

MSX

Noel

December 1984
95p

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 MEMORY UNLIKE MOST
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 32 SPRITES, MORE THAN
 ANY OTHER NON-MSX
 COMPUTER. AND I USE
 MICROSOFT EXTENDED
 BASIC, LIKE EVERY
 OTHER MSX COMPUTER."

"WOW. WITH A
 SPECIFICATION LIST
 LIKE THAT.
 NO WONDER YOU'VE
 GOT A 64K MEMORY."

You'd expect one of the best-selling home computers in Japan to have a specification list as big as its memory.

But the Toshiba HX10 doesn't just limit itself to that.

It was developed along with other Japanese home computers to operate

on one language: MSX. You can swap programs, games, cassettes, even peripherals like disk drives, printers, and joysticks: they're all compatible with every other MSX computer.

All of which makes MSX the system of the future.

So if you want a computer that won't be obsolete in a few years, buy an MSX. If you want one of the best-selling MSX computers in Japan, buy a Toshiba HX10.

TOSHIBA
MSX

Welcome to the first independent issue of MSX User. If you already know what MSX is about you'll understand that it's probably the most important step in home computing since Jobs and Wozniac put together the first Apple computer kits in the late seventies. In early 1982, a gentleman called Kay Nishi was instrumental in arranging for sixteen major Japanese consumer electronics companies to meet and agree upon a standard specification for the manufacture of home computers – an enormous task. As this standard was to be based around a version of Microsoft Extended BASIC, the project was titled MSX.

Now, some 2 years later, MSX computers claim 40% of the burgeoning Japanese home market. As I write this, MSX computers from five companies are beginning to trickle into British high street stores backed up by some 200 professional programs and a depth of technical support unprecedented in a computer launch. At the same time, many established computer 'experts', while applauding the concept of a standard home micro, are shaking their collective heads of what they see as a backward step in an industry that seems to adopt 'ever onwards, ever upwards' as its motto. Although MSX breaks no new technological ground in using tested and proven components in a well understood architecture, it seems clear that such complex wheeling and dealing between enormous companies demands that the joint product be a 'known quantity' from launch.

The perils of thrusting an experimental product at an already suspicious public are well understood and a project of this magnitude can't afford the luxury of entrepreneurial production or support breakdowns. As it

is, MSX compares favourably with home micros already available and gives a security in purchase that no individual manufacturer can come close to. If the manufacturer of the MSX machine that you buy should cease trading (highly unlikely), your MSX retains its place as a current micro because it's supported equally well by the remaining members of the MSX group; and with such giants as Sony, Canon, Mitsubishi, Hitachi, JVC, Toshiba, GEC, NEC, Philips, Sanyo etc, etc, behind it, the future of MSX is assured. In addition, provision has been made for the standard to be extended as current technology is proven, while compatibility with the present standard is retained.

So, we believe in MSX as a nugget of good sense in a crazy industry that markets its products on the strict basis of new = better and disappears up its own User Ports, annually, amidst a pile of superseded micros and abandoned owners. These are then bombarded with propaganda enticing them into buying the 'next big thing' to stay ahead, only to be abandoned again the next year. No – MSX is a pause for breath and a base for growth that promises a day when each home micro is compatible with every other, allowing a level of intercommunication not possible with the mad diversity at present.

"Hm", you are thinking. "OK, it seems like a great idea but a magazine

dedicated to MSX must be the lacky of the MSX Group." Not so. We support the standard but owe allegiance to no-one. We see our role as monitors of MSX, encouraging owners to learn about their machines, keeping them up to date with developments and providing a collective voice that the Group will listen to. In the pages of this first issue we've put together as much information as we can amid the confusion of frantic efforts to fill the stores with MSXs before Christmas. Our approach is to provide clear, easy-to-read features that avoid unnecessary jargon and don't take themselves too seriously. What we need is feedback from you; as much and as often as possible – then we can be sure of representing you properly. Please, no 'phone calls' though. We've got enough to do.

First moan. MSX micros in general are too expensive. The vast range of prices isn't reflected in additional features and if you want a standard MSX it's as well to remember that each performs identically within the standard – so go for the cheapest. If most buyers do this, prices will fall below the £200 pound level where they belong.

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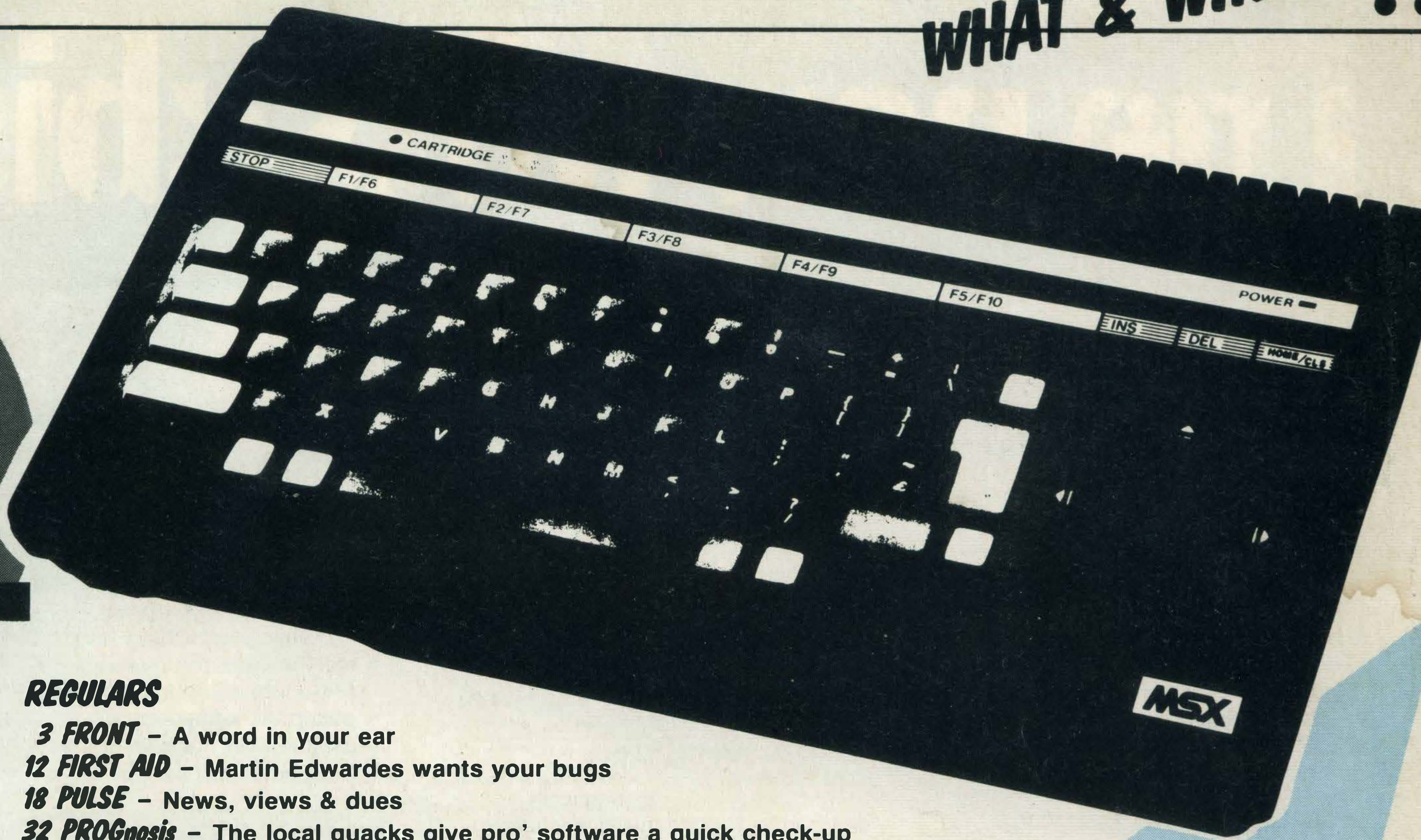
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MSX



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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.

