A Haymarket publication

October/November 1985 95p

MSX COMPUTING

MSX 2 Focus on the future

TESTED: *Using JVC's MIDI music system*

PRIZES: *'Computer Hits' tapes & Philips monitors*

PLUS: *Bumper 23 page software section!*

All MSX computers are built to the same standard.

That's what makes our first one different.

At Pioneer we've never believed in following the crowd. We prefer them to be one step behind us.

And with our innovative reputation in Hi-Fi and In-Car Entertainment, people tend to demand rather special things from us. Our new PX-7 home computer is just that.

It has all the benefits you'd expect from a standard MSX home computer, but with a few added talents.

No other home computer enables you to create your own art and animation like the PX-7.

Up to 16 different colours are available and by using the optional PX-TB7 graphics tablet you can create illustrations, shapes and various backgrounds. Then store up to eight of these shapes with their respective animation programmes in the computer memory.

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Video control. When used in conjunction with our SD-26 component television and LD-700 LaserDisc* player, the PX-7 has the added versatility of being able to understand and control the complete system.

So if you're looking for a home computer that's versatile, talented and one step ahead of the crowd, remember there's only one. The Pioneer PX-7.

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

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The LaserVision trademark certifies compatibility with

MSX COMPUTING

October/November 1985

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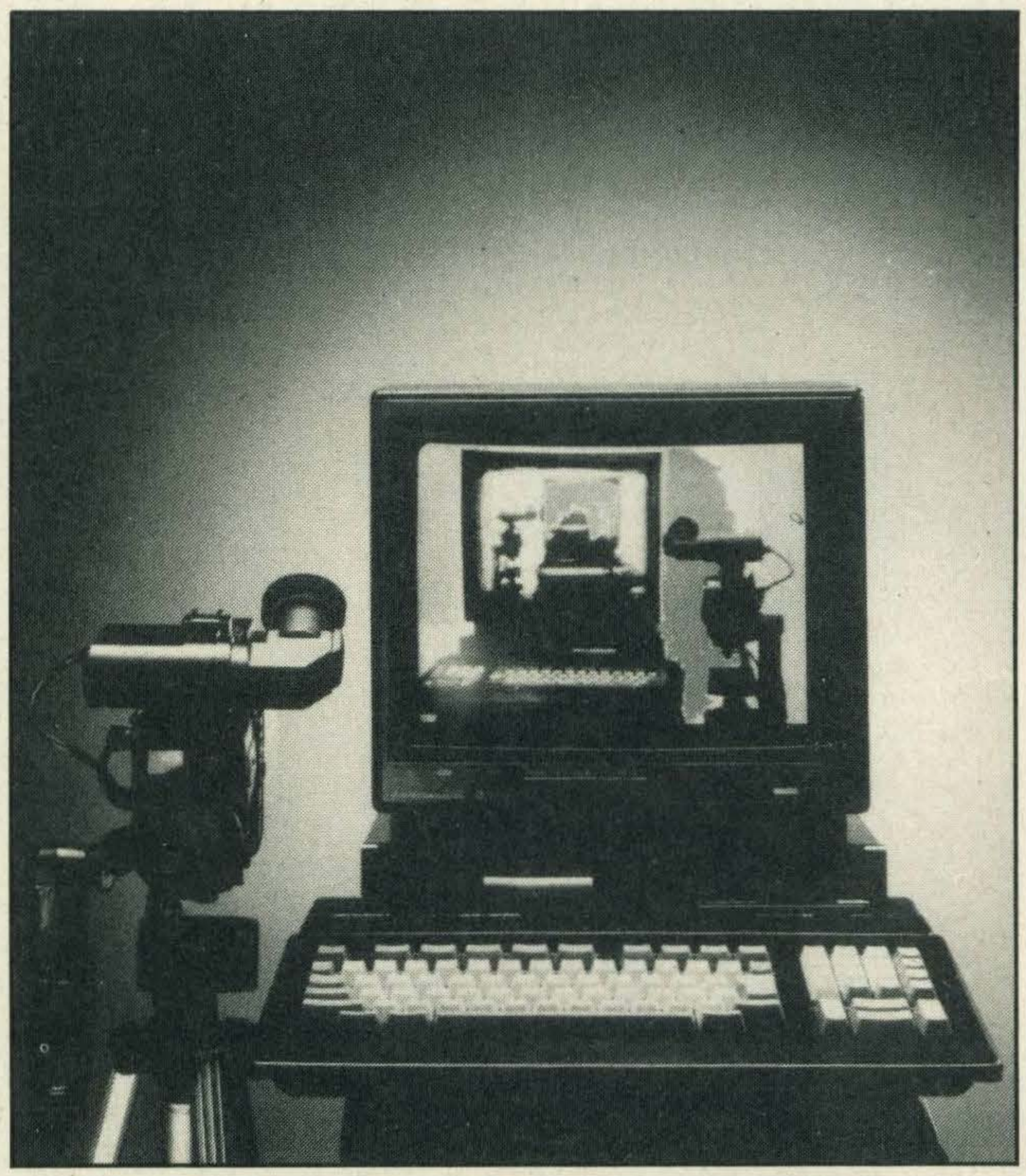

30 MSX 2 EXCLUSIVE We've managed to get our hands on the first MSX 2 machine to arrive in Britain — courtesy of Mitsubishi — and also bring you an exclusive preview of Mitsubishi's exciting video digitising unit.

With the help of the superior video processing chip incorporated into MSX 2 machines, images are taken by a video camera, plugged into the digitiser, and captured on monitor screen. With the help of a mouse and in-built graphics software, this image can be comprehensively edited.

The effects are absolutely stunning — good enough for professional use and, if all goes well, innovative MSX 2 systems like this will soon be within reach of home users.

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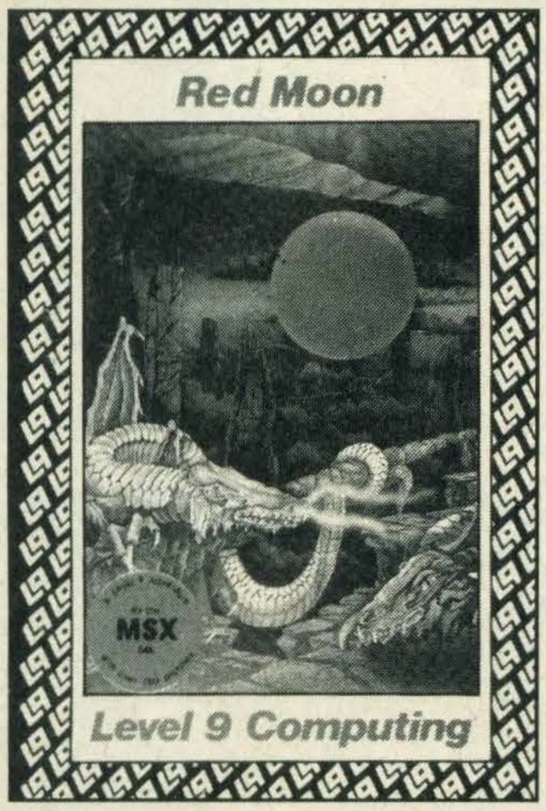
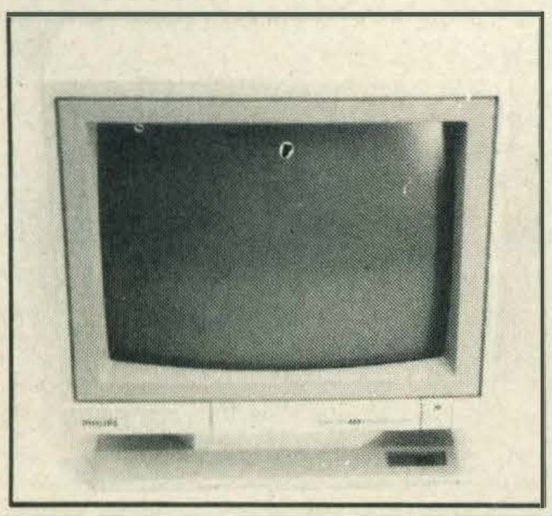
REGULARS

FEATURES





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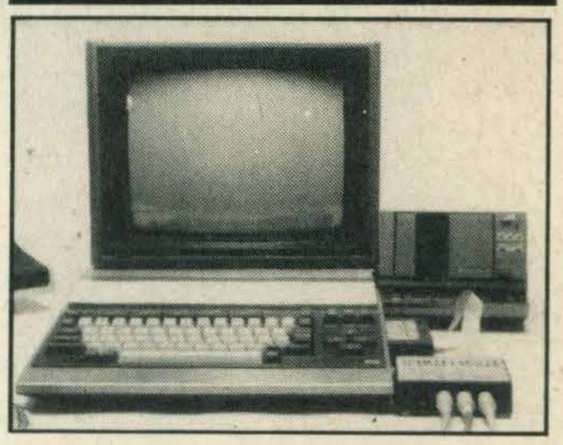


TESTING

REVIEWS

LISTINGS

Printed at Chase Web, Plymouth

Hago® Personal Computer Workstation.

At last you can get it all together.

Whether you're operating from home, school or office, the Halgo PCW (Ref 812) adds the professional touch to your computer layout. Handsome, sturdy, with a place for everything, the Hago PCW
is the home every personal computer deserves.

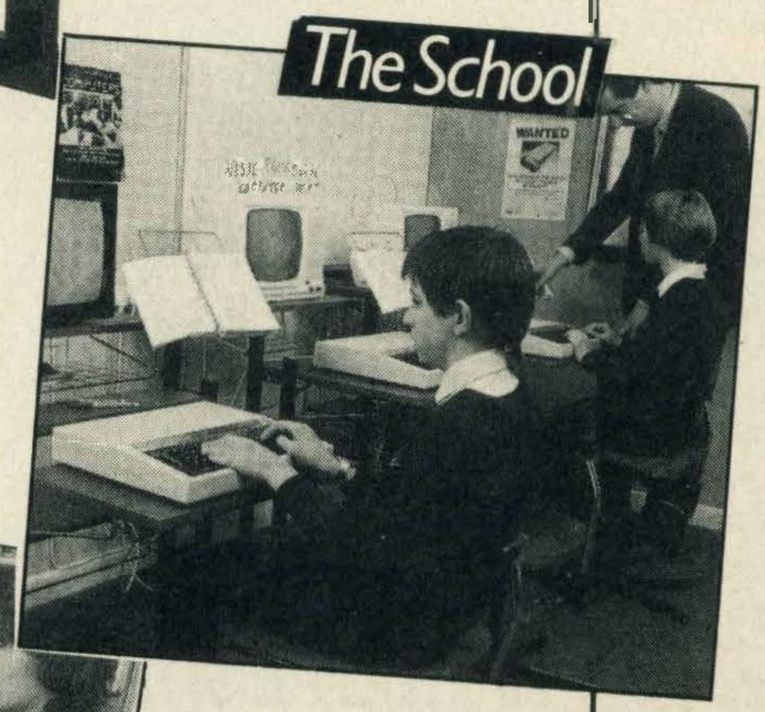
● **Optional programme copyholder** (Ref 815).

● VDU Worktop with paper rack takes all VDU's and TV's up to 14" size.
Adjustable to keep VDU correctly related to the keyboard. Worktop size 24¼" × 13¾".

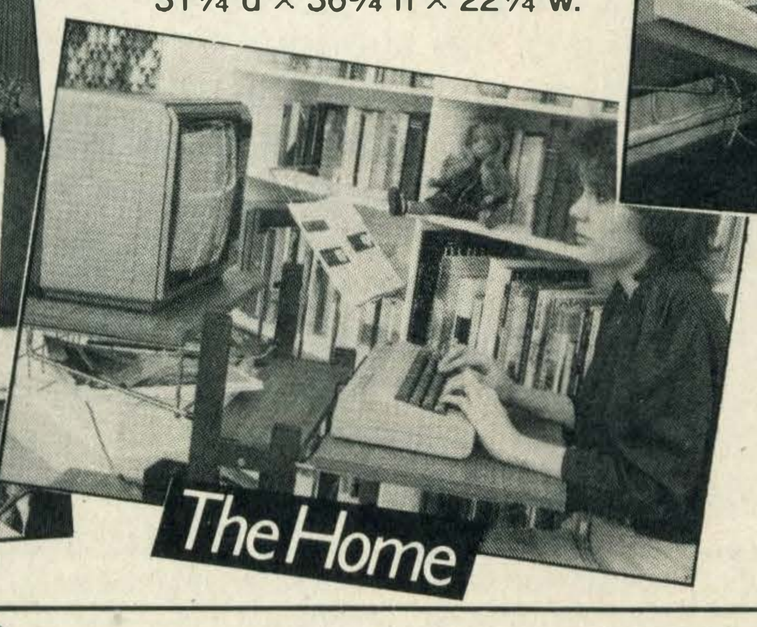
● Keyboard Worktop.
Adjusts from 20¾" to 29¼" high.

● **Optional shelf** for disc drives, tape recorder, printer etc. (Ref 813).
Optional undershelf with paper rack (Ref 814).

● Sturdy stable frame finished in Chocolate Brown with simulated Teak work tops.
Mounted on castors for complete mobility.



● Overall size:
31¼"d × 36¾"h × 22¼"w.



Hago®

**Hago Products Limited, Shripney Road,
Bognor Regis, West Sussex.
Telephone: 0243 863131 Telex 86421**

Please send me full details of the Hago PCW.
Name
Address
(What MSX/Aut)

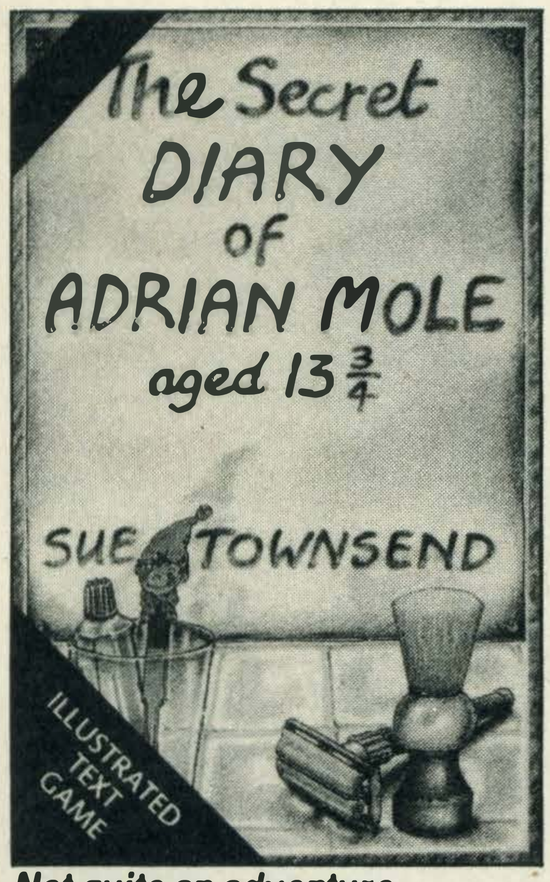
Put this one in the diary

Sue Townsend's best selling book *The Secret Diary of Adrian Mole aged 13¾* has not only been televised but will also be available as a computer game for MSX computers this month.

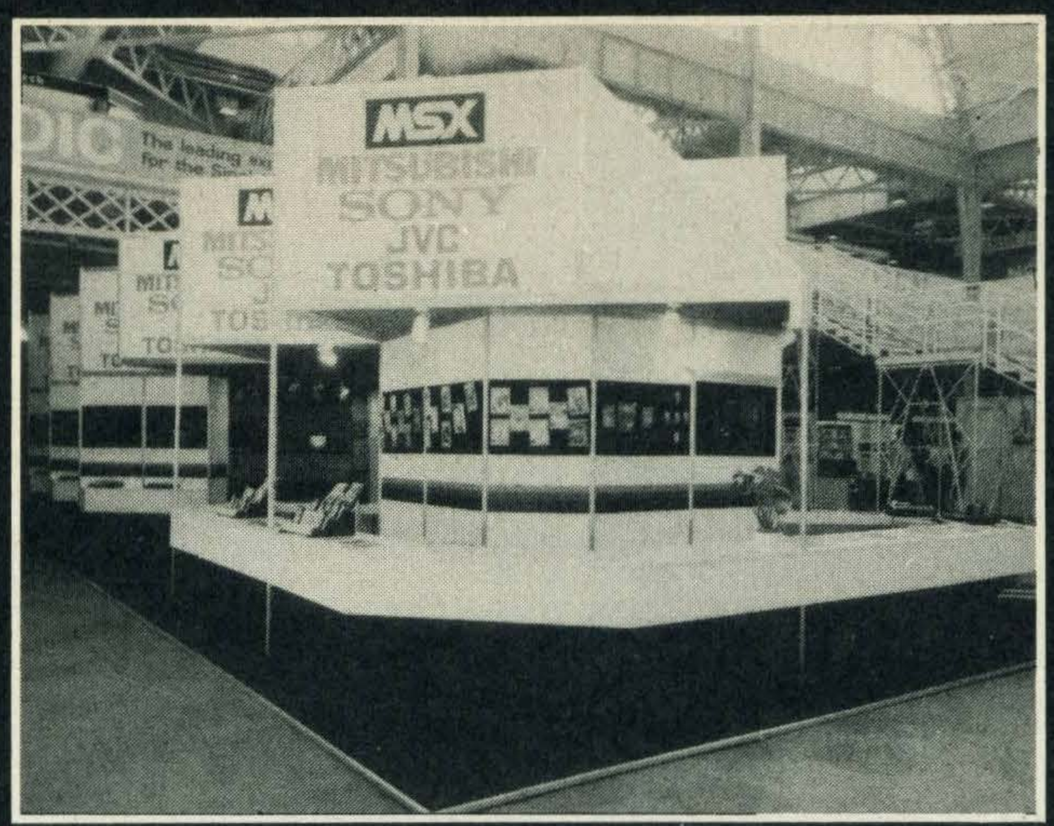
It's an illustrated text game which has been programmed by Level 9, a software house well known for producing value for money adventures, and is being retailed by Mosaic publishing.

The game will sell for £9.95 but there's also a £12.95 gift pack which includes a 1986 Adrian Mole diary.

Mosaic is also developing a MSX game based on the popular BBC TV series *Yes Minister*, but you'll have to wait until March next year for its release.



Not quite an adventure . . .



The MSX stand before the crowds arrived!

Mood of optimism at the PCW Show

A record audience of 63,154 visitors attended the 1985 Personal Computer Show, held at the beginning of September at London's Olympia.

Many of the exhibitors were demonstrating MSX products — games, utilities and hardware — and, despite the current lull in personal computer sales, the overwhelming mood of the show was optimistic with the majority of MSX exhibitors anticipating a fruitful Christmas and New Year.

An impressive stand organised by the MSX working party dominated the centre of the hall and JVC, Mitsubishi, Sony and Toshiba were all there to show off their new products.

Of special interest was Mitsubishi's picture grabbing facility — a set-up consisting of a digitiser, video camera, monitor screen and the MLT-10, Mitsubishi's new MSX 2 micro and JVC's MIDI interface and KV600 keyboard. (All reviewed in this issue.)

Other new products attracting attention were JVC's and Toshiba's interactive video systems (so popular that we couldn't get near enough to even see them!), JVC's MSX 2 machine the HC-80, and the HC-F303, a single 3.5 inch disk drive selling for a competitive £250.

Toshiba demonstrated its new music keyboard, the HX-MU901, selling for £279.99 together with interface and FM synthesiser. Also on display were Toshiba's HX-F101 disk drive costing £349.95, and the *Bank Street Writer* word processing cartridge at £39.95. Toshiba's own program replaces *Bank Street Writer* as the HX-22's built-in word processor. Sanyo had its own stand, but neither it nor Sony had any new products in great evidence.

Utility packages from HiSoft

HiSoft has released two new MSX utilities; *C++*, a CP/M C compiler on disk costing £39.95, and *Font MSX*, a sprite editor selling for £9.95 on cassette.

C++ is a Kernighan & Ritchie implementation of C, the computer language, and HiSoft claims that it is one of the fastest CP/M C compilers available.

Accompanying *C++* is *ED80*, a *WordStar* compatible full screen editor. These are well integrated and, in the event of a compilation error, a programmer may transfer directly from compiler to editor to get to the source file where the error occurred.

Features include an extensive function library providing Unix-style stream-based input and output with random access abilities on files. It also has advanced data types such as structures and unions and a number of useful composite operators.

C++ is available on a 3.5 inch disk together with a 175 page manual.

HiSoft also plans to convert its existing utility titles, *Pascal Compiler* and *Devpack Assembler/Debugger* to the CP/M 2.2 operating system for use with MSX-DOS.

More information about these products can be obtained from HiSoft on (0582) 696421, or contact them at 180 High Street North, Dunstable, Beds LU6 1AT.

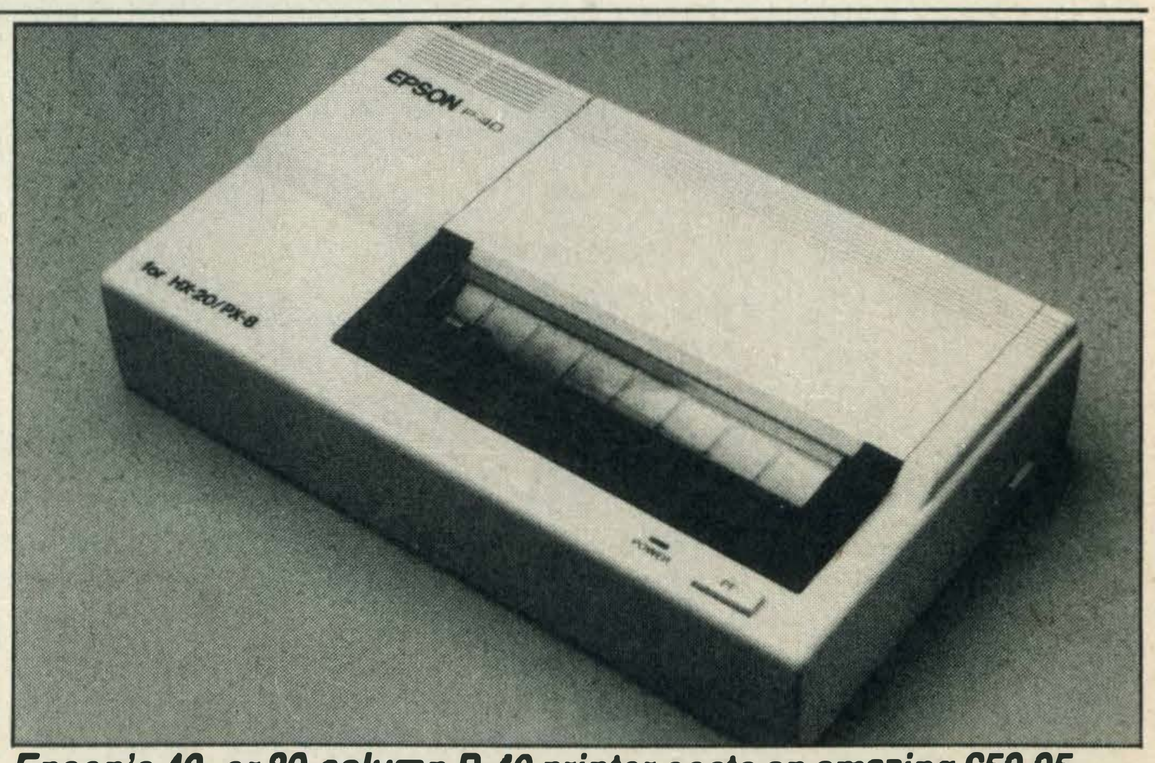
Bargain thermal printer from Boots the chemist

If you're after a low-cost thermal dot matrix printer for your MSX then Epson's P-40 might fit the bill.

Although the model has been available for nearly a year it could only be purchased through Epson's own dealers. The company now wants to attract home users and is making the P-40 available on a nationwide basis through Boots' computer departments and most computer dealers.

The P-40, which costs £59.95, weighs only 0.7Kg, has a printing speed of 45cps and a full 96 character ASCII character set.

Further details can be obtained from Epson UK at its offices in Dorland House, 388 High Road, Wembley, Middlesex.



Epson's 40- or 80-column P-40 printer costs an amazing £59.95

Six for the price of one

A compilation of six popular MSX games is being offered by software house Beau Jolly.

Called *Computer Hits*, the tape costs a mere £6.95 and contains a mixture of adventure, arcade, sports simulation and strategy games from well-known software houses like Alligata, Bubblebus and Lothlorien.

Company director Eddie Hooper tells us; 'This is the first time we've produced an MSX compilation and we're planning another for the Spring.'

Beau Jolly also produces compilation packs for the Commodore, Amstrad, Spectrum and BBC all of which, including MSX, will be supported with a huge national TV campaign at the beginning of October. So keep an eye out for them.

See our competition on page 49 — and win yourself a copy of Computer Hits!

Package deal from Toshiba

If you're on the brink of buying an MSX micro, it could be worth your while visiting your local Toshiba dealer and taking a look at Toshiba's starter pack for the first-time buyer.

The £139.99 pack includes a 64K HX-10 micro, HX-C810 data recorder, three software titles, a step-by-step paperback guide to MSX computing, a blank cassette, plugs, fuses and even a screwdriver!

Toshiba's Guy Attenborough tells us, 'We've packaged the HX-10 so that first time buyers can start computing at an affordable price'.

It's so complete it even includes a screwdriver

The company is also launching a £2 million television advertising campaign to promote the HX-10 micro throughout November and December whose aim, according to Toshiba's Steve Skuce, is to 'boost greater awareness of our products'.

The starter kits will be available from all Toshiba MSX retail dealers throughout the UK from the beginning of October, a spokesman tells us.

If you wear specs, you can avoid that nasty screen glare with the latest anti-reflection coating

Special anti-reflection coating for glasses

Screen glare from monitors can be very taxing on the eyes, particularly if you wear specs which themselves create reflections.

However, thanks to an anti-reflection coating for spectacles called *Quazar*, developed by Balzars, such problems can be eradicated.

If you find that your eyes are sore after slogging away at your screen for hours on end, have a word with your optician. It could work out much cheaper for your bank manager than buying an anti-glare filter or screen for your monitor.

Only Dreams?

Rod Cousens, ex-managing director of Quicksilva and the brains behind *Soft Aid*, has formed his own software house, Electric Dreams.

The company has been formd with another ex-Quicksilva employee, Paul Cooper, formerly the company's marketing manager.

Electric Dreams has already released three titles for the Spectrum — *Riddler's Den, Winter Sports and I of the Mask*.

And, according to Cousens, the latter has been in such great demand that a version for MSX is under consideration. Watch this space for more details.

Adventure

Adventure addicts can look forward to the release of Level 9's new graphics adventure later this month.

Called *The Worm in Paradise*, it's a political science fiction adventure set in a futuristic state from which you have to escape to reality.

The game will cost £9.95 and if Level 9's other titles are anything to go by, should be a great hit.

NEWS

Anirog gets some action

Anirog Software has got four action packed sporting titles lined up for MSX in the next few weeks.

The first title to be released will be *Jump Jet*, written by an ex-jet pilot and claimed to be a realistic flight and combat simulator. It will retail at £9.95.

Five-a-side is the second release, a one- or two-player option soccer game for £5.95 followed by *Slapshot*, a fast action ice hockey game at £8.95.

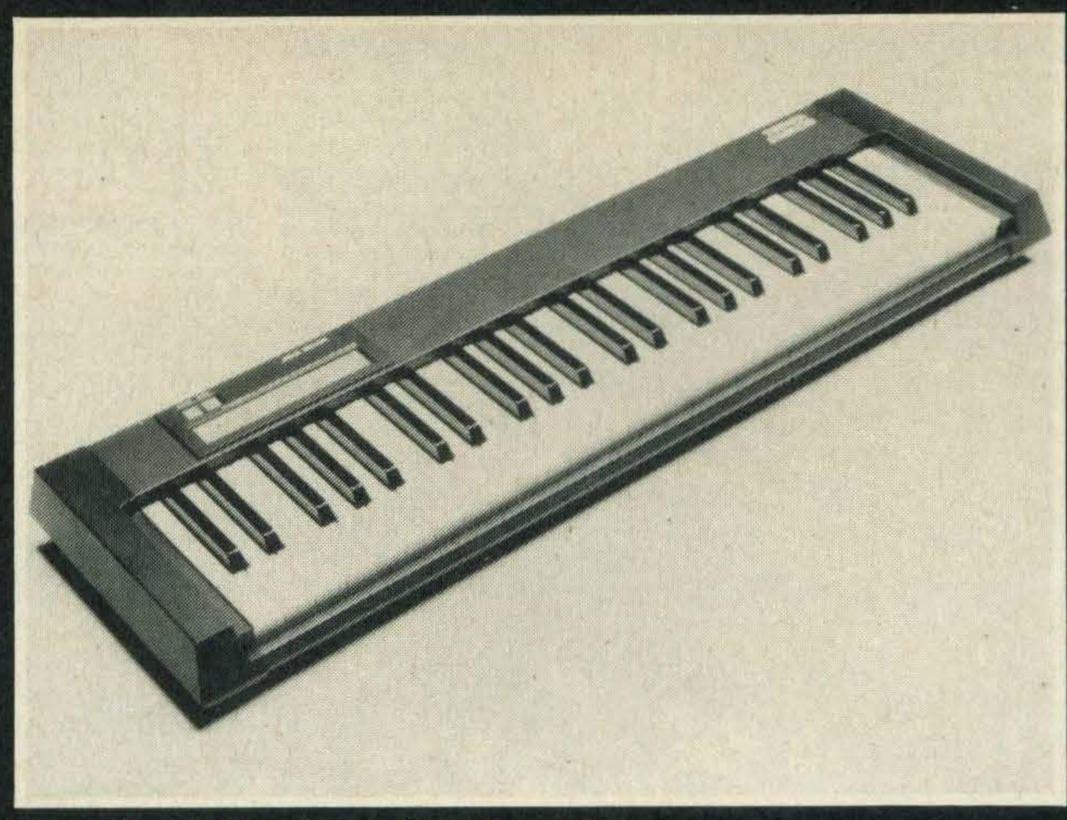
All these titles will be released throughout October and in November Anirog is launching an arcade game called *Jump Machine*, which is expected to cost £7.95.

Go for gold

The latest sporting title for MSX to come out of the Martech stable has been endorsed by Olympic medallist Geoff Capes.

Called *Geoff Capes Strong Man*, the game consists of six challenges ranging from wrestling and tug-o-war to car rolling and barrel loading.

The game will be available in October for £8.95.



Flex those fingers and tap those keys . . .

Making music with Toshiba's keyboard

Keen keyboard wizards can now turn their MSX micros into professional music synthesisers with Toshiba's new music keyboard.

The HX-MU901 musical keyboard is on sale now at £279.99.

Special features include a full MIDI interface, nine simultaneous notes capability (when connected to a television or audio system), 65 different voices and 20 different rhythm patterns. Compositions can be saved to and loaded from disk or tape.

Steve Skuce, Toshiba's marketing manager, tells us; 'The keyboard is being sold initially as an add-on for existing MSX micro owners but will also be available in our Music Maker package for first-time buyers'.

The Music Maker package costs £369.99 which gives you an HX-10 64K micro, music keyboard, music interface and music manual for your money.

Two other Toshiba packages are in the pipeline covering word processing and education. Prices aren't available yet but a late autumn launch is scheduled.

Both the music keyboard and the Music Maker package are available through Toshiba's MSX dealers all over the country.

Zap aliens with Spectravideo's new joystick

Good news for alien zappers—Spectravideo has just launched the latest model in its Quickshot range of fast firing joysticks.

Known as the Joyball, because of its similarity to a tracker ball, it has a large base with a multi-directional ball placed in the centre. Features include LED lights, two large firing buttons, built-in microswitches and autofiring—all for £19.95.

Spectravideo's Keith Newman claims that tests show the Joyball is much more responsive than 'ordinary' joysticks and he anticipates that it will sell well because 'it gets away from the traditional concept of a stick'.

The Joyball will be available from computer dealers later this month.

UPDATE

Konami's cut-price carts

The silly season is upon us and Konami is the latest company to jump on the price cutting bandwagon by reducing the cost of its games cartridges.

The company's cartridges will now cost £14.95 instead of £17.40 which is good news for gamesters.

Luther de Gale, Konami's marketing manager, tells us, 'For some time we've felt that the cost of our cartridges was too high, but now that we are selling greater quantities we can pass on the benefits to the consumer.'

The company is also planning to release three more of its excellent games titles in time for the festive season.

The first HyperSports III is a run up to the popular Hyper Sports I and II. The other two titles are Soccer and Ping Pong, and all should be well worth looking out for.

Pete's perils

Bubble Bus's *Wizard's Lair*, already a hit on the Spectrum and Amstrad, will be available for MSX from the beginning of next month.

Priced at £8.95 the game is an adventure based on the problems encountered by Pot Hole Pete who's got himself trapped in an underground cave. His only means of escape is to find the four pieces of the golden lion. That's where you come in!

THE MSX SOFTWARE SPECIALISTS

IF YOU ARE AN MSX RETAILER PLEASE CONTACT US.

PROFIT FROM OUR EXPERIENCE AND OUR 24 HOUR DELIVERY SERVICE

WE CARRY A *FULL* RANGE OF MSX SOFTWARE

EXPORT ENQUIRIES WELCOME

Nemesis Distribution Ltd., 2 Iffley Road, Hammersmith, London W6 0PA. Tel: 01-741 2299

Good shot!

Design your own golf course with Ariolasoft's first MSX conversion, *Golf Construction Set*. It should be available on cassette by the beginning of 1986 for about £12.95.

Featuring four courses as well as the facility to design and save courses, Ariolasoft claims it's a must for all golfers.

In the game, plan views as well as perspective views of each hole are displayed. The latter is redrawn after each shot from where the ball lands, so the player has to think about each shot as if he or she were on an actual golf course.

Ground and weather conditions need to be considered before taking a shot.

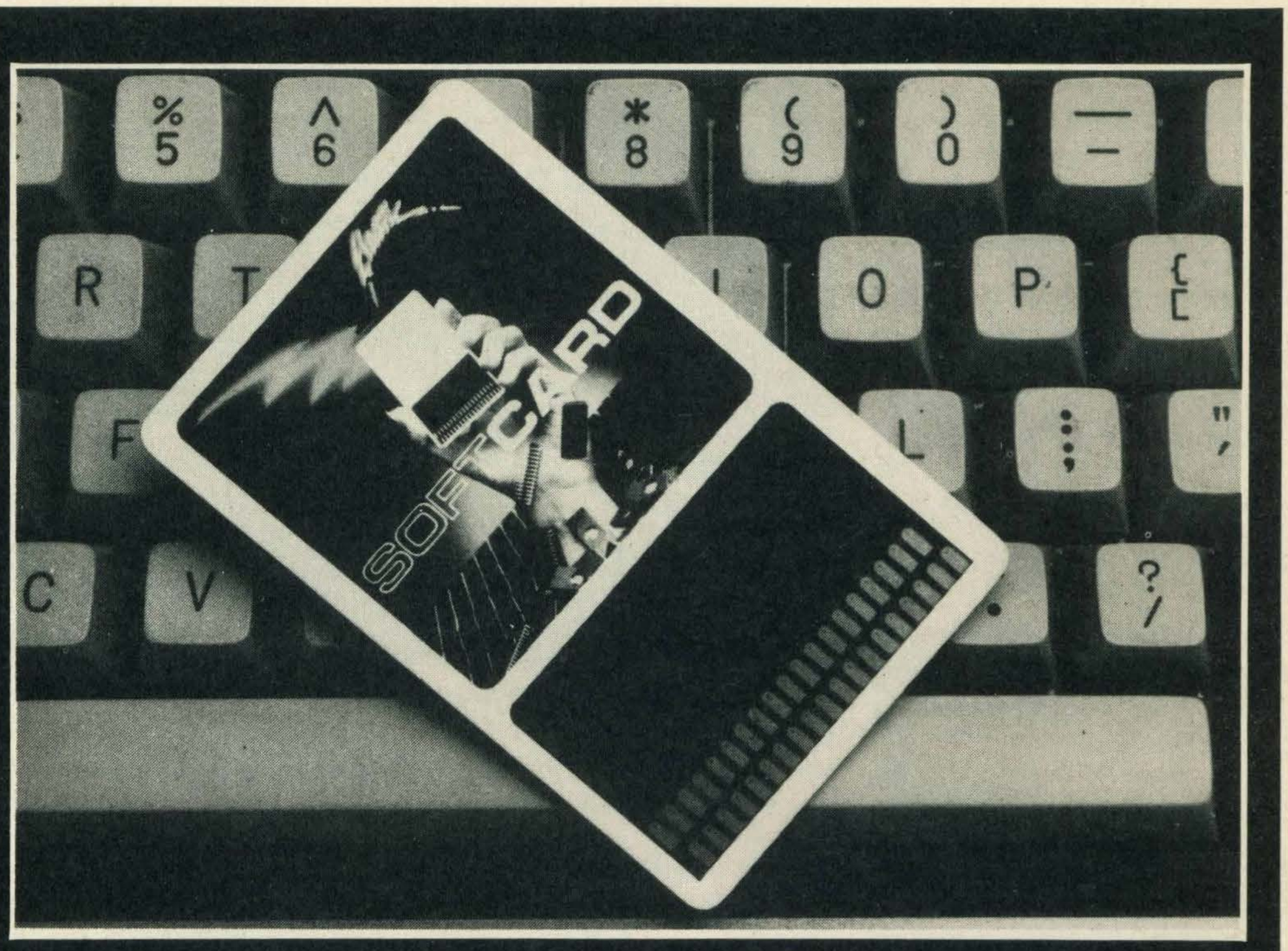
More information from Ariolasoft on 01-834 8507.

Obituary

MSX User, our rival title in the MSX magazine market, will cease to exist on the bookstalls after the October issue.

Published by Argus, *MSX User* wasn't its only title to fold. According to various sources eight other computing titles have also been closed down with a number of staff being made redundant.

But *MSX Computing* is still in business so keep sending us your letters and listings! We're alternating on a monthly basis with our sister magazine, *What MSX?*, until the end of the year.



A bright idea from Electric Software

Three of Electric Software's games titles will be released on Astron soft cards before Christmas.

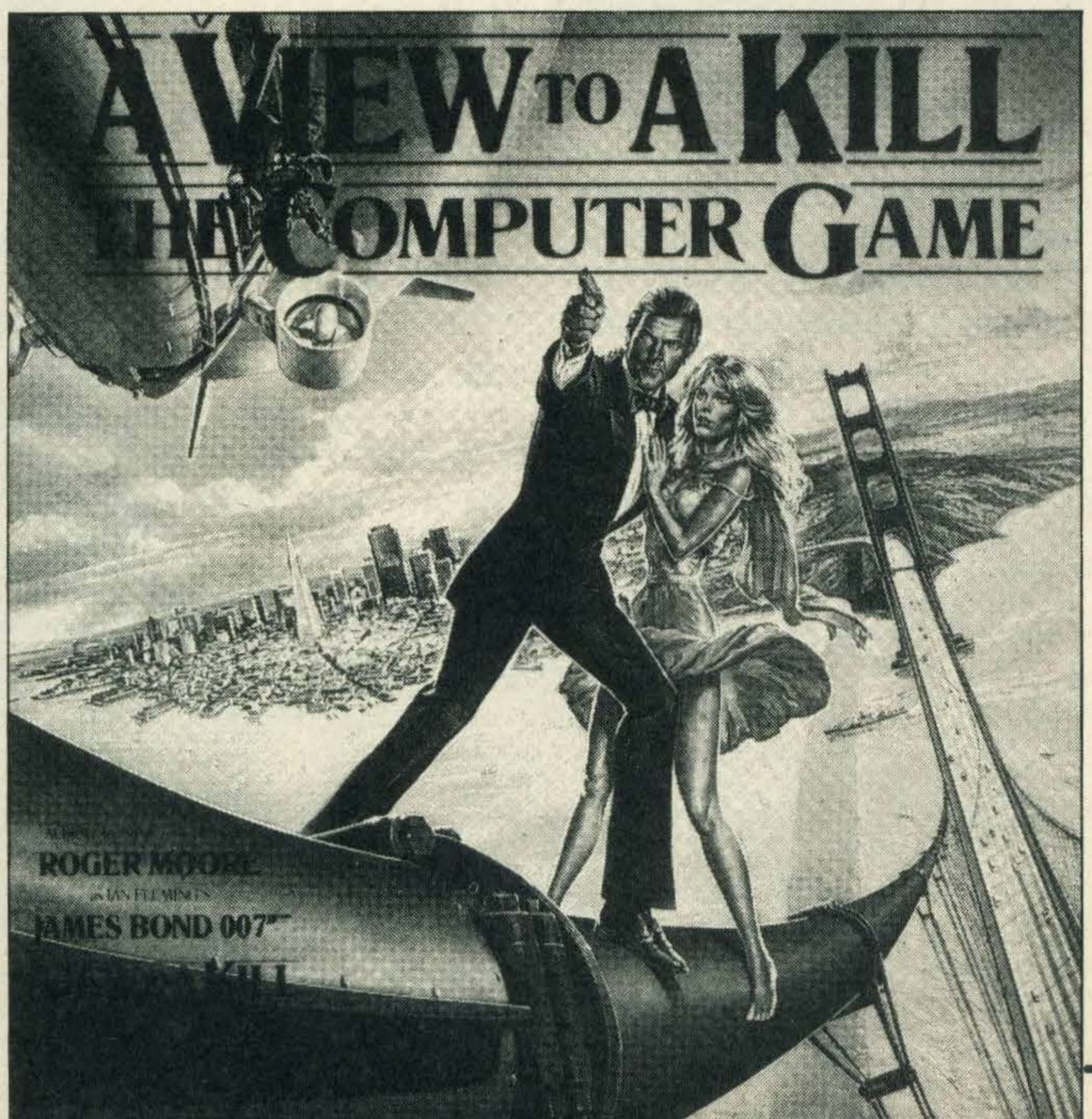
The soft card, a credit card sized, cheaper alternative to cartridges, contains 16K of masked ROM. It plugs into the cartridge port of your MSX micro by means of a special adapter.

Electric is launching a promotional campaign throughout this month and will be offering *Le Mans* on soft card, along with an adapter, for £19.95. The adapter alone retails for £7.95 and the game £15.95.

In the run-up to Christmas Electric will be selling a duo pack for £29.95 containing *Sweet Acorn* and *Choro Q*, plus an adapter.

The company has also just released a cassette-based game called *Barnstormer* which features the antics of a bi-plane pilot called Barnie and costs £8.95. Two more titles, *Eros* and *Pinkie*, will be released next month for £8.95 each.

All Electric's titles are available through Nemesis and Lightning dealers.



Bond comes into view

At long last Domark is ready to launch its *A view to a kill* game on MSX.

According to company director Dominic Wheatley, the launch has been held up by a shortage of programmers. The game is based on the James Bond movie of the same name and will retail for £10.99 and one of your tasks is to save Silicon Valley from the evil threats of Max Zorin.

Domark also has plans to release a horror game called *Friday 13th* just before Christmas but details have yet to be finalised.

Domark is on 01-947 5622.

Start here

The latest introductory MSX text to arrive on the bookshelves comes from Glentop Publishers.

Called *Starting BASIC on MSX* and written by Shaun Grey it costs £5.95 and is aimed at the newcomer to MSX.

Chris Fallows, Glentop's marketing manager, tells us that the book is primarily written for the 13 to 15 age bracket but is 'suitable for anyone who's familiar with an MSX micro but hasn't quite got to grips with BASIC.'

The book can be ordered direct from the publishers at Glentop Publishing, Standfast House, Bath Place, High Street, Barnet, Herts EN5 1ED or telephone 01-441 4130.

LETTERS

More games wanted

After purchasing my Toshiba HX10 I went out and bought your magazine. Before I had a Spectrum and it's not until you try a decent computer like the MSX that you realise how outdated the Spectrum is!

I enjoy reading *MSX Computing* but have one complaint, would you review more of the latest games?

Andrew Brown
Spalding

We're glad to hear that you're pleased with your MSX and hope that you continue to enjoy using it.

As regards games, we do our best to include the latest software releases in our review section. Unfortunately manufacturers occasionally launch new titles just as we've gone to press, so they have to wait for the next issue.

