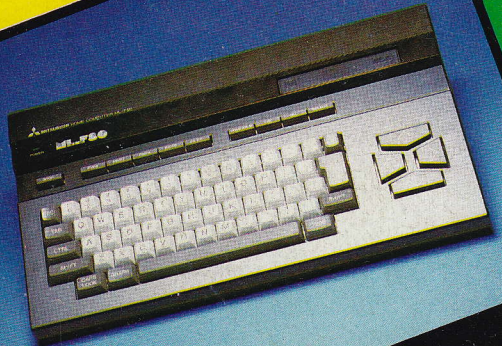


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Everything you wanted to know about MSX, but was afraid to ask

WE ARE now experiencing the biggest shake-up to hit the computer world in years. By this time next year we shall know if the three letters MSX are to rival IBM in computer importance, or if they merit just a footnote in tomorrow's history books. It is interesting to note that the Great British computer buying public are to be key figures in the MSX story. If we take to these standardised computers then MSX will go on to greater things elsewhere. If on the other hand the British public spurn the advances of much respected names such as Sony and Yamaha then the Japanese will have to think again.

Much has already been said about the possible success of MSX. Some pundits have sneered saying that it doesn't have a chance, others have staked their futures on the standard. The wisest remain aloof, waiting to see what happens. After all, there are so many ifs. The truth is that it can succeed provided that the manufacturers get their act together, and the software houses throw their full weight behind them. And that is a big if.

MSX, Micros and Modems

SONY HAVE just developed a smaller, cheaper compact disc player, that computer users will find very interesting. A disc usually contains thousands of bytes of digital information representing music, but there is no reason why the information stored on such a disc couldn't be computer data, or even programs. At £279.95, the player is going to be a little expensive for the average user to buy and connect up to his MSX micro

while waiting for software to appear, but then you can't buy Elton John discs for a 3 inch floppy drive.

If it arrives, compact disc software will really appeal to the software houses, as it can be made difficult to pirate, though music pirates love CD as it gives them a perfect master to copy off. But it offers the user a lot of advantages. For a start it is very quick, and each disc can store vast amounts of data, best of all, compact discs are uncorruptable. Later this year there will be read/write CD units available, and who knows maybe software with stereo music.

Coming to save the world.

GHOSTBUSTERS HAS already been a worldwide smash-hit record. Before long the film will be breaking box-office records and no doubt the new video game will be the first MSX game to hit the number one position. Coming to a TV screen near you soon, Ghostbusters is available on cassette from Activision. The game has elements of adventure, strategy and arcade action and has been written by David Crane, the brain behind Pitfall and Decathlon.

Ghostbusters — the video game is based on events in the film and

features some of the music and characters together with some surprises. Other MSX games from the Activision stable include Beamrider, Decathlon, Pitfall II, River Raid, Space Shuttle and Zenji. All six come on cassette and cost £11.99 each.



CD for MSX

COMPUTER communications is the in-thing at the moment, everyone seems to be connecting up Modems, and running up massive phone bills. Amongst the various services available are British Telecom Gold which is an electronic mail service, the Nottingham Building Society "Homelink" system which offers home banking and shopping facilities, and services such as Compunet and Micronet. These last services are especially designed for home computer users and often have a large amount of free software available for

downloading.

To use such services with an MSX computer you need: an RS232 interface, a modem and some operating software. MSX Viewdata from Kuma Computers is just such a software package. It allows the saving of Viewdata frames, and the off-line preparation of messages, and it also works with the Telex service. Anyone who has seen the film "War Games" will know what fun you can have with micros and modems, so for more details ring Kuma on (07357) 4335. You don't need a modem to speak to them yet.

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THE MSX STORY SO FAR...

THE HOME COMPUTER industry has spent the last few years running around in circles. Each of the dozens of home computers has to have its own software especially written for it. Even different models from the same company can't use each other's software. This is set to change, thanks to the Japanese.

Over a dozen Japanese companies including Sony, Canon, Sanyo, JVC, Hitachi, Toshiba, Mitsubishi, Teleton and Yamaha have got together and agreed a standard for home computers. The standard is called MSX and the first microcomputers which meet it are now on sale in the high streets at prices a little under £300. Each model will be able to use software and accessories intended for the others. This would simplify life for micro owners, but rival computer makers say the MSX standard is already old fashioned. They also fear it could allow the Japanese to dominate the UK computer market.

The MSX story began in 1983 when several well known Japanese companies were planning home micros. Each asked Microsoft for a version of Basic for its computer. The version Microsoft produced was called MicroSoft eXtended Basic, or MSX Basic. From here the idea of producing machines which were fully compatible evolved and other Japanese companies were pulled in to agree to the standard. This took the name MSX, even though it went much further than just having the same Basic.

There are good arguments for standardising. It would be absurd if each hi-fi company produced record players which needed different types of record, yet this is just what happens with home computers.

!There are three main types of microprocessor in common use, the Z80, 6502 and 6809. Each understands its own set of machine code instructions, so a program written for one has to be totally re-written for the

others. Even computers which use the same microprocessor arrange the display, keyboard, sound, memory and so on in quite different ways, so considerable work still has to be done to convert software. This means software is only produced for the top selling models.

Without a good range of software a microcomputer is little use. Several promising computers have failed because the companies which write software haven't bothered to produce any for them. If the Japanese companies had each produced different machines, they would have had a hard time getting software. Because they all use the same software there should be lots available.

Until now Japanese companies have made little attempt to sell home micros, for which no standards exist. The only ones to have reached the UK was the unsuccessful Sord M5 and the Sharp M2700. On the other hand they have done quite well selling business micros, for which there are two clear standards. By establishing the first home computer standard they could clean up.

The details of the MSX standard were drawn up by Microsoft. The main inspiration coming from Kay Nishi, the head of the Japanese division of Microsoft. All companies making MSX micros pay royalties and a hefty licence fee to Microsoft. Non Japanese companies are also taking out licences to build MSX micros, helping it become an international standard.

All MSX micros and software should carry the MSX logo. This is guarantee they meet the standard, so MSX owners can buy with confidence. Software really is interchangeable between different makes, both cartridges and tapes. At first being able to pull a cartridge out of a Sony and use it on a Toshiba seems amazing. After a few days using MSX micros it seems amazing that other computers can't do the same.

To achieve software compatibility meant virtually designing an entire standard computer. Designing microcomputers is largely a matter of choosing a combination of computer chips and then fitting them together on a circuit board, with a case and keyboard to go around them. The MSX design specifies chips which include the Zilog Z80 microprocessor, Texas Instruments 9918A display chip and the General Instruments AY-3-8910 sound chip, or their equivalents. It also specifies MSX Basic, standard keyboard functions, a cartridge socket, a cassette tape standard, one Atari style joystick socket and other details.

Each company is left to come up with its own keyboard and case styling. They also have some freedom over the other features included in each computer. The minimum MSX standard only insists each machine has 8K of main memory plus 16K of memory which is dedicated to the screen display. Almost all machines coming to the UK, however, have 64K of main memory, making a total of 80K including the screen memory. They also have a Centronics printer interface and a second joystick socket, neither of which has to be included in an MSX micro.