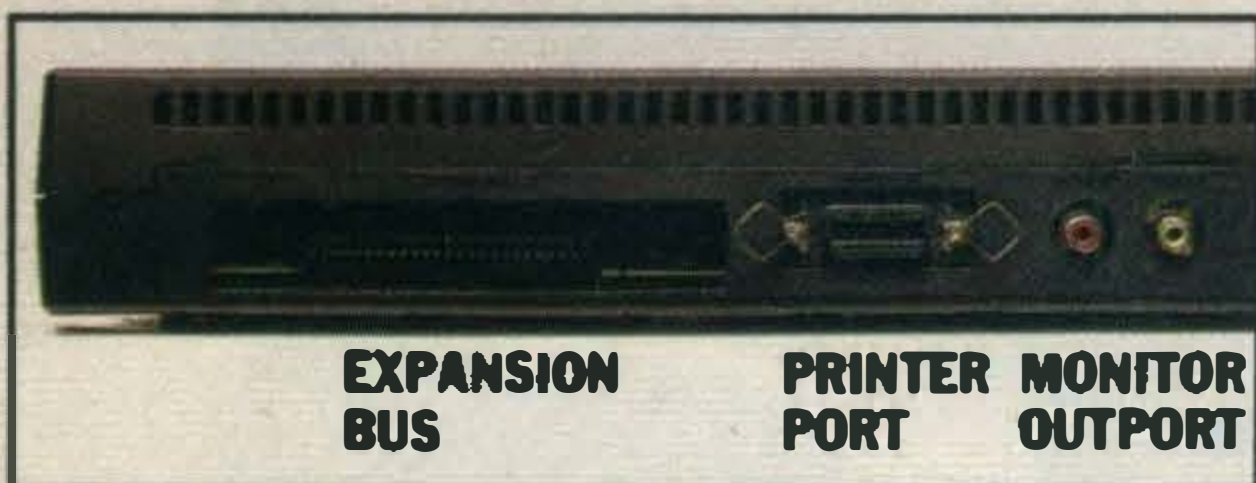
And those in the know will not be surprised that Mitsubishi are in the vanguard of the MSX movement. For, with the F-series, Mitsubishi offers everything that MSX is and more.

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.

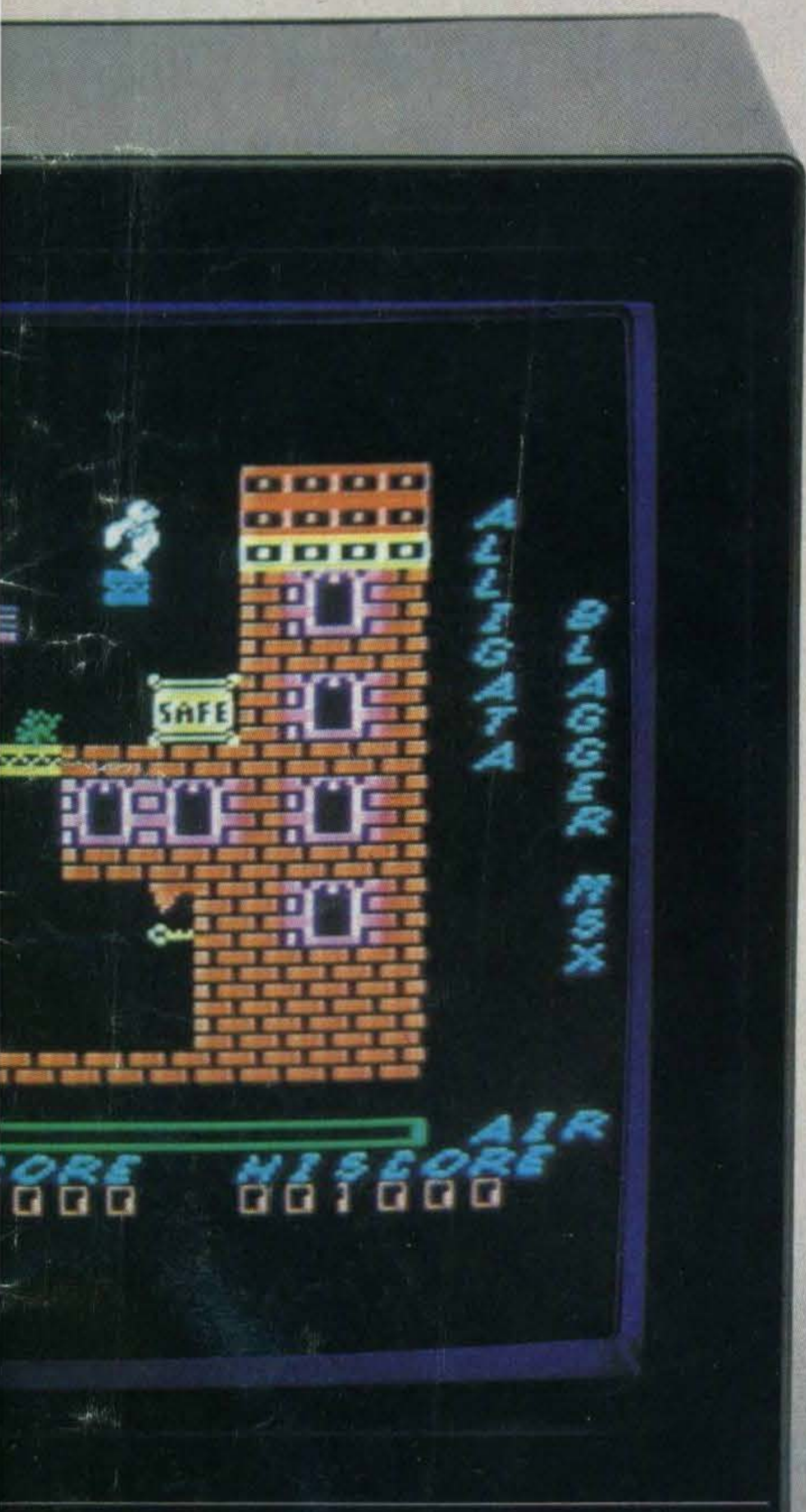


Mitsubishi Electric (UK) Ltd., Hertford Place, Denham Way, Rickmansworth, Herts WD3 2BJ. Tel: 0923 770000.

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 Amplifier
Screen Displays: *Text Mode: 40 columns x 24 lines *Graphics: 256 x 192 pixels Colours: 16 (15+ transparent) Sprites: 32 Output: RF, Composite Video	Cassette Interface: 1200-2400 baud Motor controlled by CPU
Keyboard: 73 moving-key keyboard 5 function keys Cursor control keys	Parallel Interface: Centronics Joy-Stick: 2 x 9 pin connectors Rom-Cartridge: 2 x 50 pin connector