Full of regrets

Eight months ago I took the plunge and declared my faith in MSX—paying £299 for a Sony Hit Bit. I was very impressed initially and could hardly await the arrival, indeed flood, of new software and add-on peripherals.

I now regret showing faith in MSX so quickly. Decent software remains at a trickle while I am becoming increasingly annoyed at the situation I find myself in.

Now Sony Hit Bits sell for £179, Spectravideo's new micro for £400 which includes built-in disk drive, RS232C interface etc, and Pioneer has launched its MSX with add-on laser disks etc. On top of all this I read about MSX II! Is my Hit Bit now defunct and where is the upward compatibility and add-ons necessary to enable me to use Pioneer's laser disk, for example?

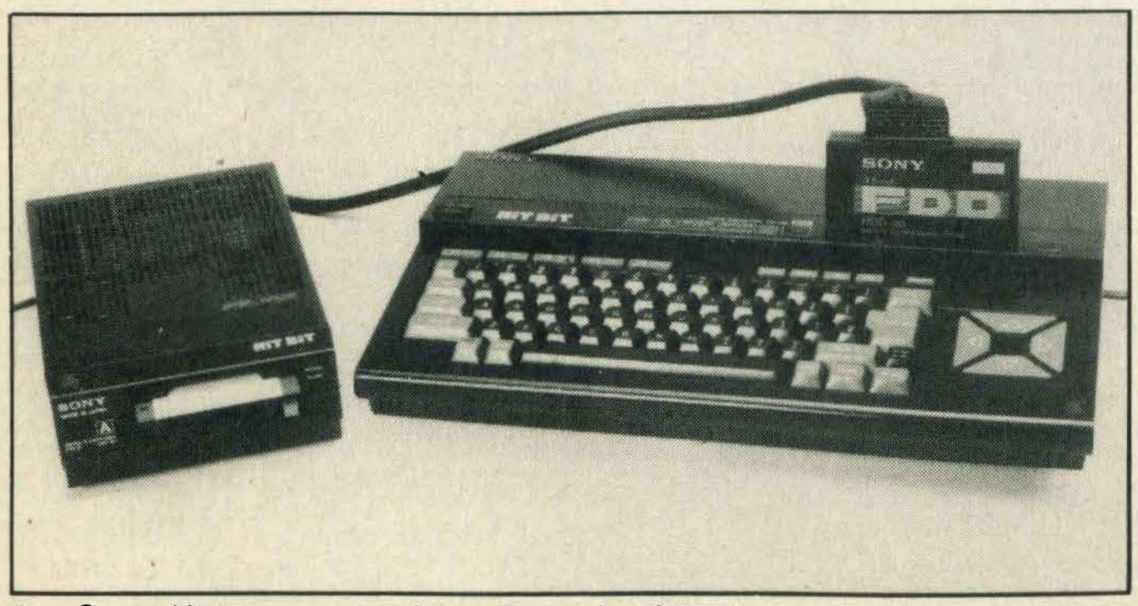
Jim McAreavy
Co Armagh

Once a manufacturer establishes a user base prices tend to level out and drop, which is good news for the consumer.

This doesn't mean that your Sony Hit Bit is a defunct model — the idea behind MSX is software compatibility and upgradeability with peripherals such as disk drives, graph pads, light-pens and the like.

However, Pioneer decided to go for a complete home entertainment system, so although its micro is a standard MSX machine it has a few extra interfaces bolted onto to it so that you can add laser disk players, video cameras and graphics tablets.

As you seem particularly interested in the Pioneer it's well worth writing direct to the company at 116 Field Way, Greenford, Middlesex.



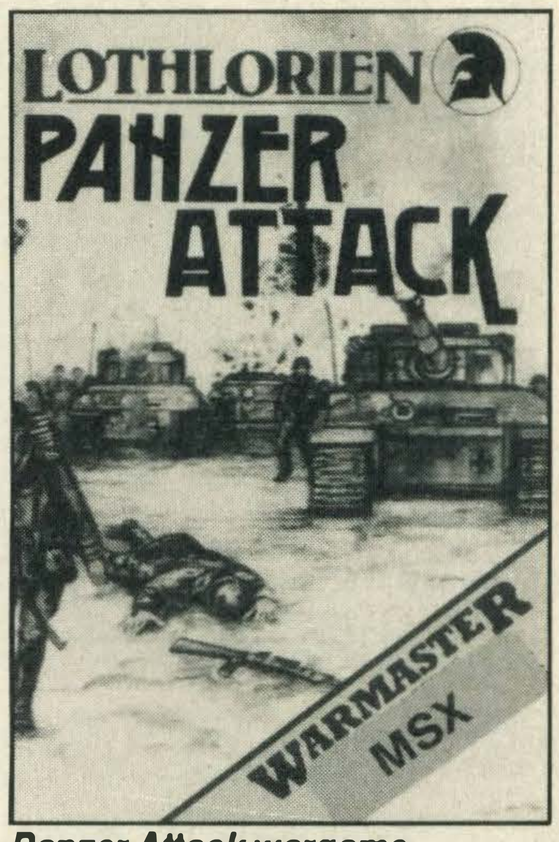
The Sony Hit Bit — now down to under £200

Wargames

I am very keen on strategy type games and there are plenty for the Commodore, which was my first micro.

Are there any strategic war games on MSX?

J Dennerly
Prestwich



Panzer Attack wargame

At the moment the only strategic war games we've come across are *Special Operations* and *Panzer Attack*, both by Lothlorien. But rumour has it that another title, *Battle of the Bulge*, could be in the pipeline some time next year.

Making the right connection

I was reading an issue of *MSX Computing* and came across an article about Spectravideo's MSX.

Shopping around in Al Kho-

Spectravideo goes east

bar I saw an SVI 728 and fell in love with the machine, but to my disappointment there was no version of this machine with NTSC video output. It is necessary to specify NTSC since in the Philippines where I live we use NTSC 3.58.

Is there an NTSC version of the SVI 728 in Saudi Arabia? And are peripherals the same for PAL and NTSC? I would appreciate a reply as I'm going to buy a micro soon and my choice is Spectravideo's 728. More power to your magazines!

A Eayte
Saudi Arabia

You can only buy a 'SECAM' version of Spectravideo's 728 MSX micro in Saudi.

But the good news is that a Spectravideo dealer can alter a gadget called a 'switch modulator' in your machine so that it will work in the Philippines.

As for peripherals, yes they are the same for PAL and NTSC.

Where is it?

I am writing with a query, and perhaps you will print an answer in a future publication of *MSX Computing*?

My question concerns the listing of Peter Jess's Who Did It?' There seems to be a line missing, could you please print line 1490 of this program as its absence is noticeable.

I should add that this was in the July issue of *MSX Computing*. I would also like to pass on my thanks to all those concerned with your publication which has helped me considerably to understand the uses of a home computer, thank you.

Sgt R Parsons
South Glamorgan

The reason you didn't find line 1490 is . . . how shall we put this . . . there isn't a line 1490. True, the jump of 20 at the end of the program seems a little odd, but it's not an error.

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 mega-game?

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.

Basic problems

I have recently purchased a Toshiba HX10 and I am having problems getting to grips with BASIC.

Having originally learnt the language on the BBC and Sinclair machines I have noticed a substantial difference between the 'basic' construction.

I am also having problems understanding the manufacturer's manual — could you recommend some suitable books for beginners to MSX computing?

Patrick Warren
Broadstairs

Quite a few readers have written in asking for help in mastering the finer points of BASIC.

There are several good MSX titles on the market and we are continually reviewing new titles. But to get you started you could try working through *An Introduction to MSX BASIC* by R & J Penfold, *Very basic BASIC the first 15 hours on your MSX* by Ellershaw and Schofield or *Introducing MSX BASIC* by Kuczora and King.

Getting the picture

I wonder whether you can help me. I have a Sony Hit Bit and want to get an RGB monitor to complement the computer. However, the dealers I have consulted appear to have no knowledge of a suitable monitor.

As far as I can tell, I need an analogue RGB colour monitor, as opposed to a TTL RGB monitor. Could you supply me with the details of some companies who supply such monitors?

Andrew Perry
Sutton

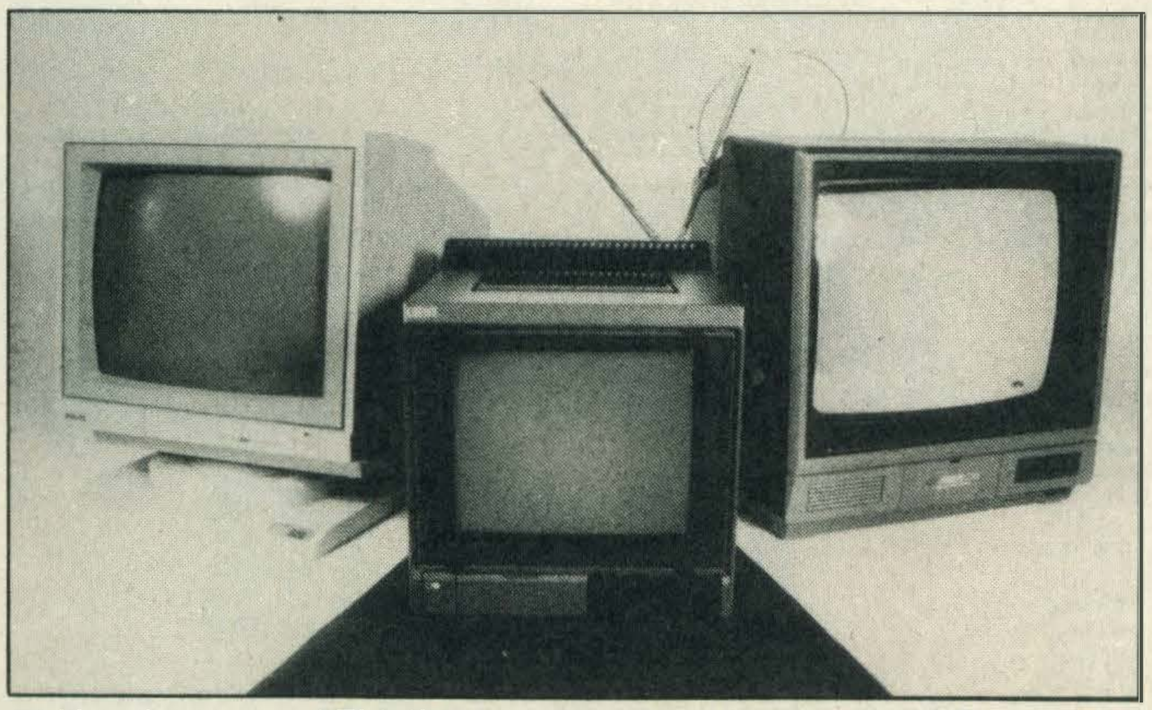
We're suprised your dealers have no ideas about suitable monitors — there are loads about and you even have a choice of a dedicated monitor or TV/monitor.

As you mention, two types of RGB signal exist; analogue (or linear) and TTL (Transistor-Transistor Logic) and because the Sony Hit Bit uses the former, it will operate best with an analogue RGB monitor.

The difference between the two signals is complex, but we'll do our best to explain. TTL signals operate at either zero or five volts — there are no intermediate signal stages and so only eight colours can be displayed on screen. This is because signals of varying strengths are needed to produce pictures with more than eight colours.

With analogue RGB inputs, the signal intensities vary between 0V and 1V and so the resulting picture has a greater variety of colours.

In the past year, we've reviewed several TV/monitors, of which Ferguson's MC01, Fidelity's CTM1400, Loewe's MCP110 and Philips' CT2007 have analogue RGB outputs and would all be suitable.



Philips, Loewe and Fidelity monitors have analogue RGB

Can't get through the screen

Screen 10 is a real !?*!!

I have recently purchased a copy of Alligata's *Blagger* and since then I've had a lot of trouble tackling screen 10, level nine — the University House.

I can collect the nearest key to the starting position without any difficulty, but if I make any attempt to get down, I just end up losing a life, whether it be falling heavily or landing on one of the passing skulls. Please can anyone help?

S. Jones
Bromgrove

Blagger is quite a difficult game to master — we have been having some problems, too.

However, if it's any consolation we've talked to the game's author Ross Goodley who smugly tells us that screen 10 is the most difficult screen and he purposely designed it that way. Apparently it's all a matter of timing and once you've cracked it your home free.

Sounds of silence

I have recently purchased a Sony Hit Bit and though I thought I'd followed the setup instructions and am successfully entering BASIC, to date I have not been able to produce any sounds — neither the key depression clicks nor beeps. In fact the only sound I do get is the sibilance of the TV set.

I am considering the purchase of a disk drive and have a couple of related questions:

1. Have there been any recent reviews of the various models available?
2. Is MSX-DOS available?

John Barker
Jeddah

A lack of clicks and beeps while programming could be due to a number of reasons. The most likely is that you are forgetting to fill in the key click screen command. With MSX BASIC, the screen commands have five parameters — the first two are mode select and sprite size and the third is key click. If this is set on the zero value, no key sounds will be emitted.

If that isn't the problem and the lead connections are OK, the micro may be faulty.

As for disk drives, we reviewed the Sony disk drive in our February issue.

Finally, the question of MSX-DOS availability is difficult to answer because no one really knows! There have been problems with its development, but these are resolved now and Tom Sato of Microsoft believes that MSX-DOS 3.5 inch disks will be available from now on.

It isn't available by itself at present, but negotiations are under way — watch our news pages.

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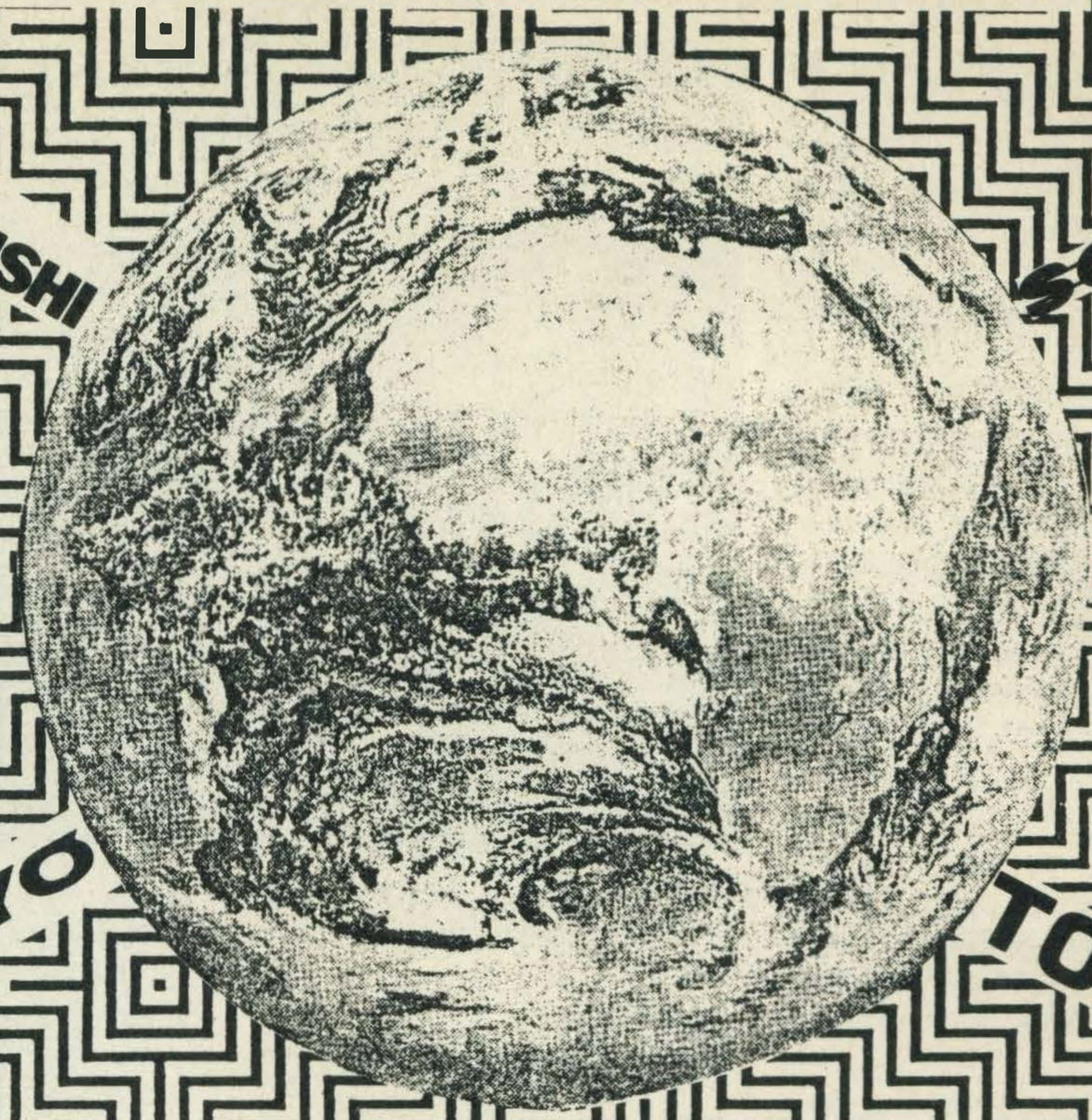

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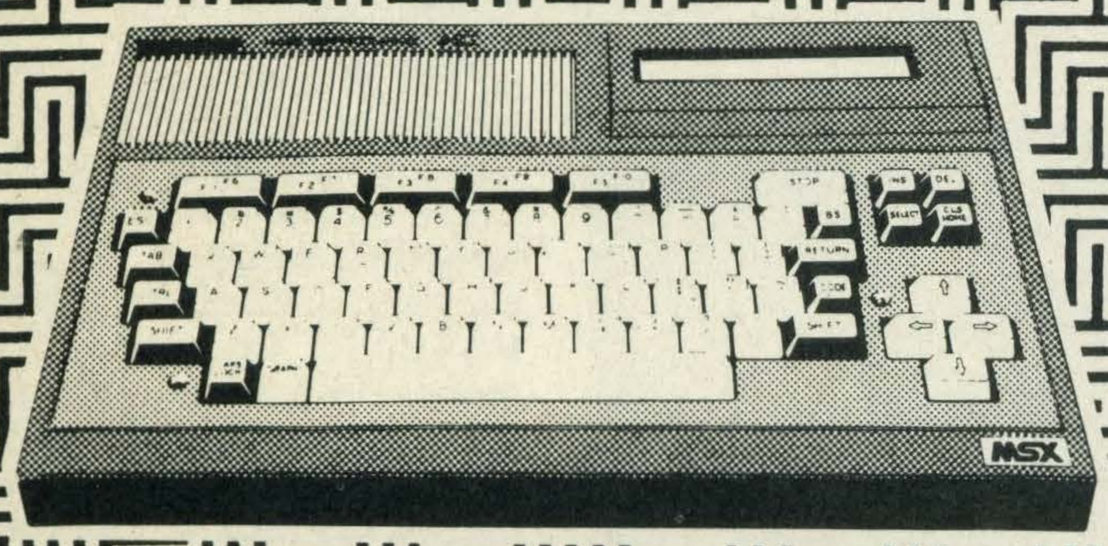

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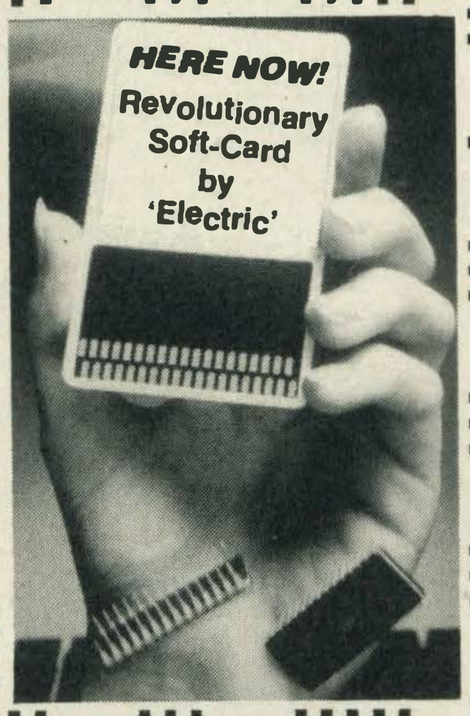

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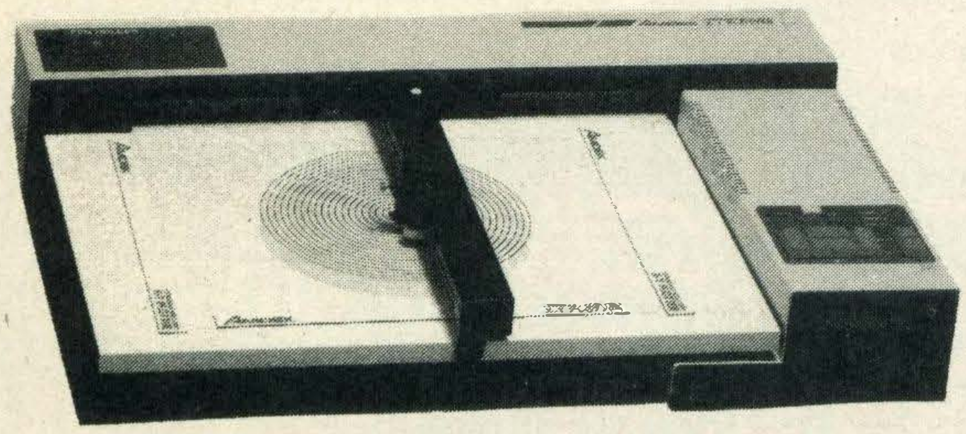

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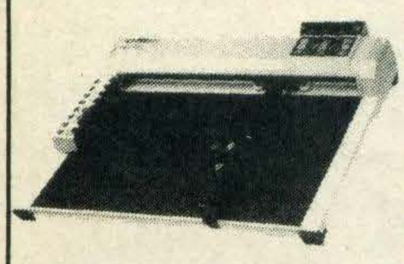

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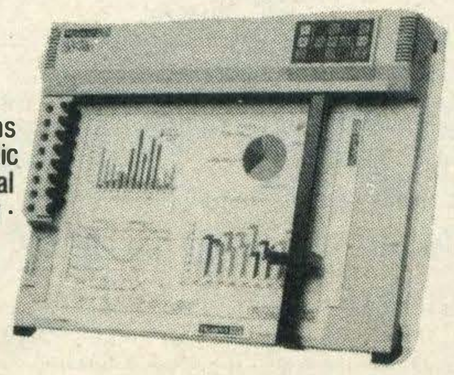

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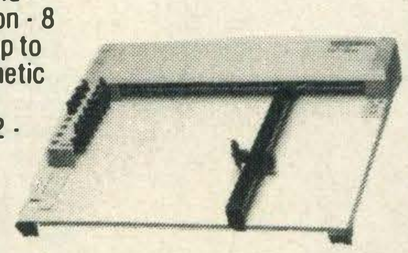

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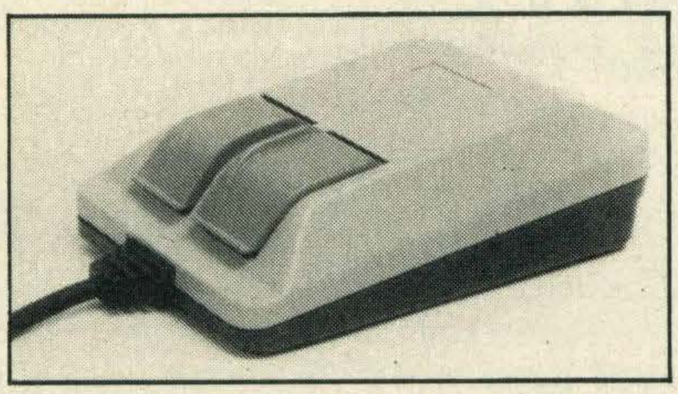

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TEST

MIGHTY MOUSE

Creating graphic masterpieces is so simple with Wigmore's mouse. Sally Wood investigates

There's a mouse in the house, but don't worry, it's not the furry bewhiskered variety — it's a sophisticated little grey device from Wigmore House. This particular species provides a very sensitive means of controlling, communicating and interacting with MSX computers.

Wigmore House already had experience of BBC graphics tablets and mice in the educational field, when it decided to move into the MSX market with a mouse — the MS2000 from Japan to be precise.

The company wants to emphasise the creative aspects of mice and is selling the mouse together with its own versatile graphics software, called *Cheese*, as a package. As John Bendall, Wigmore's managing director tells us, 'With a graphics program you immediately see results — who on earth wants to do home accounts on a computer? We are putting the emphasis on having fun.'

The cost of Wigmore's mouse and graphics cassette is £78.40, but for an extra £5.75 you can get the software on ROM cartridge. Our advice is get the cartridge — for speed and efficiency it wins hands down.

The mouse is an attractive device — two large blue buttons adorning a light and dark grey body — but its main attraction is the compact size enabling it to fit snugly into the palm of your hand. A rubber coated ball is housed in a compartment beneath the mouse and is easily retrieved for cleaning.

By now you may be wondering exactly how this device can help you produce graphics. Well, by moving the mouse over a flat surface, the rubber ball transfers any movements to an optical timing device inside. These signals are translated onto a VDU where they are used to either guide a cursor round the screen or for selecting items already listed. As the ball is rubber coated, the mouse moves in silence.

Like any other peripheral, mice can vary in quality — Wigmore saw quite a few mice of dubious character before they settled on the MS2000. The company considers this model to have all the characteristics of a quality mouse.

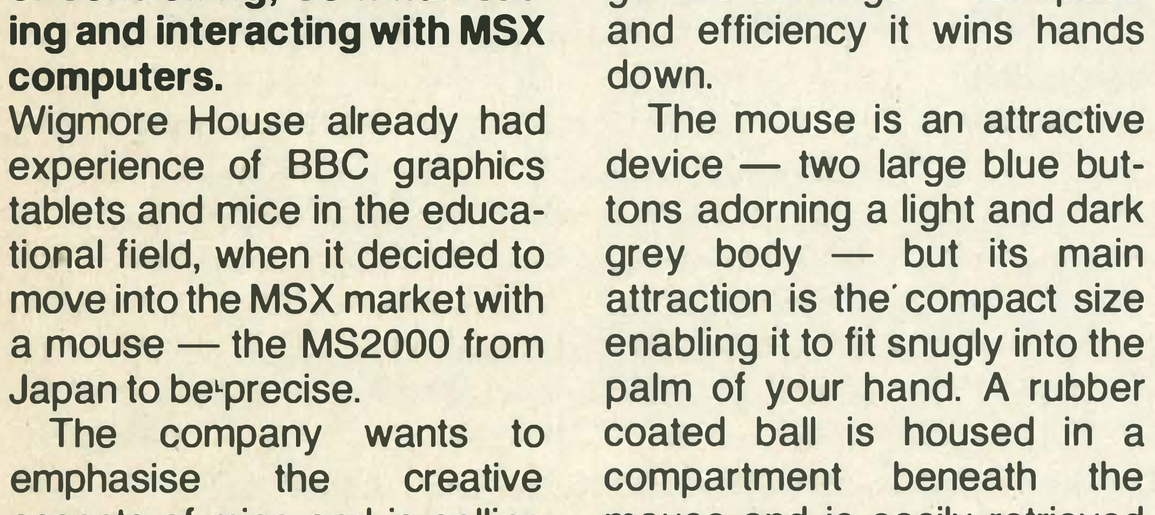
The two main types of mouse currently generally available are those controlled by potentiometers (the same controls used in many joysticks) and those using an optical timing device. The mechanics of these are explained in figure 1, but the latter type gives you much greater, and more sensitive control then the former. Mechanical mice tend to be more cumbersome and unwieldy.

For most purposes, the mouse is considered superior to other computer controlling devices such as lightpens, graphics tablets and joysticks. It doesn't cause the arm fatigue you can suffer from holding a light pen to the screen, and no part of the screen is obstructed by your arm while it's in use.

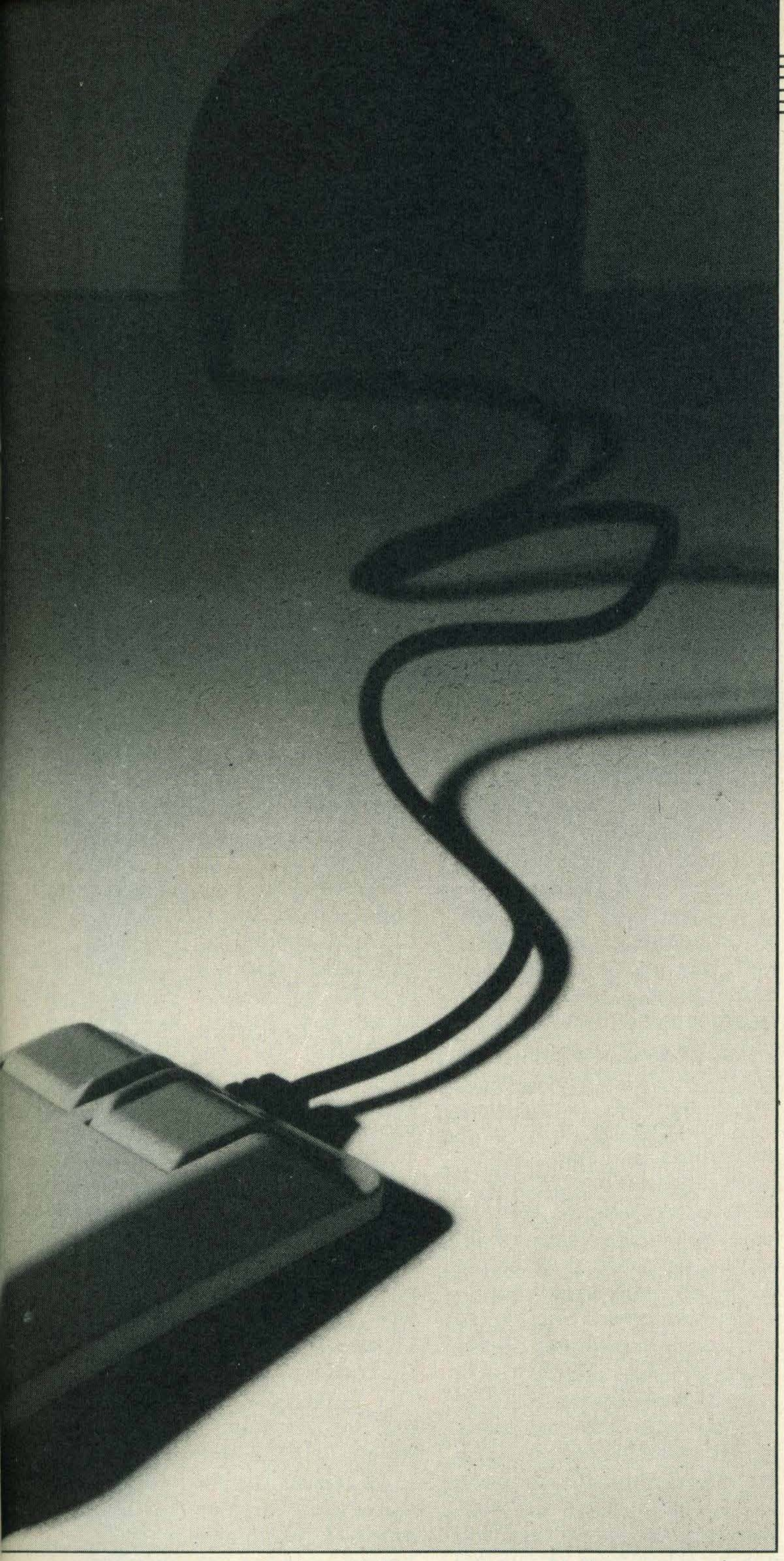
The mouse's main advantage, though, is that it's so sensitive and easy to control. Bendall sums the mouse up like this: 'It soon becomes a natural extension to the hand and using it to point, reposition and draw quickly becomes almost instinctive.'

Cheese, the graphics program accompanying the mouse, is one of the best MSX graphics package we've seen. It's very straightforward to use and we were creating colourful masterpieces within 30 minutes of plugging it in.

The only requirements for a good picture are a modicum of artistic imagination, a large flat surface and a monitor with a good resolution display. The latter is important because the mouse can operate at 100 points to an inch. If a low



Movement of the ball in an X or Y direction rotates the axis and its encoders. A hundred signals are recorded for every one inch movement of the mouse — considerably more accurate than mechanical potentiometers



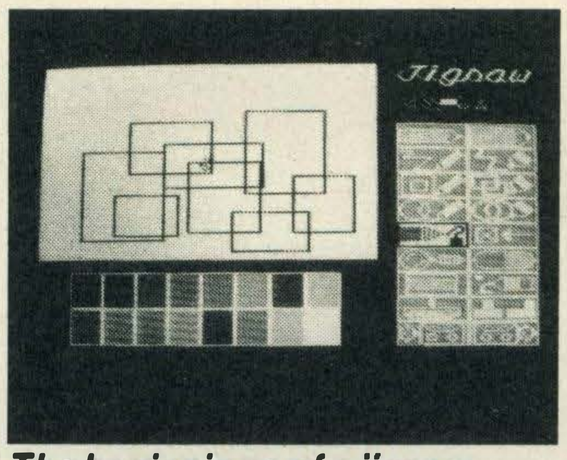
resolution screen is used this ability is wasted — lines will appear to be disjointed.

Once switched on, a menu of icons (an array of graphic symbols representing functions carried out by the program) appears on one side of the screen. As the menu is not a fixed feature, the whole screen can be used for graphic creations.

Choosing a function from the menu is simple. For example, to change the screen colour, all you have to do is move the cursor to the appropriate graphic symbol, press the left button and then move it to the desired colour on the colour palette. At the press of the same button, the screen instantly changes colour. Pressing the right button automatically moves you back to the icon.

All the usual shape commands are included — squares, rectangles, circles, ellipses. Line drawings are created using either the straight line command or with dotted and continuous freehand. Three line thicknesses are available. Many graphics programs contain more, but the real beauty of *Cheese* is the variety of colours available.

Not only do you get the usual 15 prime colours, but in addition



The beginnings of a jigsaw
120 different shades have been incorporated into the program — that represents a formidable array of colour combinations. Even if your pictures aren't worthy of the Tate gallery, at least they'll be colourful!

These shades are created by combining primary colour stripes. For some strange reason, the various colour palettes aren't arranged with the different shades of one colour together, but on different palettes. Consequently judging which shade you want can be difficult.

Experimentation with colour mixing is important because although some shades and primary colours go well together — with no running or spreading — some will just not behave. For example a greenish shade won't cover a blue or purple shade, but will cover a red primary colour with no trouble at all.

Other functions include X-Y co-ordinates, copying, mirror, scrolling the picture upwards and downwards, reproducing all the symbols that an MSX keyboard is capable of — including graphics — and changing border and cursor colours.

A magnification feature is incorporated, but unfortunately it's not possible to alter the picture with it. Although the package does lack some features like this, Bendall assures us that 'It's always possible to write your own subroutines and incorporate any facilities you think missing, into the program'.

Loading and saving facilities are available, but we only managed to save very simple pictures utilising primary colours. Saving more complicated pictures was impossible.

Wigmore will be including its own print routines, free of charge, with the package, enabling pictures to be printed on the Seikosha printer range.

Wigmore is expecting a

A mouse-drawn landscape
whole array of packages for the mouse to arrive soon, but Bendall is unsure of what, exactly, is coming. If the two cartridge programs he showed us are anything to go by, they will be fairly unusual!

Jigsaw Puzzle, currently selling for £19.90 on cartridge, is a game in which the user creates a jigsaw puzzle using a number of graphic commands such as an airbrush, shapes and a magnifying facility. The whole image can be broken into large and small pieces and put back together.

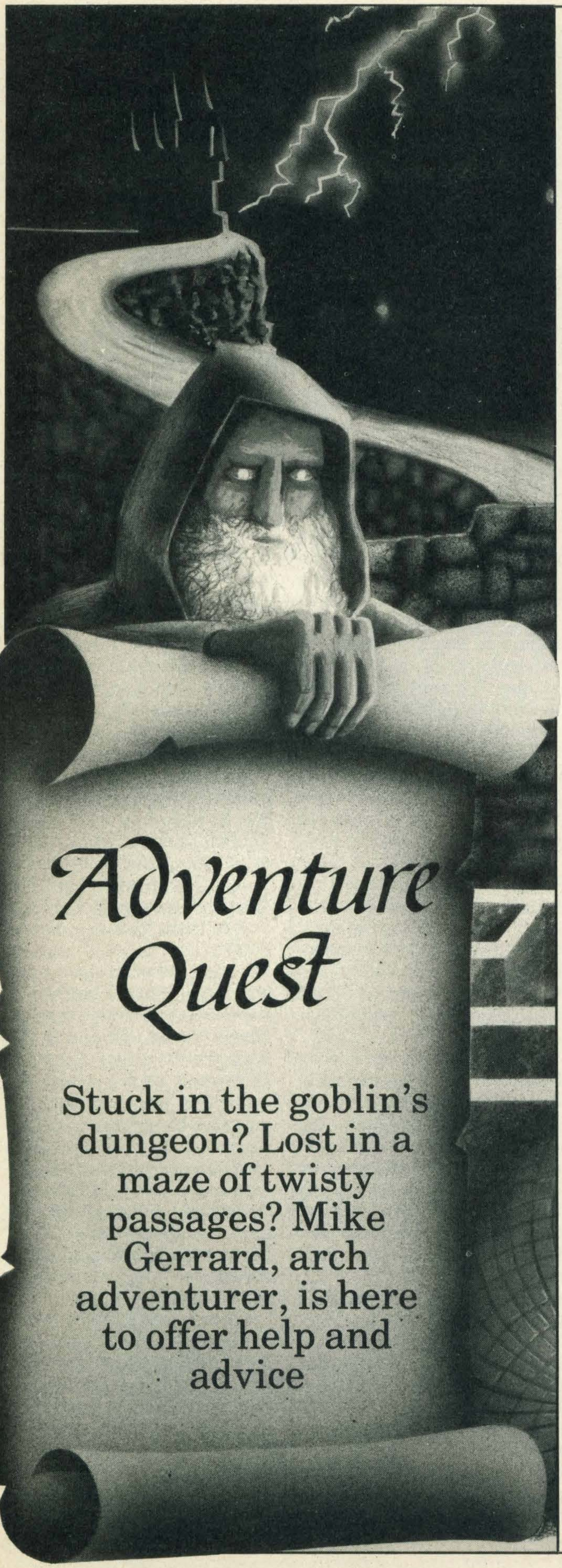
The other program, called *Audio Visual* is a mystery. It seems to transfer sounds into sound patterns on screen, but we're not positive about that because the instruction manual is in Japanese at the moment!

Applications for the mouse are as varied as your imagination is wide. It functions as a joystick and can be incorporated into personal programs. In the home it can be used to design clothes, plan that boat you've been meaning to build and so on.

It has a place in the business world, too. Bendall knows of a kitchen designer who uses it to design kitchens for clients. He finds it much easier to swop a fridge and cooker round on screen at a client's request rather than redrawing all his kitchen plans. Professional graphic designers are increasingly using home computer graphics systems like this to formulate rough ideas before transferring them to a more expensive CAD (computer aided design) system.

Mice are without doubt one of the most versatile computer controllers available and with the MS2000 and the accompanying graphics software, Wigmore House has come up with a winner. We couldn't put it down and we're pretty sure you'll soon think of plenty of applications for it within your own MSX system.

GAMES



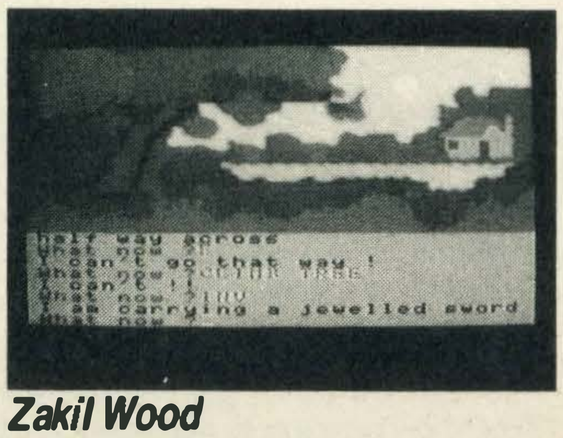
Welcome to the first of a regular series of columns for the MSX adventurer . . . and would-be adventurer. With a steady stream of adventure games being released by the likes of Level 9, Kuma and Melbourne House, and an equally steady stream of letters from readers already well and truly stuck in some adventure or other, we decided it was high time to set aside some space for this ever-popular style of game.

If you're slightly put off adventures because you imagine them to be full of trolls and dragons, elves and ogres, and other inhabitants of the worlds of *Tolkein* and *Dungeons and Dragons,* then it's high time you gave them a closer inspection.

While it's true that the majority of adventures do send you off on quests for magic rings with silly names, there's a whole host of other types waiting out there whether your interest is science fiction, thrillers or maybe something with a dash of humour.

I'll be covering all types of adventures in this column, mainly because I like all types of adventures, and as well as reviews of new titles I'll be offering hints and clues on old favourites, and trying not to forget newcomers who I know from past experience sometimes feel like outsiders at a party of close friends. So I'll try not to forget that for every reader asking how to get out of the infamous goblins' dungeon in *The Hobbit,* there are probably two wondering how you get thrown in there in the first place!

Before we get down to the main business of this month's column then, which is a lengthy look at the new Level 9 title, *Red Moon,* a few words of general advice for those taking their first tentative steps into the world of adventures.



Zakil Wood

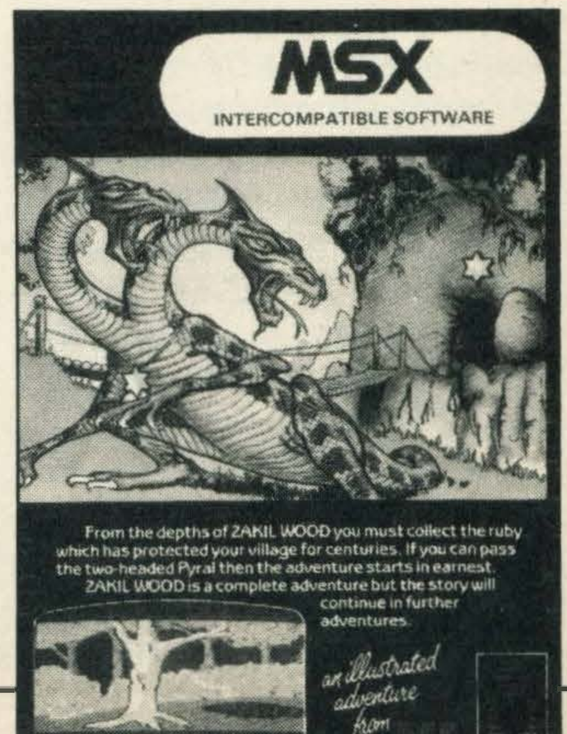
One thing that regular players soon take for granted is the vocabulary used, but this can be a little baffling for a beginner, especially trying to get used to the very common two-word input that is recognised by most adventure programs.

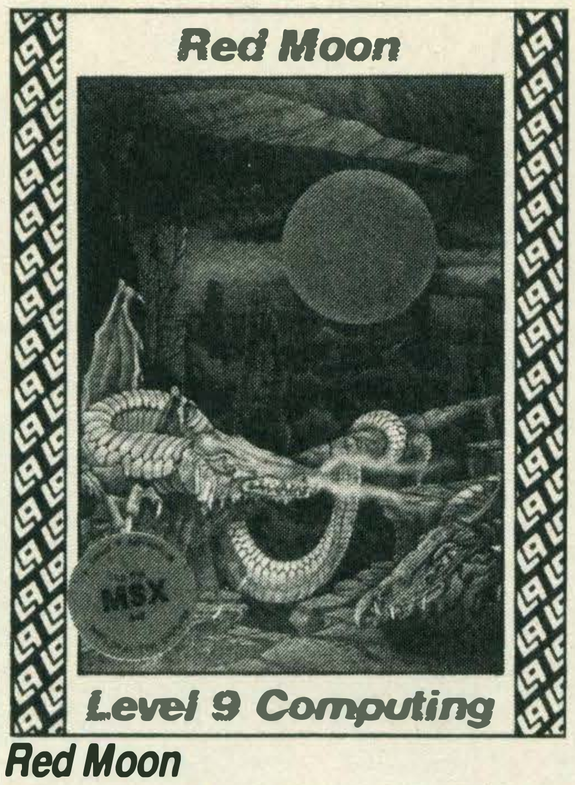
I was reminded of this recently when someone asked me how to get into a castle in a dracula-type adventure on another computer. They were confronted by a stubborn door, and had tried everything they could think of along the lines of OPEN DOOR, UNLOCK DOOR, KICK DOOR and so on. The command that was needed was a very simple GO DOOR, which I'd used so automatically when playing the game myself that it hadn't occurred to me it might even be a problem for someone.

