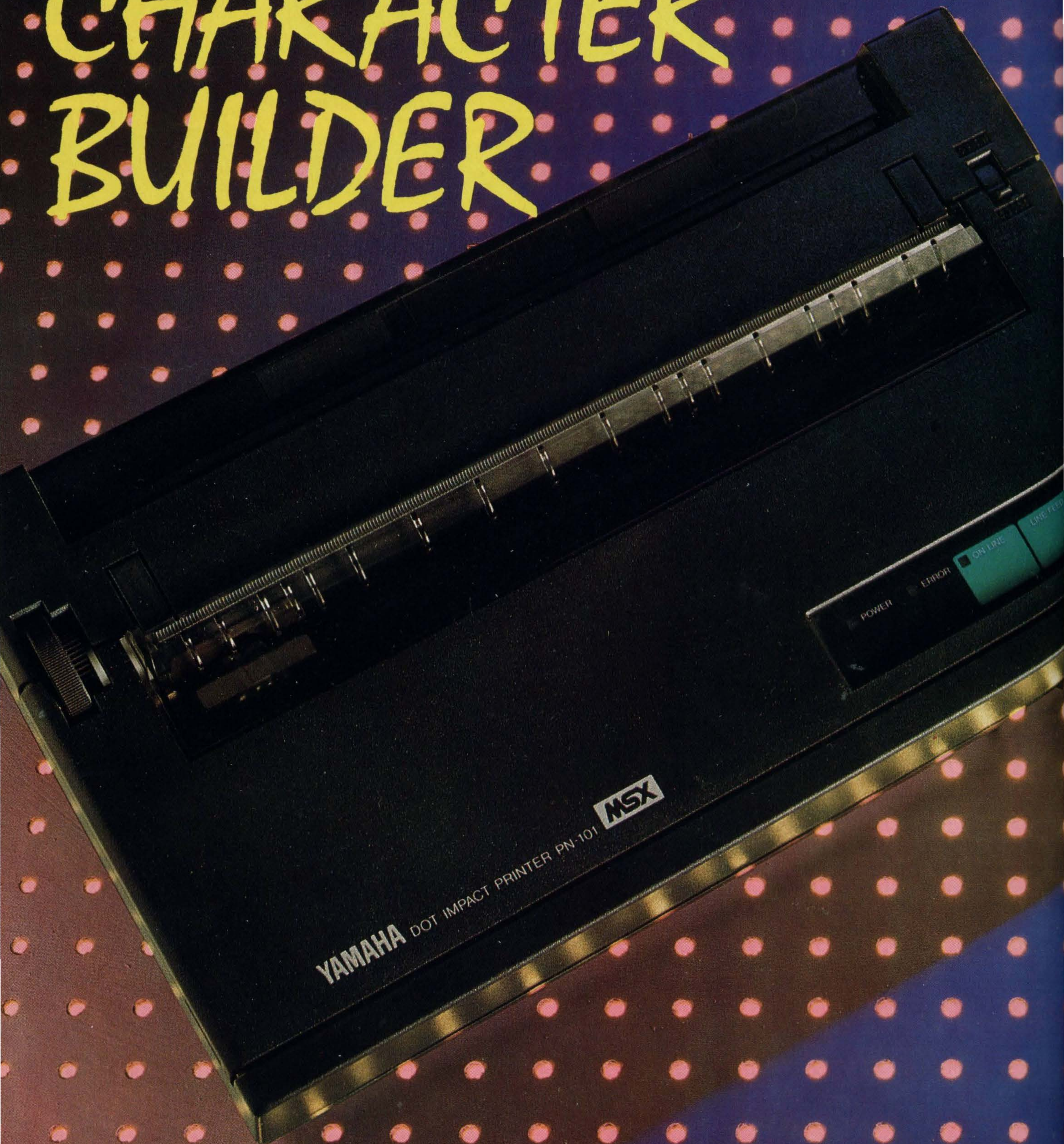
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TEST

CHARACTER BUILDER



Yamaha's printer is one of the few that can print the full MSX character set. We test it out.

Whatever computer you own, the choice of a printer to use with it can be quite difficult as there are so many to choose from. The same problem applies to MSX computers — unless you want to make use of the extra graphics character set included with MSX micros.

If that is the case, you have until recently been limited to just six models from various printer manufacturers. Now, however, Yamaha has launched a seventh, the Yamaha PN-101, which costs £244.

It's an attractive, small dot matrix printer, with a sleek-looking matt black plastic casing adorned with a green control panel. It feels surprisingly heavy but its compact size ensures that it takes up very little desk space.

Dot matrix printers are so-called because of the way they create characters — each one is made up of a number of little dots, every one about 0.33mm in diameter.

The print head — the mechanism which strikes the paper — is made up of a number of pins mounted on a base and these form the character matrix. The quality of print is directly related to the number of pins on the print head and the more there are, the better the print quality.

The PN-101's matrix is 9x7

which means that the print head has nine pins and moves across seven columns to create each character. The resulting character quality isn't word processing quality, but it is adequate for essays, memos, informal business or personal correspondence and, of course, listings.

This printer doesn't have the 'near letter quality' print offered by some dot matrix printers so it may be unsuitable for professional use.

Setting up the printer presents no problems — the ribbon slots in easily and loading cut paper sheets is a cinch. An optional tractor feed is available for £25, so if you intend to print out long listings on continuous fan fold paper, it might be advisable to invest in one. The only other important item to purchase for this printer is a printer cable — Yamaha is selling one for £25, but, if you shop around, you should be able to get hold of one a lot cheaper.

Once you've set up the printer, loaded the paper and plugged in, the first thing you should do is try the self test function. The MSX character set, along with the normal alphanumeric set, is printed out complete with smiley faces and musical notes.

The PN-101 isn't the fastest printer we've ever seen, as its speed of 40 characters

per second (cps) is quite slow for a dot matrix printer, but it is fairly quiet.

Two green touchpads and two indicator lights, labelled Power and Error, make up the control panel. Many printers will wind on paper for a full page length (formfeed), but the PN-101 will wind on only a line at a time (line feed).

Altogether the PN-101 has 256 characters at its disposal and, using the printer control codes which are fully explained in the manual, you can print out various types of character including pica, elite, enlarged, condensed, bold, emphasized, underlined and double-width.

One of the best things about the PN-101 is that using the printer's 8-pin bit image mode it can be used to print out hard copies of screen images, and you can create your own character sets such as elite.

In addition to controlling the character sizes and so on, these control codes can be used to set printer functions such as vertical and horizontal tabs, margins, form feeds and so on.

At £244, this printer doesn't come especially cheap if you consider the extra cash needed for a printer cable and tractor feed unit, but it is strong and sturdy and has enough features to make it worth the investment.

SPECIFICATIONS


Model name:	Yamaha PN-101
Type:	Dot matrix printer
Print speed:	40cps
Character matrix:	9x7
Character pitch:	5, 6, 8.5, 10, 12, 17cpi
Max columns:	80 columns
Paper width:	8.5 inches
Paper feed:	Friction, tractor feed (optional)
Interface:	Centronics
Dimensions:	H65xW333xD200mm
Weight:	3.2Kg
Price:	£244
Distributor:	Yamaha Kemble Mount Avenue, Bletchley Milton Keynes Tel: (0908) 71771

Sanyo's MSX may be fun, but it's far from frivolous.

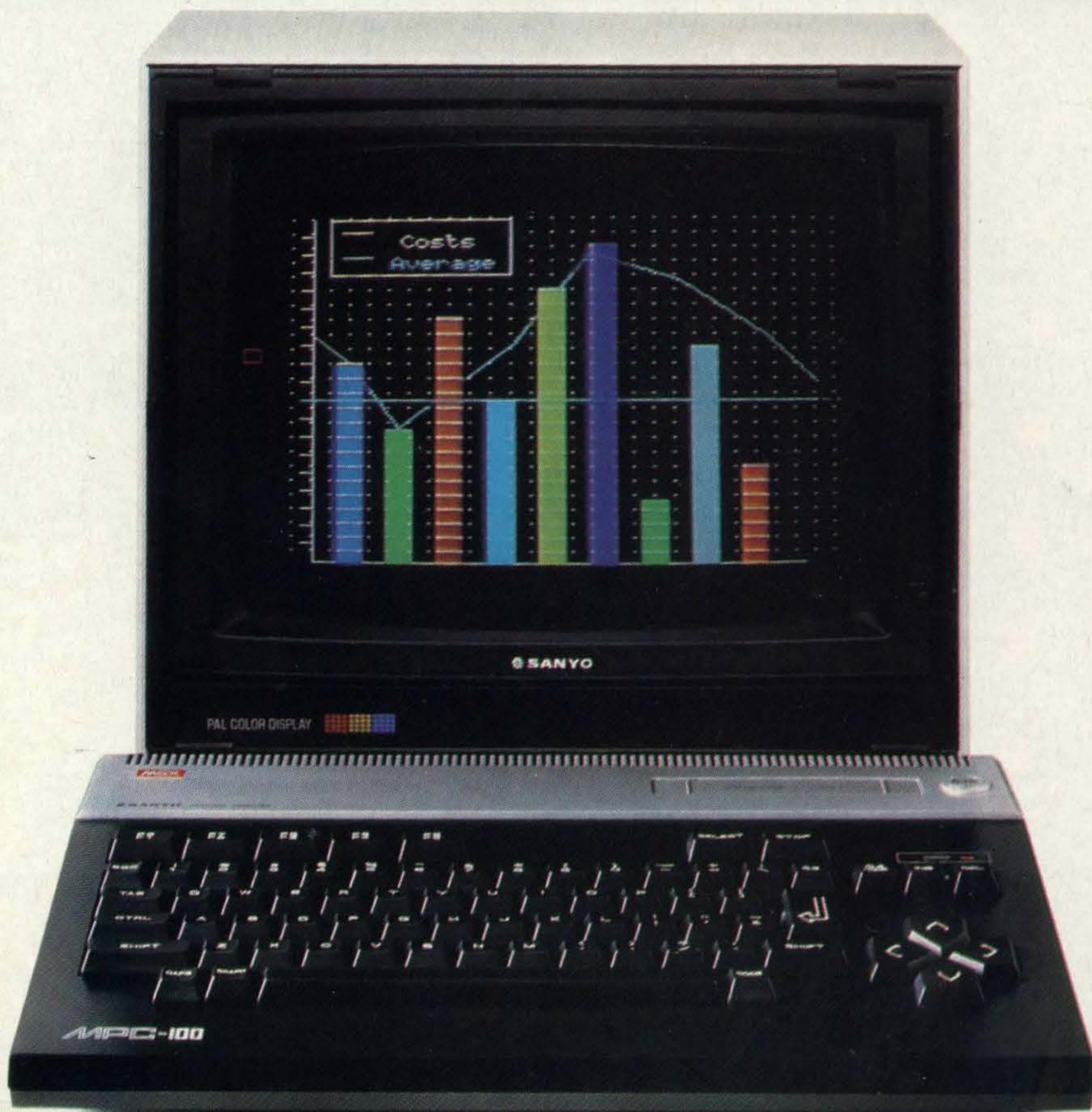
Our MPC 100 is the kind of quality machine only one of the world's leading manufacturers of business micros could produce.

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You can rely on Sanyo back-up as well. We've a factory entirely devoted to computer production. Other MSX manufacturers haven't.

So even if you do just want an MSX for playing games, you could end up a loser if you don't first see Sanyo, then decide.  **SANYO**

When it comes to MSX, we're not just playing games.



February 85

Introduction to machine code
 What do you do when your micro breaks down? We offer some sound advice
 Lightpens and graphics tablets open up new horizons, we put them through their paces
 Disk drives
 Monitors — we test three models and help you make a choice

March 85

Compact disc ROMS
 A behind-the-scenes look at how software is created
 An A-Z of machine code programming
 Brush up your keyboard skills with our typing tutor
 Make the right connections with your peripherals — we show you how

April 85

Learn how to write better BASIC programs — helpful tips and advice
 Mastering machine code — a step by step guide to the basics
 A look at the first MSX Robot
 Get to grips with RS232 hardware — all you need to know
 Daisywheel printers tested for quality, durability and reliability

May 85

A behind-the-scenes look at Electric Software
 Grasp the fundamentals of BASIC with the second part of our series for beginners
 More machine code with plenty of useful routines
 Disk based word processing and database programs for the small business user
 Two budget priced disk systems are put through their paces

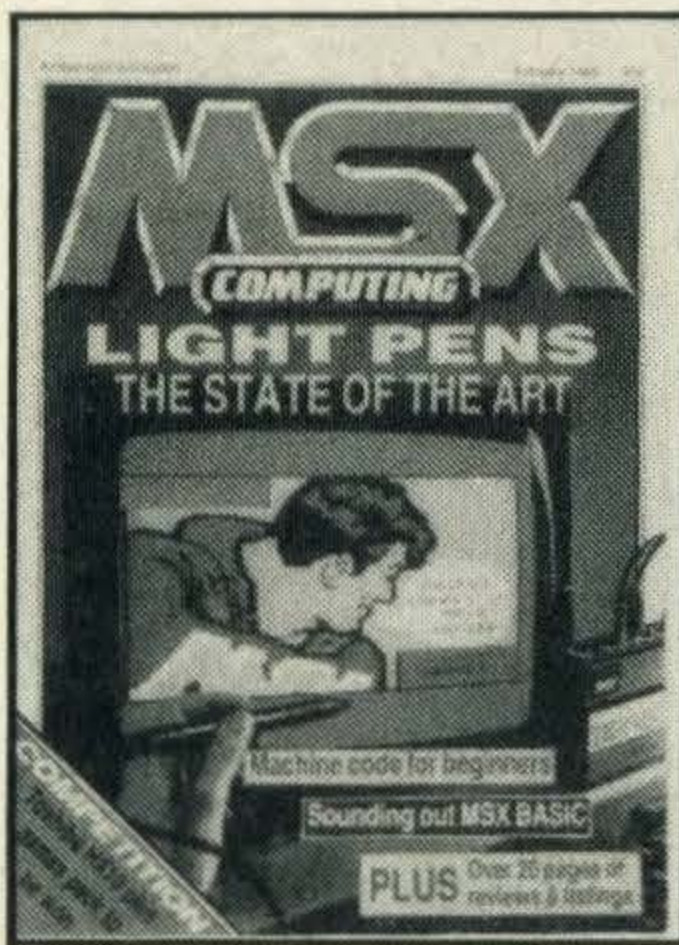
READ ALL ABOUT IT

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



February '85



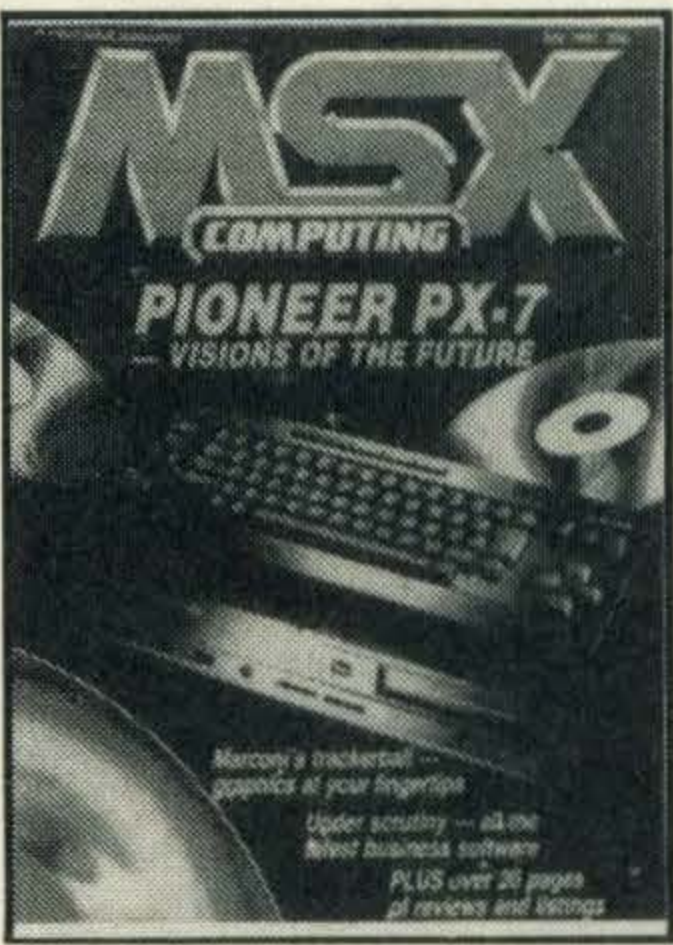
March '85



April '85



May '85



July '85



September '85

July 85

The third article in our BASIC series explains how to read data into your programs
 Get to grips with Z80 addressing modes in the penultimate instalment of our machine code series

An exclusive preview of Pioneer's video-controlled MSX computer

Graphics at your finger tips, Marconi's Tracker Ball is put on trial

Profile of Mike Beecher who developed the first MIDI interface for MSX

Plus all the latest business software

August/September 85

We assess two cassette-based sprite designers with a difference

A sneak preview of Spectravideo's new business micro, the X'Press

Thinking of buying a monitor? We guide you through the pitfalls

The interrupt system wraps up our series on machine code

Tidy up your programs — we show you how in the fourth part of our BASIC series

October/November 85

Read the first of our regular series for would-be adventurers

An exclusive review of JVC's new MIDI interface

Looking for a graphics package? Then read our review of Wigmore Houses's Mouse and graphics software

We check out *Master Voice*, a revolutionary cartridge program enabling you to use your own voice in BASIC programs
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Copies of *MSX Computing* are selling like hot cakes (other magazines just look like hot cakes). If you don't get down to the newsagent on time you could miss out on all the latest news, views, reviews and features.

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EXPRESS SUBS SERVICE

IN SAFE KEEPING

Once you've created a BASIC program, how do you save it? Tim Markes shows you how

This month, as a change from looking at the complexities of individual BASIC commands, we will review how you 'dump' and maintain all those programs you have been writing.

Only the more advanced — and perhaps well-heeled — of our readers will possess a disk drive, so we will concentrate on the cassette system. Let's ensure that having created a masterpiece (well almost), you really get it taped.

Most simple mono tape recorders will be OK. Look for an index counter facility and ideally Cue/Review or MSS (Music Search System) which will help to locate the start and finish of programs.

There are several 'data recorders' on the market, but a careful check may reveal that they offer little more than a conventional £20 audio tape recorder.

Check that the connection lead between your MSX and tape recorder is fitted correctly. The 8 pin DIN computer end is plugged into the 'Cassette' socket on your computer, and the lead, normally supplied with the computer, terminates in three mini jack plugs.

One 3.5mm jack, usually white, is to receive data so plug this into the cassette recorder socket marked Phones, Ear,

Play or Read. The second, usually red, is to send data — plug this into the recorder socket marked Mic, Record or Write. The third jack, usually black and smaller than the other two, is to enable the computer to switch the cassette motor on and off directly — plug this into the recorder socket marked Remote or Motor.

The most popular audio cassette tape today is the C90 which will record 45 minutes of sound (or computer data) per side. In pounds per hour, this is probably the most economical medium.

There are now much shorter tapes down to C15 or smaller, however, which are intended specifically for the computer market. If you think you might have problems keeping track of several programs on one tape, a short tape is probably the answer. They are also useful for telephone answering machines, incidentally — so don't leave them lying around.

Zero the tape counter, load and move the tape past any non-recording transparent leader. Remember that you can't do any manual operations (FF or REW) unless you remove the Remote jack briefly.

The tone controls should be set to high or treble (rather than low or bass) and the volume

usually about $\frac{3}{4}$ of the range. Depending on the sensitivity of the controls, you might have to experiment to get a suitable setting. Suppose we want to SAVE this short pseudo program:

**10 REM Test Program
20' Written to
30' Cassette — 29OCT
40' Last line**

Let's call this program 'PROG', just to get started! Now with the Remote jack reconnected, press RECORD and PLAY together. Finally start recording ('writing' or 'dumping', as it is known) your program to tape, by typing:

CSAVE "PROG"

CSAVE will write the program in memory to a file called PROG. In the absence of any other information, it assumes that you wish your file to be written to tape. The tape will start moving and recording under computer control. When your MSX thinks that the program has been successfully written to tape, it will display 'Ok'. Now press the STOP button on the recorder to release the tape heads and all should be well . . . or is it?

Remember that your MSX is only sending information to the cassette port; it can't check that you have connected everything correctly and pressed all the

right buttons. Even if you don't own a cassette recorder it will still say 'Ok'. This really means 'I'm OK . . . let's hope you've done your bit!'

There are two main methods of proving that your program has indeed been SAVED successfully. The most straightforward is to erase the old program and try to load the NEW. Rewind your tape to line

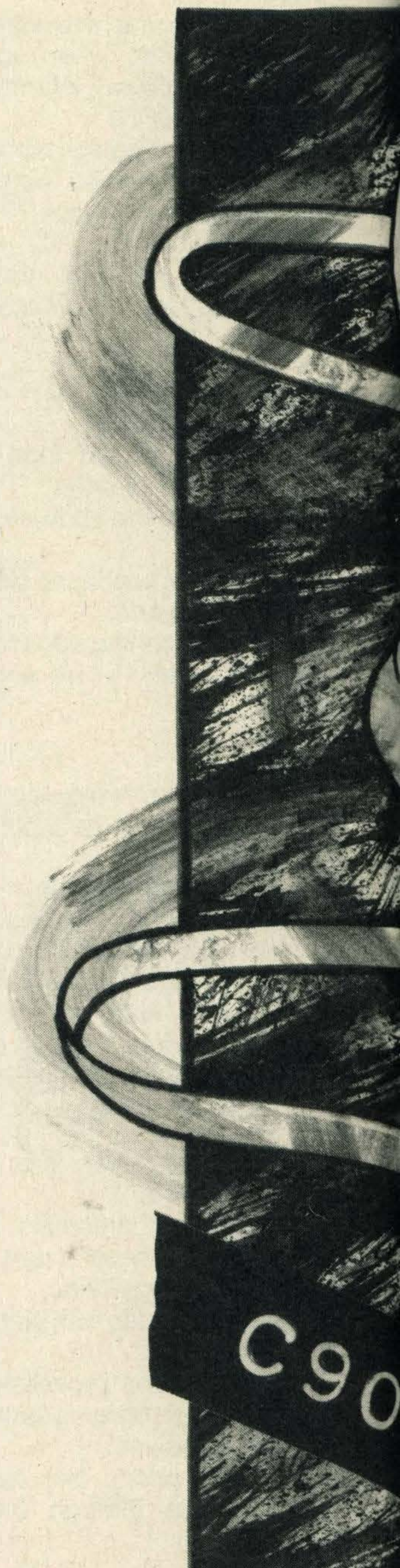


Illustration by 'Radar'



up with the start of 'PROG'. Reconnect the remote jack, press PLAY and type:

```
NEW
[Ok]
CLOAD"PROG"
[Found:PROG]
[Ok]
```

The command NEW will effectively erase the old program (check LIST). CLOAD will

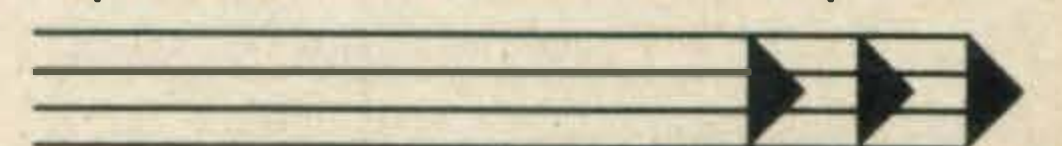
start the cassette motor, search the tape for a CSAVED BASIC program called PROG and load it. If any other programs are encountered, their names will be noted ('Skip :namexx') as the search continues. If you forget your program file name, just use the short form CLOAD and the first program hit will be loaded.

For those of a nervous dis-

position who want to pre-check that their CSAVED program really can be CLOADed successfully, CLOAD? is the answer. Add a question mark to CLOAD and it will not load, but just compare the specified program on tape with the program in memory. Any discrepancy will be highlighted as 'Verify error' — also useful for comparing different versions of

the same program.

In practice, 'PROG' is a pretty stupid name to call a program, of course. MSX permits up to six characters of significant upper and lower case letters, numbers and symbols (starting with a letter). Why not make the names of your program files on tape as informative as possi-



ble? All these are acceptable, for example:

'GAMEa', 'SUB-2d',
'ACS6.3', 'OCT (3)'

Using a suitable naming convention, you can show which variation and development version of a program is held in your tape file. It is sometimes also helpful to include this information as an identification line in the program itself — like this:

10 REM Sprite Designer
20 REM by Tom Dowling
30' SDE-1d on 23OCT85

How do you keep track of what has been written to tape, and where? 'With considerable difficulty', is the usual answer, unless you get organised. Most effective systems involve at least some writing on a real paper surface with a real pen or pencil — if only on the cassette tape index card.

If you are likely to dump several programs on one tape, though, there are additional options you might think about. Rather than dump your programs one immediately following the other, start recording each new program routine at fixed intervals (say 25 or 50) on the index counter — sufficient to allow for some expansion of each program. Since you are using a tape recorder, of course, you could also record a spoken identification preceding each routine.

A further interesting option is to reserve the first few seconds of the tape as a program index (dummy program), which you can arrange to update every time the contents of the tape are changed. This is a similar technique to indexing systems on disk. The first dummy program on your tape might look like this:

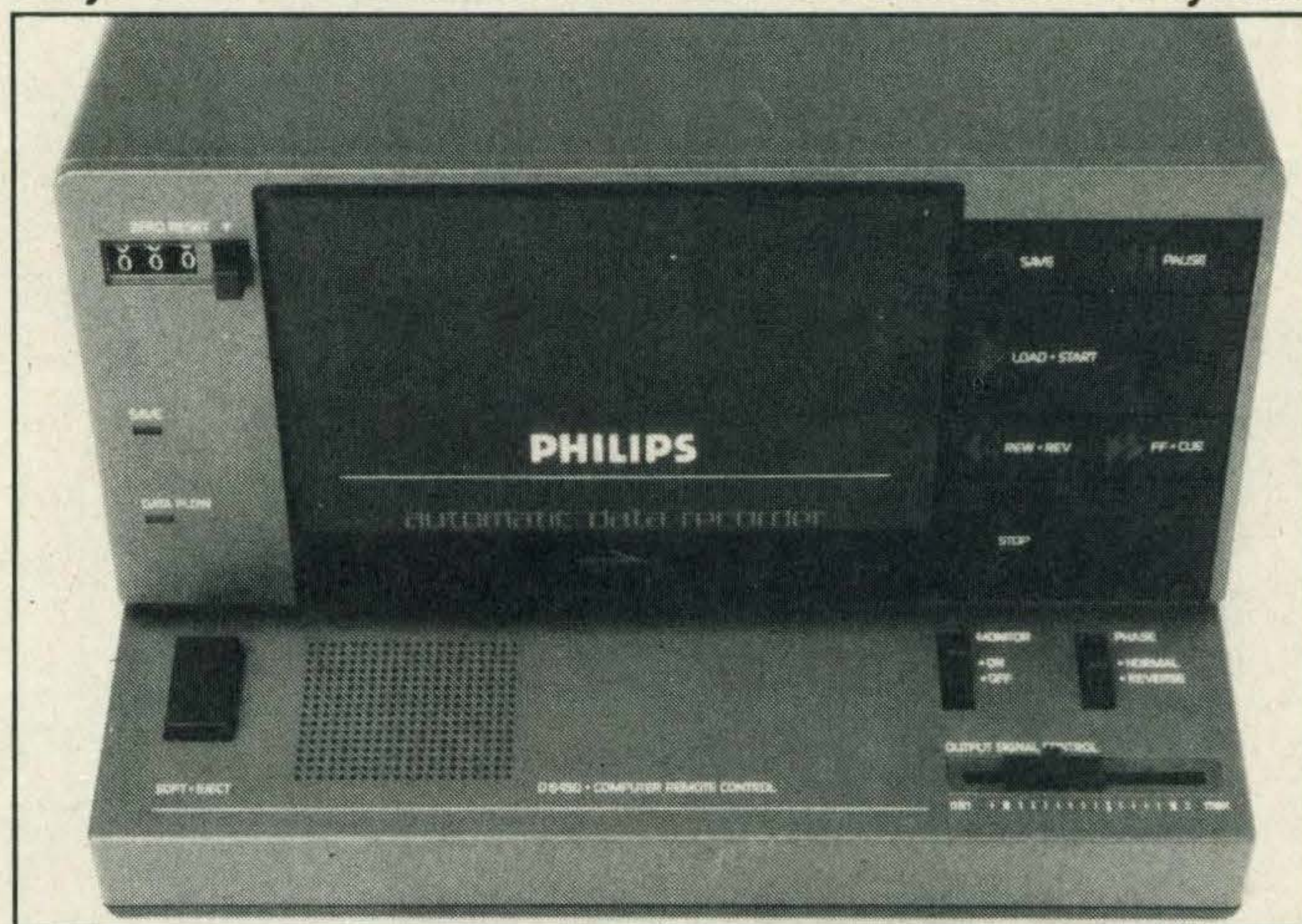
10' Name	-----	Index
20' SDE-1a		25
30' SDE-1b		50
40' Free:		75-150
50' SUBA.1		150
60' SUBB.2		160

Now—providing the index is kept up to date — the tape itself will contain a description of its own contents.

The CLOAD/CSAVE system deals well with single programs. Suppose, however, that we want to take two programs, which have been written to tape on separate occasions, and



Sanyo's £45 DR202 data recorder features the useful ADSS system



Philips' data recorder (£38) has been 'ergonomically designed'



For the upper bracket, JVC's £89 recorder always loads perfectly

MERGE them together to make a single program. In this case we need to use a slightly different system of saving.

Any program routine which is required to be added to, or merged into sequence with, another program, must be SAVED in standard ASCII format. This is a character by character dump, which is marginally slower and longer than the more compressed format of the CSAVE/CLOAD system. The relevant command is SAVE (rather than CSAVE) and the resulting SAVED program file can be MERGED with any other program which has

been previously loaded into memory. The effect is as if the merging program was being typed in at the keyboard.

Suppose we have some lines of Program A which look like this:

10 REM Program A
20 REM Program A
30 REM Program A
40 REM Program A
50 REM Program A
60 REM Program A

Program A can be saved in the usual (CSAVE) manner like this:

CSAVE "ProgA"
NEW

We now develop a further program sequence called Program B — which might, for example, be drastic amendments to Program A — as follows:

05' Program B
12' Program B
14' Program B
30' Program B
55' Program B
70' Program B

In order to merge Program B lines into Program A, we must SAVE Program B in ASCII format, like this:

SAVE "CAS:ProgB"

Notice that, unlike CSAVE, you must include the cassette device description CAS: in the SAVE filename. Now clear the memory, re-load Program A, merge in Program B and list the result — with a sequence like this:

NEW
CLOAD "ProgA"
MERGE "CAS:ProgB"
LIST

05' Program B
10 REM Program A
12' Program B
14' Program B
20 REM Program A
30' Program B
40 REM Program A
50 REM Program A
55' Program B
60 REM Program A
70' Program B

Notice in the above sequence that lines from Program B are merged in sequence into Program A.

Where lines occur in both programs (line 30), the tape program (B) simply overwrites the previously loaded line in memory.

There are many applications of this MSX facility, one in particular being the creation of a tape library of useful (SAVED) subroutines — including those borrowed from friends or copied out of *MSX Computing*. Then, with careful use of RE-NUMBER, you can incorporate (or MERGE) the routines you need into as many programs as you wish.

Your cassette recorder can also be used for storing (writing) and retrieving (reading) program DATA, of course — another of the topics I look forward to exploring in 1986. Happy Christmas!

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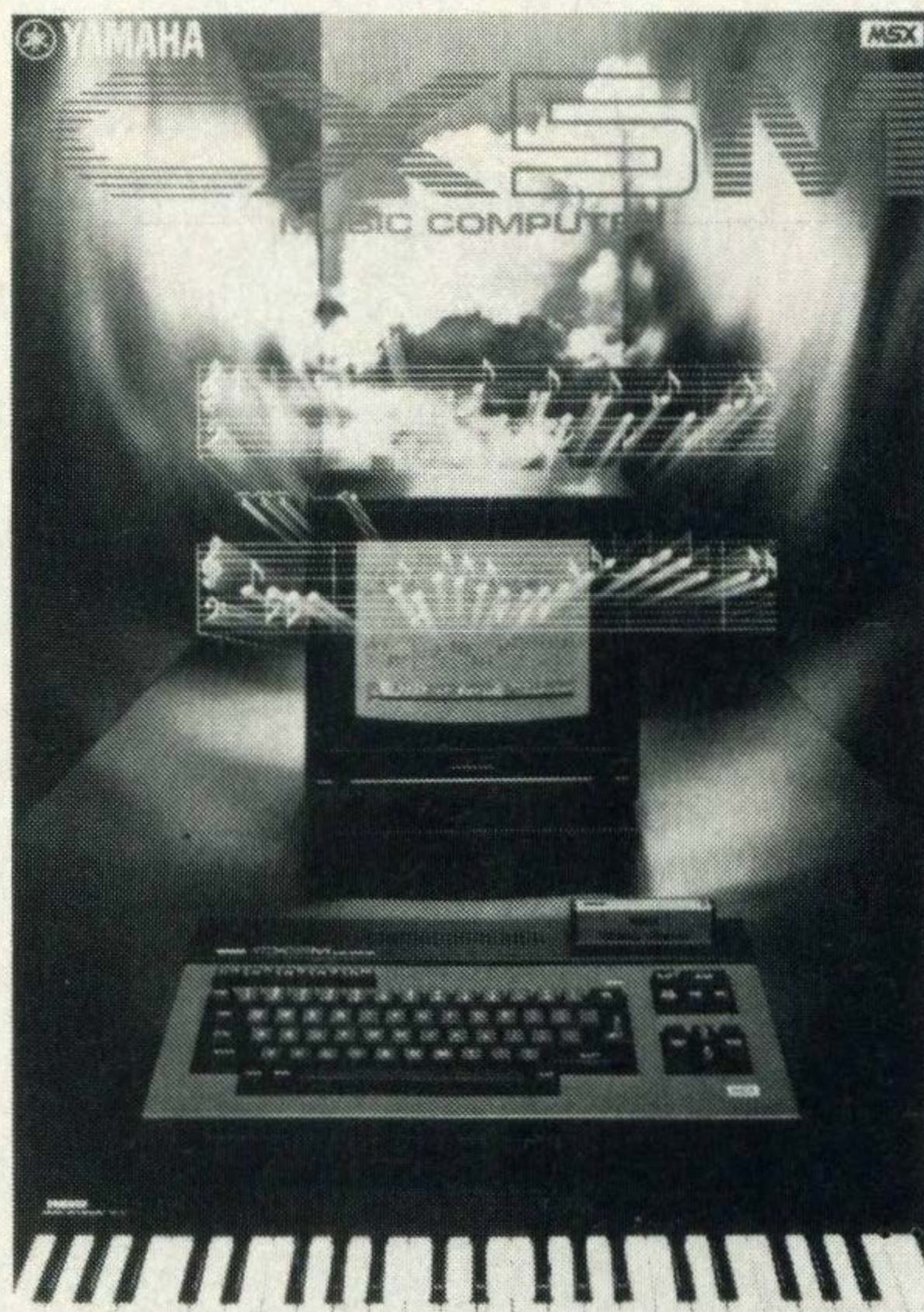
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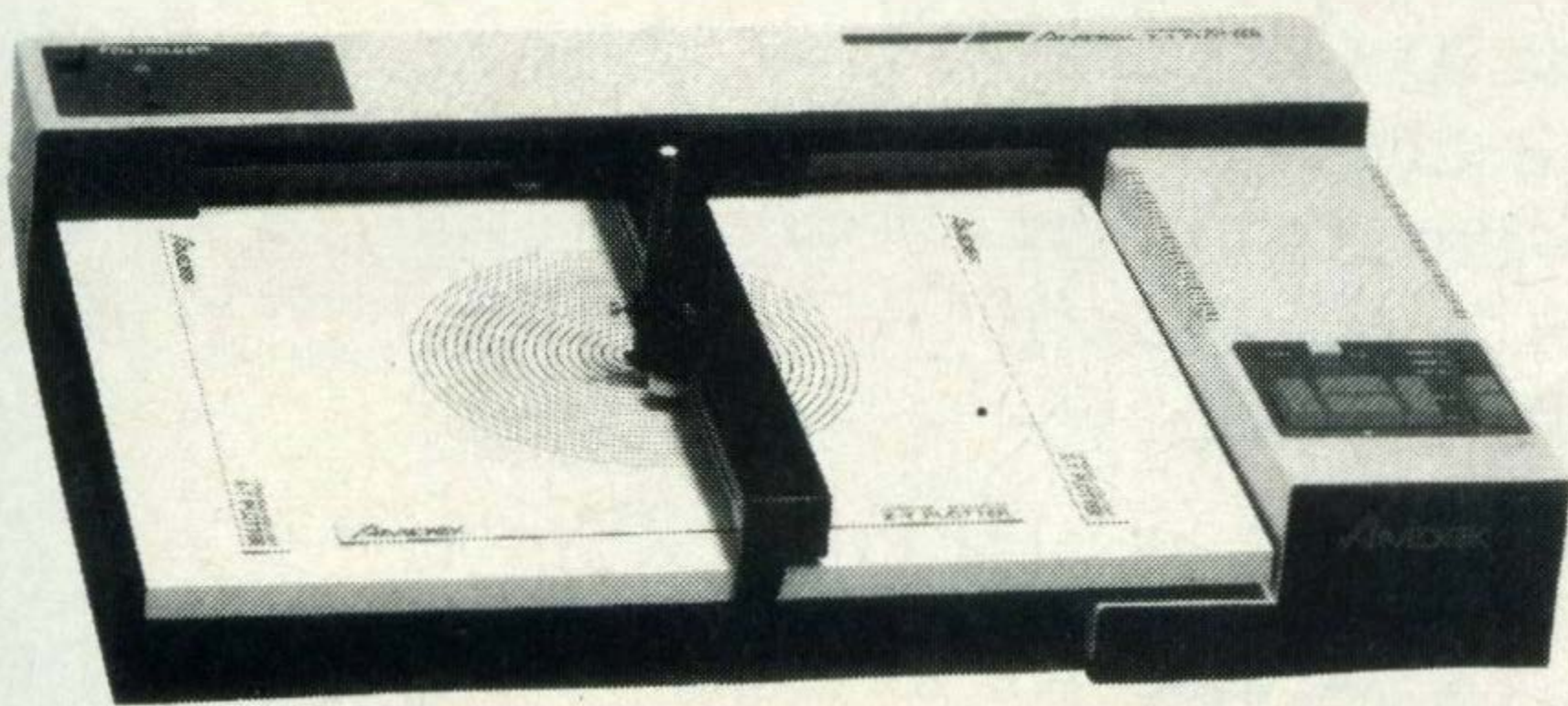
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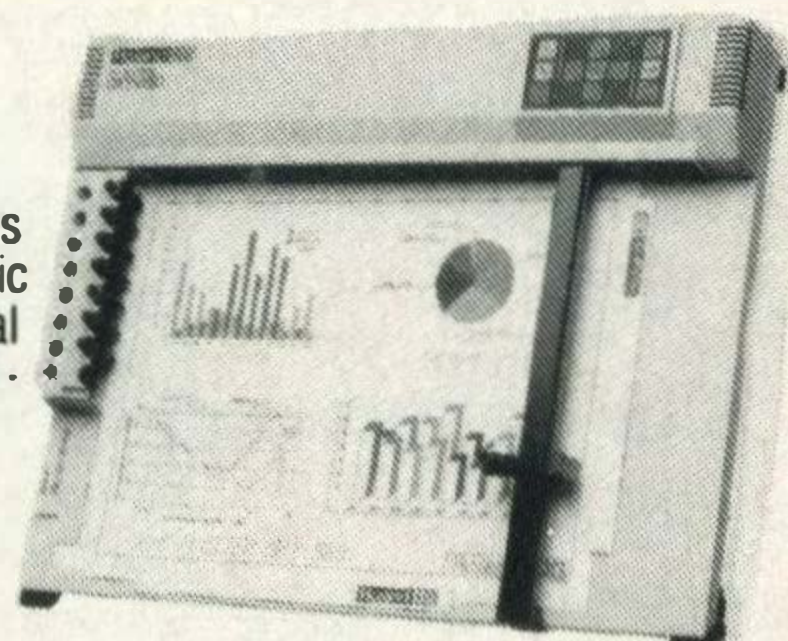
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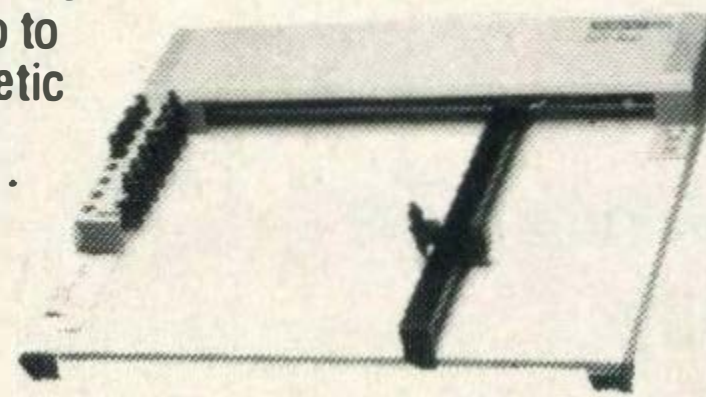
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TOP

20

Since the MSX micros were launched last year, we have been inundated with hundreds of games.

Selecting games in the shops can often be confusing because you can't try them out — as you would do with a record or cassette — and so to help you make an informed choice, we've compiled what we consider to be the all time best top 20 MSX games.

Some of you are bound to disagree with the order or even the choice, but we guarantee that the games mentioned are some of the best available in their class and are excellent value for money.