*Subject to Scan of Monitor



ML-F80



ML-F48



MSX

MSX

MSXercise

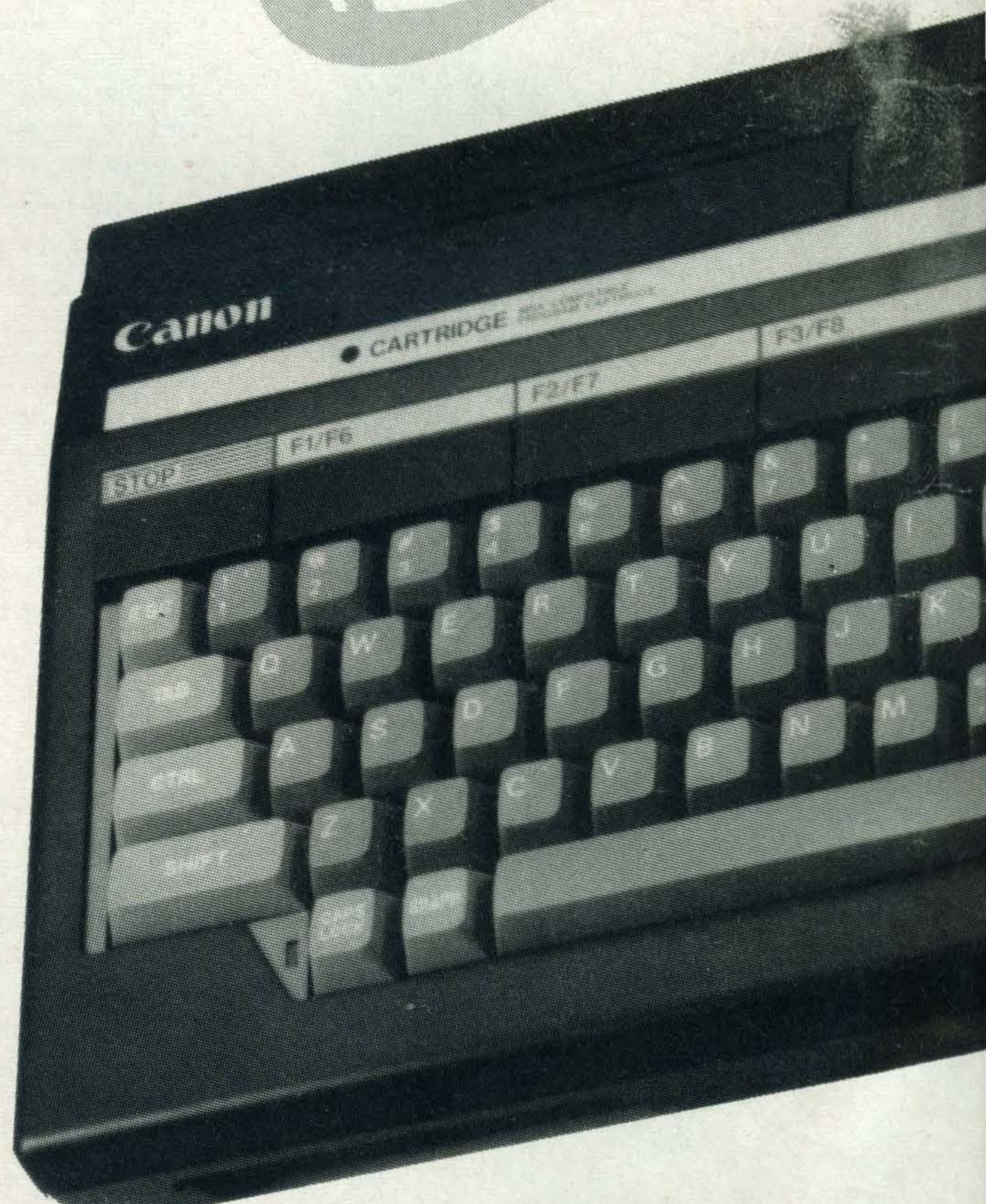
**Check *INSIDE* for info and tutorials
within the MSX standard**

This series of articles is for those readers who have little or no experience of programming in BASIC. The 'MSX' in MSX BASIC stands for MicroSoft eXtended BASIC. Microsoft is the name of the company that designed the language used by all MSX machines and their version (or dialect of BASIC) has been the standard BASIC used by most manufacturers for several years. For the new range of MSX computers Microsoft have extended their version of BASIC, adding new words that help to control the new standard graphics facilities incorporated into every MSX machine. Learning MSX BASIC will not only allow you to program your MSX computer but most other microcomputers that use BASIC. You can think of Microsoft BASIC as a core of instructions that all BASIC computers understand, other dialects of BASIC having extra commands peculiar to them. If you are totally new to programming then all this talk of instructions and dialects may not make a great deal of sense just now, but try re-reading it when you've followed the few simple programs we shall be looking at in this article. Let's get down to business, then, with our first MSX BASIC program.

First steps

After switching on your shiny new MSX machine you will see the friendly, reassuring word 'OK' appear on the screen. This means that the

computer is working correctly and waiting for you to tell it to do something. Unfortunately commands like 'Put the kettle on' or 'Dust the furniture' don't make a great deal of sense to a computer. It is a myth that



INSIDE

computers are clever. What they are good at is following simple commands in a language they understand. MSX computers understand BASIC and the dialect of BASIC they like best is, not surprisingly, MSX BASIC. Shouting BASIC commands at the top of your voice is also unlikely to motivate your computer into doing much for you. So, you must communicate your commands by typing them in at the keyboard. If you're like me and don't rate your typing skills too highly, then don't worry. I programmed computers for two years before learning to use two

```
10 REM MY FIRST PROGRAM
20 SCREEN 2
30 CIRCLE (100,100),50
40 GOTO40
```

If you have now typed this program in, you will be singularly unimpressed at the lack of action. This is because we haven't told the computer to RUN the program yet. (Everyone knows that computers RUN programs). All we've done is give the computer a short list of things to do and the order that they are to be

you should see a circle drawn somewhere on the screen. For a reason that will be explained shortly the program is still running so to stop the program press the CTRL and STOP keys together. This should get you back to a listing of your program. If not, type LIST and press RETURN. Let's look at what the four lines of this program do, line by line:

Line 10 – the word REM is a BASIC command and is short for REMark. This instruction is used if you want to make comments in your program or, as in this case, a title. Anything you write after a REM is ignored by the computer, so you can write anything you want provided that its legal, decent, honest and truthful!

Line 20 – SCREEN 2 tells the computer that you want to use screen 2. MSX has several different types of screen that are used for different types of display. Screen 2 is one of the screens that can be 'drawn on'. We'll talk about the other screens a little later on.

Line 30 – The command CIRCLE tells the computer to draw a circle on the screen. The two numbers that follow in a bracket tell the computer where on the screen the centre of the circle is to be placed and the third number is the radius of the circle.

Line 40 – Normally, when the computer runs out of program instructions to carry out, it stops running the program and returns the display to screen 0. This is the text, or writing screen. If we can keep the program running then we will be able to keep looking at screen 2, the drawing screen where the circle is. GOTO 40 tells the computer to GO TO line 40 and carry out the commands it finds there. As the only command it finds is GOTO 40 the computer will just keep chasing its own tail, repeatedly going to line 40. The only way to break out of this never-ending loop is to press the CTRL and STOP keys together. When you do this, the screen display will revert back to screen 0 and you should be

able to see a list of your program instructions.

We have now run our first program. Most programmers like to play around with programs that they've written, making small changes to see what happens. One of the nice things about writing programs is that it's easy to make changes. The simplest way is just to retype a line and press RETURN. so let's do that now. Type in:

```
30 CIRCLE (100,100),90
```

Type RUN and press RETURN and you should see a new circle on the screen. This one is much larger than the original because we've changed the third number (the radius) from 50 to 90.

Press CTRL and STOP to break out of the program and type:

```
30 CIRCLE (50,100),50
```

RUNning this version of the program will draw a circle the same size as the first one but its position on the screen will be different.