Some companies are building more specialised features into their machines. The Sony Hit-Bit MSX micro has a built-in database program. Yamaha's CX5M goes further and includes a high quality FM polyphonic synthesiser and piano-style keyboard. Add-ons such as disc drives and an RS232 interface can be added via the slot for cartridge software, which also acts as an expansion port.

MSX Basic is one of the best versions of Basic around, and is far better than found on popular micros such as the Spectrum and Commodore 64. It includes some powerful graphics and sound commands. The graphics commands include full control over 32 sprites. This makes it easy to write games, which could be mistaken for programs written in machine-code. All calculations are done to a much higher accuracy than normal. Ten functions can be programmed into the function keys and the computer displays a label for each key on the bottom line of the TV screen.

A wide set of other useful commands are included, plus some which are revolutionary. MSX Basic includes a full set of "event handling" commands. These can be made to interrupt a program when the joystick fire button is pressed, two sprites collide, a function key is pressed or at regular intervals. This makes the programmer's life much easier. For example, rather than writing a program so it repeatedly checks to see if a fire button has been pressed, just one command is needed to automatically send it to a subroutine when the button is pressed.

Although most MSX micros have 80K of memory, only 28K is free for use by Basic programs. A full 64K of memory is only available when using disc drives.

Graphics are produced with a resolution of



256 by 192 cots in 16 colours. There can only be two colours in each row of eight dots which is a standard limitation of the 9918 chip.

Perhaps the most controversial part of the MSX standard is the Z80 microprocessor. At over seven years old, this 8-bit chip is almost prehistoric by computer standards. Other computer makers say standardising on such an old microprocessor is a mistake when the latest designs could be used instead.

Yet the Z80 microprocessor is well known and is still used in many business and home computers. The latest UK computer, the Enterprise, uses the Z80 and Commodore's latest two home micros use a version of the 6502, a microprocessor of similar vintage.

Only two home computers have appeared with anything other than 8-bit microprocessors. One is the Advance 86a which uses a 16-bit microprocessor similar to the IBM PC's, allowing it to be expanded to use IBM PC software. It has not been popular as a home micro, however. The other is the controversial Sinclair QL. This uses the Motorola 68008 which has variously been described as a 32-bit, 16-bit and glorified 8-bit microprocessor. Despite using the latest technology, the QL is slower than many 8-bit micros.

Any standard tends to inhibit progress. As developments in computing happen so quickly there is a real danger the MSX standard will be left high and dry in a couple of years time.

The companies behind MSX say it will not go out of date because it will be able to switch to more advanced chips, such as the 16-bit Z800 microprocessor and the 9229 graphics chip. These are new versions of the chips in the MSX standard. They should be able to use all the old MSX software plus new software written to use their extra features. For example the 9229 chip allows an 80 column



screen display as well as the normal 40 columns.

There is also due to be an MSX disk drive using a system known as MSX-Dos. This is similar to CP/M, but is able to exchange data (though not programs) with MS-Dos computers, so people will be able to take work from a 16-bit computer at the office and continue at home on an MSX micro.

The companies bringing MSX micros into the UK have formed the MSX Working Group to maintain the standard. The Group expects 85,000 MSX micros to be sold in the UK by Christmas and world wide sales of 780,000 next year, although estimating computer sales is a tricky business. MSX is claimed to have sold around 300,000 in Japan since its launch there in autumn 1983 and to now have 40 per cent of the market.

The UK has been chosen for MSX's first foray outside Japan because it has the highest ownership of home computers in the world.

Companies outside Japan are starting to

take out licences for MSX. Spectravideo, a joint American and Hong Kong company produced a micro called the SV-318 which was a virtual prototype for MSX. Now the company has a true MSX micro. Philips is the first European company to announce an MSX micro, but it will be selling it in Italy and perhaps Germany before bringing it to the UK next year. GEC could become the first UK company to produce an MSX micro, it has bought a licence but has not yet committed itself to building anything. About 20 companies around the world have announced MSX micros and more will soon join the club.

The MSX standard makes it possible for lots of companies to launch home micros because they are guaranteed a range of software for them. Many UK software houses are converting their existing programs to run on MSX micros. This will make it possible for well known electrical companies which don't build computers to get into the business. It may also mean own brand home computers from chains such as Boots and Dixons.

Surprisingly the Japanese are not using the latest technology to build MSX micros. Each machine uses many computer chips. UK and US companies keep costs down by combining the functions of many of the simpler chips onto a single chip especially made for each micro, which is called an uncommitted logic array (ULA). The present MSX micros don't use ULAs which is one reason their prices are higher than expected. Indeed the demand for chips by MSX micros has helped make the world shortage in computer components worse and so push up prices further.

Cheaper MSX micros may be produced by using ULAs, or this stage may be missed out in a plan to go straight to a superchip combining all the major chips specified by the MSX standard. This would be more advanced than any chip used in home computers, allowing low cost computers to be build from just a few chips.

The strength of MSX is not that it is bang up to date, but that it is a well thought out standard with lots of features which make MSX micros pleasant to use. It is aimed squarely at the bottom of the market but has none of the major faults of existing micros, such as poor keyboards, small memories, poor versions of Basic, poor displays, no add-ons or little software. If there is going to be a standard, MSX is quite a good one.



SOFTWARE REVIEWS

Les Flics PSS

LIKE MOST of the home grown MSX software, Les Flics is a conversion of a popular game from another micro, in this case the Sinclair Spectrum. It is an arcade action game that, though it never says so, gets its inspiration from the famous Pink Panther movies. Whoever wrote the mock French notes on the back of the cassette should be shot, but they manage to set the tone for what is essentially a fun game.

Les Flics is the French nickname for the "Old Bill", the game of the name, or the name of the game is about avoiding them as you guide a pink panther around a map of Paris. There are two parts to the game, a car chase around the streets, and a more conventional arcade chase-about inside the buildings. There are nine buildings to choose from, and they each contain objects to help you commit the crime of the century.

Like any other supercreek, you need food to keep your strength up, ignore it and you die; however you may only eat while you possess the knife and fork. Keys let you open doors and so on. In a way Les Flics is like an Arcade Adventure, in the same genre as Atic Atak, though it is somewhat less sophisticated.

Rating ***

Holdfast Kuma

HOLDFAST IS the first overtly political game for the MSX computers. In the game you lead a village's campaign for a school and a clinic. The hypothetical country that the game is set in is called Dictatoria, but might as well be Great Britain. There is a slight, but only a very slight, resemblance to Hamurabi, or Kingdoms, though your aim is not to manipulate stocks of grain and raise taxes, instead to have to manipulate public opinion, and get it on your side.

On the surface, Holdfast is a mildly amusing computer parlour game. But under the surface lies something far more significant: a message. Fortunately the message, and the lesson learnt from playing the game, is a fairly sound one: If you want to get things done, organise peaceful campaigns. As such this is a laudible sentiment, yet suppose someone with a darker motive was to try and "teach" in this manner. What if the National Front put out a similar game where you win by persecuting a minority?