THE HIT LIST

- | | | | |
|----|---------------------|----|-------------------|
| 1 | Road fighter | 11 | Tennis |
| 2 | Sorcery | 12 | Dungeon Adventure |
| 3 | The Hobbit | 13 | Yie Ar Kung Fu |
| 4 | Kings Valley | 14 | Hunchback |
| 5 | Manic Miner | 15 | Finders Keepers |
| 6 | Elidon | 16 | Minder |
| 7 | Antarctic Adventure | 17 | Ghostbusters |
| 8 | Jet Set Willy | 18 | Blogger |
| 9 | Chuckie Egg | 19 | Boulderdash |
| 10 | Red Moon | 20 | The Wreck |



No. 1

Road Fighter

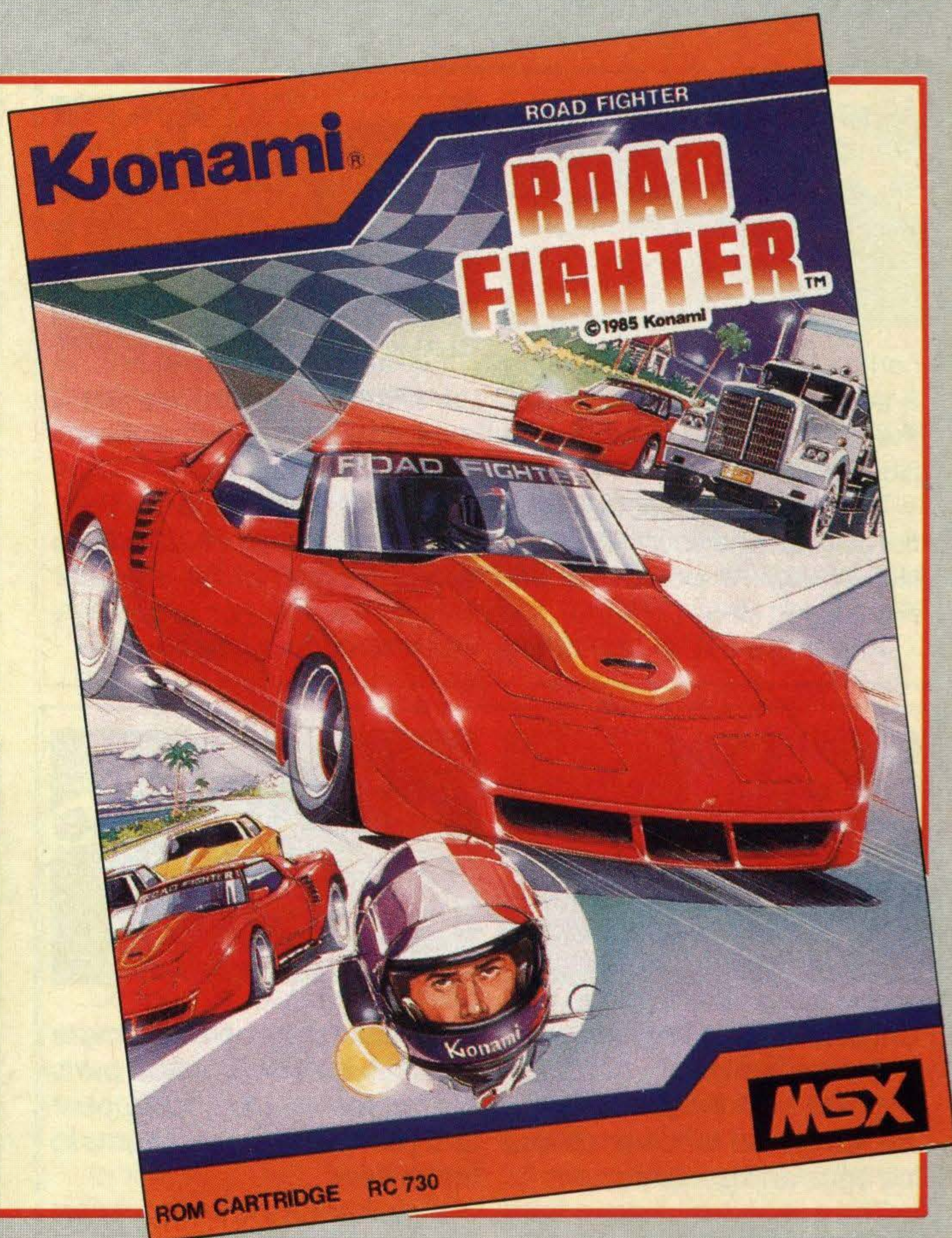
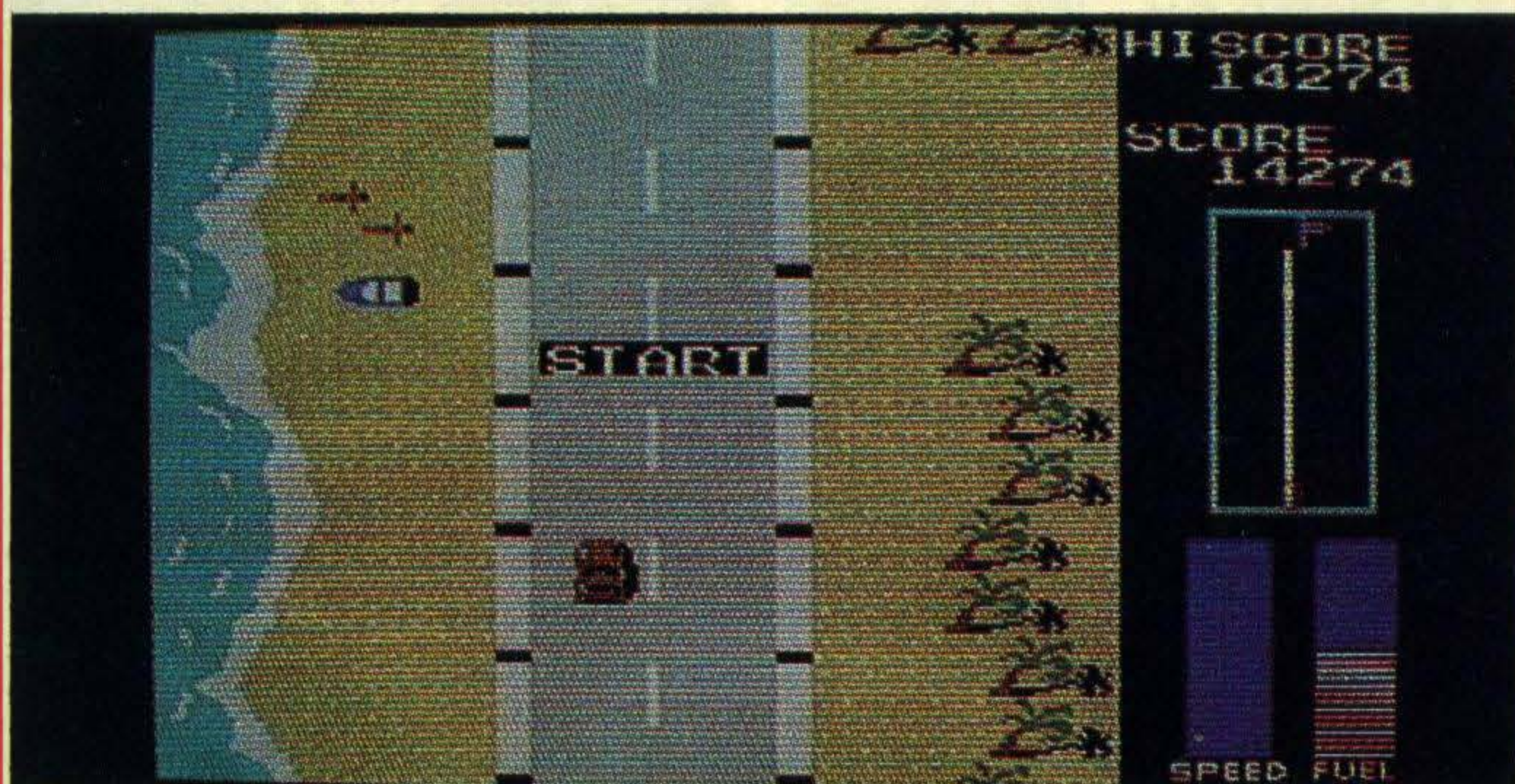
We just had to vote this title the tops in our charts because, like Konami's other games, it has superb sound, graphics and best of all is totally addictive.

We've spent many an hour hurtling through wastelands, across cliff highways and over precariously narrow suspension bridges clinging onto our sweat soaked joysticks.

Our car, a bright red roadster, has bombed along at break-neck speeds, but only occasionally have we become the victim of a multiple pile up or smashed into one of the crash barriers.

The action comes thick and fast and we've loved every minute of it. The grating of the gears, the sound of the engine purring and the screeching of the brakes add to the game's appeal and has kept our adrenalin pumping furiously.

Playing *Road Fighter* takes time to master but with practice you'll soon out-lap Alain Prost.



No. 2

Sorcery

Virgin's *Sorcery* came a very close second in our league. It is an intriguing game, combining fast arcade action with adventure.

Cast as a sorcerer you have to move through all the rooms (there are 50 in all) and free your fellow sorcerers in order to fight the evil and treacherous Necromancer. On your way you'll come across various objects such as axes, swords and falling stars and it's up to you to figure out their use.

Throughout the game you are racing against time which is indicated by an ancient book at the bottom of the screen. As it slowly crumbles away, so does your time limit.

Sorcery is an unpredictable game to play with fascinating graphics. It's full of intriguing and exciting surprises and we guarantee you'll become addicted!



No. 3



The Hobbit

Third place just had to go to an adventure and none better than Melbourne House's adaptation of Tolkien's famous fantasy novel, *The Hobbit*.

It is one of the most colourful and imaginative combined text adventures to arrive in our offices and had us enthralled for weeks.

Playing the part of Bilbo Baggins you are sent on a mission to seek out the evil Smaug and re-capture the treasure he hoards. And as a secondary mission, you must look out for and protect Thorin, for without him you won't survive the adventure.

It goes without saying that your journey will be hampered by all sorts of nasty creatures — trolls, goblins, wolves and so on. The graphics alone are worth looking at with colourful pictures of every location Bilbo travels to.

With a vocabulary of over 500 words and over 50 locations, this has got to be one of the best adventures we're likely to see in a long time.

No. 4

Kings Valley

This is one of the best platform games we've seen and deserves its fourth place, although some are still arguing that it should have been placed higher up the scale!

If you're looking for fast action, excitement, intrigue and a game that requires mental agility then this is it!

An explorer called Vick (that's you) is after fame, fortune and eternal life and the only way to get it is to enter the Valley of the Pharaohs and ransack the sacred pyramids.

But once inside you not only have to outwit the mummies and find the treasure, but also find a way out.

What we liked best is that the game combines the excitement of the traditional zap 'em and kill 'em arcade games together with the planning required of an adventure game.



Manic Miner

Manic Miner is best described as a classic and since its launch, the game has been a best seller. It is definitely worthy of fifth place in our top 20.

The idea of the game is to control Miner Willy and explore a series of caves deep below the pavements of suburban Surbiton!

Each screen depicts a location with an odd sounding name like Wacky Amoebatrons and Alien Kong Beast.

And that's not all, the design



No. 5

ner Matthew Smith has got a vivid and somewhat perverse imagination because in the Attack of the Mutant Telephones you have to collect ten pence pieces, whilst a further screen has snapping lavatory bowls whirring around you!

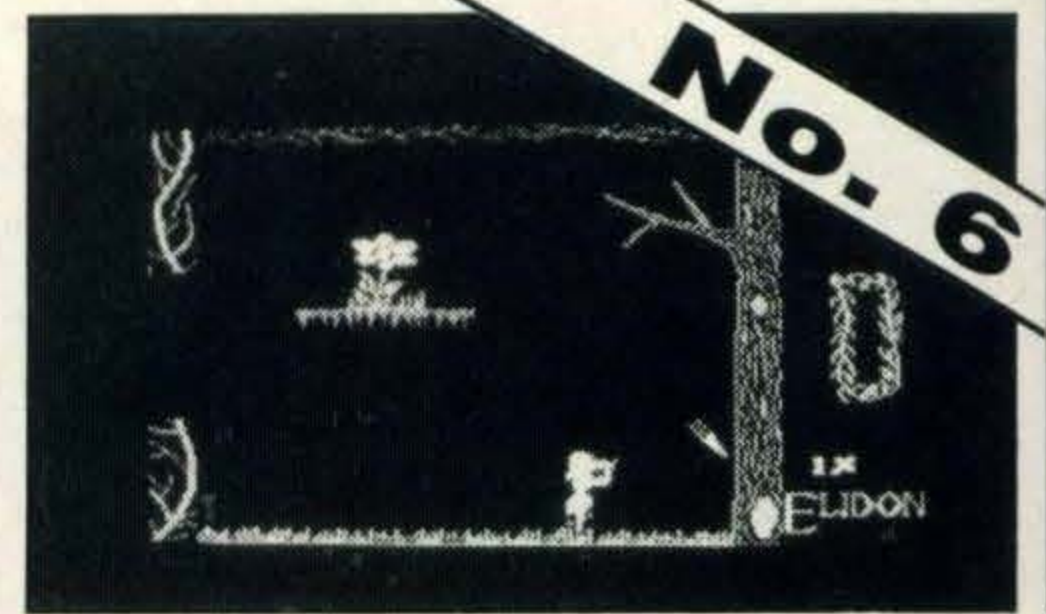
Elidon

There aren't many games that you can describe as enchanting, but *Elidon* definitely falls into this category.

It is a beautiful game based on faeries and magic and is set in the forest of Elidon.

Scattered through 4,000 rooms are seven magical positions which must be taken to seven flowers deep in the forest in order to make them bloom, and banish winter's harsh cold shadow.

Stools, torches and other



No. 6

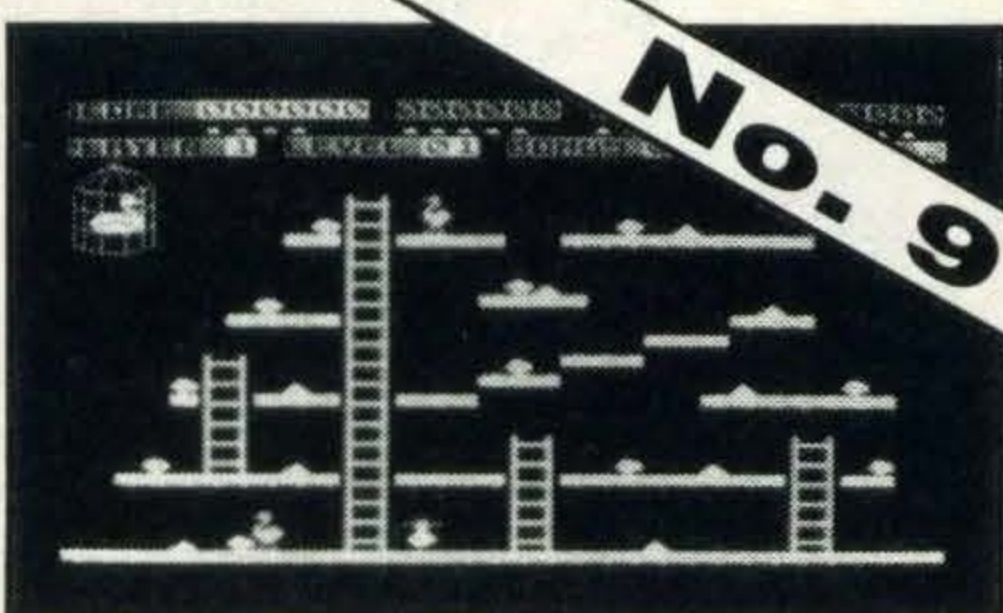
objects in the game are there to help. Few instructions are provided with this game so much of it is down to trial and error. However, it's well worth persevering with this brilliant piece of programming, skilfully designed and great fun to play.

Chuckie Egg

Chasing weird looking creatures around a television screen may not be everyone's cup of tea. But if you're looking for a game that is slightly different from the normal run-of-the-mill platform game, then *Chuckie Egg* will appeal.

Set in a farmyard, your task is to guide Hen House Harry up and down the ladders, collecting eggs and gobbling corn.

The scenarios remain basically the same, but climbing the ladders together the corn and eggs



No. 9

does get progressively more difficult, especially when parts of the floor start to disappear and you've got great chasms to leap over!

It's a little on the pricey side at £6.90 but it's a title we still can't keep our hands off.

Red Moon

After a lot of debate we eventually decided that Level 9's *Red Moon* should be awarded tenth position in our top twenty line up.

Like most adventures there are spells galore and treasures to find as you crawl through dark passage ways and eerie caverns.

But where this adventure differs from the rest, is that many of the characters you come up against like Sog the Newtling and Drella the Troll



No. 10

can be fought against.

There are over 200 locations to explore, each with accompanying graphics and it is crammed with puzzles and riddles to solve. *Red Moon* is sure to stay high on our list of favourite games.

Yie Ar Kung Fu

There's no getting away from the fact that Konami produces great games and no wonder it's often referred to as King Of the Carts.

Set in ancient China and cast as Lee, a Kung Fu expert, you have the unenviable task of protecting the locals from the Chop Suey Triad Gang.

With only a pair of pantaloons to your name your skills at the martial arts are tested. Watch out for the crafty kicks.

Graphic effects are brilliant



No. 13

and the body movements as the fighting duo rush about the floor are the most realistic we've seen.

A great example of games programming and a title that comes with a high recommendation from us.

Hunchback

Our first impressions of this title ranged from 'its a bit daft' to 'what a great game' and it attracted quite a few onlookers who begged for a quick game.

With such an enthusiastic following we had no choice but to include it as one of our hits.

Cast as Quasimodo, your task is to rescue the love of your life, the fair Esmerelda.

She is trapped inside a castle and you've got to leap over the ramparts without breaking your neck, dodge arrows, balls of fire



No. 14

and keep out of the way of a fanatical knight, hell bent on running his sword through your kidneys.

It's a fun and deceptively simple game to play, once you've worked out the timing, and we found it totally addictive.

Ghostbusters

Original and full of variety best describes our next top game, *Ghostbusters* by Activision.

It is just as punchy as the film and we kept on coming back to it for more fun.

Your aim is to run a franchise and save New York from the Ghosts. But watch out for the Marshmallow man who is out to stomp down the buildings!

To catch your ghosts, you have to choose various bits of equipment such as negative ionisers, ghost traps and so on.



No. 17

There are so many elements in this game, that like us you'll have great problems tearing yourself away.

It comes with the same familiar catchy tune that had us all humming, so, what are you gonna play? *Ghostbusters!*

Blagger

Inspired by the likes of *Manic Miner* and *Jet Set Willy*, *Blagger* is still a firm favourite and no top twenty could be complete without it.

The scope of the game is impressive: there are 20 action packed screen to get through, each with its own weird, amusing and dangerous assortment of inhabitants.

All you have to do is steal the keys and open the safe in each location, but we warn you it's not easy. The designer is very



No. 18

fond of removing parts of the floor which can lead to an early demise.

The graphics are crazy with homicidal sweets and disembodied mouths, but are extremely well done. We guarantee it's compulsive playing.



Antarctic Adventure

This title is an old favourite and was one of the first cartridge based games to be launched for MSX. We just had to include this, if only for sentimental reasons!

The game involves directing a sweet little penguin around the Antarctic dodging hazards such as walrus who pop up unexpectedly through ice cracks, ice patches that make you skid along on your bottom and the odd crevasse or two.

The scenery scrolls very



realistically past you and moves faster or slower as you increase or decrease the penguin's speed. As he moves along, his shadow also moves with him. It's a great game to play and one that we find difficult to keep our hands off!

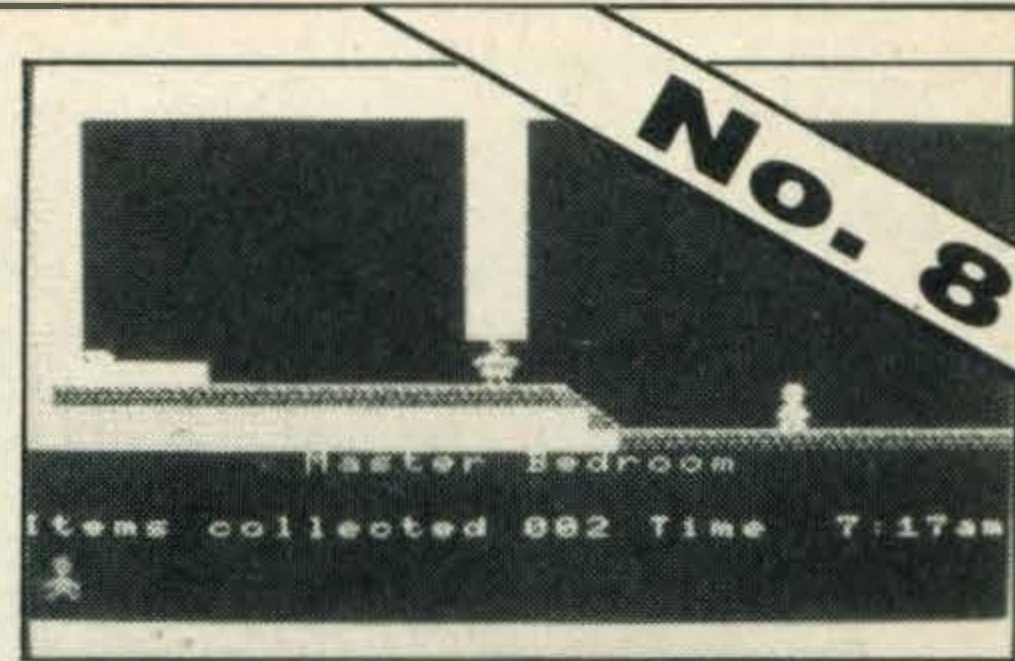
Jet Set Willy

If you like a colourful, but noisy game that requires some pretty sharp joystick-wagging then try you hand with *Jet Set Willy*.

The game starts off with Willy suffering from a nasty hangover, the result of a riotous party he threw the night before in his recently acquired mansion.

It's a nice house, but haunted by a variety of apparitions and booby traps left behind by a looney professor, the previous owner.

The graphics are excellent



and obviously well thought out. Half the fun of the game is in trying to identify the bewildering assortment of potential assailants.

It is certainly a bizarre game but curiosity will keep you entranced for hours.

Tennis

Fancy a game of tennis? Then how about a quick set or two from the comfort of your own armchair with Konami's *Tennis*.

Wimbledon watchers will be in their element with three levels of difficulty to choose from and very realistic plink plunk noises emanating from the ball as it is lobbed back and forth over the net.

When a ball lands on the court, an amazingly fast ball boy sprints into action.



Try the doubles game and we guarantee you'll be stirred into action as the rallies become fast and furious.

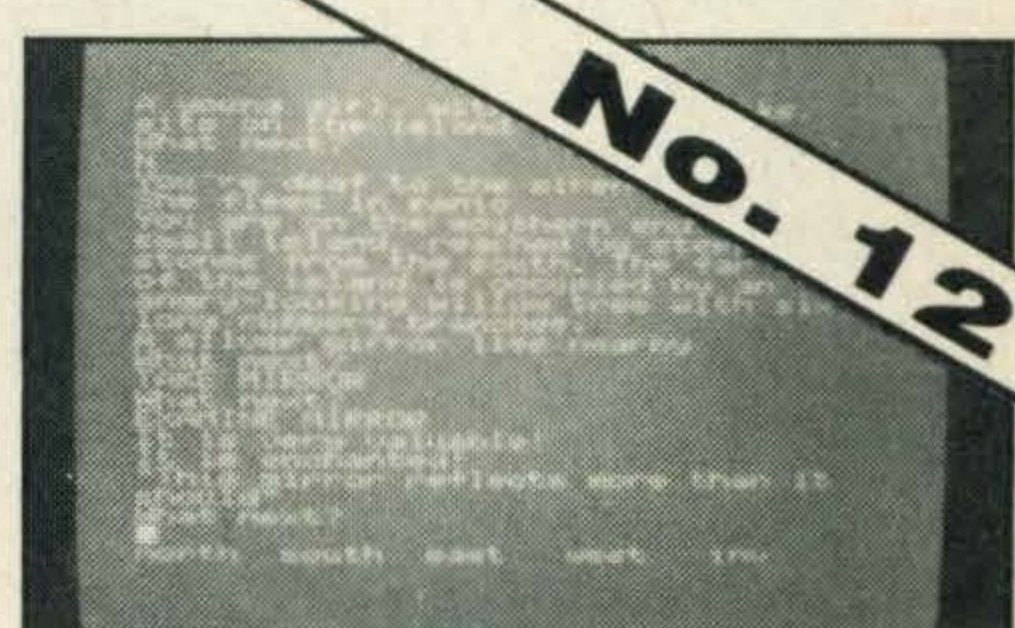
Our only moan is that you can't throw your racquet into the air, stamp your feet and insult the umpire!

Dungeon Adventure

The demon Lord is dead and his vast store of treasure is still tucked away unguarded in the Northern Black Tower just waiting for someone like you to rescue it.

Sounds a simple task but unfortunately you waken by a river, cold damp and defenceless. Now your troubles are just starting!

In keeping with its excellent adventure standards, Level 9 has created yet another gripping and imaginative adven-



ture which stretches your imagination to the limit.

We simply had to include this title in our hit list because there aren't many games around where you can find yourself under attack from 'globs of jelly' and bloated birds!

Finders Keepers

We've included *Finders Keepers* from Mastertronics in our collection, not only because it's cheap at £1.99, but because it's also a darn good game.

The format is the very familiar multi-screen platform-type with a magic knight (you) belting round a castle collecting objects and avoiding enemies. These come in the shape of ghouls and creatures.

Finders Keepers has got a very catchy tune and the graphics are excellent, with



many of the monsters wearing the most wicked expressions!

Once you've got used to the controls and mastered the techniques for transporting the knight through the different screens, the game becomes very exciting to play.

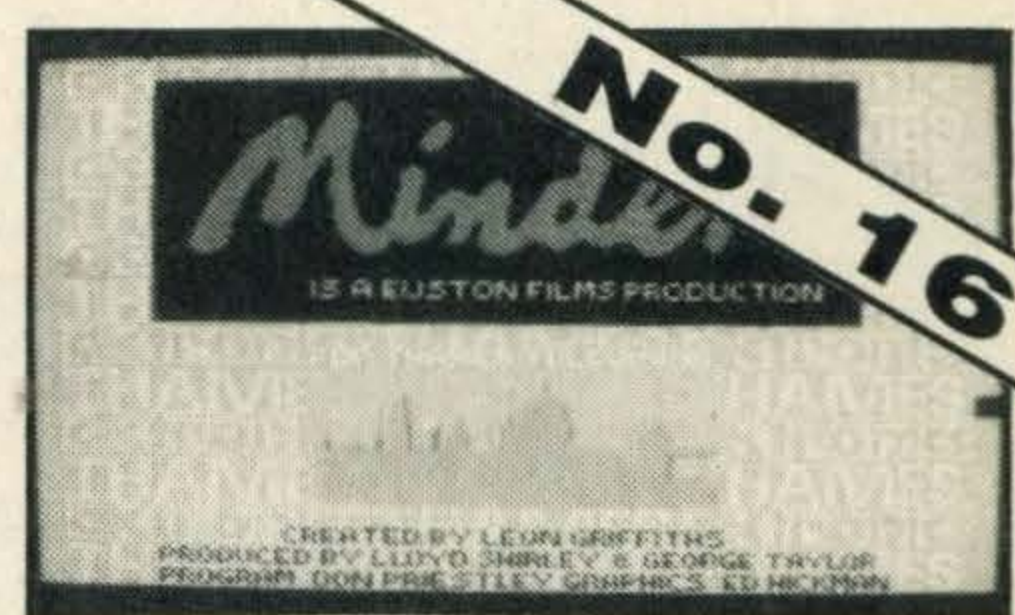
Minder

Fans of Thames Television's *Minder* series will love this computer game spin-off which narrowly missed being voted fifteenth in our top twenty.

Naturally, the whole game is based on money with you taking the part of Arthur.

You are given four locations — Terry's flat, the infamous Lock Up, the dealer premises and Arthur's favourite watering hole, the Winchester.

With £2,000 in your pocket and a few suspect items such



as nucleonic ferkinators, you have a fortnight to wheel and deal and make as much money as possible.

The game certainly takes getting used to, but some of the conversations are amusing and it is worth having a go.

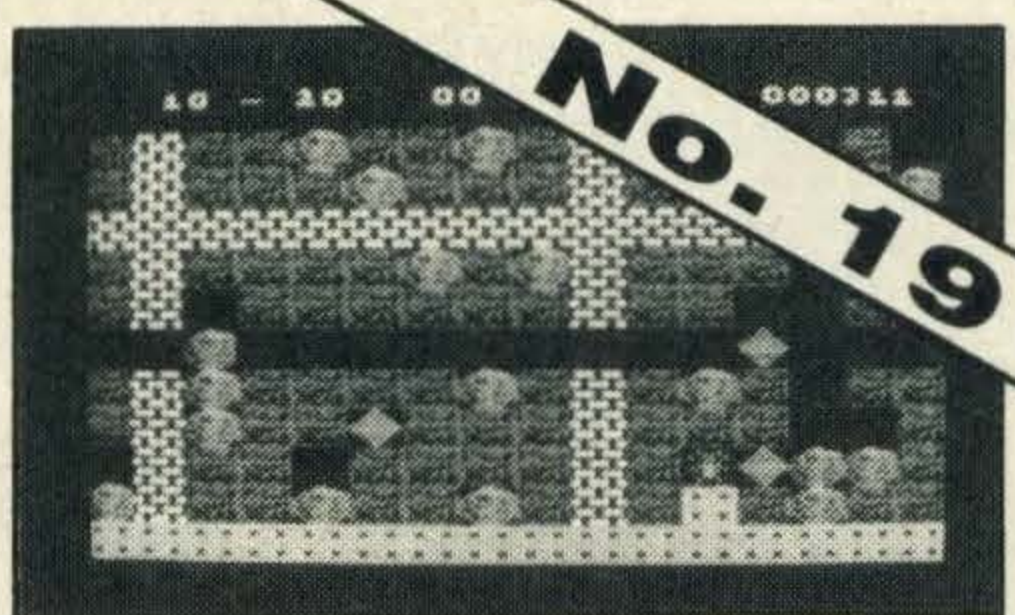
Boulderdash

We voted it game of the month in our July issue and we still think it's the tops!

Boulderdash was first released in the States on Atari machines and was an overnight success. It has proved to be just as popular over here.

The basic idea of the game is to score lots of points by digging through earth blocks and collecting enough diamonds to get you though to the next screen.

But, watch out for falling rocks that have become dis-



logged otherwise you'll get squashed!

The game is aptly named because it really is a dash from boulder to boulder.

One thing's for sure, there's so much going on you won't have time to get bored!

The Wreck

Our final title is Electric Software's three dimensional graphics adventure, *The Wreck*.

You'll be most impressed by the graphics, with its realistically scrolling corridors, and fast moving hostile beasts such as huge octopii.

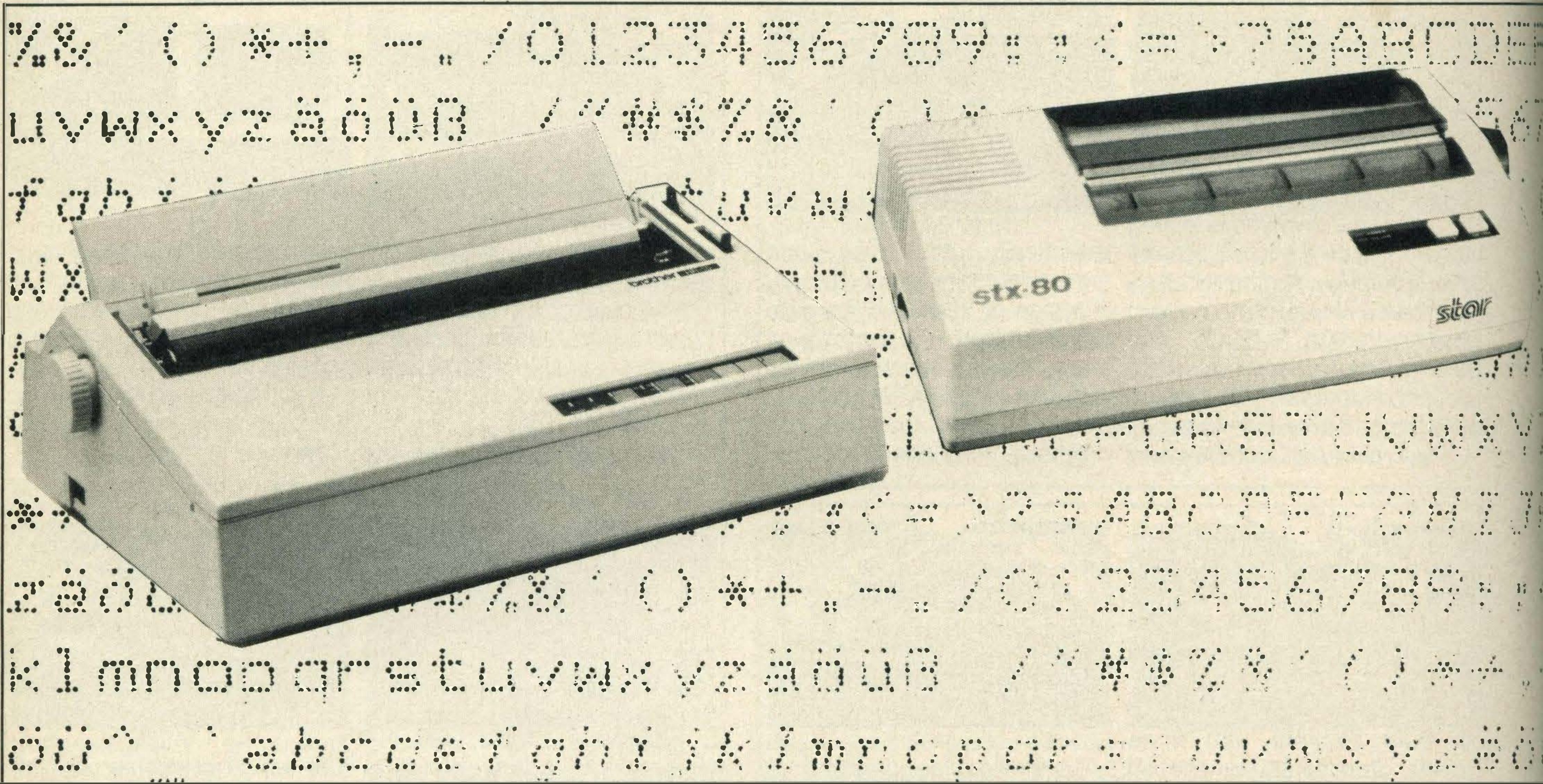
Your goal is to collect the bullion which lays hidden in a safe on the bottom deck — put there by the ship's captain.

Sounds easy but it isn't. Each deck appears in the form of a



maze with clues placed in strategic places that aren't immediately obvious.

It isn't an easy adventure to solve, in fact we're still hard at it. You'll be intrigued by the design and baffled by the clues, but like us you'll be hooked!



HIDDEN

Dot matrix printers are not normally regarded as the most exciting of peripherals you can buy for your computer. They seem to spend most of their lives churning out program listings or reproducing text from a word processor.

Yet these humble devices are really quite sophisticated, and with a little fiddling about you can create your own characters, print out text in a variety of typestyles and even produce pictures.

The key to unlocking these features is contained in your printer manual. Aside from the information related to setting up the printer, these manuals usually give details of the printer's *control* and *escape codes*. These look very uninviting, and are generally so badly documented that most printer owners never get around to using them.

Unfortunately, there is no official standard applied to printer codes. Epson dominates the dot matrix printer market, and pieces of software that are

Dot matrix printers are often under-used. Graham Bland explains how to get the most out of yours

required to drive printers nearly always have a default which uses Epson control codes.

As a result, a large number of manufacturers have decided to make their printers 'Epson-compatible'. These include Shinwa, Star, Brother and C-Itch. You can't rely 100 percent on this compatibility, but the examples discussed here will work on most printers of the Epson type.

The *control* codes are those characters with ASCII codes from 0 to 31. These are often referred to as 'unprintable' codes. Examples include the RETURN character, form feeds and line feeds. Code 7 is referred to as the 'bell' (from the days of teletype terminals) and will produce a beep if you try to print it.

Escape codes or *Escape*

sequences are more complex. The escape character (ASCII code 27) is first sent to the printer, followed by a list of codes. The printer recognizes the escape character and expects to receive a series of instructions. These codes can be used as a software alternative to the bank of DIP switches which set things like line spacing and the number of characters printed per inch (the pitch).

The simplest way of issuing control information to a printer is by using the LPRINT statement and CHR\$ function in a BASIC program. We can produce a condensed typeface simply by sending the control code 15 (known as SHIFT IN). The normal typeface is restored by sending the code 18.

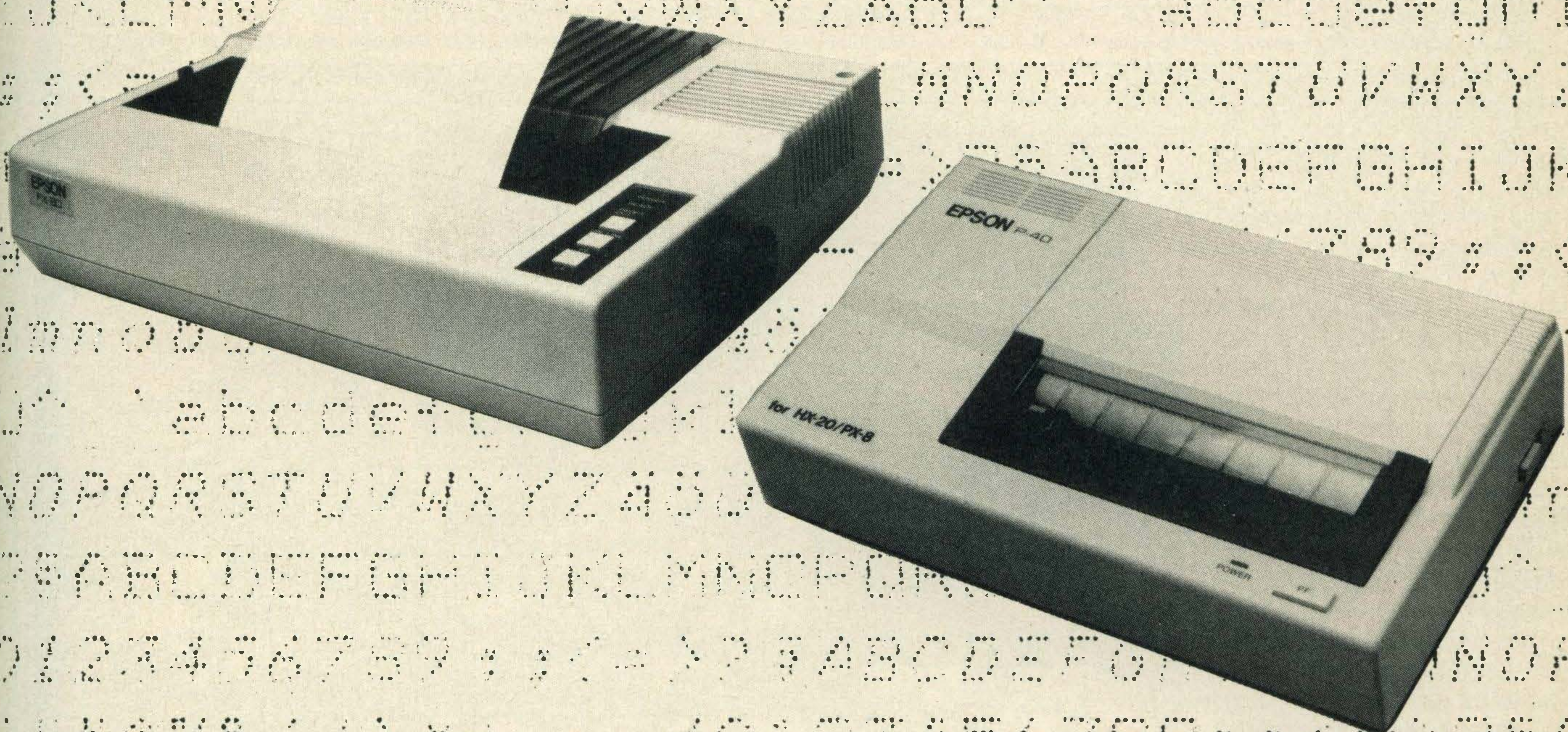
Enlarged characters are produced in a similar manner.

Code 14 (SHIFT OUT) turns the enlarger mode on, while code 20 turns it off. The following short program shows how this is done, with the output shown in figure 1.

```
10 LPRINT "This is
standard"
20 LPRINT CHR$(15);
30 LPRINT "Now
Condensed"
40 LPRINT CHR$(18);
50 LPRINT "Back to
normal"
60 LPRINT CHR$(14);
70 LPRINT "Now Enlarged"
80 LPRINT CHR$(20);
90 LPRINT "Normal again"
```

Note the semi-colon in the statements that send the control characters. This must *always* be included, otherwise some strange results may be produced. Table 1 details some of the more useful control codes and their purposes.

Escape sequences are not as straightforward, as they are often composed of three or more codes. Effects like underlining and emphasized text offered by software packages like *WDPRO* and *Tasword* can



EXTRAS

be achieved from within your own BASIC programs by sending the appropriate codes. The following program uses both emphasized and underlined text.

```

110 REM ★ Bold on ★
120 LPRINT CHR$(27);"E";
130 LPRINT "BOLD Text"
140 REM ★ Underline on ★
150 LPRINT CHR$(27);"—"
    "CHR$(1);
160 LPRINT "Underlined
    BOLD"
170 REM ★ Turn bold off ★
180 LPRINT CHR$(27);"F";
190 LPRINT "Underlined
    only"
200 REM ★ Underline off ★
210 LPRINT CHR$(27);"—"
    ";CHR$(0);
    
```

As you can see, the various printing effects can be combined. There are sometimes restrictions on these combinations which should be detailed in your printer manual.

Another feature which is frequently offered by printers but seldom used — even by word processing packages — is *super-* and *sub-script* type-styles.

Purpose	ASCII Code (CHR\$)
Condensed characters ON	15
Condensed characters OFF	18
Enlarged characters ON	14
Enlarged characters OFF	20
Line feed — advance paper one line	10
Form feed — advance to top of form	12
Back space — move print head back one character space	8
RETURN — move print head back to left most position	13
Horizontal Tab — move to next tab position	9

Table 1 — Control Codes

The next program shows how super-script may be used to neaten the output of a simple mathematical program. The program prints out the value of 0 to 15.

```

100 REM ★ Powers ★
110 FOR I = 0 TO 16
120 LPRINT USING
    "#### = 2";2^I;
130 REM ★ Select
    Superscript ★
140 LPRINT
    CHR$(27);"S";CHR$(0);
150 LPRINT I
160 REM ★ Cancel Super
    
```

```

Script ★
170 LPRINT CHR$(27);"T";
180 NEXT I
    
```

If your word processor allows you to send codes directly to the printer, you can effectively extend the range of features offered by the package. Kuma's *WDPRO*, for instance, has a command to send printer codes.