Variables

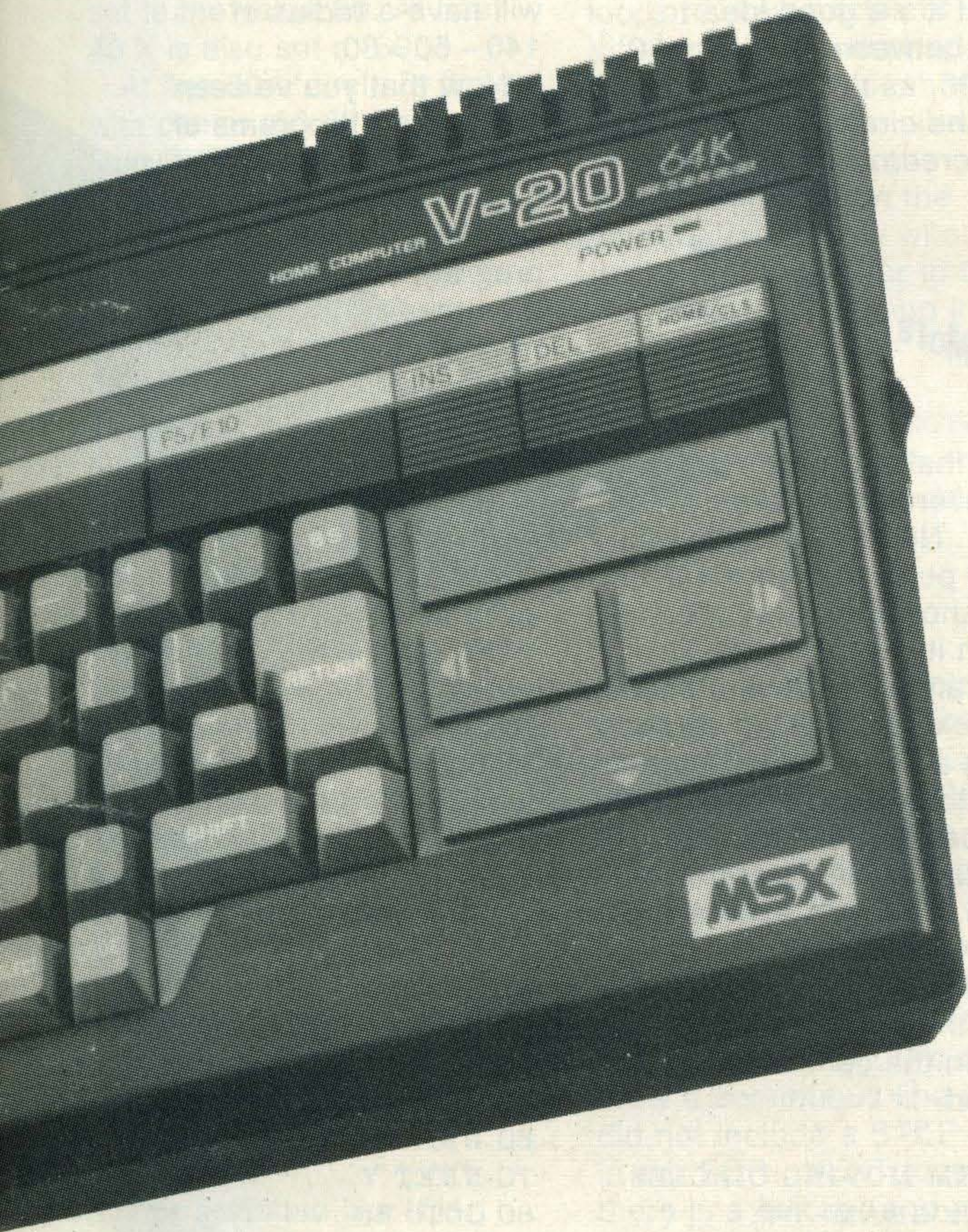
The word 'variables' means things whose value can vary. In this case those 'things' are letters and we can make letters stand for numbers by using the command LET. The following program does exactly the same as the first program but uses the letter 'R' to stand for the value of the radius. Line 25 sets the value of R to be 50. You may notice that line numbers don't have to go up in tens. We normally just start by numbering in tens so we can slot in any lines we have forgotten later. Type NEW and press RETURN to get rid of the first program and then type in this program.

```
10 REM VARIABLES
PROGRAM
20 SCREEN 2
25 LET R = 50
30 CIRCLE (100,100),R
40 GOTO40
```

You may well be asking yourself 'why use variables when this program does the

done in. (That's what the numbers at the beginning of each line are for!) Before the computer will actually try and carry out the instructions we have given it we must give it another command to start running the program. No prizes for guessing that this instruction is RUN. Type in RUN and press the RETURN key. If all goes according to plan then

fingers instead of one. Try typing in this program exactly as it's written here. Because computers are rather dim-witted they get upset if you miss out any commas (,) or brackets or leave out spaces! Every time you finish a line press the RETURN key before starting the next line.



same as the first'. If we want to use variables properly we should change their value during a program. Type NEW again and try this program:

```
10 REM BETTER VARIABLES
PROGRAM
20 SCREEN 2
30 FOR R = 50 TO 90
40 CIRCLE (100,100),R
50 NEXT R
60 GOTO 60
```

This program doesn't just draw one circle but 40! The first circle drawn by the program has a radius of 50, the second a radius of 51, the third a radius of 52 and so on until the last circle drawn has a radius of 90. The program works by repeating the circle drawing command on line 40 using different values of R each time. The two commands that do this are on lines 30 and 50 and form what is known as a FOR...NEXT loop. The computer's thought process goes something like this:

The first time it meets FOR R = 50 TO 90 the computer sets R to be 50 and then goes on to line 40 to draw the circle.

After drawing a circle radius 50, the computer moves on to line 50, NEXT R. This tells the computer to add one to the value of R, making it 51, and to go back to the FOR statement. The CIRCLE command is obeyed a second time but this time the circle drawn will have a radius of 51. On reaching NEXT R again the computer adds one to R, making R = 52, and goes back to the FOR statement to draw another circle and so on. Eventually, after drawing many circles, R will reach the value of 90. This means that the upper limit for R has been reached. The program will draw a circle with this radius before going past the NEXT R statement on to line 60.

You can see that any command placed between the FOR and NEXT statements will be carried out each time the program loops back for the next value

of R. The program we've written causes 40 circles to be drawn, all with the same centre, and with radius going up from 50 in steps of one. FOR...NEXT loops can be a bit cleverer than this. We can set the step-length between one value of R and the next. Changing line 30 to:

```
30 FOR R = 50 TO 90 STEP 5
```

will cause the radius of each succeeding circle to be 5 units bigger than the last. This will space out our circles a little. You may wish at this point to try experimenting with different step lengths, such as 10 or 2, but it's a good idea to stick between the limits 50 and 90, as this will ensure that the circles drawn fit on the screen.

More on variables and loops

Now that we have discovered the power of the FOR...NEXT loop, let's move on to put it to different uses and show the many ways in which it can be used. This program will draw a number of circles across the screen using a FOR...NEXT loop to alter the value of the first number that defines the position of the centre of the circle. This first number is the 'X' coordinate, and it tells the computer how far in from the left-hand side of the screen the centre should be placed.

```
10 REM MOVING CIRCLES
PROGRAM
20 SCREEN 2
30 FOR X = 60 TO 140 STEP 5
40 CIRCLE (X,100),50
50 NEXT X
60 GOTO 60
```

This program gives us a group of circles, all with the same radius, but different centres, forming a kind of tube on the screen. We can change the radii of the circles as well as the position of the centres to form a cone shape.

```
10 REM CONE SHAPES
PROGRAM
```

```
20 SCREEN 2
30 FOR X = 60 TO 140 STEP 5
35 LET R = X - 60
40 CIRCLE (X,100),R
50 NEXT X
60 GOTO 60
```

This time we are using a second variable, R for the radius. Every time the FOR...NEXT loop is done and a new value of X used, line 35 calculates a corresponding value of R. For example, the first time through the loop the value of X will be 60 and R will be calculated as $60 - 60 = 0$. The next time through the loop X will be 61 so R will be calculated as $61 - 60 = 1$, and so on. The final circle drawn will have a radius of $140 - 60 = 80$.

Now that you've seen some short programs of mine, try to write one of your own. Write a program that will draw a cone, as in the program above, but pointing the other way. [Hint: you have to change line 35]

Using two loops

It is possible to write programs with two or more FOR...NEXT loops running together. The program that follows shows this by using a loop with a variable called Y wrapped around another loop with a variable called X.

```
10 REM TWO LOOPS
PROGRAM
20 SCREEN 2
30 FOR Y = 60 TO 140 STEP 5
40 FOR X = 60 TO 140 STEP 5
50 CIRCLE (X,Y),50
60 NEXT X
70 NEXT Y
80 GOTO 80
```

RUN this program before you look at the explanation that follows. When trying to understand a program that has more than one loop it is best to remember the 'inside-out' rule. In this program the CIRCLE command on line 50 is at the 'centre' of the program. Outside that, forming a shell around it, is the FOR X...NEXT loop. Outside that is another shell, the FOR Y...NEXT loop. To understand the program start at the centre and work

outwards.