No doubt Holdfast was meant to be controversial but that doesn't stop it being fun. Destined to be a smash-hit with Guardian readers, CND members and anyone who doesn't like the government.

Rating ***

Eric and the Floaters Kuma

ERIC AND the Floaters sounds more like a rock band than a computer game. Either way, Eric and his friends are not going to top any charts. Eric is a little man trapped in a maze and he is being chased by the "evil" floaters. Though they don't look all that evil, they resemble party balloons, and some of the time their little faces smile.

The object of the game is to kill all the floaters, pick up some treasure, and find the door to the next level of the game. Killing all the floaters on one level sends you to a more difficult level, either with more floaters, or with automatic bomb laying. The delayed action bombs are your only weapon against the balloon baddies. Personally I found myself sympathising with the baddies.

Rating **

Shark Hunter Electric Software

ESKIMOS HAVE a hard life, all that snow and ice, aggro every few months from Greenpeace and all those trainee salesmen trying to flog them fridges. However such tribulations bring rewards, and the Eskimo is the star of a surprisingly large number of MSX games. In one of them, Shark Hunter, our friend the Eskimo has a Herculean task on his hands, keeping the sharks away from his fishpens. All through the spring, summer and autumn, he struggles to keep the sharks away, so that Ms Eskimo and little baby Eskimo can eat through the long dark winter.

The Eskimo can be controlled by either the joystick, or the cursor keys, and he must dash about mending nets and throwing harpoons at the big bad sharks. To mend the nets he has to swim in the sea, and if you don't watch out, he becomes a meal for the sharks. Shark Hunter is a gruesome, but addictive, game and will appeal to all the family, unlike most other computer games.

Rating ****

Driller Tanks Kuma

DRILLER TANKS is not the best MSX game to date. It involves burrowing a tank deep into the earth beneath a building that looks remarkably like Brighton Pavilion. Naturally there are some nasty creatures living in the tunnels that get dug, and naturally they can either get you, or get zapped by your tank's water cannon — well that's what it looks like.

Points are scored for dispatching the hostiles, and for progressing around the maze-like tunnels. There are eight screens of tunnels for you to get utterly bored in. Driller Tanks makes watching Crossroads seem like worthwhile activity. Avoid this game, it is the software equivalent of a lullaby.

Rating *

Maxima PSS

MAXIMA IS billed as a "pure arcade game", so it will appeal to the shoot-'em-up brigade. It is the kind of game that is best played with a joystick, and better still if you have some friends along to join in the alien blood-letting. Like most of these shoot-'em-ups, Maxima is effectively space invaders with knobs on.

There are 16 different waves of nasties to zap, and the smooth graphics, sound and movement is all very nice, but ultimately Maxima is unsatisfying. There is no aim other than to create lots of alien orphans, and no real reward for all your efforts. Still if you never caught space invaders first time around, then this might appeal to you.

Rating **

Sparkie Sony Hit-Bit cartridge

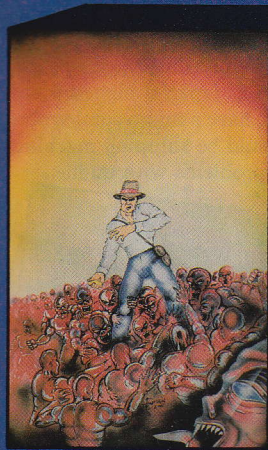
SPARKIE IS a very original game. It puts the lie to the story that the Japanese can neither program, nor come up with, innovative ideas. Although on the surface it does bear a passing resemblance to Pac-Man, the game has much more depth, and an equally odd theme. Sparkie is a bomb, the old fashioned type, complete with a fuse. He lives in a maze, which is crawling with mobile cigarette lighters and matches. These chase Sparkie and if they connect, Kerpow! he explodes.

Fires burn, and to make things worse every

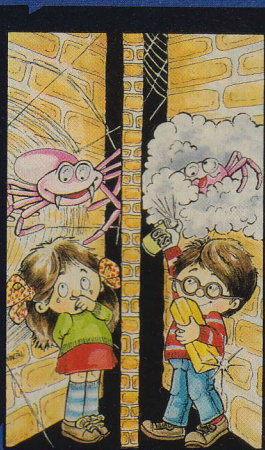
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the only choice

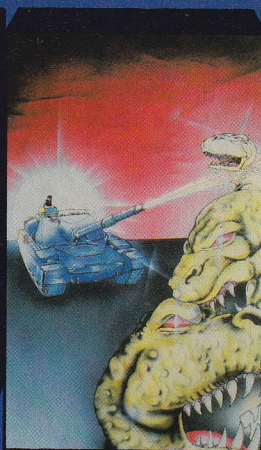
Kuma



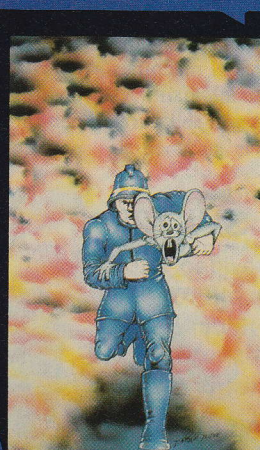
Eric and the Floaters



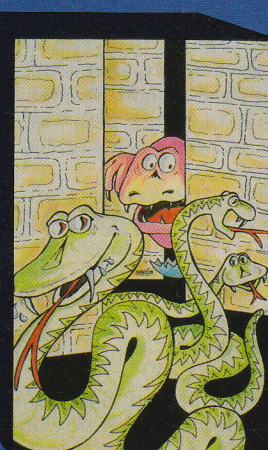
Binary Land



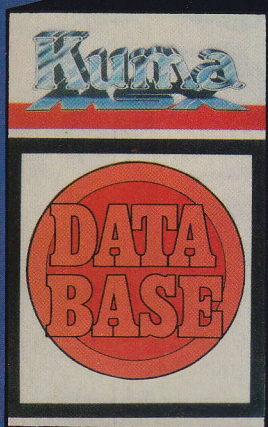
Driller Tank



Fire Rescue



Hyper Viper



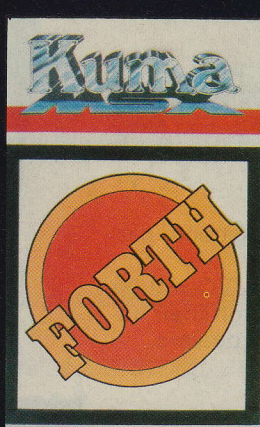
Database



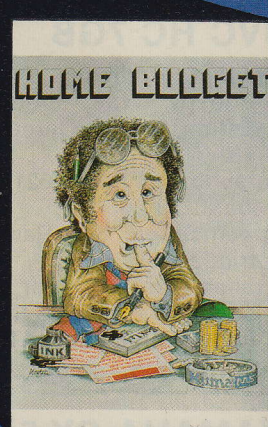
ZEN Assembler



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THE SAME BUT DIFFERENT

MSX micros offer the same basic specifications but choosing one isn't as easy as it appears.