Using this software, you could change to condensed script then back to normal again by embedding the code in your text like this:

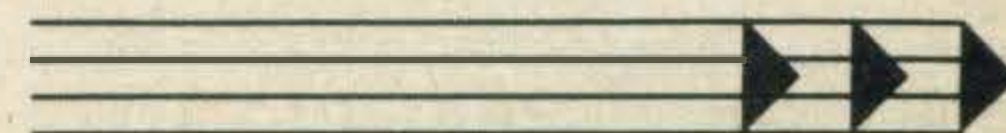
●X15 example text ●X18

As an alternative to using LPRINT, you can OPEN the printer as a file. This is slightly more long-winded but is useful if your programs allow output to be switched from monitor screen to the printer. This short example shows this alternative approach:

```

100 OPEN "LPT:" FOR
    OUTPUT AS #1
110 REM ★ Send
    condensed codes ★
120 PRINT #1,CHR$(15);
130 PRINT #1,"Condensed
    Text"
140 REM ★ Cancel
    Condensed ★
150 PRINT #1,CHR$(18);
160 CLOSE #1
    
```

In the examples shown so far, the characters printed have all been the 'standard' characters of the printer, i.e. those stored in the printer's ROM. You may run into problems if you want to produce a special character such as pi or a square root sign. Fortunately, you can rely on the bit-image mode to



```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ\^_`
abcdefghijklmnopqrstuvwxyzäöäü /!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ\^_`
abcdefghijklmnopqrstuvwxyzäöäü /!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPO
RSTUVWXYZ\^_`äöäü /!"#$%&'()*+,-./0123456789:;<=>?@AB
```

produce the character you want.

The printhead is composed of a vertical row of eight or more points.

In the bit image mode, each pin of the printhead can be 'fired' independently. The pin to be fired is determined by the bit positions that are 'set' in the number sent to the printer. If 255 is sent in bit-image mode, all the bit positions in the binary value 255 are set, so a solid vertical line is produced. If zero is sent, no pins will be fired.

The standard bit-image mode allows a maximum of 480 dots to be plotted on one line. The escape sequence needed to select this mode has to specify the number of bytes of data you are going to send. The first value given is known as the 'low-byte', and the second, not surprisingly, is the 'high-byte'.

Assume you wanted to send 300 bytes of data to the printer. A simple equation will give you the required setting of the low- and high-bytes, where number is the amount of information you wish to send:

Low byte = number MOD

256

High byte = INT(number/

256)

For our example value of 300, we would produce a low-byte of 44 and a high-byte of 1. The following example program produces a simple box by sending eight bytes of data to the printer.

100 REM ★ Set up Bit mode

★

110 LPRINT CHR\$(27);"K";

CHR\$(8); CHR\$(0);

120 FOR I=1 TO 8

130 READ N

140 LPRINT CHR\$(N);

150 NEXT I

160 REM ★ BOX data ★

170 DATA &B11111111

180 DATA &B10000001

190 DATA &B10000001

200 DATA &B10000001

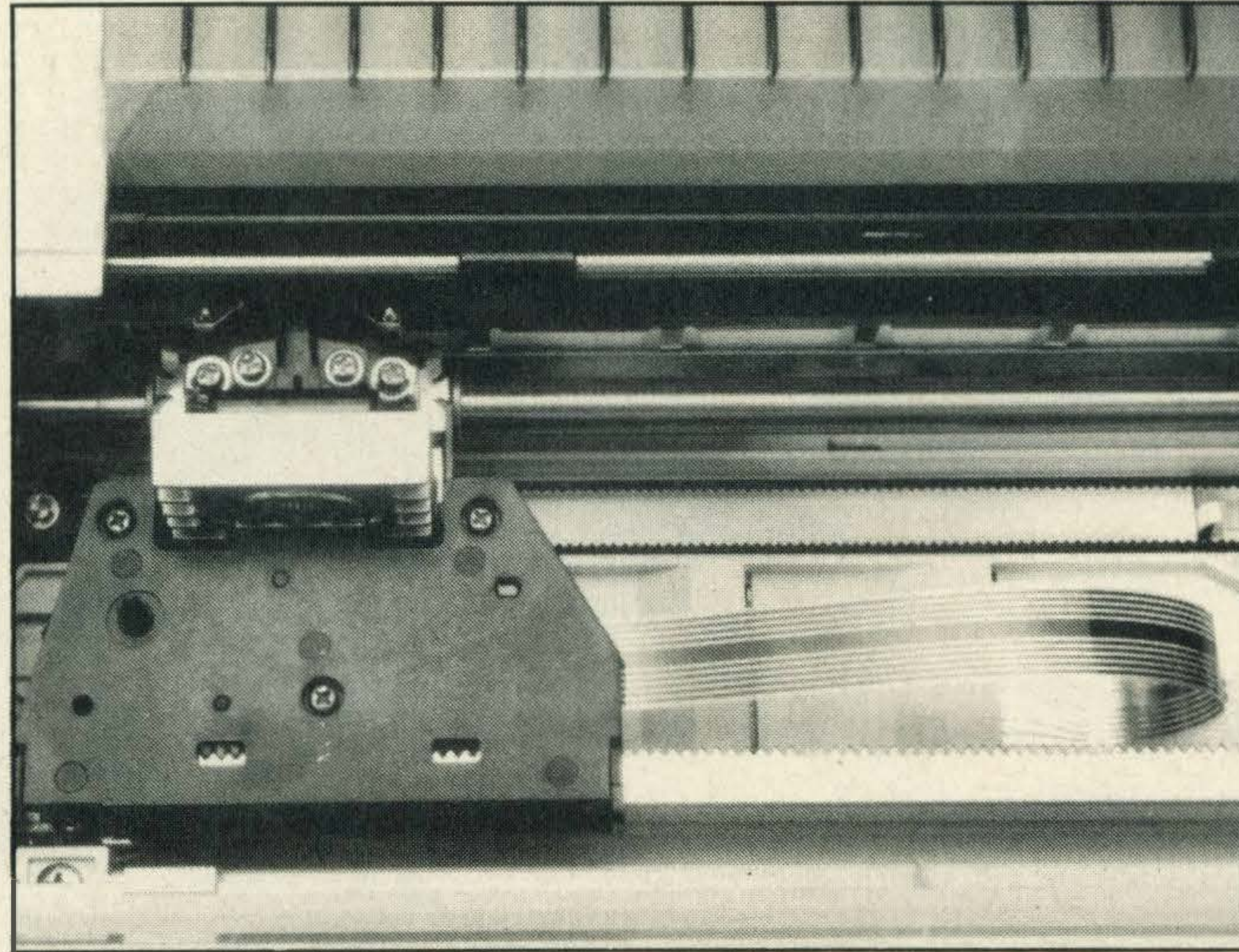
210 DATA &B10000001

220 DATA &B10000001

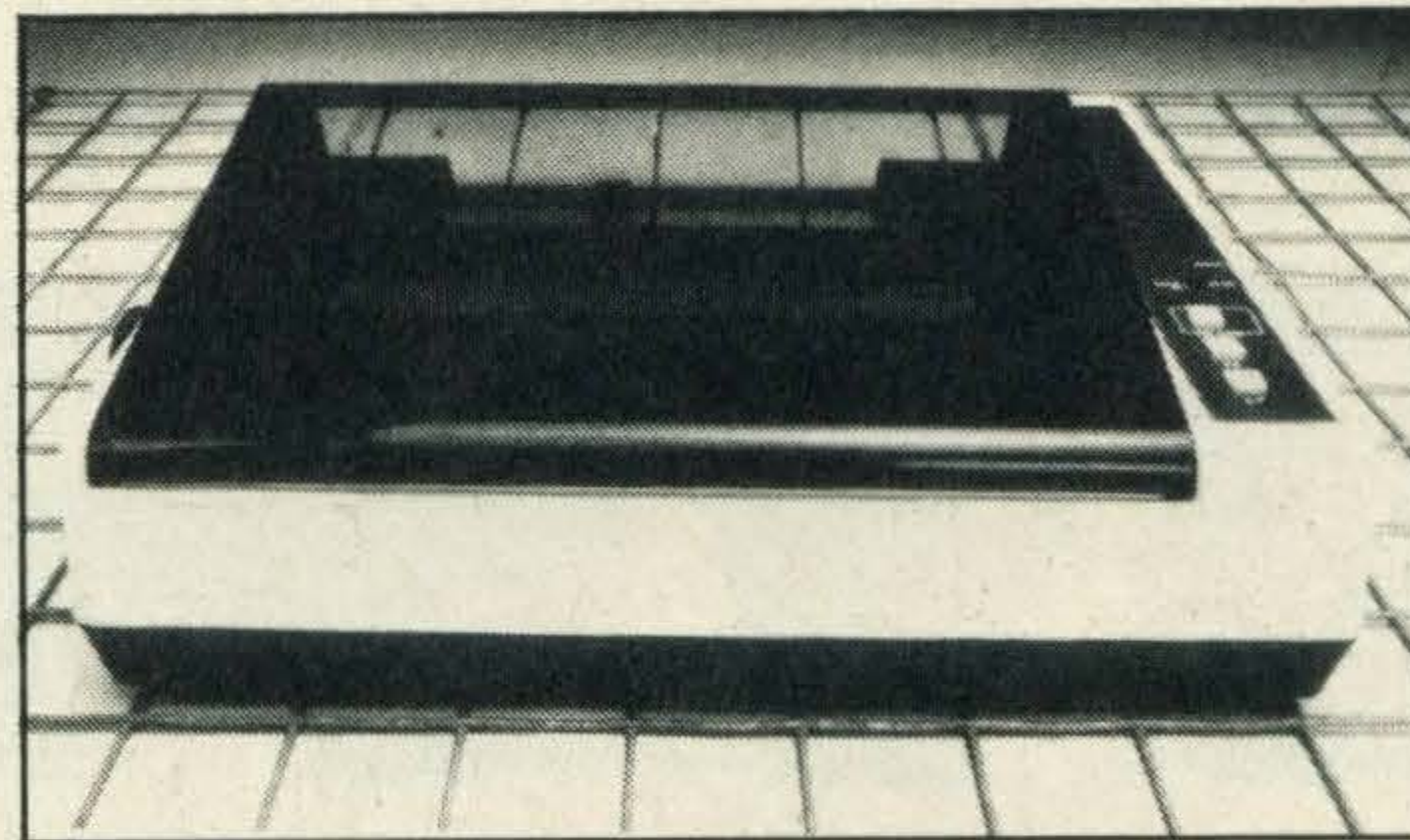
230 DATA &B10000001

240 DATA &B11111111

By way of a slightly more complicated example, our final



ABOVE: Close-up of printhead
RIGHT: The Shinwa prints MSX characters
BELOW: Brother's HR-15 printer



program produces a tapestry of space invader characters!

100 RESTORE

110 DIM A(8)

120 FOR I=1 TO 8

130 READ A(I)

140 NEXT I

150 REM ★ Main loop ★

160 FOR I=1 TO 16

170 FOR J=1 TO 16

180 LPRINT CHR\$(27);"K";

CHR\$(8); CHR\$(0);

190 FOR K=1 TO 8

200 LPRINT CHR\$(a(K));

210 NEXT K

220 LPRINT CHR\$(32);

230 NEXT J

240 LPRINT

250 NEXT I

260 END

270 REM ★ Invader

definition ★

280 DATA 57,75,76,248

290 DATA 248,76,75,57

Using the bit-image mode, 'screen dumps' can be written

Draft pica

Elite

Near letter quality

Emphasized

Double-Strike

Enlarged

Condensed

Italics

Underlined

Superscript

Subscript

NLQ/Emphasized

Double-Strike/Condensed

Double-Strike/elite

Double-Strike/condensed/elite

Condensed/elite

quite easily so allowing you to produce hard-copy of your graphics. The main problem with writing a dump routine in BASIC is associated with speed.

It can take four or five minutes or more to produce a single picture. If you are up to it, you can of course resort to machine code to cure this problem.

More to offer

Whether you use your MSX system for programming or for word processing, it is worth getting to know your printer a little better.

Most printers have far more to offer than the few features discussed here — for instance they may well have italic type-faces, international character sets, near letter quality (NLQ) and, if you are very lucky, colour.

As much commercial software assumes that your printer is fairly limited in its capabilities, you may find that it is up to you to get the best from your hardware.

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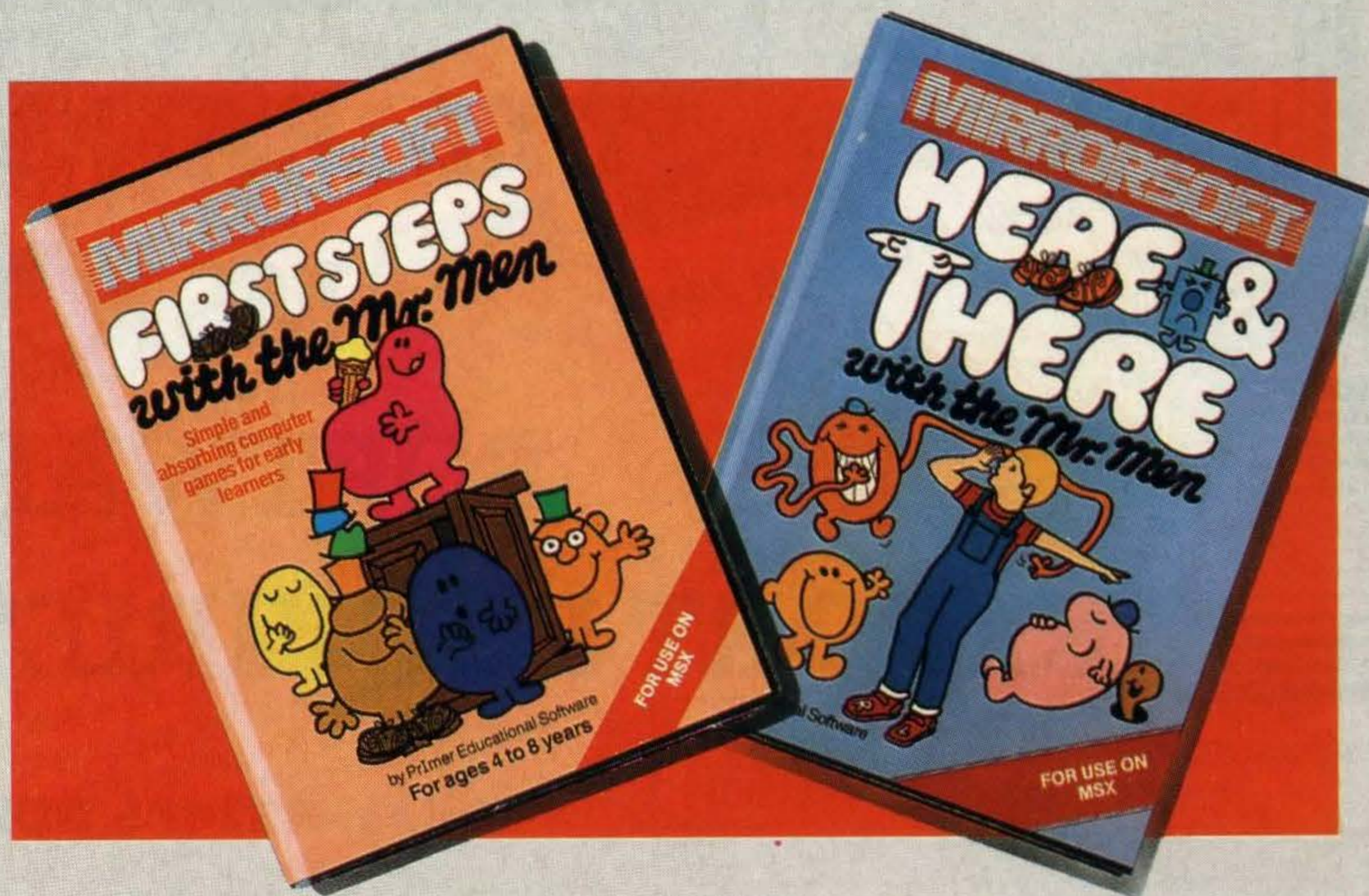
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Devpac (cassette only) £19.95

An excellent, fast (4000 lines per minute) assembler coupled with a powerful disassembler/debugger. So many features that we cannot possibly do the package justice here - conditional assembly, assembly from tape, macros, screen and line editing, full arithmetic, front panel debugger with disassembler, single step, multiple breakpoints, modify, list and move memory etc. Everything you need AND fully relocatable so that it works on ALL MSX machines with more than 16K memory.

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Pascal80

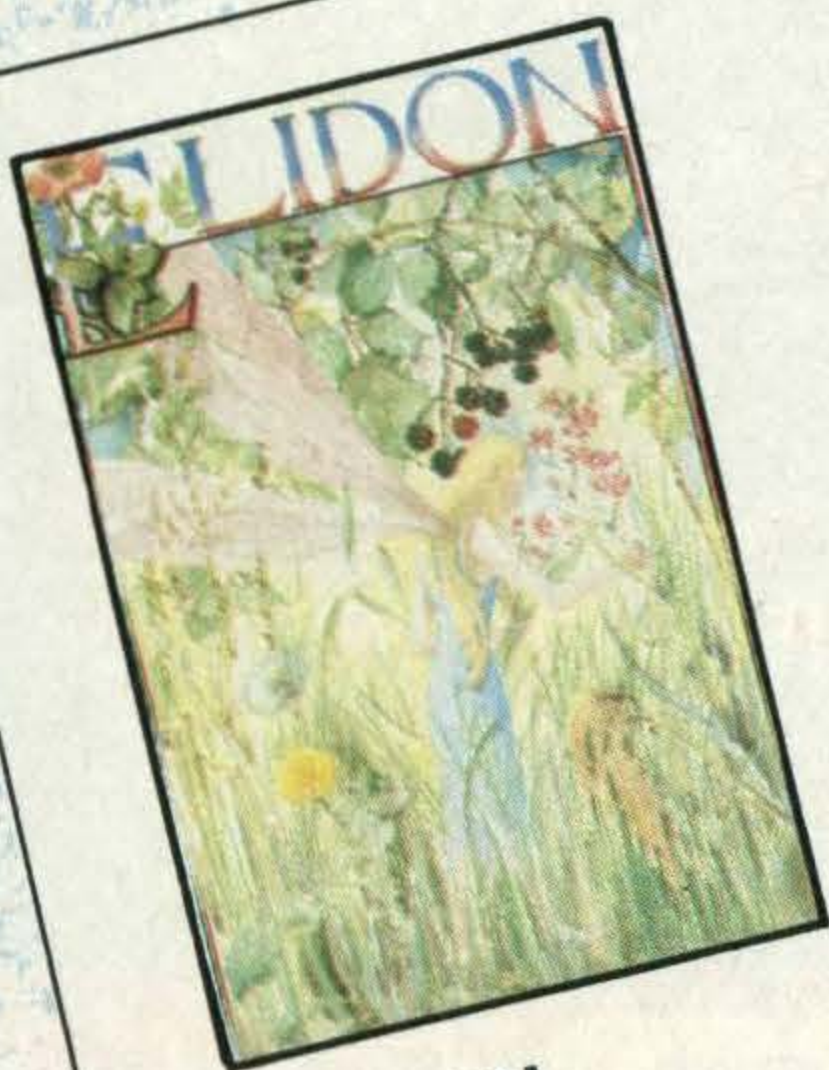
A powerful and virtually full implementation of Pascal, producing fast Z80 directly (no P-codes or linking). There is full heap management by NEW, MARK and RELEASE and access to machine code via PEEK, POKE, INLINE, ADDR, INP, OUT and CPM. Among the compiler options are source file inclusions and runtime check disabling. ED80 is supplied with Pascal80 (see Devpac80 above).

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A fast compiler for the C systems language which invokes ED80 automatically when it finds an error. C++ has UNIX standard I/O including random access files and command lines with redirection. C is a very flexible language combining high-level structured programming with low-level access to the Z80. HiSoft C++ conforms almost exactly to the 'Kernighan and Ritchie' standard with the exception of floats. Again, ED80 is part of the package.

HiSoft, 180 High Street North, Dunstable, Beds. LU6 1AT Telephone (0582) 696421

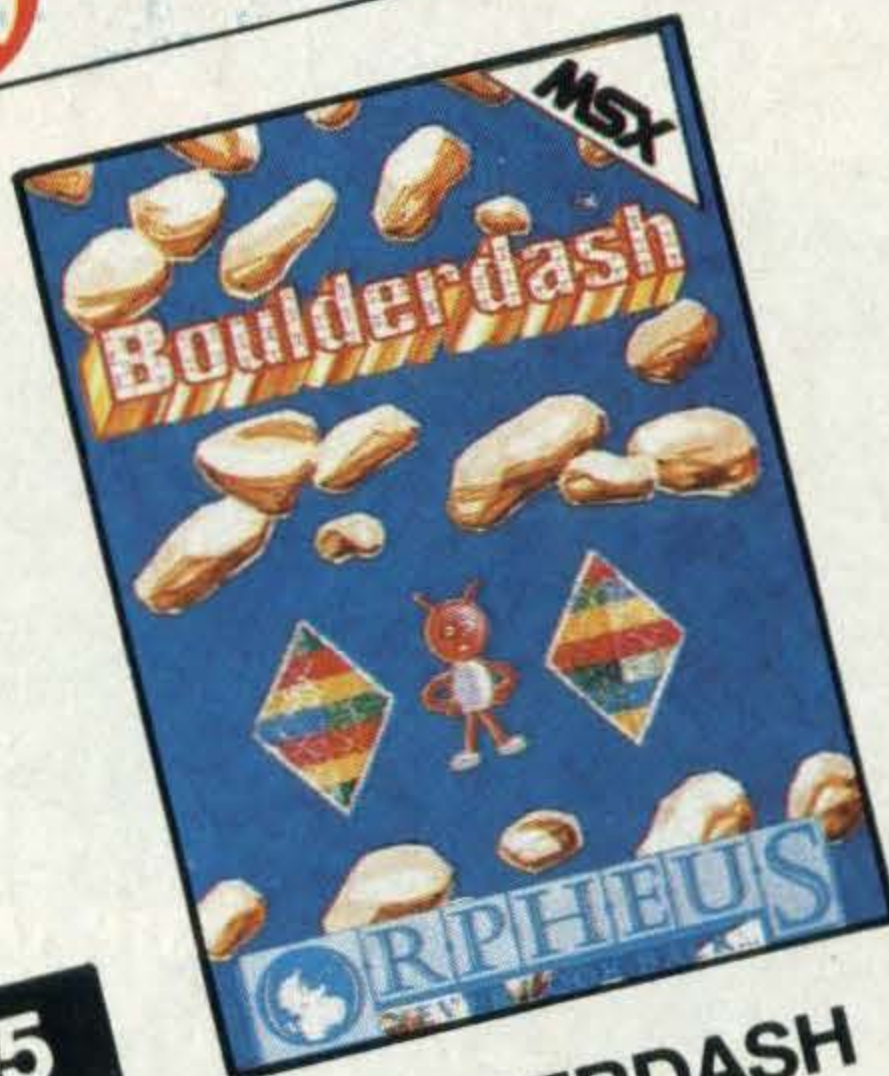
MSX Software from Orpheus



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The game is based on Faerie mythology which has been popular with the young for many years. The player controls a beautifully animated Faerie which flies around the forest collecting magical objects which are needed to complete the game. There are several hundred rooms which are displayed with very close attention detail. The music of Grieg is used to accompany the game. Elidon has been awarded several 'Best Buy of the Month' and 'Game of the Month' with Your 64 and Commodore Computing International, plus several excellent reviews on T.V.

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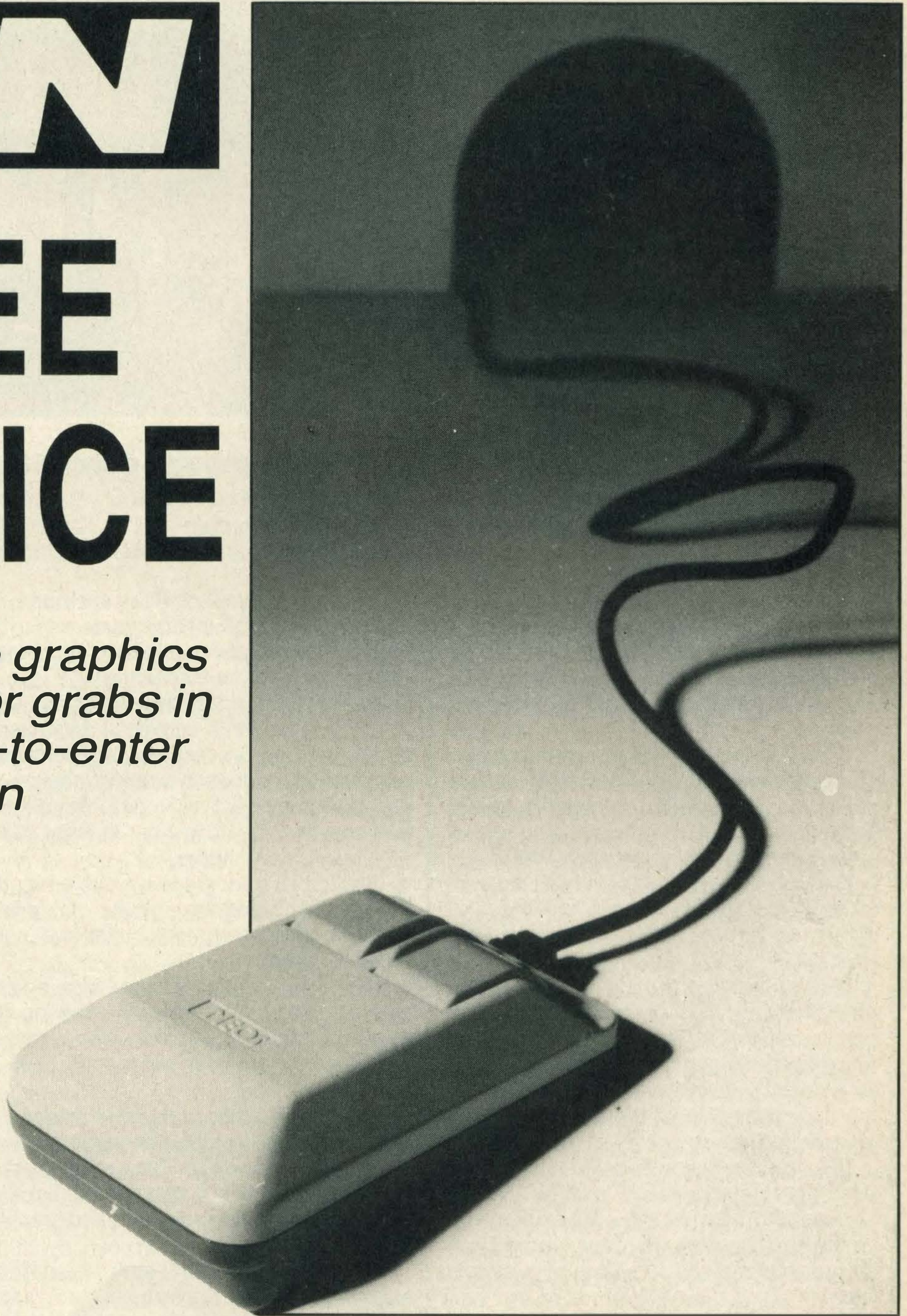
- A. Rubber coated ball
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- C. Fits neatly in palm of hand
- D. Versatile software package
- E. Simple, easy to operate
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Competition, MSX Computing, 38-42 Hampton Road, Teddington, Middx TW11 0JE to arrive not later than Monday 20th January. The winners will be the first three correct entries out of the hat.

RULES

1. The judges' decision is final and no correspondence will be entered into.
2. No employees of Haymarket Publishing or Wigmore House or their families may enter.
3. The winners' names will appear in the next issue of *MSX Computing*.



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2 5

3 6

The Pre-BASIC Book

F. A. WILSON



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The Pre-BASIC Book

by FA Wilson

Bernard Babani £2.95

Most books on BASIC are written for people with computers — not this one! The author has decided to be different and claims to have written for the non-computer owner in the hope that after reading the book he'll rush out, buy a micro and put the theory into practice.

Wilson goes on to say that as there are so many different variations of BASIC he has used a general BASIC, not specific to any machine, for all of his programming examples. And in an attempt to keep everybody happy, he has added a 'Table of Variations' at the back of the book showing the differences between BBC, Commodore and MSX BASIC.

Other than that the book is relatively straightforward. It is divided up into fifteen chapters, of which the first four are devoted to a potted history of computing, how the BASIC language evolved and a run down on the finer principles of the keyboard — in other words how to use it.

The fifth chapter guides you through the use of simple commands such as PRINT, LIST and RUN and provides the groundwork for the next chapter which is concerned with strings and the actual writing of a simple program.

By the time the reader has worked through the chapters on input, loops and conditional statements, he or she should be confident enough to start designing more detailed programs. To help you along the author suggests various types of games that you could design and although he doesn't actually print the games listings for you to copy, he does include plenty of flow charts as a rough guide.

My only complaint is that the chapters could have been better organised and that the chapter on strings should have come after the one on variables. Other than that *The Pre-BASIC Book* is an excellent introductory text with plenty of illustrations and goes a long way towards helping the uninitiated understand the whys and wherefores of BASIC. And at £2.95 it's within the reach of most pockets.

An Introduction to Computer Peripherals

by RA & JW Penfold

Bernard Babani £2.50

Selecting peripheral devices such as printers, monitors, disk drives or data recorders can be a nightmare particularly if you are a newcomer to home computing.

With this in mind the Penfolds have produced a text that explains how to use a variety of add-on devices, highlights the practical value of each piece of equipment and also points out any interfacing difficulties you may need to bear in mind when making your purchase.

The first chapter starts off with a resumé on monitors going through the differences between monochrome, colour and combined TV/monitors.

This is followed by a more detailed and serious chapter on printers covering the complete range of printers including daisy-wheels, thermal, dot matrix and ink jet printers.

The most disappointing chapter was that on keyboard alternatives because although the authors provide an interesting account of the mouse and its graphics potential, they completely ignore the lightpen and graphics tablets.

Other than that, I can't fault the book. It's concisely written, doesn't bog the reader down with unnecessary technical details and shows that there is a lot of truth in the saying that 'a computer is only as good as its peripherals'.

An Introduction to Computer Peripherals

R.A. & J.W. PENFOLD



Dictionary of Computing and New Information Technology

by AJ Meadows, M Gordon & A Singleton

Century Communications £2.95

As you've probably guessed by the title, this is the sort of reference book that isn't just geared towards the home computer user, but to anyone who is interested or involved with computers at any level.

Like many other texts with similar titles, this book aims to explain computer terminology to baffled computer users who are having problems getting to grips with the finer points of packet switching, loops, binary chops and modems. To make the explanations more interesting, the authors have taken pains to include a liberal scattering of illustrations which not only break up the text but make it more appealing.

Many of the definitions are long winded and heavy going and I'm convinced that a shorter and more snappy explanation would be far more appealing.

For example, when explaining a File, Messrs Meadows, Gordon and Singleton describe it as 'any organised and structured collection of information. The data in such a collection are organised into items, and structured so as to facilitate the type of access required.' Phew! All they needed to have said is that a file is a particular set of data, a program and so on, stored on tape or floppy disk.

My only other complaint is that the publishers have picked the wrong typeface. It is so minute that a magnifying glass should be standard issue with every copy sold!

Other than that the book is a good reference guide to a subject that, to the uninitiated, can be very confusing and difficult to grasp. This title goes a long way to cutting through the jargon and defining key terms and techniques in a simple (if not long winded) manner.

At £2.95 you certainly get your money's worth and it offers more text and illustrations than many other dictionary-type titles that are wafer-thin, skimpy and twice the price.

And it's the sort of title that's handy to have by your micro to continually refer to.



MSX Starting BASIC

by Sean Gray
Glentop Publishing £5.95

Yet another introductory text with the all too familiar title: 'MSX Starting BASIC.' But unlike the rest this one doesn't make any bold claims. The author simply states that his aim is to introduce the novice to MSX BASIC programming techniques and nothing more.

With this in mind I eagerly skimmed through the pages and despite initial apprehensions it proved to be not only interesting, but also an entertaining read.

Entertaining in the sense that the first paragraph of the book starts off with those immortal words from Radio 4's *Listen with Mother*, 'Are you sitting comfortably?'... an unusual and novel way to entice the reader — but effective.

The first chapter starts off with the very basics, explaining how to plug in and switch on your micro. It rounds off with a quick run through the keyboard, emphasising the function and cursor control keys.

Assuming you haven't found the first chapter too much of a struggle, the author then gets down to the rudiments of programming, starting with an explanation of variables and examples of how to use the PRINT command.

The following chapters go into the language in greater depth and as more commands are introduced, the author goes to great lengths to include simple programming examples which reinforce these concepts.

Once you've managed to get to the fourth chapter he includes a simple anagram game, not just for fun but also to show the reader how to use strings and arrays.

The final chapter is dedicated to the different ways of structuring programs — in other words how to plan them. With the aid of a hangman game the author shows you, step-by-step, how to write a well constructed program.

If you are a complete novice and haven't a clue how to start programming then investing £5.95 in this title will whet your appetite and should have you writing pretty complex programs in no time at all.

Our latest batch of books includes one MSX introductory text and two general interest titles on microprocessors and peripherals. Reviewed here by Julia Alexander

The Family Computer Book

by Richard Graves and Andrew Thomson
Century Communications £7.95

If you are on the brink of parting with your hard earned cash to purchase a micro, but aren't quite sure exactly what you're going to do with it once you've got one, then reading this title by Graves and Thomson should put you on the right track.

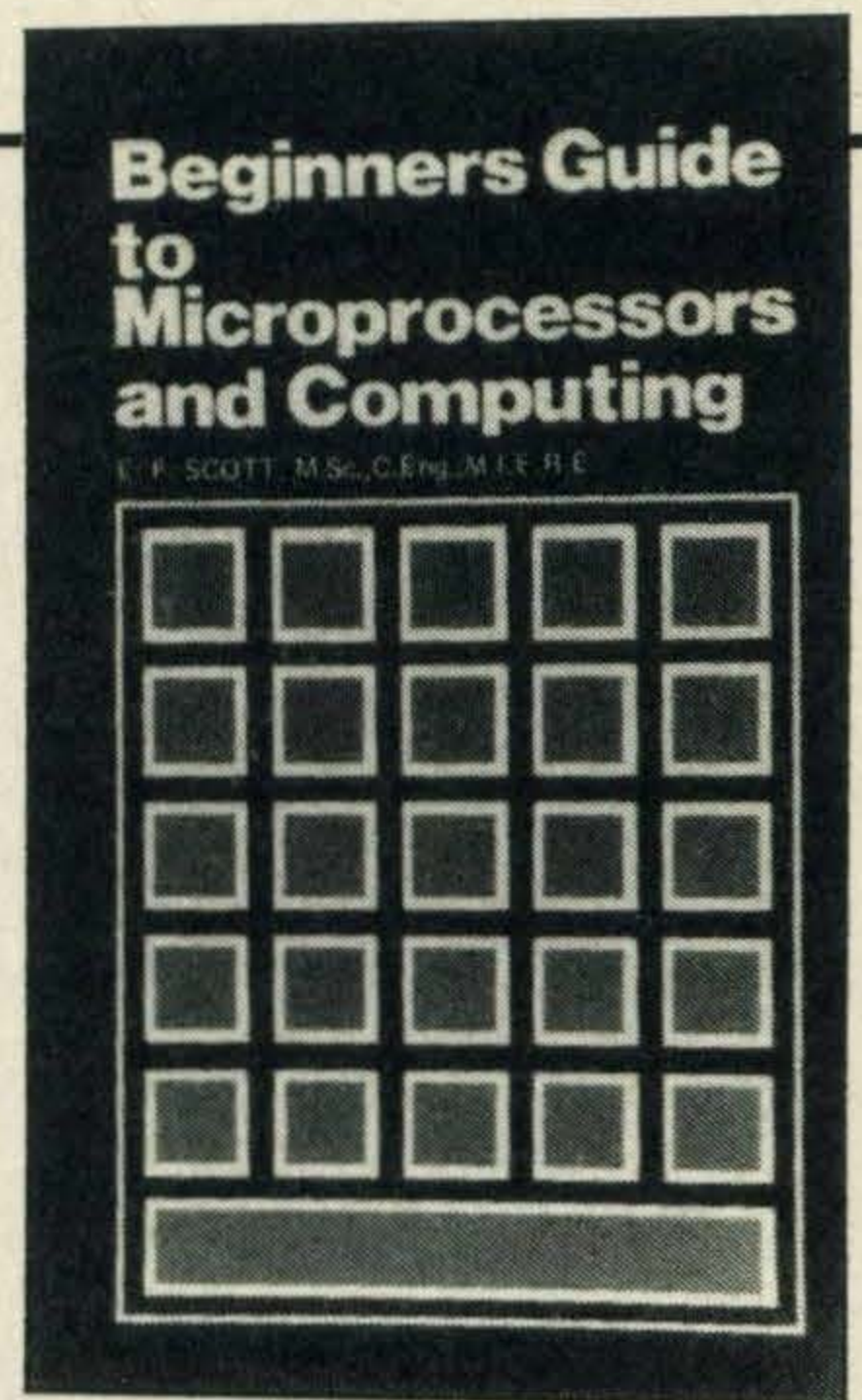
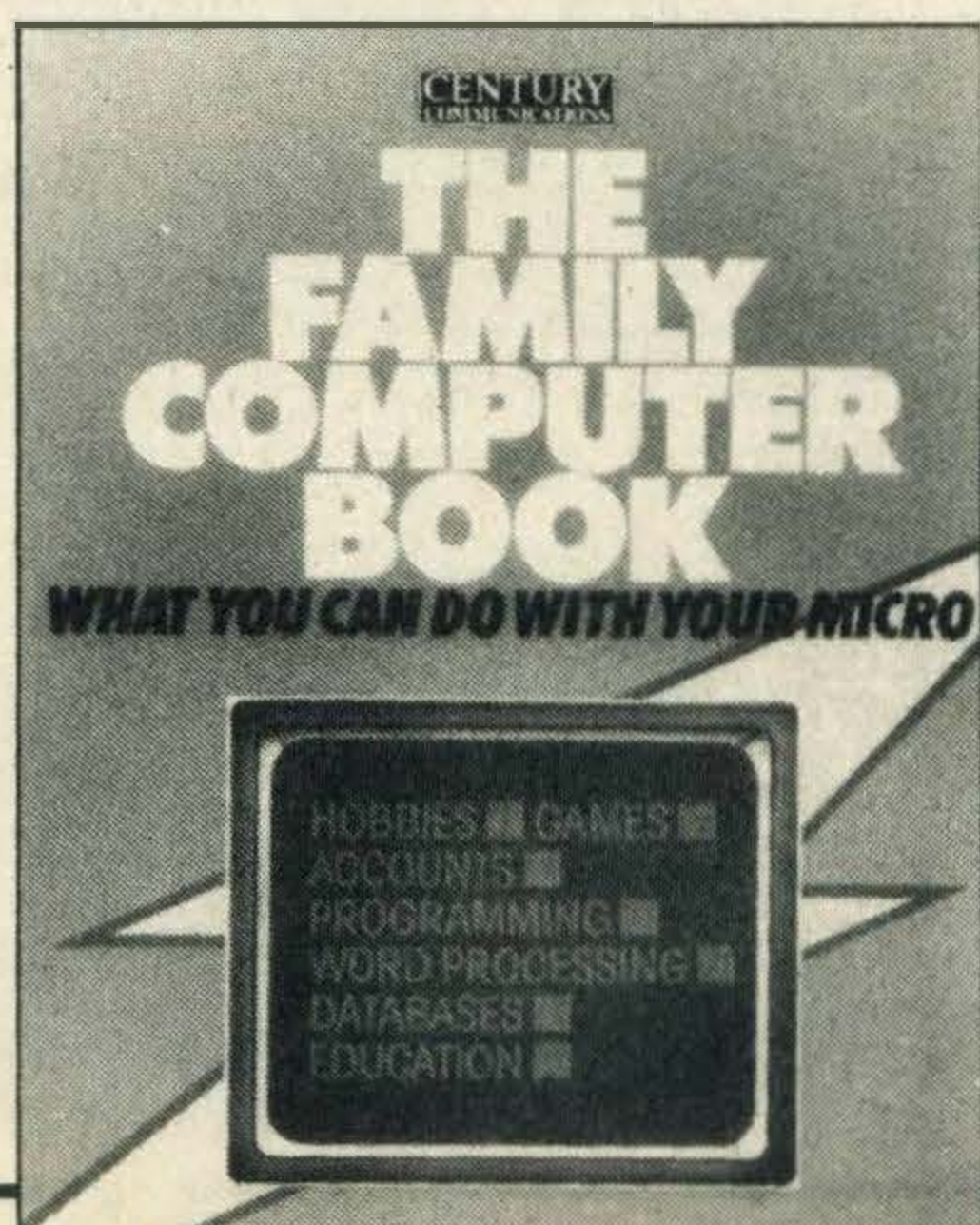
Although this book is not specific to MSX, it is crammed full of ideas that apply to any micro be it the MSX, BBC or Commodore.

The authors have taken a lot of trouble to cover as many areas as possible where a home micro could be of use, including education, games, hobbies, family accounts, and business applications such as accounting and word processing.

Once your appetite has been whetted, the authors then go on to explain how you can extend your system by buying a disk drive or investing in a printer. And how you can make the most of your micro's graphics potential by purchasing a lightpen or a graphics tablet for the creation of designs and patterns.

The penultimate chapter is concerned with communications and explains how you can plug into the telephone line with a modem and log on to bulletin boards, public databases and fellow micro users.

In the eleventh and final chapter the authors cover more specialist applications such as how a micro can be used to help the handicapped and how it can be of value on small farms and businesses.



Beginners Guide to Microprocessors and Computing

by EF Scott
Bernard Babani £1.95

Unless you are interested in the basic theory and concepts of binary arithmetic, microprocessor operation and machine language programming, this title is going to be of little interest.

But, for those who are and intend to master machine code, read on. This isn't aimed at technical whizz kids, in fact the author stresses in the preface that a complete novice should be able to work through the text and get to grips with hexadecimal numbers and ASCII codes—if I can do it then so can you!

The first chapter kicks off with an easy to follow introduction to binary arithmetic and codes. All the examples are perfectly straightforward and by the end of the chapter you should be confident enough to convert binary to decimal and vice versa without any hitches — you should be!

In the next chunk you are supplied with a detailed explanation of a computer's memory, the central processing unit and the input/output controllers. The author includes plenty of well labelled diagrams just in case you can't quite get to grips with what he's saying in the text. I found that it's well worth reading this particular section twice just to make sure that you understand it.

Once you've absorbed all that, the author then throws you in at the deep end with a very heavy chapter on machine language, and again if it wasn't for the inclusion of very detailed diagrams and the step-by-step instructions I would have been hopelessly confused.

Getting to grips with the technical side of micros isn't easy and as there are so many ready-to-buy software packages, few people bother to get to know their computer and understand how it works. But, if you are keen to make use of machine code, you will need to understand your machine's architecture and how the CPU functions. All you need is a little common sense, perseverance and £1.95, which I'm sure won't break the piggy bank.