The circle command plots a circle with centre (X,Y) and radius 50. That bit's easy. The next layer is the FOR X...NEXT loop. This does exactly the same as it did in the 'MOVING CIRCLES' program, it draws a row of circles across the screen. The outer layer is the FOR Y...NEXT loop. This changes the vertical position of the circle drawn. You probably know (if you've run it!) that this program draws a number of rows of circles. Here's an explanation of how it works:

When the program is RUN and line 30 is reached, Y is set to the value 60. At line 40 X is also set to 60.

At line 50 a circle is drawn with centre (60,60).

At line 60 the NEXT X command adds 5 to X and then goes back to line 40.

Line 50 will draw another circle but this time the centre will be (65,60).

The computer will rattle around the FOR X...NEXT loop, drawing a row of circles until X reaches 140. After this, the computer will drop through the NEXT X instruction and come to the NEXT Y instruction. The value of Y has not changed since it was first set at 60, but now Y will be increased to 65 and the computer will go back to line 30. It then has to go through the FOR X...NEXT loop again, drawing another row of circles, but this row will have a different Y coordinate to the first. Still with me? Try running the program again to see what I mean.

Loops arranged like this, with one totally inside the other, are called 'nested' loops. FOR...NEXT loops must always be arranged like this. If one loop crosses over the other, as in the following example, then the computer can get very confused and will probably give up, causing your program to 'crash' (stop running because of an error). If you don't want your programs to crash then don't do this:

```
10 REM WALLY'S  
PROGRAM 1
```

```
20 SCREEN 2  
30 FOR Y = 60 TO 140 STEP 5  
40 FOR X = 60 TO 140 STEP 5  
50 CIRCLE (X,Y),50  
60 NEXT Y  
70 NEXT X  
80 GOTO 80
```

To see if you have really understood about nested loops try writing a program to draw columns of circles to fill the screen, rather than rows.

Other graphics commands

So far, we have only looked at the CIRCLE command and used variables and loops to draw circles of different sizes and shapes. There are other commands in MSX BASIC that allow us to draw lines or plot individual points on the screen. Let's apply what we've learned so far to these commands. Try typing in this program:

```
10 REM POINTS PROGRAM  
20 SCREEN 2  
30 FOR X = 1 TO 200 STEP 10  
40 PSET (X,100)  
50 NEXT X  
60 GOTO 60
```

The command PSET plots a point on the screen. There is another command PRESET that 'unplots' a point. (We can think of PSET as a command to turn on a point of light and PRESET a command to turn it off again). Using a FOR...NEXT loop plots a row of points across the screen. We could draw a continuous line if we did not include a STEP part in our FOR...NEXT loop but, there is a quicker and easier way of doing this. Change line 40 to:

```
40 LINE (0,0) - (X,100)
```

Running this program causes a number of lines to be drawn. Notice that they all start from one corner of the screen. This is the point (0,0). Each line is drawn between (0,0) and another point (X,100). The value of X is given by the FOR...NEXT loop.

This final program shows how much work can be done

by a few simple statements in MSX BASIC.

```
10 REM CURVES FROM LINES  
PROGRAM  
20 SCREEN 2  
30 FOR X = 180 TO  
0 STEP - 10  
40 LET Y = 180 - X  
50 LINE (X,0) - (0,Y)  
60 NEXT X  
70 GOTO 70
```

Notice that we can use negative steps in FOR...NEXT loops as well as positive ones. As the computer goes round the loop the value of X will decrease in steps of 10, eventually reaching zero.

Adding colour

CIRCLE, PSET and LINE can all be made to work with different colours. Up to now we have only used one colour to make the programs easier to follow. Sixteen colours are available on MSX computers and each is given a number (see page).

To make your MSX computer draw circles, points or lines in different colours, simply add the colour number of your choice onto the end of the drawing command you want to use. So, to draw a red circle, centre (100,100) and radius 50 units, we should use the command:

```
CIRCLE (100,100),50,8
```

A light green line can be drawn by:

```
LINE (0,0) - (100,100),3
```

and a point can be plotted in yellow using:

```
PSET (100,100),11
```

In the next part of the series we shall be looking at programming your MSX to make decisions and use words. In the meantime, experiment with the graphics commands and colour to draw your own pictures. Try using a variable to change the colour used. Experiment - you can't do any damage unless you drop your MSX down the stairs!

Got any programming problems? Hardware headaches? Graphics glitches? or anything else you can't figure out? Martin Edwardes is the man for you. Write to him.

If you're one of the lucky few to have an MSX micro already it's unlikely that you're having any really major problems so for this first issue I'll remind you about some of the simple precautions you can take to avoid most hardware hang-ups.

Setup

Always work with your computer, TV and tape deck on a firm base. If the computer is perched on your knees or moved around while in use you'll find that cables will work loose. Also, if problems develop, it's worth checking all the cable connections before giving up the ghost.

While we're on the subject of cables, make sure they

aren't draped all over the floor. Tripping up Granny will do neither her nor your MSX much good.

The tape deck

Your MSX computer can be used with any domestic tape deck, but remember that too cheap a deck will play at variable speeds. Computers need fairly stable signals and speed problems will make LOADING and SAVEing difficult. Also, don't use a deck that's too expensive or has been specially designed for audio use: computers use high-frequency tones and audio decks have mufflers to stop these. Don't use stereo decks: these are fine for LOADING and SAVEing your own tapes but their success with commercial software

will be variable due to the smaller stereo read heads. Finally, remember to clean and demagnetise your tape deck regularly.

When SAVEing programs remember to make at least two copies. There is nothing more annoying than finding that your masterpiece won't load because it was saved on a faulty tape.

Also, unplug the remote control on the tape deck when SAVEing. Different tape decks auto stop and start differently; usually this will not be important, but if you allow the maximum period for stop/start on loading (by not stopping when saving) this will cover most problems caused between different tape decks.

When loading always

check and adjust the volume. Tapes recorded on different tape decks will have different signal levels. Wrongly adjusted volume can cause misloading or complete failure to load!

Protecting your MSX

While your MSX computer will be able to operate continuously without switching off, this is not a recommended practice! When powering-down always switch off the computer before disconnecting the mains plug. It's better to cover your computer if it is not to be used for long periods, but this is not vital: MSX's are robust creatures. Beware drinks too close to the computer a careless hand can cause grief!

Electric SOFTWARE

A New Name to Generate Excitement!

BUZZ OFF!

32K MSX Cassette

Zoom around and eat as much delicious fruit as you can — it's as easy as that! — except that the spider's web grows alarmingly each time you take a bite!

If you avoid the web, you have the chance to steal the 'Golden Fruit' from right under the spider's nose.

Ten levels of hilarious arcade action with high resolution graphics and multi-channel sound.

Versions for Commodore 64 and 48K Spectrum also available.

SHARK HUNTER

32K MSX Cassette

The eskimo community is under attack! — Ice-floes sweeping downstream threaten to tear apart the flimsy nets which hold the vital fish stocks — while from the sea marauding sharks attempt to break into the pens and eat the fish.

Our hero must, single-handedly, melt the floes, kill the sharks and repair the nets to ensure that, at the end of the year, there is enough fish for his village to survive.

This highly animated arcade action game has high-resolution graphics and multi-channel sound.

Versions for other computers to follow

and coming soon!..

THE WRECK

32K MSX Cassette

An exciting 3D "Adventure" game — Danger and treasure abound as you swim around the sunken liner — and who knows what may be lurking in the murky depths . . .



**Electric
SOFTWARE**

Electric Software Ltd., 8 Green Street, Willingham, Cambridge CB4 5JA.
Dealer enquiries: phone Mike Hall on (0954) 81991.

A day at the sea-side for floating voter Mike Johnston

There I was. A wide-eyed Aussie walking the streets of London with a plastic bucket and spade, feeling like a right toss. (Struth, I thought, the shielas back home'll never believe this).

Seems this PR mob had sent them in the post along with an invitation for lunch in Juan les Pins to celebrate the UK launch of MSX. More important to me was the promise of 90 degree heat!