CHOOSING A MICRO is never easy, choosing MSX micros is even more difficult. This is because there isn't much to choose between. All machines offer the same fundamental specification, though certain models might have differing amounts of memory. This leaves three criteria; manufacturer, price and the extras offered.

You might think that the cheapest machine is the best buy, after aren't all MSX machines the same anyhow? But the big name manufacturers claim that their machines will sell purely on the strength of the labels attached to

them. The big names boast that they can offer customers a better back-up service, or a more reliable machine, or in some cases a prettier box around the computer.

Whatever manufacturer you choose, the price is going to be important. MSX micros are not exactly cheap when you consider their specification. Yet some machines are better value than others. Lastly comes the extras, these vary from Yamaha's mini piano keyboard and music software, to Sanyo's light-pen interface. On the whole you can expect to pay more for a machine with extras than for a

bare-bones MSX micro.

In addition to the machines in the buyer's guide below, are a number of other machines not yet announced in the UK. Most of the manufacturers are cagey about releasing details, they want to wait and see how these machines sell first. Amongst those planning first releases are Phillips, who have already released a MSX micro in Italy, but say the specification is too unsophisticated for the UK market. Fujitsu, Japan's biggest computer manufacturer, have a micro coming, but not yet. Teleton would be shipping machines now but is having problems with quotas.

SPECTRAVIDEO SVI 728

Contact Address: Spectravideo Ltd.,
165 Garth Road, Morden, Surrey SM4
4LH.

Telephone: 01-330 0101.

Prices: £249

Specification: 64k Ram.

Availability: Out now in some electrical shops.

JVC HC 7GB

Contact Address: JVC House, 12
Priestly Way, Eldonwall Trading
Estate, Staples Corner, London NW2
7BA.

Telephone: 01-450 2621.

Price: £279

Specification: 64k Ram, second cartridge slot

Availability: November 84, JVC will be selling the HC 7GB through their nationwide network of hi-fi dealers.

See figure 1.

YAMAHA CX-5

Contact Address: Kemble Yamaha
Ltd., Mount Avenue, Bletchley,
Milton Keynes, Buckinghamshire
MK1 1JE.

Telephone: (0908) 640202.

Price: £600.

Specification: 48K Ram. The Yamaha CX-5 is sold primarily as a musical instrument, it comes complete with a three and a half octave piano keyboard, and a built-in synthesiser. The CX-5 also has a midi-interface. There are 48 pre-set voices and can play either monophonically or in 8-note Polophony. (See main magazine for full review.)

Available: Out now, but sold through music shops.

Figure 4. ▼

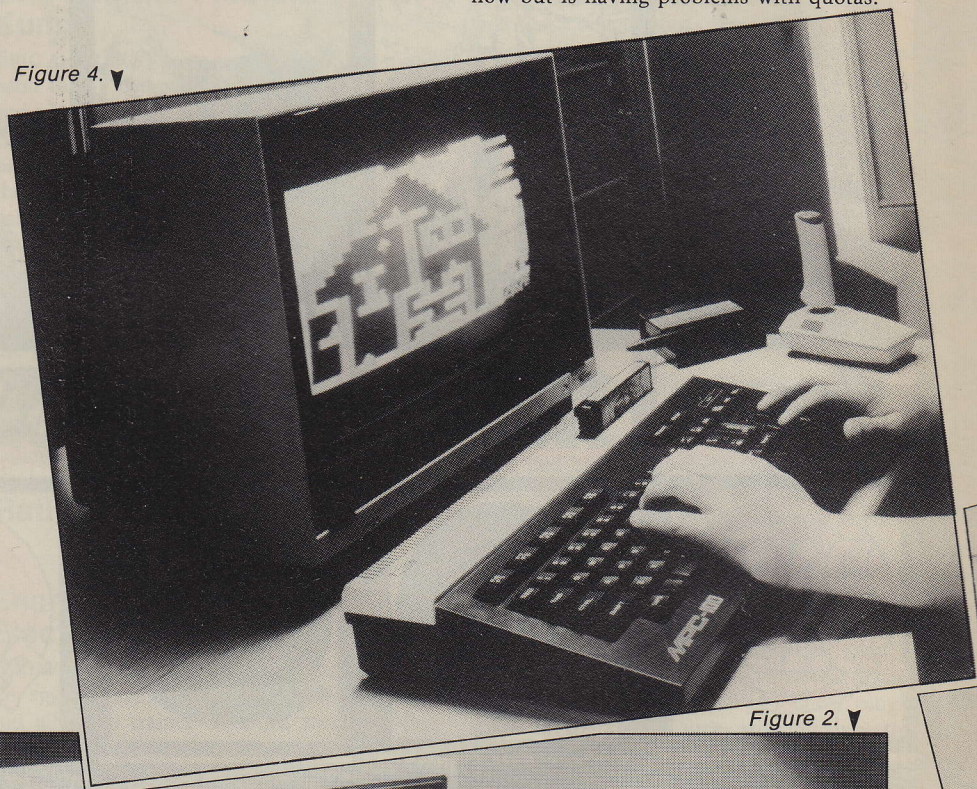
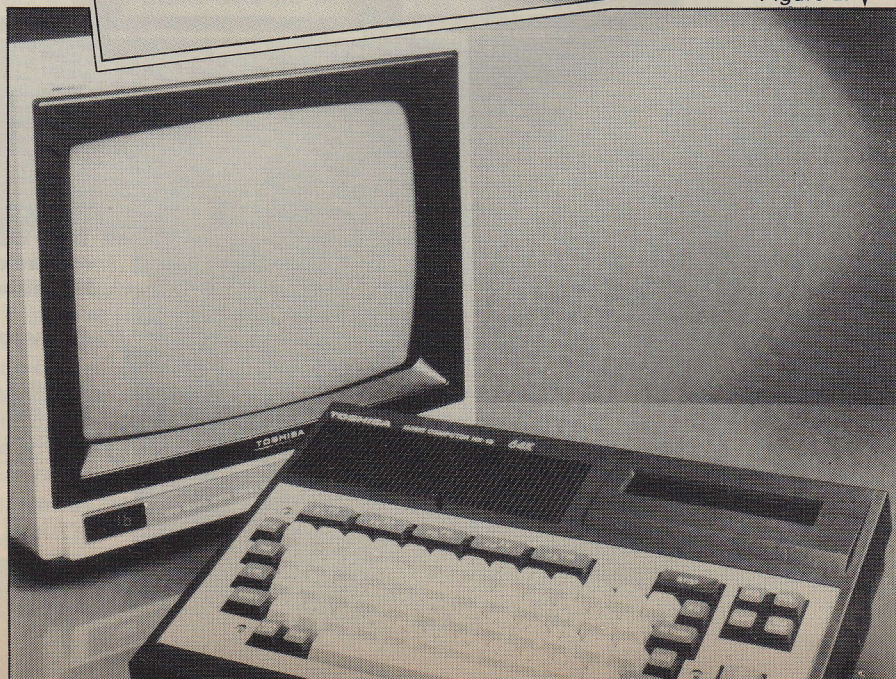


Figure 2. ▼



TOSHIBA HX-10

Contact Address: Toshiba (UK) Ltd., Toshiba House, Frimley Road, Frimley, Camberley, Surrey GU16 5JJ.