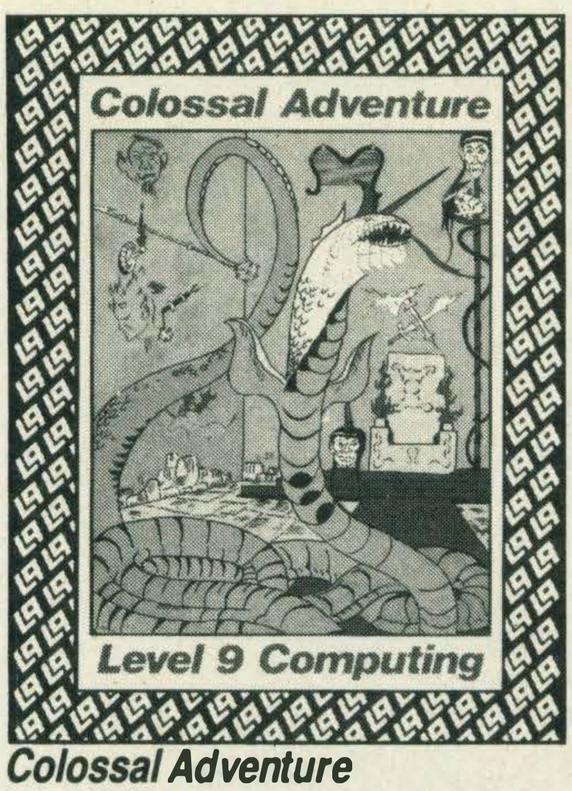
The program was obviously badly written, as it should also have responded to a similar command such as OPEN DOOR, but when I thought about it I realised that the instruction GO DOOR isn't exactly an obvious combination of words, until you get used to two-word shorthand.

The general convention, then, is that the first word is a verb and the second word is a noun (omitting the prepositions and articles that you would normally put in). So, you might type GET AXE, DROP JEWEL, LIGHT LAMP . . . or GO DOOR. Don't get annoyed if you type GO THROUGH THE DOOR and the program ignores it, while GO DOOR works.

As realistic as the world of some adventures can be, you mustn't forget that the program behind it is simply manipulating strings in order to help create this illusory world you're temporarily living in. Even accidentally typing an extra







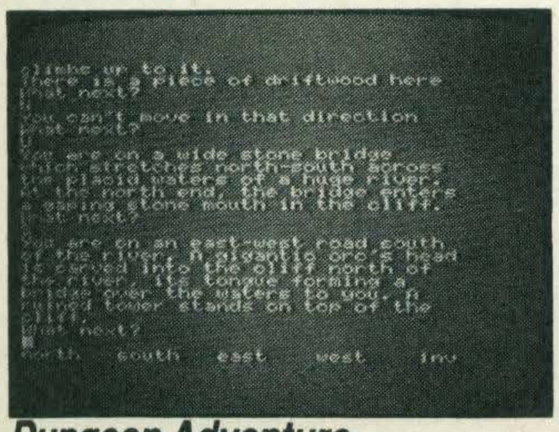
Lords of Time

space between the verb and the noun can throw some programs into confusion.

You might not be the type of adventure player who's the least bit interested in knowing how an adventure program works, but it does help you, and also improves your patience, if you're aware of at least some of the fundamentals. I also hope to be helping you understand some of these aspects of adventure playing too, over the coming months.

A final tip for beginners is that some of the commonest words in any adventurer's vocabulary should be LOOK, EXAMINE, SEARCH and INVENTORY. The last of these is usually the first thing I type in any adventure, as it obviously helps to know what you might be carrying at the start of the game — even if it usually is 'Nothing at all.' You should also LOOK in every location, as this frequently reveals something you didn't know was there, probably something innocuous and scarcely visible like a fire-breathing dragon or a giant with an axe. SEARCH and EXAMINE are often synonyms, the latter being more common, but if the location description includes something that might be of interest you should always try an examination.

Also EXAMINE all objects you start with or pick up along



Dungeon Adventure

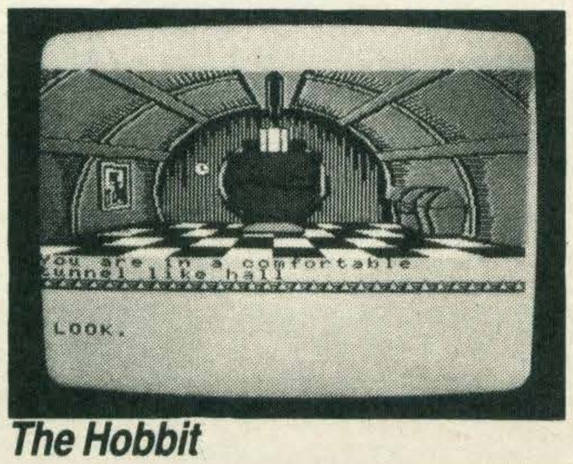
Red Moon

the way. On closer inspection the sword that you started with might be revealed to have magical properties, or a bottle might contain a potion or water. Check everything in this way, especially if you don't seem to be getting anywhere. You may be overlooking an obvious clue.

Whether you're a beginner or an old-hand, no adventure collection is complete without at least one game from the software house Level 9, though aficionados will have the collected works. In the past Level 9 has been noted for coming up with some toughies, which would keep even the keenest player occupied forever and a day, but the last couple of titles have recognised that not everyone likes battering heads against seemingly impossible problems.

Emerald Isle was aimed at everyone, with old hands inevitably complaining that it was too easy, but I enjoyed it as it enabled anyone to get stuck into the game before the problems got thornier and thornier. Now the latest release, *Red Moon,* is along the same lines and at the same price, £6.95.

A slight word of warning about loading the software, though, as we did experience some problems. The first two tapes had to be returned, and with the program recorded on each side of the tape that meant



The Hobbit

Colossal Adventure

four non-loading versions. With the third one we received, only one side would load, and that wouldn't load on the first cassette recorder we tried, so if you're buying the tape in a shop try and see it up and running first.

Red Moon is worth getting up and running, though, as it's up to the high standards we've come to expect from Level 9. You'll need 64K to play it, and into this is packed over 200 locations, each with accompanying graphics. The pictures are drawn fairly briskly, but most of them are quite simple and I soon found I was choosing the WORDS option in order to play with text only (graphics can be brought back by typing PICTURES).

The aim of the game is to recover the Red Moon crystal and return the kingdom of Baskalosk to its former magical glories: magical in its literal sense, as there are spells galore in this adventure . . . well, ten spells altogether, if you discount SAVE and RESTORE, though I suppose these count as magic in a micro sense, allowing you to temporarily halt the game and resume later without having to go back.

The various spells are focused on particular objects, all listed in the accompanying notes, and once you've found the object you can cast the spell associated with it . . . though spells don't work in the presence of iron, not even the SAVE spell! If you find the Dulcimer, for example, this carries the ESCAPE spell, allowing you to teleport yourself back to the first location, then return to where you were in the game. This makes it easier to stash away the treasures that

Dungeon Adventure

you find in pursuit of the Red Moon crystal.

This is more an adventure in the fighting fantasy tradition, as there are other characters that you will come across and will have to deal with. But are they friend of foe? From Ziix I obtained the spices that carry the spell of strength, but later I encountered a giant rat in a grain store and thought I'd better deal with it. Having killed it, nothing much has happened, so now I'm wondering if I'd have been better off feeding it some meat instead.

The adventure takes place in, around and beneath a castle, or at least it does in the initial stages I've managed to get through. Not that this is particularly hard, as about half the game's locations open up to you almost at once, and it's more of a tactical adventure as you watch for doors that allow you to pass only one way, and wonder where to make best use of the various spells you've found so far.

The text is fairly lengthy and atmospheric, and I thoroughly enjoyed crawling through caverns and along passageways, convinced that I was exploring a complicated network of places deep beneath a castle.

Red Moon would be a useful buy for beginners, but old hands should like it as well, as long as they don't expect the impossible. And if you get stuck, Level 9 will provide you with a clue sheet . . . while if you have problems on other adventures then the *MSX Computing* Adventure Helpline, in conjunction with this column, will do its best to help. No problem too small! Be adventurous... write in.

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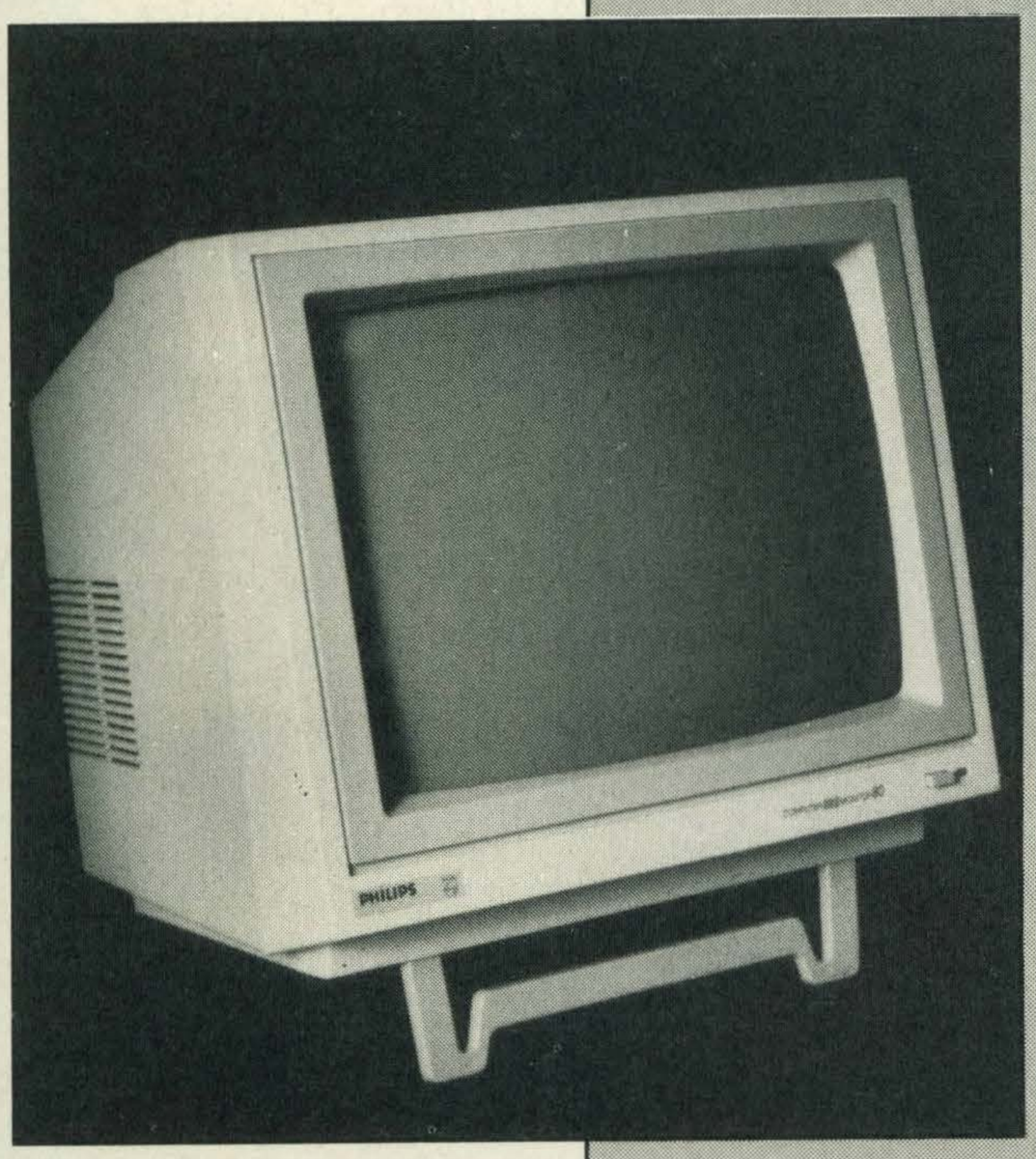

Like the look of these two Philips monitors? Fed up clashing with Dallas fans over the family TV? The solution is simple — just enter this month's Philips competition and win a quality Philips monitor.

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Entries on a postcard, please, addressed to Philips competiton, *MSX Computing*, 38-42 Hampton Road, Teddington, Middlesex TW11 0JE. Closing date Friday November 15th.

RULES

1. The judge's decision is final and no correspondence will be entered into.
2. No employees of Haymarket Publishing or Philips or their families may enter.
3. The winners' names will appear in the December/January issue.

GRAFPAD WINNERS

Here are the three winners of our July Grafpad competition. Each receives a British Micro Grafpad.

John Donohue, Co. Tipperary,
Jamie Browning, Eastbourne,
Clive Walker, Beaconsfield.

BASIC

STRINGS 'N THINGS

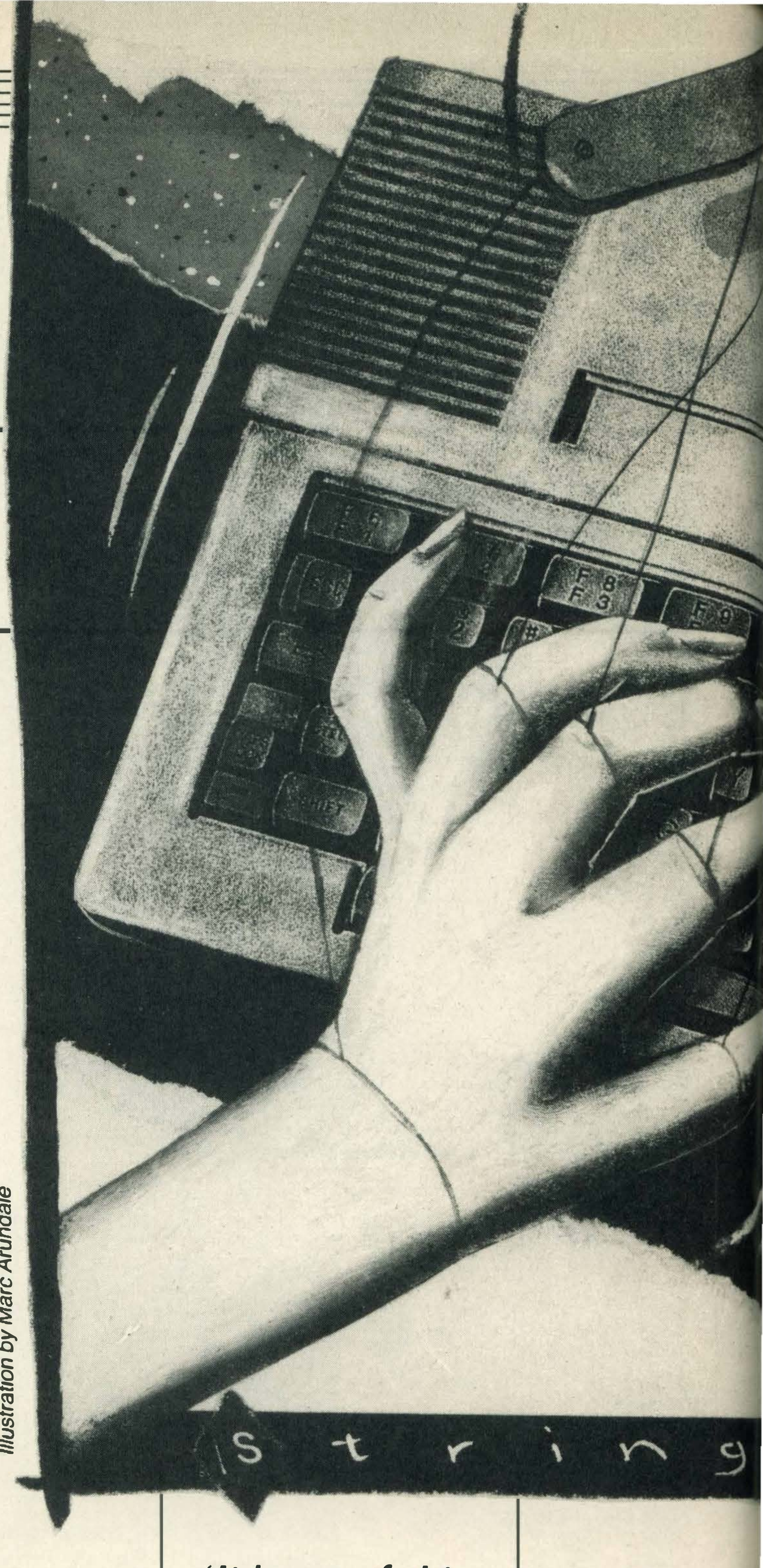

Illustration by Marc Arundale

No more knotty programming — here's some useful string handling tips from Tim Markes

Most of the non-numerical information we deal with in simple BASIC programs consists of words and phrases. We get the computer to display English language titles and friendly question and answer sequences, for example. This 'text' is held as a string of characters in string variables identified by the qualifier $.

You might imagine that all we can do with string variables is to PRINT them, but this is not so. MSX BASIC has several useful character string manipulation facilities — call it 'string handling'.

These are helpful in any forms of wordplay including word processing which is not as boring as it sounds.

For a start, let's go back to basics.

```
S1$="Y":S2$="N"
[Return]
OK
IF S1$<>S2$ THEN PRINT
"TRUE"
```

When you press Return after the IF statement you should see TRUE printed on the screen. This is eminently reasonable—because Y and N are indeed not the same (the symbols <> mean not equal to). But what happens if you try to use other IF comparisons like < (less than) or > (more than)?

Using > in the IF statement above shows that it is also TRUE that Y is 'more than' N: and not TRUE that Y is 'less than' N. So we seem to be able to check string variables for alphabetical sequence.

Yes . . . well, your MSX is really comparing its internally held ASCII code of each letter (American Standard Code for Information Interchange). Check out what these codes are by using the ASC qualifier like this:

```
PRINT   ASC("Y").ASC("N")
89              78
```

It is useful to remember that the ASCII code for 'A' is 65 and 'a' is 97. You can then derive codes for the other letters from their position in the alphabet. There will be a full table of ASCII codes in your MSX manual.

'It is useful to remember that the ASCII code for 'A' is 65 and 'a' is 97. You can then derive codes for the other letters from their position in the alphabet'

'Although capital letters are physically bigger, their ASCII value is numerically smaller — so 'jill' is greater than 'Jack''

You may also need to derive a screen character from its ASCII code, so remember that the reverse operation looks like this:

```
PRINT   CHR$(89).CHR$(78)
Y                       N
```

If we can compare single letters, what about trying names as well?
Let's check:

```
05 '** Alpha sequence? **
10 CLS:INPUT"2
Names";N1$,N2$
20 IF N1$>N2$ THEN PRINT
N1$ ELSE PRINT N2$
30  Z$=INKEY$: IF Z$=
""THEN 30 ELSE 10
```

Run this short program and you will find that it successfully compares two names and prints the higher in alphabetical sequence. So, Jack is 'less than' Jill and Mr Smithy is 'greater' than Mr Smithson. Remember that your MSX is comparing ASCII codes, though, so upper or lower case are significant. Although capital letters are physically bigger, their ASCII value is numerically smaller—so 'jill' is greater than 'Jack'.

Can we do any other arithmetical operations with strings, I wonder? Addition works too—try this:

```
K1$="A": K2$="B": K3$=
K1$+K2$
OK PRINT K3$
AB
```

This ability to add characters together is often used to build up SPRITE$ definitions.

To continue the words and phrases theme here is another mini program which uses INKEY$ to build up a word or phrase character by character with no screen display:

```
05'**Secret type**
10  INPUT"No of chars";
C;K1$=""
20 FOR N=C TO 0 STEP-1
30 K$=INKEY$:IF
K$="":GOTO 30
40 K1$=K1$+K$:NEXT
50 PRINT K1$;:GOTO 20
```

Since we can add single characters together, it's reasonable to assume that words and phrases addition is OK too — and it is. Too much of that, though, and your friendly 'Out of string space' message will appear (use to CLEAR nnnn to reserve extra string space).

The greater than/less than comparison will check alphabetical sequence, but it doesn't tell us anything about the number of letters in each string. For the answer to the . . . how long is a (piece of) string . . . question, we must turn to another MSX BASIC facility. Try this:

```
N1$="Fred":PRINT
LEN(N1$) 4
```

So the qualifier LEN can be used with any string variable to

extract 'the number of characters in'. One of its many applications would be to lay out text in the centre of the screen — like this title sequence:

```
05 '** Title centering **
10 LOCATE 0,0:INPUT
"Title";T$
20 X=(37-LEN(T$))/2:
'Centre?
30 LOCATE 0,12
40 PRINT SPC(X);T$;SPC(X)
50 GOTO10
```

Enter a title of any length less than the width of the screen (37 characters in screen mode 0) and the formula (37–LEN(T$))/2 will find where to start the text for a centre position.

So we can compare strings alphabetically, add them together and check their length. But how do we examine the actual content of a string by program? Suppose in a question and answer sequence, the program needs to test if a certain word has been used by the user — how is this done? Here is a snatch from a 'Doctor, Doctor' sequence, which might give you a clue:

```
05 '** Help me, doctor **
10 PRINT"Tell me all about it"
20 INPUT T$
30 IF INSTR(T$,"awful")<>0
THEN 90
40 IF INSTR(T$,"foul")<>0
THEN 90
50 ' other word checks here
80 PRINT "How interest-
ing":GOTO20
90 PRINT"Don't be so
NEGATIVE!:GOTO20
100 'other comments here
```

When INSTR fails to find the specified 'string' in the target variable (T$), it gives a zero reply to the IF question. This type of general text search for key words is often used in adventure game programming to allow the player to give a more colourful, free-form — but still intelligible — answer.

The non-zero result when the search is successful, is actually the start position of the string which has been found. The 'string' can just be a single letter, of course. To find the character position of a capital letter K$ on the top row of the computer keyboard we could use

INSTR("QWERTYUIOP".K$).

This helps to give effective 'prompts' in touch-type programs (see March issue of *MSX Computing*).

INSTR makes it a simple matter to search text for a word and replace it with another (spelling correction, say). Here is an example:

```
05 '** Replace word in text **
10 CLS:INPUT"Text";T1$
20 LOCATE 1,12:PRINT T1$
30 INPUT "Replace";T2$,T3$
40 X=INSTR(T1$,T2$)
50 IF X<>0 THEN LOCATE
X,12:PRINT T3$
60 K$=INKEY$:IFK$=""
THEN 60 ELSE 10
```

This program will only deal with the simplest kind of replacement — overwriting, where the new word is the same length as the old. Where the length of the two words is different, the new must be carefully sandwiched in between the left and right sections of text. Fortunately, MSX has three instructions which extract respectively the RIGHT$, LEFT$ and even the MID$ characters from a text string. Here they are in action with LEN — successfully dealing with the problem of replacing a piece of text with one of a different length.

```
05 '** Insert & Replace **
10 INPUTT$:'Input some text
20 INPUT "Insert";T1$,T2$
25 'Replace T2$ by T1$
30 X=INSTR(T$,T2$):IF
X=0THEN 20
40 T3$=LEFT$(T$,X-1)
+T1$+RIGHT$(T$,LEN(T$)
-X-LEN(T2$)+1)
50 PRINT T3$:END
```

The statement T$=LEFT$(string,number) places the specified number of characters on the left of the string into T$. As you can guess, RIGHT does the same for the right hand characters of a string.

MID$ is more flexible than the other two in the trio. MID$(string,X,L) for example, will return any part, length L, of the specified string from the Xth character position. This function is a convenient tool for splitting up a text into its component words — here it is in action:

```
05 '** Split up text **
10 CLS:INPUT T$:S1=1
15 'Input any text
20 S=INSTR(S1,T$," ")
30 IF S=0 THEN S=LEN
(T$)+1
40 T1$=MID$(T$,S$,S-S1)
45 'Print next word
50 PRINT T1$:S1=S+1
60 IF S1>LEN(T$) THEN END
65 'Press any key
70 Z$=INKEY$:IF Z$=
""THEN70ELSE20
```

In case there are any of our readers still not aware, line 70 and variations thereof is to be found in almost every program issued on every home computer. Any time you see a "Press any key to continue" — that's it! INKEY$ returns the keyboard key being pressed — or a null string if no key is pressed.

Finally, Figure 1 shows a version of Hangman — without the gallows and ropes, which nevertheless needs some effective string handling! Rather than INPUT to read a target word or phrase, the program uses INKEY$ which has no screen display. Unless you type very carefully (but discreetly), your opponent will get very frustrated! The CHR$(13) in line 140 uses the ASCII code for RETURN to detect the end of your typing.

Why not use your word power to spread increasing gloom as lives decrease (subroutine 300)? Notice that you turn out to be immortal in this game, however. Try a short INKEY$ sequence to check a password before you start — another 'play on words' perhaps?

```
100 '** DIY Hangman **
110 CLS:INPUT
    "Lives";L:T$=""
120 PRINT"Secret Word/
    Phrase?"
130 T1$=INKEY$
140 IF T1$=CHR$(13)THEN
    PRINT"Letter Please?
    ":GOTO160
150 T$=T$+T1$:GOTO130
160 IF L=0 THEN PRINT
    "GAME OVER!?"
170 K$=INKEY$:IF
    K$=""THEN 170
180 P2=P1+1:IF
    K$="?"THEN110
190 P1=INSTR(P2,T$,K$)
200 IF P1<>0 THEN V=V+1:
    LOCATE P1,12:PRINT
    K$
210 IF P1=0 THEN
    GOSUB300:GOTO160
    ELSE 180
300 '** Win/lose SR **
310 LOCATE 0,18
320 PRINT "Hit ";V
330 IF V=0 THEN L=L-1
    ELSE V=0
340 PRINT L;" Lives left"
350 PRINT"Press ? to re-
    start"
360 RETURN
```

Figure 1.

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

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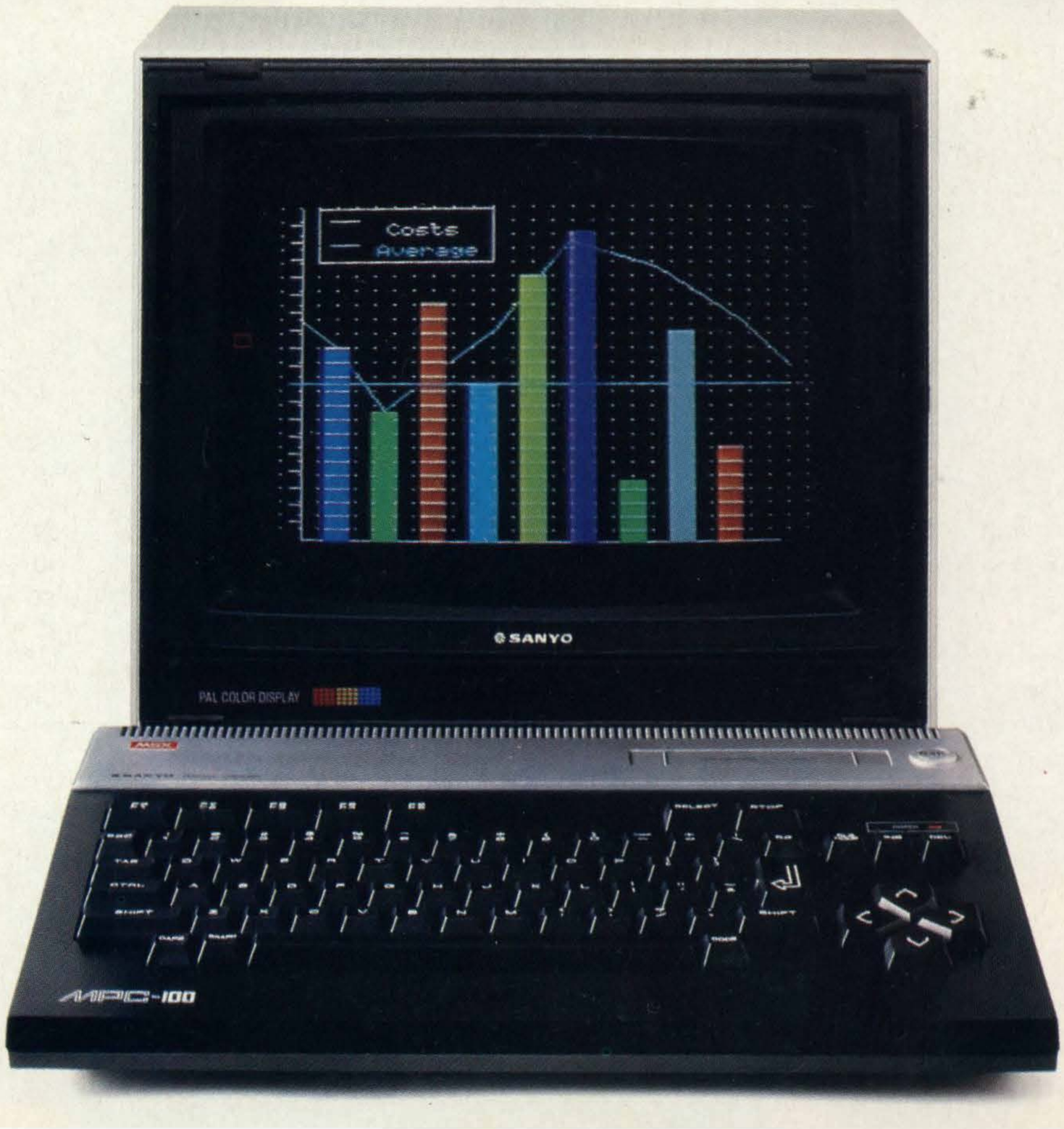
So even if you do just want an MSX for playing games, you could end up a loser if you don't first see Sanyo, then decide. SANYO

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



FUTURES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MSX TAKE TWO

Better design, sound and graphics — they're all ready and waiting in the wings for 1986

Although the dust has hardly settled on the current MSX range of computers, we are being promised a new generation which may revolutionise our home use of computers. Advanced sound synthesis, comprehensive video manipulation and new mass storage media are a few of the areas explored by the first major upgrade to the MSX standard: MSX 2.0.

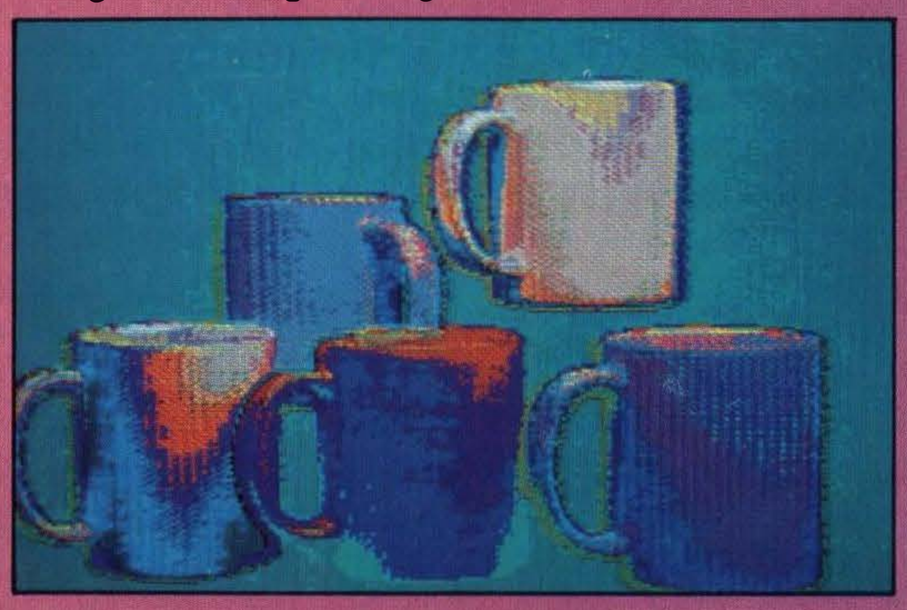
At present, there are two distinctive breeds of MSX micro. MSX version 1.0 covers systems like the Toshiba HX-10, Canon V-20, JVC HC-7 and the Goldstar. Between MSX 1.0 and MSX 2.0 lie those machines with a little bit extra — the so-called MSX-Plus (or 1.5!) systems. These usually incorporate a few extras bolted on to the standard machine.

The most notable examples of 'plus' systems are the Yamaha CX5 with built-in synthesizer, Toshiba HX-22 with the addition of an RS-232 interface and word processing software, and the Spectravideo X'Press, with RS-232, 80 column card and 3.5inch disk drive included. Sony's Hit-Bit just scrapes in as an MSX-Plus machine by virtue of its ROM-based address book software.

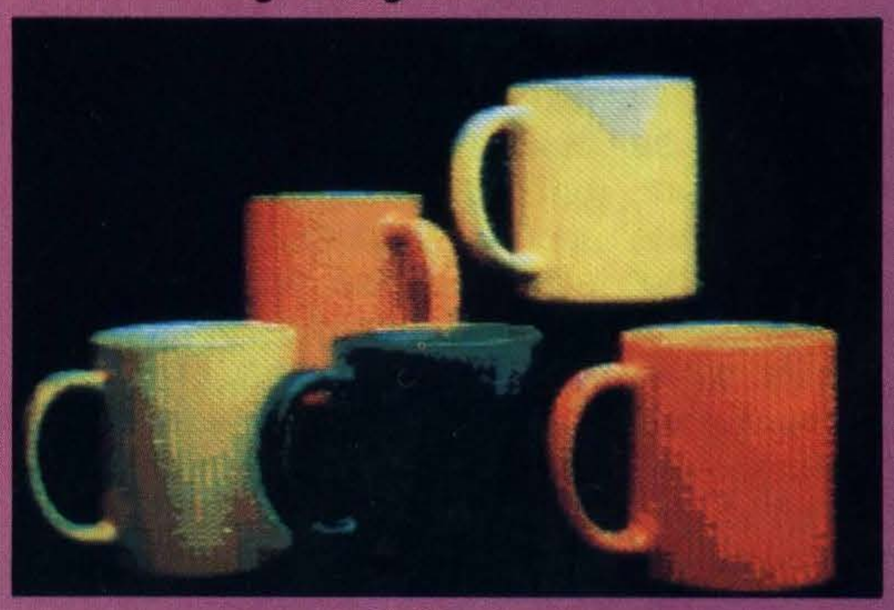
The systems mentioned above are the halfway stage between first and second generation MSX. The basic chip set remains unaltered: CPU, video and sound chips remain the same, and no major extensions to the standard have been undertaken. What MSX 2.0 brings is a *fundamental* change to the hardware present, while preserving compatibility with earlier machines.

The most radical of these changes has been the introduction of a new and vastly superior video processing chip. One of the major criticisms of current MSX computers has been the limited high-resolution graphics capability and the 40-column text mode. The latter restriction is particularly infuriating to would-be users of business packages such as word processors and spreadsheets. Packages such as these written for the universal CP/M operating system usually expect an 80-column screen, so MSX users have so far been

A digitised image using 16-colour mode

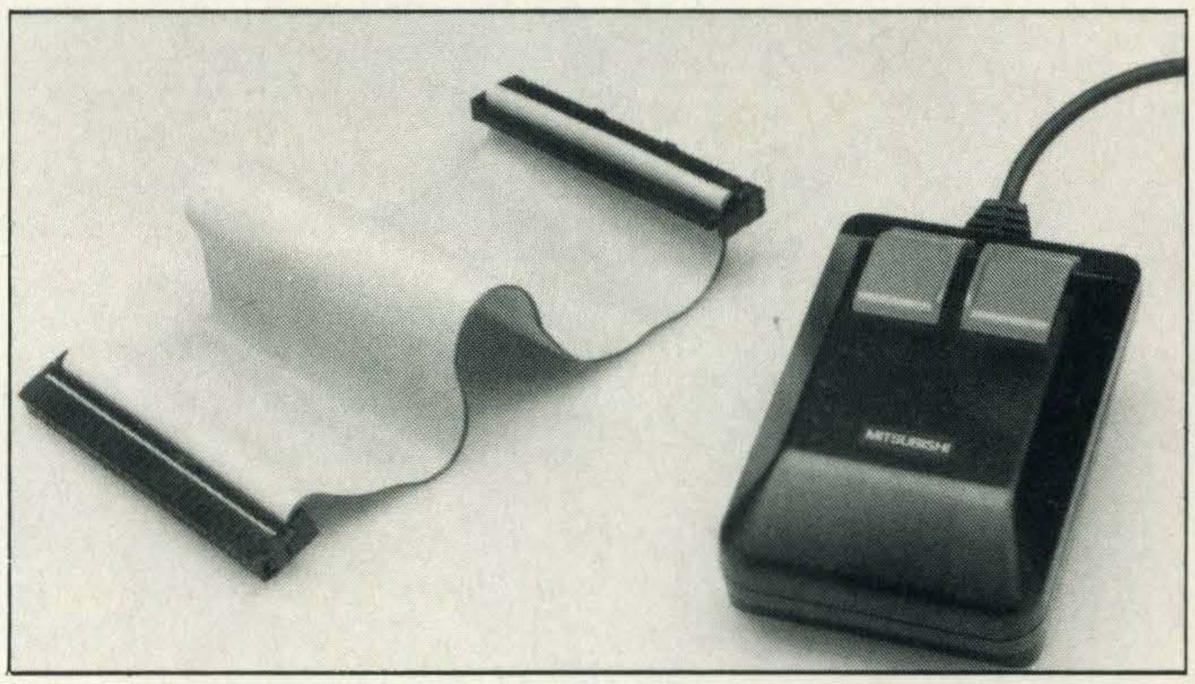


The same image using all 256 colours



FUTURES

Mitsubishi's prototype MSX2 micro with separate numeric keypad



Drawing options are selected with a Mitsubishi mouse divice

effectively denied access to a wealth of tried and trusted software.

Microsoft obviously took these criticisms to heart when it designed the V-9938 video chip. Not only is the graphics resolution increased, and an 80-column text mode added, but everything else from sprites to colour handling has had what might be termed 'a good seeing to'.

The maximum screen resolution has been increased to a hearty 512x424 pixels with up to 16 colours on screen. In a lower resolution mode, a palette of 256 colours is available to the programmer, which should improve the quality of commercial games software.

Sprites are an attractive feature of the current MSX system, but present a few problems in their use. Only four sprites may lay in a horizontal line at a time; add a fifth and one of your sprites will disappear. The 'fifth sprite rule' as it is known, has been modified to the 'ninth sprite rule' in MSX 2.0. Up to eight individual sprites may now happily co-exist on the same line.

Sprites also have to be of a uniform colour under MSX 1.0. Assuming you want a little green man with a red cap to appear as a sprite, you would usually have to use two sprites: one red for the cap and one green for the man.

The new video chip in MSX 2.0 systems allows each line of a sprite definition to be assigned a different colour, which would not only solve the little green man problem, but would also allow a fair degree of colour mixing to give the widest possible range of colour hues to a sprite.

When two sprites collide, an MSX 1.0 machine can say that two sprites have collided, but that is all the information you are likely to get. MSX 2.0 computers not only tell you when a collision occurs, but also *where* on screen it occurred, which should please a good number of games programmers.

Lastly, the video chip is capable of combining external signals from video cameras, VCRs and televisions with computer generated images. A number of new BASIC commands and statements have been added to control this superimpose feature.

Unlike a number of other computers (notably the BBC microcomputer), the high resolution graphics modes do not take up any precious system RAM. As with MSX 1.0, a separate block of dedicated video RAM is set aside, but the new video chip requires substantially more of it — 128K in fact.

Not only is MSX 2.0 a treat to the eye, but with the addition of a new, optional sound chip, it should give the ears a shock or two. As an option to the rather dated AY-3-8910 sound chip, which started life producing the necessary audio accompaniment in arcade games, the new sound chip will be modelled along the rather sleek lines of that found in the Yamaha.

Details of what this device can actually do are a little sketchy as yet. It offers nine voices in all, and these are generated using the FM synthesis technique. So it is possible to produce sounds like pipe organs, flutes, pianos etc. to a very high level of realism. You can also record and play back pieces of music, produce sound effects like gunshots, bongo drums, ambulances, or whatever else takes your fancy. Games programs might never be quite the same again.

Curiously, MSX 2.0 does not bring MSX into the 16-bit field — the ageing Z80 still holds court over a series of increasingly sophisticated peripheral chips. Why there has been no move towards a 16-bit MSX system is a mystery. One reason may be the difficulty in choosing a suitable upwardly-compatible processor. Zilog's initial 16-bit chip, the Z8000, had the dubious distinction of total incompatibility with the Z80. The recently introduced Z800 device *is* compatible but not available in sufficient numbers as yet to be considered as a possible upgrade.

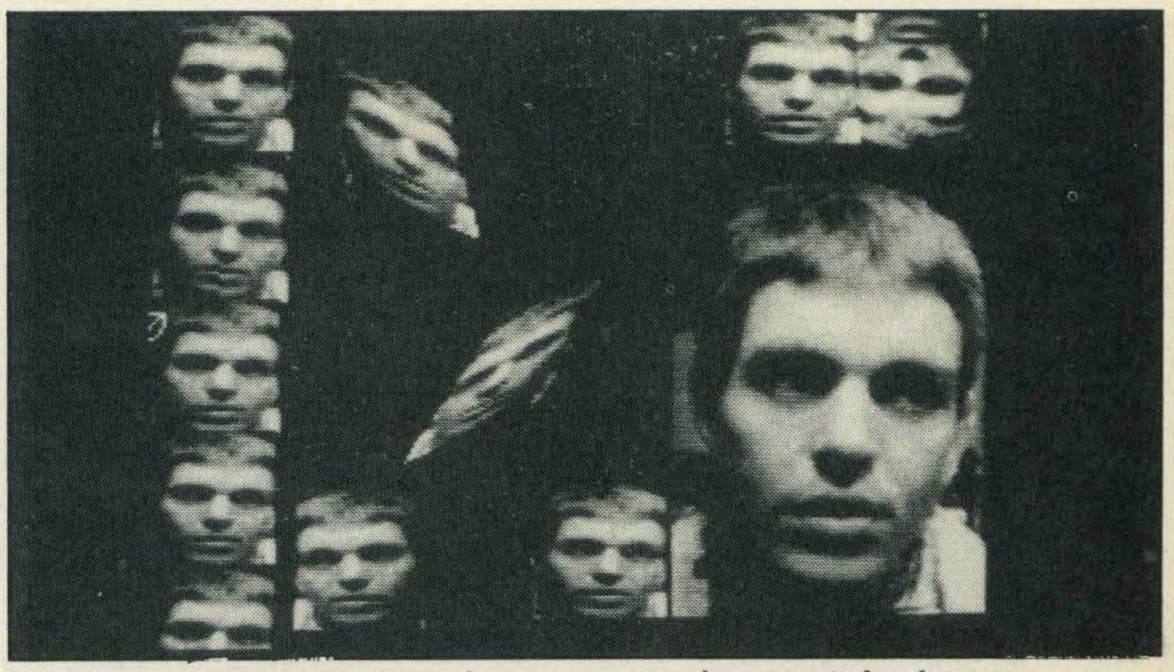
Other manufacturers' microprocessors suffer the same incompatibility problems as the Z8000, but this does not rule out their use in 16-bit MSX systems. Kay Nishi of ASCII Microsoft sees the Motorola 68000 as a likely contender. This chip is enjoying an unprecedented boom at the moment, being employed in systems like the Apple Macintosh, the Atari 520ST and Commodore's revolutionary Amiga. In future versions of MSX (MSX 3.0 perhaps?) we might expect to see a 16-bit Motorola chip *and* a Zilog Z80 to maintain compatibility with the earlier generations.