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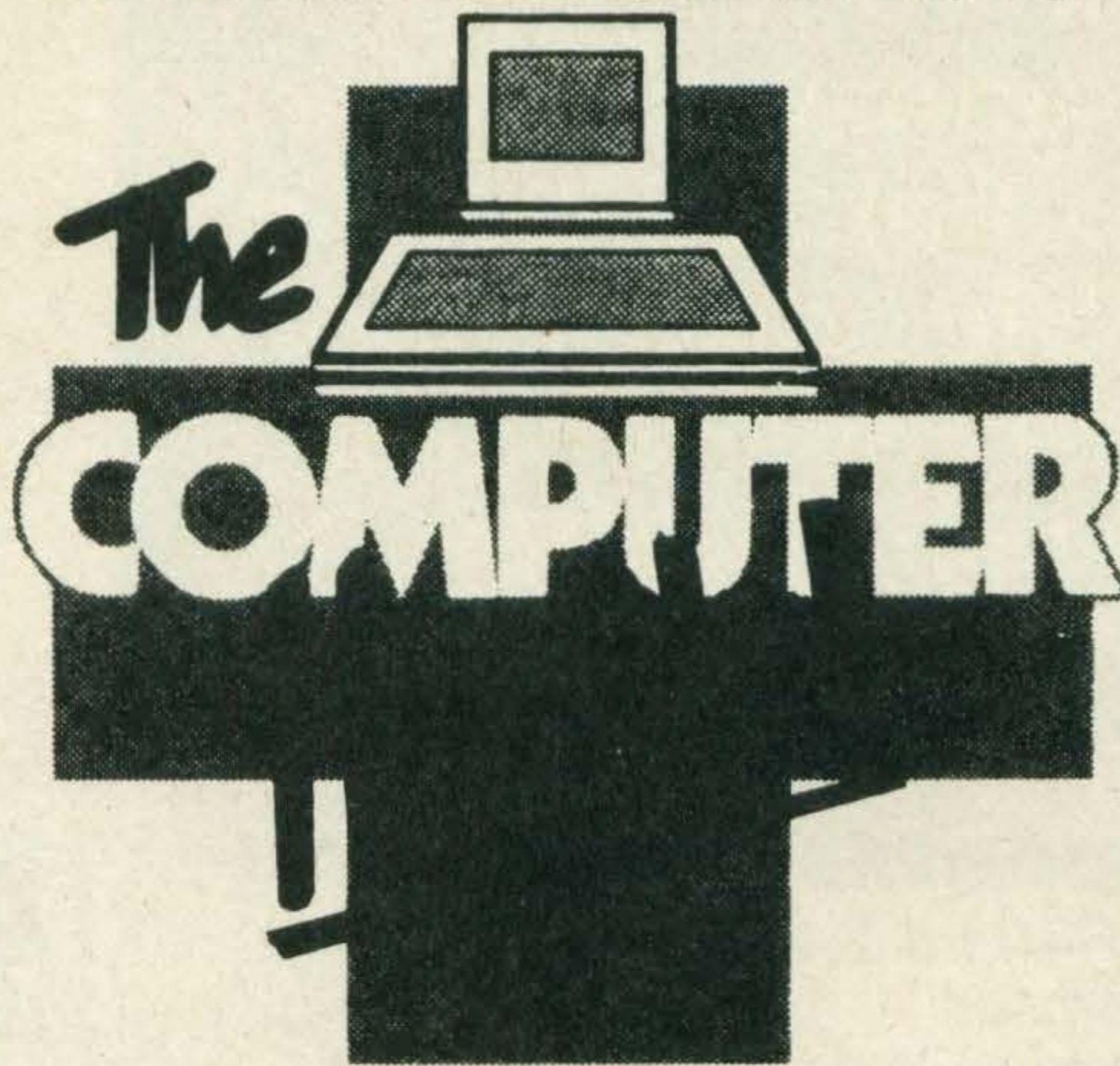
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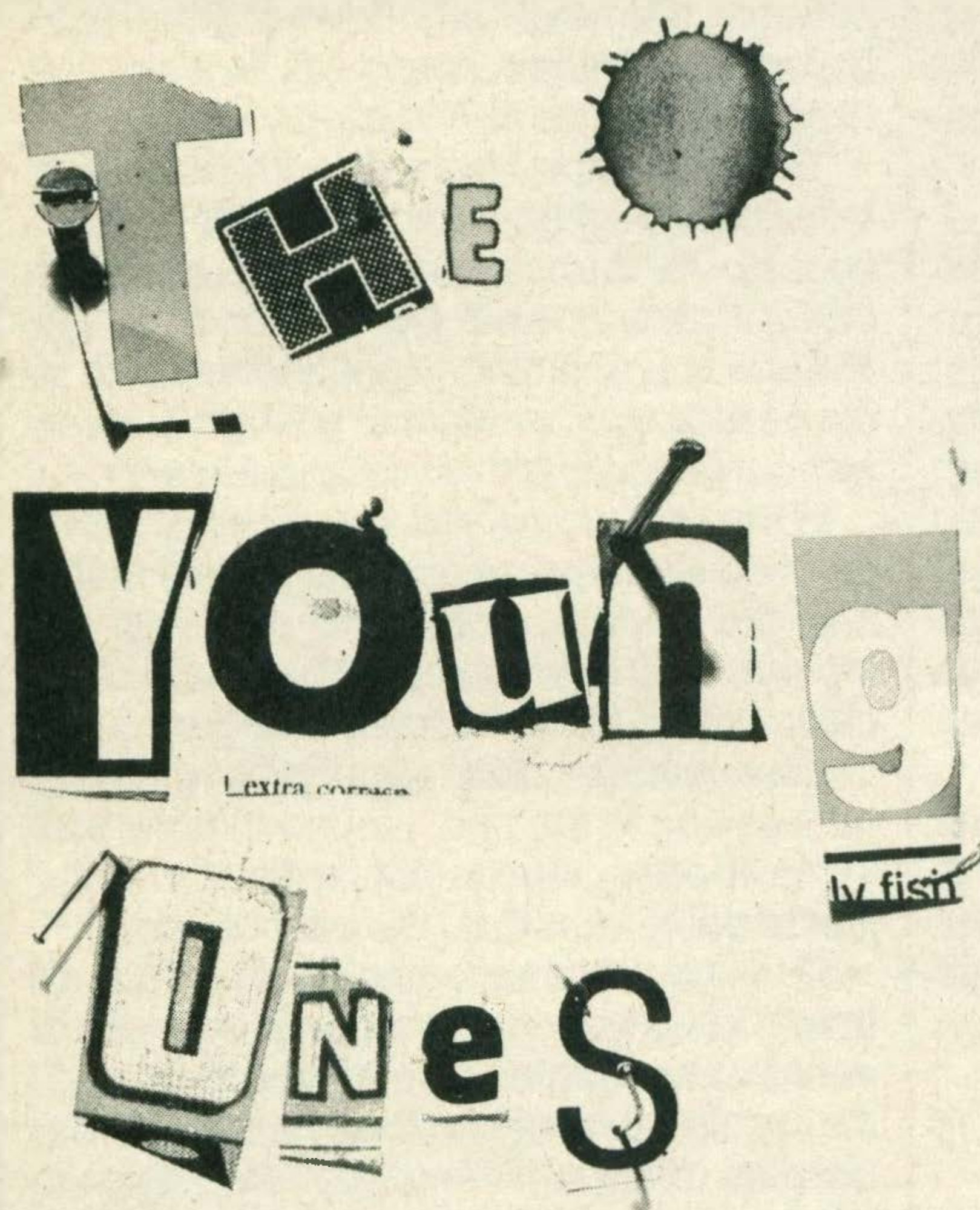
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"Oh wow, technofear." *Anonymous (related on his mother's side)*

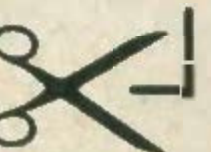
© 1985 Rik Mayall, Ben Elton, Lise Mayer as creators of the "Young Ones" characters, format and storylines of the television series. © 1985 Orpheus Ltd the packaging, program code/data and game play.

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SOFTWARE SCENE

Our review panel has been working overtime to bring you all the very latest MSX software releases. To help you make an informed choice, we're using a star rating system.

Each game will be awarded one to three stars for its graphics, sound, value and verdict. Business and utility software will be awarded stars

for facilities offered, layout, value and, again, verdict.

STAR RATINGS

- ★ Yawn!
- ★★ Good effort, but nothing to shout about
- ★★★ Great — really liked it!
- N/A Not applicable

ELIDON

£8.95

Elidon, the faerie's secret forest, has shrugged off the cold shroud of winter and is once again the playground of the Queen Faerie and her subjects.

These shadowy figures are preparing for the annual ball but, horror of horrors, the Queen's garland has lost all seven of its flowers — you have the long and dangerous task of finding them.

It isn't easy because the seven flowers are scattered around over 4,000 rooms — yes, we did say 4,000 rooms and not only do you have to find them, you also have to bring them back to the first screen!

On the TV display, the woodland is divided into screen-sized rooms containing various types of flora such as flowers, ferns, prickly bushes and creepers. As you guide your faerie around these flowery rooms, you must be careful not to bump into anything, as doing so drains your energy supply. Collecting faerie dust replenishes it. Score, lives left, energy gauge and other bits of information are indicated on one side.

Before grabbing the flowers, you first have to find a bottle of potion. An arrow indicator points in the direction of the nearest bottle, but to keep this arrow working, you must collect the lucky horse-shoes. Once a bottle is found, the arrow points towards the nearest flower.

It isn't an easy game and you need to be fairly quick as nasty tree spirits do their best to knock you about causing energy to be lost.



Some of them even suck your energy out — if they can get hold of you. They can be killed, but you have to find out how!

Various objects lie around — stools, torches, leaves, stars — and these are all important in the game, but we'll leave you to discover their use. Very few instructions are provided and a lot of it is trial and error.

Orpheus advises players to make a map as they go along and estimates that it will take 24 hours to finish. And that's when you know what you are doing. One player spent three days playing and only got through 3 per cent of the rooms!

Elidon is a brilliant piece of programming and is original, fun and challenging. It will appeal to everyone, although you do need to be patient — 4,000 rooms takes a lot of travelling.

SUPPLIER: Orpheus

(0767) 51481

TYPE:

Arcade/adventure

FORMAT:

Cassette

GRAPHICS ★ ★ ★

SOUND ★ ★ ★

VALUE ★ ★ ★

VERDICT ★ ★ ★

MSX

MT-BASE

the number one data base



MT-BASE is famous for its quality, speed and user-friendliness

MT-BASE is a card index system which allows you to store data normally stored on conventional cards. From important addresses to stock, from your stamp collection to a prospect-address system, from a membership list to an agenda etc etc. With MT-BASE the possibilities are endless. You can choose from 7 built-in card indexes, and design an unlimited number of card indexes yourself.

The reviews are the proof

Read the reviews! "The best price/performance we have ever seen." "Out-performs any other database on MSX." "A very special card index, unbelievable speed." "Even the most spoiled user will be satisfied." These are extracts from reviews by European magazines.

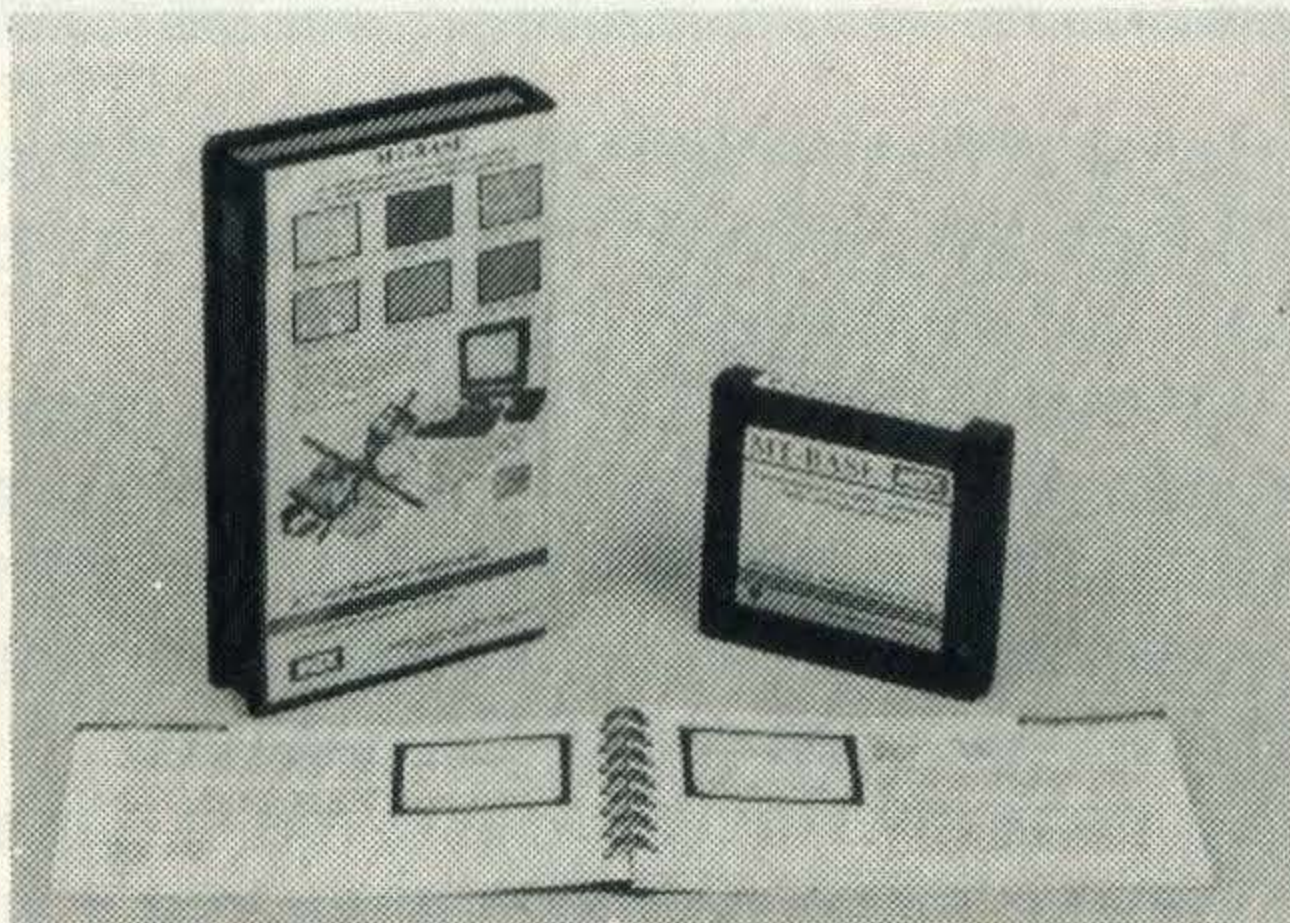
Extensive manual

MT-BASE is easy to learn, and easy to handle, so much so that the manual is almost superfluous! Nevertheless, each MT-BASE program comes with an extensive manual of over 150 pages with examples and 'help-pages'. If for any reason you are not sure about a certain part of the program just look at the top right hand of the screen which points to the 'help-page' in your manual.

Printing

The printing features of MT-BASE are almost unlimited. You can produce labels, lists, forms etc etc in any design. It's just a question of 'composing' your label from your records!

Plastic carrying case



Extensive manual

Memory expansion

The MT-BASE system can be used on all memory sizes. It even uses RAM expansion cartridges up to the maximum MSX configuration. This means that should you decide to expand your MSX computer at a later date to 256Kbyte or even 1 Megabyte MT-BASE already supports it!

For disk and cassette

Because MT-BASE is on cartridge (which can be plugged directly into your MSX cartridge slot) a diskette or cassette can be used to store your data — this gives you more data storage and doesn't alter any MT-BASE functions — you can start now on a cassette based system and expand at a later date to a diskette base system.

Easy plug-in module

For MSX Computers

£49.95

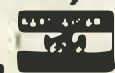


(inc. VAT)

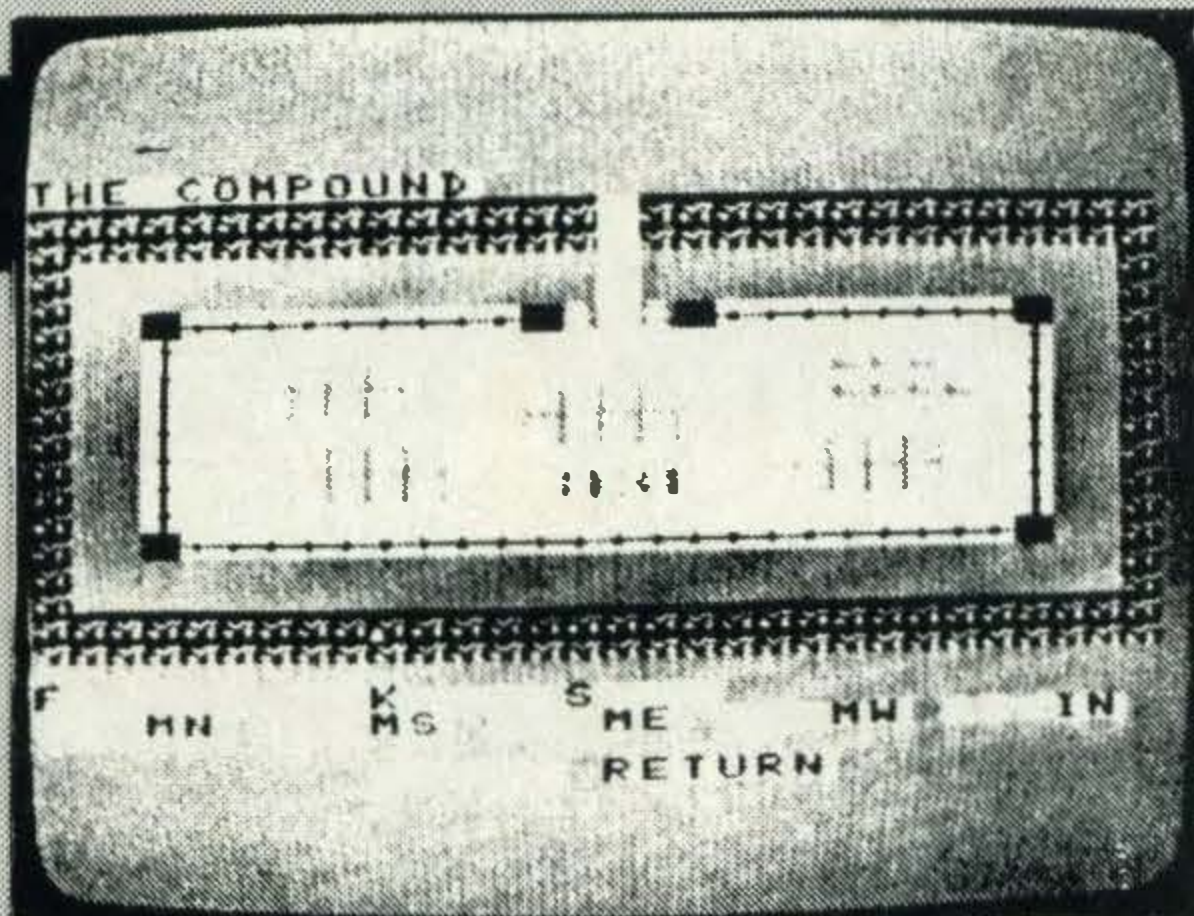
DISTRIBUTORS

Belgium: Wvde Elektronika, Machelen, 02-2511358. UK: Electric Software, Long Stanton, 0954-81991. Germany: Sony Deutschland, Köln, 0221-59661. Finland: Sanura Suomi OY, Helsinki, 0-441233. France: Sony France, Clichy, 01-7393206. Spain: Sony Espana, Barcelona, 03-3306551. Italy: Sony Italia, Milano, 02-6121551. New Zealand: Please Promotions, Paekuranga, 562529.

NETHERLANDS AND WORLDWIDE DISTRIBUTION

Micro Technology, PO Box 95, 3353 GZ Papendrecht, Netherlands. Telex: 62425. Tel: 010-31-78410977.

Eurocard, Mastercard,    welcome.



JET SET WILLY II

£8.95

SUPPLIER: Software Projects
051-428 9393

TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★ ★

SOUND ★ ★

VALUE ★ ★ ★

VERDICT ★ ★ ★

In *Jet Set Willy*, the first game in the series, Willy had amassed a large fortune, built a huge mansion and thrown a party to celebrate. The result was a mass of empty bottles that had to be collected before he could get to bed.

Gathering bottles is exactly what Willy has to do in this sequel, but the bottles arrive in the house in a different way.

Willy finds himself in hospital after falling down one of his staircases. He's hopping mad and has to call in the builders to mend them.

But, they are no ordinary builders — they have green skin and instead of lounging around the house drinking tea, as normal builders are inclined to do, they build hundreds of extra rooms and then refuse to charge him.

It's all the more strange because they've built a rocket room. Willy's maid, Maria isn't impressed, especially with all the mess they've left behind and once again Willy has to rush around collecting bottles and other unidentifiable objects before he can get to bed.

Many of the rooms are exactly the same as in the first game. For instance he still starts off in the bathroom and rooms such as the nightmare room where he turns into a flying pig, the ballroom east and the hallway

still exist, but there are a lot more rooms than in the first game and Willy isn't even sure where they all are.

It sounds easy enough collecting a few bottles, but he has things like yellow rotating waiters, jumping African masks and rolling-pin-wielding-Marias to contend with. All extremely bad for Willy's health, we're sure you'd agree.

The rooms are all given names — Macaroni Ted, Ball Room, Dumb Waiter and with all the stairs, platforms and dangerous occupants, most of them resemble obstacle courses.

As the objects are collected they are totted up on the screen below and the aim of the game is to collect objects, see all the rooms and stay alive. Willy has eight lives and you'll certainly need them!

The graphics and sound effects are adequate, but Software Projects have obviously spent more time making the game entertaining than on creating stunning graphic effects.

If you liked the first *Jet Set Willy* game, you will like this one. If you haven't played it yet, you're in for a treat because it is an arcade game with a difference. It is imaginative, colourful, great fun and full of weird and wonderful inventions. We heartily recommend it.

COMPUTER HITS

£6.95

Someone had to do it and at last someone has — Beau Jolly has put together six entertaining computer games on the one tape and is selling it for a cool £6.95. Calling the tape excellent value doesn't do it justice.

The first game on the tape is also the most recently released — Martech's *Brian Jacks Superstar Challenge*. It's aimed at the sports enthusiast who prefers to enjoy his (or her) sporting entertainment from the comfort of an armchair and involves the player in events such as canoeing, arm dips, squat thrusts, football, cycling, swimming and the 100 metres. The graphics could be better and the odd award ceremony wouldn't have gone amiss.

Next on the list is *Disc Warrior* from Alligata, a rather unusual arcade game. It pits you against a massive computer complex and the idea is to move around a huge grid-like maze collecting objects and destroying attackers such as dogs, androids and floating spheres using discs.

Eventually with the help of a teleport and travel disc, you should find and destroy the central processing unit. Great graphics and sound.

Hustler from Bubble Bus is a pool game and packs six different game combinations into the program. On screen a pool table is displayed with six pockets, six balls and a

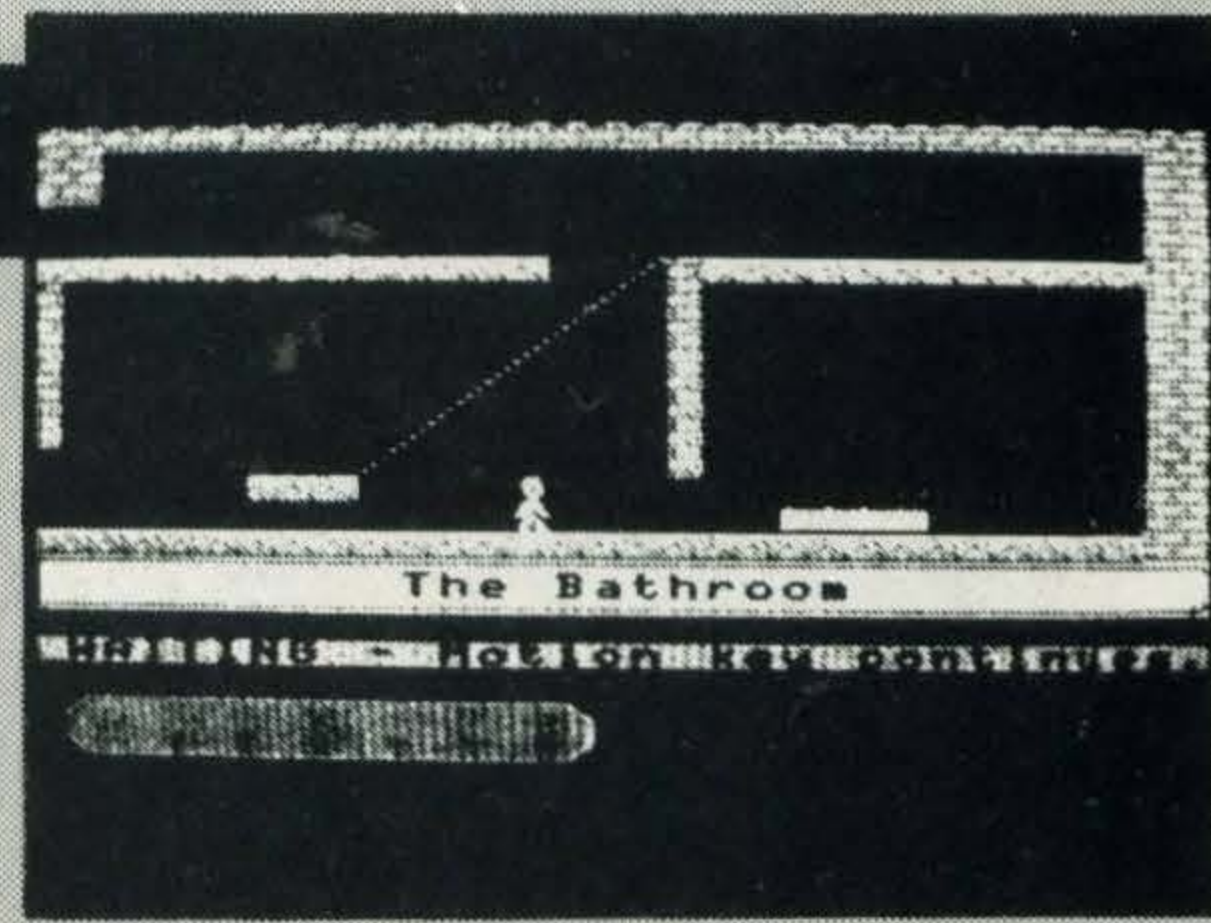
cue ball. Ball control on screen is very good and playing the games with two players increases the fun.

The most confusing game on the tape is PSS's *Les Flics*, an arcade game starring the Pink Panther characters. The aim is to recover the Purple Puma diamond by dodging in and out of buildings collecting food and objects whilst evading capture. The purpose of many of the objects is obscure and it's your task to find out what they are for. Great police siren sounds.

Special Operations from Lothlorien is described as a graphics adventure war-game and has you in charge of a commando group trying to sabotage an Advanced Weapons Research Centre. Much strategy is involved and there are three scenarios to explore. As you move around these fields of play, you must find useful objects or clues and fight off the guards.

It is important to choose the right team, but combat takes place on a man to man level. If you complete the mission, an aeroplane takes you to safety. *Special Operations* is a challenging game with seven levels of difficulty.

There you have it, six diverse and enjoyable games to keep you amused for hours all for £6.95. Don't get crushed in the rush to buy it!



SUPPLIER: BEAU JOLLY
01-567 9710
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★ ★

SOUND ★ ★

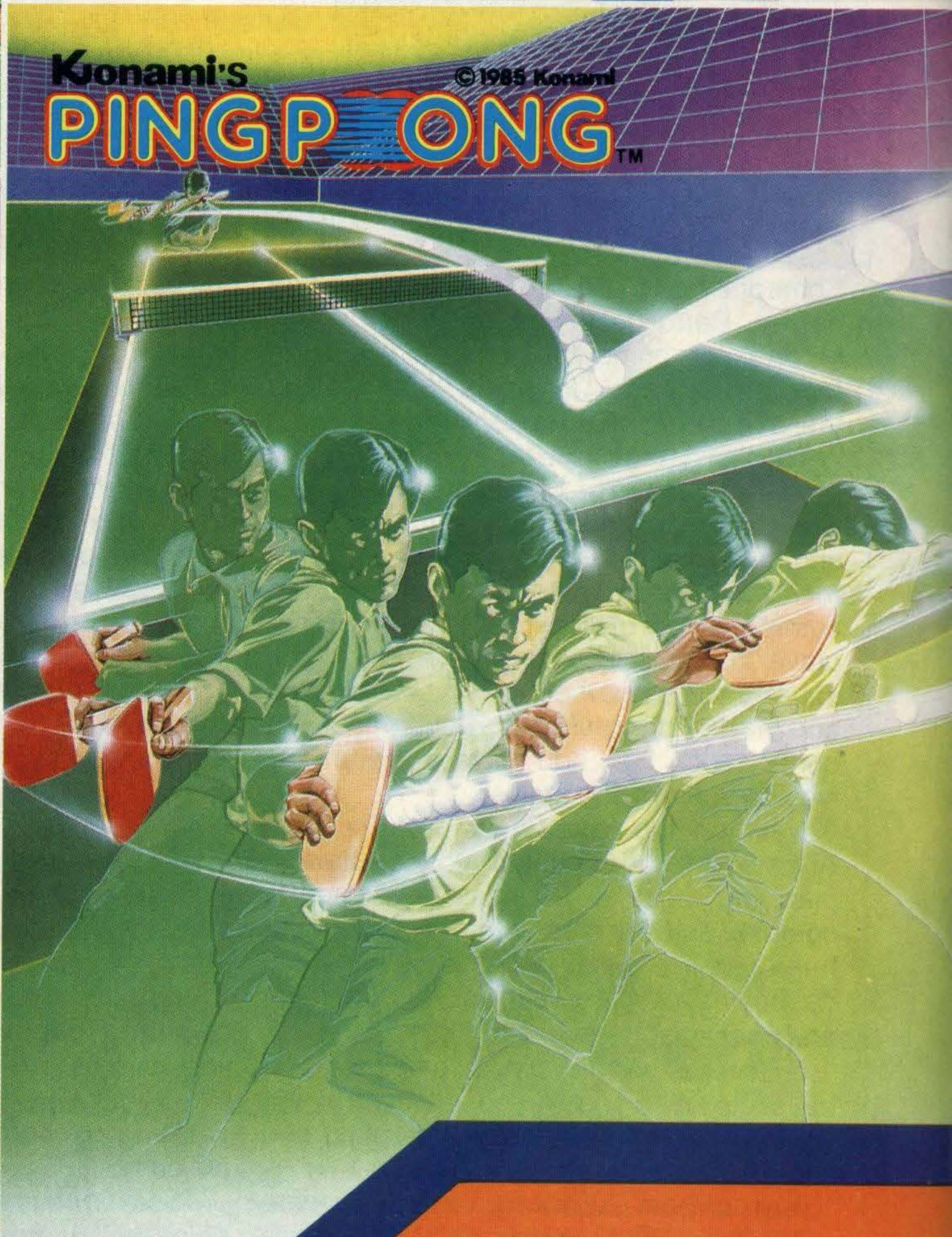
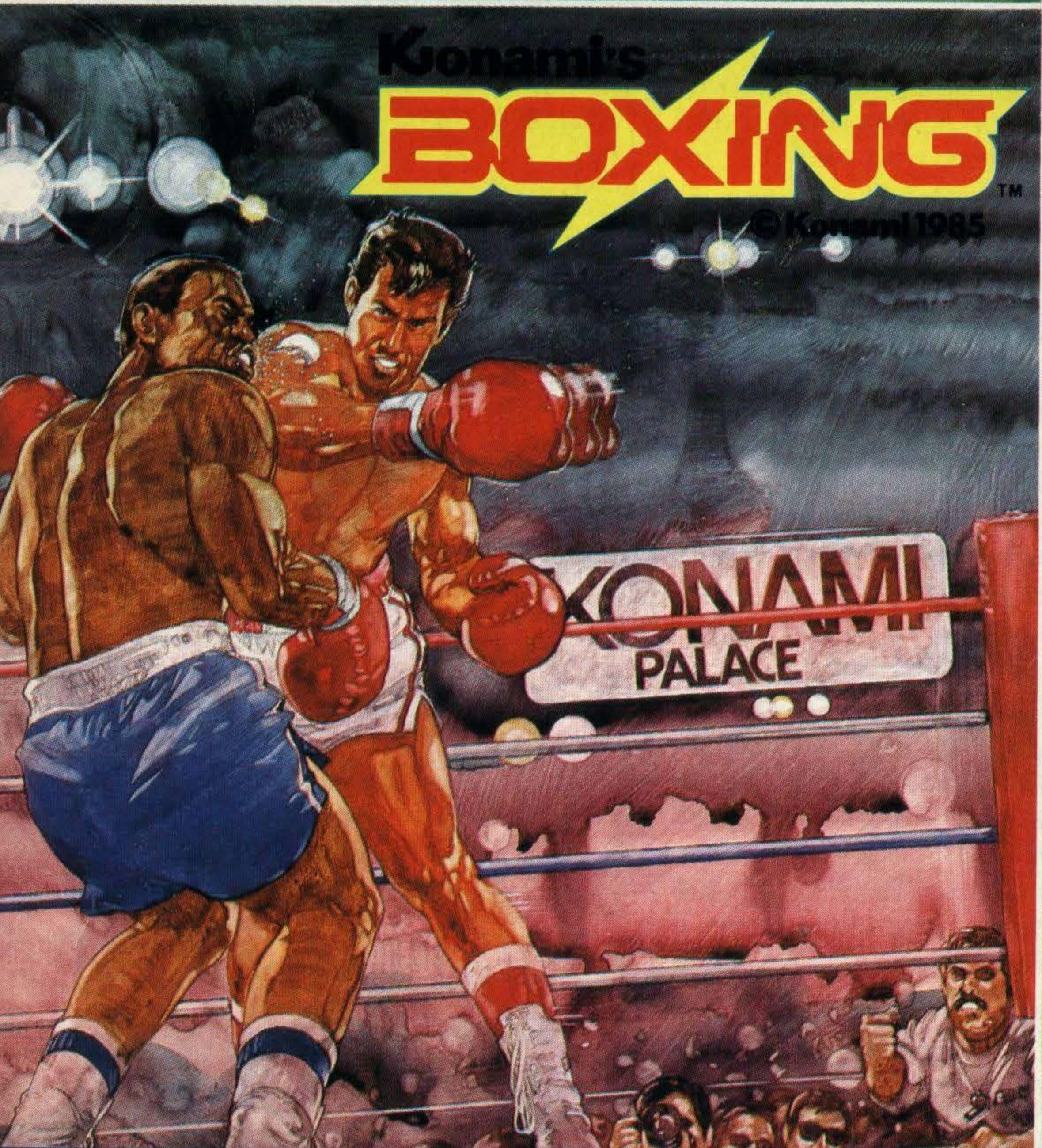
VALUE ★ ★ ★

VERDICT ★ ★ ★

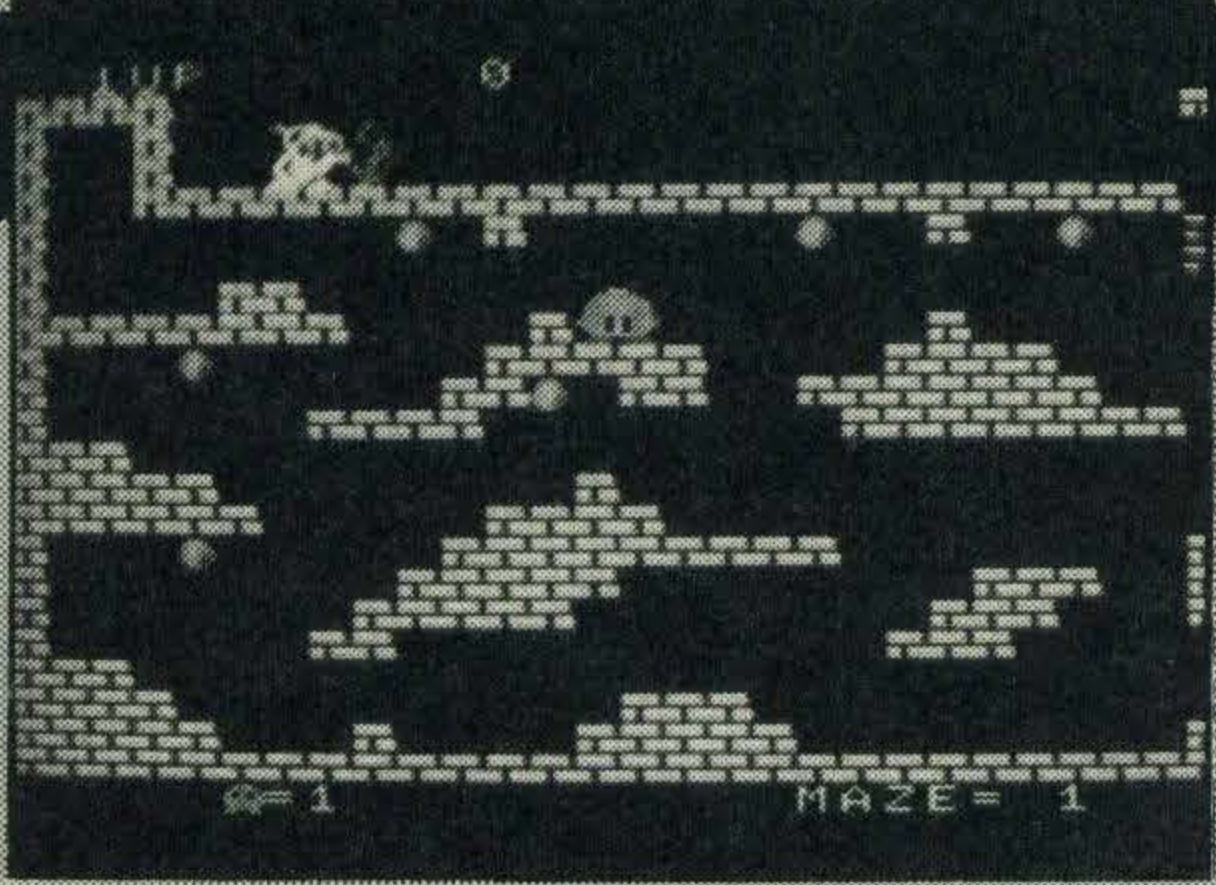
Konami®

NOW AVAILABLE

On ROM cartridge



MSX



CHACK'N POP

£8.95

SUPPLIER: Electric Software
(0954) 81991

TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★ ★

SOUND ★

VALUE ★

VERDICT ★

A wicked ghost has stolen and hidden a great quantity of lonely hearts deep in the dungeons of his castle. Our hero, Chack'n, is determined to set them free and with his endless supply of bouncing bombs, he sets out on his quest.

In case you're wondering, the character Chack'n is a loveable yellow-coloured creature with large red feet and a tuft of hair that waves about as he moves.

Once inside the maze-like castle catacombs, he risks death at the fangs of a load of nasty looking fish-like monsters which hatch out of purple eggs hanging from the ceiling. Yuck!

His first task on entering the maze is to free the entrapped heart. He moves in a curious way — moving along floors and on ceilings until he drops off and carries on walking along the floor below, his legs extending and contracting to accommodate steps and obstacles.

To free the heart, he throws one of his bombs underneath. This explodes causing the cage to burst open releasing the heart which then floats up to the brick blocking Chack'n's exit.

Once there, the heart melts the brick and chaos results as all the eggs suddenly hatch, releasing these monsters. They move quickly and the only way for Chack'n to

escape is to start furiously chucking bombs at them.

If he does manage to get out, he goes onto the next maze — there are four maze levels altogether.

A time limit for the completion of each level is set by the ghost's movement along the top of the screen. If it manages to get to the exit before Chack'n does — he has had it and dies a horrible death.

The main aim of the game is to score points and you can score them by destroying eggs and monsters, freeing hearts, eating bonus fruits, leaving the maze and eating an energy mark.

Eating an energy mark is rather important because it turns Chack'n into Super Chack'n which in turn enables him to destroy all monsters on contact.

The graphics are cute and Chack'n is extremely responsive to keyboard and joystick controls. The sound effects, however, are not terribly impressive and most people will probably prefer to turn them off after the first few turns.

Chack'n Pop is a cross between a platform and a maze game and it's quite good fun. It isn't the most challenging and exciting game we've ever seen, but it's very entertaining and will probably appeal most of all to children.

PASTFINDER

£11.99

By the year 8878 A.D., exploration had almost become a thing of the past. Only time travel remained and so the Ruling Council elected that a group of stellar explorers, the Pastfinders' should have the task of unearthing its mysteries.

In your capacity as an intrepid Pastfinder, you are in control of a blue spidery vehicle called a Leeper and in this you are expected to travel through countless lands collecting artifacts and depositing them at bases and stations lying around.

The Leeper is a handy vehicle which can move at great speeds or drop to a crawl, but is always very easy to control.

It is no easy quest. The land is unknown territory and countless dangers await you not least the dangerous red spaceships which fire at you and the high radiation levels which if allowed to accumulate, will kill one of your four lives. The red areas contain the highest radiation levels, so try and stay clear of them.

On screen, you are shown a map of the land and you can choose which direction you move in. Once a piece of land has been explored, it turns black on the map.

Once your direction is selected, you must choose some supplies. These are important and include gadgets to slow down the Leeper's absorption of radiation,

a protective shield, a signal scrambling device for confusing the enemy and a de-radiator to eliminate radiation. You start off with one of each, but fortunately they can be found on route.