Telephone: (0276) 62222.

Price: £279.

Specification: 64k Ram

Availability: The Toshiba is already available in a number of high street stores.

See figure 2.

CANON V-20

Contact Address: Canon (UK) Ltd., Canon House, Manor Road, Wallington, Surrey SM6 0AJ.

Telephone: 01-773 3173.

Price: £280.

Specification: 64k Ram.

Availability: In shops from November '84.

See figure 3.

SANYO MPC 100

Contact Address: Sanyo House, 8, Greycaine Road, Watford, Hertfordshire WD2 4UQ.

Telephone: Watford 46363

Price: £299.

Specification: 64k Ram, special light-pen interface. Two manuals and two introductory cassettes.

Availability: Out now in high street stores.

See figure 4.

GOLDSTAR MSX

Contact Address: Microdealer UK Ltd., Burrowfield, Welwyn Garden City, Hertfordshire.

Telephone: (07073) 28181.

Prices: £230.

Specification: 64k Ram.

Availability: Through specialist computer shops.

See figure 5.

SONY HIT-BIT

Contact Address: Sony (UK) Ltd., Sony House, South Street, Staines, Middlesex. TW18 4PF.

Telephone: Staines 61688.

Price: £299.

Specification: 64k Ram, second cartridge slot. An extra 16k ROM contains special built-in software which can be used with CMOS battery powered RAM to provide database facility. Software includes; Address Book, Memo Pad and Schedule Reminder. Supplied with three manuals.

Available: Out Now.

See figure 6.

MITSUBISHI ML-F 80 and ML-F 48

Contact Address: Mitsubishi Electric (UK) Ltd., Hertford Place, Denham Way, Rickmansworth, Herts, WD3 2BJ.

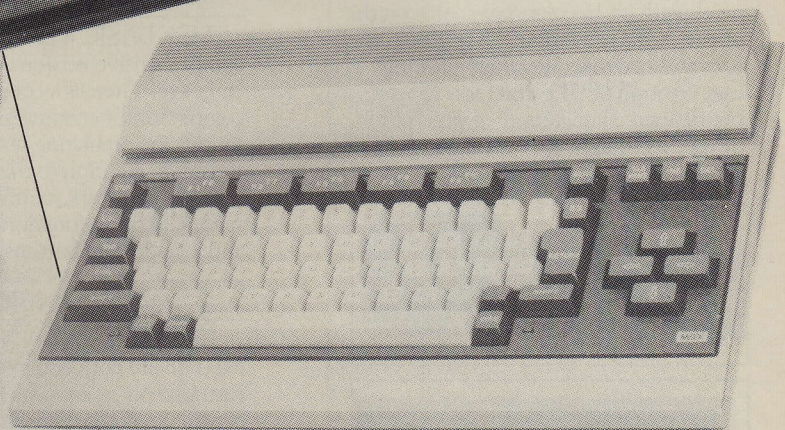
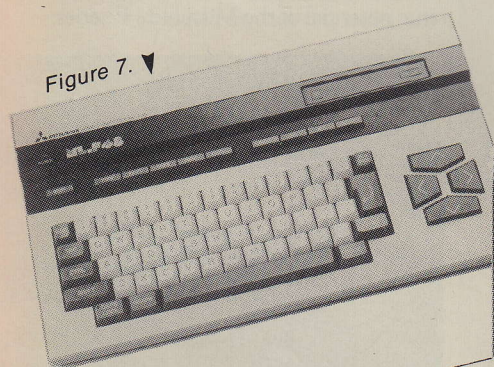
Telephone: Rickmansworth (0923) 770000.

Prices: ML-F 80 £299; ML-F 48 £249.

Specification: ML-F 80 has 64k Ram, ML-F 48 has 32k.

Availability: November 1984, available throughout Mitsubishi TV dealers.

See figure 7.



The new Mitsubishi

For those in the know

Anyone conversant with home computers will know precisely why MSX was worth waiting for.

The sheer proliferation of computer and software systems flooding the market loudly underlined the need for a unified standard.

So the major companies jointly developed a single computer and software system. The result – MSX – the format that will be standard for all time.

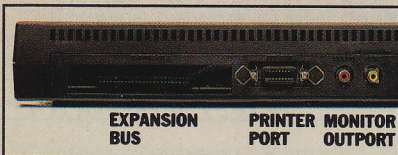
And those in the know will not be surprised that Mitsubishi are in the vanguard of the MSX movement. For, with the F-series, Mitsubishi offers everything that MSX is and more.

GRAPHICS

Maximum resolution of 256 x 192 pixels with all 16 colours available on the screen at the same time. 32 sprites in two sizes and two magnifications allowing easy creation of '3D' graphics. 255 pre-defined characters all of which can be used as straight text or easily mixed with graphics.



JOYSTICK AND CASSETTE PORTS



EXPANSION BUS

PRINTER PORT

MONITOR OUTPUT

SOUND

Three independent channels which can be output through the TV loudspeakers at any volume, individually or simultaneously, at any of the available 8 octaves. All three channels can use the 'noise' generator for stunning sound effects.

KEYBOARD

73 moving keys, ergonomically designed for many hours of fatigue free use. Large cursor control keys which are excellent for both programme editing and game playing. 5 function keys giving 10 pre-defined functions which can easily be redefined from 'BASIC' using the 'KEY' command.

BASIC

MSX BASIC is possibly the most comprehensive version of the original language. There is a complete set of commands for creating graphics and sounds, manipulating text and moving sprites. In addition to this there are 'built-in' interrupt routines for detecting sprite collisions, function key selections and joy-stick fire buttons.

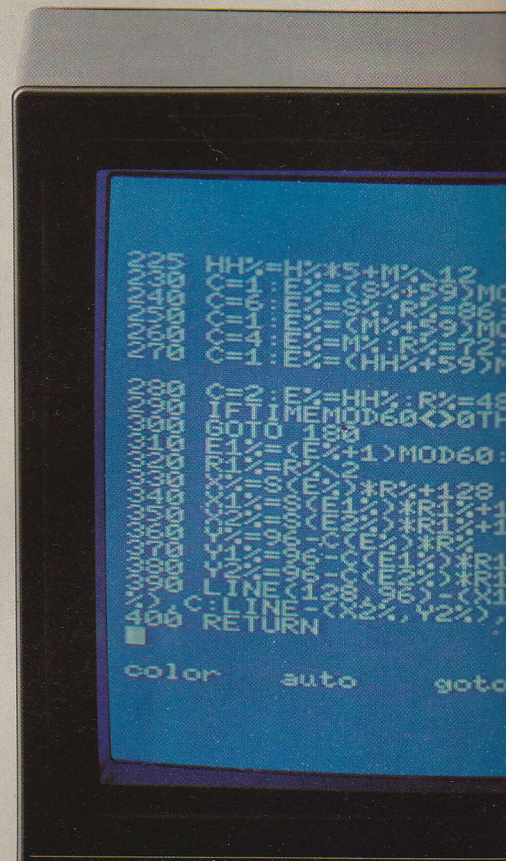
EXPANSION

The Mitsubishi 64k ML-F80 and 32k ML-F48 are both equipped with 2 cartridge ports, 2 joy-stick ports and a centronics compatible parallel interface. It is through these devices that the MSX system can be expanded for use with disc-drives, printers, serial interfaces, modems and other peripherals.