Philips is concentrating on the video possibilities of MSX 2.0, including its work on new mass storage media, namely

SPECIFICATIONS

CPU	Z80A (3.6MHz clock)
MEMORY	RAM: 64K minimum VRAM: 128K maximum Battery backed up RAM
VIDEO DISPLAY	40x24 Text mode 80x24 Text mode 32x24 Text mode 256x192 Graphics (16 colour) 64x48 Graphics (16 colour) Graphics 3 mode (Teletext?) 256x212 bitmapped (16 out of 512 colours) 512x212 bitmapped (4 out of 512 colours) 512x212 bitmapped (16 out of 512 colours) 256x212 bitmapped (256 colours) Maximum 512 colours available
STANDARDISED OPTIONAL FEATURES	Up to 8 sprites per line Super Impose Light Pen Kanji character generator Audio Visual control Mouse pointing device 9 voice FM synthesis sound chip

The digitizer unit interfaces with a 64-pin slot on the micro



Images can be reproduced, compressed or stretched on screen

CD-ROM. The amount of data that may be held on a compact disk is astronomical when compared with floppy disks and even hard disk units, running into hundreds of megabytes. The problem with CD is that it may only be read from at present, which makes potential users of such a large amount of data difficult to define. Applications will no doubt be found, but the technology is still in its infancy.

Mitsubishi

The MSX 2.0 computers will not be available in Europe this year, but we have been fortunate enough to borrow a Japanese production system from Mitsubishi. The basic computer system looks altogether more professional, with a separate numeric keypad and a perfectly adequate keyboard. The familiar cartridge ports are there. To test the upwards compatibility between MSX 1.0 and 2.0, a handy games cartridge was slotted in and . . . it worked. Flawlessly.

In fact, on the face of it, the only difference in appearance between this and other MSX systems is the discreet number '2' added after the logo. But turning the system on gives you the first impression that things are not as they appear. Instead of the normal copyright message, a graphic MSX logo scrolls onto the screen, and the system proudly declares that it has 128K of video RAM.

The exciting potential of MSX 2.0 was demonstrated by means of a Mitsubishi 'digitiser' unit and video camera plugged into a 64-pin slot on the back of the computer. The digitiser is a device used to capture video signals from a source such as a VCR or video camera, so that images may be processed by the computer. Some of the amazing effects seen on commercial television will thus be available to the home user at a fraction of the cost of commercial systems such as the ubiquitous Quantel so beloved of Kenny Everett and *Top of the Pops*. This system is only available in Japan at the moment but with luck it'll arrive here with the advent of MSX 2.0.

An image is captured and frozen by pressing the space bar on the computer. Whatever the camera was pointed at is displayed in digital form on the monitor screen. Now the real fun begins.

Inside the digitiser is a piece of ROM-based software called 'Artpaper'. Using a pointing device known as a mouse to control a cursor, you can select a number of drawing or editing options from a menu of icons on the screen. Then, with a click or two of the mouse button, you can start transforming the image on the screen.

For example, you could start off with a picture of a black terrier. The first thing you could do is paint it pink by painting on the screen. By selecting the aerosol option, you could turn your terrier into a dalmation by spraying it with green spots. All the drawing features you would expect of a good drawing package are present, such as rubber banding, box and circle drawing, paint-fill and the ability to add text to the picture.

The image editing functions are comprehensive. Pieces of the screen image may be 'cut out' and moved around the screen. In no time at all, you could harmlessly create a dog with two heads, or a screen full of dogs heads. Reduction and enlargement of a picture is also possible, as is the compression or stretching of a section of the screen.

Your final picture can also be combined with a 'live' image from the TV camera using the superimpose feature. Various sections of your computer processed image can be cut away to reveal the TV picture beneath.

Remaining options allow you to save a picture to disk or tape for later recall, or even to print your picture. This latter feature we were unable to test as the necessary printer drivers were not available from the software as yet.

Although the system sounds like fun, by now you must be wondering how much it all costs. The MSX computer is expected to be around £300 to £400, with the digitiser similarly priced.

This may be outside the price range of most home users, but Mitsubishi's Steve Wankling sees it appealing to video contractors who want to add a more professional title sequence to film sequences like weddings etc. Software houses could also use the system to design title screens.

When MSX 2.0 becomes established, it is likely that innovative and unusual hardware like the Mitsubishi system will come within the reach of the home user as an entertainment device, rather than for purely professional purposes. If this represents the vanguard of the new systems, it should be very interesting to see what developments have been made by the time MSX2.0 reaches us next year.

COMMANDS

MSX2 includes several new video BASIC commands:

COLOUR = (PALETTE NUMBER, RED, GREEN, BLUE)
change colour table, and specify intensity of each of primary colours

COLOR SPRITE <PLANE NUMBER>, <STRING EXPRESSION>
specify the colour for *each* line of a sprite

COLOR SPRITE <PLANE NUMBER> = <PALETTE NUMBER>
specify a single colour for a sprite

SET VIDEO
set mode for superimpose

COPY VIDEO
digitise an external video input

GET DATE, GET TIME
read the date and time from the system clock

SET DATE, SET TIME
set the date and time on the clock chip

SET PASSWORD
set up a user password in the battery backed RAM

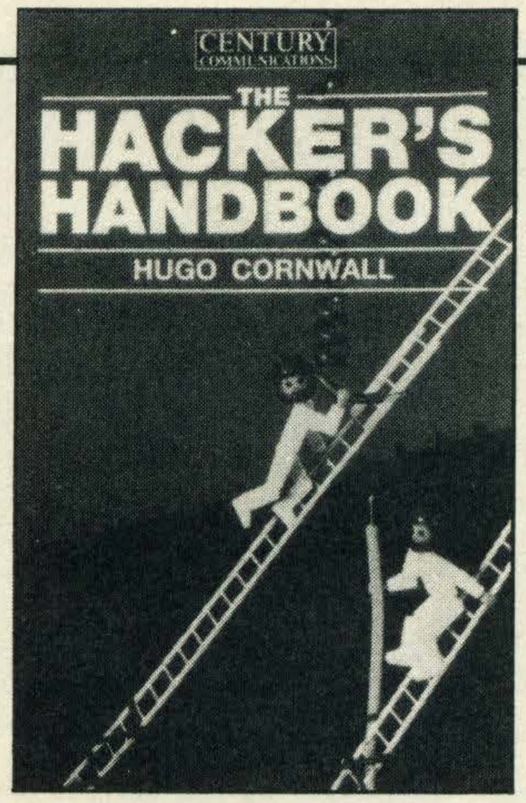
SET TITLE
set up a message which is to be displayed as soon as the system is turned on

SET PROMPT
change the BASIC prompt from the standard 'OK'

SET SCREEN
set up the initial screen colour, mode, width etcwhich are to be used

REVIEWS

PRINT OUT



The Hacker's Handbook

by Hugo Cornwall
Century Communications, £4.95

When Hugo Cornwall (a pseudonym, by the way) first published this book it caused quite a stir among the computer press and home computer enthusiasts.

Its purpose, according to Cornwall, was to point the potential hacker (or should I say criminal?) in the 'right direction' (whatever that might be) and equip them with the necessary skills and a grasp of the methodology involved.

Fair enough, he does highlight a few well-used techniques but many of the tips are old hat. It's hard to believe that users are still naïve enough to endanger the security of their systems by using their own initials or those of their friends or even car number plates in their passwords!

Despite the fact that the author has included a host of 'useful' numbers, it's reasonable to assume that since publication they will without doubt have been changed. So if you were hoping this book would provide you with a short cut to MI5's mainframe . . . forget it!

The most useful chapter describes the various databases you might want to access, such as the British Library's BLAISE, Finsbury Data Service's TEXT-LINE and the Stock Exchange's TOPIC. None of these is exactly top secret but if you need to check press cuttings or see what your BT shares are doing there are a few useful numbers to keep handy.

Chapter six is by far the most interesting mainly because it contains so many inaccuracies. For instance, contrary to the author's claims, it is not easy to break into university computer systems — a detailed knowledge of the operating system is required. Any modifications can only be carried out through a designated terminal or physical access, which is difficult, to say the least.

Throughout the book Cornwall stresses that a hacker's best weapon is research; it's a pity he didn't do a little more himself.

Apart from the factual mistakes that do little for the book or the author's credibility, *The Hacker's Handbook* is a good read. But remember, you shouldn't believe everything you read!

MSX Applications

by Garry Marshall
Argus Books, £7.95

This title by Garry Marshall departs from the usual 'How to program your MSX' offerings and explores and explains various ways in which you can put your micro to work.

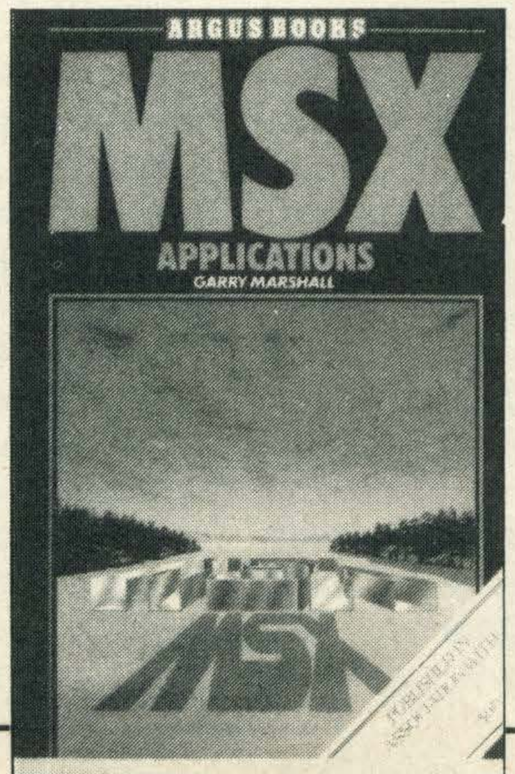
The author starts off by looking at word processing, spreadsheet and database packages from software house Kuma, showing that MSX computers have wider applications than just playing games.

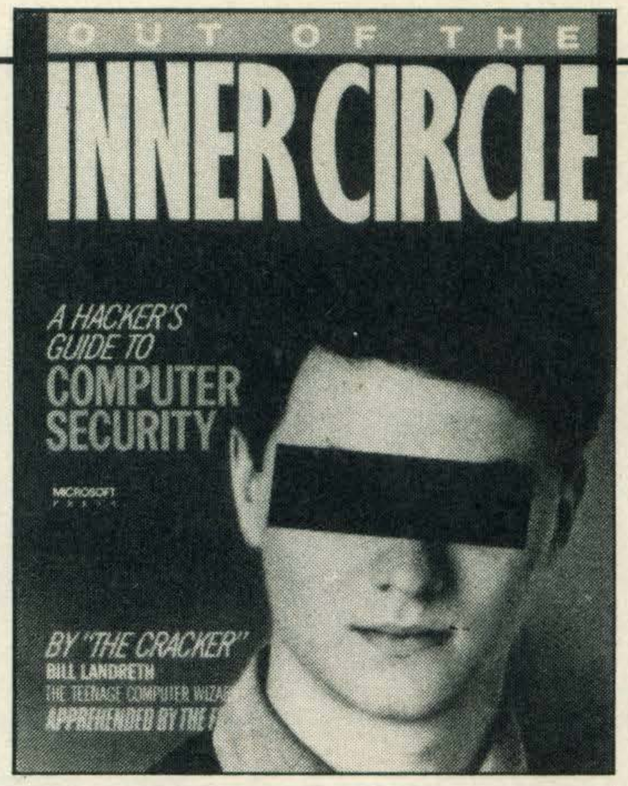
He points out that by using such packages your micro can carry out all sorts of information-related tasks such as keeping details of the family's medical history or working out the family budget.

The third chapter is dedicated to problem solving: how to write your own programs for working out the quickest and cheapest route to Amsterdam, for example. However, I'm not convinced home computer users are going to be bothered to key in the necessary data when a quick call to the Air Travel Advisory Service will give them all the information on-line. Having said that, an architect or accountant working from home could probably save valuable time using a micro as a number cruncher.

A chapter on the various add-ons available, such as disk drives, lightpens and printers, rounds off the book, together with an overview of communications and how you can get connected (legally!) to Prestel, Telecom Gold and MSX-NET.

At £7.95 the book is moderately priced and an easy read.





Out of the Inner Circle

by Bill Landreth
Penguin, £8.95

Since the release of the film *Wargames*, and the publicity surrounding various arrests both here and in the States of teenagers who've broken into commercial computer systems, hacking has fast become a subject of great interest.

Many a computer programmer's enthusiasm to 'crack' a system has been fired with the publication of several books on computer security and so-called 'hacking'. *Out of the Inner Circle* is the latest such book, written by a 19 year old American who soon became known as simply 'The Cracker', and who was eventually stopped by the FBI.

The book is basically a potted autobiography of the author's fascination for computers that didn't belong to him, and the exploits of his fellow members within a select group of hackers known as The Inner Circle.

He supplies not too detailed accounts of the numerous corporations and networks that the Inner Circle managed to infiltrate and without giving too much away he describes some of the favoured hacking techniques used.

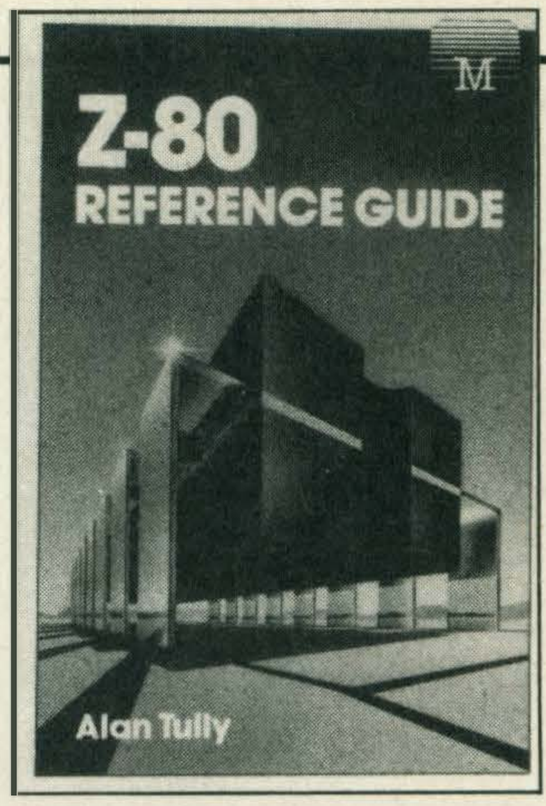
A large chunk of the book profiles the various categories of hacker from the novice through to the thief whose only interest is to infiltrate systems for profit, better-known as industrial espionage.

The concluding chapters deal with computer security. Drawing on his own experiences Bill Landreth offers advice and tips on how security can be tightened up, for example by not using obvious passwords. One banking system he came across, for instance, had the incredibly obvious account name and password of . . . BANK! Other tips include the monitoring of users and making sure that your system hangs up after one or two incorrect log-ons.

Throughout the book Landreth continually emphasises that the Inner Circle was only interested in computers and not the organizations that owned them. And he claims that, a little like criminals, hackers have their own code of conduct.

Altogether, it's an entertaining read — some of the 'capers' are extremely intriguing and even amusing.

A varied selection of new books this month, including two MSX specific books and two 'hacker' titles. Reviewed here by Julia Alexander



Get more from the Epson printer

by Susan Curran
Collins £7.95

As Epson has dominated the home and small business computer market with its range of dot matrix printers, it's not surprising that someone has eventually got round to publishing a book about them.

Get More From The Epson Printer is geared towards anyone who has no idea how to begin choosing a printer, let alone set it up and use it with a computer.

So, the first chapter gives the uninitiated a quick run down on Epson's product range, together with a mention of other manufacturers' products.

After a guided tour of the intricacies of bi-directional printing, interfaces, buffers and ribbons, you're told how to obtain alternative type styles, how to define new characters and how to print out computer images designed onscreen.

One of the most interesting chapters concerns type styles provided by the FX-80 printer in particular.

Plenty of examples are shown, ranging from enlarged to Elite styles. This is followed by a useful section dealing with how to define your own character sets — for which some basic knowledge of BASIC programming is required.

Despite the fact that this book is aimed at Epson owners many of the programming examples should easily be adapted for other printers, provided you have some basic programming ability. They can, at least, be used as a platform for writing your own routines.

The final chapter runs through the different types of stationery available for all kinds of printers, explaining the differences between cut sheets, fanfold and rolls. And, of course, there's the usual appendices detailing ASCII character sets and control codes.

If you want to make hard copies of your flow charts, run off a few business letters, flick your DIP switches or just point out some listings — and you are or intend to be an Epson owner — then this is a worthwhile guide to supplement your manufacturer's manual.

Computer Peripherals

by Barry Wilkinson & David Horrocks
Hodder and Stoughton, £6.95

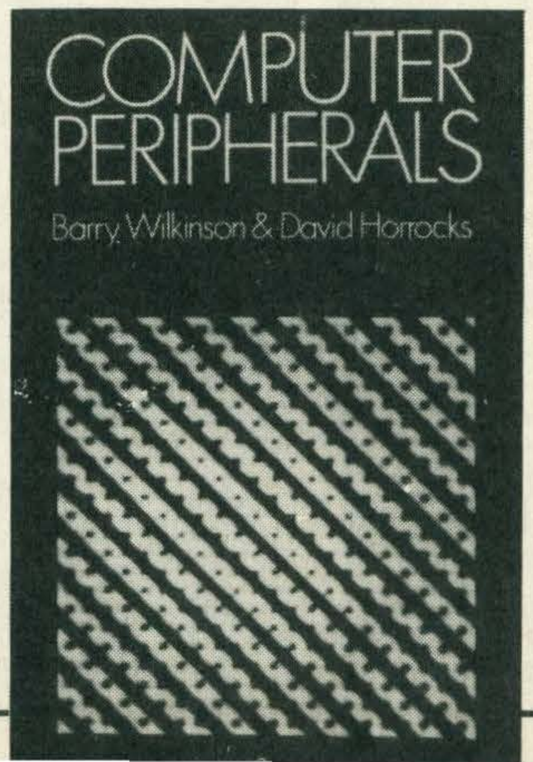
A computer system is very limited without add-on devices such as printers, data recorders and disk drives. Yet most text books I've come across have only a token chapter on the numerous peripherals that can be purchased and more often than not only mention a couple of devices.

As you've probably gathered this book is not specific to MSX but is aimed at the general computing fraternity. However it does offer an interesting insight to what is taking place and what sort of devices we can expect for our micros in the future.

The first chapter starts off very much like a text book, discussing the roles of peripherals before going on to explain exactly how you can use them to expand your system.

In the second chapter the authors show how peripheral devices are connected to computers and the ways in which the data is passed between the two, something few books usually attempt to explain. That's followed by the main chunk of the book, which takes you through all the different devices such as graph plotters, RS232 interfaces, printers, joysticks, lightpens and graphpads. You'll also find out all you need to know about bar code and optical character readers as well as laser printers.

The final chapter gives you a run-down on data communications and explains how you can link into public databases via the telephone network. It all gets a bit technical here but is nonetheless of interest.



Z80 Reference Guide

by Alan Tully
Melbourne House, £9.95

Anyone seriously interested in becoming a proficient Z80 machine code programmer should have a comprehensive reference manual to refer to.

Just such a manual has been written by Alan Tully. You could describe it as more of a Z80 programmer's bible than a guide, as it contains almost everything there is to know about one of the most widely used processors in home computers — including, as we all know, MSX.

The first chapter runs through the various registers provided in the Z80 microprocessor and contains tables showing the effect various groups of transactions have on the flag register.

The third chapter, which consists of one page (the briefest chapter in the entire book you'll be relieved to know) details the timing principles used in the Z80.

It's all pretty interesting stuff but unless you're a whizz coder working in a commercial environment then you don't really need to know how long it takes instructions to be carried out. You could just skip this section altogether and get down to the business in the following chapter.

Chapter four contains a summary of Z80 instructions and is written in such a way that an experienced programmer can easily pick out the instructions he wants to use to achieve the desired effect. He can then refer to the tables in the next section which will show the effects a specific instruction will have on the flag register, the number of bytes and its object code.

The book is rounded off with hints and tips experienced programmers have found useful in the past — often the kind of stuff you may not have thought of using yourself. There's also a useful appendix right at the end of the book, that includes ASCII codes, hexadecimal/decimal conversion table and a condensed quick reference table of all the source codes.

The publisher claims this is the first chip specific book written for the Z80. At £9.95 it offers a great deal of well-presented information for any serious machine code programmer.

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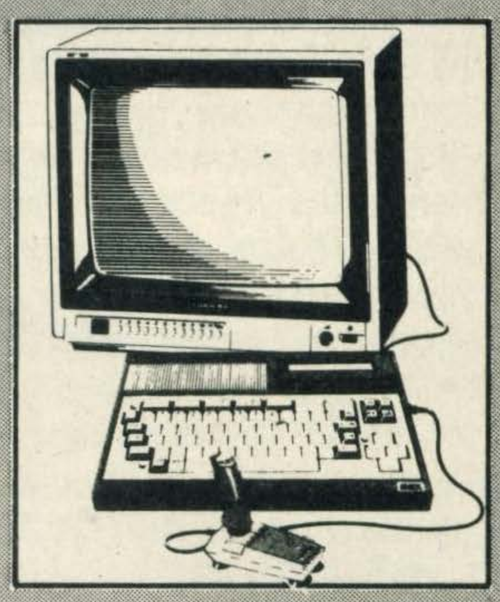

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MUSIC

MIDI MAGIC

Tim Markes gets his hands on JVC's latest MSX MIDI music system

In the July issue of *MSX Computing* we told you about a MIDI (Musical Instrument Digital) Interface being developed by Electro Musical Research (EMR). An agreement has now been reached with JVC to market this interface under the JVC logo. And we managed to check out the only available review model, before it went to Japan for evaluation.

How would you expect your MSX computer to send information to an external electronic instrument? By sending a serial (or parallel) pattern of binary bits down a line connection maybe? The MIDI communications link is indeed a fast serial connection (31.25K baud — compared with 19.2K for the RS232).

The line connection to the synthesiser is a standard non-mirrored DIN connection into a MIDI interface (DIN) socket. Most modern keyboards now have built in MIDI sockets. One IN socket for receiving information and one OUT for transmission. Some keyboards also have a MIDI THRU socket — just a copy of MIDI IN for transmission to another MIDI instrument.

How do we get this information from the MSX computer to the MIDI equipped keyboard? Via the JVC MSX MIDI interface — naturally!

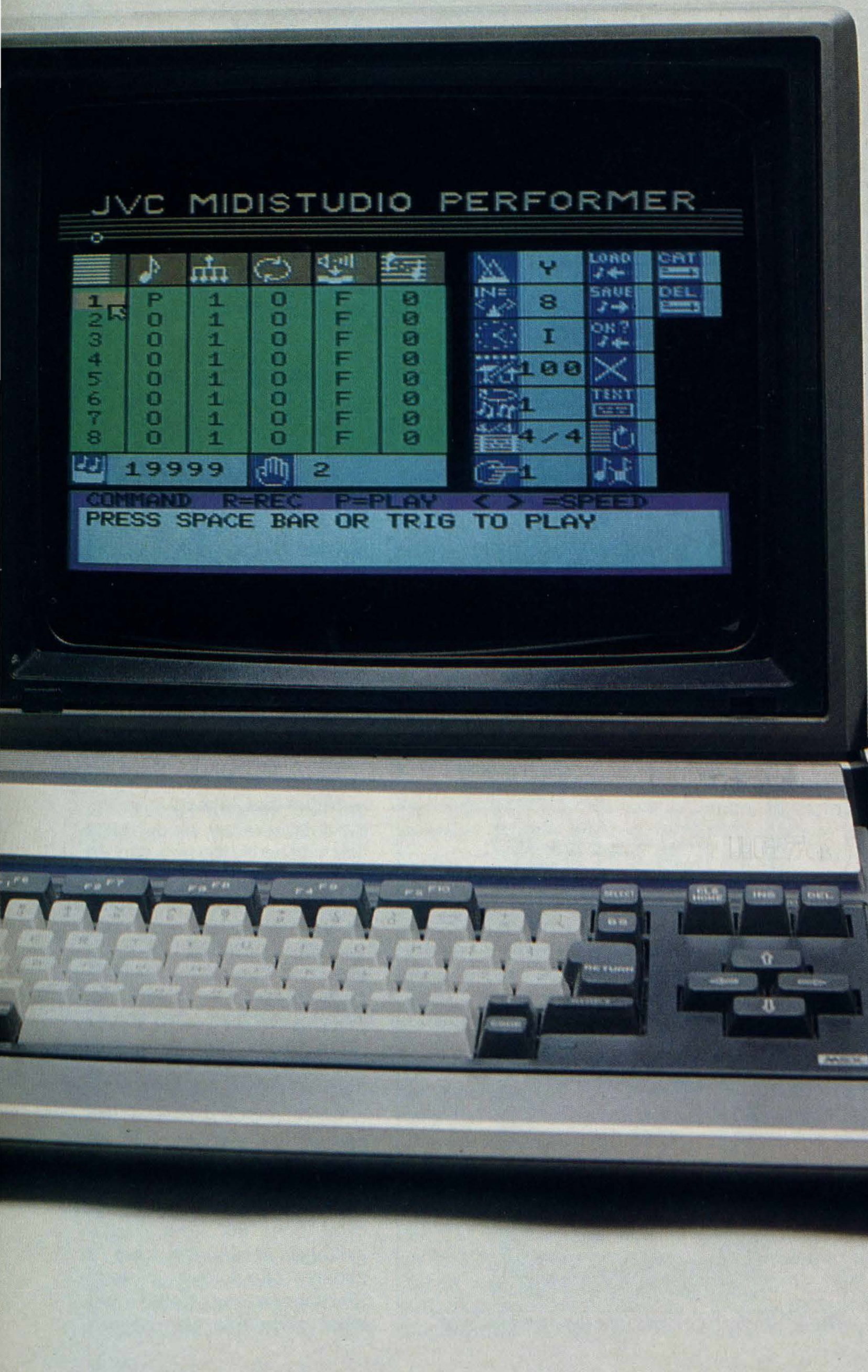
The interface consists of a cartridge connected to a black box on which you will notice four DIN sockets marked IN, OUT1, OUT2 and CLOCK START/STOP. Plug the cartridge into the first cartridge slot on your computer and switch on. Then connect one of the two OUT sockets on the black box to the IN socket on the synthesiser.

To switch on a note, you must send the three byte binary pattern specified by the internationally agreed MIDI standard — here is Middle C:

10010000 00111100 01111111

Now, with program instructions to send the right byte patterns to the correct port, your MSX will be able to play notes on a MIDI synthesiser.

The helpful tape provided with the interface tells us to use the MSX program



The Midilink accessory lets you connect up to six MIDI controlled musical instruments

instruction OUT to send a data byte 0-255 to the specified output port — Port 3 in this case. Using the more compact decimal notation, the corresponding program line to turn on Middle C, for example, is:

OUT 3,144:OUT 3,60:OUT 3,127

Playing notes manually on the synthesiser will also generate information, of course. To read this, DIN connect the MIDI OUT socket on the keyboard to the MIDI IN socket on the interface and read bytes using the INP command addressed to the same Port 3. There are helpful IN and OUT LEDs on the interface which keep flashing reassuringly when bytes are buzzing.

The software also includes a simple monophonic (single note) screen piano keyboard, which plays corresponding notes and some 'effects' on a real MIDI keyboard. The final JVC MIDI software may not incorporate these particular features, however; so our main interest was to check that the general MIDI specification worked successfully with MSX communicating with some suitable electronic keyboards.

All MIDI information is sent as a group of between one and three bytes. The first is a 'Status' byte, indicating a particular function (like NOTE ON) and specifying to which MIDI channel the information refers. There are 16 available channels, although some MIDI instruments are fixed at Channel 1. All the examples here will refer to Channel 1. To specify a different channel, just add 1 to 15 to the Status byte appropriately.

There are also several MIDI communication modes available. These determine whether particular or all (OMNI) channels are recognised and whether the instrument is polyphonic (multi-note) or monophonic (single note). Most MIDI keyboards will operate in OMNI/POLY mode — all channels of information are received and transmitted (played) polyphonically.

The second and third bytes — if they are required — have a meaning which depends on the function specified by the first (Status) byte. Here is the example above — NOTE ON Middle C at max volume — with the value and meaning of each of the (three) bytes:

Byte	Description
144	NOTE ON — Channel 1 145-Cha 2 etc. (to 16)
60	5th Octave C (1-127 in semitones)
127	attack velocity (0-127)

The third byte is tasteful.

On a conventional piano, the harder we hit the keys, the louder the sound. Some synthesisers simulate this effect using special circuitry to check the speed (velocity) at which a key is attacked. Keyboards which have this facility are called touch sensitive or, more accurately, velocity sensitive. The third of the NOTE ON bytes, then, will control the attack velocity (and thus volume) of a note played on a MIDI equipped 'velocity or touch' sensitive synthesiser.

The only currently available JVC keyboard with MIDI, the four octave KB600 (£689), is not touch sensitive. Any non-zero value <128 for the third byte will sound the note on this keyboard at the current (manually set) volume. The same is true for the popular four octave Casio CZ101 (£395). The five octave Casio CT6000 (£695), on the other hand, does have touch sensitivity and the value (1-127) of the third byte of the NOTE ON message is significant for touch sensitive voices like 'Electric Piano' — but not 'Organ'.

Notice that there is no time value associated with NOTE OFF. The MIDI standard requires a NOTE OFF message, which is also three bytes and looks like this:

128	NOTE OFF Channel 1 129 Cha 2 etc (to 16)
60	5th Octave C (1 to 127 in semitones)
0	Release velocity (0-127)

The third byte in this sequence is defined as the 'release' — rather than 'attack' — velocity, but it is rarely used. Notice that we specify the note pitch to be turned OFF, or the effect of the original note ON message will continue.

Apart from simple NOTE ON and OFF messages, the MIDI standard can also include messages about how notes should be further 'controlled' with special effects. The simplest of these effects is SUSTAIN.

On a piano, pressing this pedal stops the normal action of the dampers on the strings and the sound is no longer cut off sharply when the fingers are lifted from the keys. Some synthesised sounds have a sustain effect built in (e.g. 'vibraphone' or 'bells'), but most keyboards also have a

JVC's music software, developed by EMR

The MIDI interface slots into the cartridge slot

The four-octave KB600 stereo music keyboard is JVC's only MIDI keyboard and costs £689

sustain on/off footswitch which can be plugged in to a jack socket.

The MIDI status byte for making any control changes is 176 (or 177 for channel 2 etc). The full three byte 'SUSTAIN ON Channel 1' message is 176 64 127. If the third byte is zero, sustain is switched off. Both these MIDI messages can be successfully sent from the MSX to the CT6000 — which also has a useful sustain on/off switch on the keyboard itself.

Aftertouch may be what you feel following an evening out with a very good friend. It is also the name of a keyboard effect you won't find on any conventional piano. Neither the CZ101 nor the KB600 have aftertouch, but the CT6000 does.

On this instrument, additional pressure on the keys after the initial attack, will increase the volume of sound proportionately. This effect will be apparent for voices which normally sound continuously when the key is held down (e.g. 'flute' but not 'electric piano').

The MIDI standard does have a three byte message to specify the amount of aftertouch on individual keys. Even the Yamaha DX7 (£1499) cannot implement this facility, however, and you will have to go upmarket for the DX5 (£2500) or the 88 fully weighted keys of a DX1 (£9999) to hear it in action!

The more common feature is for any single key aftertouch to affect the whole keyboard. The equivalent MIDI two byte message, successful on the CT6000, is directed to a particular Channel — like this:

	Bytes		Meaning	
1	2	3		
176	126	0	:Switch to MONO	
192	7		:Synth Bass	Ch 1
193	4		:Elec Piano	Ch 2
194	9		:Vibraphone	Ch 3
195	6		:Flute	Ch 4
144	48	127	:C on	Ch 1
145	58	127	:B flat	Ch 2
146	64	127	:E on	Ch 3
147	67	127	:G on	Ch 4

Figure 1

208 AFTERTOUCH on channel 1
209 Cha 2 etc (to 16)
64 at Pressure of 64
(pressure range 0-127)

Perhaps Pitchbend might be what you get the morning after that night out, but it is also a common feature on contemporary keyboards. This is usually in the form of a springloaded wheel which, when turned with the left hand, raises or lowers the pitch of any notes being played with the right hand.

Pitchbend is featured on both the Casio CZ101 and CT600, but not on the KB600. The corresponding MIDI three byte message (status byte = 224 for Channel 1) worked successfully on both Casio keyboards. Specify a pitchbend value up to 127 with mid-point of 64. The degree of bend will also depend on the pitch bend range which can be set between a semitone and an octave. Remember to program a return of the setting to the 64 neutral point.

Portamento is somewhat like an automatic pitchbend facility. When portamento is on, the pitch of each note is 'glided' (continuously bent) up or down from the previous note. The Casio CZ101 includes portamento — amazingly for a keyboard in this price range. You can also vary the glide time manually from very slow to fast. A three-byte MIDI message (176 65 127) to switch on portamento worked successfully, although different time graduations didn't seem to be recognised — can't win'em all.

A few keyboards have a modulation facility — usually another springloaded wheel — as on the Yamaha DX7. This is to give the left hand sensitive control of the amount of pitch variation (i.e. 'vibrato') on a melody line played with the right hand, say.

The CZ101 really showed its paces when I used the MIDI standard to change voices (synthesised sounds). This keyboard has 16 preset sounds, any of which can be specified as the voice of the moment on a particular MIDI channel — Status byte 192 for Channel 1 plus one data byte for voice number 0 to 15. Neither the CT6000 or KB600 responds to attempts to change their preset voices via MIDI.

The CT6000 and KB600 respond to all messages regardless of which MIDI channel is specified (OMNI). The CZ101 must be manually switched to the right channel (1 to 16) to receive information. Two CZ101s, therefore, switched to different channels and connected to OUT1 and OUT2 of the MIDI interface, can be programmed to play separate tracks of music simultaneously.

The final experiment was to use the CZ101 in MONO mode (switchable also via MSX MIDI). In this mode, the keyboard functions like four independent monophonic synthesizers played at the same time. This means that four channels of data, each with a different voice (sound), can be received and played simultaneously as in figure 1.

MIDI equipped instruments will themselves generate similar codes when notes and effects are played on the keyboard, of course. The MSX successfully reads these codes via the JVC MIDI interface with the INP (read in a byte on specified port) instruction. For effective real time music software, however, machine code is essential. That, and the subject of rhythm and timing is a topic for 1986, perhaps.

BE SERIOUS!

Utility and business software for the serious user — the latest arrivals on the MSX scene

Holland is really taking MSX seriously. It was the home of the first disk-basd business software, and now Dutch-based Micro Technology bv has produced several high quality business programs on cartridge.

The three we got to see were *MT-Debug*, a programming utility, *MT-Base*, a database, and a preliminary version of a communications package.

The simplest, and at £39.95 the cheapest, of the three programs is *MT-Debug*. As the name suggests, it's a debugging tool, designed to help serious programmers who work in machine code, or who like to PEEK and POKE.

When you turn on the micro with the cartridge inserted you're presented with a copyright message. This soon disappears and you're back in BASIC, albeit with 379 bytes less memory than usual, so that you can load in your own program.

'At the heart of the program is a straightforward machine code monitor to examine memory'

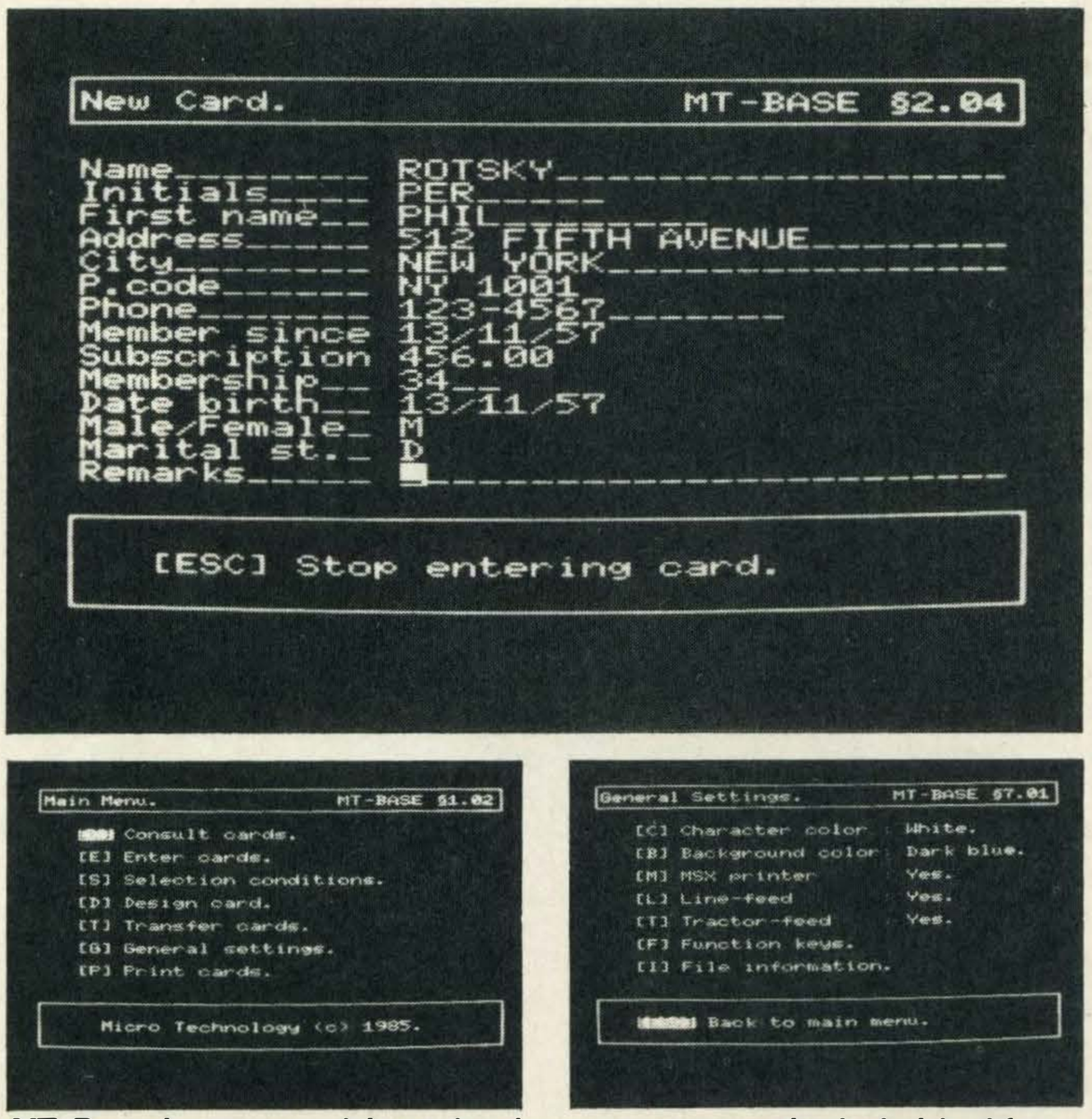
Getting back into the debugging program is a simple matter of typing CALL DEBUG. Indeed, this command may be used in BASIC programs so that at a crucial moment the computer filps into *MT-Debug* to show what your program has done to the memory.

At the heart of the program is a straightforward machine code monitor which allows you to examine the memory of the computer. The information is displayed in the familiar way—rows of hex numbers, with ASCII equivalents in a column down one side. If you press TAB the ASCII display is replaced by MSX graphics characters.

Using the cursor keys you can highlight any byte, or scroll rapidly through memory. Registers, flags and any memory byte can be altered and then, by returning to BASIC, you can save the machine code to tape or disk.

The manual is fairly skimpy, with simple explanations of the commands. Machine code is such a complex area that Micro Technology has been sensible in not trying to do too much in the manual, so you'll have to know a fair bit about machine code to get anything out of this program.

A database, on the other hand, shouldn't require any computer knowledge. Any database is judged by how easily you can put information in, and how fast you can get it out again.



MT-Base is a menu-driven database system particularly ideal for clubs and hobbyists

MT-Base is a menu-driven package where, at each stage, you simply press a letter to indicate which option you wish to select. And to make life easier for people unfamiliar with keyboards, letters can also be selected with the cursor and RETURN keys.

With *MT-Base* Micro Technology has succeeded in producing a database which, on the surface, is very simple, but which has hidden powers. The clue to this is the extensive manual.

The basic style is the traditional card index file. Before any work can start you must design the card, naming the fields and deciding how large they should be. Then you can enter the information.

This method does have its drawbacks. Once information has been entered the length of a field is fixed. If you want to change it, you have to start again from scratch. Free-form text entry systems get around this problem, but often at the expense of wasted memory.

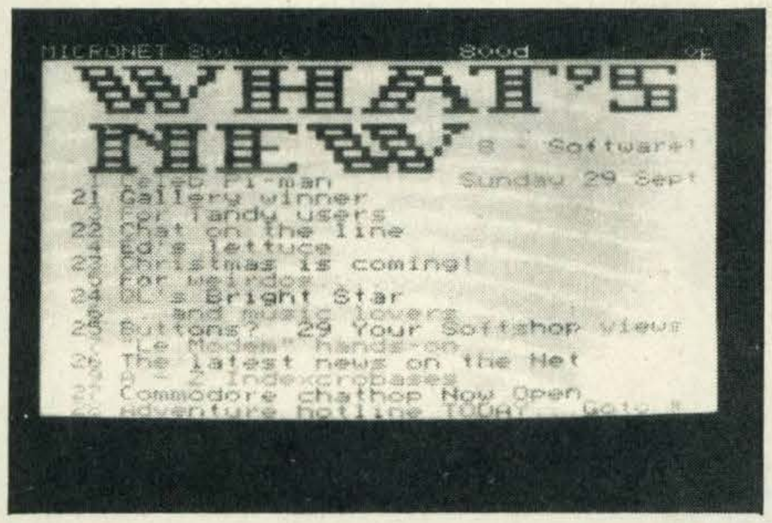
It's important that the information is well presented. *MT-Base* is quite good in this respect, giving you excellent control over the formatting of the cards, especially when dumping entries to a printer. And while on the subject, *MT-Base* interacts with Micro Technology's word processor, *MT-Text*, allowing you to create mailouts easily.

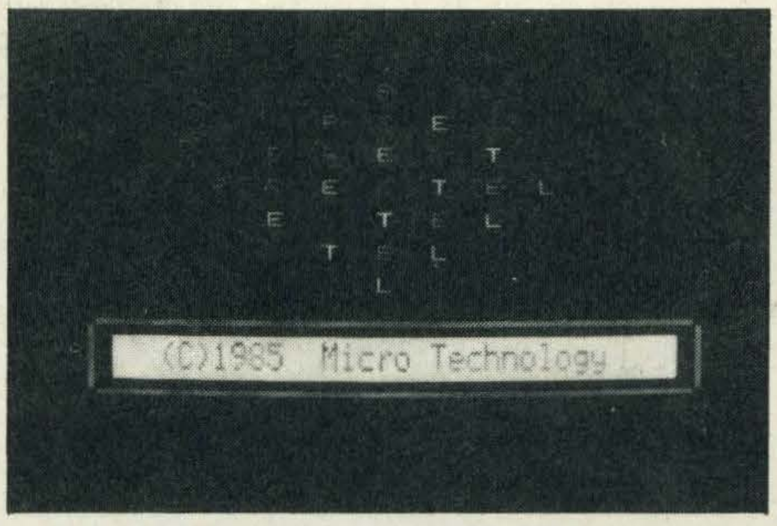
Finding information is easy too. Searching and sorting can be done on any field, and a wide variety of criteria can be used. At £49.95, the package isn't cheap, but it's sophisticated without being baffling.