Why hold the UK MSX launch in the South of France?

Why not?

So there I was on me way to the airport, smug in the knowledge that I'd left behind an overworked, albeit very green (green? - Ed) editoress, a disappointed advertising manager and the bucket and spade; but none too sure what I'd be shovelling the next day.

8am isn't a pretty hour for most people anywhere in the world, but at Gatwick it must be one of the ugliest. Relieved I wasn't the only one to forget my bucket and spade (what about the photos? - Ed), I was herded with about 100 other dishevelled late-risers onto the "MSX EXPRESS". If you're thinking of impressing friends with lunch in the South of France, a 727 jet costs about £10,000 to hire for the day!

Ever had that nagging feeling that the pilot may have been into some of the free champagne handed out? Always one to look on the bright side, *especially* when flying, I put it down to ours just having a bad gag writer, judging by his Tannoyed repartee. I guess the friendly approach is to appease first-time flyers. It wasn't doing a thing for my white-knuckled neighbour.

If nothing else, the day proved that the companies behind the launch have plenty of faith in MSX - or at least its profit potential. They're prepared to stuff money up front.

Over-zealous guests, who did a quick check of the menu at the ritzy Hotel Juana, figured the day would have cost at least £30,000.

It's also understood that a double-page MSX launch ad has been taken in a top British journal at a cost of around £36,000.

I felt OK about accepting the free lunch.

Of course, there were those who unashamedly went just for the free tucker and a scoot 'round Juan les Pins.

"MSX doesn't mean a thing to me," one contented guest offered as he wiped remnants of the fifth course from his lips and headed off for some sighseeing.

One thing that even PR

boffins can't organise is the weather. Juan les Pins was overcast. London was sunny.

So there we were. Sitting in a restaurant decorated a la pots-of-money, where the glasses are never left empty and the table is swept after each dish, juggling five courses of unpronounceable fodder.

Someone had to say something to the table of smiling sales reps - other than collaring them about how to read the French menu.

"Competition between manufacturers?" offered one fellow ligger. It isn't something they seem concerned about. Besides, most of the companies involved don't just market computers. Competition is still stiff in their other fields, like TV, HI-FI etc.

You get the feeling that you're in the middle of a truce. 'Gloves on' outside of computers.

At last, fed and lubricated post-lunch, a chance to grapple with an MSX computer. A rare commodity (unless you're a software house). This magazine for one spent many hours sweet-talking over the phone begging to get hold of something, anything! It seems strange that we'll soon be swimmin' in 'em.

The day gave away little else that the world didn't



know or hadn't already heard about MSX. "The group doesn't discuss price, quantities, distribution and marketing," according to MSX Working Group representative Alan Kirkenry.

The Working Group, described as a "loose association" of normally fierce rivals, is in fact Canon, Hitachi, JVC, Mitsubishi, Sanyo, Sony, Teleton and Toshiba. This is the main eight, pulling together, coxed by the Grayling PR company.

The only real competition I could see between the companies was in packaging and what extras will or won't be thrown in with the overall price.

All eight previewed their product. Those we were able to get a hold of are reviewed in this issue.

For what it was worth, the launch could have been held in a central London hotel. Whether it caught "the flavour of MSX", as one exec put it, is another matter. But who am I to

knock a free lunch, let alone a jolly to the South of France.

Official and overheard hype:

"MSX opens the way for a new era of hardware and software innovation... the specification allows the manufacturer to personalise their own MSX machine. Some manufacturers have already built in specialist functions like speech synthesis, music synthesis, video editing capabilities,

graphics and robot control." Microsoft's general manager, David Fraser.

"Home computer confusion has come to an end..." Company rep.

"We want as many people as possible to have access to computers and we want them to be happy." Kay Nishi, Microsoft Japan.

"What are you doing tonight?" Guest under table, clearly enjoying the fresh sea air. (which guest and to whom? - Gossip Ed).

Why not?

MSX

Mark Jenkins kick starts the Yamaha combo

Manufacturer – Kemble-Yamaha, Mount Avenue, Eastern Industrial Estate, Old Milton
Keynes
Price – £549



YAMAHA CX5M

Of the many companies entering the MSX field, Yamaha are, typically, one of the most interesting and one of the most frustrating. The activities of their electronic musical instrument division have been known to drive previously well-balanced musicians to distraction as the company alternately

delighted them with the most exciting new range of instruments for years – the DX synthesizers – and devastated them with an astonishing lack of technical backup, spares and accessories.

Admittedly the situation has eased recently, but the news that Yamaha's MSX micro specialised in musical

functions caused a bad case of nerves in micro enthusiasts with contacts in the music world. Yamaha's internal politics appear to make relations between the computing and music divisions somewhat strained; and sure enough, the CX5 story has proved a long and complex one which is still far from a satisfactory conclusion.

Construction

Initial models of Yamaha's MSX micro seemed quite conventional, using a silver plastic casing, the familiar cursor key cluster and a top panel cartridge slot. The first models to carry the CX code, however, had a little something extra in the form of a special module screwed onto the computer's underside containing a version of Yamaha's DX9 synthesizer – of which more later. With or without synthesizer, the Yamaha also uses the conventional MSX sound chip, the AY-3-8910 with three voices and white noise and a range of 8 octaves.

The CX5, of course, uses the standard Z80 processor, has 32K of ROM, a disappointing 32K of RAM and 16K of VRAM. Graphics are 256 x 192 dot with 16 colours and weight is a hefty 2Kg. The CX5M (the version we examined) has a high-quality moving keyboard as opposed to the rubber keyboard of earlier versions such as the CX5F. The function keys are rather disappointingly small (compared to the Canon's generous layout for instance), but the keyboard's quite usable and the overall styling (apart from the use of black and grey as opposed to black and white keys) is almost identical to that of the JVC machine.

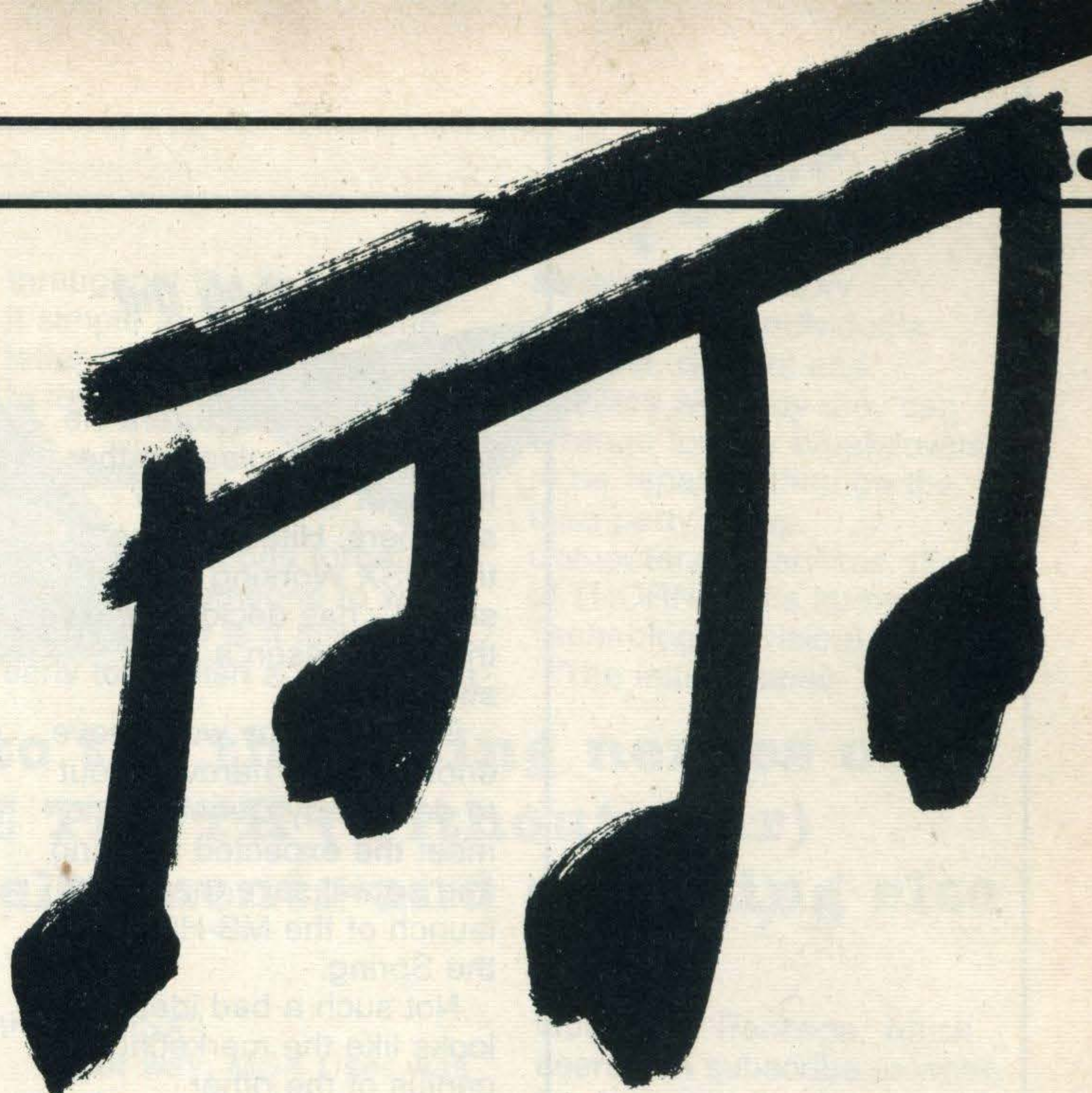
Some of Yamaha's major offences in the past lie in