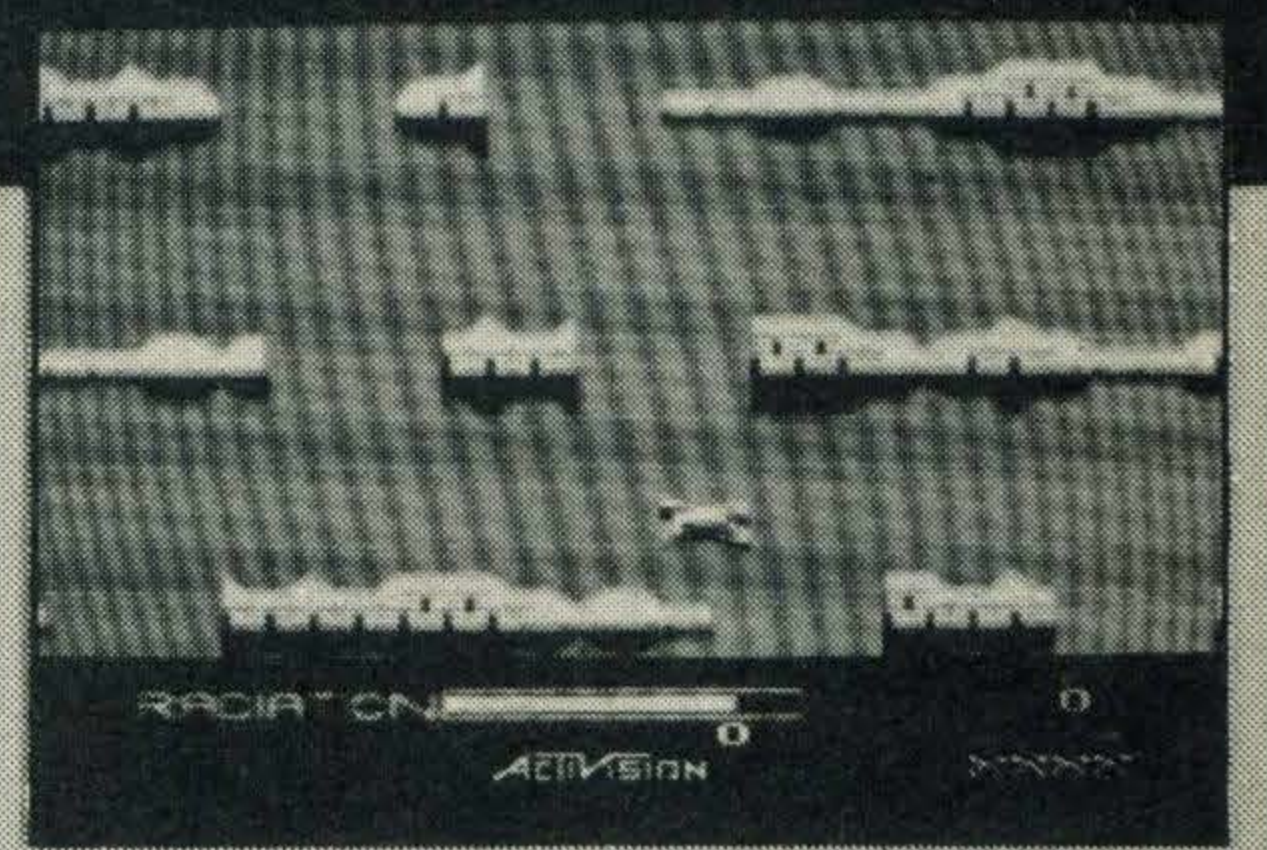
The score, a radiation gauge, the number of artifacts and number of lives left are all indicated on screen.

Once all your supplies are ready — use them carefully as part of the game's skill is using them exactly at the right moment — you move onto the unexplored lands. These resemble obstacle courses with mountain ridges, arches, doors that pop out of the ground and suddenly disappear. All of them are deadly to touch and using the Leeper, you have to either move round, over or under them.

In addition to these barriers, there are enemy ships of various shapes and hues hanging about in the air. Destroy these for points.

Graphics and sound effects are superb and can't be faulted. Activision have come up with a winner.

Pastfinders combines the best qualities of an arcade, adventure and strategy game and is a good example of what computer games should be like. It will keep you occupied for days, but be careful, it is very addictive.



SUPPLIER: Activision
(0628) 75171

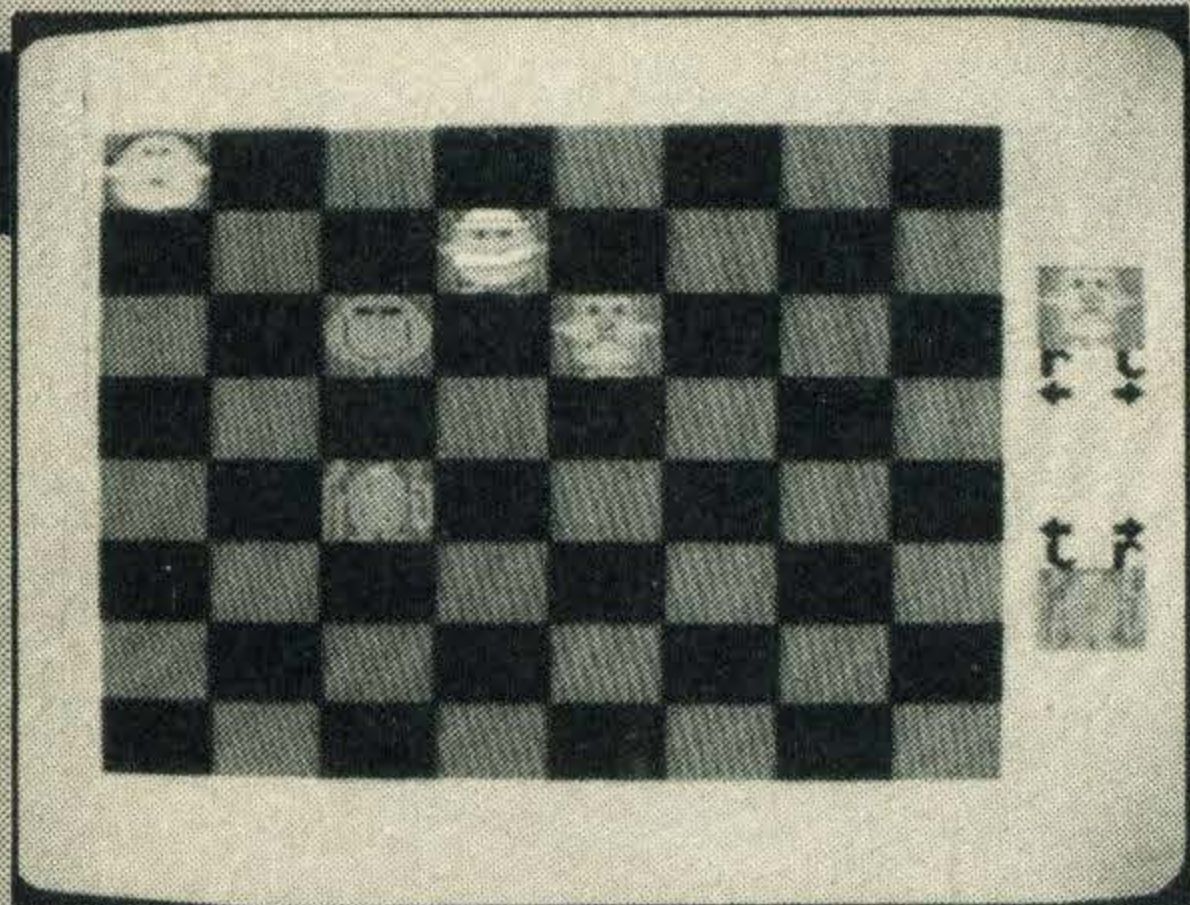
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★ ★ ★

SOUND ★ ★ ★

VALUE ★ ★ ★

VERDICT ★ ★ ★



SUPPLIER: Mirrorsoft
01-377 4600
TYPE: Educational
VERDICT: Cassette

GRAPHICS ★ ★

SOUND ★ ★

VALUE ★ ★

VERDICT ★ ★

HERE AND THERE

£7.95

By using the Mr Men from the Roger Hargreaves cartoon series, Mirrorsoft has hit on an excellent way of introducing ideas to children.

Here and There is intended to teach children in the four to eight year old age group the principles of directions — giving them and planning routes. Giving accurate directions is something that some adults never properly learn and so it's a good idea to teach your children the difference between right and left while they're still quite young.

The program is divided into four games and in the first one, Mr Tickle's Jigsaw Puzzle, you are confronted with an empty box surrounded by four pieces of Mr Tickle. Each of the four pieces is tinged with yellow and the idea is to level each of the wall openings with this yellow bit and press the RETURN key.

If the yellow piece can fly in a straight line into the empty box space, they do so and another part turns yellow. In this way the child builds up Mr Tickle inside the square.

The second game is similar to the first because there is a box with four openings, but this time Mr Grumpy is on the inside and Mr Tickle is outside trying to tickle him.

Again, the wall openings must be levelled so that they face some part of Mr Grumpy,

but then you have to give directions for Mr Tickle's arms to travel into the box. If you get too good at it, Mr Grumpy places chairs in the way.

Mr Lazy is resting under an apple tree in the third game and has decided to lie under the one ripe apple until it drops rather than climb up and get it. Fortunately, a kind worm agrees to go and get it for him and once again, you have to give the directions. Once you get it right, the tree grows from a mere two branches to one sprouting eight branches.

The final game is our favourite and involves some forward planning as well as giving directions. A gang of Mr Men line one side of a chequers board with Mr Tickle on the other side and the aim is to stop Mr Tickle from getting to the other side by blocking his path using the gang of four. They can only move diagonally downwards, but he can move up or down. If he gets past, he gives a big grin and leaps to the other side.

An attractive and colourfully illustrated booklet accompanies the program and explains all of the games. But, very young child will need help to understand what is needed.

The graphic effects are boldly coloured — as in the cartoon books — and most children will love and learn from this program.

SHOWJUMPER

£7.95

To date, Harvey Smith's *Show Jumper* is the only horse jumping simulation available on MSX and is, perhaps surprisingly, considering the nature of the sport, very good.

Software Projects has packed an enormous amount of different options into the game and if you enjoy watching or even participating in the various horse jumping events, then you'll be enthralled by this game because it incorporates so many features.

Displayed on screen is the jumping arena which contains all the jumps, a little scoreboard indicating the horse's name, its country and times the animal has jumped the course in. The map is important because only a little of the arena is displayed at any one time and it can be used to guide you to the next jump.

You control a white horse using either a joystick or keyboard and it can be made to walk, trot, canter, gallop and jump. Its movements as it runs around are impressively realistic and are backed up by the thud of hooves flying over the ground.

Graphic effects are on the whole quite good, although they do lapse when the horse is eliminated — it runs to the start, oblivious of the jumps in its path and just disappears into the crowd — it doesn't even leave through an entrance! It also tends to

move up or down the screen in a strange sideways fashion — very funny to watch!

Controlling the horse is a knack and at first you may find jumping the jumps a very hit and miss affair. We lost count of the number of times we fell off, knocked fences over, jumped the wrong fence or when our horses refused to jump. But, after a while it became easier.

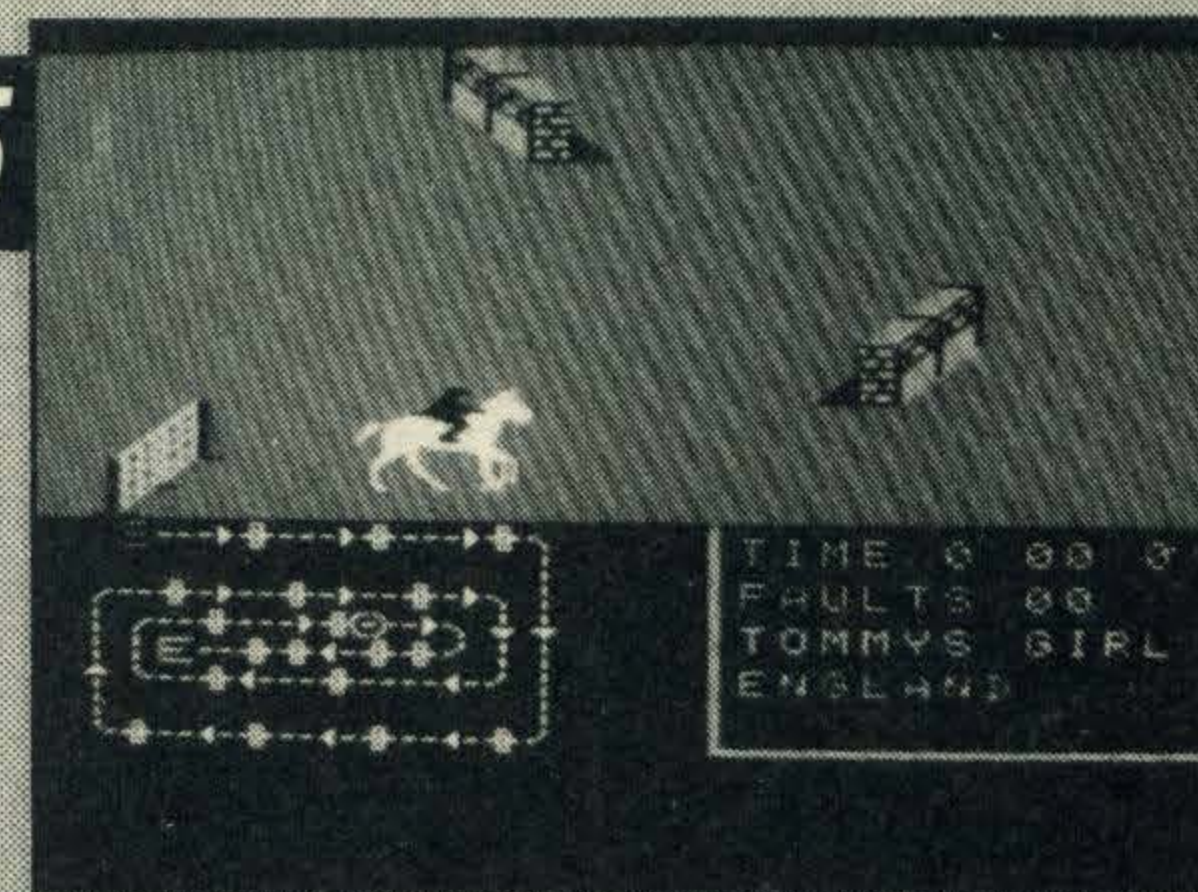
If the horse decides to refuse a fence — you fly over its head, ending up on the ground!

There are 18 different courses included in the game and some of them are very difficult, especially if they have several fences close together. Once you've mastered all of the courses, you can design your own. No programming skill is necessary.

It is possible to control up to six horses per round and although they have already been given name and nationality in the program, you can change them.

After each round, the horse's name, country, time it took to complete the round and number of faults is indicated, a useful feature if you want to play with friends or try to beat your own score.

A horse jumping simulation game isn't the sort of game that would appeal to everyone, but this program is so well done that it is well worth having a go.



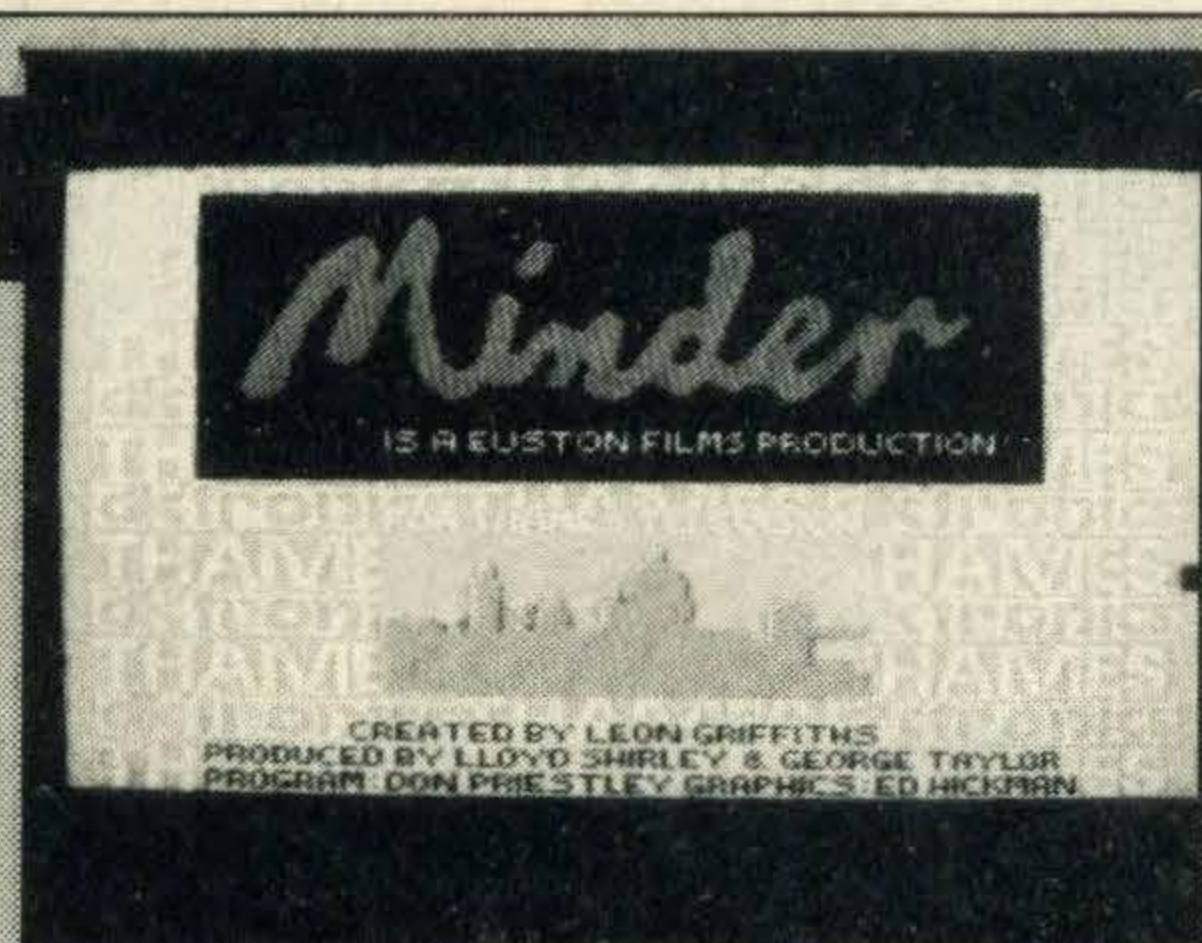
SUPPLIER: Software Projects
TYPE: Simulation
FORMAT: Cassette

GRAPHICS ★ ★

SOUND ★ ★

VALUE ★ ★

VERDICT ★ ★



MINDER

£9.95

SUPPLIER: DK'Tronics
(0779) 26350
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★ ★

SOUND ★ ★

VALUE ★ ★

VERDICT ★ ★

Anyone familiar with *Minder*, the TV series, will love this computer game spin off. Arthur and Terry, of course are the two main characters in the game, whose aim is to buy and sell goods over a two week period. The idea is to finish with more money than you started with.

Arthur starts out with £2,000 and a few rather suspect items such as unisex corsets and rabbit hutches and with only these belongings to his name, he has to travel around various locations trying to sell goods as well as buying more.

He starts the fortnight bright and early from his house and has a choice of four locations to go to: Terry's flat, the lock up, the Winchester and the dealer premises.

The game is timed and every move you make — whether you go somewhere or just wait — is counted as one hour. It's important to observe the time, because if you visit the Winchester, Arthur's local bar, early in the morning or late at night, you're likely to find it shut.

If Arthur decides to try to get rid of his stock, the dealers are the best people to approach. There are a number of them and so you have to select the one you wish to speak to. They converse with Arthur using the computer and he is expected to reply.

For instance if he wants to sell off the

unisex corsets, he has to try and strike a deal quoting reasonable prices. If the dealers get fed up they say something like 'stop messing me about' and then disappear. It is very annoying when they do go off in a huff because they will bear you a grudge.

The Winchester club is the best place to buy goods and the characters offer him dubious products such as nucleonic ferkinators, highly absorbent cat litter — ideal for desperate pussies — smutty literature and so on.

Don't, whatever you do, get angry because if you say anything they don't like, a big fist hits you right on the nose and you lose valuable trading days recuperating in hospital!

Sgt. Chisholm occasionally makes his appearance and it's usually to cause trouble by chasing up goods that 'aren't quite kosher'. Terry comes in quite useful in these situations as not only will he collect and deliver goods from your deals, but he will get rid of anything you don't want.

Minder's sound effects and graphics are good and there are some lovely pictures of the various people in the game.

Minder is certainly a challenging game as the dealers are a sharp lot, but it's worth persevering because it is a brilliant piece of programming.

MUTANT MONTY

£6.95

Mutant Monty, a curious little creature with a big long nose, blue trousers and a white shirt, is in the midst of some caverns filled with gold. The only way to get out is to collect all the gold and escape through the exit. Sounds easy — but it isn't!

Monty starts off in an entrance cavern filled with lots of bright sparkling pieces of gold, but unfortunately, the cave is also inhabited by vicious trolleys with revolving eyes on stalks. These dash along the corridors and will blow Monty up if he comes into contact.

It's quite difficult to control the little character because he seems to dash around at top speed and it occasionally seems almost impossible to stop him rushing headlong into an oncoming trolley. Either a joystick or the keyboard cursor keys can be used.

The graphics are super and the various caverns, caves and mazes in the game are well illustrated with vivid colours. Sound effects, too, are rather nice and help to liven up the game.

Mutant Monty bears some resemblance to *Manic Miner* from Software Projects in many ways; they both incorporate the mine scenarios, have weird underground occupants, and involve a little man running around trying to avoid the nasty enemies.

But, where all the scenarios in *Manic Miner* are platforms, *Mutant Monty* has a combination of maze and platform-based scenes.

A weird variety of creatures assail Monty — fluttering eyelashes, skulls, spiders, jumping TVs, arrow wielding skeletons and many more in the 40 different cavern scenarios.

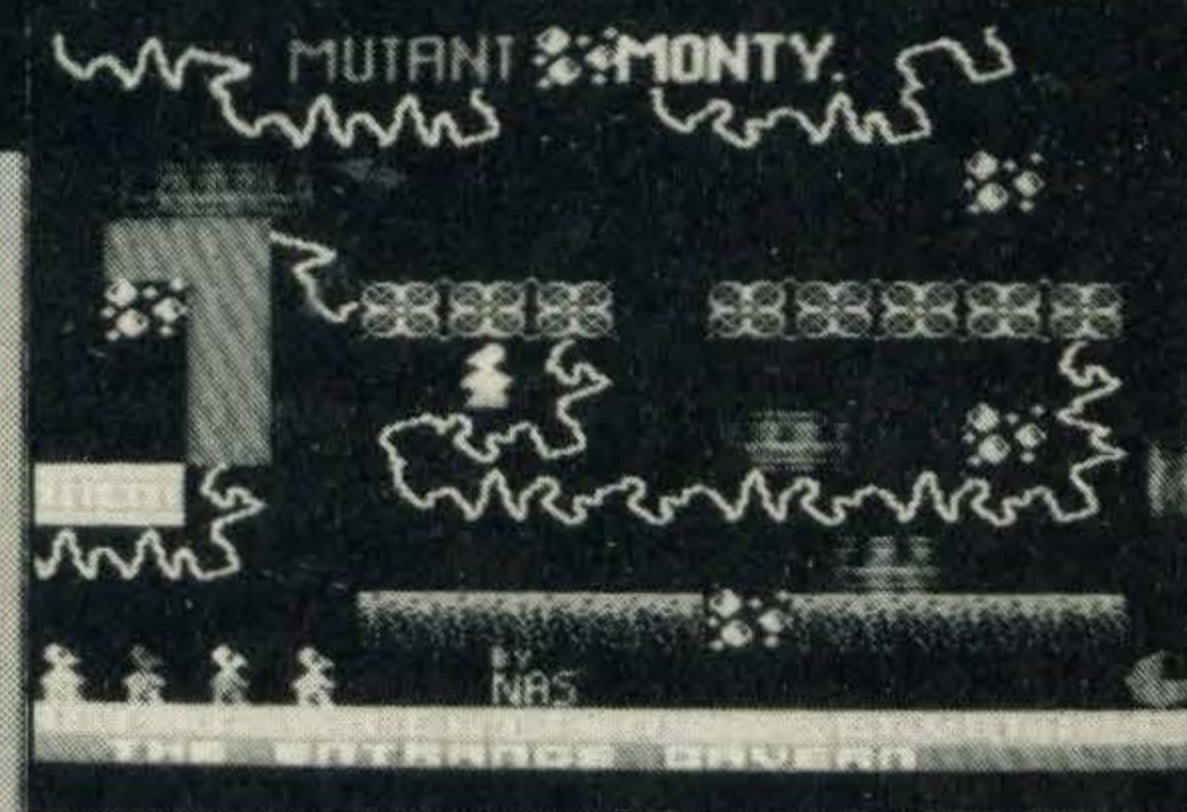
He encounters all sorts of obstacles within these caverns — brick walls, spears, mazes and he has to be careful as there are many places he can't go to.

It's quite frustrating to spot what you think is a safe place, try to get there only to find that you're not allowed in and that there is an evil creature bearing down on you!

Before passing from one level to the next via the exits, Monty has to collect all the gold from each level and get to the door without being annihilated.

The creatures on each level move so quickly that sometimes the dash seems almost impossible especially as it is quite difficult to control Monty. It is a difficult game, admits an Artic spokesman, but it is possible to finish.

If you enjoy games like *Manic Miner* and *Jet Set Willy* from Software Projects and Konami's *Kings Valley*, you'll like *Mutant Monty*. It is a challenge, but when you get the hang of it, it's great fun.



SUPPLIER: Artic Computing
(0401) 435533
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★ ★

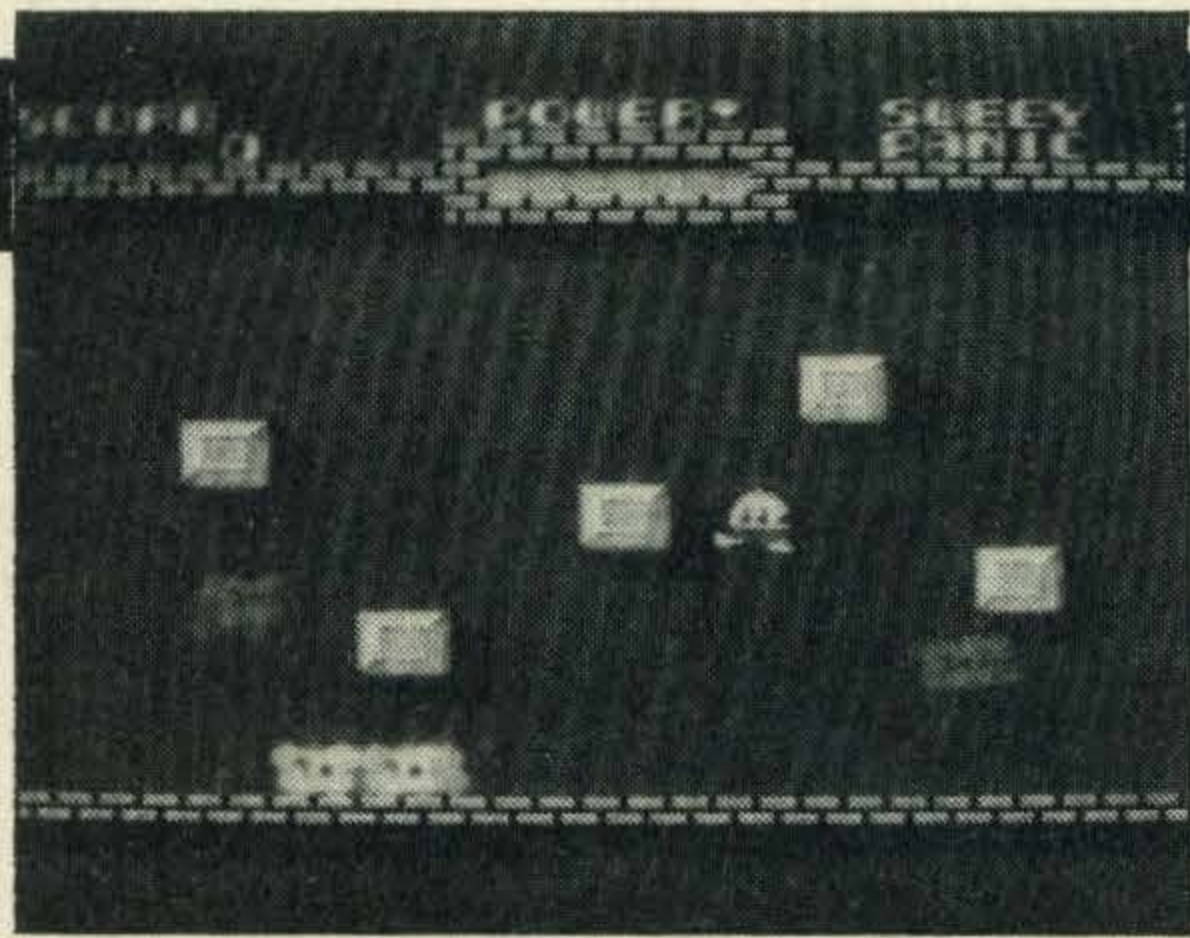
SOUND ★ ★

VALUE ★ ★

VERDICT ★ ★

SWEET ACORN

£8.95



SUPPLIER: Electric Software
(0954) 81991
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★ ★

SOUND ★ ★

VALUE ★ ★

VERDICT ★ ★

Sweet Acorn is one of those uniquely Japanese games that manages to combine an interesting degree of arcade action with highly impressive and — dare one say it — charming characters.

Little Acorn is the star of the game and is a funny-looking creature with a red skirt. He has wandered into a magic garden and is finding it difficult to get out. To make things worse, weird creatures keep appearing and if they come into contact with Little Acorn, he dies.

Luckily, Little Acorn is no fool and has a supply of acorn nuts hidden in his pockets. He can use these to fend off and kill his enemies.

The garden scene fills up the whole screen and contains bop-bumpers. Knocking into these bop-bumpers wins a few points for Little Acorn. An energy gauge runs across the top of the screen and must be maintained because Little Acorn can't throw his acorn ammunition unless he has some energy left.

Spinning the acorn from left to right very quickly with a joystick or the cursor keys builds up his energy, but while you're doing this, you must keep a look out for the Peepas.

Peepas are the enemy and come in six colours, each one behaving in a different

manner. For instance some are non-aggressive and don't chase Little Acorn, some are incredibly aggressive and do chase him, some hide when they see Acorn coming, others release various treasures when hit while the rest remain invisible until revealed by the treasure.

Hitting them usually kills them, but the red ones tend, instead, to split into two more! The Acorns can also be made to bounce off walls allowing you to shoot round corners. They also rebound off bop-bumpers causing the colours and behaviour of peepas to change.

Gathering together masses of points is the aim of the game and points can be gained by building up energy, hitting bop-bumpers, killing peepas and picking up treasure.

Extra lives are awarded at 40,000 points and then again at 80,000 points.

There are several levels to the game and once you've killed all the existing peepas, you go onto the next garden level. The scenarios don't vary much — the position of the bop-bumpers just changes around.

Sweet Acorn is a lovely game involving engaging characters and an uncomplicated theme. The musical accompaniment is super and contributes much enjoyment to playing the game.

XYZOLOG

£8.95

Millions of years in the future lies the planet Fairis. Once a thriving earth colony, Fairis is now a desolate wasteland populated by only two strange species, Deotum and Xyzon. These creatures were made by man and thrive on a diet of pure energy, but now they battle for supremacy and only one can survive.

That's the background of the game according to the blurb on the cover and who are we to argue? You are in charge of Xyzon, a red, spherical, single-celled creature and the computer is controlling your opponents, the Deotum.

The planet's ruined remnants influence the behaviour of both Xyzon and Deotum because it is covered in slopes called Grains. These are convex structures which Xyzon can climb if it has enough momentum. Zetas, on the other hand, are concave structures down which it rolls. As you move round the screen, Xyzon rolls around the landscape as a ball would roll around a bumpy landscape — in all directions.

Making life even more difficult are the Loids (who makes up these names?!) which are vertical pylons. These deflect Xyzon if it bumps into one of them.

The aim of the game is to move around avoiding the lime green Deotums whilst sapping energy from the Quramzo —

energy reservoirs — on which the Xyzon feed. If you manage to pass over all of the reservoirs on a screen without losing all three lives, Xyzon goes onto another part of the planet.

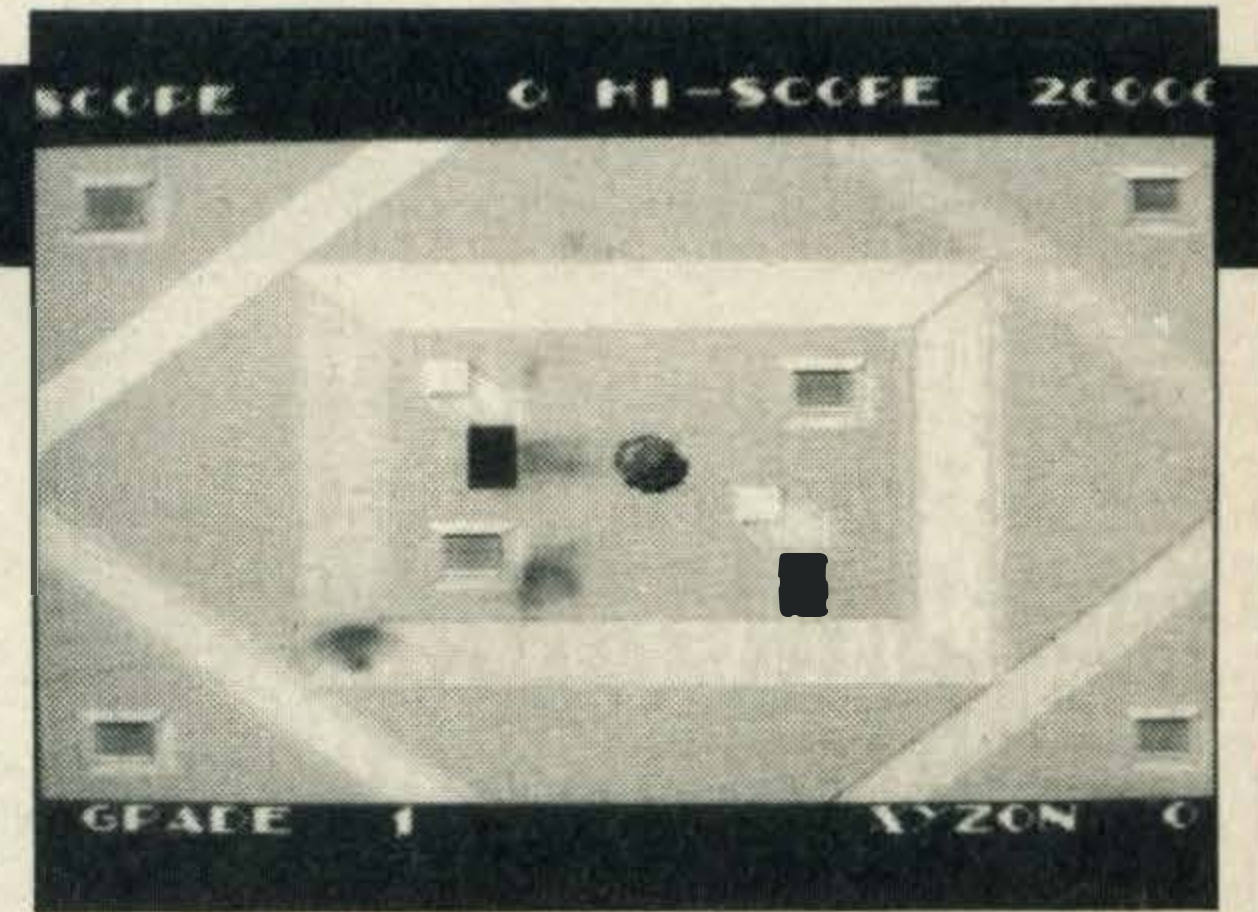
Each screen is a different combination of Grains and Zetas and it is these that make Xyzon's life so difficult — it is never easy to tell where you are going to roll.

Xyzon has no means of defence, but it can explode, shooting four bullets off in all directions.

These may or may not kill the aggressive Deotums, so it is a good idea to maximise the effect by waiting until they are really close because you lose a life every time you do it. The power of the explosion depends on Xyzon's energy charge. Unfortunately, the Deotums soon regenerate.

Points are awarded for collecting energy from Quramzo and for destroying Deotum. *XYZOLOG's* graphics are simple, but effective because it is fairly easy to tell which direction the slope is going — up or down. The music too is pleasant and helps to jolly the game along.

It's not the sort of arcade game that would appeal to the blood-crazed alien bashers amongst you, but it is a game which needs some skill and, if you like a challenge, it will take a while to master.



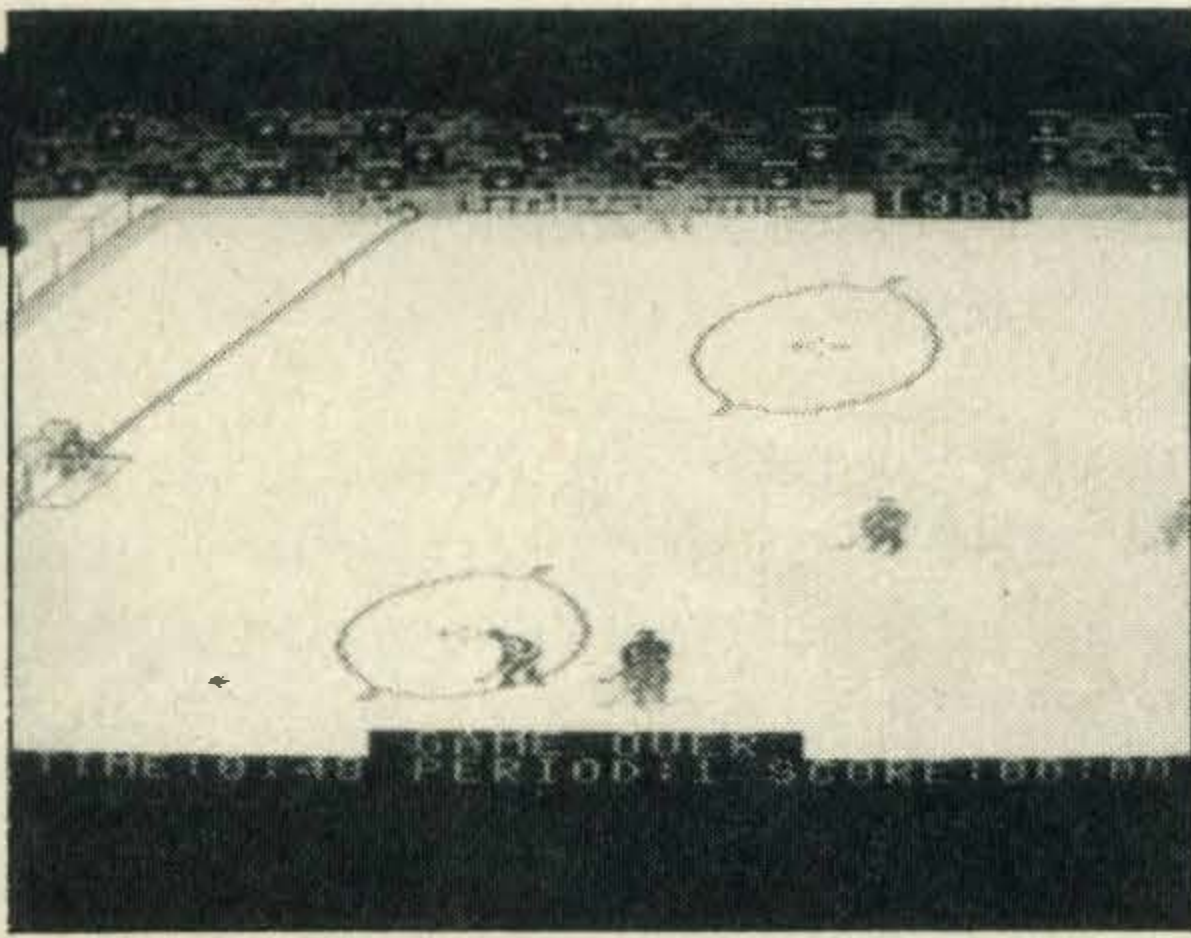
SUPPLIER: Electric Software
(0954) 81991
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★ ★

SOUND ★ ★

VALUE ★ ★

VERDICT ★



SLAPSHOT

£8.95

SUPPLIER: Anirog
(0332) 92518
TYPE: Simulation
FORMAT: Cassette

GRAPHICS ★

SOUND ★

VALUE ★

VERDICT ★

Ice hockey is one of the roughest and most demanding of the team sports. It requires courage, determination plus a lot of skill. To play *Slapshot*, Anirog's version of ice hockey, players will also need some measure of these characteristics as it isn't easy for the newcomer to play successfully straight away.

In fact we found it quite difficult to master, but like many sports simulation games, once you get the hang of the necessary techniques, they are great fun especially if you play with a friend.

A large ice hockey rink is displayed on the screen surrounded by a rather strange assortment of onlookers. The screen isn't large enough to hold the whole pitch so only the bits where the action is taking place are shown.

Anirog has tried to keep the game as close to the real rules as possible and has divided the game into three minute periods. These periods are timed together with a score display.

If you are playing the computer, the player takes charge of the team in green shirts and after the bully off — you have to be quick because the computer controlled team doesn't hang around — you can do all sorts of things to try and take or even keep control of the puck.

Methods available in the program are to outskate the opponent, manoeuvre across his path or intercept a pass or check (knock into) the player. It is possible to pass the puck from player to player in a number of directions and at several different speeds.

Bumping into the opponents too roughly constitutes a foul, but you can control the strength with which you check.

Controlling your players with the keyboard isn't easy as you have to use the letter keys — very fiddly! If you have a good responsive joystick, you will probably find it much easier. It's a pity the programmer didn't incorporate a cursor-key alternative for the ham-fisted!

Every goal is cheered by an enthusiastic crowd and is accompanied by a replay. The players then all return to the centre of the rink for another play off.

Slapshot's graphics are not the most sophisticated we've ever seen, in fact they are quite crude. But it is just about possible to see what the players are trying to do when they check each other, intercept a pass and so on.

Slapshot is a fairly good implementation of a ice hockey game, but the quality of the graphics did irritate us especially when you compare them with the likes of Konami's sport simulation games.

INTRODUCTION TO SHAPES

£7.95

Mentor has already made a large number of educational programs and is fast establishing itself as one of the major producers of educational software, an area of home computing sadly neglected by most software houses.

Although Mentor is the designer of these programs, the company is based in Ireland and so Spectravideo has taken over the British distribution.

Introduction to Shapes is part of a trio of programs intended for seven to ten year olds. However, we can't help thinking that the ideas Mentor is trying to put across are far too simple for that age range. Most nine year olds are aware of the difference between a circle shape and a triangle shape.

Squares, triangles, circles and rectangles are the shapes introduced and are presented with the use of colourful graphics and the sporadic use of pretty tuneless noises.

The program is menu-based and the user has to choose which definition or test he or she wants to do or see. Young children will probably need help controlling the program for the first few times.

Squares is the first choice on the menu and in this exercise, you are first treated to a display of coloured squares, immediately followed by a picture of a square house which gradually gets decorated with square

windows and a chimney.

Similarly, in *Triangles* a drawing of a road crossing complete with church bearing triangular windows, a triangular sign and moving vehicles flashes up on screen.