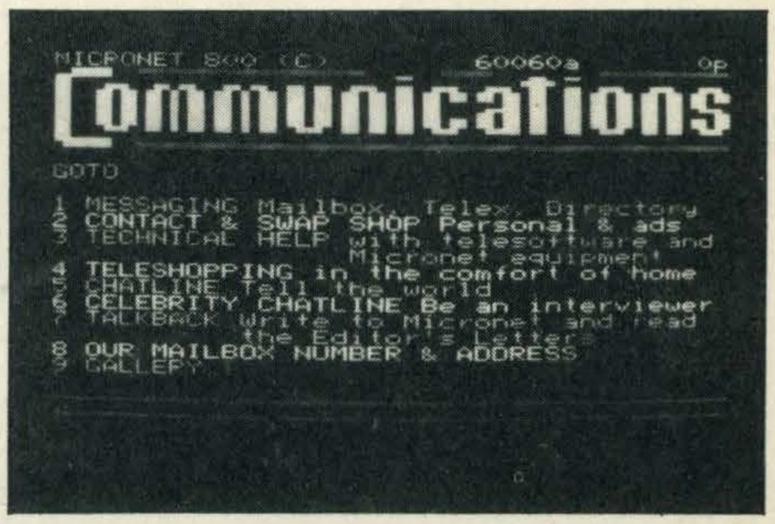
'MT-Base may be good, but the comms package is the most impressive of the three'

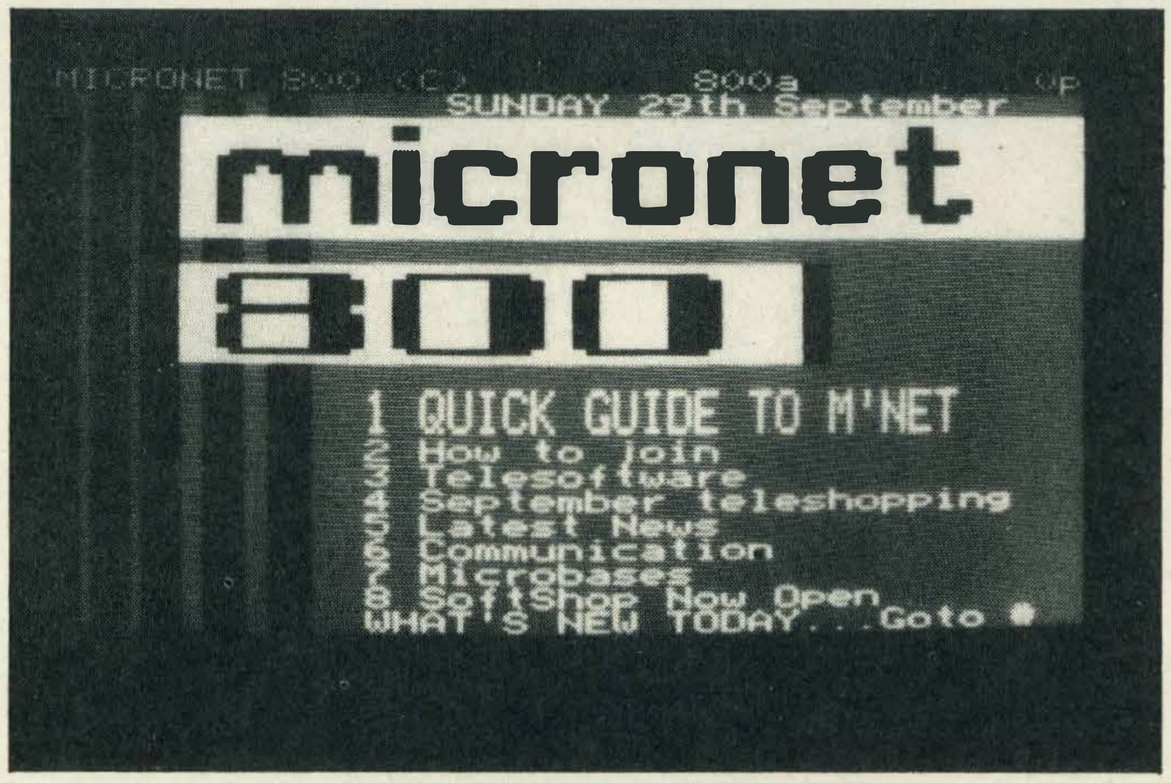
MT-Base may be good, but the communications package is the most impressive of the three. Known as *MT-Viditel* in the Netherlands, after the Dutch viewdata system, it will probably be renamved *MT-Prestel* in the UK. The cartridge contains both a programmable RS232 interface and a 16K ROM with the communications software. It's suitable for any viewdata-type system, of which Prestel is the biggest and best-known, and at an estimated retail price of £49.95 it's one of the least expensive ways of getting online.

Attached to the cartridge is a lead ending in a standard D-plug. This plugs into the RS232 port of a 1200/75 baud modem. Once this is connected and the cartridge is in the machine you're ready to go.









MT-Prestel includes a programmable RS232 interface and communications software at a very reasonable price

Switching on presents you with the Prestel symbol and an apparently dead keyboard. In fact, the program is in online mode, and is waiting for you to either phone Prestel or enter one of the special commands, which must be preceded by a slash (/).

Assuming that you just want to link up to Prestel, all you have to do is pick up the phone and dial, switching your modem online when the main computer answers. But this package allows you to do much more than that.

For a start, it can be used as an offline editor. This is only really relevant if you are a Prestel information provider (IP), as it allows you to create pages, including full colour graphics, and unload them to the Prestel editing computer. But there are also plenty of features for the average home user.

Something that really impressed us was the use of the MSX micro's memory as a page storage area. With a 64K machine you can save pages in memory, while online, to be displayed or printed later. The preliminary manual we saw mentioned that up to 34 pages can be stored in this way, but the prompt which appears on screen suggests that the true figure is actually 51.

'As well as storing pages in memory, you can also save them to disk or tape'

You assign each page a number and time. The latter is important as the pages can be displayed automatically in rotation, like a kind of endless slide show, and the time determines how long each page stays on the screen. Travel agents particularly like this kind of feature as they can show their Prestel pages in a window display without the expense of being permanently online.

As well as storing pages in memory you can also save them to disk or tape. And the system also supports both MSX and Epson-type dot matrix graphics, so you can dump a screen to a printer for a permanent record.

Other notable features include the possibility of program overlays — so you can write your own routines to customise the software for special applications. And it's also possible to use batch files, if you have a disk-based system, where you create a set of commands and instructions which the program will execute in turn. These can include screen messages, delays, logging on procedures (including your IDs and passwords for various services), and so on. In this way you can simplify the routine of calling up a service and running through it — simply write a batch file, using a word processor, to include all your most common commands.

The one thing the system seems to lack at the moment is software downloading. As there is no software available for MSX machines on Prestel at the moment this may not seem much of a loss, and indeed excluding this feature has allowed space for more screens to be stored in memory.

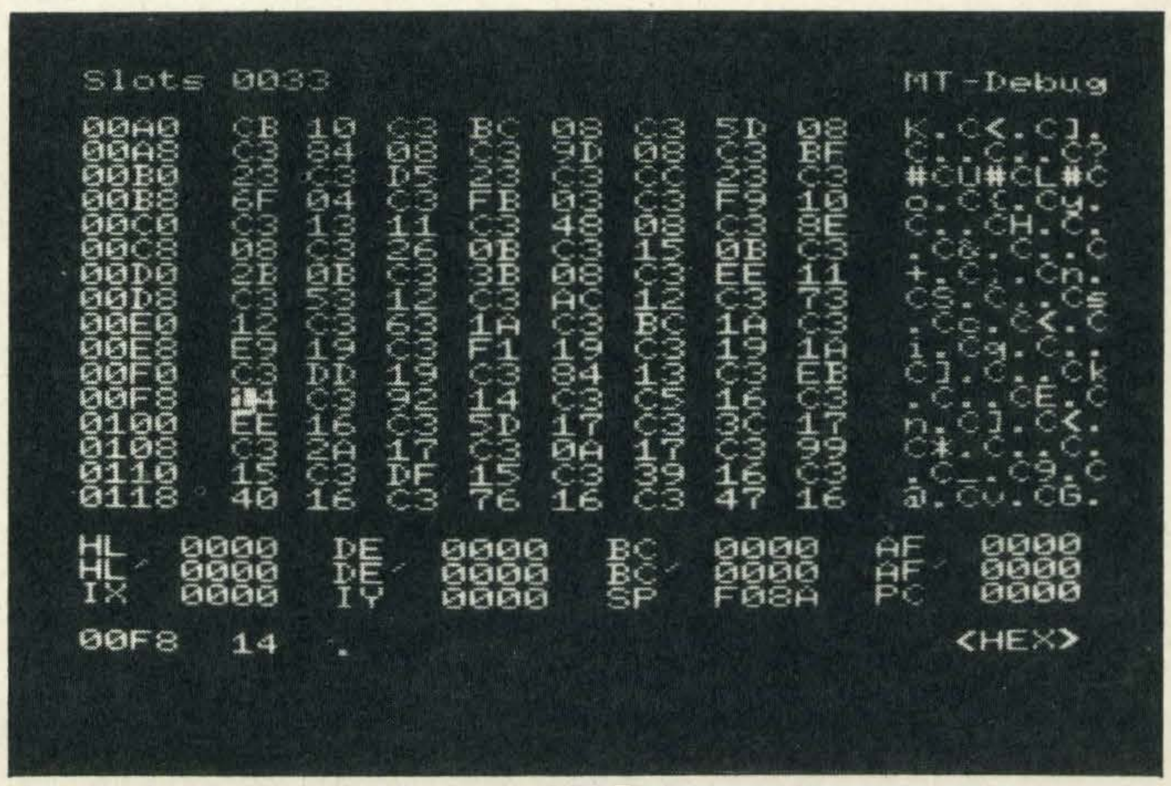
Inevitably the database and communications titles will be compared with the packages produced by Computermates, the only other producer of cartridge-based business software.

Powerful

The Prestel program compares very favourably. The Computermates communications packages are more sophisticated, with auto-dialling and access to non-viewdata systems such as Telecom Gold. But *MT-Prestel* is very inexpensive for all the facilities it offers — in fact it costs considerably less than most RS232 adapters alone!

As far as the database is concerned, some people may prefer the *Cards* program from Computermates for screen presentation, and some will prefer the free-form text entry. However, *MT-Base* has many powerful features that *Cards* lacks, especially when it comes to formatting of printout, and includes several sample layouts.

Micro Technology has made an impressive entry to this country, and once again proved that MSX computers are capable of some serious work.



A sample screen shot from the MT-Debug package

DISTRIBUTOR

Micro Technology programs are being distributed in the UK by Electric Software. For further information contact:

Electric Software Ltd, 91 High Street, Longstanton, Cambridge CB4 5BS. Tel: Crafts Hill (0954) 81991.

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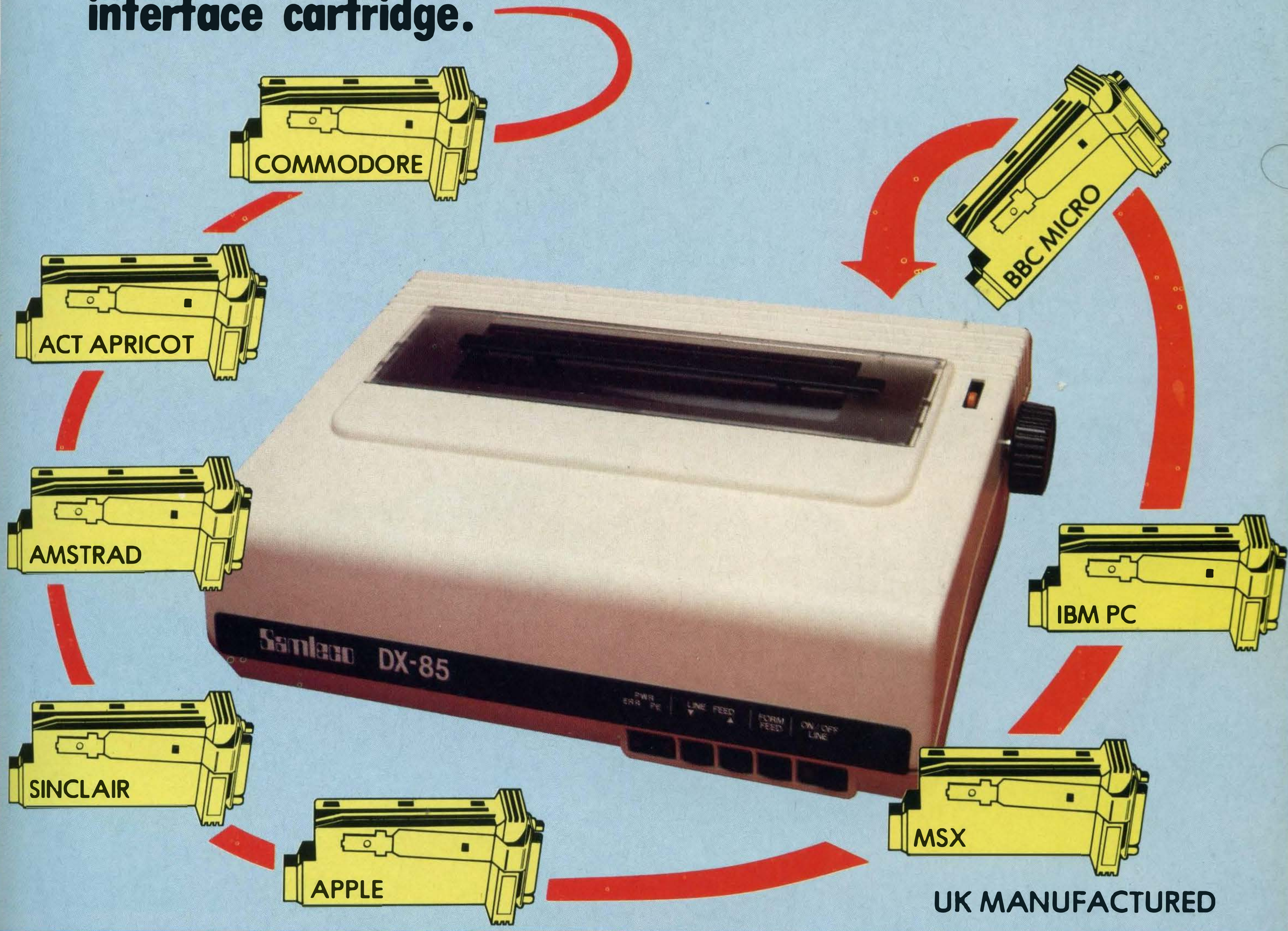

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Read the reviews! "The best price/performance we have ever seen." "Out-performs any other database on MSX." "A very special card index, unbelievable speed." "Even the most spoiled user will be satisfied." These are extracts from reviews by European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

FOR DISC 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 based system.

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!

MT-BASE is available through most computer shops, further information can be obtained from UK distributor:

Electric Software, 8 Green Street, Willingham, Cambridgeshire CB4 5JA. (0954) 81991

WORLDWIDE DISTRIBUTION:
Micro Technology, PO Box 95, 3353 GZ Papendrecht, Netherlands, TX: 62425

COMPETITION

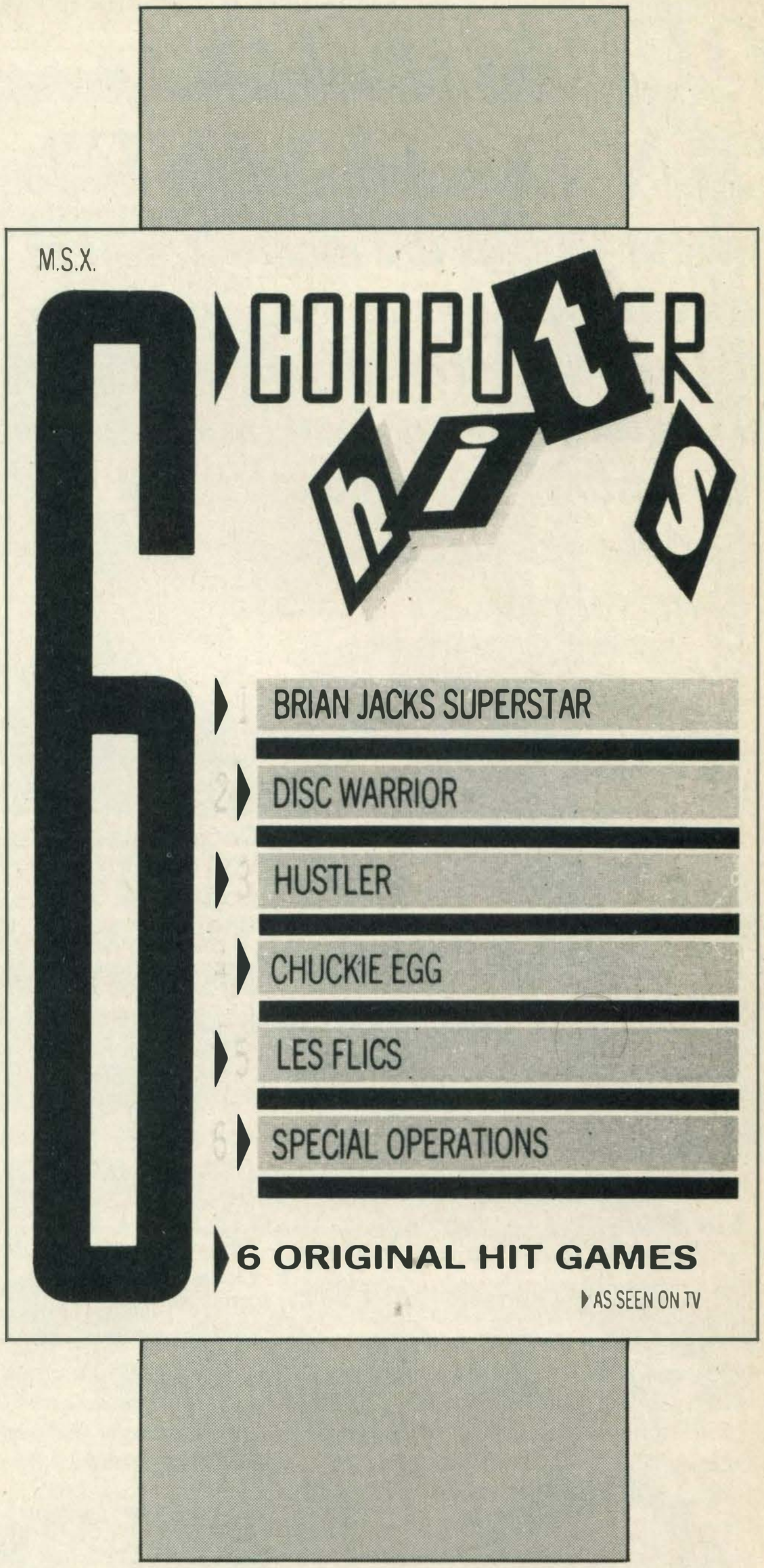
COMPUTER HITS!

Get those grey cells into action and add six great games to your collection

Beau Jolly is a software house which has had the extremely brilliant idea of getting hold of six mega-popular games and putting them all on one tape. And here's your opportunity to grab yourself one of the 50 *Computer Hits* tapes we are giving away in this month's software competition.

As you can see in our picture, we've blanked out the names of the publishers of each game — that's where you come in. List the games on the back of a postcard, and next to each one write who you think produces it. The first 50 correct answers out of the bag on November 15th each win a copy of *Computer Hits*.

Postcards should be addressed to Beau Jolly Competition, *MSX Computing*, 38-42 Hampton Road, Teddington, Middlesex TW11 0JE.



RULES

1. The judges' decision is final and no correspondence will be entered into.
2. No employees of Haymarket Publishing or Beau Jolly or their families may enter.
3. The winners' names will appear in the December/January issue.

GHOSTBUSTERS WINNERS

Here are the winners of the *Ghostbusters* competition.

I. K. Bourne, Plymouth; Damian McCarthy, Greater Manchester; Stephen Traynor, Stirlingshire; Shirley Edgerton, Carshalton; Christopher Lewis, Raynes Park; George Hall, Welwyn Garden City; Paul Backhouse, Tadcaster; Jane Darling, Morden; I. M. Pugh, Exeter; Tom Sawyer, Andover; Geoff Symons, York; David Spinks, Dover; F. G. Longman, Sutton Coldfield; Ian Blackman, Wiltshire; Scott Duncan, Sunderland; Jason Judge, Cheltenham; John Kennedy, Fleetwood; H. G. Bridgman, Maidenhead; John Simmons, Southampton; Ian Rowntree, Sunderland; Raymond Kelly, Glasgow; Robert Brownhill, Liverpool; W. G. Britton, Haringey; D. Fake, Portchester; Bill Strezelecki, Tewkesbury; A. M. Cutting, Nottingham; K. N. M. Crapper, Devon; Brian Trewitt, Ripon; R. Jones, Oldham; Kevin Walsh, Co. Waterford; J. Tasker, Merseyside; Simon Dobson, Horrabridge; Damian Newton, Kent; Daniel Read, Pontefract; J. E. Baker, Greenford; P. Britten, Northampton; S. Marsden, Redcar; Trevor Davies, Huddersfield; Mark Leetham, Glasgow; Andy Platts, Coalville; V. Hickman, Sale; P. S. Fox, Chester-le-Street; David Bartholomew, Orpington; Alan Riddle, North Shields; C. Porter, Saltash; A. Tetsola, Willesden; A. Green, Liverpool; Jeremy Thomas, Abingdon; Andrew McCrea, Co. Tyrone; P. Whincup, Cleethorpes.

HAVE YOU THE COURAGE TO JOIN DATELINE?

If all your friends are married, you're not meeting anyone at work, you've moved to a new area or you are newly single again, joining Dateline is really just a sensible way of meeting lots of compatible people, and perhaps someone special...

'Well, you've got to do something!' Clive and Sara —

To Clive, without a wide circle of friends after his divorce, joining Dateline seemed 'logical', and to Sara, a single parent with little opportunity to make a social life, joining Dateline was simply a decision to 'do something' about it. They were attracted to each other when they first met over a cup of tea at Sara's home, and Clive thought Sara had done marvellously well to bring up such a joyful little girl on her own. Initial liking and attraction grew into love and Clive and Sara were married six months later.

'The best thing I could have done.' John and Margaret — married.

As she was rather shy, one of Margaret's friends from work who had met and married someone through Dateline suggested she should join, and John joined us as a last ditch effort to invigorate his social life at home before emigrating to South Africa. Four years of marriage and two children later, they still think it's the best thing they could have done!

'It took about a week to fall in love' Margaret and Michael — married.

Within two weeks Margaret and Michael were talking about marriage. 'It might seem a little bit far-fetched, but we weren't prepared to settle for just anything to try to regain happiness. We both wanted something a little bit special, and thanks to Dateline, we've got it now.'

WHO JOINS DATELINE?

People just like you! Thousands of people join Dateline each month so you probably already know people who have used the Dateline service or met through Dateline.

People who join Dateline come from all over the country — from farms, villages, market towns and cities. The problems of meeting people are not confined to any particular locality, occupation or class. What all Dateline members have in common is an optimistic, positive attitude in tackling the problem practically.

HOW DOES DATELINE WORK?

Forget fears of cold-hearted computers! *You* choose the sort of people you want to meet. When you join Dateline you will complete a very comprehensive questionnaire. Information from this will be locked into our computer memory, and the matching process, in which your data is compared with that of every Dateline member of the opposite sex, will begin. The most compatible matches will be found and their details forwarded to you. You will also be matched to other compatible people and they will contact you, and so a whole new social life begins.

IS DATELINE SUCCESSFUL?

Many thousands of couples like those on this page, have met and married through Dateline. The Dateline questionnaire is designed to match couples through many facets of physical type, personality and life-style; not just matching those who want to meet people similar to themselves, but those who also want to meet someone different.

If you think you would like to join the thousands of people all over the country who have been finding a new social life or love and happiness through Dateline, simply complete the questionnaire below. We will send you confidentially and completely free, full details about Dateline and how it works, and details of just one of the Dateline members who are compatible with you. Send to: Dateline Computer Dating, 23 Abingdon Road, London W8. Tel: 01-938 1011.

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- ☐ Creative
- ☐ Practical
- ☐ Intellectual

2 Indicate which activities and interests you enjoy by placing a '1' (one) in the appropriate box. If you dislike a particular activity, write a '0' (nought) in the box. If you have no preference, leave the column blank.

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- ☐ Fashion
- ☐ Pubs
- ☐ Sport
- ☐ Pets
- ☐ Folk music
- ☐ Jazz
- ☐ Travelling
- ☐ Cinema
- ☐ Good food
- ☐ Politics
- ☐ Classical music
- ☐ Art/Literature
- ☐ 'Live' theatre
- ☐ Science or technology
- ☐ Creative writing/painting
- ☐ Poetry
- ☐ Philosophy/Psychology/Sociology
- ☐ History/Archaeology
- ☐ Conversation

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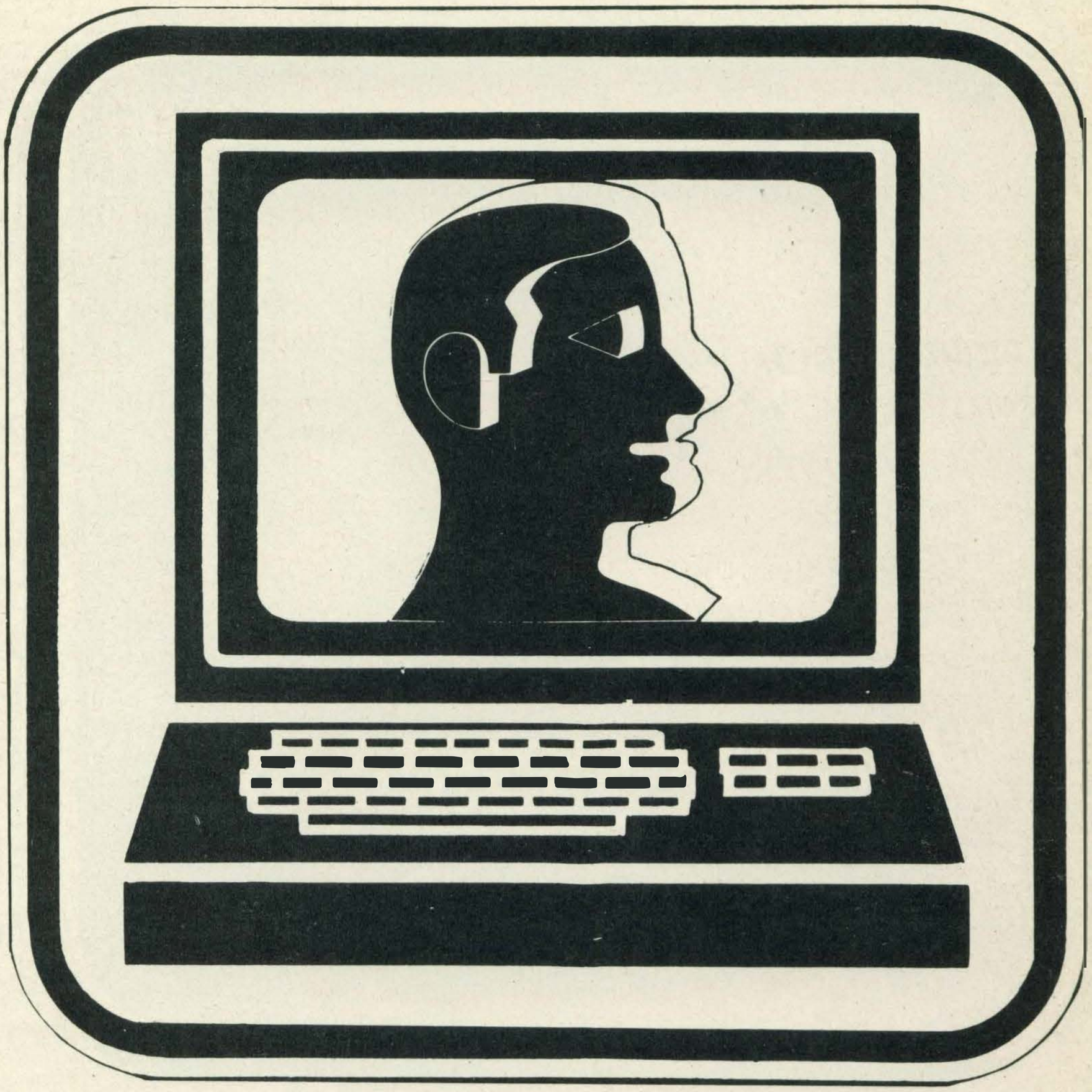
TEST

Like the sound of your own voice? Then MSX's first sound digitiser could be just right for you



SMOOTH

The MSX specification includes a very interesting sound generator chip, the AY38910, coupled with the ability to make sounds of reasonable volume through a domestic TV rather than the puny speaker supplied with many home computers. Unfortunately it is quite difficult to program the sound chip in BASIC for anything other than elementary sound effects.

Other options do exist, of course — more advanced programmers will try machine code programming of their own, which certainly opens up more interesting possibilities. However, if you don't know your assembly language, the architecture of the sound chip, *and* everything there is to know about sound dynamics inside out, producing a specific effect is still a pretty hit-and-miss affair. It is also very time-consuming.

Another alternative is the use of a music synthesis software package, of which several examples are available. The Yamaha CX-5 even lets you add a music-type keyboard for easier data entry. This approach means you can produce some pretty effects, but you still can't use them as part of your own programs.

Master Voice, also known as *Wordstore*, gets around all these difficulties. This simple (but clever) program from Aackosoft in Holland lets you digitise sound and store it in the RAM of your 64K MSX machine. You can feed in noises of any kind *via* microphone or tape, and later call these sounds back from within BASIC programs to give yourself customised sound effects. It all sounds very simple—and, from the user's point of view, it certainly is.

To start the whole process, you fire up your MSX computer and load the *Master Voice* 'recording' package. This consists of a short BASIC loader program followed by a chunk of machine code (again, surprisingly short). When loading is completed, up comes the main menu which is a simple three-choice affair: RECORD, CREATE MVFILE, and PLAYBACK.

To start recording a sound you push the joystick away from you and to the right

Underneath this menu, the bottom line of the display scrolls steadily from right to left giving some instructions and hints on how to best use the program — as well as some amusing personal notes from the programmer.

A large arrow points to the centre option on the menu: at this stage you spend a few minutes trying to move this arrow-shaped cursor with the cursorkeys. This, you discover, is a complete waste of time as the only way to make a menu selection is to plug a joystick into port 2, whereby control of the program is altogether taken over by the joystick.

There may be technical reasons why the alternative of the cursor keypad could not be used, and the joystick is certainly easy to use, but there are times when my 9-pin D plug joystick is busy being used on another machine, and there is always the possibility that some poor deprived MSX users don't have a joystick at all.

Not surprisingly, you get no action from this program until you feed it some sounds. Selecting options two or three — PLAYBACK or CREATE MVFILE — gives you a terse message that there is nothing in memory to play back or create a file with. To start recording a sound you push the joystick away from you and to the right — it's a bit like changing gear in a Land Rover.

You now have to link up your sound equipment. If you want to enter sound directly, this is where you get to tear the hi-fi to bits. Plug a microphone into the amplifier, and run a lead from the output line to the cassette port on the MSX machine. This

TALKER

is best done using an ordinary MSX cassette lead, though you might have to fiddle around with the end at the amplifier if your equipment uses different connectors.

To start recording you select option 1 and press the fire button on the joystick. As long as you hold the button down, whatever goes into the mike is going into RAM. Releasing the button is like hitting the pause button on a tape deck.

Slip in a Dire Straits cassette into your MSX cassette recorder and hit play

So you press the button, say something, release the button, press it again, say something else, and so on until the 32K allotted for data storage is all used up. This tends to take 20 or 30 words.

You *must* use the whole 32K, because you don't get the main menu back until you fill it up. This 32K, incidentally, does not infringe the BASIC programming space, as it is the chunk which lives behind the ROM, normally used only by machine code addicts who are independent of BASIC anyway. As Aackosoft's Guurt Koch told us, fixing the memory management was the hardest part of writing the package.

There is another, easier way to get sound into the computer. Once the machine is expecting its diet of noise, just slip a Dire Straits cassette into your normal MSX cassette recorder, turn the volume up louder than you would normally have it for loading programs, and hit PLAY. Fifteen seconds later you have a rather odd version of *Sultans of Swing* ready to play back.

When the memory is full and the menu reappears, select PLAYBACK and the whole 32K worth of nursery rhymes, explosions, Beach Boys or whatever is broadcast over the TV set. It takes a bit of juggling with recording levels to get the best results, and I found that women's voices worked better than men's (too many male frequencies are outside the pitch range of the MSX sound chip). But you do get easily recognisable speech, and certain kinds of music also play back well. Bangs and explosions from my BBC Sound Effects LP worked beautifully!

So far so good, but what about using these effects within BASIC programs? With the memory full of your favourite sounds, select Option 2, CREATE MVFILE. This prompts you to stick a blank tape into the recorder and then saves the digitised sounds as a chunk of binary data on to cassette.

Unfortunately you are not allowed to give the data file an individual filename — they are all called 'MVFILE' — so if you plan on doing this kind of thing a lot, you will have to keep your tapes well labelled and properly organised. Each data file contains not only the digitised sound but also a run-time machine code module to translate it back into MSX-compatible noises.

Once the data is saved, reset

It takes a bit of juggling with volume levels – women's voices work better than men's

the machine to get into BASIC. Type BLOAD"CAS:",R to reload the data file complete with its run-time module. When this loads it gives you back BASIC.

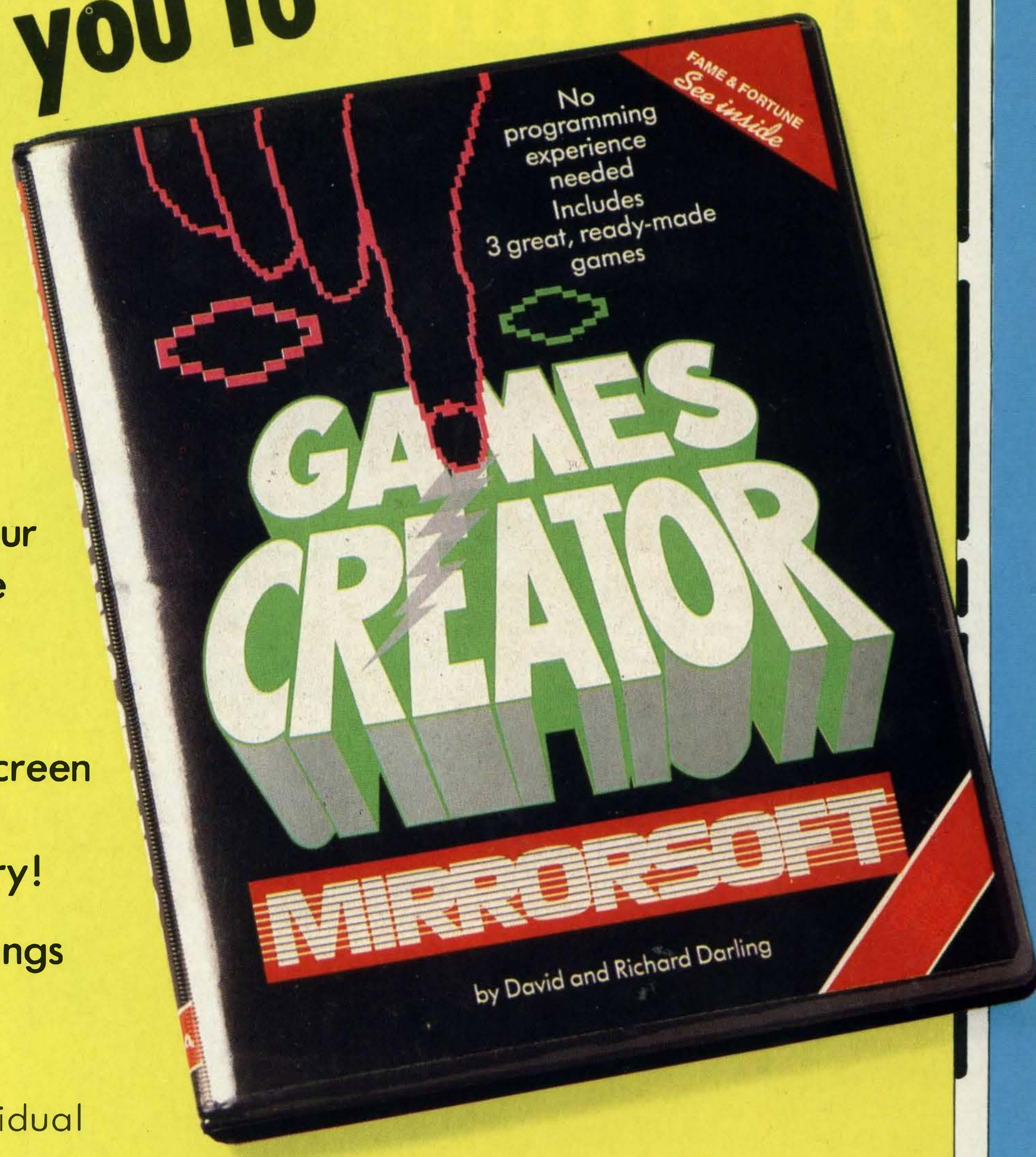
MSX experts will discern that they are about 500 bytes down on the normal BASIC user RAM. Each 'word' (be it a word, a siren blast or a burst of song) is stored as a machine code function call, so that typing A=USR(1) plays the first word, A=USR(2) plays the second, and so on.

If you already have a variable called A in your program, type B=USR(n) instead, or use your own preferred way of calling machine code routines. These statements can be typed directly from the cursor, or used as program lines in the normal way.

Master Voice / Wordstore is a simple but ingenious program which will give any 64K MSX user a lot of fun. Distribution in this country is via Nemesis, who can be contacted on 741 2299. The price was not finalised at press time.

MIRRORSOFT

. . . invites you to become a



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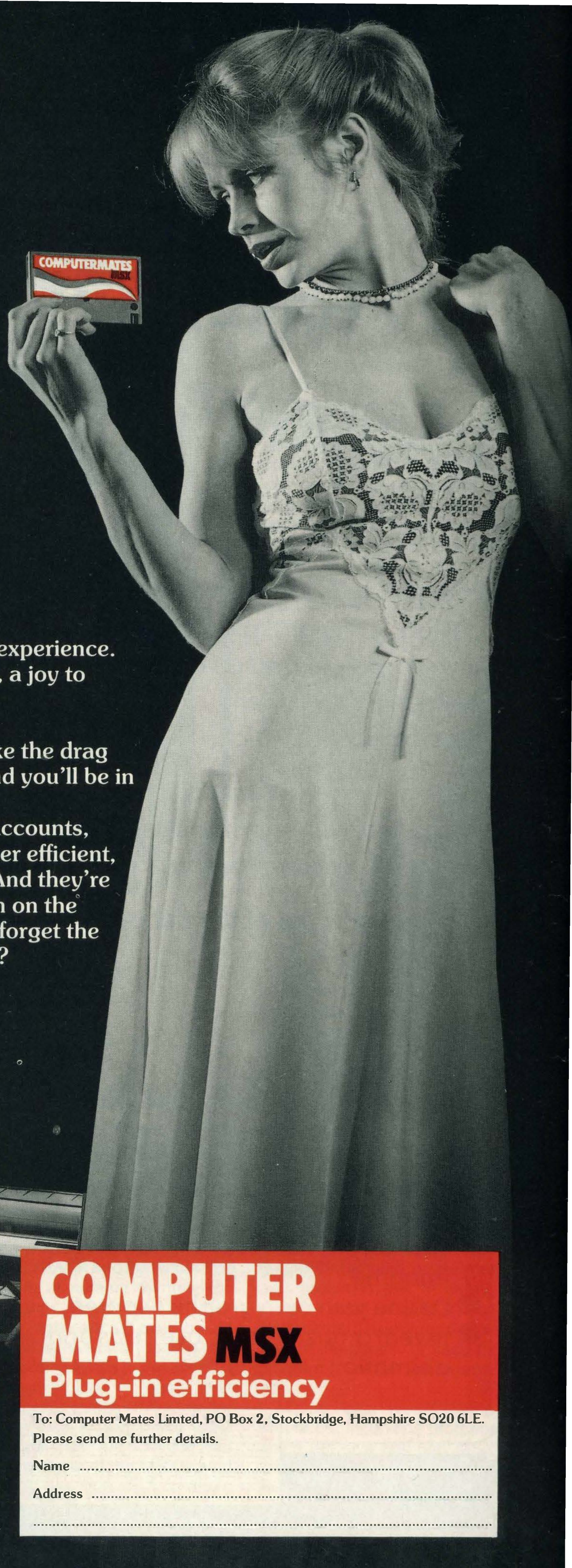

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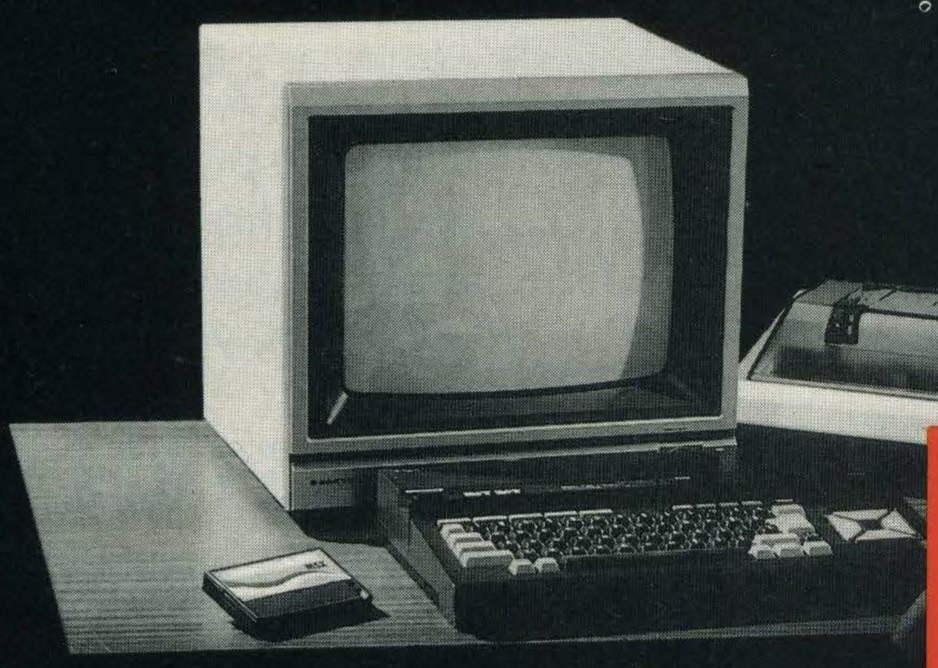

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SOFTWARE SCENE

Notice something different? Yes, there's a new look to *Software Scene* this month. Bigger screen shots, clearer layout and a star rating system for each program reviewed — all designed to help you make your software choice.

Each game will be awarded one to three stars for its graphics, sound, value and, finally, our verdict. Business and utility software will be awarded stars for facilities offered, layout, value and, again, our verdict.

The star system works like this:

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

So read on, and discover all the latest MSX software releases!

ROAD FIGHTER
£14.95

Eat your heart out Niki Lauda because we've just got hold of the fastest car in the racing business — a red hot roadster especially designed and brought to us by Konami.

We've spent the last fortnight thundering along race tracks through arctic wastelands, along cliff highways and over precarious suspension bridges getting ourselves into multiple pile ups, crashing into barriers, exploding into smithereens and generally having a great time.

Road Fighter is one of the best.

All the action takes place on a grey road that twists and turns, narrowing from three lanes to two before you know it. You have a bird's eye view, and control the car's steering and speed with the keyboard or a joystick. The sound effects of the cars accelerating through the gears, skidding and exploding are fantastic.

Gauges at the side of the screen indicate fuel supply and speed. The most important thing to remember is not to run out of fuel because once you're out of gas — that's it — you're out of the race.

Driving over the bonus pink hearts lying along the road at intervals sends the fuel gauge and your score soaring. Also indicated at the side of the screen is the distance travelled on the present stage. Altogether, there are six race stages and two difficulty levels.

Unfortunately, you don't have the road to yourself — five other types of vehicle are also getting in your way: harmless green family sedans, purple GT cars, 18-wheeler trucks and the redneck hot rodders.

Crashing into another car sends you into a skid or a spin. Usually it is possible to get out of a skid by driving into it, but doing so successfully is a knack.

Hitting black oil slicks has a similar devastating effect; blue oil slicks slow the car down. Hitting the side of an 18-wheeler, oil drum or road barrier results in a devastating explosion.

The different scenery and terrain at each stage and the bright colours add to the general excellence of the game.

It takes time, but playing *Road Fighter* becomes almost instinctive, even with the cursor controls. We all loved this game — it's exciting, colourful, fun, addictive, challenging and great value for £14.95.