improper implementation of standards, but in the case of the CX5 the MSX spec seems to have been closely adhered to (difficult to avoid with standard components – Ed). On the rear panel are sockets for power (which accepted its 13-way plug very loosely and was coupled with a very fragile slider switch on the review model), RF, Monitor, Sound, eight-pin Cassette connection, Printer and Expansion Port, while on the side are two joystick ports (which at least is one more than the system minimum). The rear expansion slot is protected by a removable (read; loseable) cover when not in use, and as previously mentioned the cartridge slot is on the top panel, where it's to be found on all the MSX designs so far apart from the Fujitsu and the JVC.

Operation

In use the CX5M is smooth and reliable. The implementation of the graphics specification seems perfect, with glowing colours and all the extended BASIC graphics commands being capable of extremely impressive effects. At power-up the standard MSX function key options COLOR, AUTO, GOTO, LIST and RUN flash up, with SHIFT options COLOR, CLOAD'', CONT, LIST and RUN as alternatives.

A quick look at Buzz Off!



from Electric Software showed that the graphics and animation capabilities inherent in MSX are fully implemented, although the system is capable of much more than collecting fruit and freeing the evil spider's intended breakfast! Standard Atari-type joysticks work quite happily and as an added bonus there's an LED built into the CAPS button to indicate when CAPS LOCK is on.

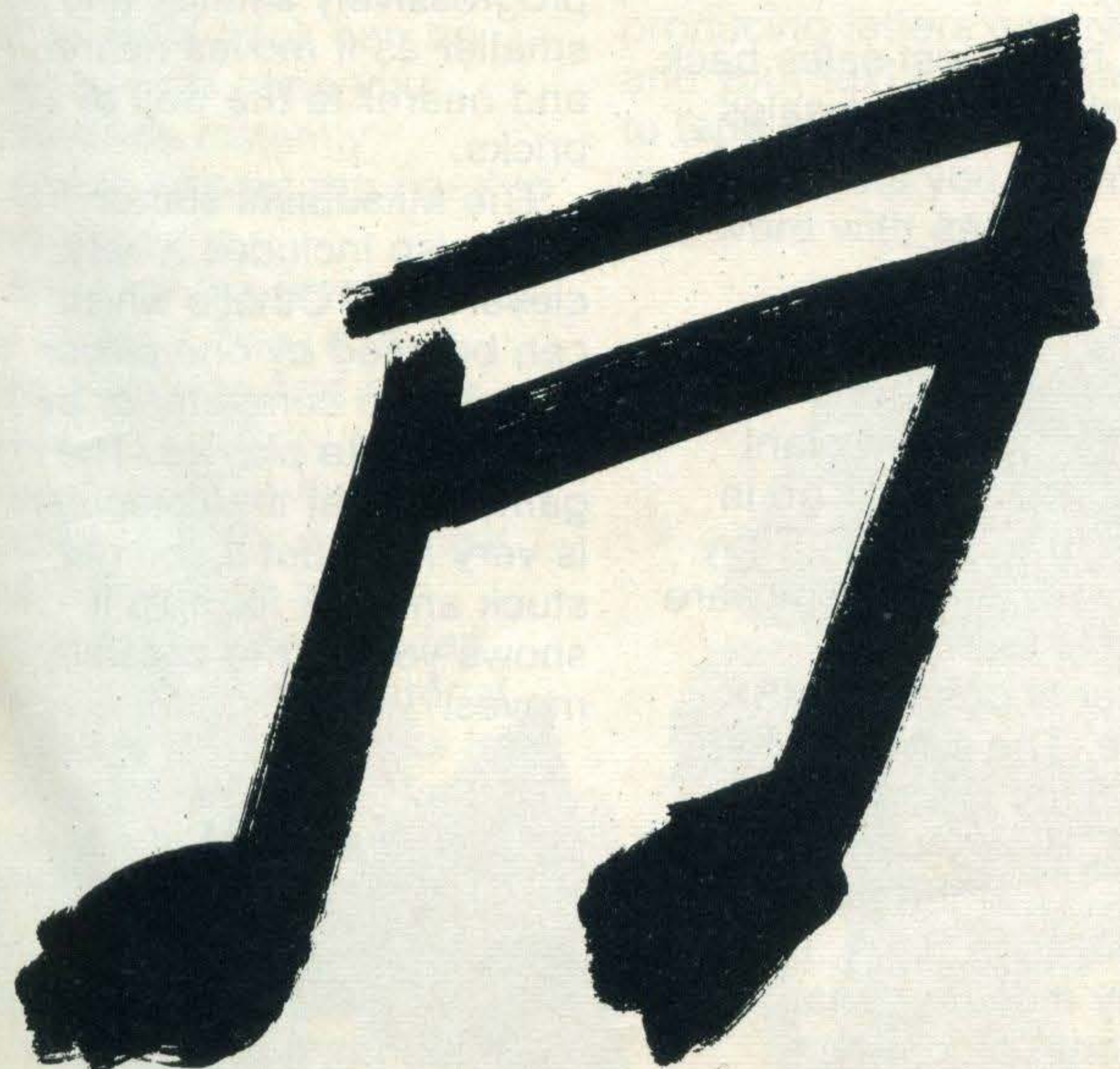
Most of the CX5M's major deviations from the standard MSX format centre around the synth module built into its underside. This can be removed by undoing a single large screw and sliding the flat plastic module out; it's not clear yet whether Yamaha will be marketing a version of the computer with a blank plastic panel instead of the synth module, but if they did presumably it wouldn't be a music computer so they'd have to scratch the name off the front panel and knock a couple of hundred off the price.

The module itself has five sockets which appear on the left-hand side of the computer – these are a twenty-pin multiconnector to a miniature music keyboard (almost certain to be supplied with the computer), a pair of MIDI (Musical Instrument Digital Interface) DIN sockets (for interfacing musical instruments with the CX5 MIDI system, which includes the synth module)

and a pair of phono audio outputs (left and right stereo), quite distinct from the audio output for the built-in sound chip, giving high quality, low noise signals out.