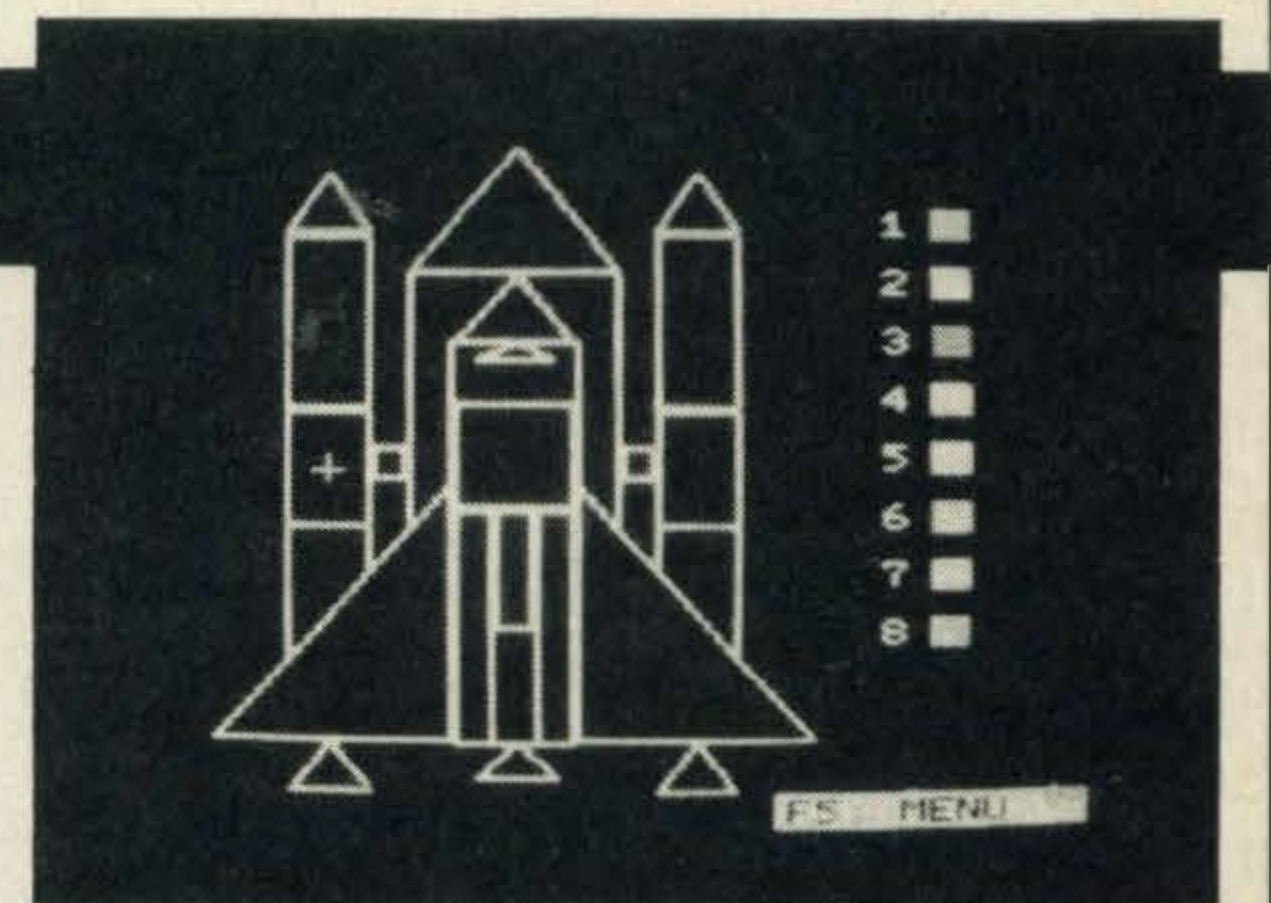
The programmer seems to have lost interest with the program at this point because in the *Circles* exercise, the illustration is exactly the same except that everything that had previously been triangular is now circular!

By using familiar pictures, the idea of different shapes is portrayed quite well.

The tests reinforce the information put across in these exercises. Three different things — a rocket, robot and train are displayed on screen using simple shape outlines.

A cursor appears in one of these shapes and the idea is to identify what shape it is — circle, triangle, rectangle or square, before colouring it in with one of eight colours. If you are wrong, though, the shape won't be coloured in.

Mentor has done what it set out to do — to introduce the shape concept — but we can't help but feel that there really isn't enough work in the program to warrant a £7.95 price tag. Maybe more competition in this rather neglected field would mean lower prices for everybody.



SUPPLIER: Spectravideo
01-330 0101
TYPE: Educational
FORMAT: Cassette

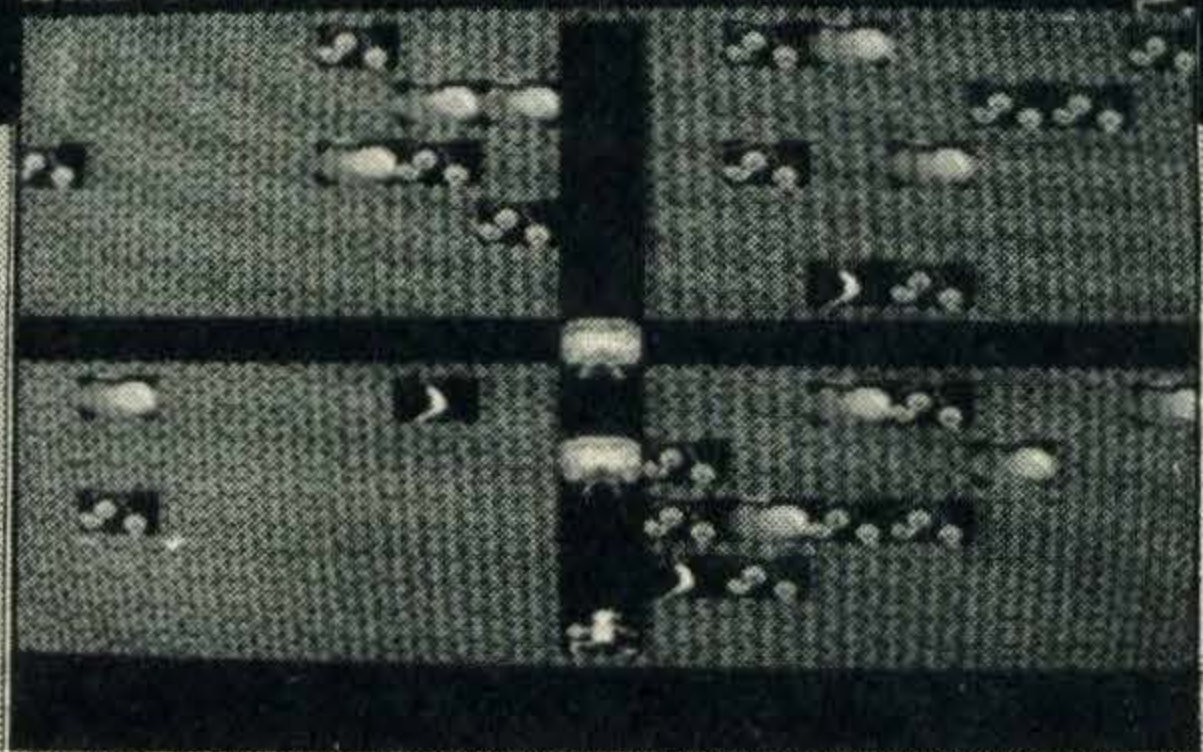
GRAPHICS ★

SOUND ★

VALUE ★

VERDICT ★

SCORE 00000 HIGH SCORE 00000



SUPPLIER: Kuma
(07357) 4335
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★ ★

SOUND ★ ★

VALUE ★ ★

VERDICT ★ ★

FRUITY FRANK

£8.95

Frank's fruit garden has been invaded by a gang of marauding monsters and he's finding it hard work picking the fruit. It's your task to try and make things easier for him by killing off the marauders.

Fruity Frank is extremely similar in style and theme to *Boulderdash* from Orpheus Software, but isn't quite so complex.

Before starting the game, you must select a speed level from the choice of three and redefine the keys. If you are fairly new to fast action arcade games, we advise that you start off with the slowest level — it helps you to get used to this type of game. After the first three levels, the game's speed will move first to the medium and finally the fastest speed levels, at which point movement becomes pure reflex — there's no time to stop and plan where to go next.

On the first level Frank, a little man in white shorts and a blue singlet, sits at the bottom of a screen covered in fruit and apples. Yellow long-nosed monsters start to appear as soon as the game starts and they head off down the open corridor towards him.

The main idea is to move around the screen collecting various fruits such as cherries, pears, bananas and lemons. Also dotted around the area are big juicy apples and these behave rather like the boulders in *Boulderdash*, in other words they crush

anyone or anything that happens to be beneath them.

These apples can get you out of tight spots because if you manage to push one of them onto a monster, it dies and you are awarded points. The number of points that you win depends on which type of monster is killed.

There are four enemy monsters in all — yellow long-nosed creatures, plum, strawberry and green monsters. The former are the most numerous, but are worth the least points. The green monsters are worth the most.

Another way to win points is to chuck red bouncing balls at them. As you move towards the fruit, gaps begin to open up behind you.

By throwing the ball along these gaps, it moves along bouncing on walls until it either hits its target, disappears or goes into your hand. More points are scored for hitting monsters with apples than with balls, but it's worth doing both.

The graphics and sound effects are fun but the music may get on your nerves eventually. The game is, however, great fun to play.

Although *Fruity Frank* is based on the *Boulderdash* idea, it does have a charm of its own and will appeal to most people.

PING PONG

£14.95

We thought Konami's *Tennis* was a super version of the real thing, but the Konami programming team have really excelled themselves with *Ping Pong*. It is nothing short of brilliant.

On screen, a large green ping pong table complete with net is displayed from one end. Suspended in the air at either end are two hands wielding ping pong bats — it looks fairly strange, but you get used to it.

Using either a joystick or keyboard (or if two players are in competition, both) you manipulate these bats to take the various shots. But you will need plenty of practice before you can claim any real proficiency at the game.

When you start, choose the easiest of the five difficulty levels — the ball is much slower and the computer-controlled opponent isn't quite so good. The higher the level, the faster the ball, the higher the rate of smash returns and the more side-to-side action there is.

In the fifth and fastest level, your opponent will tend to hit the ball to your undefended side of the table or even onto the table edge much more often.

Controlling the bat is a knack, and by using a combination of controls you can serve the ball with a backhand, straight forehand or spin stroke.

Returning the ball can also be carried out in either a forehand or backhand stroke to drive, cut (or spin) or even to smash the ball.

You never have to position the bat — it is done automatically — and the real skill in *Ping Pong* is hitting the ball at the right time. Too high and it goes into the net, too low and it flies off the board.

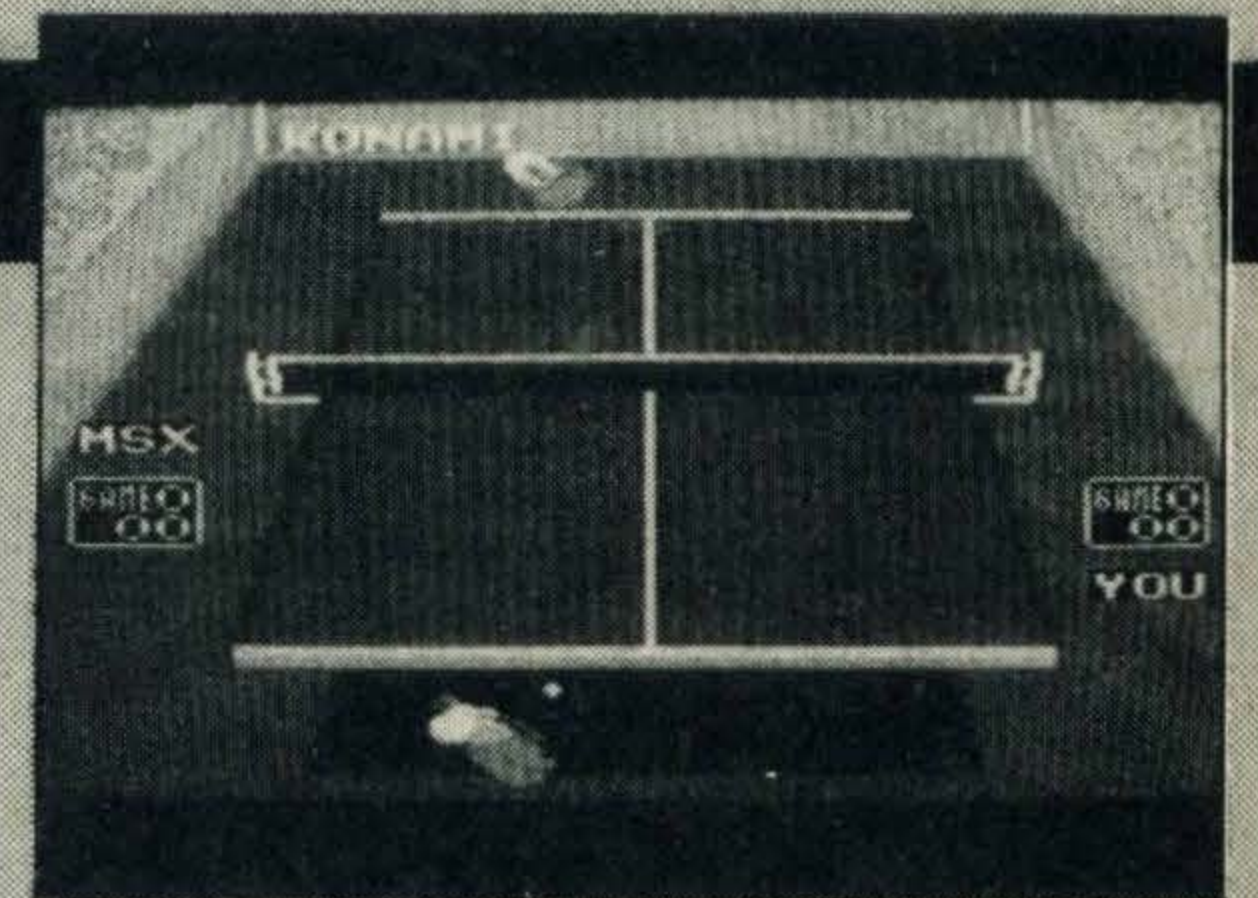
An extremely detailed manual accompanies this cartridge and you will need to examine it carefully as it explains how to make all the shots and also includes hints for skilful play.

An attentive audience complete with penguin surround your table clapping frantically every time someone wins a point. But if you lose, the penguin turns his back on you and starts to sob — you have been warned!

A score records the number of games you've won and the present score. The first player to 21 points wins the game and the match is played over three games — as in real ping pong.

It goes without saying that the graphics are good, but the sounds, too, are incredibly realistic.

Skill is acquired over time and we guarantee that you'll be riveted to your seats playing this game — we can't keep our hands off it!



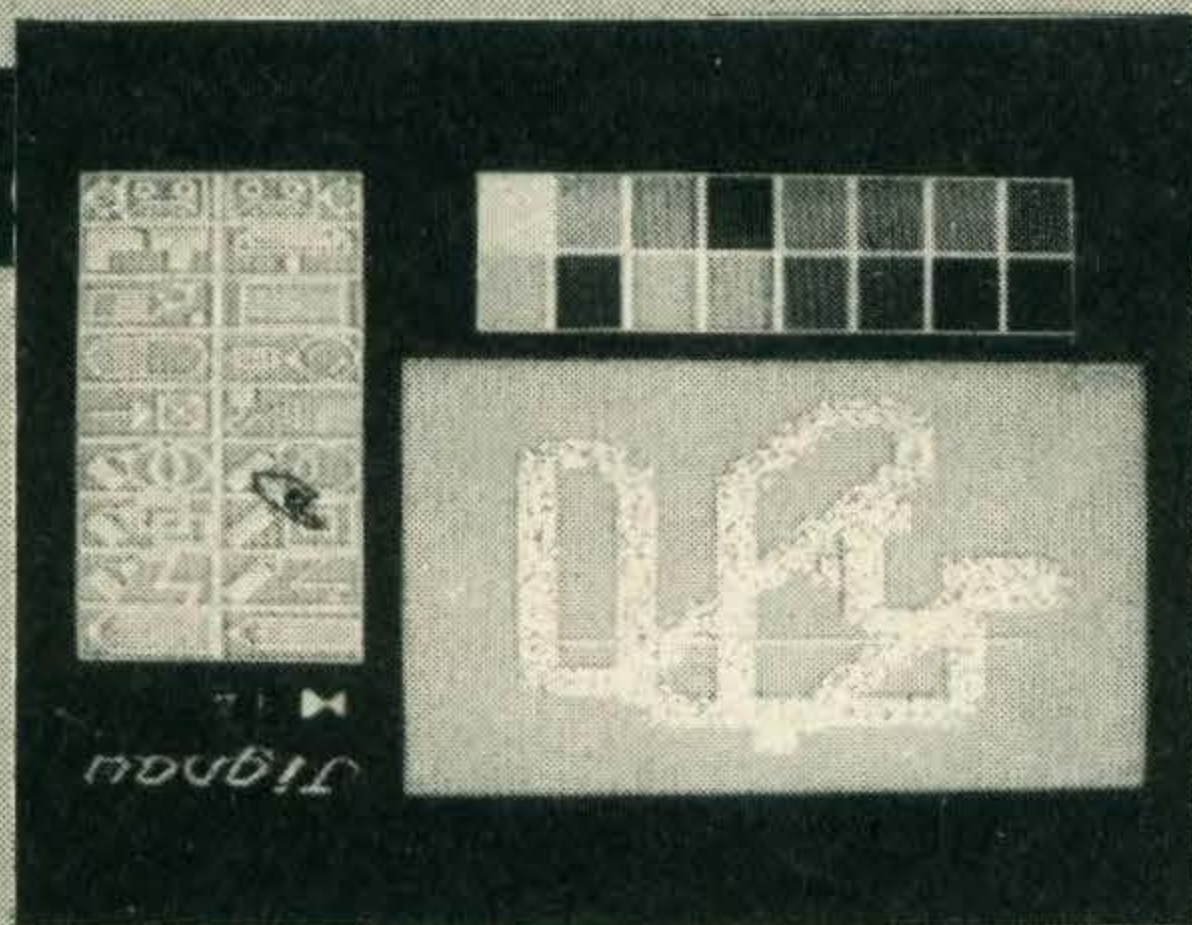
SUPPLIER: Konami
01-429 2446
TYPE: Simulation
FORMAT: Cartridge

GRAPHICS ★ ★ ★

SOUND ★ ★ ★

VALUE ★ ★ ★

VERDICT ★ ★ ★



SUPPLIER: Wigmore House
01-734 0171

TYPE: Arcade
FORMAT: Cartridge

GRAPHICS ★ ★ ★

SOUND ★

VALUE ★ ★ ★

VERDICT ★ ★

JIGSAW

£17.50

Jigsaw is a game with a difference, in fact we've never seen anything like it before.

The cartridge originally accompanied Wigmore House's mouse, the MS2000, but the company decided to market the game by itself. As *Jigsaw* can be used with just the keyboard as well as the mouse, we think it's a good idea.

On screen, a menu of drawing functions, a colour palette containing 16 colours and a space for drawing the picture are displayed.

By controlling a mobile hand on screen, it's possible to choose any of the drawing features, select a colour and start to draw.

By itself, the graphics program included in this game is extremely good, but unfortunately it is only possible to draw a picture using two colours.

You can use any two colours, but all the same, a two-tone picture will have to be very good if you're going to be able to turn it into a convincingly successful jigsaw.

Painting features included on the menu include free hand, straight line, square and circle—all in two line thicknesses—plus an airbrush stroke which is made up of a lot of little dots and looks very effective and an infill command.

A magnifying facility, one of the best we've seen on a graphics program, enables the user to see any part of the diagram close-up

to make minute adjustments. Also included is an eraser control which operates just like a rubber and enables you to change pen and background colours.

The cursor keys control the moving hand fairly well, but to get really brilliant results you need the versatility of the mouse. Why not try your luck in our easy-to-enter mouse competition on page 49?

Once you are satisfied with the picture, you simply change the menu and choose your shape and how large you want the jigsaw pieces to be.

The picture then gets covered up and jigsaw-like pieces drop off onto the conveyor belt below to accompanying plink plunk noises.

Once on the conveyor belt, they disappear off the screen and have to be brought back. Once they are all off, they reappear, face-side up and all you have to do is replace them—in the right order.

If you get too many pieces in the wrong order, one of the icons on the menu starts to flash.

Jigsaw is likely to have more attraction for the younger generation because it is a fairly simple package, but there is nothing simple about the graphics program apart from its inability to cope with more than two colours at a time.

JUMP JET

£9.95

Jump jets are a type of aircraft that don't need long runways to become airborne—that's why they are used on ocean-going ships.

It's obvious that a lot of work has gone into the making of Anirog's combat and flight simulation game, *Jump Jet*.

The accompanying manual is comprehensive and explains all you need to know about jump jets. To play the game successfully, you'll certainly need to become very familiar with this manual.

The manual is stuffed with interesting facts relating to the design of jump jets. Did you know that the reason jump jets can achieve vertical lift-off from the ground is because their jet nozzles point downwards rather than towards the back as in conventional aircraft? When airborne, these jet nozzles swivel round so that the jet behaves just like a normal aircraft.

On screen, you are confronted with a control panel displaying most of the essential indicators and gauges in a jet aircraft. These include a radar screen, altitude and fuel meter, a clock measuring the flight time, a compass, an artificial horizon, the angle of vertical thrust, position of undercarriage, a power gauge and an indicator showing the wing flap positions.

At first, Anirog advises you to practise

simply taking off, hovering and landing—just to get the feel of the controls. When you feel more confident you can start to make longer journeys and even bomb a few enemy ships.

Detailed instructions on how to take-off, hover, land, attack over sea, navigate and finally return to the carrier are included in the manual, but don't expect to take it all in at once.

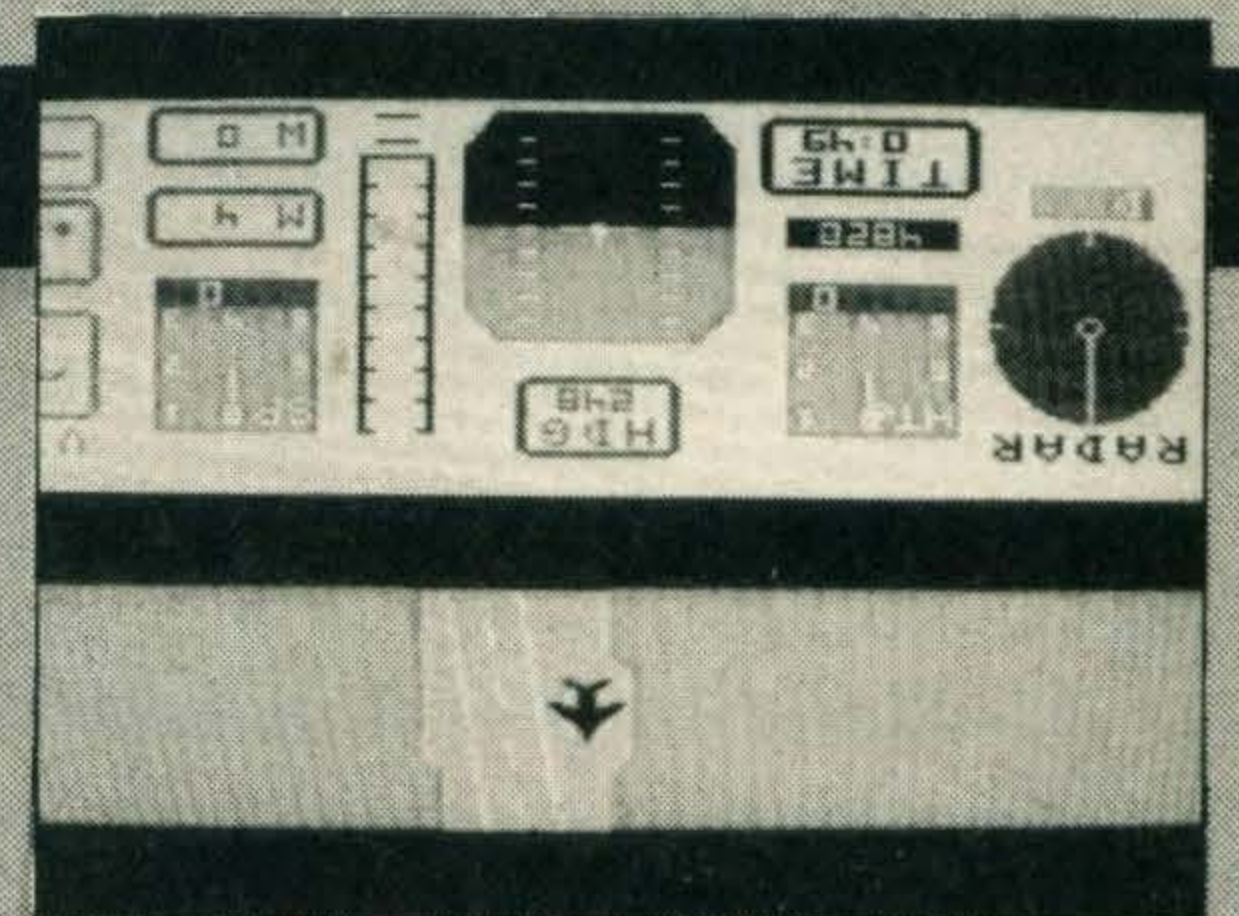
Different views from the cockpit, as well as the control panel, help you to assess your whereabouts.

For instance, you get a bird's eye view of the jet while it is still on the aircraft carrier's deck, but as soon as you've risen 50 feet, the view changes to a split screen showing different views of the carrier.

Jump Jet's graphic effects are extremely good and once the jet gets going, the clouds react realistically to your approach, getting larger and larger.

Sound effects are extremely realistic and the noise from the jet engine powering up sounds just like the real thing—not quite so loud, you'll be relieved to hear.

Anirog has put a lot of hard work and effort into *Jump Jet*, and flying enthusiasts will love it. Even confirmed passengers will find it an excellent absorbing and worthwhile game to play.



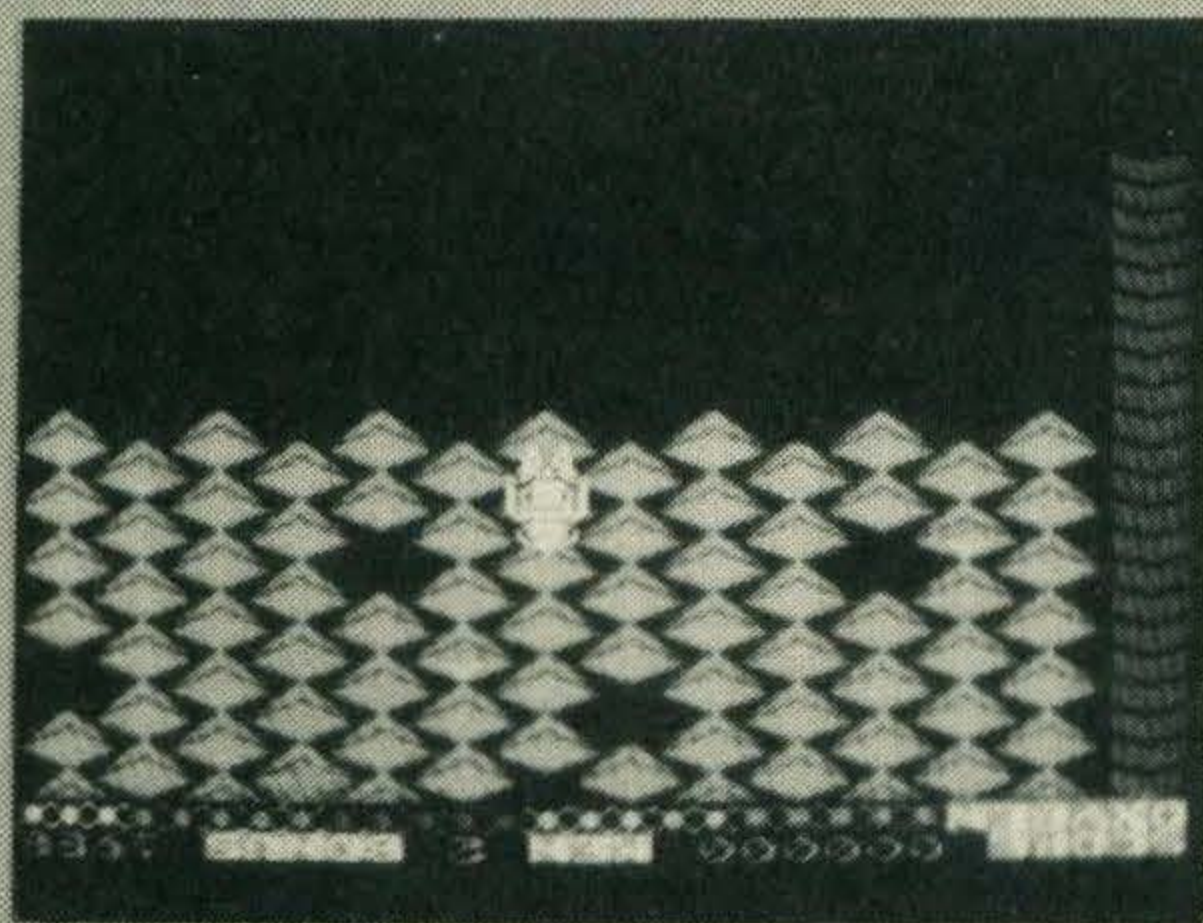
SUPPLIER: Anirog
(0322) 92518
TYPE: Simulation
FORMAT: Cassette

GRAPHICS ★ ★

SOUND ★ ★

VALUE ★ ★

VERDICT ★ ★



SUPPLIER: Kuma
(07357) 4335
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★

SOUND ★

VALUE ★

VERDICT ★

KUBUS

£6.95

Kubus is a version of the popular arcade game *Q-Bert*, and involves collecting red crystals from a grid while avoiding nasty aliens.

You are controlling a character clad in spaceman's clothing — white suit, huge bubble helmet, big boots and oxygen pack. He reacts sensitively to both the joystick and keyboard controls.

A three-dimensional grid made up of diamond-shaped crystals fills the screen, and to move around your spaceman has to move diagonally. Gaps are liberally sprinkled around the grid and if you accidentally jump into one, you've had it — one life down, three to go.

Red crystals are dotted around the grid and to pick them up you just have to move over them. Once they've all been collected, more blue crystals suddenly appear to bridge the gap between the first and second screen.

Unfortunately you are not alone in your task — a variety of aliens are out to stop you. There are different types on each screen grid — springs, green balls, spinning tops and yellow boxes to name a few.

Although they all look different, they do have one thing in common — they all bounce around the blue crystals, annihilating you on contact.

You have to be pretty nippy to keep away from the aliens and all your game skills will be needed to finish the game, especially on the faster 'advanced' level. The 'beginners' level, though, is fairly easy.

You have four lives and you'll certainly need them to get through the nine screens. They get progressively more difficult; not only do the diamond-shaped crystals spread themselves out making it almost impossible to cross to the red crystals, but the aliens seem to get much faster and more intelligent.

Making your man jump the required distance is tricky to control at first, but it is a knack and you'll soon get the hang of it after a few games.

Besides the score, bonus score and number of lives left, the only other indicator on screen to watch out for is the oxygen level.

If you run out of oxygen, you lose a life. It is possible to replenish the supply by pressing UP on the cursor keys causing your crystal to go light blue. You then have to find an oxygen cannister and get back to the light blue crystal in time — it's a bit of a rush!

Kubus is a reasonable version of a popular game but it isn't one of the best around. Still, it's quite attractive and will keep you amused for a while, at least.

CHORO Q

£8.95

All the action in *Choro Q* takes place inside a Beetle factory where you spend your time assembling cars. It doesn't sound as if it has the making of a good game, but in fact whatever it lacks in theme, it more than makes up for in excitement, music and cute graphics.

Choro Q is in essence a platform game. On the first screen there are three platform levels, each with some part of a Beetle car lying either end.

The idea is to assemble the cars together; to do so you must push the chassis, key and finally the vehicle body over the edge of each platform — in that order. The pieces automatically drop on top of each other if you've done it right.

Your little motor — a smart yellow model with blue wheels — is fitted with rotator blades (like a helicopter) enabling it to fly up and down from platform to platform through gaps.

Your car can move fast, but it also takes a while to stop — so when you're pushing pieces over the edge you need to remember to slow down. If you forget and go over the edge you explode, immediately losing one of your three lives.

As soon as you've assembled a car in this way, it changes into a dollar sign. By moving through this, your car turns into a super-

charged wheelie special. This is definitely OK because you can charge through the pursuing enemy cars, destroying them on contact.

Otherwise you can only kill the enemy by jumping on top of them. The explosive sounds as the enemy disappear in a puff of smoke are very satisfactory.

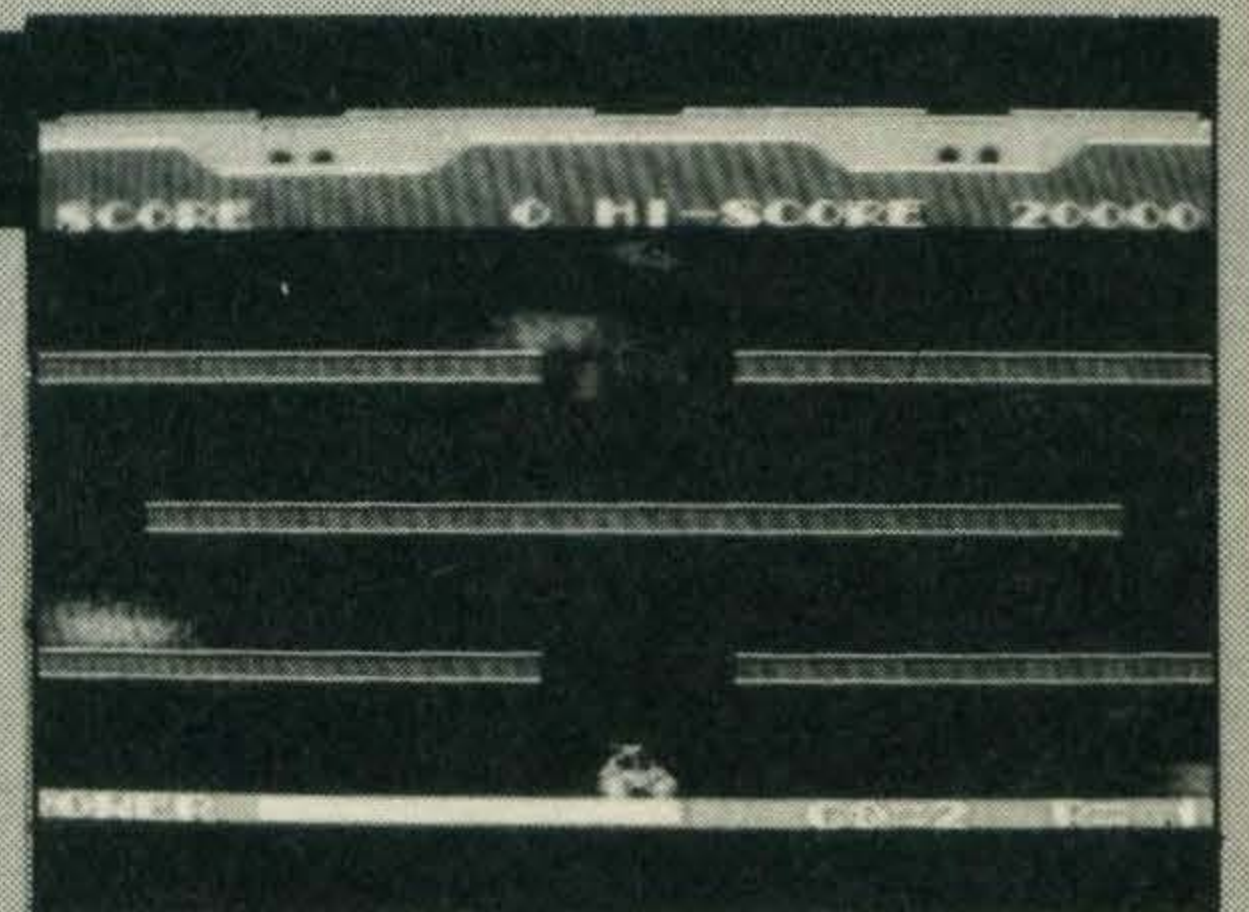
Cars in pursuit include Hi-lux 4WDs, *Choro Q* trucks and armoured cars, their movements being very unpredictable. They too can fly up and down, colliding with you in mid air with annoying frequency so be warned!

A bar indicator at the base of the screen shows your energy level together with current score, high score, which level you're on and lives left. You can only jump up to platforms if your energy level is at a high enough level.

The main aim of the game is to score millions of points and you can do so by destroying the enemy cars and by collecting dollar coins.

After two *Choro Q* cars have been assembled, you move onto another part of the factory and face different attackers.

This game will present a challenge to both novices and experienced game players and will appeal to most. But at £8.95, it is a little over priced.



SUPPLIER: Electric Software
(0954) 81991
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★ ★

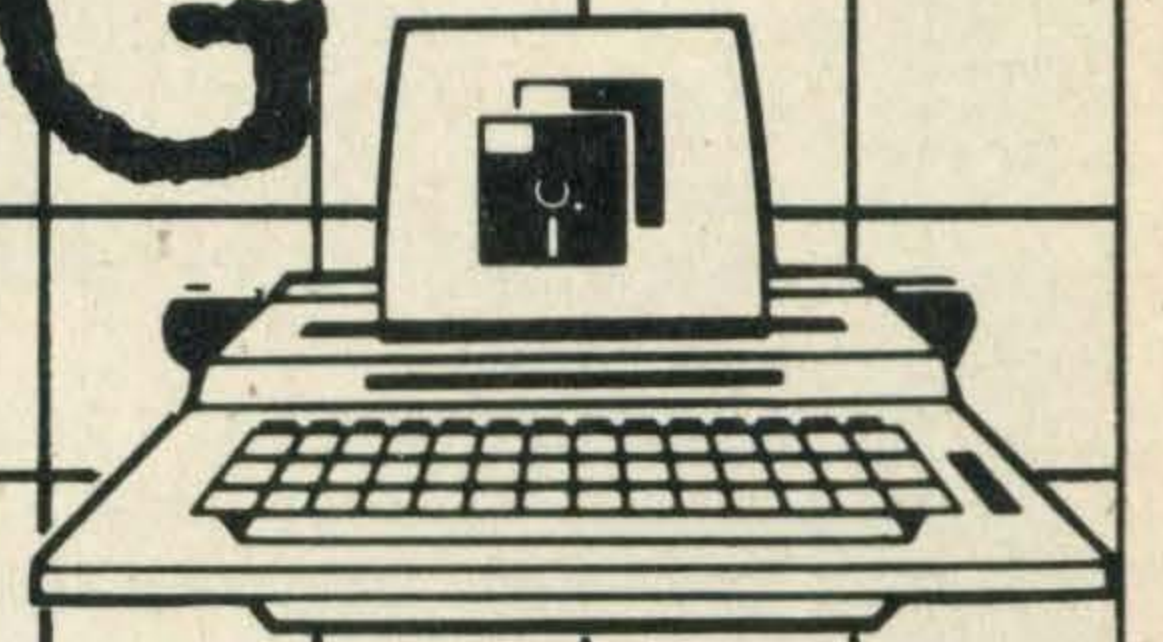
SOUND ★ ★

VALUE ★

VERDICT ★ ★

GET TYPING

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



BIORHYTHMS by Senan Murphy

If we are to believe the experts, biorhythms are far too important to ignore. Like the sun, moon and stars our bodies are controlled by natural cycles and in our case they're divided into three major cycles — emotional, physical and intellectual.