SUPPLIER: Konami 01-429 2446

TYPE: Arcade

FORMAT: Cartridge

GRAPHICS ★★★

SOUND ★★★

VALUE ★★★

VERDICT ★★★

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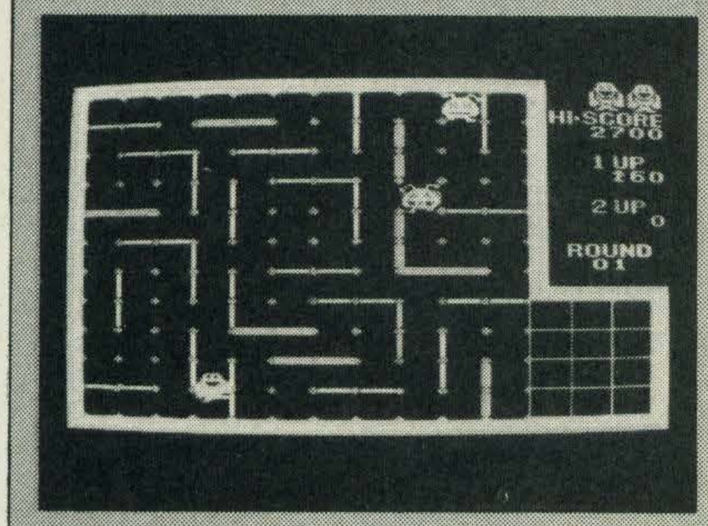
DORODON £18



SUPPLIER: Sony (81) 61688
TYPE: Arcade
FORMAT: Cartridge

GRAPHICS ★★
SOUND ★★
VALUE ★★
VERDICT ★★

Nasty gremlins are out to get Dorodon as he blunders around a maze of swing doors in a desperate attempt to turn them all red.

Each maze is characterised by a 12 by 12 grid of blue dots. Attached to many of these dots are red, yellow and blue swing doors.

The player is in charge of controlling Dorodon, a harmless little mustard coloured creature clad in a blue jumpsuit, and by guiding him through these doors they should turn red.

In the first screen, a door remains red even if you push your way through it, but in later screens moving back through red doors causes them to change back to yellow or white, depending on whether they are pushed clockwise or anti-clockwise. So try to leave doors alone once they're red.

As Dorodon moves round the maze, multi-coloured gremlins creep out of the woodwork and follow him around. These gremlins — ugly little things with fanged gaping mouths, waggly feelers and little legs — kill him on contact.

Log fires are fatal too. Be careful to avoid them or even better try and lead the gremlins into the fire and gain yourself some points. It shouldn't be too difficult as they can't move through the doors.

The aim is of course to score points and there are several ways of doing so using the mazes' windmills and metamorphic marks.

If passed through, metamorphic marks yield 100 points and leave the Gremlins in an unhappy frenzy. Police siren-like sounds loudly indicate this status and if you manage to capture them in this state you'll get another 100 points.

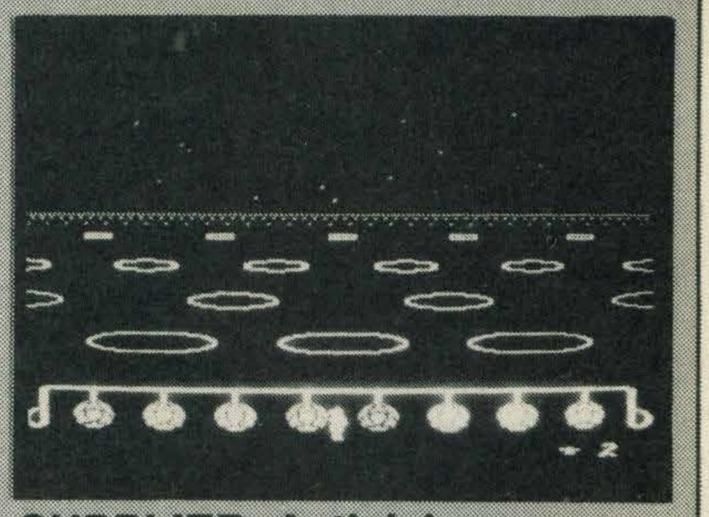
Occasionally a big juicy apple appears and yields 1000 points if you can reach it before it disappears. The other main way of obtaining points is to move through a windmill. As soon as you do so, the screen goes haywire — the swing doors turn erratically and the gremlins get shaken all round the maze.

If any of them have been penned in by the doors, they are removed and deposited in a prison on one side of the screen. If you manage to turn all the doors red without being killed — in other words get through the level — the number of boxed gremlins × 500 is added onto your score.

A series of whistles, beeps and arcade pinball-like sounds liven the game up and the graphics are excellent.

We found *Dorodon* to be an enchanting and addictive game — full of excitement and challenge. It's possible to get a high score even if you're not the world's greatest computer games player and it will appeal to almost anyone.

MASTER OF THE LAMPS £11.99



SUPPLIER: Activision (0628) 75171
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★★★
SOUND ★★★
VALUE ★★
VERDICT ★★★

A land once happy and peaceful has been completely taken over by a bunch of naughty genies and turned into a lawless, chaotic hell. One day, a young prince anxious to prove his worth, appears on the scene. If he can return the genies to their lamps he will have claim to the throne.

Master of the Lamps is an arcade game with a difference — it utilises original ideas, it doesn't involve mindless zapping and, best of all, anyone can play it.

Before starting on either the Seven Trials or Throne Quest (the two different challenges facing the prince), it's probably a good idea to start with the Magic Carpet scenario first.

Magic Carpet gives you valuable practice on the flying carpet used by the prince to travel around. To get to the genie dens, he has to fly through sky tunnels and it's no easy matter.

The tunnels are made from coloured diamond shapes which suddenly appear out of a star studded night sky.

Touching the sides of the tunnel causes the prince to fall off his carpet and start from the beginning again. This can be irritating, so it's best to gain some degree of proficiency before going on to the real thing.

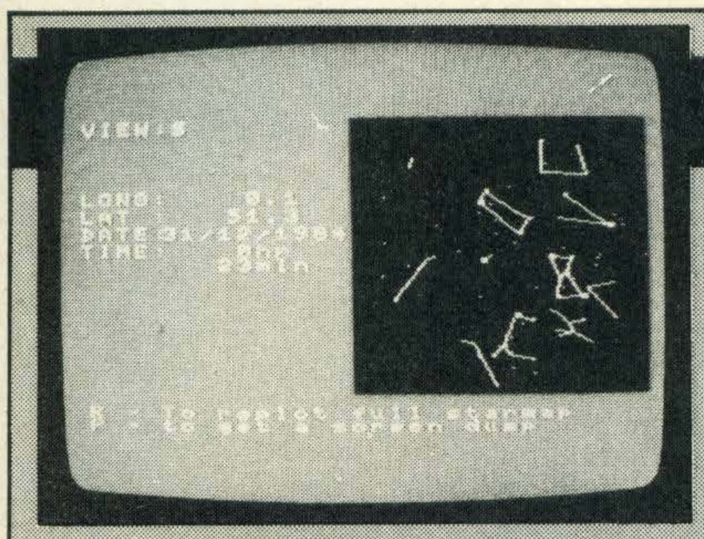
In Seven Trials, the prince has to enter seven genie dens in order to collect the seven pieces of the lamp. Once you've negotiated the tunnel you're into the den and a row of eight colourful gongs confronts the prince. Hitting each one produces a musical tone — memorise these if you can as remembering which gong makes which sound is crucial in the Throne Quest.

To summon a pyjama clad genie, hit one gong three times and he appears cross-legged complete with hookah pipe. In the second level he blows two coloured notes (three notes on level three and so on). These stay suspended in mid air and then fall. You have to hit the correspondingly coloured gong before each note hits the ground. If you manage it, part of the lamp appears — if not, you have to start the level again. Once you've collected enough pieces to form a lamp, you're ready to move onto the next game.

In Throne Quest, three seven-piece lamps must be completed. Everything is the same as the other game except the note sequences. Only the note tones are given — no colours — making it very difficult to hit the right gong.

At £11.95, *Master of the Lamps* isn't cheap, but it's addictive, fun and good value for money.

REVIEWS



STAR SEEKER £9.95

SUPPLIER: Microsoft 01377 4600
TYPE: Educational
FORMAT: Cassette

GRAPHICS ★★
SOUND ★
VALUE ★★
VERDICT ★★

Have you ever gazed into the night sky, looked at the twinkling stars and wondered about the origins of the universe and whether there's life on Mars? Well, probably not. And in any case, this program won't answer those sorts of questions. But at least it will tell you what you're gazing at.

There are two programs on this tape. Both are large and take ages to load in. But if you are interested in astronomy, or even have just a passing interest in the firmament, you may find the wait worthwhile.

On the first side, *Star Seeker* allows you to set your location on Earth (using standard co-ordinates), the date and time of day, and then look at any portion of the sky. A simple star map is drawn, using crude but adequate graphics, and you're shown the various parameters which you selected (date, time and so on). You can even obtain a quick print out of the screen — the program caters for Epson and MSX compatible printers — which is extremely handly.

You can also ask the computer for more detailed information of any of the stars shown.

If you're more interested in constellations than single stars, the program will 'join up the dots' to show the various groupings and you can ask it to name all the constellation contained in the map. Constellation maps can be printed out, too.

The second program, Solar System, gives you the position of the various planets, including details about their brightness and so on.

Perhaps the best part of this program is the lunar information. For any date and time you're given the position of the moon and its phase the latter being backed by by a simple diagram.

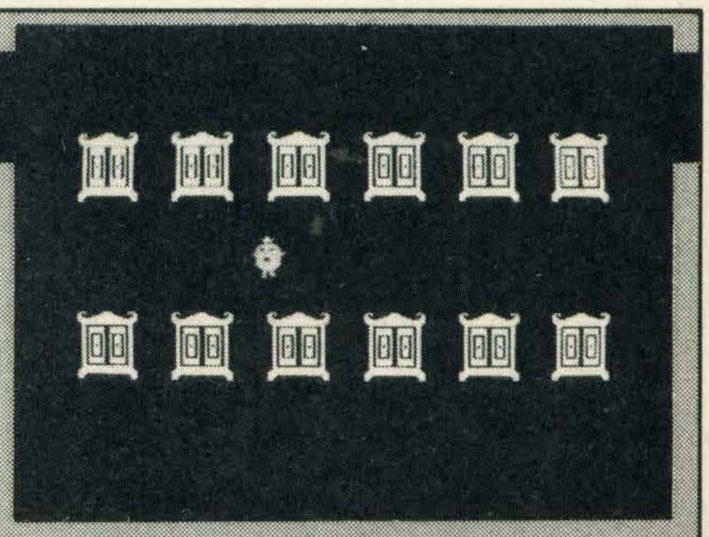
There are a few problems though. For a start, the star and constellation maps aren't annotated. If you want a hardcopy to take down to your backyard observatory, you'll need to label the blips representing stars by hand.

And calculating the position of the stars, and other data is tediously slow (not surprisingly). That means an irritating wait each time you want to change the date or time.

The graphics are primitive and the overall screen presentation merely adequate. But this is probably to do with lack of memory— you can either have pretty pictures or lots of information.

Ultimately it's an impressive piece of software, and could well be invaluable to those who take an interest in the stars.

FIRST STEPS £8.95



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

GRAPHICS ★★
SOUND ★
VALUE ★★
VERDICT ★★

Roger Hargreaves and the *Mr Men* gang have become internationally famous since their debut in a *Daily Mirror* comic strip. They have proved to be so popular with children that *Mirrorsoft* has chosen them to feature in a series of educational games.

Mr Greedy, Mr Silly and Mr Forgetful are the main characters in *First Steps* and they give the program a light hearted and amusing touch.

First Steps is intended for children aged four and upwards and has two main aims; to introduce computers to young children in a friendly and absorbing way and to help develop reading skills.

Accompanying the cassette containing four games, is a story booklet written by Roger Hargreaves. You also have four Mr Clever stickers for the cursor keys.

These are particularly useful in the first game which features Mr Greedy and an ice-cream hunt. A yellow room, bounded by two red and two blue walls contains a huge ice cream lying in one corner. If the child wants to head towards the red wall, all he or she has to do is press the cursor key with the relevant red sticker.

As soon as Mr Greedy reaches the ice cream, the next screen comes up — with more obstacles.

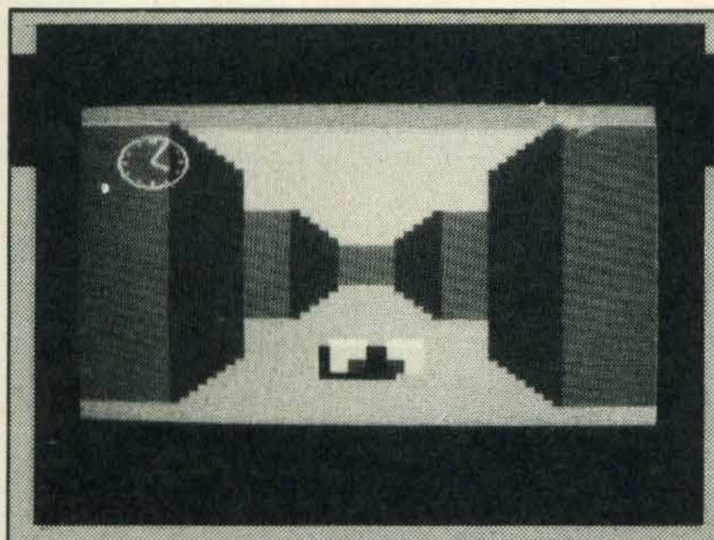
Mr Silly's hat game is the next story. On screen, the character is standing beside four shelves each containing four hats. The hat that he thinks he'd like to try appears on screen in a think bubble. There are three different hat shapes in four colours to choose from and the idea is to move the cursor along to the hat he is considering and to press RETURN. It immediately appears on his head.

Mr Forgetful's Wardrobe game is the third story and involves memory as well as cursor control skills. He has 12 wardrobes arranged in a rather strange way; six contain one half of a pair of shoes, socks or mittens and the remaining six contain the other half.

He can't remember which half is where and so by opening only two doors at a time, the child should eventually reveal six pairs. *Mirrorsoft* should have included some sort of points system indicating how quickly the child finds six pairs. As it is there is no real incentive to finish the game quickly.

The final game is very similar to the wardrobe game except that various letters of the alphabet replace the foot gear.

Although the graphics in *First Steps* are fairly good the sound is minimal. Just a series of high pitched electronic beeps and a sort of pitter pattering sound as the Mr Men wander around the screens. A few jolly tunes would have enlivened the program.



ILLEGUS £18.80

SUPPLIER: Panasonic 75 34522
TYPE: Arcade
FORMAT: Cartridge

GRAPHICS ★★
SOUND ★
VALUE ★★
VERDICT ★★

Al-Mazar, a mysterious alien planet, is covered by a vast network of mazes. Escaping from the planet, the game's goal, is a bit tricky because you have not one, but ten mazes to find your way out of.

Fate has dealt a cruel blow and you find yourself in the first maze with no food or water. Worst of all, you are given just one day and night to get out of all ten mazes.

All the labyrinths are exactly the same in both colour and structure but they change as the day wears on. In full daylight, the walls are coloured light and dark green producing a brilliant three dimensional effect. The floor is yellow and the sky is bright blue. A vivid red sun hangs in the sky. Noting its position can help give you some bearings.

As the sun goes down, the maze starts to darken and if you haven't managed to find some infra-red spectacles (enabling you to see in the dark) by sundown, the maze turns black and dark blue.

Your view of the maze is portrayed on screen as if you are standing on the ground, the labyrinth walls looming up either side. Either the joystick or cursor keys can be used to control movement.

Illegus's best feature is undoubtedly the excellent screen scrolling built into the game. As you wander around corners and along corridors your progress is made smooth, even and extremely realistic by this jerk free scrolling.

Unfortunately there are no markers to help you judge your location in relation to the entrance. Much trial, error and luck is needed to complete *Illegus*. The time limit can be extended if food and water can be located as they increase your stamina.

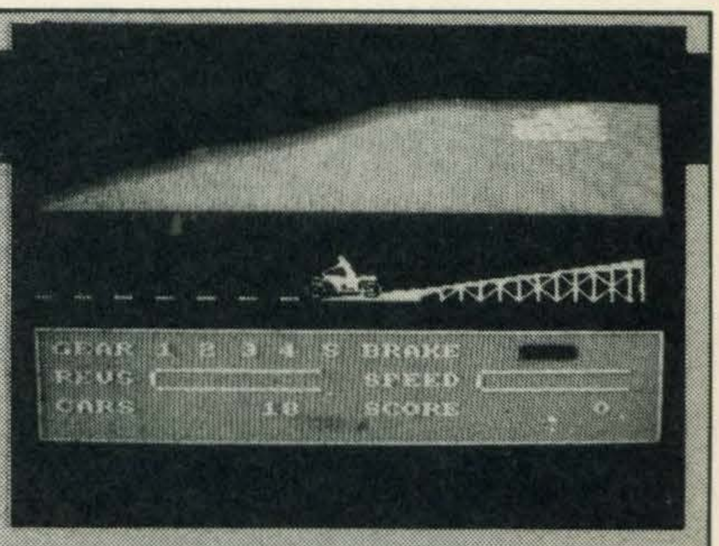
Apart from the realistic scrolling, graphic effects in *Illegus* are a let down: the deadly robots are represented by shimmering blobs of red; food, water, batteries and viewers by shapeless masses lying on the ground and pits are just black lines across the earth.

If you are lucky enough to stumble out of a maze, nothing of note occurs, you just carry on to the next one.

It is hard to pass judgement on *Illegus*, some people might find it excruciatingly boring, but others may find the simple act of escaping from a maze to be one of gripping excitement.

The main problem with *Illegus* is that there isn't enough to occupy the player's attention; escaping from one maze is an achievement, getting out of the next one quite thrilling, but on the fourth, initial excitement will have worn off. The mazes do vary slightly and become more difficult, but for £18.80 we would really expect more.

EDDIE KIDD JUMP CHALLENGE £7.95



SUPPLIER: Martech (0323) 768465
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★★
SOUND ★
VALUE ★★
VERDICT ★★

Signing up sports personalities to endorse computer games seems to be all the rage at the moment. And *Martech* has lost no time in putting stuntsman supremo Eddie Kidd down on tape.

The game is based on many of Eddie Kidd's past stunts including death defying leaps over oil barrels and rows of cars.

At first glance the game looks a doddle, but looks can be deceiving! The instructions warn that skill and a 'feel' for bike jumping is a prerequisite, advice worth heeding.

Our first few attempts were feeble, manoeuvring the bike is a lot more difficult than we anticipated.

Without developing a few skills you're not going to get very far and we spent a lot of time familiarising ourselves with the gears, revs, speed and brake controls which are indicated in a large box at the bottom of the screen.

Before attempting to leap off the ramp it's essential that you are aware of the speed you are travelling and the distance needed for 'take-off'. This can only be achieved by trial and error. We repeatedly crashed the bike and broke Eddie's neck yet he still managed to get up and give the crowd a wave before climbing back onto the bike for another dance with death.

Eventually we cracked it. The speed was just right, the correct distance had been gauged, Eddie was on target for a momentous leap — was being the operative word. We lost control in mid air, Eddie went through some pretty spectacular somersaults before crashing headlong into the tarmac!

The score is dependent on where the back wheel of the motorbike hits the ramp on landing. If you miss even by a cat's whisker you don't get any score.

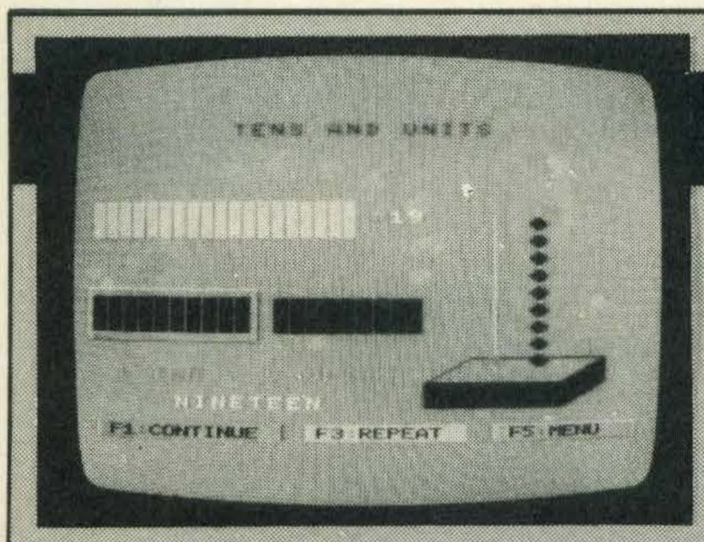
Control of the bike is maintained through the cursor control keys (or a joystick) and with continual practice and patience we managed to 'wheelie' down the tarmac. We also tried it on the ramp but weren't quite so successful!

The game provides a demonstration mode for those not confident enough to try their luck at the 'real' thing and this is where we recommend you to start.

Overall we were impressed with the idea but disappointed with the graphics and sound. The latter was nothing like a motor bike — more like a food processor. As for the graphics they vaguely resemble a stunt circuit but Eddie looks like a matchstick man.

We can't help feeling that £7.95 is a lot to pay for a game, however popular, that could offer a few more thrills and spills for your hard-earned cash.

REVIEWS



TENS AND UNITS — £7.95

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

GRAPHICS ★
SOUND ★
VALUE ★
VERDICT ★

Most three year olds are intrigued with brightly coloured toys and watching *Play School*. With this in mind, Mentor has developed a mathematical package with the maximum content of attractive graphics and the minimum of text.

Tens and Units is pitched at the three to seven age range which seems a pretty broad spectrum for which to cater in one program. The program starts with a menu which we presume will be controlled either by the child if he or she can read or by a parent or teacher.

The program is divided into eight sections, the first four conveying the same information but with different graphics. The first choice is a tree full of apples. After a couple of seconds the apples start to fall and as they do so the number is registered in a box headed 'units'. When the figure reaches ten the 1 is displayed in the box headed 'tens' and the 0 in the units box.

The same process is repeated in the following sections but instead of a tree it's cars coming out of garages, candles on a birthday cake and coloured boxes. Sections five, six and seven introduce the abacus as a method of dividing objects into groups of ten and then adding them up.

The concluding section is in keeping with the rest of Mentor's educational titles and is the inevitable four problems. Guessing the number on the abacus is the game and when the correct answer is supplied the screen changes colour and 'Well Done' appears on the screen. If the answer is wrong the program prompts you to 'Try Again'.

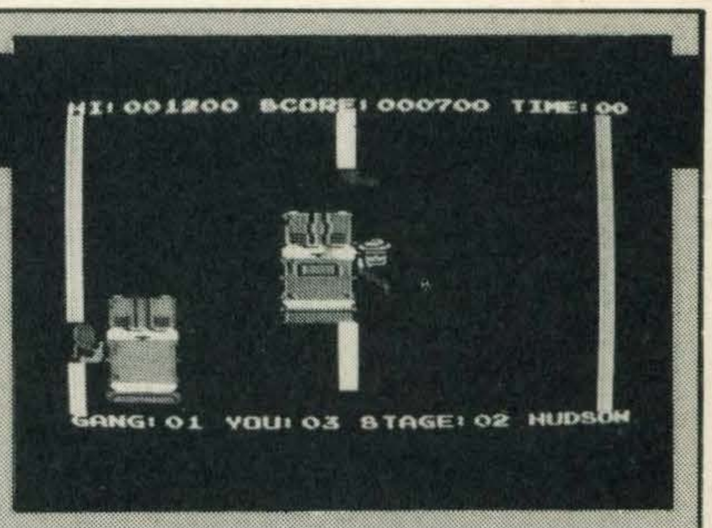
Once all of the problems have been worked through, the user has two options. The first is to see the score he or she has achieve, in the form of a bar chart accompanied by a short tune; the second is to go through the entire program again.

Many youngsters will probably find *Tens and Units* an intriguing program and will enjoy seeing their scores — and trying to improve upon them.

All the Mentor titles sell at the fixed price of £7.75 but after going through *Tens and Units* we feel that Mentor could have offered better value for money by including more sections and problems on the other side of the tape. Although the contents on the first side are well presented, it's a pity there's not a lot more of it! And, although we reckon most three and four year olds will enjoy running through the tape, seven year olds may well find the material too elementary.

Educational titles for children of this age group are a bit thin on the ground, but even so, this title does what it claims even if it is a bit lacking in quantity.

GANG MAN — £7.95



SUPPLIER: Hudson Soft 01-458 3310
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★★
SOUND ★★
VALUE ★
VERDICT ★★

In the shady world of godfathers and gangster mobs, you don't mess with the opposition unless you're fed up with living. But, in a moment of madness you've double crossed a rival gang and they are after your blood.

All the action takes place on the fast lanes of a highway in speedy sedan cars. On screen, you are given a bird's eye view of the road.

To make the goodies (that's you) and the baddies (that's them) easier to differentiate, the cars come in two colours only. You're driving a rather natty red car and the pursuing hoods are all in blue vehicles.

In the first level the good guy, dressed in a rather fetching yellow homburg hat and bright green sweater, is up against one of the orange haired, purple jumpered opposition — no colour sense, these gangsters! In the second level, two gangsters appear on the scene, in the third level three gangsters show up and so on.

Everyone is armed with Colt 45s and the idea is to blast the gangsters before they blast you. You have unlimited ammunition, but then so do they and there are more of them.

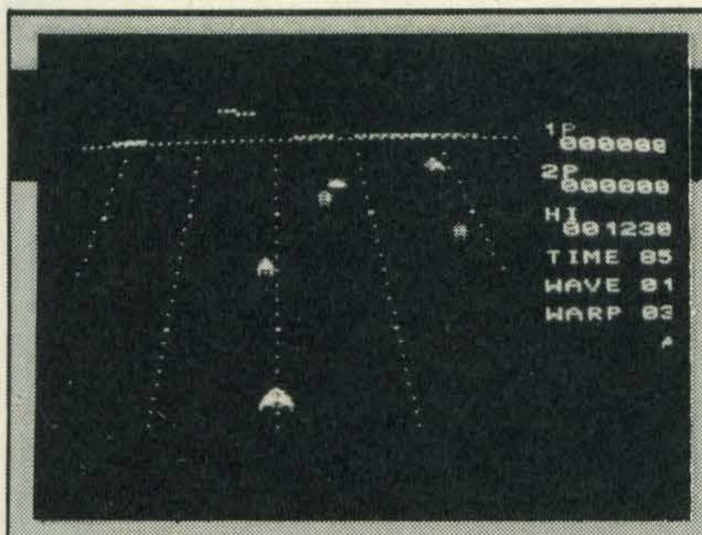
You can shoot in four directions — left, right, forwards and backwards. Perfecting your firing technique is quite difficult because if you move left, the gun fires to the right or if you move forwards, the gun will only fire backwards — it's a bit like playing the game in a mirror. It takes a bit of practice to get it right.

Besides staying alive, one of the main aims of the game is to gain millions of points. Each level is timed; on level one, you are given ten time points and if you kill the other guy before the time limit is up, the number of time points left is multiplied by 100 and added to your score. So it's in your best interests to kill them as quickly as possible.

If you've been shot, you fall out of your car and lie on the road in an odd, twisted sort of way — quite macabre. Just to drive the fact home, the message 'YOU DIE' appears over the top of your lifeless corpse. Bright, sparkling diamonds and bags of swag lie on the road at various intervals and driving over these yields lots of lovely points.

Some sound effects are excellent — the sounds of the guns firing and the cars purring along the road are realistic. The accompanying ditties are a bit naff, but fortunately the quality of the graphics , although not perfect, makes up for what the game lacks in tonal brilliance.

Gang man is fun, and is challenging and addictive enough to keep the whole family occupied for hours.



JUNO FIRST — £18

SUPPLIER: Sony (81) 61688
TYPE: Arcade
FORMAT: Cartridge

GRAPHICS ★★★
SOUND ★★
VALUE ★★
VERDICT ★★

Destroy the enemy magnetic power station and save the world from an alien invasion. If this theme sounds familiar to you — it is, but it's still one of the best subjects to shape a computer game around.

You are controlling *Juno First* — an atomic turbine space fighter, no less — and zapping all oncoming enemy space vehicles with the ship's gas laser.

Juno's movement is restricted to the bottom of the screen, as in *Space Invaders*, and the enemies drop from the sky erratically firing white bombs in all directions. These are lethal to touch and you have your work cut out avoiding as well as shooting them.

A set of game indicators on one side of the screen inform players at what stage of the game they are at, scores, the highest score so far, number of enemy waves negotiated, time remaining in which to destroy the enemy, the number of warps left and the remaining *Juno First* fighters.

A time limit of 100 is allowed to destroy each enemy wave. Once they have been annihilated, the time returns to 100 again.

Enemy ships appear in a number of guises — variously-shaped yellow, purple and white space crafts. They vary their attack formations and can be difficult to avoid. Sony has thoughtfully put in a control whereby it's possible to slow their attack down — very useful especially if you're in a tight spot.

Similarly if you think the game is getting too tame, it's possible to speed the action up a bit. Another way out of a sticky situation is to move time warps. It's possible to move three time warps in the first stage.

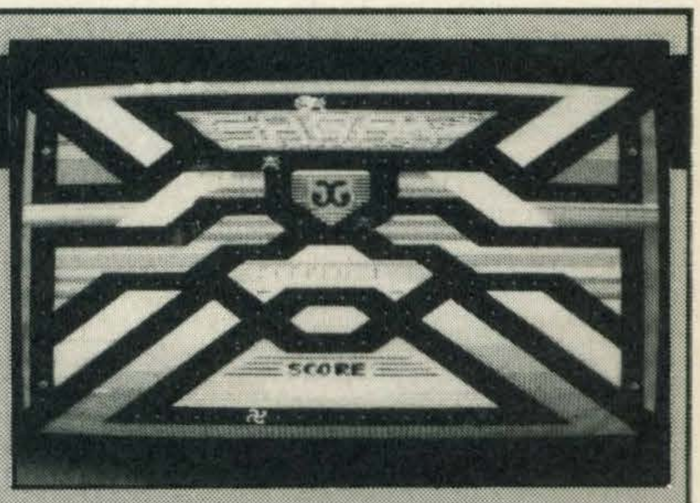
Every so often, at the tail end of an enemy wave, a green blob, known as the enemy magnetic power station, appears. Zap this and the entire screen turns a brilliant shade of lime green. Shortly after, another blob, red this time, appears — the source of energy. If *Juno First* touches this, the screen turns red, Juno becomes stronger and it's possible to get higher scores.

The main aim of the game is to score lots of points by demolishing alien ships. Ten points are gained for zapping aliens on black or green screens, but on a red screen, the ships are worth 200 points each.

Graphics are fairly good and *Juno First* responds well to both joystick and cursor key controls. Sound effects simulate the sounds emanating from the video game-filled amusement arcades — brash and tuneless.

If you like the occasional spell of completely mindless alien bashing, this is the game for you, although at £18, it's not exactly cheap.

SHNAX — £6.95



SUPPLIER: Kuma Computers (07357) 703889
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★★
SOUND ★★
VALUE ★★
VERDICT ★★

Rolling two arcade games into one should combine the thrills and spills of each to produce an exciting, addictive megagame. Unfortunately *Shnax*, although a mixture of two popular games, *Pacman* and *Pinball*, is neither of these — it's pretty irritating, not to mention frustrating.

It's a shame because the idea has a lot of potential and if a bit more care and attention had gone into its development the product could have been much more interesting all round.

The first screen scenario is a multi-coloured angular maze. The corridors are filled with white dots and the aim is to gobble these up.

A bright blue dot-munching creature is under your control, although control is probably not the right word to use. The creature's response to our joystick controls was very shaky and we often found ourselves struggling to get round one of the sharp corners — rather distressing if one of the enemy is in hot pursuit. Unfortunately the game is for joystick control only: players who prefer using the keyboard will be disappointed.

Life is complicated by colourful spiders with little feelers and legs. These appear out of nowhere and rush around the maze like lunatics. Contact with them is fatal and your creature instantly loses one of his four precious lives.

Luckily there is a way of protecting yourself. Yellow shields lie around the maze which, if picked up, confer your creature with a few seconds of complete immunity. It's also possible to gobble the opposition up during this stage.

The other obstacle to the successful clearing of the maze is a vicious four bladed knife which darts around one of the maze stretches. Getting to the white dots guarded by this knife is difficult as the shields give no protection.

Every time a shield is picked up a little symbol appears at the top of the maze. These are named and have special qualities.

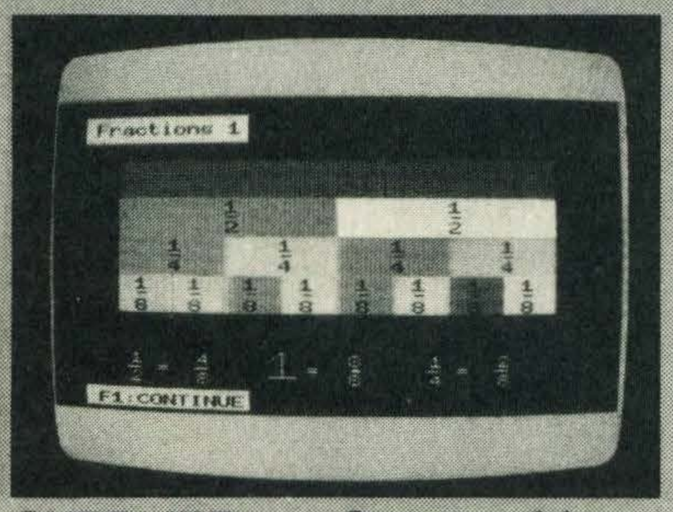
Home yields bonus points and pushes you back to starting position at the press of a fire button, Mirror lets the munching creature move to opposite ends of the corridor and Pogo seemed to quicken up the creature's movement.

Sound effects are pretty dull and not worth the bother of turning on, graphics are adequate, but again nothing special.

Altogether there are ten different levels and each one gets a bit faster, but as the joystick controls are so bad it is doubtful that anyone will ever reach the top!

REVIEWS

INTRODUCING FRACTIONS 1 £7.95



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

GRAPHICS ★★
SOUND ★
VALUE ★★
VERDICT ★★

Mentor has spent much time and effort preparing a range of educational programs dealing with mathematics for a variety of age groups. *Introducing Fractions 1* is just one of a pair of cassettes dealing with fractions — the other one is, not surprisingly, called *Introducing Fractions 2*.

Aimed at seven to ten year olds, the cassette is intended to help youngsters understand a few basic facts about fractions — what they are, how they are formed, the correct terminology and a few problems to solve to reinforce the knowledge the child has, hopefully, picked up.

As with all Mentor's mathematical programs, *Fractions 1* is menu based and only very simple key commands are necessary to move around the program. Before doing anything else, it seems logical to start off with the definition of a fraction and this is exactly what Mentor does. A big coloured circle appears and then splits into two pieces, each one labelled with a ½. The two halves separate and then rejoin to form a whole once again.

It's not fast-action, attention-grabbing stuff, but it should put the point across to most kids. After the demonstration of the half circles, the circles are divided into quarters and then eighths in similar displays. Just in case any child misinterprets the diagrams and thinks that fractions are only slices of a circle, a square is divided up as well.

Simple sounds, shimmering visual images and colours are used in the program to illustrate ideas but, unfortunately with minimal effect. Although they're fairly attractive additions, they don't really add much to the program.

Mixed numbers are the next subject on the menu and circles followed by squares are displayed on screen. A full circle or square is accompanied by a quarter or eighth and labelled 1¼ or 1⅛ — or whatever is relevant.

The third program, Equivalents, shows mixed fractions in their two forms. A pyramid-like structure is used to demonstrate the point. By observing this pyramid, the child will see that a 1 is equal to 8/8, that 1/4 is the same as 4/16 and that 1/8 is equivalent to 2/16. Three problems follow the explanations. A score screen displays a percentage mark which is given together with a comment on the achievement.

Fractions 1 is quite a dry program and young children may find their attention straying from the tasks in hand. As no explanatory booklet accompanies the program, any difficulties in understanding the facts will remain unexplained unless some passing adult lends a hand.

INTRODUCING THE RECTANGLE £7.95

So far, squares, triangles and circles have been explained in Mentor's introductory mathematical series. Now it's added rectangles to the list.

Introducing the Rectangle follows a similar format to the other programs with its written definitions of various aspects of the rectangle. These definitions are complemented by crude diagrams and the program includes a few problems which are intended to test the user's understanding. It's aimed at 11 to 14 year olds and Mentor suggests in the blurb that it is 'ideal for learning, teaching and revision situations'.

Moving within the program is simple as it's menu based. All the user has to do is press the function keys or numbers.

First on the menu is the explanation of a rectangle. It has four sides, four right angles and the opposite sides are equal. Reinforcing this pearl of wisdom are a few simple coloured line drawings showing that the opposite sides are, indeed, equal in length.

Once the player has digested this part it is safe to go onto more rectangle descriptions — length and width. Again, rather tame diagrams and simple sound effects.

Mentor does not waste computer memory space with frivolous graphics, tuneful ditties or anything else that may brighten the program up, but it does come straight to the point and say what it means.

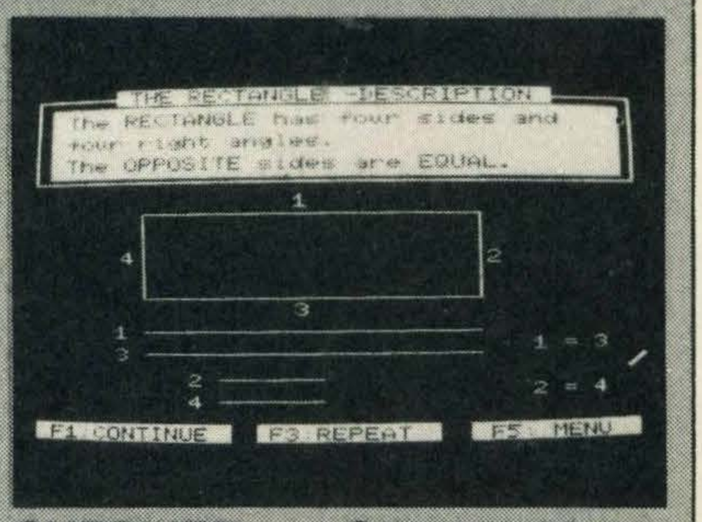
Next on the menu is the perimeter. This we are told is the sum of all four sides. A diagram, drawn by an invisible hand holding a visible pen, illustrates this fact.

The part of a rectangle's anatomy that might create most difficulty is its area. The idea of multiplying the width by the length is introduced very gradually, so that anyone using it will fully understand why and how the area is calculated. For instance a rectangle, one inch by three inches in size, is displayed on screen and then divided into its component three squares.

The program finishes with four problems. The first deals with the perimeter, the second and third with area and the fourth requires some thought. The perimeter and width size of a rectangle is given, and you have to work out the length.

Mentor must have done its homework and decided that there was a real need for these computerised definitions. But they could be made more fun and perhaps have included more complex information.

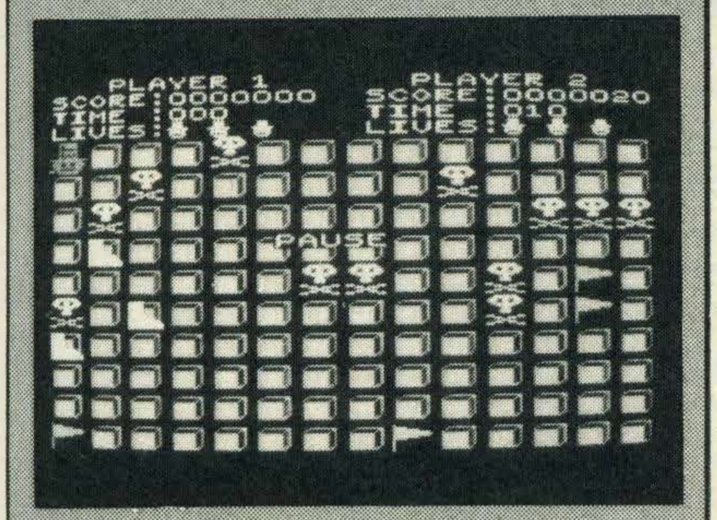
As soon as disk drives become more popular, Mentor intends to put all its mathematical programs on one disk. If the price isn't too high this will provide much better value for money, we think, than individual cassettes.



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

GRAPHICS ★★
SOUND ★
VALUE ★★
VERDICT ★★

GRIDTRAP £1.99



SUPPLIER: Livewire (061) 832 7806
TYPE: Arcade/strategy
FORMAT: Cassette

GRAPHICS ★★
SOUND ★
VALUE ★★★
VERDICT ★★

There aren't many games with good quality graphics and reasonable sound effects that cost only £1.99.

Gridtrap is yet another title that, although it may not appeal to all tastes (and what game does?), will no doubt sell well partly because it's cheap.

It's described as a strategy game because you have to move a man over a grid of stepping stones, to reach and defuse a time bomb. As the character walks across the stones they vanish behind him so that he cannot retrace his steps.

However by using the cursor control keys and the space bar together it's possible to scroll the stones across the screen from left to right or vice versa when you find yourself running out of stones.

The scrolling facility is a good idea but we found it difficult to implement and it does take practice — in our case a lot of patience too!

Skulls and crossbones occupy various parts of the grid and it's up to you to avoid them otherwise a life is lost. There are also flags which, when collected, add bonus points to your score.

Throughout the whole game the seconds tick away on the bombs (there's a 30 second count-down) and if you don't defuse them within the time limit they explode and you lose a life.

Further lives will be lost if you allow your man to be swotted by a flying boot . . . it looks more like a yellow wellie and tends to hover around the bombs ready to pounce.

The only way to get onto the following levels is by defusing five bombs and naturally the further you get the harder the game becomes.

We managed to get up to level seven and could have got further if we'd used PAUSE and thought about where to move to next.

If you get a good enough score at the end of the game a hall of fame appears and you can enter your name for posterity.

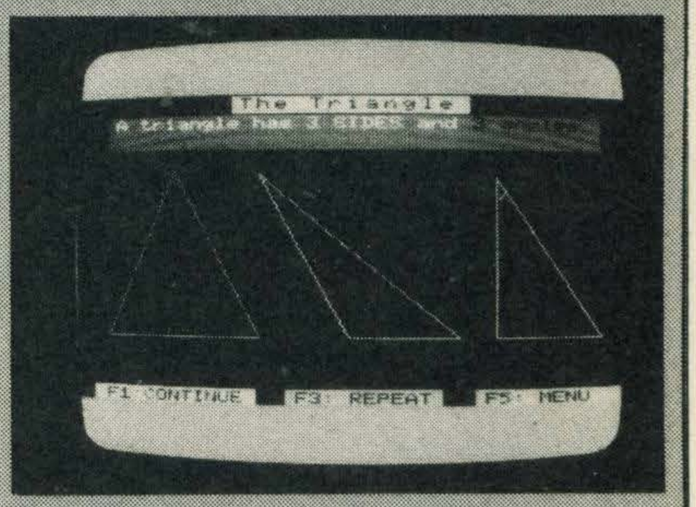
On the whole we were impressed with *Gridtrap*, it offers nine skill levels ranging from easy to downright difficult thus catering for a wide ability range.

The scoring system is quite generous too. For every flag collected your score is bumped up by an extra 500 points and should you manage to knock up a score of 100,000 you'll be well rewarded with an extra life.

We found the background music monotonous and repetitive but by pressing N you can switch it off. That leaves you with a continually bleeping noise, which we dispensed with by turning the sound down!

If you've got a couple of quid to spare then this is the game to buy.

INTRODUCING THE TRIANGLE £7.95



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

GRAPHICS ★★
SOUND ★
VALUE ★★
VERDICT ★★

Educational software for MSX seems to be going through a boom period and it's largely thanks to prolific contributions from the Irish software house Mentor Educational Services. It is a company that set itself the task of producing courseware for primary and secondary schools.

All the company's titles have been designed and written by teachers and computer professionals and this is reflected in the products.

Introducing the Triangle is aimed at 10-14 year olds and runs through the various triangles — equilateral, scalene, isosceles, etc — and follows them up with detailed sections illustrating how to calculate areas, angles and perimeters.