SOFTWARE ON CASSETTE

The MSX system can load and save data onto cassette at 1200 or 2400 baud and unlike certain other home computers, the Mitsubishi F-series can be used with a normal domestic tape recorder for this purpose.

When you put all of these features together, with the knowledge that Mitsubishi is the largest manufacturer of Mainframe computers in Japan, those in the know will immediately recognise the true potential of the Mitsubishi F-series.



Mitsubishi MSX Computers

For those who aren't

The Mitsubishi MSX family computer is everything you wanted to know about computers, but didn't know who to ask.

It's friendly, it's fun and so simple, a grown man can use it. Yet so versatile even his computer-versed children would be hard-stretched to over-tax it.

It operates with any colour TV set. Just plug it in, and the full power of the computer is instantly at your fingertips.

FOR FATHER

The Mitsubishi MSX can do many things, from keeping a simple check on the bank balance to running a complete business with customer account files, stock control programmes and word processing. It is just as much at home keeping control of your record or stamp collection or playing 'strategy' games such as chess, othello or contract bridge.

FOR MOTHER

There is the opportunity to store recipes and other household information or keeping record of the children's progress at school. Household accounts can also be recorded so that savings can be planned for holidays and other seasonal expenses.

FOR THE CHILDREN

There is education, particularly computer education. In a world where computer literacy is now of foremost importance, MSX offers a broad base of educational software. With simple programmes for the very young through to complex programmes for older students like language learning.

Also, the graphics system of the Mitsubishi computer ensures that the MSX versions of your favourite games are reproduced with incredible speed and accuracy.

Undoubtedly, MSX is the format for the future, and will become the byword for computer

education and entertainment.

And you can be secure in the knowledge that regardless of future developments, any investments made in MSX hardware, software and peripherals today will always be compatible with the Mitsubishi F-series.

So if you've waited until now to buy a computer, you couldn't have timed it more perfectly. Get to know one today.

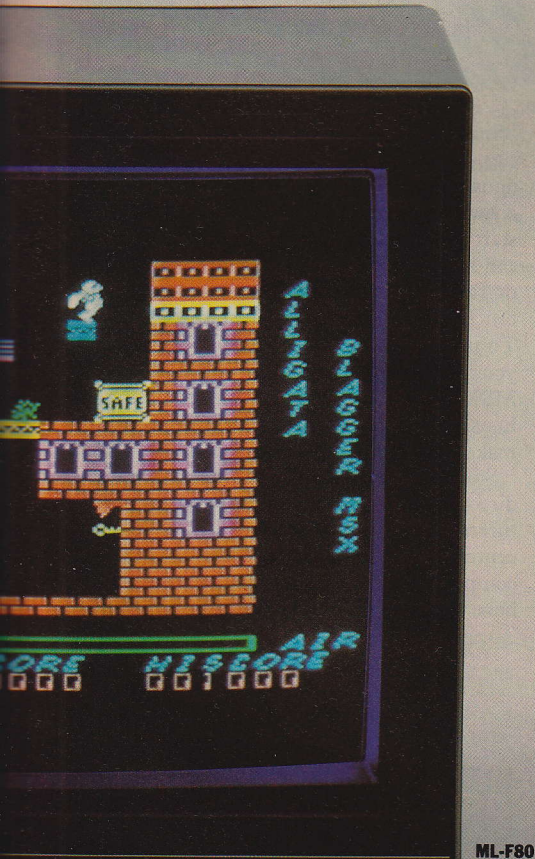


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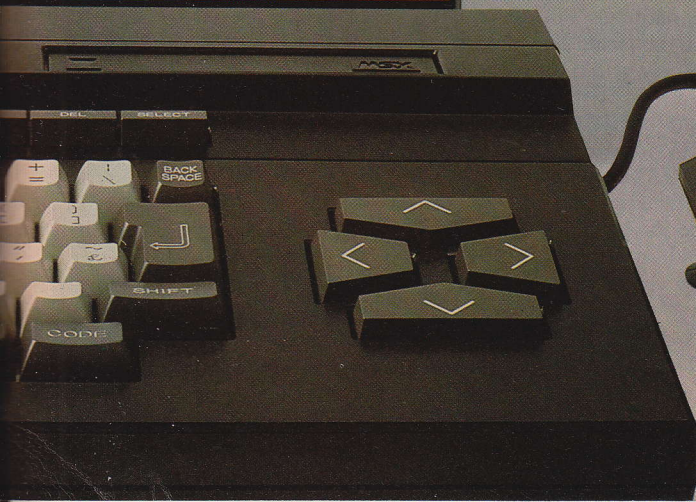
SPECIFICATIONS

CPU: Z80A (3.6 MHz)	Special keys for screen editing
Memory: ROM: 32 KB RAM: 64 KB (F80) RAM: 32 KB (F48) Video Ram: 16 KB	Sound: 8 octaves 3 channels for sound or 'noise' Output by TV sound or External Audio
Screen Displays: *Text Mode: 40 columns x24 lines	Amplifier
*Graphics: 256 x 192 pixels Colours: 16 (15 + transparent) Sprites: 32	Cassette Interface: 1200-2400 baud Motor controlled by CPU
Output: RF, Composite Video	Parallel Interface: Centronics
Keyboard: 73 moving-key keyboard 5 function keys Cursor control keys	Joy-Stick: 2 x 9 pin connectors
	Rom-Cartridge: 2 x 50 pin connector

*Subject to Scan of Monitor



ML-F80



ML-F48



MSX

PSS AND MSX

GARY MAYS, director of PSS is not certain about the future of MSX. His Coventry based software house is currently writing and converting software to run on the new standard, yet that doesn't mean he thinks the end-users are going to pick up on it. So why does PSS produce MSX software? "In the short term the multiple stores are going to stock MSX computers, and they will need some software to help sell the hardware.

"I have faith that the large stores will go for MSX. It is that kind of product. Holding MSX software greatly reduces their stock problems as they only need one set of software for a whole range of hardware. Whether the end-user will pick up on it remains to be seen. It will open up a totally new sector of the market, just as the Amstrad machine is doing."

Gary thinks that there is one question which the computer industry, both software and hardware, should address themselves to, "what do people want to do with computers?". Something useful no doubt, but he thinks that the software houses don't help the situation churning out one arcade game after another and expecting the public to be as enthusiastic as they were a year ago. "If the MSX manufacturers can answer this question then they will clean up".