These cycles start from the day we are born and can be divided into high, low and critical periods. By typing in your birth date, BIORHYTHMS indicates when these periods fall. So don't, whatever you do, arrange a party or travel to Timbuctoo on the date that the lowest part of the cycle falls — you could be asking for trouble!

```

5 REM BIORHYTHMS
6 REM by Senan Murphy
10 STOP ON
20 ON STOP GOSUB 20100
30 REM this program allows the user
40 REM to calculate biorhythm curves
50 REM and compatability ratings.
60 DIM V%(12),M$(12),VV%(12)
70 REM variables used (sub 10000)
80 REM p=physical modulus
90 REM e=emotional modulus
100 REM m=mental modulus
110 REM pp=physical %age
120 REM pe=emotional %age
130 REM pm=mental %age
140 REM pa=average %age
150 REM variables used (sub 11000)
160 REM vv%=progressive days for month
h
170 REM y1%=older year
180 REM m1%=older month
190 REM d1%=older day
200 REM y2%=younger year
210 REM m2%=younger month
220 REM d2%=younger day
230 REM variables used sub 12000
240 REM y1=older year
250 REM m1=older month
260 REM d1=older day
270 REM y2=younger year
280 REM m2=younger month
290 REM d2=younger day
300 REM variables used (sub 13000)
310 REM a$=inkey$
320 REM n$=name of subject
    
```

```

330 REM variables used (sub 14000)
340 REM x=x co-ordinate
350 REM y=y co-ordinate
360 REM m$=month names for year
370 REM c=colour of curve to be plotted
380 REM dn=number of days in a month
390 REM yn=year number A.D.
400 REM sl=cycle length
410 REM ps=phase of cycle to be drawn
420 REM pp=physical cycle phase
430 REM pe=emotional cycle phase
440 REM pe=mental cycle phase
450 REM pi=value for >
460 REM po=used to convert rads/degrees
470 REM variables used (sub 15000)
480 REM a$=inkey$
490 REM d$=date
500 REM mm$=month
510 REM y$=year
520 REM variables used (sub 15310)
530 REM d%=day
540 REM m%=month
550 REM y%=year
560 REM v%=array containing month of
570 REM year
580 REM f%=error flag
590 REM l%=leap year indicator
600 REM month for a non leap year
610 FOR I%=1 TO 12
620 READ V%(I%)
630 NEXT I%
640 DATA 31,28,31,30,31,30,31,31,30,31,30,31
650 REM progressive days for each month
660 FOR I=1 TO 12
670 READ VV%(I)
680 NEXT I
690 DATA 1,32,60,91,121,152,182,213,244,274,305,335
700 REM list of month names
710 FOR I=1 TO 12:READ M$(I):NEXT I
720 DATA January,February,March,April,May,June,July,August,September,October,November,December
730 DEFINT I,X,Y,L,S,J,C
740 DEFSNG P
750 REM ***** MAIN-MENU *****
1000 SCREEN 1:CLS:KEYOFF:COLOR 15,4,4
1010 LOCATE 10,5:PRINT "Main-Menu"
1020 LOCATE 5,7:PRINT"Do you want to:
"
    
```

LISTINGS

```
1030 LOCATE 0,9:PRINT"(1) Calculate a
Bio-Curve?"
1040 LOCATE 0,11:PRINT"(2) Calculate
compatability?"
1050 LOCATE 0,13:PRINT"(3) Exit from
programme ?"
1060 LOCATE 5,17:PRINT"Please enter n
umber          of your choice"
1070 REM key select routine
1080 A$=INKEY$:IF A$="" THEN 1080
1090 IF A$<"1" OR A$>"3" THEN 1080
1100 X=VAL(A$)
1110 REM select appropriate subroutin
e
1120 ON X GOSUB 3000,2000,4000
1130 GOTO 750
1140 END
1150 '_____sub 2000_____
2000 REM this routine works out the
2010 REM bio-rhythm compatability
2020 REM between two people and
2030 REM expresses it as a percentage
2040 REM enter first person's name
2050 CLS:PRINT:PRINT"Enter 1st person
's name";
2060 GOSUB 13000:N1$=N$
2070 FOR I=1 TO LEN(N1$):PRINT"-";:NE
XT I
2080 REM enter first person's birth-d
ate
2090 LOCATE 0,7:PRINT"Enter birth dat
e":GOSUB 15000:Y1%=VAL(Y$):M1%=VAL(MM
$):D1%=VAL(D$)
2100 IF F%=1 THEN GOSUB 16060:F%=0:GO
TO 2090
2110 FOR I=1 TO (LEN(Y$)+LEN(MM$)+LEN
(D$)+6):PRINT"-";:NEXT I
2120 GOSUB 18010:IF F%=1 THEN F%=0:GO
TO 2050
2130 REM enter second person's name
2140 CLS:PRINT:PRINT:PRINT"Enter 2nd
person's name";:GOSUB 13000:N2$=N$
2150 FOR I=1 TO LEN(N2$):PRINT"-";:NE
XT I
2160 REM enter second person's birth-
date
2170 LOCATE 0,7:PRINT"Enter birth dat
e":GOSUB 15000:Y2%=VAL(Y$):M2%=VAL(MM
$):D2%=VAL(D$)
2180 IF F%=1 THEN GOSUB 16060:F%=0:GO
TO 2170
2190 FOR I=1 TO (LEN(Y$)+LEN(MM$)+LEN
(D$)+6):PRINT"-";:NEXT I
2200 REM find the age of the older
2210 GOSUB 18010:IF F%=1 THEN F%=0:GO
TO 2050
2220 REM person in days at the birth-
2230 REM date of the younger person
2240 GOSUB 12000
2250 GOSUB 11000
2260 REM calculate bio-phase differ-
ences at that date
2270 GOSUB 10000
2280 REM print out results of calcu-
lations
2290 COLOR 15,2,2
2300 CLS:LOCATE 7,2:PRINT"COMPATABILI
TY"
2310 LOCATE 0,5:PRINT"Physical.....
```

```
.....";ABS(PP)
2320 LOCATE 0,7:PRINT"Emotional.....
.....";ABS(PE)
2330 LOCATE 0,9:PRINT"Mental.....
.....";ABS(PM)
2340 LOCATE 0,11:PRINT"Average.....
.....";PA
2350 LOCATE 0,15:PRINTN1$
2360 LOCATE 0,17:PRINTN2$
2370 REM return to main-menu
2380 LOCATE 5,20:PRINT"Hit any to ret
urn to"
2390 LOCATE 5,21:PRINT"main-menu or (
M) for"
2400 LOCATE 5,22:PRINT "more compatab
ilities"
2410 A$=INKEY$:IF A$="" THEN 2410
2420 IF A$="M" OR A$="m" THEN GOTO 21
40
2430 RETURN
2440 '_____sub 3000_____
3000 REM this routine is used to
3010 REM print graphs of biorhythms
3020 REM for any month
3030 '
3040 REM enter birth date
3050 CLS:COLOR 4,14,14
3060 CLS:LOCATE 0,3:PRINT"Enter birth
date":GOSUB 15000
3070 REM assign values
3080 Y1%=VAL(Y$):M1%=VAL(MM$):D1%=VAL
(D$)
3090 IF F%=1 THEN GOSUB 19000:F%=0:GO
TO 3060
3100 REM enter today's date
3110 LOCATE 0,10:PRINT"Enter today's
date":GOSUB 15000
3120 REM assign values
3130 Y2%=VAL(Y$):M2%=VAL(MM$):D2%=VAL
(D$)
3140 IF F%=1 THEN GOSUB 16060:F%=0:GO
TO 3110
3150 REM check that today's date is
3160 REM a younger date
3170 IF Y1%>Y2% THEN 3210
3180 IF M1%>M2% AND Y1%=Y2% THEN 3210
3190 IF D1%>D2% AND M1%=M2% THEN 3210
3200 GOTO 3220
3210 GOSUB 16060:GOSUB 19000:LOCATE 0
,17:PRINT SPACES(15);:GOTO 3060
3220 GOSUB 18010:IF F%=1 THEN F%=0:GO
TO 3060
3230 REM calculate difference in days
3240 GOSUB 11000
3250 REM convert difference to %age
3260 DAYS=DAYS-D2%:GOSUB 10000
3270 REM present graph of bio-curves
3280 REM for month in question
3290 GOSUB 14000
3300 IF F%=1 THEN F%=0:CLS:GOTO 3110
3310 REM return to main menu
3320 RETURN
3330 '_____sub 4000_____
4000 CLS:SCREEN0:NEW:END
4010 '----- sub 10000 -----
10000 REM routine to find average per
io-
10010 REM dicity as a %age
10020 REM
```

```

10030 REM variables used
10040 REM days=age in days
10050 REM p=physical modulus
10060 REM e=emotional modulus
10070 REM m=mental modulus
10080 REM pp=physical %age
10090 REM pe=emotional %age
10100 REM pm=mental %age
10110 DIYS=DAYS
10120 REM pa=average %age
10130 IF DAYS >31993 THEN DIYS=DAYS:M
D=23:GOSUB 21000
10140 P%=DAYSMOD 23
10150 IF DIYS>31993 THEN SWAP DAYS,D
IYS
10160 IF DAYS >31976 THEN DIYS=DAYS:M
S=28:GOSUB 21000
10170 E%=DAYSMOD28
10180 IF DIYS>31976 THEN SWAP DAYS,D
IYS
10190 IF DAYS >31977 THEN DIYS=DAYS:M
D=33:GOSUB 21000
10200 M%=DAYSMOD33
10210 IF DIYS>31977 THEN SWAP DAYS,D
IYS
10220 PP=100-ABS((200/23)*P%)
10230 PE=100-ABS((200/28)*E%)
10240 PM=100-ABS((200/33)*M%)
10250 REM find average periodicity
10260 PA=(ABS(PP)+ABS(PE)+ABS(PM))/3
10270 RETURN
10280 '___sub 11000___
11000 REM routine to calculate differ
ence
11010 REM between two dates in days
11020 REM
11030 REM variables used
11040 REM vv%=progressive days for mo
nth
11050 REM y1%=older year
11060 REM m1%=older month
11070 REM d1%=older day
11080 REM y2%=younger year
11090 REM m2%=younger month
11100 REM d2%=younger day
11110 REM days=age in days
11120 REM add days for intervening ye
ars
11130 DAYS=(Y2-Y1)*365
11140 REM check for leap years
11150 FOR I=Y1 TO Y2
11160 IF IMOD4=0 AND IMOD100<>0 THEN
DAYS=DAYS+1
11170 NEXT I
11180 REM add day diference for young
er year
11190 REM make test adjustment for le
ap year
11200 IF Y2MOD4=0 AND Y2MOD100<>0 THE
N GOTO 11240
11210 K1%=VV%(M1%)+(D1%-1):K2%=VV%(M2
%)+(D2%-1)
11220 IF K1%>K2% THEN DAYS=DAYS-(K1%-
K2%)ELSE DAYS=DAYS+(K2%-K1%)
11230 RETURN
11240 FOR I=3 TO 12
11250 VV%(I)=VV%(I)+1
11260 NEXT I
11270 K1%=VV%(M1%)+(D1%-1):K2%=VV%(M2

```

```

%)+(D2%-1)
11280 IF K1%>K2% THEN DAYS=DAYS-(K1%-
K2%)ELSE DAYS=DAYS+(K2%-K1%)
11290 FOR I=3 TO 12
11300 VV%(I)=VV%(I)-1
11310 NEXT I
11320 RETURN
11330 '___sub 12000___
12000 REM check for same date
12010 IF M1%=M2% AND Y1%=Y2% AND D1%=
D2% THEN PRINT "Same date!":F1%=1:RET
URN
12020 IF Y1%>Y2% THEN 12080
12030 IF Y1%<Y2% THEN RETURN
12040 IF M1%>M2% THEN 12080
12050 IF M1%<M2% THEN RETURN
12060 IF D1%>D2% THEN 12080
12070 RETURN
12080 SWAP Y1%,Y2%
12090 SWAP M1%,M2%
12100 SWAP D1%,D2%
12110 RETURN
12120 '___sub 13000___
13000 REM routine to enter a name
13010 N$=""
13020 REM enter one character at a ti
me
13030 COLOR 12,14,14
13040 PRINT" and then hit the <ENTER
> key."
13050 LOCATE 0,5
13060 A$=INKEY$:IF A$="" THEN 13060
13070 IF ASC(A$)=8 THEN N$=LEFT$(N$,(
LEN(N$)-1)):PRINTA$;CHR$(255);A$::GOT
O 13060
13080 IF N$="" AND A$=CHR$(13) THEN 1
3060
13090 IF A$=CHR$(13) THEN PRINT A$:RE
TURN
13100 IF ASC(A$)<>32 AND ASC(A$)<65 O
R ASC(A$)>90 THEN IF ASC(A$)<97 OR AS
C(A$)>122 THEN 13060
13110 N$=N$+A$: PRINT A$;
13120 IF LEN (N$)>27 THEN PRINT:PRINT
:PRINT "Name too long.,"Please re-en
ter.":GOSUB 20000:N$="":GOTO 13050 EL
SE GOTO 13060
13130 PRINT CHR$(&H1E);CHR$(&H1E);CHR
$(&H15)
13140 GOTO 13060
13150 '___sub 14000___
14000 REM routine to plot bio-curves
14010 REM variables used
14020 REM x=x co-ordinate
14030 REM y=y co-ordinate
14040 REM m$=month names for year
14050 REM c=colour of curve to be plo
tted
14060 REM dn=number of days in a mont
h
14070 REM yn=year number A.D.
14080 REM sl=cycle length
14090 REM ps=phase of cycle to be dra
wn
14100 REM p=physical cycle day
14110 REM p=emotional cycle day
14120 REM p=mental cycle day
14130 REM pi=value for >
14140 REM po=used to convert rads/deg
rees

```

LISTINGS

```
14150 REM ininialise variables
14160 YN=Y2%:DN=V%(M2%)
14170 REM set up graph backround
14180 COLOR 1,14,14:SCREEN2
14190 LINE(38,140)-(38,0)
14200 LINE (38,70)-(255,70)
14210 LINE(38,140)-(255,140)
14220 FOR I= 45 TO(DN*7)+38 STEP 7
14230 LINE (I,140)-(I,145)
14240 NEXT I
14250 FOR I=73 TO (DN*7)+38 STEP 35
14260 LINE (I,145)-(I,150)
14270 NEXT I
14280 PSET(10,185)
14290 OPEN "grp:"FOR OUTPUT AS #1
14300 PRINT #1,"PHYSICAL="
14310 LINE (82,188)-(87,188),8
14320 PSET (96,185)
14330 PRINT #1,"EMOTIONAL="
14340 LINE (175,188)-(180,188),4
14350 PSET (185,185)
14360 PRINT #1,"MENTAL="
14370 LINE (245,188)-(250,188),12
14380 PRESET(25,70)
14390 PRINT #1,"0"
14400 PRESET(25,40)
14410 PRINT #1,"+"
14420 PRESET(25,100)
14430 PRINT #1,"-"
14440 PRESET(50,0)
14450 PRINT #1,M$(M2%),YN
14460 REM draw physical curve
14470 SL=23:PS=(360/SL)*P%:C=8
14480 GOSUB 14630
14490 REM draw emotional curves
14500 SL=28:PS=(360/SL)*E%:C=4
14510 GOSUB 14630
14520 REM draw mental curve
14530 SL=33:PS=(360/SL)*M%:C=12
14540 GOSUB 14630
14550 A$=INKEY$:IF A$="" THEN 14550
14560 CLOSE
14570 SCREEN1 :COLOR 4,14,14
14580 IF A$="M" OR A$="m" THEN F%=1:R
RETURN
14590 SCREEN1
14600 COLOR 15,4,4
14610 RETURN
14620 REM plot curves
14630 PI=ATN(1)*4:'calculate value of
>
14640 REM initialise cursor
14650 L=(360*DN)/SL
14660 PO=PI/180:'CONVERT FROM RADS TO
DEGREES
14670 PRESET(38,(-SIN(PS*PO)*45+70))
14680 FOR I=0 TO L STEP 7
14690 X=(I/L)*217+38
14700 Y=-SIN((I+PS)*PO)*45+70
14710 LINE -(X,Y),C
14720 NEXT
14730 RETURN
14740 REM _____sub 15000_____
```

```
15000 ' this routine is used to enter
15010 ' dates for validation
15020 REM variables used
15030 REM a$=keyboard input
15040 REM d$=date
```

```
15050 REM mm$=month
15060 REM y$=year
15070 REM initilaise
15080 D$="":MM$="":Y$=""
15090 REM user insctructions
15100 PRINT "Please enter date in for
m of:"
15110 PRINT"DD/MM/YYYY":PRINT
15120 REM numeric validation
15130 REM enter day
15140 A$=INKEY$:IF A$<"0" OR A$>"9" T
HEN IF A$<>CHR$(13) THEN 15140
15150 REM check for field seperators
15160 IF A$=CHR$(13) AND D$="" THEN 1
5140
15170 IF A$=CHR$(13) AND LEN(D$)=1 TH
EN PRINT" / "':GOTO 15200
15180 D$=D$+A$:IF LEN(D$)=2 THEN PRIN
T A$;" / "':GOTO 15200; ELSE PRINTA$;
:GOTO 15140
15190 REM enter month
15200 A$=INKEY$:IF A$<"0" OR A$>"9" T
HEN IF A$<>CHR$(13) THEN 15200
15210 IF A$=CHR$(13) AND MM$="" THEN
15200
15220 IF A$=CHR$(13) AND LEN(MM$)=1 T
HEN PRINT" / "':GOTO 15250
15230 MM$=MM$+A$:IF LEN(MM$)=2 THEN P
RINTA$;" / "': ELSE PRINTA$;:GOTO 1520
0
15240 REM enter year: 4 digits requir
ed
15250 A$=INKEY$:IF A$<"0" OR A$>"9" T
HEN 15250
15260 Y$=Y$+A$:IF LEN(Y$)=4 THEN PRIN
T A$:GOTO 15270 ELSE PRINT A$;: GOTO
15250
15270 D%=VAL(D%):M%=VAL(MM%):Y%=VAL(Y
%)
15280 REM this program can be used
15290 REM as a subroutine to validate
15300 REM dates
15310 '
15320 REM variables used
15330 REM d%=day
15340 REM m%=month
15350 REM y%=year
15360 REM v%=array containing month o
f
15370 REM year
15380 REM f%=error flag
15390 REM l%=leap year indicator
15400 '
15410 REM main part of subroutine
15420 F%=0
15430 REM validate year
15440 IF Y%<1772 THEN 16010
15450 IF M%<1 OR M%>12 THEN 16010
15460 IF M%=2 THEN 15500
15470 IF D%>=1 AND D%<=V%(M%) THEN 15
560
15480 GOSUB 16010
15490 GOTO 15560
15500 L=Y%MOD4:IF L%=0 AND Y%MOD100<>
0 THEN 15540
15510 IF (D%>=1) AND (D%<=28) THEN 15
560
15520 GOSUB 16010
15530 GOTO 15560
```

```

15540 IF (D%>=1) AND (D%<=29) THEN 15
560
15550 GOSUB 16010
15560 RETURN
15565 REM sub ----16000 ---
16000 REM subroutine to print error
16010 REM message
16020 PRINT "Error-Invalid date"
16030 F%=1
16040 RETURN
16050 REM error description routine
16060 PRINT"INCORRECT ENTRY"
16065 REM sub 17000---+++++
17000 FOR X=1 TO 1000:NEXT X
17010 LOCATE 0,12
17020 FOR I=1 TO 9
17030 PRINT SPACE$(29);CHR$(7);
17040 NEXT I
17050 FOR X=1 TO 1000:NEXT X
17060 RETURN
18000 REM re-entry of data routine
18010 LOCATE 3,21
18020 PRINT "Is this correct (Y/N)?"
18030 A$=INKEY$:IF A$="" THEN 18030
18040 IF A$<>"Y" AND A$<>"y" AND A$<>
"N" AND A$ <>"n" THEN 18030
18050 IF A$="N" OR A$="n" THEN F%=1

```

```

18060 RETURN
19000 PRINT"INCORRECT ENTRY"
19010 FOR X=1 TO 1000:NEXT X
19020 LOCATE 0,7
19030 FOR I=1 TO 10
19040 PRINT SPACE$(29);CHR$(7);
19050 NEXT I
19060 FOR X=1 TO 1000:NEXT X
19070 RETURN
19080 REM re-entry of data routine
19090 PRINT"INCORRECT ENTRY"
20000 PRINT"INCORRECT ENTRY"
20010 FOR X=1 TO 1000:NEXT X
20020 LOCATE 0,5
20030 FOR I=1 TO 10
20040 PRINT SPACE$(29);CHR$(7);
20050 NEXT I
20060 FOR X=1 TO 1000:NEXT X
20070 RETURN
20080 REM re-entry of data routine
20090 PRINT"INCORRECT ENTRY"
20100 RETURN
21000 REM routine to prevent overflow
errors
21010 DAYS=DAYS/MD-INT(DAYS/MD)
21020 DAYS=INT((DAYS*MD)+.5)
21030 RETURN

```

TENPIN BOWLING by A. Phillips

No need to waste effort going to the bowling alley, this game is a realistic simulation of Tenpin bowling and needs skill and judgement.

The normal rules of play and scoring methods still apply and the game consists of ten frames. After selecting the strength and bias of your ball, its position can be altered using cursor keys or keyboard. A slowball will swerve more than a fastball, although the degree of swerve is unpredictable. Don't get too bowled over by this game!

```

10 REM:TENPIN BOWLING
20 REM:by A. Phillips
30 SCREEN0,0,0:COLOR15,4,11:KEY OFF
40 DEFINT A-Z:DEFUSR=&H156
50 LOCATE1,5:PRINT "CHOOSE JOYSTICK (
J) or KEYBOARD (K)";
60 K$=INKEY$:IF K$="" THEN GOTO60
70 K=ASC(K$) AND 223
80 IF K<74 OR K>75 GOTO60
90 N=75-K
100 SCREEN2:OPEN "GRP:" AS 1
110 ON SPRITE GOSUB2200
120 SPRITE ON
130 SPRITE$(0)=CHR$(&H3C)+CHR$(&H7E)+
CHR$(&HFF)+CHR$(&HFF)+CHR$(&HFF)+CHR$(
&HFF)+CHR$(&H7E)+CHR$(&H3C)
140 SPRITE$(2)=CHR$(&H18)+CHR$(&H3C)+
CHR$(&H3C)+CHR$(&H18)+CHR$(&H3C)+CHR$(
&H7E)+CHR$(&H7E)+CHR$(&H3C)
150 SPRITE$(3)=CHR$(0)+CHR$(&H6)+CHR$(
&H6F)+CHR$(&HFF)+CHR$(&HFF)+CHR$(&H6
F)+CHR$(&H6)+CHR$(0)
160 SPRITE$(4)=CHR$(&H38)+CHR$(&H38)+

```

```

CHR$(&H18)+CHR$(&H3C)+CHR$(&H7A)+CHR$(
&H58)+CHR$(&H14)+CHR$(&H12)
170 DEFFNA(R)=INT(RND(1)*R)+1
180 DIMA(10,1),H(10)
190 FORI=1 TO 10:FOR J=0 TO 1
200 READ A(I,J):NEXT J,I
210 LINE(0,57)-(240,134),,B
220 LINE(0,64)-(240,127),,B
230 LINE(0,65)-(240,126),13,BF
240 LINE(240,57)-(240,134)
250 FORI=20 TO 154 STEP134:FOR X=1 TO
10 STEP3
260 PRESET(X*20,I):COLOR9:PRINT#1,MID
$("FRMSTKSPRSCR",X,3)
270 NEXT X,I
280 DIM B1%(1),B2%(1),CS%(1),OS%(1),S
T%(1),SP%(1),SF%(1),SC%(1),B(1)
290 Y1=1:Y2=0:F=0
300 FOR P=0 TO 1:GOSUB740:NEXT P
310 REM:main routine
320 FOR F=1 TO 10:FOR P=0 TO 1
330 R=RND(-TIME)
340 SWAPY1,Y2:GOSUB630
350 GOSUB740
360 GOSUB840
370 IF B1%(P)=10 THEN B2%(P)=10
380 B1%(P)=0:GOSUB970
390 GOSUB1560:B1%(P)=TL%
400 IF B1%(P)=10 THEN GOSUB910:GOSUB1
490:GOTO460
410 GOSUB910
420 GOSUB970
430 GOSUB1560:B2%(P)=TL%-B1%(P)
440 IF TL%=10 THEN GOSUB1770
450 GOSUB910
460 SC%(P)=SC%(P)+TL%
470 GOSUB740
480 GOSUB600
490 NEXT P,F

```

LISTINGS

```
500 FOR P=0 TO 1
510 SWAPY1,Y2
520 IF CS%(P)=B(P) OR SF%(P)=B(P) THE
N GOSUB1830
530 NEXT P
540 GOSUB2020
550 IF K=78 THEN END
560 ERASE B1%,B2%,CS%,OS%,ST%,SP%,SF%
,SC%,B
570 SCREEN2:COLOR15
580 GOTO210
590 '
600 REM:wait
610 FOR DL%=1 TO 750:NEXT DL%:RETURN
620 '
630 REM:indicate player
640 PLAY"O5L8CDEFGFEDC"
650 COLOR4:PRESET(84,Y2*168+8):PRINT#
1,STRING$(16,CHR$(219)):COLOR7:PRESET
(90,Y2*168+8):PRINT#1,"PLAYER"Y2+1
660 COLOR1:PRESET(84,Y1*168+8):PRINT#
1,STRING$(9,CHR$(219)):COLOR7:PRESET(
90,Y1*168+8):PRINT#1,"PLAYER"Y1+1
670 RETURN
680 '
690 REM:print line
700 PRESET(84,92):COLOR13:PRINT#1,STR
ING$(17,CHR$(219))
710 PSET(84,92):COLOR15:PRINT#1,A$
720 RETURN
730 '
740 REM:update scores
750 Y=P*134+30
760 IF F>10 THEN F=10
770 LINE(2,Y)-(256,Y+8),4,BF:COLOR15
780 PRESET(20+4*(F>9),Y):PRINT#1,F
790 PRESET(80+4*(ST%(P)>9),Y):PRINT#1
,ST%(P)
800 PRESET(140+4*(SP%(P)>9),Y):PRINT#
1,SP%(P)
810 PRESET(200+4*(SC%(P)>9)+4*(SC%(P)
>99),Y):PRINT#1,SC%(P)
820 RETURN
830 '
840 REM:set up pins
850 FOR I=1 TO 10
860 H(I)=0
870 PUT SPRITEI,(A(I,0),A(I,1)),15,2
880 NEXT I
890 RETURN
900 '
910 REM:calculate bonus
920 IF B(P)<3 THEN RETURN
930 IF SF%(P)=B(P)-1 THEN SC%(P)=SC%(
P)+B1%(P):RETURN
940 IF OS%(P)=B(P)-2 OR CS%(P)=B(P)-2
THEN SC%(P)=SC%(P)+B1%(P)+B2%(P)
950 RETURN
960 '
970 REM:bowling
980 B(P)=B(P)+1
990 HT%=-1:MI%=-1:PY%=0
1000 A$="Strength (0 - 9)?:GOSUB690
1010 DMY=USR(0)
1020 K$=INPUT$(1):V=ASC(K$)
1030 IF V<48 OR V>57 GOTO1020
1040 A$="Bias (L or R)?:GOSUB690
1050 DMY=USR(0)
```

```
1060 K$=INPUT$(1):W=ASC(K$) AND 223
1070 IF W<>76 AND W<>82 GOTO1060
1080 A$="":GOSUB690
1090 T=(V-47)+FNA(3)
1100 D=9-(V-48)
1110 Q=1+FNA(2)
1120 X=242:IF W=76 THEN Y=89-FNA(20)
ELSE Y=95+FNA(20)
1130 PUT SPRITE11,(X,Y),15,4:PUT SPRI
TE0,(X-8,Y),1
1140 IF STRIG(N) GOTO1190
1150 M=STICK(N)
1160 IF M=1 THEN Y=Y+Q*(Y>65)
1170 IF M=5 THEN Y=Y+ABS(Q*(Y<119))
1180 GOTO1130
1190 REM:bowling ball
1200 ON INTERVAL=T GOSUB1400
1210 PUT SPRITE11,(0,209),4
1220 N1=6:N2=31:GOSUB2310
1230 INTERVAL ON
1240 FOR X=234 TO -16 STEP-1
1250 IF Y<62 OR Y>122 THEN GOSUB1450
1260 PUT SPRITE0,(X,Y),1
1270 FOR I=0 TO D:NEXT I
1280 IF X MOD 8=0 THEN SPRITE ON
1290 NEXT X
1300 INTERVAL OFF
1310 SOUND7,56
1320 IF MI% THEN PLAY"L2O2FD":RETURN
1330 GOSUB1610
1340 GOSUB600
1350 FOR I=1 TO 10
1360 IF H(I) THEN PUT SPRITEI,(0,209)
1370 NEXT I
1380 RETURN
1390 '
1400 REM:bias
1410 IF FNA(2)=2 THEN RETURN
1420 IF W=76 THEN Y=Y+1 ELSE Y=Y-1
1430 RETURN
1440 '
1450 REM:in gutter
1460 Y=57+ABS(Y>122)*70:INTERVAL OFF
1470 RETURN
1480 '
1490 REM:strike
1500 OS%(P)=CS%(P):CS%(P)=B(P)
1510 PLAY"L16O5CFGCFGCFG"
1520 PRESET(88,92):PRINT#1,"STRIKE!"
1530 ST%(P)=ST%(P)+1
1540 RETURN
1550 '
1560 REM:number of pins hit
1570 TL%=0
1580 FOR I=1 TO 10:TL%=TL%+ABS(H(I)):
NEXT
1590 RETURN
1600 '
1610 REM:check for knockdowns
1620 IF H(1) AND PY% AND FNA(3)=3 AND
B1%(P)=0 THEN FOR S=1 TO 10::GOSUB17
30:NEXT:RETURN
1630 GOSUB1560:IF TL%=B1%(P) OR FNA(2
)=2 THEN RETURN
1640 FOR I=1 TO 6
1650 IF H(I)=0 GOTO1700
1660 IF I=1 THEN Z=0:GOTO1690
1670 IF I=2 OR I=3 THEN Z=1:GOTO1690
1680 Z=2
```

```

1690 FOR J=0 TO 1:S=FNA(2)+I+Z:GOSUB1
730:NEXT J
1700 NEXT I
1710 RETURN
1720 '
1730 REM:knock down pins
1740 IF H(S)=0 THEN PUT SPRITES,(A(S,
0),A(S,1)),,3:H(S)=-1
1750 RETURN
1760 '
1770 REM:spare
1780 PLAY"L1605FAFAFA"
1790 PRESET(88,92):PRINT#1,"SPARE"
1800 SF%(P)=B(P):SP%(P)=SP%(P)+1
1810 RETURN
1820 '
1830 REM:extra
1840 GOSUB850
1850 B1%(P)=0
1860 GOSUB630
1870 PRESET(168,P*168+8):COLOR15:PRIN
T#1,"EXTRA"
1880 IF SF%(P)=B(P) THEN NO%=1 ELSE N
O%=2
1890 FOR E=1 TO NO%
1900 GOSUB980:GOSUB1560
1910 IF E=2 GOTO1940
1920 B1%(P)=TL%:IF B1%(P)=10 THEN GOS
UB1490:GOSUB600:GOSUB840
1930 GOTO1970
1940 IF B1%(P)=10 THEN B2%(P)=TL% ELS
E B2%(P)=TL%-B1%(P)
1950 IF B2%(P)=10 THEN GOSUB1490:GOTO
1970
1960 IF TL%=10 THEN GOSUB1770
1970 GOSUB910
1980 NEXT E
1990 GOSUB740:GOSUB600
2000 RETURN
2010 '
2020 REM:end of game
2030 IF SC%(0)=SC%(1) THEN A$="Drawn
game":GOTO2050

```

```

2040 IF SC%(0)>SC%(1) THEN A$="Player
1 wins" ELSE A$="Player 2 wins"
2050 GOSUB690
2060 PLAY"O5L12CFAO6C8O5AO6C8"
2070 GOSUB600:A$="ANOTHER GAME ?":GOS
UB690
2080 DMY=USR(0)
2090 K$=INPUT$(1):K=ASC(K$) AND 223
2100 IF K<>78 AND K%<>89 GOTO2090
2110 SCREEN0:COLOR9
2120 FOR I=3 TO 19 STEP16:LOCATE7,I:P
RINT"*****":NEXT
2130 FOR I=4 TO 18:LOCATE7,I:PRINT"*"
SPC(22)"*":NEXT
2140 FOR I=0 TO 1:IF SC%(I)>HI% THEN
HI%=SC%(I):NEXT
2150 LOCATE11,11:PRINT "HIGH SCORE ="
HI%
2160 FOR I=0 TO 1:GOSUB600:NEXT
2170 RETURN
2180 '
2190 REM:sprite interrupt
2200 SPRITE OFF
2210 IF HT% THEN HT%=0:N1=16:N2=8:GOS
UB2310
2220 IF X>39 THEN S=1:GOTO2270
2230 IF X>31 THEN S=3+(Y>92):GOTO2260
2240 IF X>23 THEN IF Y>99 THEN S=4:GO
TO2270 ELSE S=6+(Y>83):GOTO2270
2250 IF Y>90 THEN S=8+(Y>108) ELSE S=
10+(Y>75)
2260 IF Y<88 OR Y>96 THEN PY%=-1
2270 GOSUB1730
2280 MI%=0
2290 RETURN
2300 '
2310 REM:sound
2320 SOUND7,55:SOUND8,N1:SOUND6,N2
2330 SOUND13,9:SOUND12,40
2340 RETURN
2350 '
2360 DATA40,92,32,100,32,84,24,108,24
,92,24,76,16,116,16,100,16,84,16,68

```

SUPER LANDER by Raymond Russell and Paul Saldeba

Landing space modules on planet surfaces is a tried and tested theme in computer programming, but we like this version. Eight little men are stranded on planets throughout the universe and it's your task to save them.

Main Program Variables

X,Y Lander co-ordinates
P Landing pad position
ST Level
Sc Score
Hi High Score
A1-A4,B1-B Alien co-ordinates
Cursorleft moves left
Cursorright moves right
Spacebar Upward thrust

```

10 *****
20 '* *
30 '* SUPER LANDER *
40 '* BY *
50 '* P.SALDEBA *
60 '* & *
70 '* R.RUSSELL *
80 '* *
90 '* (C) 1985 *
100 *****
110 COLOR7,1,1
120 CLS:KEY OFF
130 A$="*PLANET RESCUE*"
140 FORI=1TO LEN(A$)
150 LOCATE11,10:PRINTLEFT$(A$,I)
160 SOUND13,8:SOUND11,9:SOUND12,9: SO
UND6,20:SOUND8,16:SOUND7,&B110111:FOR
P=1 TO 100:NEXTP:SOUND8,0
170 NEXT
180 PRINT:PRINT: PRINT" BY RA
YMOND RUSSELL & P
AUL SALDEBA"
190 FORP=1TO 2000:NEXTP
200 COLOR7,1,1: ST=1:AF=2 :CLS:SS=1

```

LISTINGS

```
210 B1=60:B2=90:B3=120:B4=150
220 DATA PLUTO, NEPTUNE, URANUS, SATURN,
JUPITER, MARS, VENUS, EARTH: DIMA$(9)
230 FORI=1 TO 8
240 READA$
250 A$(I)=A$
260 NEXTI
270 SCREEN2, 2: COLOR, 1, 1: SC=0: STRIG(0)
ON
280 S=2: L=255
290 X1=51 : Y1=12: LINE(50, 12)-(250, 15)
, 10, BF: X=10: Y=20
300 LINE(49, 11)-(251, 16), 4, B
310 OPEN"grp: "FOROUTPUTAS #1
320 GOSUB 900
330 GOSUB 1870
340 GOSUB 2320
350 PRESET(10, 9 ): PRINT#1, "FUEL "
360 PRESET(130, 0): PRINT#1, "HI-SCORE"
; HI
370 PUTSPRITE1, (0, 0), 0, 0
380 '***** main loop *****
390 A3=RND(1)*256: A4=RND(1)*256: A1=R
ND(1)*256: A2=RND(1)*256: FORI=1 TO 50: P
SET(20+RND(1)*256, RND(1)*165), 5: NEXTI
400 P=20+INT(RND(1)*200)
410 LINE(P, 140)-(P+22, 192), SS, BF
420 Q1=INT(RND(1)*14)+2: Q2=INT(RND(1)
*14)+2: IF Q1=Q2 OR Q1=8 OR Q2=8 OR Q1
=5 OR Q2=5 OR Q1=7 OR Q2=7 THEN 420
430 C1=Q1: GOSUB 800: PAINT(255, 191), Q1,
Q1: C1=Q2: B=190: GOSUB 800: PAINT(255, 191
), Q2, Q2
440 LINE(P, 140)-(P+22, 192), SS, BF: LINE
(P, 188)-(P+22, 200), 8, BF
450 LINE(50, 12)-(250, 15), 10, BF
460 LINE(56, 0)-(100, 8), 1, BF: PRESET(1
0, 0): PRINT#1, "SCORE": SC
470 PUTSPRITE1, (0, 255), 0, 0
480 FORK=1 TO 2: PUTSPRITEF, (X, Y), 13
, F
490 LINE(X1, Y1)-(X1+2, Y1+3), 1, BF
500 IF STICK(0)=3 THEN D=D+.6
510 IF STICK(0)=7 THEN D=D-.6
520 Y=Y+G: G=G+.4: Y=INT(Y): IF G>4 THE
N G=4
530 IF Y<20 THEN Y=20
540 IF X1>250 THEN 1060
550 X=X+D
560 SPRITE ON: ON SPRITE GOSUB 2300:
SPRITE OFF
570 IF X<0 THEN X=0
580 IF X>234 THEN X=234
590 IF STRIG(0)=-1 THEN G=G-.8: X1=X1+
2 : SOUND6, 0 : SOUND8, 15: SOUND7, &B11011
1: GOTO 610
600 SOUND8, 0
610 IF M=2 THEN 660
620 IF POINT(X, Y+16)=Q1 OR POINT(X, Y+
16)=Q2 THEN 1060
630 IF POINT(X+16, Y+16)=Q1 OR POINT(X
+16, Y+16)=Q2 THEN 1060
640 IF POINT(X+8, INT(Y)+16)=8 THEN 11
20
650 GOTO 700
660 IF POINT(X+5, Y+15)=Q1 OR POINT(X+
5, Y+15)=Q2 THEN 1060
670 IF POINT(X+11, Y+15)=Q1 OR POINT(X
+11, Y+15)=Q2 THEN 1060
```

```
680 IF POINT(X+8, INT(Y)+16)=0 THEN 12
50
690 QW=RND(1): IF Y>168 THEN 1060
700 NEXTK
710 PUTSPRITE2, (A1, B1), 10, AF
720 A1=A1+3
730 PUTSPRITE3, (A2, B2), 4, AF
740 A2=A2-5
750 PUTSPRITE4, (A3, B3), 12, AF
760 A3=A3-3
770 PUTSPRITE5, (A4, B4), 6, AF
780 A4=A4+4
790 GOTO 480
800 B=185
810 PRESET(0, 170): FORA=0 TO 256 STEP 3
820 C=INT(RND(1)*3)
830 IF C=1 THEN B=B-3
840 IF C=0 THEN B=B+3
850 IF B>190 THEN B=190
860 IF B<165 THEN B=165
870 LINE-(A, B), C1
880 NEXT
890 RETURN
900 DATA 0, 0, 0, 6, 11, 11, 11, 15, 21, 35, 36
, 40, 48, 32, 112, 244
910 DATA 0, 0, 0, 224, 240, 240, 240, 240, 23
2, 196, 36, 20, 12, 4, 14, 31
920 DATA 0, 0, 0, 0, 1, 1, 1, 2, 2, 2, 5, 5, 13,
13, 2, 0, 0, 0, 0, 128, 128, 128, 192, 192, 19
2, 224, 224, 240, 240, 192, 0
930 FORI=1 TO 32
940 READA
950 S$=S$+CHR$(A)
960 NEXTI
970 SPRITE$(0)=S$
980 S$=""
990 FORI=1 TO 32
1000 READA
1010 S$=S$+CHR$(A)
1020 NEXTI
1030 SPRITE$(1)=S$
1040 S$=""
1050 RETURN
1060 FORI=1 TO 20: CIRCLE(X+8, Y+8), I, I
NT(RND(1)*14)+2
1070 NEXTI
1080 PUTSPRITEF, (X, Y), 0, F
1090 FORI=1 TO 20: CIRCLE(X+8, Y+8), I, 1
1100 NEXT
1110 GOTO 1670
1120 M=2
1130 F=1
1140 L=255: PRESET(98, 96): COLOR 15: PRIN
T#1, "RIGHT ON!"
1150 X2=X: Y2=Y-4
1160 FORI=X1 TO 250 STEP 4
1170 SC=SC+20
1180 LINE(I, 12)-(I+3, 15), 1, BF
1190 SOUND0, L: SOUND1, 2 : SOUND2, L: SOUN
D3, 4: SOUND9, 15: SOUND8, 15: SOUND7, &B111
100: L=L-2
1200 NEXTI: LINE(90, 96)-(170, 104), SS, B
F
1210 SOUND8, 0: SOUND9, 0
1220 LINE(X+5, Y+1)-(X+11, Y+3), 0, BF
1230 X=10: Y=20: LF=255: X1=51
1240 GOTO 450
1250 L=255: PRESET(60, 96): PRINT#1, "DOC
KING SUCCESSFUL"
```



```

1260 PUTSPRITE0,(X2,Y2),13,0:PUTSPRIT
E1,(X2,Y2-13),13,1
1270 FORJ=1 TO 100:SOUND8,15:SOUND1,0
:SOUND0,RND(1)*255:SOUND7,&B111110:NE
XTJ:SOUND8,0
1280 FORI=X1 TO 250 STEP4
1290 SC=SC+40
1300 LINE(I,12)-(I+3,15),1,BF
1310 SOUND0,L:SOUND1,2 :SOUND2,L:SOUN
D3,4:SOUND9,15:SOUND8,15:SOUND7,&B111
100:L=L-2
1320 NEXTI
1330 IF ST=9 THEN 2640
1340 GOSUB 2570
1350 PUTSPRITE10,(128,0),0,0
1360 L=255
1370 SOUND8,0:SOUND9,0
1380 PRESET(90,106):COLOR15:PRINT#1,"
1500 BONUS"
1390 LINE(57,93)-(201,115),13,B
1400 FORJ=1TO 6
1410 FORI=0 TO 25
1420 SOUND1,1:SOUND8,15:SOUND7,&B1111
10:SOUND0,I:NEXTI,J:SOUND8,0
1430 SC=SC+1500
1440 LINE(55,90)-(209,116),1,BF
1450 GOSUB 1530
1460 LINE(0,165)-(255,192),1,BF
1470 X=0:Y=0
1480 A1=RND(1)*256:A2=RND(1)*256:A3=R
ND(1)*256:A4=RND(1)*256:AF=AF+1
1490 F=0:M=1:X1=51:PUTSPRITE1,(0,0),0
,0
1500 X=10:Y=20:L=1
1510 IF ST=9 THEN LINE(0,20)-(255,191
),7,BF:SS=7
1520 GOTO 400
1530 PUTSPRITE0,(0,208),0,0: FORI=1 T
O 70 STEP 6
1540 DRAW"S=I;C9BM128,96BG4U8R8D8L8"
1550 NEXTI
1560 FORI=1 TO 70 STEP 6
1570 DRAW"S=I;BM128,96BG4C1U8R8D8L8"
1580 IF I=49 THEN 1610
1590 NEXTI
1600 RETURN
1610 PRESET(110,96):PRINT#1,A$(ST)
1620 FORJ=1 TO 3: FORO=1 TO 255 STEP
10
1630 SOUND0,0:SOUND1,2:SOUND0,255-0:S
OUND1,2:SOUND8,15:SOUND7,&B111100:NEX
TO
1640 NEXTJ
1650 SOUND8,0:ST=ST+1
1660 LINE(105,96)-(164,104),1,BF:GOTO
1590
1670 '***** NEW GAME? *****
1680 PRESET(20,40):PRINT#1,"YOUR SCOR
E IS";SC;
1690 IF SC>HI THEN HI=SC
1700 PRESET(20,60):PRINT#1,"THE HI-SC
ORE IS ";HI
1710 PRESET(20,80):PRINT#1,"*****
NEW GAME? *****"
1720 A$=INKEY$
1730 IF A$="N"THEN END
1740 IF A$="n" THEN END
1750 IF A$="Y" THEN 1790

```

```

1760 IF A$="y" THEN 1790
1770 SOUND8,0
1780 GOTO1720
1790 LINE(130,0)-(250,8),1,BF:SC=0:PR
ESET(130,0):PRINT#1,"HI-SCORE";HI
1800 PUTSPRITE0,(0,208),0,0
1810 PUTSPRITE1,(255,0),0,0
1820 M=1:F=0:ST=1:X=10:Y=20:X1=51:AF=
2
1830 LINE(0,0)-(255,191),1,BF
1840 LINE(50,12)-(250,15),10,BF
1850 LINE(49,11)-(251,16),4,B
1860 GOTO 350
1870 DATA 255,57,31,7,63,67,159,56,25
4,0,0,0,0,0,0,0,255,156,248,224,252,1
94,249,28,127,0,0,0,0,0,0,0
1880 FORI=1 TO 32
1890 READK
1900 S$=S$+CHR$(K)
1910 NEXTI
1920 SPRITE$(2)=S$:SPRITE$(9)=S$
1930 S$=""
1940 DATA 0,0,13,127,103,127,63,14,28
,57,57,28,15,1,1,0,0,0,252,254,238,25
4,252,112,224,192,200,232,120,0,0,0
1950 FORI=1 TO 32
1960 READK
1970 S$=S$+CHR$(K)
1980 NEXTI
1990 SPRITE$(3)=S$
2000 S$=""
2010 DATA 240,48,63,51,113,255,170,11
3,255,48,24,14,248,0,0,0,15,12,252,20
4,142,255,171,85,255,12,24,112,31,0,0
,0
2020 FORI=1TO 32
2030 READK
2040 S$=S$+CHR$(K)
2050 NEXTI
2060 SPRITE$(4)=S$:SPRITE$(8)=S$
2070 S$=""
2080 DATA 12,63,115,227,127,6,12,60,0
,0,0,0,0,0,0,0,48,252,106,199,252,96,
48,60,0,0,0,0,0,0,0,0
2090 FORI=1 TO 32
2100 READK
2110 S$=S$+CHR$(K)
2120 NEXTI
2130 SPRITE$(5)=S$:SPRITE$(10)=S$
2140 S$=""
2150 DATA 4,30,54,39,44,43,63,16,30,3
0,0,0,0,0,0,0,32,120,108,228,52,180,2
52,8,120,120,0,0,0,0,0,0
2160 FORI=1 TO 32
2170 READK
2180 S$=S$+CHR$(K)
2190 NEXTI
2200 SPRITE$(6)=S$
2210 S$=""
2220 DATA0,0,63,127,96,121,63,31,60,1
20,120,60,36,14,0,0,0,0,252,254,62,25
4,252,248,60,36,30,60,120,112,0,0
2230 FORI=1TO32
2240 READK
2250 S$=S$+CHR$(K)
2260 NEXTI
2270 SPRITE$(7)=S$
2280 S$=""

```

LISTINGS

```

2290 RETURN
2300 IF A1+16> X THEN IF B1<Y+16 THEN
1060
2310 RETURN
2320 DATA 0,0,3,3,3,1,1,1,1,1,1,1,7,5
,1,1,0,0,128,128,128,128,128,224,128,
64,32,64,128,0,0,192
2330 DATA 0,0,3,3,3,3,5,9,5,1,1,1,31,
16,0,0,0,0,128,128,128,128,128,240,12
8,64,32,16,16,16,24,0
2340 DATA 0,0,3,3,3,3,15,9,9,9,1,1,34
,84,8,0,0,0,0,128,128,128,136,208,160
,192,232,16,16,16,28,0
2350 DATA 0,0,3,3,3,3,5,9,5,1,1,34,84
,8,0,0,0,0,128,128,128,128,128,240,12
8,128,128,128,128,128,224,0
2360 S$="": FORI=1 TO 32
2370 READK
2380 S$=S$+CHR$(K)
2390 NEXTI
2400 FORI=1TO32
2410 READK
2420 T$=T$+CHR$(K)
2430 NEXTI
2440 FORI=1TO32
2450 READK
2460 T$=T$+CHR$(K)
2470 NEXTI
2480 SPRITE$(11)=S$
2490 FORI=1TO32
2500 READK
2510 V$=V$+CHR$(K)
2520 NEXTI

```

```

2530 SPRITE$(12)=T$
2540 SPRITE$(13)=U$
2550 SPRITE$(14)=V$
2560 RETURN
2570 MF=11
2580 FORM1=0 TOX
2590 PUTSPRITE10,(M1,172),15,INT(MF)
2600 MF=MF+.2:IF MF=15 THEN MF=11
2610 NEXTM1
2620 RETURN
2630 SCREEN 2:OPEN"grp:"FOROUTPUTAS#1
2640 SOUND8,0:LINE(0,96)-(255,104),7,
BF: FORI=30 TO 150 STEP 9: PRESET(55,
I ):COLOR 1:PRINT#1,"MISSION COMPLETE
D":NEXTI
2650 GOSUB 2720
2660 FORI=1 TO 2:PLAY"V1502T255;AAABA
CADAFAFAGAFADACABAA":NEXTI
2670 LINE(0,17)-(255,191),1,BF
2680 LINE(80,0)-(256,8),1,BF
2690 ST=1:AF=2:X1=51:X=20:Y=20:PUTSPR
ITE0,(2,208),0,0:M=1:F=0:COLOR 15:GOT
O 360
2700 LINE(50,12)-(250,15),10,BF
2710 LINE(49,11)-(251,16),4,B
2720 FORI=1 TO9
2730 FORM1=X TO 256 STEP 2
2740 PUTSPRITE10,(M1,172),1,INT(MF)
2750 MF=MF+.2:IF MF=15 THEN MF=11
2760 NEXTM1
2770 NEXTI
2780 SS=1:RETURN

```

TILER by J. Moscrip

Tiling floors is not everyone's cup of tea, especially if you have to do it quickly, but it's great fun in this game. Vicious spikes make life difficult and you must ensure they don't bump into each other — otherwise you've had it. The spikes get faster each time you complete a floor.