Throughout the whole program the student has the option of repeating any of the exercises or returning back to the menu.

Once the basic concepts have been grasped the menu appears and you can then choose to work through a set of problems to evaluate just how much (if anything) you have learnt.

The problems start off with questions asking for the value of certain angles. As long as you've remembered that all the angles of a triangle add up to 180 degrees you should have few problems.

Naturally the questions get harder and your brain cells are stimulated into action when it comes to working out the areas of triangles. It's amazing just how much can be forgotten with the passage of time!

Having worked through several sets of questions (which are randomly generated) I can't help feeling that the program is pitched at the wrong age group.

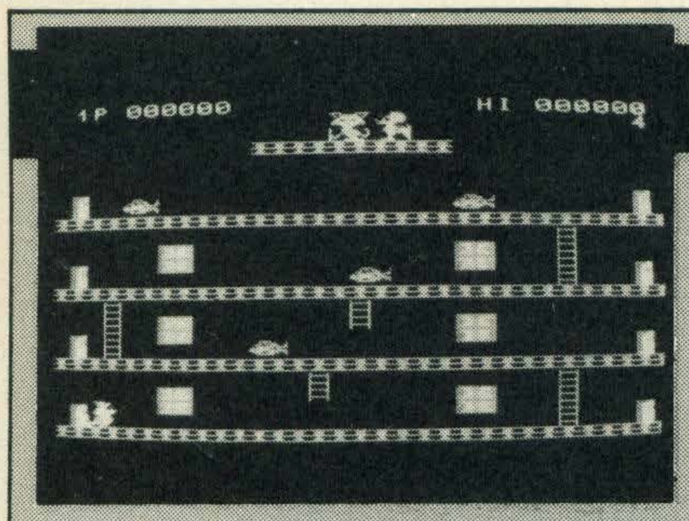
Most children of up to the age of eleven are taught the rudiments of mathematics which includes basic trigonometry. And according to several school teachers that we talked to, once in a secondary school pupils are expected to be capable of moving straight onto so-called 'modern mathematics' which entails understanding the binary system, probability problems and calculating the areas of rhomboids.

Introducing the Triangle is by no means meant to be a replacement for the school text book, but a supplement. Most schools are equipped with micros and youngsters will no doubt find working on a computer a welcome relief to ploughing through uninspiring texts.

And, unlike a text book, if you get the answer wrong a clear illustration of the solution is supplied showing not only the answer but how to work it out.

At £7.95 the price is average for MSX educational software in this country.

REVIEWS



MOUSER — £18

SUPPLIER: Sony (0784) 61688
TYPE: Arcade
FORMAT: Cartridge

GRAPHICS ★★★
SOUND ★★
VALUE ★★
VERDICT ★★

We have come across some pretty extraordinary games in our time with titles to match and *Mouser* is no exception.

It is based on the very familiar cat chasing mouse theme, but there isn't a mouse to be seen anywhere — only rats!

The idea is to rescue Tom's girlfriend Kitty who is being held hostage by the Frat Rats.

Kitty is being held on the fifth floor and Tom has to get past the rolling balls, avoid the flowerpots being thrown at him by the Boss rat and eat the fish that are liberally strewn on each floor.

Sounds easy but as in all good computer games there is a catch. The ladder from the fourth floor to the fifth floor is missing and will only appear after Tom has caught a certain number of rats.

The more rats you kill the higher your score and bonus points can be acquired by gobbling up the fish as well.

This isn't a difficult game to play, it just requires common sense and the ability to suss out the obstacles and the frequency of their appearances. The rest should, as they say, be a piece of cake!

When you finally rescue Kitty the event is heralded with a quick rendition of Mendelssohn's wedding march.

In level two the going really hots up as the rolling balls are replaced by twirling spanners (what will they think of next?) and dynamite. Then, to cap it all parts of the floor are missing, and the Boss rat has a more plentiful supply of flowerpots.

Once again the ladder to the fifth floor will only appear when a certain number of rats have been devoured.

If you get through all that, there's a real treat in store in the third level, but you'll have to discover that for yourself!

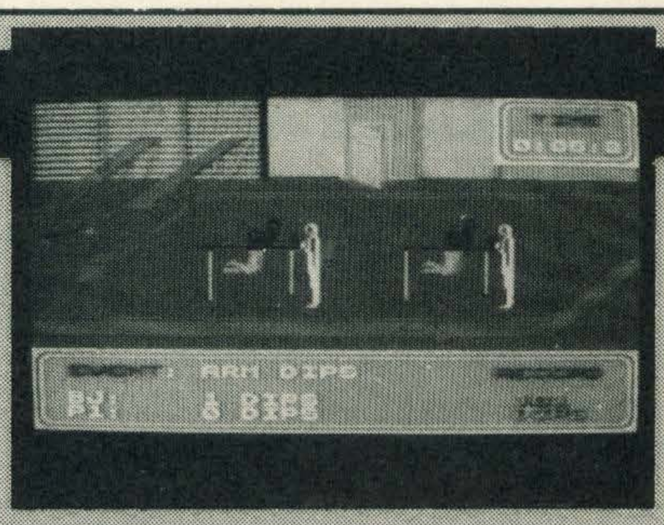
Although the scenarios remain virtually the same there's plenty of action to keep your attention firmly fixed. To be honest, we weren't too impressed to start with, but after a few plays the game began to get under our skin.

Our only complaint is that the graphics, although good (as they should be for a cartridge), tend to flicker when Tom is balanced on the ladders between floors—a programming glitch, maybe.

The game can be played with one or two people using joysticks or the cursor control keys. The latter seem better suited when Tom has to leap over spanners and belt up ladders.

If you are bored with playing adventure games and find alien zapping soul destroying and want a lighthearted and comical game to while away the hours then *Mouser* is definitely a title to consider.

SUPERSTAR CHALLENGE — £7.95



SUPPLIER: Martech (0323) 768456
TYPE: Arcade
FORMAT: Cassette

GRAPHICS ★
SOUND ★
VALUE ★
VERDICT ★

Armchair sports enthusiasts can now enjoy the thrills of winning the 100 metres, scoring a bulls eye in archery and scoring a hat trick in the football without so much as a flick of the wrist.

Brian Jacks Superstar Challenge contains eight 'exciting, addictive and challenging games' goes the blurb on the cassette cover. However after playing the games we have quite a few reservations about those comments.

Like many other games, *Superstar Challenge* requires a player with a competitive streak and a desire to win. With this in mind we got down to the first event, canoeing. Try as we might the canoe wouldn't pick up speed and we eventually crawled across the finishing line at a snail's pace. But that didn't deter the computer; it still allowed us to qualify and continue with the next strenuous event.

Ever optimistic we tried our luck at arm dips. It was a real struggle; with sweat pouring from the brow we managed to notch up . . . 11!

The squat thrusts proved to be just as taxing and it was a welcome relief to cool off in the swimming pool and knock spots off Brian Jacks.

As for football, we could probably have fared better if the graphics had been of better quality, and the goalkeeper hadn't feigned dead all the time!

Although the graphics are fairly lifelike, they do not stand comparison with those of Konami's athletics series of games.

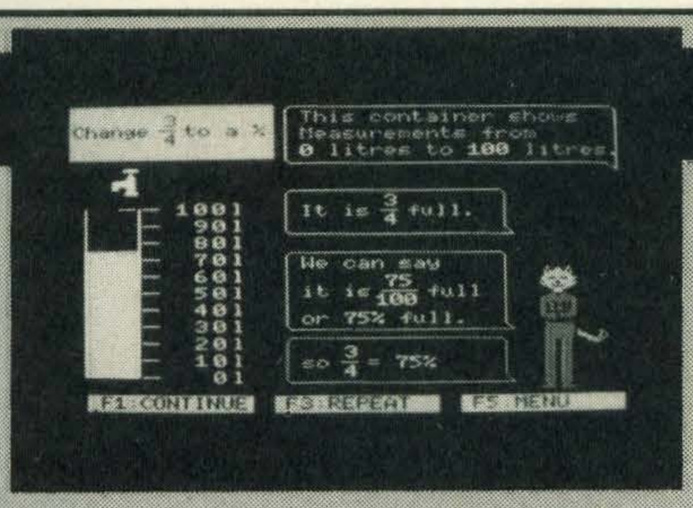
The graphics are pretty dull, featuring such colours as fluorescent greens and purples.

Not enough information is given to play the events, the leaflet enclosed with the cassette provides only the briefest of details and states that the 'instructions have been kept to a minimum' . . . they're not kidding either! By the time we had worked out what to do a lot of interest and enthusiasm had waned.

The most exciting event on the cassette is the cycling but it would be even better with improved graphics. All the same once underway we changed into top gear and whizzed past the finishing line in record time.

The tape could have been vastly improved if the programmer had taken the trouble to include an awards ceremony and some zippy music in the background to create a more sporty atmosphere.

Our views are probably coloured by the fact that we've been spoilt by the superb graphics in Konami's titles but there is no reason why a cassette based game shouldn't be just as good.



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

GRAPHICS ★★
SOUND ★
VALUE ★★
VERDICT ★★

INTRODUCING PERCENTAGES 2 £7.95

Most children have problems when it comes to fractions and percentages, it is generally not the working out that confuses them but the rules for changing fractions to decimals and *vice versa*.

Mentor has come up with an appeealing cassette for 10 to 14 year olds that not only simplifies the topic but gets the facts across in a colourful and attractive manner. The program is split up into five sections and concerns itself with a cat who imparts his knowledge through speech bubbles and, where appropriate, draws on 'props' such as grid squares, and a water tank, to hammer home the message.

In the first section, the student learns that percentages are just another way of talking about fractions and this is explained by the cat, using such examples as $^{15}/_{100}$ is the same as 15%, before moving on to explain how to write percentages as fractions and their decimal equivalents.

The following sections run through the methods for converting decimals to fractions and fractions to percentages. A tank of water is used to illustrate the concepts and the cat runs through exercises to show what percentage of the tank is full/empty etc.

By the time you reach the fourth section you should have grasped the basics and be able to whizz through the worked out problems with little difficulty. Should students find themselves stuck and unsure the program has facilities for repeating the sections or running through the entire program again.

The final section adopts a slightly different approach to the preceding ones — you are asked to enter your name before going on to tackle the five problems.

A nursery rhyme followed by a picturesque garden of flowers on the screen leads you into the problems. The idea is that you have to work out what percentage of flowers are blue, and what fraction of them are orchids and so forth.

Once you've finished, a bar chart at the end of the program reveals how well (or how badly) you have performed.

Although Mentor has obviously put a lot of effort into the design of this title we do have the odd minor criticism. For instance, when trying to work through the problems, it would have been more beneficial if the method of working out the correct answer was shown. Without this facility the program is really only suitable for children with parents or teachers close at hand to show them where they've gone wrong.

Our other criticism is that with so few problems to work through, the user will soon know all the answers.

INTRODUCING THE SQUARE £7.95

Writing quality educational software is an art that Mentor has mastered where others have failed or not even bothered to try.

Introducing the Square is another in the company's series of programs aimed at the 10 to 14 year age bracket, with the aim of instilling in young minds elementary mathematical concepts.

The program is divided up into four sections. The first kicks off with a definition of a square and lots of colourful examples.

In the following two sections the student is introduced to the concepts of perimeters and areas and how to calculate them.

Once the basic facts have been grasped the student is then invited to work through a selection of questions randomly generated in the fourth section.

When tackling the problems you're allowed two attempts. After that the machine takes over and shows the correct answer with the appropriate working out.

There isn't a lot to be said about squares, they have four sides, all of which are equal in length. All of them have perimeters which can be found by adding the lengths of the four sides or by multiplying the length of one side by four. And that's about it.

It is always difficult to judge educational software, mainly because there are too few titles to compare.

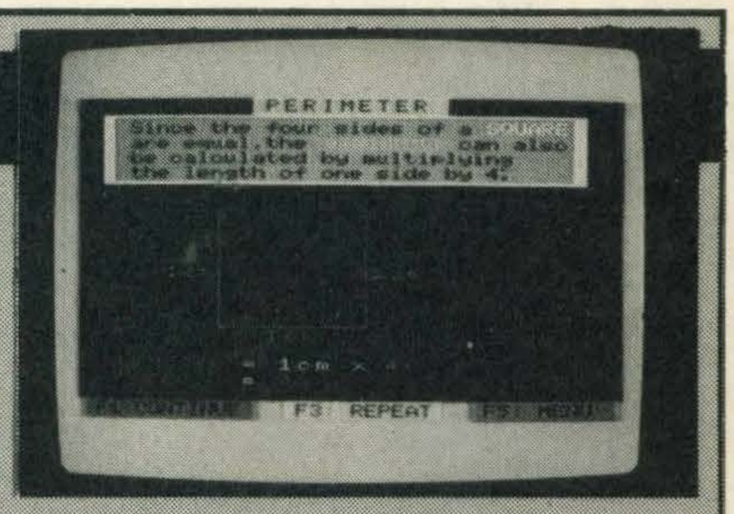
However we do have one criticism; Mentor could have crammed a lot more onto the tape. The same worked through examples are included on the reverse side of the tape and it would have been far more beneficial for the student to have more problems to work out for themselves.

Or, Mentor could have gone a step further and included the rectangle on the reverse side with a more varied selection of problems combining the two shapes.

On the whole, after working through the tape, we were generally impressed with the contents and the way in which the material has been presented. A colourful tape is more likely to hold a child's attention than a stuffy text book. And the tape can quite easily be used by two children who will no doubt end up competing to achieve the highest score, and learn that which might otherwise lose their interest.

The graphics are clear, and bright and attractive and the whole program is personalised by the way it invites you to enter your name at the beginning and telling you how well you have done at the end, something no text book can do.

If your child is having problems with maths at school, buying an educational tape could well solve the problem without your child even knowing he had one in the first place.

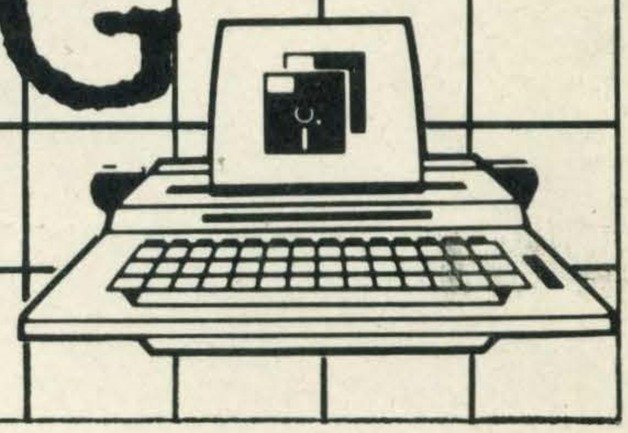


SUPPLIER: Spectravideo 01-330 0101
TYPE: Educational
FORMAT: Cassette

GRAPHICS ★
SOUND ★
VALUE ★★
VERDICT ★★

GET TYPING

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



AIRFOX
by Paul Mather

Now, here's a real challenge. You are the inimitable and ludicrously-named *Stringbean Sparrow*. You have at your disposal an *Airfox* multi-purpose combat helicopter, which you can use to rescue two kidnapped scientists and bring about the demise of the evil Dr Murtceps. But why tell you about it here? Full instructions are contained in the program.

```
10 REM**********************************
20 REM**     AIRFOX---MSX----          **
30 REM**  WRITTEN BY PAUL MATHER        **
40 REM**********************************
50 OPEN"GRP:"AS#1
60 HI=2200:HI$="PAUL MATHER."
70 TS=0
80 SCREEN2,2:COLOR15,1,1:CLS
90 KEY OFF:SC=0
100 CX=210:CZ=226:CY=186:MR=0
110 X=218:Y=187
120 EO=0:KT=0:BA=0:DY=160:RH=0:LI=3:M
L=0
130  A$="C3E5F5L3D10L4U10L3"
140 R$="F5G5U3L10U4R10U3"
150 L$="G5F5U3R10U4L10U3"
160 REM**SCREEN HEADINGS**
170 SCREEN2,2:COLOR15,1,1:CLS:CP=0
180 IF SC=1 THEN PSET(30,5),1:PRINT#1
,"SCREEN 1----'THE BASE'---":GOTO1310
190 IF SC=2 THEN PSET(30,5),1:PRINT#1
,"SCREEN 2----'THE RIVER'---":GOTO131
0
200 IF SC=3 THEN PSET(30,5),1:PRINT#1
,"SCREEN 3----'THE CAVERN'---":GOTO13
10
210 IF SC=4 THEN PSET(30,5),1:PRINT#1
,"SCREEN 4----'THE REACTOR'---":GOTO1
310
220 DATA11110000
230 DATA00011111
240 DATA11000001
250 DATA01000001
260 DATA01100011
270 DATA00100011
280 DATA00100111
290 DATA01111111
300 DATA00110011
310 DATA00111111
320 DATA01100011
330 DATA01000011
340 DATA10000000
350 DATA00000000
360 DATA00000000
370 DATA00000000
380 DATA10001111
390 DATA11111000
400 DATA11000000
410 DATA10000000
420 DATA11000000
430 DATA10100000
440 DATA11010000
450 DATA11110000
460 DATA10011000
470 DATA10001110
480 DATA10000111
490 DATA11111110
500 DATA11111000
510 DATA11000000
520 DATA00000000
530 DATA00000000
540 RESTORE 220:SR$=""
550 FOR SB=1 TO32 :READ SB$
560 SR$=SR$+CHR$(VAL("&B"+SB$)):NEXT
570 SPRITE$(2)=SR$
580 DATA00000000
590 DATA11110001
600 DATA00011111
610 DATA00000011
620 DATA00000001
630 DATA00000011
640 DATA00000101
650 DATA00001011
660 DATA00001111
670 DATA00011001
680 DATA01110001
690 DATA11100001
700 DATA01111111
710 DATA00011111
720 DATA00000011
730 DATA00000000
740 DATA00000000
750 DATA10001111
760 DATA11111000
770 DATA11000000
780 DATA10000011
790 DATA10000010
800 DATA11000110
810 DATA11000100
820 DATA11100100
830 DATA11111110
840 DATA11001100
850 DATA11111100
860 DATA11000110
870 DATA11000010
```

```
880 DATA00000001
890 DATA00000000
900 DATA00000000
910 RESTORE 580:SL$=""
920 FOR SI=1TO32:READ SI$
930 SL$=SL$+CHR$(VAL("&B"+SI$)):NEXT
940 SPRITE$(2)=SL$
950 DATA11111001
960 DATA00001111
970 DATA00000001
980 DATA00000011
990 DATA00000011
1000 DATA00000111
1010 DATA00001001
1020 DATA00010001
1030 DATA00100001
1040 DATA00111111
1050 DATA00011111
1060 DATA00011111
1070 DATA00000111
1080 DATA00000000
1090 DATA00000000
1100 DATA00000000
1110 DATA10011111
1120 DATA11110000
1130 DATA10000000
1140 DATA11000000
1150 DATA11000000
1160 DATA11100000
1170 DATA10010000
1180 DATA10001000
1190 DATA10000100
1200 DATA11111100
1210 DATA11111000
1220 DATA11111000
1230 DATA11100000
1240 DATA00000000
1250 DATA00000000
1260 DATA00000000
1270 RESTORE950:SF$=""
1280 FOREC=1TO32:READEC$
1290 SF$=SF$+CHR$(VAL("&B"+EC$)):NEXT
1300 SPRITE$(2)=SF$
1310 REM***SCREEN SELECTOR***
1320 IF SC=0 THEN SCREEN2,2:COLOR15,4
,4:CLS:SPRITE$(2)=SR$:GOTO4830
1330 IF SC=1 THEN 1380
1340 IF SC=2 THEN 2220
1350 IF SC=3 THEN 3000
1360 IF SC=4 THEN 3570
1370 REM*** DRAW BASE ***
1380 LINE(0,185)-(255,185),3:LINE(0,1
91)-(255,191),3:PAINT(1,186),3
1390 DRAW"BM50,185;C4U30R50D30L50":PA
INT(55,180),4
1400 DRAW"BM65,160C1R10D5L10U5":PAINT
(67,162),1
1410 DRAW"BM85,185;C3U20R10D20":PAINT
(90,180),3
1420 DRAW"BM45,155;C14R60H10L40G10":P
AINT(60,150),14
1430 DRAW"BM60,145;C15U40"
1440 LINE(0,40)-(255,40),15
1450 DRAW"BM230,20;XA$;":DRAW"BM15,20
;XA$;"
1460 PSET(245,25),1:PRINT#1,"2"
1470 PSET(30,25),1:PRINT#1,"2"
1480 PSET(45,30),1:PRINT#1,"MEN CARRI
ED=";MR
1490 DRAW"BM38,40;C15U27L38R255L38D27
"
1500 DRAW"BM90,175;C1U1R3"
1510 DRAW"BM5,41;C6NL5F5G5D4R3D2R2F3D
2D4R2G4R2D4L2D4E3F4D3L2D10F4D3L2D4R2E
4R2D4L2F4D3F2D3L1D4R2F3D4L3D10R3D3G5D
3R3D5E3D1G3G4L2D4G2D5R1D5G3F5D3L30":P
AINT(10,183),6
1520 DRAW"BM155,41;C6NR100;F10D4R3D10
R3D4R2D4R2D5R3D6F4L3D4R2E4R5D10R4D5R4
D2R2D5R1D3R2D5R10D3R10D2L5D5F4D3R3D2R
4D2R3D2E5D10R3D2R3D2R4D4D10R3D10DR5D1
0R5D5F10"
1530 PAINT(170,42),6
1540 DATA00111100
1550 DATA01111110
1560 DATA11111111
1570 DATA11000001
1580 DATA11000001
1590 DATA11001001
1600 DATA11000001
1610 DATA11000001
1620 DATA11001111
1630 DATA11001111
1640 DATA11001111
1650 DATA11001111
1660 DATA11001111
1670 DATA11001111
1680 DATA11111111
1690 DATA11111111
1700 DATA11111111
1710 DATA00111100
1720 DATA01111110
1730 DATA11111111
1740 DATA00111001
1750 DATA00000001
1760 DATA00000001
1770 DATA00101001
1780 DATA00111001
1790 DATA00111001
1800 DATA00111001
1810 DATA00111001
1820 DATA00111001
1830 DATA11111111
1840 DATA11111111
1850 DATA11111111
1860 RESTORE1540:SA$=""
1870 FOREC=1TO32:READEC$
1880 SA$=SA$+CHR$(VAL("&B"+EC$)):NEXT
1890 SPRITE$(0)=SA$
1900 SPRITE$(1)=SA$
1910 SPRITE$(2)=SF$
1920 REM MAIN LOOP
1930 REM
1940 D=STICK(JN)
1950 IF D=3 AND RA<12 THEN RA=RA+1:SP
RITE$(2)=SR$
1960 IF D=7 AND RA>-12 THEN RA=RA-1:S
PRITE$(2)=SL$
1970 X=X+RA
1980 PUTSPRITE2,(X,Y),15
1990 IF D=1 AND RA>0 THEN Y=Y-RA/3
2000 IF D=2 AND RA>0 THEN Y=Y-RA/3:X=
X+RA/3
2010 IF D=8 AND RA>0 THEN Y=Y-RA/3:X=
X-RA/3
2020 IF D=5 AND RA>0 THEN Y=Y+RA/3
2030 IF D=1 AND RA<0 THEN Y=Y+RA/3
2040 IF D=5 AND RA<0 THEN Y=Y-RA/3
```

LISTINGS

```
2050 IF D=1 AND RA=0 THEN Y=Y-1:SPRIT
E$(2)=SF$
2060 IF D=5 AND RA=0 THEN Y=Y+1:SPRIT
E$(2)=SF$
2070 IF CY>168 THEN CY=CY-1
2080 IF Y>152 THEN Y=Y-1
2090 IF CX>194 AND CY=168 AND Y>152 T
HEN CX=CX-1
2100 IF CZ<240 AND CY=168 AND Y>152 T
HEN CZ=CZ+1
2110 PUTSPRITE0,(CX,CY),12
2120 PUTSPRITE1,(CZ,CY),12
2130 SOUND0,50:SOUND1,137:SOUND2,56:S
OUND3,11:SOUND4,10:SOUND6,64:SOUND7,3
7:SOUND8,84:SOUND9,5:SOUND10,38:SOUND
11,26:SOUND12,1:SOUND13,42
2140 IF Y<41 THEN SC=2:GOTO 170
2150 IF Y<152 AND CX<210 THEN CX=CX+1
2160 IF Y<152 AND CZ>226 THEN CZ=CZ-1
2170 IF MR=2 THEN TS=TS+200:PSET(40,2
0),1:PRINT#1,"TOTAL SCORE=";TS
2180 IF MR=1 THEN TS=TS+50:PSET(40,20
),1:PRINT#1,"TOTAL SCORE=";TS
2190 IF MR=1 OR MR=2 THEN MR=0:IF KT=
1 THEN EO=1:DY=160
2200 IF POINT(X-1,Y+8)<>1 AND Y<150 O
R POINT(X+17,Y+8)<>1 AND Y<150 THEN 2
830
2210 GOTO 1940
2220 REM***SCREEN2***
2230 X=220:Y=140:RA=0
2240 LINE(0,185)-(255,185),4
2250 LINE(0,191)-(255,191),4
2260 LINE(0,40)-(255,40),15
2270 LINE(0,41)-(255,41),6
2280 LINE(0,20)-(255,20),15
2290 LINE(215,20)-(215,40),15:LINE(50
,20)-(50,40),15
2300 PAINT(1,190),4
2310 DRAW"BM0,60;C6D40F10R5U3R2R3U4R1
0U3R5F5E2R3E4R6U2R3U2R4U2R5U2R5U3E4R5
U2R4F5R4F3U4R5U2R5U5R8"
2320 DRAW"BM115,80;F10R5U3R2R3U4R10U3
R5F5E2R3E4R6D2R3D2R4D2R5D2R5U3E4R5D2R
4F5R4F3D4R5D2R5D5R8"
2330 DRAW"D5R5D3R7E4R3E2R4U30BL255D30
"
2340 PAINT(20,80),6
2350 DRAW"BM250,25;XR$;":PSET(230,25)
,1:PRINT#1,"1"
2360 DRAW"BM15,25;XL$;":PSET(35,25),1
:PRINT#1,"3"
2370 RX=INT(220*RND(1)):LINE(RX,100)-
(RX,175),15:LINE(RX,100)-(RX,175),1
2380 H=RND(-TIME):TI=INT(25*RND(1))+5
0
2390 COLOR6,1,1
2400 PSET(58,25),1:PRINT#1,"ALERT:LAS
ER ATTACK!":COLOR15,1,1
2410 DATA00000000
2420 DATA00000000
2430 DATA01011010
2440 DATA01111110
2450 DATA01111110
2460 DATA01111110
2470 DATA11111111
2480 DATA11111111
2490 RESTORE2410:SM$=""
2500 FOR EC=1TO8:READEC$
2510 SM$=SM$+CHR$(VAL("&B"+EC$)):NEXT
2520 SPRITE$(20)=SM$
2530 REM**MAIN LOOP**
2540 MX=1:MY=177
2550 PUTSPRITE2,(X,Y),15
2560 PUTSPRITE20,(MX,MY),5
2570 IF MX>255 THEN MX=1
2580 IF MX<=X AND MX+8>=X THEN ML=1
2590 IF ML=1 AND MY>100 THEN MY=MY-5
2600 IF MY<=100 THEN MX=1:MY=177:ML=0
2610 SPRITEON
2620 ON SPRITE GOSUB2830
2630 IF MX<=255 AND ML=0 THEN MX=MX+5
2640 D=STICK(JN)
2650 IF D=3 AND RA<12 THEN RA=RA+1:SP
RITE$(2)=SR$
2660 IF D=7 AND RA>-12THEN RA=RA-1:SP
RITE$(2)=SL$
2670 IF D=1 AND RA>0 THEN Y=Y-RA/4
2680 IF D=5 AND RA>0 THEN Y=Y+RA/4
2690 IF D=1 AND RA<0 THEN Y=Y+RA/4
2700 IF D=5 AND RA<0 THEN Y=Y-RA/4
2710 IF D=1 AND RA=0 THEN Y=Y-4:SPRIT
E$(2)=SF$
2720 IF D=5 AND RA=0 THEN Y=Y+4:SPRIT
E$(2)=SF$
2730 X=X+RA
2740 SOUND0,50:SOUND1,137:SOUND2,56:S
OUND3,11:SOUND4,10:SOUND6,64:SOUND7,3
7:SOUND8,84:SOUND9,5:SOUND10,38:SOUND
11,26:SOUND12,2:SOUND13,42
2750 TG=TG+1
2760 IF TG=TI THEN TG=0:RX=INT(220*RN
D(1)):LINE(RX,100)-(RX,175),15:LINE(R
X,100)-(RX,175),1:GOTO 2380
2770 IF X=RX OR X<RX AND X+16>RX THEN
 2830
2780 IF POINT(X+8,Y-1)<>1 THEN 2830
2790 IF POINT(X+8,Y+17)<>1 THEN 2830
2800 IF X<0 THEN SC=3:GOTO 170
2810 IF X>=230 THEN X=140:Y=140:RA=0:
SC=1:GOTO170.
2820 GOTO 2550
2830 SPRITEOFF:SOUND0,0:SOUND6,15:SOU
ND7,7:SOUND12,16:FORX=8TO10:SOUNDX,16
:NEXT:SOUND13,0:FOR X=1TO500:NEXT:LI=
LI-1
2840 IF LI>0 THEN RA=0:SC=1:X=218:Y=1
87:GOTO 170
2850 BEEP:SCREEN0:COLOR15,1,1:CLS
2860 A$="M5000T140S11O4L8BAGFEDCGFDDC
DECADADDC"
2870 B$="M300S11T140O3L8BAGFEDCGFDCBG
FDCBGFDC"
2880 C$="M5000S11T140O3L8BAGFEBGFBFGB
FDCDAGADC"
2890 PLAYA$,B$,C$
2900 PRINT:PRINT:PRINTSPC(5);"GAME OV
ER"
2910 PRINT:PRINTSPC(5);"YOU SCORED";T
S
2920 IF TS<HI THEN 2940
2930 PRINT:PRINTSPC(5);"PLEASE ENTER
YOUR NAME.";:INPUTHI$
2940 PRINT:PRINTSPC(5);"HI SCORE=";HI
;" BY ";HI$
```

```
2950 PRINT:PRINTSPC(5);"AGAIN(Y/N)?"
2960 A$=INKEY$
2970 IF A$="Y" THEN SC=1:RA=0:TS=0:GO
TO100
2980 IF A$="N" THEN PRINT:PRINT"
'BYE!":END
2990 GOTO 2960
3000 REM***SCREEN 3***
3010 LINE(0,25)-(255,25),15
3020 X=230:Y=167
3030 DRAW"BM255,160;C3L90BL20L140D25R
250"
3040 DRAW"BM165,160;U50R20F10R4D4R4D4
R4D5R2D3R19E4U30H5L3U5L10U10L3U4L3U7L
4U8L10U5L30U30R100D130"
3050 DRAW"BM145,160;C3U30L125U90L25"
3060 DRAW"BM45,108;U45"
3070 DRAW"BM45,108R100"
3080 DRAW"BM75,107U67"
3090 DRAW"BM145,107U81"
3100 DRAW"BM20,40;R125"
3110 DRAW"BM145,26;C3L145"
3120 LINE(20,185)-(20,160),3
3130 DATA10011001
3140 DATA10111101
3150 DATA01011010
3160 DATA00111100
3170 DATA00111100
3180 DATA01100110
3190 DATA01100110
3200 DATA11100111
3210 RESTORE3130:P$=""
3220 FOREC=1TO8:READEC$
3230 P$=P$+CHR$(VAL("&B"+EC$)):NEXT
3240 IF KT=0 THEN SPRITE$(3)=P$
3250 IF BA=0 THEN SPRITE$(4)=P$
3260 PAINT(240,30),3
3270 PAINT(100,150),3
3280 PAINT(30,30),3:PAINT(120,70),3
3290 DRAW"BM230,40;C1;XR$;":COLOR1,1,
1:PSET(212,42),3:PRINT#1,"2":COLOR15,
1,1
3300 RA=0:PUTSPRITE3,(215,127),4:PUTS
PRITE4,(50,98),6
3310 PUTSPRITE2,(X,Y),15
3320 D=STICK(JN)
3330 IF D=3 AND RA<12 THEN RA=RA+1:IF
 SPRITE$(2)<>SR$ THEN SPRITE$(2)=SR$
3340 IF D=7 AND RA>-12 THEN RA=RA-1:I
F SPRITE$(2)<>SL$ THEN SPRITE$(2)=SL$
3350 IF D=1 AND RA>0 THEN Y=Y-RA/4
3360 IF D=5 AND RA>0 THEN Y=Y+RA/4
3370 IF D=1 AND RA<0 THEN Y=Y+RA/4
3380 IF D=5 AND RA<0 THEN Y=Y+4:IF SP
RITE$(2)<>SF$ THEN SPRITE$(2)=SF$
3390 IF D=1 AND RA=0 THEN Y=Y-4:IF SP
RITE$(2)<>SF$ THEN SPRITE$(2)=SF$
3400 IF D=5 AND RA=0 THEN Y=Y+4:IF SP
RITE$(2)<>SF$ THEN SPRITE$(2)=SF$
3410 X=X+RA
3420 SPRITE ON
3430 ON SPRITE GOSUB3540
3440 IF X<20 AND EO=0 THEN 2830
3450 IF X<15 AND EO=1 THEN SC=4:GOTO
170
3460 IF X>=235 THEN SCREEN2,2:COLOR15
,1,1:CLS:PSET(20,10),1:PRINT#1,"SCREE
N 2---'THE RIVER'---":DY=160:X=20:Y=1
60:RA=0:SPRITEOFF:GOTO 2240
3470 IF POINT(X-1,Y+8)<>1 THEN 2830
3480 IF POINT(X+16,Y+8)<>1 THEN 2830
3490 IF POINT(X+8,Y-1)<>1 THEN 2830
3500 IF POINT(X+8,Y+16)<>1 THEN 2830
3510 SOUND0,50:SOUND1,137:SOUND2,56:S
OUND3,11:SOUND4,10:SOUND6,64:SOUND7,3
7:SOUND8,84:SOUND9,5:SOUND10,38:SOUND
11,26:SOUND12,3:SOUND13,42
3520 IF KT=1 AND DY<184 THEN DY=DY+1:
PSET(20,DY),1
3530 GOTO 3310
3540 SPRITE OFF:IF X>190 THEN PUTSPRI
TE3,(215,127),1:MR=MR+1:KT=1:SPRITE$(
3)=""
3550 IF X<100 THEN PUTSPRITE4,(50,98)
,1:SPRITE$(4)="":MR=MR+1:BA=1:RETURN
3560 RETURN
3570 REM**SCREEN 4**
3580 DATA01111110
3590 DATA00111100
3600 DATA00111100
3610 DATA01111110
3620 DATA01111110
3630 DATA01111110
3640 DATA00111100
3650 DATA00011000
3660 RESTORE 3580:SY$=""
3670 FOREC=1TO8:READEC$
3680 SY$=SY$+CHR$(VAL("&B"+EC$)):NEXT
3690 IF BA=1 THEN SPRITE$(10)=SY$
3700 REM**DRAW SCREEN**
3710 LINE(0,40)-(255,40),15
3720 U=1
3730 FOR I=70 TO 80 STEP2:LINE(0,I)-(
100,I),4:LINE(118,I)-(255,I),4:NEXT
3740 CIRCLE(109,150),40,6
3750 PAINT(109,150),6
3760 DRAW"BM10,81;C15D110R245U110"
3770 DRAW"BM69,190;C6NE11R80H11"
3780 PAINT(78,183),6
3790 PAINT(140,183),6
3800 LINE(20,69)-(20,41),6
3810 DATA00111100
3820 DATA00111100
3830 DATA00011000
3840 DATA00011000
3850 DATA00111100
3860 DATA01111110
3870 DATA11100111
3880 DATA11000011
3890 RESTORE3810:RS$=""
3900 FOREC=1TO8:READEC$
3910 RS$=RS$+CHR$(VAL("&B"+EC$)):NEXT
3920 SPRITE$(11)=RS$
3930 PUTSPRITE11,(106,145),1
3940 CIRCLE(109,150),6,11:PAINT(109,1
50),11
3950 DRAW"BM150,148;C4NR70;D4;R66D38R
4U42":PAINT(155,150),4
3960 CIRCLE(109,150),40,8,2,4,1
3970 CIRCLE(98,151),40,8,2,4,2
3980 PAINT(75,150),8
3990 PAINT(82,177),8
4000 PAINT(82,123),8
4010 DRAW"BM30,170;C3U60L5D60R5"
4020 PAINT(27,160),3
4030 DRAW"BM30,109;C6L5U20R5D20"
4040 PSET(24,81),1:PRINT#1,"TEMP."
4050 PAINT(27,100),6
4060 EN=63
```

LISTINGS

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4070 SPRITE$(2)=SL$
4080 TY=170
4090 PUTSPRITE2,(230,45),15
4100 SOUND2,10:SOUND3,18:SOUND6,EN:SO
UND4,14:SOUND5,34:SOUND7,19:SOUND8,13
:SOUND9,12
4110 FORI=1TO10:NEXT:EN=EN-1
4120 IF EN>31 THEN 4100
4130 REM** MAIN LOOP **
4140 X=230:Y=45:BX=242:BY=63:SPRITE$(
2)=SL$:RA=.25
4150 PUTSPRITE2,(X,Y),15
4160 PUTSPRITE10,(BX,BY),4
4170 IF X<=20 AND RH=0 THEN 2830
4180 IF STRIG(JN)=-1 AND BR=0 THEN BR
=1
4190 SOUND0,50:SOUND1,137:SOUND2,56:S
OUND3,11:SOUND4,10:SOUND6,64:SOUND7,3
7:SOUND8,84:SOUND9,5:SOUND10,38:SOUND
11,26:SOUND12,U:SOUND13,42
4200 IF BR=1 AND RH=0 THEN BY=BY+20
4210 IF BR=0 THEN BX=BX-RA
4220 RA=RA*1.1
4230 X=X-RA
4240 IF U<5 THEN U=U+1
4250 SPRITEON
4260 ON SPRITE GOSUB4310
4270 PSET(27,TY),15
4280 TY=TY-1
4290 IF RH=1 THEN 4340
4300 GOTO 4150
4310 REM **REACTOR BANG!**
4320 LINE(20,69)-(20,41),1
4330 RH=1:SPRITE$(10)=""
4340 IF X>-16 THEN 4150
4350 XX=0
4360 COLOR15,15,15
4370 FORI=1TO15:NEXT
4380 COLOR1,1,1
4390 FORI=1TO15:NEXT
4400 XX=XX+1
4410 FORX=1TO5:SOUNDX,104:NEXT:FORZ=1
0TO13:SOUNDZ,104:NEXT:SOUND8,104:SOUN
D6,XX
4420 IF XX<50 THEN 4360
4430 SCREEN0:CLS
4440 XX=0:FORM=1TO13:SOUNDM,0:NEXT
4450 X=40:SOUND9,X:SOUND6,X:SOUND7,X:
SOUND8,X:SOUND13,X
4460 COLOR15,15,15
4470 FORI=1TO15:NEXT
4480 COLOR1,1,1
4490 FORI=1TO15:NEXT
4500 XX=XX+1
4510 IF XX<50 THEN 4450
4520 REM **EFFECTS AND MUSIC**
4530 FOR X=6TO13:SOUNDX,50:NEXT
4540 FORI=1TO2000
4550 LOCATE10,10:COLOR15,1,1:PRINT"ME
LTDOWN!"
4560 FORI=1TO 3000:NEXT:BEEP
4570 A$="M5000S11L6AABCFGG"
4580 B$="M500S11L8AABCFGG"
4590 C$="M300S11L804AABCFGG"
4600 PLAYA$,B$,C$
4610 SCREEN2,2:COLOR15,4,4:CLS:SPRITE
$(2)=SL$:SPRITE$(10)=P$
4620 X=230:Y=30:MX=210:DRAW"BM0,180C1
5R255D6L255":PAINT(1,181),15
4630 PUTSPRITE10,(MX,172),3
4640 PUTSPRITE2,(X,Y),15
4650 IF MX>40 THEN MX=MX-1
4660 IF X>170 THEN X=X-1.5
4670 IF X=<170 AND X>MX THEN X=X-1.5:
IF Y<164 THEN Y=Y+1
4680 IF X=MX ANDY<163 THEN Y=Y+1
4690 SPRITEON
4700 ON SPRITE GOSUB4740
4710 IF MX=200 THEN PSET(10,10),4:PRI
NT#1,"YOU'LL NEVER CATCH ME STRINGBEA
N!"
4720 IF X=MX AND CP=0 THEN PSET(10,20
),4:PRINT#1,"DON'T BE SO SURE DOC!":C
P=1
4730 GOTO 4630
4740 SPRITEOFF:X=220:Y=100:PUTSPRITE2
,(X,Y),15
4750 PSET(MX+9,170),4:PRINT#1,"OW!"
4760 FORI=1TO5000:NEXT
4770 SCREEN0:CLS:PRINT:PRINT"   YOU H
AVE DEFEATED THE FORCES OF
                              EVIL!
"
4780 PRINT:PRINT"   WELL DONE!"
4790 PRINT:PRINT"   PREPARE FOR BATTL
E"
4800 MX=0
4810 FORI=1TO5000:NEXT
4820 EO=0:MR=0:TS=TS+2000:SC=1:X=218:
Y=187:CY=186:CX=210:CZ=226:RA=0:SPRIT
EOFF:BA=0:KT=0:RH=0:GOTO100
4830 'INSTRUCTIONS & OPENING SEQUENCE
4840 A$="M800S10L1GFDGFDCDECDDEEGAFGA
BGAFDECADFADFA"
4850 B$="M8000S1L20GFDGFDCDECDDEEGAFG
ABGAFDECADFADFA"
4860 C$="M4000S1L20GFDGFDCDECDDEEGAFG
ABGAFDECADFADFA"
4870 PLAYA$,B$,C$:X=-16:Y=30
4880 IF X=60 THEN DRAW"BM45,20;C15R30
G10L30NE10F5R30NH5E10H5"
4890 IF X=60 THEN DRAW"BM15,40;C15R40
G10L40NE10F5R40NH5E10H5"
4900 IF X=105 THEN DRAW"BM60,50;C15NE
30NF5R10F5NL10E15BNR10G15H5E15NF5R10B
F5G10BG5H5NE15F5R10H5NL10E5E25NL30F5N
G30BL20L10G5R10E5L10F5
4910 IF X=130 THEN DRAW"BM105,50NE20R
10E20L10;BM110,55NH5R10NH5E20H5
4920 IF X=160THEN DRAW"BM130,50E20R15
G5L5G15L10F5R10NH5E15NH5R5NH5E5H5
4930 PUTSPRITE2,(X,Y),15
4940 IF X<240 THEN X=X+1
4950 IF X<240 THEN 4880
4960 IF X=240 AND Y<100 THEN Y=Y+1:SP
RITE$(2)=SF$
4970 IF Y<100 THEN 4930
4980 SPRITE$(2)=SL$
4990 IF X=74 THEN DRAW"BM60,130;U50R2
0D10L10D10R10D10L10D20L10F5R10NH5U20N
H5R10NH5U10H5L10U10F5R10NH5U10H5"
5000 IF X=104 THEN DRAW"BM90,130;U50R
20D50L20BM97,120U30R6D30L6U30F6BM90,1
30F5R20NH5U50H5"
5010 IF X=174 THEN DRAW"BM120,80R7D15
F10E10U15R7D15G10F10D15L7U15H10G10D15
L7U15E10H10U15R7F5D15H5BM120,130F5R7N
H5U15NH5E10F5D15F5R7NH5U15H5BM154,80F
5D15NH5G10
5020 IF X>-16 THEN X=X-1
5030 PUTSPRITE2,(X,Y),15
5040 IF X>-16 THEN 4990
```