A great deal of the computers sold these days are not to beginners, but are going to people who already own one micro and are upgrading. For example a lot of Spectrum owners are buying Commodore 64s. Gary Mays doesn't think the MSX computers are in that market at all. MSX computers are not likely to sell to people who know about computing.

Cambell MacCausland is the resident boffin at PSS, and he challenges the line put forward by the captains of the home grown computer industry, which claims that standardising micros on MSX is like freezing the development of the motor car at the Model T Ford stage. "It's nonsense, of course they would say that, after all, they are in competition with them.

"However the manufacturers have thought very hard about the specification. They chose the Z80 chip for the main processor and the Texas display chip for very good reasons. For



example, Texas is currently working on a new chip which includes all the facilities of the current one, together with a whole lot more new functions. It will still work in MSX micros as it does at present, but when a few special signals are sent to it, a whole new range of capabilities will open up.

"In the same way, the processor that will go into any new MSX machines will be the Z800, which is totally compatible with the Z80. If MSX takes off, all the descreet chippery inside the computer will be compacted into a smaller number of chips, and that will bring the price of the machines down. I liken the MSX standard to a record player. If you buy a new computer your previous software tends not to run on the new machine, whereas if you buy a new record player, all old records will play on it.

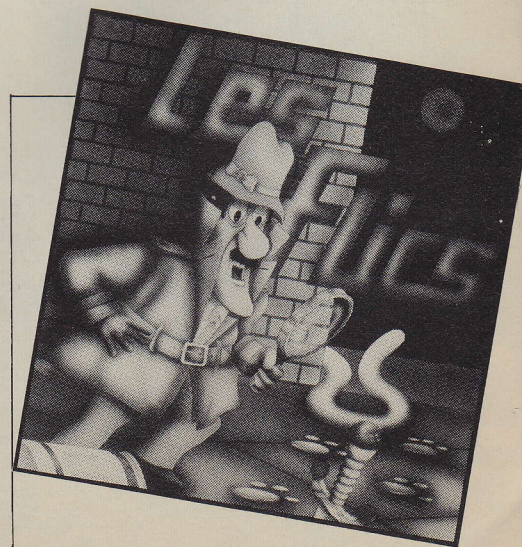
"The method of making and playing records was developed back in the 1930s. In those days the players were crackly and very Model T-ish, but you cannot compare them with modern records and record players. The technology may have changed in many ways, but there is compatibility. You can still play a 1940s record on a modern stereo."

At prices around the £300 mark, MSX computers are not cheap, and are definitely not good value, Gary Mays thinks this could be the biggest obstacle to the success of MSX. "The price isn't low enough to attract existing users — the kind of person who has a Spectrum or a ZX81 and is looking around for something a bit decent, with a real keyboard. The high price has a lot to do with the supply. Manufacturers cannot produce the numbers that a lower price would demand, so the price remains high. Once production steps up we can expect to see prices plummet."

But will Sinclair, Commodore and Acorn have to step into line? Gary Mays thinks not.

"Sinclair are something special, a separate entity. It would take something really stupendous to break his cult following." Yet the real answer to the question is more complex, for a start it depends on the software house. "If we can afford to develop a program across three or four machines, and that is unlikely, then Sinclair and Commodore can keep right on. To us the big advantage of MSX is obvious, you only need to produce one program. If MSX does take off, then we (the software houses) can get into cartridges, which would make life a lot easier all round.

Software companies like PSS have little direct contact with the hardware manufacturers. What does go on is mainly through the central MSX agency. In order to maintain compatibility across all the hardware, they have to follow very rigid guidelines. It is quite



possible that eventually the software will be tailored to one or two MSX computers, especially if only a couple dominate, but for now the programs stretch across the lot.

But surely all MSX computers are the same. Both Gary and Campbell don't think so, but admit that they are provided a programmer sticks rigidly to a set of BIOS calls — rather similar to the BIOS calls of CP/M. "Commodore make use of a similar system, which everyone seems to ignore. Once you depart from this and start calling things directly, you run into compatibility problems." The MSX group advises software houses to stay within these guidelines, but that is rather like telling Picasso to stick to painting by numbers.

"One of the disadvantages of the BIOS calls", says Campbell, "is that for some machine-code, especially in an arcade game, you need speed. And going through the BIOS is not the quickest way of doing things. This unfortunately means that games software will be brought down to the best performance of the BIOS. On the Spectrum, a hit program is usually made by a programmer doing something which was previously thought impossible. That simply won't be possible with MSX machines."

Of the new MSX software from PSS, two games are conversions. "Les Flics" was originally on the Spectrum, and "Maxima" has been converted from the Memotech. Maxima is a "pure" arcade game, a fast shoot-'em-up in the Space Invaders vein. The Assembler/Monitor, one of the first MSX utilities, first saw the light of day in the "Home Computer Advanced Course" as a giveaway.

Before committing themselves to simultaneous releases of new software on MSX and Spectrum, the PSS people want to see what happens to the new standard. This attitude is common right across the industry, wait and see. In the short term both expect to see MSX users wanting the same kind of software as other computer users. Gary Mays has particular hopes for the Assembler, which he thinks will have a huge initial market as software houses, bedroom hackers and budding Jeff Minter's all try to produce software for the mushrooming MSX market. In the longer term though there will be a different trend.

"MSX users will tend to be older, more likely a 25 year old who wants something to match his hi-fi. He will be looking for more sophisticated software, maybe business packages. In the long term utility products won't sell, because MSX users will probably not be programmers at all, they will be purely software buyers, and computing will be software based."

One good thing about MSX is that it is an international product, and there is a potential export market for shrewd software houses. PSS have already delivered product to France. As yet there is no MSX software market in the USA, because there are no MSX computers there yet. "Because we managed to get in so early it has had the side effect of letting us sell our back-catalogue to our newly found markets."

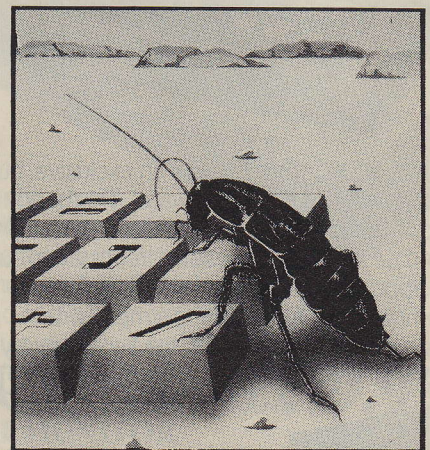
When MSX becomes a truly international product, it gives software houses a bigger market, this can only do them good. Currently PSS are exploring ways of making software multilingual, that is one program with soft-

ware options for users in different parts of the world. But for the moment the French receive a slightly different version of existing games. The biggest problem at the moment is determining which languages to put on the cassettes.

One of the problems that has dogged PSS from day one of the companies involvement in MSX was getting hold of machines. All the other software houses had the same problems, they simply were not around. As for technical help, the user group has been far more helpful than any of the existing manufacturers. All the UK manufacturers are to say the least "unhelpful". A rule of thumb is the more desperate a manufacturer is to have independent software houses writing for a particular machine, the more likely that company is to help. MSX manufacturers, through the user group have been the most helpful of all, which is a pointer to how important they see the software industry being.