Main Program Variables

IN Interval to move sprites
Y3 Y co-ordinates for sprite 3
SH Screens completed
X2, Y2 Sprite 2 co-ordinates
X1, Y1 Sprite 1 co-ordinates
N\$ Joystick or keyboard
C\$ Music on/off
S Joystick or cursor movement
L Joystick or keyboard control: 1 or 0
X, Y Sprite co-ordinates
MU Is music playing?
CLOAD loads Tiler

```

1 REM*****
2 REM***TILER***
3 REM***BY***
4 REM**J.MOSCRIP**
5 REM*****
9 KEY OFF
10 SCREEN 0
15 REM**USE JOYSTICK OR KEYBOARD**
20 LOCATE 3,6: INPUT"JOYSTICK/KEYBOARD(

```

```

J/K)";N$
30 IF N$="J" OR N$="j" THEN L=1:GOTO 6
0
40 IF N$="K" OR N$="k" THEN L=0:GOTO
60
50 GOTO 10
55 REM**MUSIC ON/OFF**
60 LOCATE 3,9: INPUT"MUSIC(Y/N)";L$
70 IF L$="y" OR L$="Y" THEN MU=1:GOTO 10
0
80 IF L$="n" OR L$="N" THEN MU=0:GOTO 1
00
90 GOTO 60
95 REM**SET VARIABLES**
100 IN=60:Y3=20:SH=1:X2=80:Y2=64:X1=1
12:Y1=120
120 KEYOFF
125 REM**DEFINE TUNE**
130 B$="T255V10R202GO3CR4ECR402GO3CR4
ECR2DED02BR403EER2"
140 A$="T255V10R202GO3ER4GER402GO3ER4
GER2FGFDR4GCR2"
150 REM**DEFINE SPRITES**
170 SCREEN 2,0,0
180 OPEN"grp:"AS1
190 FOR H=0 TO 2
200 FOR I=1 TO 8
210 READ A$
220 S$=S$+CHR$(VAL("&b"+A$))
230 NEXTI
240 SPRITE$(H)=S$
250 S$="":A$=""
260 NEXTH
270 DATA 00011000

```

```

280 DATA 00111100
290 DATA 00011000
300 DATA 11111111
310 DATA 00011000
320 DATA 00011000
330 DATA 00100100
340 DATA 01000010
350 REM **sprite2**
360 DATA 11100111
370 DATA 11000011
380 DATA 10100101
390 DATA 00011000
400 DATA 00011000
410 DATA 10100101
420 DATA 11000011
430 DATA 11100111
440 REM **sprite3**
450 DATA 00000000
460 DATA 11111000
470 DATA 11111100
480 DATA 11111110
490 DATA 11111111
500 DATA 11111110
510 DATA 11111100
520 DATA 11111000
530 REM***540-640 set up screen***
540 COLOR 15,4,4
542 ON INTERVAL=IN GOSUB 840
543 ON SPRITE GOSUB 1330
550 LINE(178,13)-(250,183),,B
560 LINE(29,13)-(176,184),15,B
570 LINE(30,14)-(175,183),1,BF
580 LINE(210,18)-(230,104),,B
590 LINE(213,25)-(227,25)
600 LINE(213,100)-(227,100)
610 LINE(211,19)-(229,103),,B
620 PSET(215,29),15:DRAW"r1015d10bd8d
10bd8d5u5r5d10u10110d10bd8d10r10110u5
r10110u5r10"
630 PSET(185,150),15:DRAW"15d5r5d515b
r7u5r515d5r5br2u5r5d515br7u5r5br2r5d2
15u2d5r5"
640 PSET(185,130),15:DRAW"L5D5R5D5L5B
R7U10D5R5D5BR2R5L5U5R5D2L5BR7U2R5D2L5
D3R5BR2R5L5U7R5L5U3"
645 REM**SET UP INTERRUPTS**
650 INTERVAL ON
660 SPRITE ON
665 REM**CHECK JOYSTICK/CURSORS**
670 S=STICK(L)
680 IFS=1 THEN Y=Y-8
690 IF S=5 THEN Y=Y+8
700 IF S=3 THEN X=X+8
710 IF S=7 THEN X=X-8
720 IF Y3=95 THEN GOSUB 1240
730 IF STRIG(L)=-1 THEN GOSUB 1090
740 GOSUB 790
750 PUT SPRITE 0,(X-1,Y-2),4,0
755 REM**PUT TILE ON SCREEN**
760 IF POINT(X,Y)<>7 THEN LINE(X,Y-1)
-(X+6,Y+5),7,BF:T=T+1
770 B=B+1:IF B=20 THEN GOSUB 1030:REM
##TO MOVE TIMER##
780 GOTO 670
785 REM**KEEP SPRITE ON SCREEN**
790 IF X>168 THEN X=168
800 IF X<32 THEN X=32
810 IF Y<16 THEN Y=16
820 IF Y>176 THEN Y=176

```

```

830 RETURN
835 REM**MOVE SPRITE1 TOWARDS MAN**
840 IF X>X1 THEN X1=X1+8:GOTO 880
850 IF Y<Y1 THEN Y1=Y1-8:GOTO 880
860 IF X<X1 THEN X1=X1-8:GOTO 880
870 IF Y>Y1 THEN Y1=Y1+8:GOTO 880
880 IF X1>168 THEN X1=168
890 IF X1<32 THEN X1=32
900 IF Y1<16 THEN Y1=16
910 IF Y1>176 THEN Y1=176
920 PUT SPRITE 1,(X1-1,Y1-2),5,1
925 REM**MOVE SPRITE2 TOWARDS MAN**
930 IF Y<Y2 THEN Y2=Y2-8:GOTO 970
940 IF Y>Y2 THEN Y2=Y2+8:GOTO 970
950 IF X<X2 THEN X2=X2-8:GOTO 970
960 IF X>X2 THEN X2=X2+8:GOTO 970
965 REM**KEEP SPRITE2 ON SCREEN **
970 IF X2>168 THEN X2=168
980 IF X2<32 THEN X2=32
990 IF Y2<16 THEN Y2=16
1000 IF Y2>176 THEN Y2=176
1010 PUT SPRITE 3,(X2-1,Y2-2),5,1
1020 RETURN
1025 REM**MOVE TIMER**
1030 Y3=Y3+1:IF Y3=>100 THEN GOTO 124
0
1040 PUT SPRITE 2,(200,Y3),15,2
1045 REM**CHECK IF MUSIC IS PLAYING**
1050 IF MU=0 THEN 1070
1060 IF PLAY(0)<>-1 THEN PLAY A$,B$
1070 B=0
1080 RETURN
1085 REM**CHECK IF SCREEN IS TILED CO
MPLETELY**
1090 PUT SPRITE 0,(100,208),15,0
1100 J=0:H=0
1110 PUT SPRITE 1,(100,208),15,0
1120 FOR J=16 TO 176 STEP 8
1130 FOR H=32 TO 168 STEP 8
1140 IF POINT(H,J)<>7 THEN RETURN
1150 NEXT H,J
1155 REM**UPDATE SCORE+SHEET**
1160 SC=INT(SC+(T-Y3)/10)
1170 SH=SH+1
1180 LINE(220,149)-(250,164),4,BF:PSE
T(212,153):PRINT#1,"";SC
1190 LINE(220,124)-(252,140),4,BF:PSE
T(220,130):PRINT#1,"";SH
1195 REM**RESET VARIABLES ETC.**
1200 IN=IN-4
1210 Y3=20:X1=112:Y1=120:Y=16:X=32
1220 X2=72:Y2=64:
1230 GOTO 540
1235 REM**SCREEN IF TIME RAN OUT**
1240 INTERVALOFF:SOUND8,0:FOR G=1 TO
500:NEXTG
1250 SCREEN 0
1260 LOCATE 4,4:PRINT"BAD LUCK YOUR T
IME RAN OUT"
1270 IF SC=0 THEN SC=INT(T/10)
1280 LOCATE 8,10:PRINT"YOU SCORED ";S
C
1290 LOCATE 5,13:PRINT"YOU DIED ON SH
EET ";SH
1300 LOCATE 5,16:PRINT"HIT SPACE OR F
IRE TO PLAY AGAIN"
1310 FOR G=1 TO 500:NEXTG
1320 IF STRIG(L)=-1 THEN RUN ELSE 132
0

```

```

1330 INTERVAL OFF:SOUND8,0:FOR G=1 TO
500:NEXTG
1335 REM**SCREEN IF SPIKE KILLED YOU*
*
1340 SCREEN 0
1350 LOCATE 4,4:PRINT"BAD LUCK YOU WE
RE KILLED BY"
1360 LOCATE 12,6:PRINT" THE SPIKES"
1370 IF SC=0 THEN SC=INT(T/10)

```

```

1380 LOCATE 8,10:PRINT"YOU SCORED ";S
C
1390 LOCATE 5,13:PRINT"YOU DIED ON SH
EET ";SH
1400 LOCATE 5,16:PRINT"HIT SPACE OR F
IRE TO PLAY AGAIN"
1410 FOR G=1 TO 500:NEXTG
1420 IF STRIG(L)=-1 THEN RUN ELSE 142
0

```

BINOMIAL FALL

By Chris Ratcliffe

Guessing the destination of a ball as it falls through a triangular matrix of pegs — similar to the fairground side show — is the subject of this program.

But, there is more to it than meets the eye. The program demonstrates how a series of purely random events can produce a mathematically predictable pattern.

The number of paths and hence the number of places the ball will fall can be calculated using a complicated mathematical expression known as 'Binomial Distribution'. But you don't need to be a mathematical genius to enjoy this game!

```

10 REM *** Binomial Fall ***
20 REM *** Chris Ratcliffe ***
40 REM
50 REM ** reset random seed **
60 X=RND(-TIME)
70 REM ** set up screen **
80 KEY OFF
90 COLOR 1,14,12
100 SCREEN 0
110 LOCATE 12,1:PRINT"Binomial Fall"
120 LOCATE 11,2:PRINTSTRING$(15,"-")
130 PRINT:PRINT" This program is a s
imulation of the famous fairground
sideshow where a ball is dropped
onto a triangle of pegs, and th
e player must guess where it will
eventually land."
140 PRINT:PRINT" The computer will k
eep a count of where the balls go, an
d will display this, along with the mo
st likely"
150 PRINT"distribution."
160 PRINT:PRINT" Press the space bar
at any time to stop the pro
gram."
170 PRINT:PRINT" Press any key
to start."
180 IF INKEY$<>"" THEN 180
190 IF INKEY$="" THEN 190
200 ON STRIG GOSUB 1760:STRIG(0) ON
210 SCREEN 2,0,0
220 DIM N(13),P(13)
230 OPEN "grp:" FOR OUTPUT AS #1
240 A$=CHR$(112)+STRING$(3,248)
250 SPRITE$(1)=A$+CHR$(112)
260 CLS
270 COLOR 1
280 REM ** draw 'triangle' **

```

```

290 FOR L=0 TO 132 STEP 12
300 FOR X=-L/2 TO L/2 STEP 12
310 PSET (128+X,18+L),1
320 LINE - STEP (2,4)
330 LINE - STEP (-4,0)
340 LINE - STEP (2,-4)
350 PAINT STEP (0,2)
360 NEXT X,L
370 REM ** draw bottom 'rack' **
380 COLOR 4
390 FOR X=44 TO 212 STEP 12
400 PSET (X,162)
410 LINE - STEP (2,4)
420 LINE - STEP (0,19)
430 LINE - STEP (-4,0)
440 LINE - STEP (0,-19)
450 LINE - STEP (2,-4)
460 PAINT (X,164)
470 NEXT X
480 LINE (42,186)-(214,191),4,BF
490 REM ** print up data **
500 COLOR 6
510 PSET (16,3),14
520 PRINT #1,"Experimental"
530 PSET (155,3)
540 PRINT #1,"Theoretical"
550 FOR X=0 TO 13
560 COLOR 4
570 PSET (X*12+48,172),14
580 PRINT #1,CHR$(97+X)
590 COLOR 12
600 PSET (16,X*8+16),14
610 PRINT #1,CHR$(65+X);
620 COLOR 1
630 PRINT #1,N(X)
640 COLOR 12
650 PSET (210,X*8+16),14
660 PRINT #1,CHR$(65+X);
670 COLOR 1
680 PRINT #1,P(X);
690 NEXT X
700 LINE (14,130)-(50,130)
710 LINE (208,130)-(244,130)
720 REM ** main simulation loop **
730 FOR V=0 TO 4
740 REM * update theoretical data *
750 PSET (202,136),14
760 FOR T=9 TO 8*LEN(STR$(Q))
770 VPOKE T+4551,0
780 NEXT T
790 PRINT #1,Q;
800 RESTORE 1740
810 FOR X=0 TO 13
820 READ T
830 I=INT((T*Q/8192)+.5)
840 IF I=P(X) THEN 920
850 P(X)=I

```

```

860 PSET (218,X*8+16),14
870 S=727+256*X
880 FOR T=9 TO 8*LEN(STR$(I))
890 VPOKE S+T,0
900 NEXT T
910 PRINT#1,I;
920 NEXT X
930 REM ** main fall loop **
940 FOR L=1 TO 10
950 X=126
960 FOR Y=-4 TO 11
970 PUT SPRITE 1,(126,Y),6,1
980 NEXT Y
990 FOR Y=11 TO 161 STEP 12
1000 M=INT(50+RND(1)*4-Y/4)
1010 PLAY "m500s0t255164n"+STR$(M)
1020 D=SGN(RND(1)-.5)
1030 FOR T=0 TO 6
1040 PUT SPRITE 1,(X+T*D,Y+T)
1050 NEXT T
1060 X=X+6*D
1070 FOR T=0 TO 6
1080 PUT SPRITE 1,STEP(0,1)
1090 NEXT T,Y
1100 FOR T=0 TO 11
1110 PUT SPRITE 1,STEP(0,1)
1120 NEXT T
1130 PUT SPRITE 2,(X,180),6,1
1140 PLAY "m2700t32n8"
1150 REM **update experimental data**
1160 N=(X/12)-4
1170 X=256*N+535
1180 FOR T=9 TO 8*LEN(STR$(N(N)))
1190 VPOKE X+T,0
1200 NEXT T
1210 FOR T=9 TO 8*LEN(STR$(Q))
1220 VPOKE T+4359,0
1230 NEXT T
1240 N(N)=N(N)+1
1250 Q=Q+1
1260 PUT SPRITE 3,(218,16+8*N),6,1
1270 PUT SPRITE 4,STEP(-194,0),6,1
1280 PRINT #1,N(N);
1290 PSET (8,136),14
1300 COLOR 1
1310 PRINT #1,Q;
1320 NEXT L,V
1330 REM ** draw graph routine **
1340 FOR T=0 TO 999
1350 NEXT T
1360 M=0
1370 FOR T=0 TO 13
1380 IF N(T) > M THEN M=N(T)
1390 IF P(T) > M THEN M=P(T)
1400 NEXT T
1410 SCREEN 2
1420 M=148/M
1430 REM ** draw a 'bar' lop **
1440 FOR T=0 TO 13
1450 X=24+16*T
1460 Y1=-N(T)*M

```

```

1470 Y2=-P(T)*M
1480 LINE (X,180)-STEP(5,Y1),4,BF
1490 LINE (X+6,180)-STEP(5,Y2),6,BF
1500 NEXT T
1510 LINE (18,180)-(248,191),1,BF
1520 COLOR 15
1530 FOR T=0 TO 13
1540 PSET (27+16*T,183),1
1550 PRINT #1,CHR$(65+T)
1560 NEXT T
1570 REM ** print up text **
1580 COLOR 1
1590 PSET (13,4),14
1600 PRINT #1,"Graph after";Q;
1610 PRINT #1,"events";
1620 COLOR 4
1630 PSET (13,13),14
1640 PRINT #1,STRING$(3,219);
1650 PRINT #1," Experimental results"
1660 COLOR 6
1670 PSET (13,22),14
1680 PRINT #1,STRING$(3,219);
1690 PRINT #1," Theoretical results";
1700 FOR T=0 TO 9999
1710 NEXT T
1720 GOTO 260
1730 REM ** binomial coefficients **
1740 DATA 1,13,78,286,715,1287,1716
1750 DATA 1716,1287,715,286,78,13,1
1760 REM *****
1770 SCREEN 1:COLOR 15,4,4

```

STAR ATTACK by Duncan Larkman

Hitting as many falling stars by manoeuvring your sight around with cursor keys is the aim of this simple but fun game. Try to score as many hits as you can before being destroyed. This is one of the first programs Duncan ever wrote and is a great first effort.

```

10 SCREEN 2,0
20 COLOR 15,1,1:CLS
30 REM *** STAR ATTACK ***
40 REM By D Larkman. 1985 (c)
50 KEY OFF
70 REM *** DEFINE SPRITES ***
80 A$=""
90 FOR AL=1 TO 8
100 READ S$
110 A$=A$+CHR$(VAL("&B"+S$))
120 NEXT
130 DATA 00011000
140 DATA 00111100
150 DATA 01111110
160 DATA 11111111
170 DATA 01111110
180 DATA 00111100
190 DATA 00011000
200 DATA 00000000
210 SPRITE$(1)=A$
220 B$=""
230 FOR AL=1 TO 8
240 READ S$
250 B$=B$+CHR$(VAL("&B"+S$))
260 NEXT AL
270 DATA 11111111
280 DATA 10011001
290 DATA 10011001
300 DATA 11100111
310 DATA 11100111
320 DATA 10011001
330 DATA 10011001
340 DATA 11111111
350 SPRITE$(2)=B$
360 REM *** VARIABLES ***
370 QP=RND(-TIME)
380 SC=0
385 SPRITE OFF
390 X=125:Y=100
400 DP=0
410 REM *** DRAW SCREEN ***
420 LINE (0,150)-(256,150),6
430 PAINT (10,160),6
440 FOR QR=1 TO 50
450 QW=INT(RND(1)*256)
460 QE=INT(RND(1)*130)
470 PSET(QW,QE),14
480 NEXT
490 CIRCLE (10,5),30,14

```

```

500 PAINT (2,2),14
510 A=STICK(0):B=STICK(1)
520 A1=INT(RND(1)*200)+50
530 REM *** MAIN LOOP ***
540 PUT SPRITE 2,(X,Y),7
550 A=STICK(0):B=STICK(1)
560 IF A=1 AND Y>50 THEN Y=Y-5
570 IF A=5 AND Y<140 THEN Y=Y+5
580 IF A=7 AND X>8 THEN X=X-5
590 IF A=3 AND X<244 THEN X=X+5
600 IF B=1 AND Y>50 THEN Y=Y-5
610 IF B=5 AND Y<140 THEN Y=Y+5
620 IF B=7 AND X>8 THEN X=X-5
630 IF B=3 AND X<244 THEN X=X+5
640 IF STRIG(0) OR STRIG(1)=-1 THEN G
OSUB 2000
650 PUT SPRITE 1,(A1,DP),11
660 DP=DP+5
670 IF DP>142 THEN GOTO 1000
680 BEEP
685 SPRITE OFF
690 GOTO 530
1000 REM * BOMB HAS LANDED *
1010 SOUND 0,0:SOUND 1,5:SOUND 2,0:SO
UND 3,13:SOUND 4,255:SOUND 5,15:SOUND
6,30:SOUND 7,0:SOUND 8,16:SOUND 9,16
:SOUND 10,16:SOUND 11,0:SOUND 12,5:SO
UND 13,0:FOR QP=0 TO 30:NEXT QP:SOUND
12,56:SOUND 13,0
1020 CLS:SCREEN 0:COLOR 15,1,1:LOCATE
0,2:PRINT "A BOMB HAS LANDED ON YOUR
PLANET AND THE PLANET IS DESTROY
ED,EVERONE IS KILLED":PRINT:PRINT "S
CORE:";SC
1030 PRINT:PRINT:INPUT "DO YOU WANT T
O PLAY AGAIN <Y/N>";B$
1040 IF B$="N" OR B$="n" THEN CLS:PRI
NT"GOODBYE...":END
1050 IF B$="Y" OR B$="y" THEN RUN
1060 GOTO 1040
2000 REM *** FIRE LASERS ***
2005 SOUND 6,15:SOUND 7,7:SOUND 8,16:
SOUND 9,16:SOUND 10,16:SOUND 11,0:SOU
ND 12,16:SOUND 13,0
2010 LINE (0,149)-(X+5,Y+5),9:LINE (2
56,149)-(X+5,Y+5),9
2020 LINE (0,148)-(X+5,Y+5),1:LINE (2
44,148)-(X+5,Y+5),1
2030 ON SPRITE GOSUB 3000
2040 SPRITE ON
2050 RETURN
3000 SPRITE OFF:CLS:SCREEN 1:PRINT "G
OOD SHOT!! COMMANDER":SC=SC+10:PRINT
"SCORE:";SC
3005 FOR AL=1 TO 500:NEXT
3010 SCREEN 2:RETURN 390

```

IF IT RUNS, WE WANT TO SEE IT!

This action-packed section will appear in every issue of *MSX Computing*, crammed full of games and utility listings for MSX micros. Each program is listed straight on to a printer from a working version.

As you grow more familiar with your micro, and become confident that you can produce a game or program of interest to all our readers, why not send it in? But we have to insist on tape or 3.5 inch disk copies, as we haven't the time to type in programs ourselves.

Your covering letter should include instructions on how to use or play the program, as well as a brief description of any interesting programming techniques and a list of the main variables.

We will, of course, pay for any listings we print, exactly how much depending on the quality of the program — NOT the length! As a rough guide, you can expect between £10 and £50, with anything up to £100 for a really exceptional program. Programs which, for any reason, we are not interested in using are returned immediately.

Entering your listings

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

Sometimes you will see a row of letters or other characters in a PRINT statement. This happens when the program, as supplied, contains graphics characters

which our printer doesn't recognise. If the particular character is important then we'll tell you what it should be in the introduction to the program.

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

For this reason you must take particular care over DATA entries. Some programs can contain a couple of hundred numbers and strings in DATA lines. Miss out just one item, or one comma, and the program will fail through DATA starvation.

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

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

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

HIGH SCORES

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

Game	Name	Score	Stage
Antarctic Adventure	David McEwan (Lanarkshire)	2,587,700	50
Battleship Clapton II	Lawrence Burke (Eire)	89,820	
Beamrider	Rodney Styles (Chester-Le-Street)	78,882	22
Blogger	John Tasker (Merseyside)	254,620	240
Boulderdash	Nick Robinson (Leamington Spa)	2,815	
Brian Jacks	Nick Robinson	695	
Superstar Challenge	(Leamington Spa)		
Buck Rogers	S Lee (Derby)	219,800	
Chuckie Egg	A Faust (London)	208,450	
Circus Charlie	Ian Bucklow (Worksop)	339,710	30
Comic Bakery	David Styles (Kent)	209,790	22
Decathlon	Nick Robinson (Leamington Spa)	12,174	
Disk Warrior	Paul Walls (Cleveland)	192,600	
Finders Keepers	Paul Griffiths (Lincoln)	16,000	
Ghostbusters	Matthew Brown (Bristol)	\$265,350	

Game	Name	Score	Stage
Hunchback	Peter Roberts (Guernsey)	450,589	
Hyper Sports I	Paul Boselli (Kenton)	839,400	
Hyper Sports II	Hugh McColgan (Glasgow)	499,830	
Kings Valley	David Speed (Dundee)	72,000	14
Le Mans	J Gleeson (Eire)	31,520	7
Manic Miner	Ross Slater	35,411	25
Maxima	Rosemary Wood (Essex)	74,200	
Pinball	Ronan MacNamara (Eire)	409,220	
Pitfall	David Speed (Dundee)	184,421	comp'd
Roadfighter	Michael Holloran (Herts)	244,288	18
Sky Jaguar	David Speed (Dundee)	63,200	7
Spacewalk	Andrew Lawrence (Swansea)	32,800	
Sorcery	Nick Robinson (Leamington Spa)	20,397	
The Snowman	Josh Cann (Amersham)	15,420	
Time Pilot	Robin Emmons	249,500	6
Yie Ar Kung Fu	Andrew Talbot (Bridlington)	7,197,000	734
Zaxxon	Lawrence Burke (Eire)	495,900	

LOOK HERE FOR YOUR MSX SOFTWARE STOCKISTS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Tavistock Hi Fi	D L Chittenden	Hi-Vi	Ward & Williams	H Reynolds	Software City	Sonic TV	R J Pratt	Audio Vision	Centro (Wiseman)	E & N French	Soft Insight	Patersons	James Robb	City Software	D & D Computing	Bennetts
Aackosoft	●	●			●	●	●			●	●		●				●
A+F Software	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●
Activision	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alligata	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Amplesoft	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●
Anirog	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●
Artic Computing	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Ask	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●
Broker Bound Software	●	●			●	●	●	●		●	●		●		●	●	●
Bubble Bus	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
CDS	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cheshire Cat Leisure	●	●															
Computer Mates	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
CRL	●	●			●	●	●			●	●	●	●	●	●	●	●
Cable	●	●			●	●	●			●	●	●	●	●	●	●	●
Century	●	●			●	●	●			●	●	●	●	●	●	●	●
D K Tronics	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Domark	●	●			●	●	●			●	●	●	●	●	●	●	●
Electric Software	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●
Eclipse	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Global Software	●	●			●	●	●			●	●	●	●	●	●	●	●
Hal Software	●	●			●	●	●			●	●	●	●	●	●	●	●
Hisoft	●	●	●		●	●	●			●	●	●	●	●	●	●	●
Hudson Software	●	●			●	●	●			●	●	●	●	●	●	●	●
Haresoft	●	●			●	●	●		●	●	●	●	●	●	●	●	●
Icon Software	●	●			●	●	●			●	●	●	●	●	●	●	●
Intelligent Software	●	●			●	●	●			●	●	●	●	●	●	●	●
John Wiley Software	●	●			●	●	●			●	●	●	●	●	●	●	●
Knights	●	●			●	●	●			●	●	●	●	●	●	●	●
Kuma Computers	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Konami	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Kemp Software	●	●			●	●	●		●	●	●	●	●	●	●	●	●
Level 9 Computing	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●
Live Wire	●	●			●	●	●			●	●	●	●	●	●	●	●
Llamasoft	●	●			●	●	●		●	●	●	●	●	●	●	●	●
Longman Software	●	●			●	●	●			●	●	●	●	●	●	●	●
Mastertronic Ltd	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●
M C Lothorien	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●
Mentor	●	●		●	●	●	●	●		●	●	●	●	●	●	●	●
Megacycal Software	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●
Micro Aid	●	●			●	●	●			●	●	●	●	●	●	●	●
Microcom	●	●			●	●	●			●	●	●	●	●	●	●	●
Mirrorsoft	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
MPL	●	●			●	●	●		●	●	●	●	●	●	●	●	●
Mr Micro Ltd	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●
Martech	●	●			●	●	●			●	●	●	●	●	●	●	●
MST Technology	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●
Melbourne House	●	●			●	●	●			●	●	●	●	●	●	●	●
Morwood	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Ocean Software	●	●			●	●	●			●	●	●	●	●	●	●	●
Orpheus Software	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●
Odin Consumer Graphics	●	●			●	●	●			●	●	●	●	●	●	●	●
Panasonic	●	●		●	●	●	●		●	●	●	●	●	●	●	●	●
Philips	●	●			●	●	●			●	●	●	●	●	●	●	●
Puddles	●	●			●	●	●			●	●	●	●	●	●	●	●
PSS	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●
Quicksilva	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rittor Music Software	●	●		●	●	●	●			●	●	●	●	●	●	●	●
Sanyo	●	●			●	●	●	●		●	●	●	●	●	●	●	●
Silver Soft	●	●			●	●	●			●	●	●	●	●	●	●	●
Software Projects	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●
Sony	●	●		●	●	●	●		●	●	●	●	●	●	●	●	●
Statesoft	●	●			●	●	●			●	●	●	●	●	●	●	●
Stell	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●
Shield	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●
Tasman	●	●			●	●	●		●	●	●	●	●	●	●	●	●
Terminal	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●
Toshiba	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ultimate	●	●			●	●	●			●	●	●	●	●	●	●	●
Virgin Games	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●
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Aackosoft			●														●
A+F Software	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●
Activision	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●
Alligata	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Amplesoft	●	●	●	●		●	●	●	●			●		●	●	●	●
Anirog	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●
Artic Computing	●	●	●		●		●		●			●	●	●	●	●	●
Ask	●	●	●	●			●	●						●	●		●
Broker Bound Software																	●
Bubble Bus	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
CDS	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cheshire Cat Leisure				●									●				●
Computer Mates	●	●	●		●	●	●	●				●	●	●	●	●	●
CRL																	●
Cable								●									●
Century			●				●	●	●								●
D K Tronics		●	●	●		●	●	●	●				●	●	●	●	●
Domark						●	●		●						●		●
Electric Software	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●
Eclipse	●	●			●	●	●	●			●		●	●	●	●	●
Global Software																	●
Hal Software					●	●	●	●				●	●	●	●	●	●
Hisoft		●	●	●	●	●	●	●	●		●			●	●	●	●
Hudson Software			●		●	●	●	●	●					●	●	●	●
Haresoft			●														●
Icon Software			●			●		●							●	●	●
Intelligent Software																	●
John Wiley Software	●				●		●									●	●
Knights	●	●	●	●			●				●					●	●
Kuma Computers	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Konami	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Kemp Software				●				●							●		●
Level 9 Computing	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Live Wire						●	●	●	●		●						●
Llamosoft		●	●	●	●	●	●	●						●	●	●	●
Longman Software			●			●		●							●	●	●
Mastertronic Ltd		●	●	●	●			●	●					●	●	●	●
M C Lothlorien			●	●				●	●		●	●	●	●	●	●	●
Mentor	●	●					●	●					●	●			●
Megacycal Software	●	●	●	●			●	●				●		●	●	●	●
Micro Aid								●						●	●	●	●
Microcom		●	●	●			●						●	●	●	●	●
Mirrorsoft	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●
MPL																●	●
Mr Micro Ltd	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●
Martech		●	●	●	●		●		●				●	●	●	●	●
MST Technology	●	●	●	●	●	●	●	●				●		●	●	●	●
Melbourne House	●	●			●	●	●	●	●		●	●	●	●	●	●	●
Morwood	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●
Ocean Software	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Orpheus Software	●	●	●	●		●	●	●	●		●		●	●	●	●	●
Odin Consumer Graphics									●								●
Panasonic											●				●		●
Philips															●		●
Puddles																	●
PSS	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Quicksilva	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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Sanyo																	●
Silver Soft		●					●									●	●
Software Projects	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●
Sony						●	●						●		●		●
Statesoft					●	●	●	●					●	●	●	●	●
Stell	●	●	●	●			●	●				●	●	●	●	●	●
Shield	●	●	●	●			●	●					●	●	●	●	●
Tasman		●	●	●	●	●	●	●	●	●				●	●	●	●
Terminal		●	●	●	●	●	●	●	●				●	●	●	●	●
Toshiba	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●
Ultimate													●				●
Virgin Games	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Visions													●				●

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TEL: (0604) 714770

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TEL: (0532) 533925

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On these pages you can see our comprehensive guide to all major software manufacturers. Having chosen the software you wish to purchase simply look along the line of the manufacturer to locate your nearest stockist. If on the other hand, you want to be included in this guide phone 01-977 8787 ext 249.

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1. Always clarify the exact nature of any guarantee being offered.
2. Never send cash — always a cheque, Postal or Money Order.
3. Insist on a written receipt.
4. Clearly state the equipment you seek, and detail any acceptable alternatives.
5. Request an immediate statement of how and when the goods are to be delivered and whether the delivery will be split.
6. Check by telephone the latest prices and availability of goods you are ordering.
7. Cases of non-supply or wrong supply of goods should initially be taken up directly and as soon as possible with the supplier.
8. Because of fluctuations in prices and discounts, it is advisable to ensure that you reply only to advertisements published in current issues.

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If you order goods from mail order advertisers in this magazine and pay by post in advance of delivery, this publication ('MSX Computing') will consider you for compensation if the advertiser should become insolvent or bankrupt, provided:

1. You have not received the goods or had your money returned; and
2. You write to the publisher of this publication ('MSX Computing') explaining the position not earlier than 28 days from the day you sent your order and not later than 2 months from that day.

Please do not wait until the last moment to inform us. When you write, we will tell you how to make your claim and what evidence of payment is required.

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This guarantee covers only advance payments sent in *direct* response to an advertisement in this magazine (not, for example, payments made in response to catalogues etc, received as a result of answering such advertisements). Classified advertisements are excluded.

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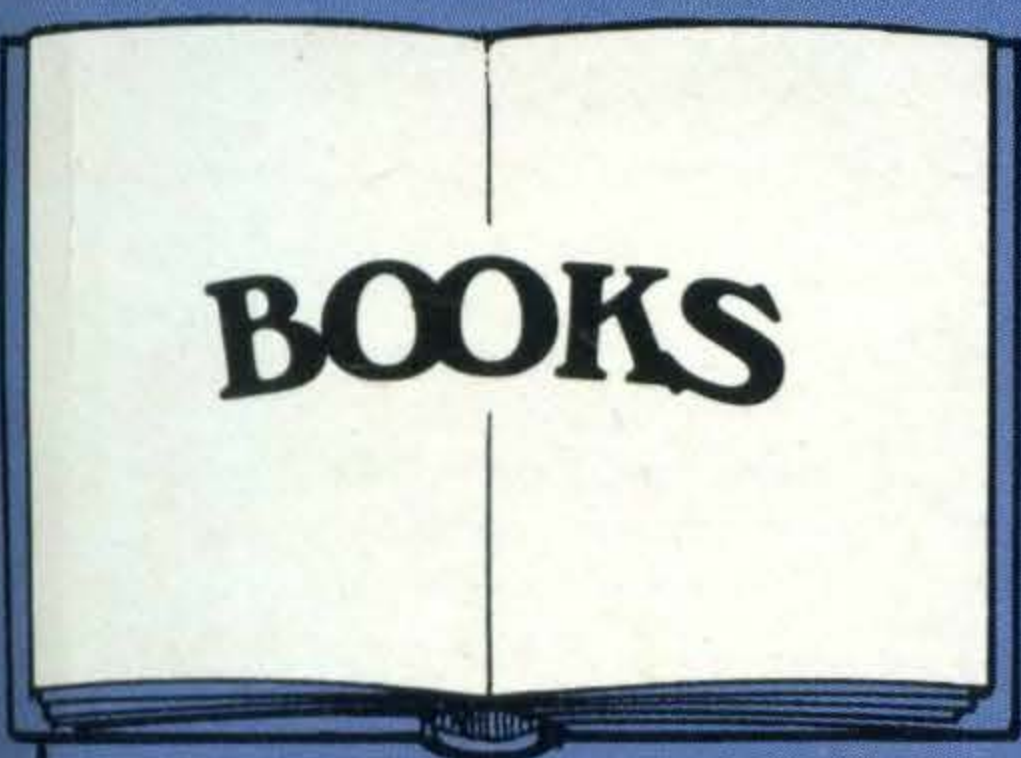
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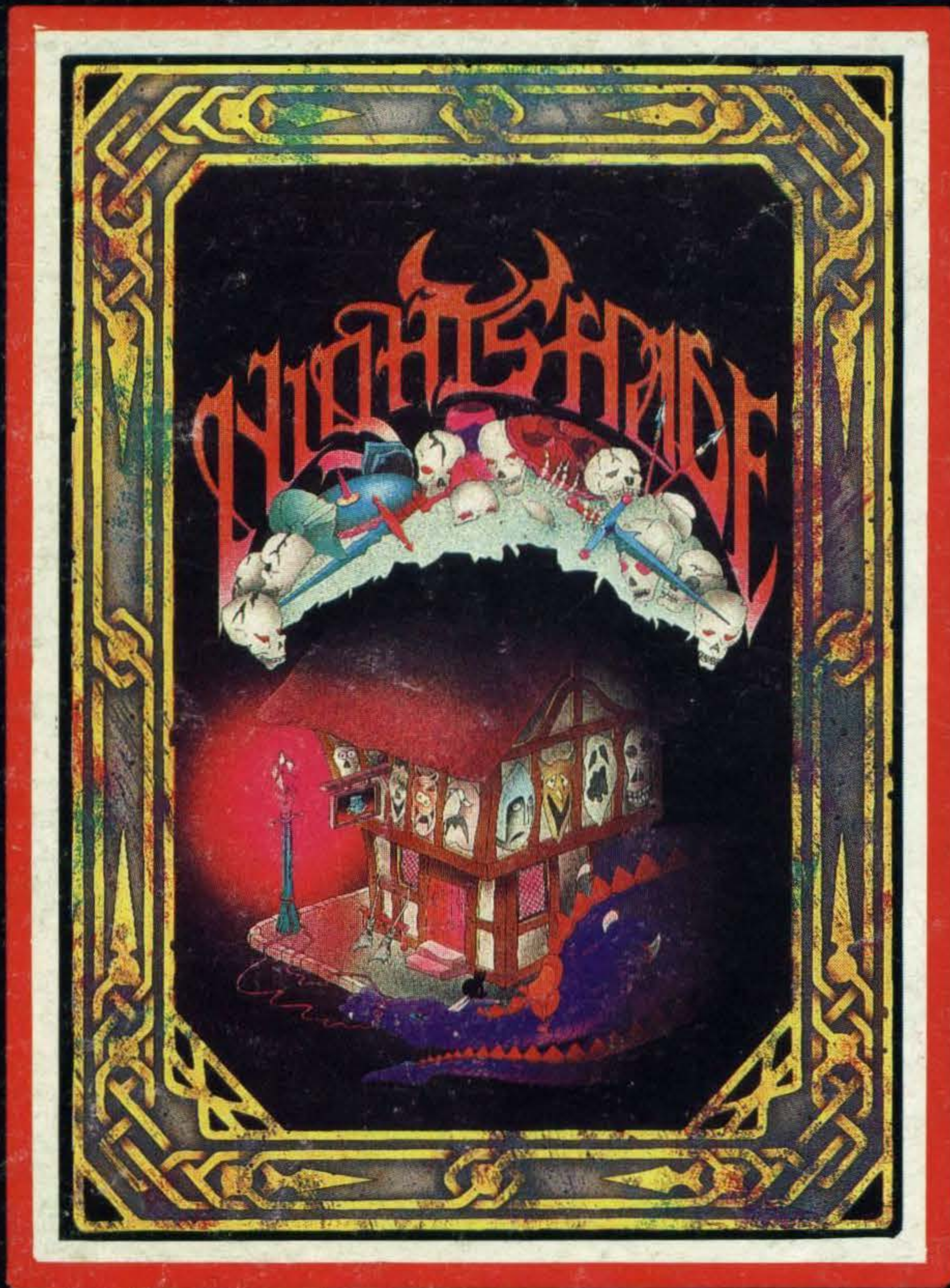
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