```
5050 IF X<=-16 THEN X=120:Y=160:SPRIT
E$(2)=SR$:PUTSPRITE2,(X,Y),15
5060 FORI=1TO5000:NEXT
5070 SCREEN0:COLOR1,3,3:CLS
5080 PRINT:PRINTSPC(5);"AIRFOX"
5090 PRINTSPC(5);"CCCCCC"
5100 FORI=1TO1000:NEXT:BEEP
5110 FORX=1TO19:LOCATE0,5:PRINTLEFT$(
"      By Paul Mather",X):FORI=1TO15:N
EXTI:BEEP:NEXTX
5120 FORX=1TO24:LOCATE0,7:PRINTLEFT$(
"     FOR 'MSX COMPUTING'",X):FORI=1T
O15:NEXTI:BEEP:NEXTX
5130 REM
5140  FOR X=1 TO 29:LOCATE0,9:PRINT L
EFT$("     MISSION BRIEFING (Y/N)?",X
):BEEP:FORI=1TO15:NEXTI:NEXTX
5150 REM
5160 A$=INKEY$
5170 IF A$="Y" THEN 5200
5180 IF A$="N" THEN 5690
5190 GOTO 5160
5200 CLS:FORX=1 TO 21:LOCATE0,0:PRINT
LEFT$("  MISSION BRIEFING:",X):FORI=
1TO15:NEXTI:BEEP:NEXTX
5210 FORI=1TO1000:NEXT
5220 PRINT:PRINT"  'AIRFOX' IS A MULT
I-PURPOSE COMBAT  HELICOPTER CAPABLE
OF DESTROYING THE CAVERNS OF DOOM CRE
ATED BY THE EVIL  DOCTOR MURTCEPS."
5230 FORI=1TO5000:NEXT
5240 PRINT:PRINT"  YOUR JOB,AS 'STRIN
GBEAN SPARROW',IS TO TOTALLY OBLITERA
TE THE NUCLEAR    REACTOR POWERING TH
E AREA & THEREBY  RENDER THE DOCTOR H
ELPLESS."
5250 FORI=1TO5000:NEXT
5260 PRINT:PRINT"  THE DOCTOR HAS ALS
O KIDNAPPED 2 OF  THE SCIENTISTS WORK
ING ON THE PROTO- TYPE 'AIRFOX' IN AN
 ATTEMPT TO STOP  THE OTHERWISE IMMIN
ENT ATTACK OF THE MACHINE."
5270 PRINT:PRINT"       HIT A KEY FOR
MORE"
5280 A$=INKEY$
5290 IF A$="" THEN 5280
5300 CLS
5310 PRINT:PRINT"  THE SCIENTISTS KID
NAPPED BY THE MAD DOCTOR MUST BE FOUN
D,RESCUED AND OF  COURSE RETURNED TO
THE AIRFOX BASE."
5320 FORI=1TO3000:NEXT
5330 PRINT:PRINT"  THE SCIENTIST DRES
SED IN BLUE HAS   DISCOVERED THE SECR
ET COMBINATION    THAT WILL DISABLE T
HE LASER FIELD &  THEREBY ALLOW THE E
NTRY OF AIRFOX TO THE REACTOR ROOM."
5340 FORI=1TO5000:NEXT
5350 PRINT:PRINT"  THE SCIENTIST DRES
SED IN RED IS THE ONLY MAN ALIVE ABLE
 TO ARM THE BOMB  WHICH 'AIRFOX' CAN
USE TO OBLITERATE THE NUCLEAR REACTOR
."
5360 PRINT:PRINT"       HIT A KEY FOR
MORE"
5370 A$=INKEY$
5380 IF A$="" THEN 5370
5390 CLS
5400 PRINT:PRINT"  ONCE YOU HAVE LOCA
TED AND RESCUED   THE MISSING SCIENTI
STS,YOU MUST 1st  RETURN THEM TO THE
'AIRFOX' BASE.    YOU ARE THEN READY
TO ATTACK!"
5410 PRINT:PRINT"       HIT A KEY FOR
MORE"
5420 A$=INKEY$
5430 IF A$="" THEN 5420
5440 CLS
5450 FORX=1TO26:LOCATE0,0:PRINTLEFT$(
"  SCREEN 1---'THE BASE'---",X):FORI=
1TO15:NEXTI:NEXTX
5460 PRINT:PRINT" YOUR TASK IS TO SUC
CESFULLY LAUNCH  YOUR MACHINE AND HEA
D FOR SCREEN 2."
5470 FORI=1TO5000:NEXT
5480 CLS
5490 FORX=1TO27:LOCATE0,0:PRINTLEFT$(
"  SCREEN 2---'THE RIVER'---",X):FORI
=1TO15:NEXTI:NEXTX
5500 PRINT:PRINT" NEGOTIATE THE PERIL
OUS UNDER-GROUND RIVER.INSIDE INFORMA
TION TELLS US     THAT THE DOCTOR MAY
BE OPERATING TWO ATTACK MECHANISMS IN
 THE AREA."
5510 PRINT:PRINT" 1)A SEMI-AUTOMATIC
SELF GUIDING MINE"
5520 PRINT:PRINT" 2)INVISIBLE LASER F
IELDS,DETECTABLE    ONLY DURING PRIMA
RY IGNITION."
5530 PRINT:PRINT"       HIT A KEY"
5540 A$=INKEY$
5550 IF A$="" THEN 5540
5560 CLS
5570 FORX=1TO28:LOCATE0,0:PRINTLEFT$(
"  SCREEN 3---'THE CAVERN'---",X):FOR
I=1TO15:NEXTI:NEXTX
5580 PRINT:PRINT"  THIS IS BELIEVED T
O BE THE PLACE OF IMPRISONMENT FOR TH
E TWO SCIENTISTS. IT ALSO HOUSES THE
ENTRANCE TO THE   REACTOR ROOM BUT TH
IS IS GUARDED BY  A LASER FIELD."
5590 FOR I=1 TO 5000:NEXT
5600 CLS
5610 FOR H=1 TO8:SOUNDH,104:NEXT:SOUN
D10,104
5620 FORX=1TO29:LOCATE0,0:PRINTLEFT$(
"  SCREEN 4---'THE REACTOR'---",X):FO
RI=1TO15:NEXTI:NEXTX
5630 PRINT:PRINT"  IF 'AIRFOX' IS PRI
MED FOR BOMBING   THEN NOW IS THE TIM
E FOR CONFLICT!"
5640 PRINT:PRINT"  ALL CONTROL HAS GO
NE APART FROM THE ABILITY TO LAUNCH T
HE BOMB BY THE    PRESSING OF FIRE OR
 THE SPACE BAR."
5650 PRINT:PRINT"  'AIRFOX WILL TRAVE
L AT IMMENSE,FAR  GREATER SPEEDS THAN
 NORMAL UNDER THE POWER OF ITS' TURBO
S!"
5660 PRINT:PRINT"   PRESS A KEY."
5670 A$=INKEY$
5680 IF A$="" THEN 5670
5690 CLS
5700 FOR X=1TO30:LOCATE0,0:PRINTLEFT$
("   (J)OYSTICK  OR  (K)EYBOARD ?",X)
:FORI=1TO15:NEXTI:BEEP:NEXTX
5710 A$=INKEY$
5720 IF A$="J" THEN JN=1:SC=1:GOTO100
5730 IF A$="K" THEN JN=0:SC=1:GOTO100
5740 GOTO 5710
```

LISTINGS

SPRINT
by Peter Edwards

Here's a simple running game with two runners — one controlled by you, one by the computer. You move your runner by pressing the left and right cursor keys or by means of a joystick, if you have one, waggling it from side to side.

You can select one of seven speeds for your competitor, then it's up to you to keep up. But don't jump the gun — you won't get away with it. Type CLOAD"SPRINT" to load.

```
10 REM        M.S.X
20 REM      JOYSTICK
30 REM       SPRINT
40 REM by Peter Edwards
50 OPEN"GRP:" AS #1
60 Y=162
70 R=1
80 OP =162
90 GOSUB 730
100 R$=CHR$(32)+CHR$(32)+CHR$(33)+CHR
$(59)+CHR$(27)+CHR$(5)+CHR$(4)+CHR$(0
)
110 L$=CHR$(0)+CHR$(32)+CHR$(160)+CHR
*(216)+CHR*(220)+CHR*(132)+CHR*(4)+CH
R$(4)
120 P$=CHR$(0)+CHR$(0)+CHR$(0)+CHR$(0
)+CHR$(0)+CHR$(0)+CHR$(0)+CHR$(0)
130 I$=CHR$(0)+CHR$(4)+CHR$(5)+CHR$(2
7)+CHR$(59)+CHR$(33)+CHR$(32)+CHR$(32
)
140 O$=CHR$(4)+CHR$(4)+CHR$(132)+CHR$
(220)+CHR$(216)+CHR$(160)+CHR$(32)+CH
R$(0)
150 N=0
160 Z=1
170 X=1
180 SPRITE$(1)=R$+P$+L$+P$
190 SPRITE$(2)=I$+P$+O$+P$
200 GOSUB 780
210 N = N+1
220 A= STICK(K)
230 IF A=3 THEN GOTO 340
240 IF A=7 THEN GOTO 340
250 IF INKEY$="S" THEN END
260 IF N>S THEN 280
270 GOTO 210
280 GOSUB 450
290 OP=OP-1
300 PUT SPRITE 2,(86,OP),10,X
310 N=0
320 IF OP<0 THEN 610
330 GOTO 210
340 GOSUB 480
350 Y=Y-1
360 PUT SPRITE 1,(64,Y),15,Z
370 N=N+1
380 IF Y<0 THEN 660
390 IF A=0 THEN GOTO 210
400 A= STICK(K)
410 IF N>STHEN 430
420 GOTO 370
430 GOSUB 550
440 GOTO 370
450 IF X=2 THEN GOTO 510
460 X=2
470 RETURN
480 IF Z =2 THEN GOTO 530
490 Z=2
500 RETURN
510 X=1
520 RETURN
530 Z=1
540 RETURN
550 GOSUB 450
560 OP=OP-1
570 PUT SPRITE 2,(86,OP),10,X
580 N=0
590 IF OP<0 THEN 610
600 RETURN
610 SCREEN 1
620 LOCATE 0,9:PRINT"           HE WON
"
630 LOCATE 0,11:PRINT"        HAVE ANO
THER GO!"
640 FOR J=0 TO 1000:NEXT J
650 GOTO 60
660 SCREEN 1
670 LOCATE 0,9:PRINT"           YOU WON
!"
680 LOCATE 0,11:PRINT"YOU HAVE BEATEN
 THE SPRINTER"
690 LOCATE 0,13:PRINT"        ON LEVEL
 ";S
700 LOCATE 0,15:PRINT"     TRY THE NE
XT LEVEL"
710 FOR J=0 TO 1000:NEXT J
720 GOTO 60
730 SCREEN 1
735 LOCATE 0,3:PRINT "          INPUT 0
 OR 1              (0 KEYS/1 JOY STICK
)"
740 INPUT K
750 LOCATE 0,7:PRINT "   INPUT 1 TO 7
 (1 FAST)"
755 INPUT S
760 SCREEN2,2
770 RETURN
780 LINE (60,0)-(60,160),15
790 LINE (82,0)-(82,160),15
800 LINE (104,0)-(104,160),15
810 LINE (60,160)-(104,160),15
820 LI NE(60,0)-(104,0),15
830 PUT SPRITE 2,(86,OP),10,X
840 PUT SPRITE 1,(64,Y),15,Z
850 PRESET(106,0):PRINT #1,"ON YOUR M
ARKS"
860 FOR D=0 TO 1000:NEXT D
870 PRESET(106,16):PRINT #1,"GET SET
    "
880 FOR D=0 TO 300
890 A=STICK(K)
900 IF A>0 THEN 990
910 NEXT D
920 PRESET(106,32):PRINT #1," GO !
    "
930 V=15
940 FOR L=30 TO 44 STEP 1
950 PLAY"O3;V=V;L=L;C;"
960 V=V-1
970 NEXT L
980 RETURN
990 CLS
1000 PRESET(0,88):PRINT #1,"          F
LYING START!"
1010 PLAY "O4;V15;L1;C"
1020 FOR G=0 TO 1000:NEXT G
1030 CLS
1040 GOTO 100
```

WALLY WEEVIL
by David Bond

Here's David Bond's version of the popular game QBERT — and it's a very good one at that, with clever sound effects.

Using the cursor keys you have to bounce Wally around the pyramid, changing the colour of the blocks as you go. When the entire pyramid has been covered, you are awarded a 200 point bonus and move on to the next stage. Every five stages, you need more than one bounce to change a block's colour.

Life for Wally, however, is not that simple. Also bouncing around the pyramid are two balls, contact with which will cause Wally to lose a life. Falling off the pyramid has the same effect.

NB: Wally can only move diagonally, so you have to press two cursor keys together, eg: up and left, or down and right.

Program break down

50 — 530	Set up characters and sprites
680 — 860	Set up screen
870 — 930	Set up variables
940 — 1030	Main loop
1040 — 1200	Routines to move Wally
1210 — 1240	Changes block colour, prints score
1250 — 1360	Collision routine
1370 — 1560	Routines to move ball 1
1570 — 1600	Ball sound
1610 — 1770	Routines to move ball 2
1780 — 1950	Bonus routine
1960 — 2010	Sets up Q Array
2020 — 2210	Game over, Title screen

```
1 REM ****************
2 REM * WALLY WEEVIL *
3 REM *      BY      *
4 REM * DANIEL BOND  *
5 REM ****************
10 SCREEN 1,2,0
20 WIDTH 31:KEY OFF
30 COLOR 15,1,1:CLS
40 VPOKE 8198,144:VPOKE 8199,144
50 FOR F=0 TO 31:READ D$
60 VPOKE 1664+F,VAL("&H"+D$)
70 NEXT F
80 DATA 0,0,F,1F,3F,7F,FF,FF
90 DATA BF,9F,8F,80,40,20,10,F
100 DATA 0,0,F0,F8,FC,FE,FF,FF
110 DATA FD,F9,F1,1,2,4,8,F0
120 REM
130 FOR F=0 TO 31:READ D$
140 VPOKE 1728+F,VAL("&H"+D$)
150 NEXT F
160 DATA 0,0,F,1F,3F,7F,FF,FF
170 DATA BF,9F,8F,80,40,20,10,F
180 DATA 0,0,F0,F8,FC,FE,FF,FF
190 DATA FD,F9,F1,1,2,4,8,F0
200 FOR F=1 TO 7:P$=""
210 FOR R=1 TO 32:READ D$
220 P$=P$+CHR$(VAL("&H"+D$))
230 NEXT R
240 SPRITE$(F)=P$
250 NEXT F
260 DATA 0,0,0,3,F,1B,31,21
270 DATA 70,7A,7F,3F,3F,1F,7,0
280 DATA 0,0,0,C0,F0,D8,8C,84
290 DATA E,5E,FE,FC,FC,F8,E0,0
300 DATA 0,0,0,0,0,4,E,1A
310 DATA F,5,0,0,0,0,0,0
320 DATA 0,0,0,0,0,20,70,58
330 DATA F0,A0,0,0,0,0,0,0
340 DATA 0,3,F,1B,31,21,70,7A
350 DATA 7F,7F,3F,3F,1F,F,3,0
360 DATA 0,C0,F0,D8,8C,84,E,5E
370 DATA FE,FE,FC,FC,F8,F0,C0,0
380 DATA 0,0,0,4,E,1A,F,5
390 DATA 0,0,0,0,0,0,0,0
400 DATA 0,0,0,20,70,58,F0,A0
410 DATA 0,0,0,0,0,0,0,0
420 DATA 0,0,3,F,1F,1F,3F,3F
430 DATA 3F,3F,1F,1F,F,3,0,0
440 DATA 0,0,C0,F0,38,D8,EC,EC
450 DATA FC,FC,F8,F8,F0,C0,0,0
460 DATA 0,0,0,3,F,1F,1F,3F
470 DATA 3F,3F,3F,1F,1F,F,0,0
480 DATA 0,0,0,C0,F0,38,D8,EC
490 DATA EC,FC,FC,F8,F8,F0,0,0
500 DATA 1E,73,65,E5,E1,E1,F3,F3
510 DATA FF,F3,73,7F,3E,30,60,80
520 DATA 0,80,80,C0,C0,C0,C0,C0
530 DATA C0,C0,80,80,0,0,0,0
540 DIM Q(23,11)
550 DIM CT(5),CL(5)
560 FOR F=1 TO 5
570 READ D
580 CT(F)=D:NEXT F
590 DATA 64,128,16,64,80
600 FOR F=1 TO 5
610 READ D
620 CL(F)=D:NEXT F
630 DATA 32,48,192,208,16
640 HI=0
650 GOTO 2060
660 P1=3:LI=3:LE=1:SC=0:CL=1:W=1
670 GOSUB 1960
680 VPOKE 8218,CL(W)
690 LOCATE 0,0:PRINT"SCORE":SC
700 LOCATE 0,1:PRINT"CHANGE TO"
710 LOCATE 3,2:PRINT CHR$(216):CHR$(2
18)
720 LOCATE 3,3:PRINT CHR$(217):CHR$(2
19)
730 LOCATE 12,22:PRINT"LIVES":LI
740 LOCATE 21,0:PRINT"HI":HI
750 LOCATE 21,1:PRINT"STAGE":LE
760 SOUND 7,&B00111100:SOUND 8,15:SOU
ND 9,15
770 A=14:B=14
780 FOR R=2 TO 20 STEP 2
790 FOR F=A TO B STEP 2
800 LOCATE F,R:PRINT CHR$(208);CHR$(2
10):LOCATE F,R+1:PRINT CHR$(209);CHR$
(211)
810 SOUND 0,R+F*4:SOUND 2,R+F*A:NEXT
F
820 A=A-1:B=B+1:NEXT R
830 VPOKE 8219,CT(W)
840 SOUND 8,16:SOUND 9,16
850 SOUND 0,200:SOUND 2,210
860 SOUND 12,20:SOUND 13,3
870 CO=0
880 R=RND(-TIME)
890 A1=120:B1=-16:DI=6:S1=5
900 X=120:Y=40:C1=0:S2=1:RT=1
910 X1=12:Y1=3
```

LISTINGS

```
920 A2=120:B2=-16:DY=6:S3=5:C3=0
930 ON SPRITE GOSUB 1250
940 PUT SPRITE 3,(X,Y),11,S2
950 PUT SPRITE 4,(X,Y),6,S2+1
960 PUT SPRITE 2,(A2,B2),7,S3
970 PUT SPRITE 1,(A1,B1),7,S1
980 SPRITE ON
990 ON DI GOSUB 1370,1400,1440,1480,1
530,1550
1000 ON DY GOSUB 1610,1640,1680,1720,
1740,1760
1010 ON RT GOSUB 1040,1130,1150,1170,
1190
1020 SPRITE OFF
1030 GOTO 940
1040 ST=STICK(0)
1050 IF CO=55 THEN GOTO 1780
1060 IF Q(X1,Y1)=0 THEN 1250
1070 IF ST=2 THEN RT=2:S2=3
1080 IF ST=4 THEN RT=3:S2=3
1090 IF ST=6 THEN RT=4:S2=3
1100 IF ST=8 THEN RT=5:S2=3
1120 RETURN
1130 X=X+4:Y=Y-8:C1=C1+4:IF C1=8 THEN
 C1=0:RT=1:S2=1:X1=X1+1:Y1=Y1-1:GOSUB
 1210
1140 RETURN
1150 X=X+4:Y=Y+8:C1=C1+4:IF C1=8 THEN
 C1=0:RT=1:S2=1:X1=X1+1:Y1=Y1+1:GOSUB
 1210
1160 RETURN
1170 X=X-4:Y=Y+8:C1=C1+4:IF C1=8 THEN
 C1=0:RT=1:S2=1:X1=X1-1:Y1=Y1+1:GOSUB
 1210
1180 RETURN
1190 X=X-4:Y=Y-8:C1=C1+4:IF C1=8 THEN
 C1=0:RT=1:S2=1:X1=X1-1:Y1=Y1-1:GOSUB
 1210
1200 RETURN
1210 IF Q(X1,Y1)>2 THEN Q(X1,Y1)=Q(X1
,Y1)-1
1220 IF Q(X1,Y1)=2 THEN Q(X1,Y1)=1:LO
CATE X1+2,Y1*2:PRINT CHR$(216);CHR$(2
18):LOCATE X1+2,Y1*2+1:PRINT CHR$(217
);CHR$(219):SC=SC+15:CO=CO+1
1230 LOCATE 5,0:PRINT SC
1240 RETURN
1250 SPRITE OFF
1260 PUT SPRITE 0,(X+12,Y-8),15,7
1270 PLAY"V12O2L64ADEADEADE","V12O3L6
4ADEADEADE"
1280 IF PLAY(1)=-1 THEN 1280
1290 PUT SPRITE 1,(0,209):PUT SPRITE
2,(0,209)
1300 SOUND 1,0:SOUND 3,0
1310 FOR F=1 TO 500:NEXT F
1320 PUT SPRITE 0,(X,209)
1330 LI=LI-1
1340 IF LI<0 THEN GOTO 2020
1350 LOCATE 17,22:PRINT LI
1360 GOTO 880
1370 B1=B1+4
1380 C=C+2:IF C=12 THEN GOSUB 1570:DI
=4:C=0:S1=6
1390 RETURN
1400 B1=B1+8:A1=A1+4
1410 C=C+2:IF C=4 THEN GOSUB 1570:S1=
6:C=0:DI=4
1420 IF B1>155 THEN DI=5
1430 RETURN
1440 B1=B1+8:A1=A1-4
1450 C=C+2:IF C=4 THEN GOSUB 1570:S1=
6:C=0:DI=4
1460 IF B1>155 THEN DI=5
1470 RETURN
1480 R=INT(RND(1)*2)+1
1490 IF R=1 THEN IF A1>X THEN DI=3 EL
SE IF A1<=X THEN DI=2
1500 IF R=2 THEN R=INT(RND(1)*2)+1:IF
 R=1 THEN DI=2 ELSE DI=3
1510 S1=5
1520 RETURN
1530 B1=B1+4:C=C+2:IF C=20 THEN A1=12
0:B1=-16:S1=5:DI=1:C=0
1540 RETURN
1550 C=C+1:IF C>20 THEN C=0:DI=1
1560 RETURN
1570 SOUND 7,&B00111100
1580 SOUND 8,16:SOUND 9,16
1590 SOUND 0,55:SOUND 2,50:SOUND 12,4
:SOUND 13,3
1600 RETURN
1610 B2=B2+4
1620 C3=C3+2:IF C3=12 THEN GOSUB 1570
:DY=4:C3=0:S3=6
1630 RETURN
1640 B2=B2+8:A2=A2+4
1650 C3=C3+2:IF C3=4 THEN GOSUB 1570:
S3=6:C3=0:DY=4
1660 IF B2>155 THEN DY=5
1670 RETURN
1680 B2=B2+8:A2=A2-4
1690 C3=C3+2:IF C3=4 THEN GOSUB 1570:
S3=6:C3=0:DY=4
1700 IF B2>155 THEN DY=5
1710 RETURN
1720 S3=5:R=INT(RND(1)*2)+1:IF R=1 TH
EN DY=2 ELSE DY=3
1730 RETURN
1740 B2=B2+4:C3=C3+2:IF C3=20 THEN A2
=120:B2=-16:S3=5:DY=1:C3=0
1750 RETURN
1760 C3=C3+1:IF C3>37 THEN DY=1:C3=0
1770 RETURN
1780 SPRITE OFF
1790 PUT SPRITE 1,(0,209)
1800 PUT SPRITE 2,(0,209)
1810 LOCATE 10,13:PRINT"BONUS  200"
1820 SC=SC+200:LOCATE 5,0:PRINT SC
1830 FOR F=1 TO 10
1840 VPOKE 8219,CL(W)
1850 PUT SPRITE 3,(X,Y),11,1
1860 PUT SPRITE 4,(X,Y),8,2
1870 FOR R=1 TO 80:NEXT R
1880 VPOKE 8219,CT(W)
1890 PUT SPRITE 3,(X,Y),11,3
1900 PUT SPRITE 4,(X,Y),8,4
1910 FOR R=1 TO 80:NEXT R
1920 NEXT F
1930 W=W+1:IF W=6 THEN W=1:P1=P1+1:IF
 P1>9 THEN P1=9
1940 LE=LE+1
1950 GOTO 670
1960 A=12:B=12
1970 FOR F=1 TO 10
1980 FOR R=A TO B STEP 2
1990 Q(R,F)=P1
2000 NEXT R:A=A-1:B=B+1:NEXT F
2010 RETURN
```

```
2020 LOCATE 10,13:PRINT"GAME  OVER"
2030 IF SC>HI THEN HI=SC
2040 FOR F=1 TO 1500:NEXT F
2050 PUT SPRITE 3,(0,208)
2060 CLS
2061 LOCATE 0,0:PRINT"SCORE";SC
2062 LOCATE 21,0:PRINT"HI";HI
2070 LOCATE 8,5:PRINT"WALLY   WEEVIL"
2080 LOCATE 14,7:PRINT"VS"
2090 LOCATE 9,9:PRINT"THE  PYRAMID"
2100 LOCATE 11,11:PRINT"OF DOOM!"
2110 LOCATE 5,21:PRINT"PRESS <SPACE>
TO PLAY"
2120 A=1
2130 PUT SPRITE 1,(116,32),11,A
2140 PUT SPRITE 2,(116,32),6,A+1
2150 A=A+2:IF A>3 THEN A=1
2160 IF STRIG(0)=-1 THEN GOTO 2190
2170 FOR F=1 TO 100:NEXT F
2180 GOTO 2130
2190 PUT SPRITE 1,(0,208)
2200 CLS
2210 GOTO 660
```

BOING!
by M Michael

You, an innocent little ball, have been sitting on the fair bench for long enough, so you decide to escape. As you bounce along the shelves, directed by the left and right cursor keys, a toy spaceman starts firing all-too-real laser bolts at you. To escape you have to bounce through the shelves and land safely on the green platform. But be warned — if you touch any of the red areas, or are hit by a laser bolt, you lose a life. Bouncing, by the way, is achieved with the cursor up key.

```
10 REM ################################
20 REM #                              #
30 REM #            BOING!            #
40 REM #                              #
50 REM # Copyright  BLADE software    #
60 REM # Written by M.Michael 1985    #
70 REM #                              #
80 REM ################################
90 SCREEN 2,2,0:COLOR 15,1,1:CLS
100 SC=0:ME=5:SH=1:OPEN "GRP:"AS 1
110 FOR T=0 TO 185 STEP 4
120 LINE (0,100)-(122,T),13
130 LINE (255,100)-(122,T),13
140 NEXT
150 PRESET (20,10):PRINT#1,"BOING!"
160 COLOR 4:PRESET (200,10):PRINT#1,"
FORM"
170 COLOR 9:PRESET (173,19):PRINT#1,"
BLADESOFT"
180 COLOR 2:PRESET (20,184):PRINT#1,"
PRESS THE SPACE BAR TO PLAY"
190 IF INKEY$<>"" THEN 210
200 GOTO 190
210 REM  ### Define Sprites ###
220 CLS
230 RESTORE 320
240 FOR T=0 TO 2
250 SP$=""
260 FOR R=1 TO 32
270 READ A$
280 SP$=SP$+CHR$(VAL("&H"+A$))
290 NEXT R
300 SPRITE$(T)=SP$
310 NEXT T
320 DATA 07,1F,3F,7C,78,F9,F9,F8,FC,F
F,FF,7F,7F,3F,1F,07,E0,F8,FC,3E,1E,9F
,9F,1F,3F,FF,FF,FE,FE,FC,F8,E0
330 DATA 03,05,06,1F,7F,67,7C,1C,0E,0
E,1F,3D,39,70,F1,F0,C0,A0,60,F8,FE,E6
,3E,38,70,70,F8,BC,1C,8E,0F,8F
340 DATA 00,01,00,01,00,01,00,01,00,0
1,00,01,00,01,00,01,80,00,80,00,80,00
,80,00,80,00,80,00,80,00,80,00
350 IF SH=13 THEN SH=1
360 ON SH GOSUB 710,840,1080,1410,710
,840,1080,1410,710,840,1080,1410
370 PRESET(10,175):PRINT#1,"SCORE ";S
C;" MEN ";ME;" SHEET ";SH
380 BOU=1000:X=10:Y=135:A=120:B=0:BA=
A:BD=B+16:JU=0:JH=0:MD=3
390 SPRITE ON:ON SPRITE GOSUB 1680
400 P1=POINT(X+4,Y+16):P2=POINT(X+11,
Y+16)
410 PUT SPRITE 0,(X,Y),4
420 C=STICK(0)
430 IF C=3 AND X<240 OR C=2 AND X<240
 THEN X=X+4
440 IF C=7 AND X>2 OR C=8 AND X>2 THE
N X=X-4
450 IF P1=1 AND P2=1 AND JU=0 THEN Y=
Y+2:GOTO 470
460 IF C=1 OR C=2 OR C=8 THEN JU=1
470 IF P1=8 OR P2=8 THEN 1680
480 IF P1=2 OR P2=2 THEN 1710
490 IF JU=0 THEN 530
500 JH=JH+1
510 IF JH=8 THEN JH=0:JU=0
520 Y=Y-2
530 PUT SPRITE 1,(A,B),13
540 PUT SPRITE 2,(BA,BD),11
550 BD=BD+3
560 IF BD>150 THEN GOSUB 1820
570 IF BA>X THEN BA=BA-2
580 IF BA<X THEN BA=BA+2
590 IF SH<>5 AND SH<>6 AND SH<>7 AND
SH<>8 THEN 630
600 A=A+MD
610 IF A<2 THEN MD=3
620 IF A>240 THEN MD=-3
630 IF SH<>9 AND SH<>10AND SH<>11 AND
 SH<>12 THEN 680
640 IF A>X THEN A=A-1
650 IF A<X THEN A=A+1
660 IF A<1 THEN A=240
670 IF A>240 THEN A=1
680 BOU=BOU-INT(RND(1)*5)+1
690 IF BOU<1 THEN 1680
700 GOTO 390
710 LINE (0,20)-(255,25),7,BF
720 LINE (0,150)-(100,155),7,BF
730 LINE (105,135)-(125,140),7,BF
740 LINE (0,155)-(255,160),8,BF
```

LISTINGS

```
750 LINE (125,120)-(145,125),7,BF
760 FOR T=75 TO 125 STEP 15
770 LINE (105,T)-(145,T+5),7,BF
780 NEXT
790 LINE (160,75)-(170,80),7,BF
800 LINE (185,75)-(205,80),7,BF
810 LINE (155,90)-(200,95),8,BF
820 LINE (230,150)-(255,155),2,BF
830 RETURN
840 LINE(0,20)-(255,25),7,BF
850 LINE(0,155)-(255,160),8,BF
860 LINE (0,150)-(50,155),7,BF
870 GH=145
880 FOR T=50 TO 75 STEP 5
890 LINE(T,GH)-(T+5,GH+5),7,BF
900 GH=GH-5
910 NEXT
920 LINE(75,135)-(120,140),8,BF
930 FOR T=115 TO 90 STEP -15
940 LINE(70,T)-(50,T+5),7,BF
950 NEXT T
960 LINE(120,150)-(130,155),7,BF
970 FOR T=150 TO 50 STEP-15
980 LINE(140,T)-(190,T+5),7
990 LINE(140,T+1)-(190,T+6),7
1000 NEXT
1010 FOR T=20 TO 16 STEP-1
1020 CIRCLE(110,60),T,7
1030 NEXT
1040 CIRCLE(110,60),10,8
1050 PAINT (110,60),8
1060 LINE(0,15)-(20,20),2,BF
1070 RETURN
1080 LINE(0,20)-(255,25),7,BF
1090 LINE(0,155)-(255,160),8,BF
1100 LINE(0,150)-(35,155),7,BF
1110 FOR T=45 TO 95  STEP 20
1120 CIRCLE(T,130),5,7
1130 PAINT(T,130),7
1140 NEXT
1150 FOR T=1 TO 5
1160 LINE(94+T,120)-(9+T,50),7
1170 NEXT
1180 FOR T=80 TO 170STEP 5
1190 CIRCLE(T,70),25,7
1200 NEXT T
1210 LINE(20,68)-(160,72),8,BF
1220 LINE (200,50)-(205,100),8,BF
1230 LINE(150,100)-(205,105),8,BF
1240 LINE(80,50)-(200,55),8,BF
1250 LINE(20,65)-(160,68),7,BF
1260 LINE (210,60)-(230,70),7
1270 LINE (210,61)-(230,71),7
1280 LINE (210,62)-(230,72),7
1290 LINE (210,63)-(230,73),7
1300 FOR T=1 TO 5
1310 J=INT(RND(1)*45)+1
1320 K=INT(RND(1)*70)+1
1330 LINE(205+J,75+K)-(205+J+5,75+K+5
),7,BF
1340 NEXT
1350 LINE(105,100)-(110,155),8,BF
1360 FOR T=190 TO 155STEP-5
1370 CIRCLE(T,132),15,7
1380 NEXT
1390 LINE(115,110)-(125,115),2,BF
1400 RETURN
1410 LINE(0,20)-(255,25),7,BF
1420 LINE(0,150)-(30,155),7,BF
1430 LINE(0,155)-(255,160),8,BF
1440 LINE(0,135)-(230,140),8,BF
1450 LINE(228,50)-(230,140),8,BF
1460 LINE(0,151)-(255,151),7
1470 FOR T=0 TO 4
1480 LINE(235+T,151)-(245+T,50),7
1490 NEXT
1500 LINE(220,55)-(225,60),7,BF
1510 LINE(0,130)-(220,135),7,BF
1520 LINE(15,125)-(205,130),8,BF
1530 LINE(0,115)-(15,120),7,BF
1540 LINE(0,100)-(170,105),7,BF
1550 LINE(170,50)-(175,120),8,BF
1560 FOR T=1 TO 15
1570 LINE(0,50+T)-(165,90+T),7
1580 NEXT T
1590 FOR T=0 TO 160 STEP 30
1600 FOR B=1 TO 3
1610 LINE(T+B,25)-(T+B,100),8
1620 NEXT B,T
1630 FOR T=1 TO 15
1640 LINE(0,25+T)-(170,70+T),1
1650 NEXT T
1660 LINE(0,35)-(20,40),2,BF
1670 RETURN
1680 PLAY"CBACBACBA"
1690 ME=ME-1:IFME=0 THEN 1790
1700 SH=SH-1:SC=SC-BOU:GOTO1720
1710 PLAY "ABCABCABC"
1720 SPRITE OFF
1730 SH=SH+1:PRESET(30,165):PRINT#1,"
PRESS 'S' FOR SHEET ";SH
1740 IF INKEY$<>"S"THEN 1740
1750 SCREEN 0,0,0
1760 SCREEN 2,2,0
1770 SC=SC+BOU
1780 GOTO 210
1790 LINE(0,100)-(255,110),15,BF
1800 PRESET(0,101):PRINT#1,"
   GAME OVER"
1810 IF INKEY$=" " THEN  RUN ELSE 181
0
1820 SC=SC+INT(RND(1)*10)+1:PRESET(10
,175):BA=A:BD=B+16:RETURN
```

GOBBLER
by Stephen Irving

No prizes for guessing which game this program drew its inspiration from. You are presented with a maze, and have to move around collecting the blue blocks. Avoid the cyan blocks though — instant death awaits you if you so much as touch them. The same thing goes for the ghost. If you score 4000 points — and it isn't easy — you move onto the next level which is even tougher. Stephen Irving has included plenty of REM statements to help you follow the programming.

Program variables

Y%, X%, D, A$	Used to define sprites
A,B	Animate sprites
Q	Speed of Ghost
LV	Lives
SC	Score
X,Y	Co-ordinates of Gobbler
XX,YY	Co-ordinates of Ghost
STI	Stick (0) cursor keys defined
ST,IR	Erase block
C	Colour
W,E,X,Y	Draw screen

```
10 '*****************
20 '*     GOBBLER     *
30 '*       BY        *
40 '*STEPHEN IRVING*
50 '*       FOR       *
60 '*     M.S.X       *
70 '*   COMPUTING     *
80 '*     4/4/85      *
90 '*****************
100 COLOR1,15,15
110 SCREEN2,2
120 OPEN"GRP:"AS#1
130 '** SPRITE DATA **
140 DATA 60,126,221,153,255,195,66,60
,60,126,187,153,255,195,126,0
150 DATA 60,126,187,153,255,195,126,0
160 DATA 126,255,189,153,255,165,255,
85,126,255,219,153,255,255,255,170
170 DATA 126,255,219,153,255,255,255,
170
180 '** DEFINE SPRITES **
190 FORY%=1 TO 6
200 A$="":FORX%=1 TO8:READD
210 A$=A$+CHR$(D)
220 NEXTX%:SPRITE$(Y%)=A$:NEXT Y%
230 '** VARIBLES **
240 A=1:B=4:Q=3.5:LV=5:SC=0
250 CLS
260 GOSUB 930
270 GOSUB 1000
280 GOSUB 1090
290 X=94:Y=80:XX=150:YY=180
300 SPRITE ON:ON SPRITE GOSUB 750
310 '** MAIN LOOP **
320 STI=STICK(0)
330 GOSUB 490
340 IF STI=7 THEN X=X-6
350 IF STI=3 THEN X=X+6
360 IF STI=5 THEN Y=Y+6
370 IF STI=1 THEN Y=Y-6
380 PUT SPRITE0,(X,Y),1,A
390 A=A+.5:IF A>3 THEN A=1
400 P=POINT(X+3,Y+3)
410 IF P=4 OR P=12 THEN GOSUB 560
420 IF P=7 THEN GOSUB 750
430 IF X<19 THEN X=19
440 IF X>236 THEN X=236
450 IF Y<12THEN Y=12
460 IF Y>181 THEN Y=181
470 GOTO 320
480 '** MOVE GHOST **
490 PUT SPRITE1,(XX,YY),9,B
500 B=B+.5:IF B>6 THEN B=4
510 IF XX>X THEN XX=XX-Q
520 IF XX<X THEN XX=XX+Q
530 IF YY>Y THEN YY=YY-Q
540 IF YY<Y THEN YY=YY+Q
550 RETURN
560 '** UPDATE SCORE & REMOVE BLOCK**
570 SC=SC+10
580 IF SC=4100 THEN GOSUB 680:GOSUB 1
090
590 BEEP
600 IR=INT((Y-3)/8)*8+6
610 ST=INT((X-12)/10)*10+14
620 LINE(ST,IR)-STEP(8,6),15,BF
630 PRESET(75,0)
640 LINE-STEP(48,8),15,BF
650 PRESET(75,0)
660 PRINT#1,SC
670 RETURN
680 '** MOVE UP A LEVEL **
690 Q=Q+.3:C=12
700 GOSUB 1010
710 X=94:Y=80
720 PUT SPRITE0,(X,Y),1,2
730 RETURN
740 '** SPRITE COLLISION**
750 SPRITE OFF
760 SOUND 0,0:SOUND 1,5:SOUND 2,0:SOU
ND 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:SOU
ND 13,0:FORX=1TO5:NEXTX: SOUND 12,56:
SOUND 13,0
770 PRESET(179,0)
780 LINE-STEP(66,8),15,BF
790 PRESET(179,0)
800 COLOR1
810 LV=LV-1
820 PRINT#1,"LIVES:";LV
830 IF LV<>0THEN 290
840 '** GAME OVER **
850 CLS
860 COLOR1
870 PRESET(90,100)
880 PRINT#1,"GAME OVER.."
890 PRESET(90,120)
900 PRINT#1,"PRESS SPACE"
910 IF INKEY$=" "THEN RUN ELSE 910
920 '** PRINT SC & LV **
930 PRESET(179,0)
940 COLOR1
950 PRINT#1,"LIVES:";LV
960 PRESET(24,0)
970 PRINT#1,"SCORE:";SC
980 '** DRAW SCREEN **
990 RETURN
1000 C=4
1010 FORA=1TO 22
1020 FORB=1 TO 22
1030 '
1040 W=B*10+14
1050 E=A*8+6
1060 LINE(W,E)-STEP (8,6),C,BF
1070 NEXTB,A
1080 RETURN
1090 X=INT(245*RND(1)+0)
1100 Y=INT(RND(1)*187-9)
1110 LINE(X,Y)-STEP (8,6),7,BF
1120 IF Y<>4THEN 1090 ELSE RETURN
```

LISTINGS

TYPE AND RUN

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

Don't worry, we know how it feels. You've stayed up all night, pounding away at the keyboard or joystick, building up a miraculous record score on your favourite game. And then . . . you've got no-one to tell!

Well, that's not quite true. Instead of bashing your head against the wall, throwing the computer out the window, or generally abusing your surroundings, you can always tell us, and we'll pass the information on to other avid games players.

So drop us a postcard or letter (please don't phone— we're busy trying to get our own high scores!) to: High Scores, MSX Computing, 38/42 Hampton Road, Teddington, Middlesex TW11 0JE.

HIGH SCORE TABLE

Game	Name	Score	Stage
Antarctic Adventure	Alex Chu (Castleford)	228,190	
Battleship Clapton II	Lawrence Burke (Eire)	89,820	
Blagger	Stephen Stothard (Essex)	2,501,300	228
Buck Rogers	S Lee (Derby)	219,800	
Chuckie Egg	Andrew Lawrence (Swansea)	133,350	
Circus Charlie	Steven Chell (Stoke on Trent)	113,080	
Disk Warrior	Paul Walls (Cleveland)	192,600	
Hunchback	Bruce Collins (Milton Keynes)	275,246	30
Hyper Sports I	Paul Boselli (Kenton)	839,400	
HyperSports II	K A Lee (Coventry)	264,560	
Le Mans	S Lee (Derby)	30,330	7
Manic Miner	Ross Slater	35,411	25
Maxima	Rosemary Woodward (Essex)	74,200	
Pinball	Ronan Macnamara (Eire)	409,220	
Road Fighter	Patrick Warren (Kent)	139,598	11
Spacewalk	Andrew Lawrence (Swansea)	32,800	
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	

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INFO

READ ALL ABOUT IT

If you've missed any issues of MSX Computing and want to get hold of a particular review or feature, help is at hand.

Contact our Book Sales department which will be happy to send you back issues from our warehouse for £1.45 per copy (including postage and packing).

Just send your name and address plus a £1.45 cheque or postal order made payable to Haymarket Publishing Ltd, to MSX Computing Book Sales, 12-14 Ansdell Street, London W8 5TR, stating which issues you require.

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.

December 84
Nik Kershaw puts Yamaha's CX-5M on trial
We review the latest colour printers
Joysticks—what to look for and how much you can expect to pay
We line up three data recorders and help you decide on the best buy
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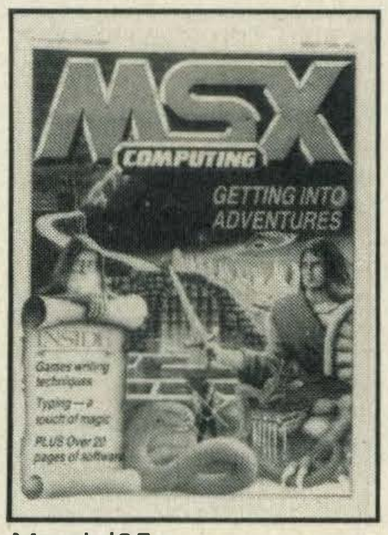
February 85
Introduction to machine code
What do you do when your micro breaks down? We offer some sound advice
Lightpens and graphics tablets open up new horizons, we put them through their paces
Disk drives
Monitors — we test three models and help you make a choice

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 easy to learn 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

February '85



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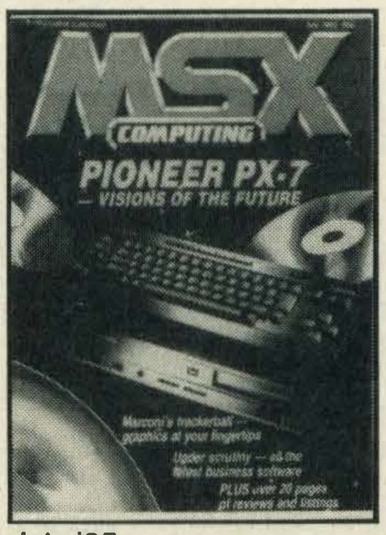

July '85

September '85

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

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

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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2. Never send cash — always a cheque, Postal or Money Order.
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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.**

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