"The Japanese have been the first people to accept what software houses have been saying all along", said Gary Mays, "that no matter how good a machine is, it ain't going to sell without software". On the other hand Amstrad has been encouraging software houses to write for the CPC 464, but insists on doing all the marketing. Giving a software house only a royalty. The MSX group provided software houses with technical manuals in fact the first technical manual PSS ever had from any source.

The key thing about MSX is that the group has managed to get software houses on their side. Something which nobody has bothered to do in the past.



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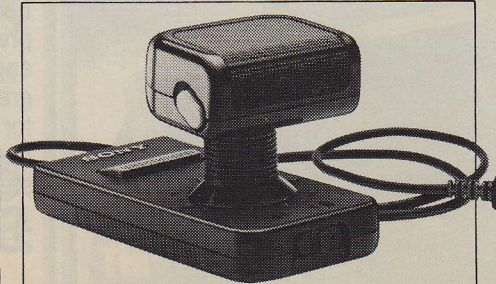


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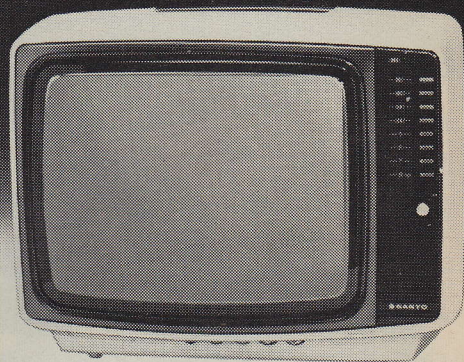


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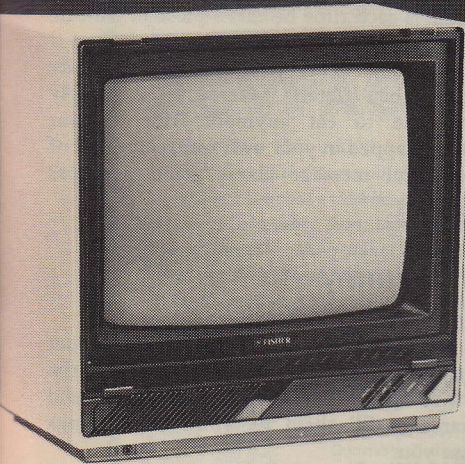
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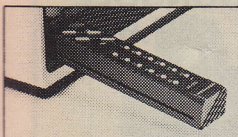
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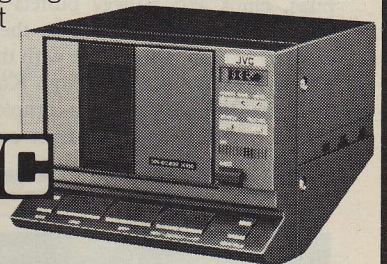
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SOFTWARE REVIEWS

(continued from page 6)

so often give out flames which also chase Sparkie. The flames cause Sparkie's fuse to burn, and all hell is let loose as Sparkie has to dash to a water bucket to douse the fizzing fuse. As Sparkie progresses through the maze, it turns blue, and when the whole of the maze has been coloured, he moves on to another, yet harder maze.

This game is not to everybody's taste. It is a bit cute, but it will go down well with families. As an example of Japanese programming, it is impressive. Best of all is the colourful moving graphics, and the oriental music. Sparkie is hot stuff.

Rating ****

Hyper Olympics Konami

SUDDENLY THE whole world is athletics crazy. And so are computer games freaks. All over the western world one arcade game dominated the summer. "Track and Field" could be found in pubs, clubs and railway buffets everywhere. Now MSX users can join in the fun in the comfort of their own homes with the three new Hyper Olympic products from Konami.

Hyper Olympics is such a complex game that it comes in two parts, or rather comes on two cartridges. The third part is a special two-

button playing device which allows you to really punish the buttons, in the same way that it is possible to hammer the arcade version. This device is called the "Hyper Shot", and simply plugs into the MSX joystick port. I found that it greatly improved my scores, and saved me from totally destroying my stock of joysticks, which can also be used to play the games.

The games included on the two cartridges will be familiar to fans of the arcade version. Cartridge one has 100m Dash, Long Jump, Hammer Throw and 400m Run. The second cartridge contains 110m Hurdles, Javelin Throw, High Jump and the 1500m Run. Unfortunately you have to play the game in two separate parts, but that doesn't seem to spoil the fun.

Each of the events in the Hyper Olympics is a separate game. You have to reach the qualifying standard, be it a time or a distance, to be able to move on to the next event. As you progress through the game your score appears to multiply, depending on how well you perform at each event.

In running events speed is governed by the rate at which you thump the run key, or wiggle the joystick. In field events you still have to control speed, but you also have to control the jump or throwing trajectory. This is done by holding down the jump button, or pressing the

fire button on the joystick.

If Hyper Olympics is typical of the software that is going to appear on MSX cartridges, then the new Japanese standard will be a great success.

Rating ****

Buzz Off Electric Software

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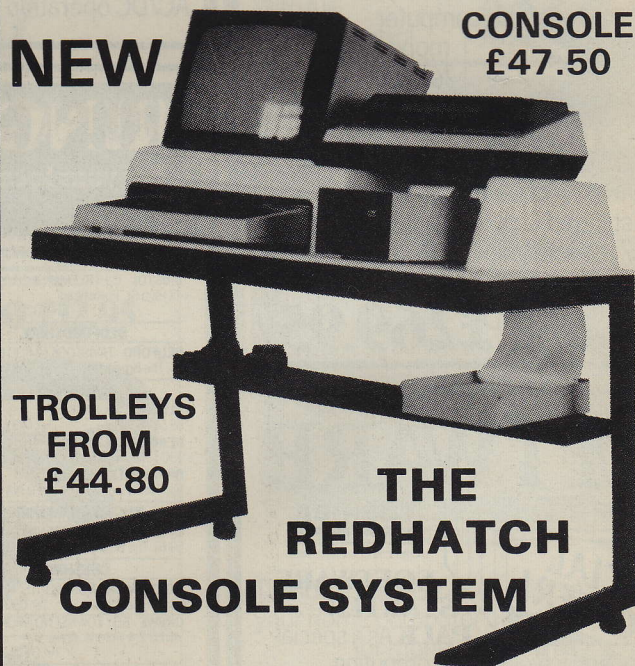
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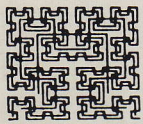
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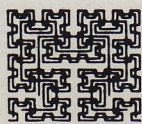
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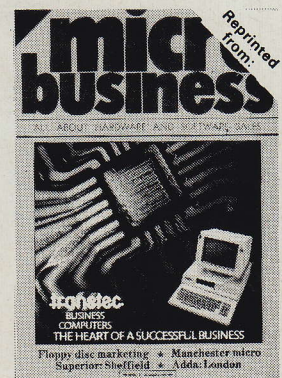
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