Software

So far there are four Yamaha cartridges for the music computer; two are composition packages and the others are sound library/editors for the DX7 and DX9 professional synths. These have caused quite a stir in the music world, since the sonic potential of the CX5's little module exceeds that of an £800 DX9 synthesizer. For those with little interest in music this is the point where details of the FM synthesis system, the advantages of Step Time and Real Time composition and the economic niceties of modular synthesis cause the eyes to glaze over, in which case it's sufficient to conclude that the Yamaha MSX without the synth module gives every indication of being a good buy when and if it appears on the UK market, presumably at a price comparable with other MSX's. For the musically inclined, however, it's worth going into a little more detail on what may be the first home micro to stand a reasonable chance of putting you on Top Of The Pops (see INSIDE – CX5M Music, page 88).



PULSE

Hitachi Holds Out

While major MSX manufacturers vie for a place in the hearts of British Xmas shoppers, Hitachi – one of the MSX Working Group seven – has decided to give the silly season a body swerve.

The company won't have enough of its hardware out to dealers by December to meet the expected demand and so will save the official launch of the MB-H80 until the Spring.

Not such a bad idea as it looks like the marketing genius of the other companies intending to cash in on the traditional festive spending spree will be thwarted by the fact they won't be able to meet demand either.

Says Hitachi's marketing and sales director, Leslie Burrage: "Our pre-Christmas allocation from Japan will be less than expected which means we will be able to supply only a fraction of our potential customers."

They figure that if they miss the Xmas 'show' its better to wait until June to launch, when machines and peripherals will be aplenty – and shoppers will be over the shock of their Xmas overdraft. Also the Hitachi will be £199 – the cheapest so far!

Hitachi will still play a major promotional role as part of the MSX Working Group of companies including Canon, JVC, Mitsubishi, Sanyo, Sony and Toshiba, all of whom have already launched but, in some cases, expect to have less than 10,000 machines in the UK by December 25.

Meanwhile

The race amongst the MSX suppliers to be first in the shops was won by Toshiba who delivered thousands to Currys, Dixons, and many independent shops during the last 10 days in September. Their HX-10 model has a total memory of 112K, comprising 32K of ROM for the Basic, 64K of RAM and 16K of VRAM. Each Toshiba comes packed with the TV lead, cassette cable and a five program starter pack. The programs demonstrate all the colours and show how to use the Toshiba for education and games. My younger sister's multiplication has improved no end with the Junior Maths program!

Where MSX?

MSX User staff hit the PCW show en masse at Olympia in September feeling like miners at a police benefit. No books, a smattering of software and a lone Micro Dealer Goldstar FC-200 computer summed up the non-representation of the new standard at the country's leading personal computer turn out.

It's all well and good to spend 30 grand launching MSX but what about the hundreds of thousands of poor souls who flocked to the five-day show but can't afford lunch in the South of France?

Let's hope post-sales back up is better than pre-sales support.

On Tour

Thorn-EMI, the entertainment giant has decided to go in for MSX in a big way. They now have a team of software specialists touring the computer shops with MSX software. The entertainment titles include Eric and the Floaters, Binary Land, Fire Rescue, a Communications Package, Data Bank, and probably most important, educational programs – Teach French, Teach

Spanish, and Teach German.

One of the most infuriating games from Thorn-EMI is "Blogger" which was created by software house Alligata. As the name suggests the main character in this program is a thief who has to negotiate moving platforms and burglar alarms, find special keys and cross a stack of obstacles before completing a successful robbery.

Just two Good

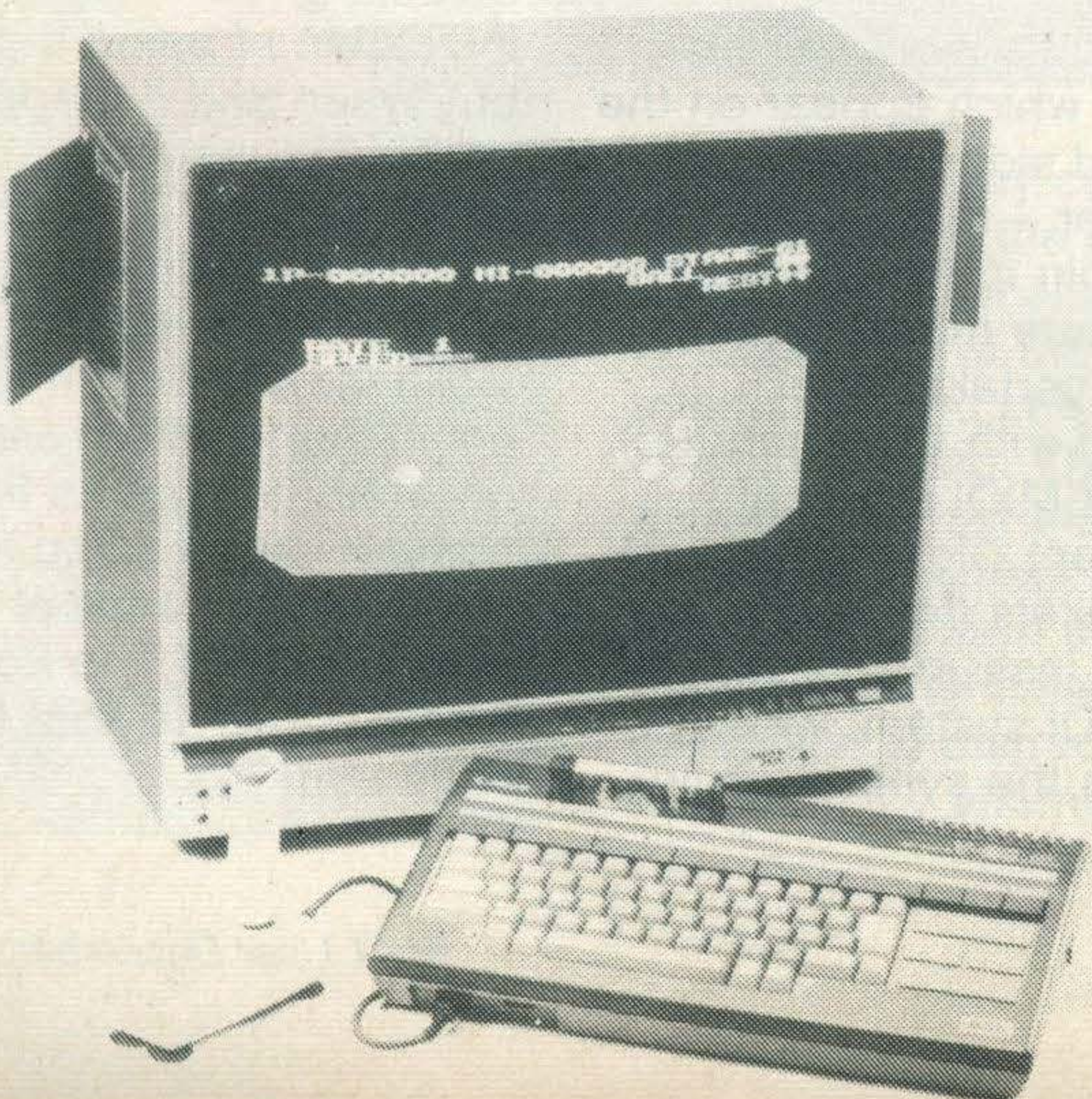
Mitsubishi have decided to release two models in the UK – one has 32K RAM and the other has 64K of RAM. Both models give 28815 free for BASIC and it must be remembered that on MSX the amount of memory free does not reduce as you use all the colours or the high resolution graphics. MSX is very clever – check the amount of memory available on other micros when you use 16 colours.

Each Mitsubishi has a double cartridge slot and every computer is supplied with a starter pack of programs. These include a great demonstration of programming the 32 MSX sprites so that trees can be drawn dimensionally from the background to the foreground and an aeroplane can fly in front of the sun and behind a hill. The pack includes "Smashout" which looks like a Breakout type game, but the bat gets progressively smaller and smaller as it moves nearer and nearer to the wall of bricks.

The Mitsubishi starter pack also includes a very clever MSX Othello which can be used by one player against the computer or by two separate players. The game against the computer is very hard but if you get stuck and ask for help it shows you all the possible moves.

See the Light

Sanyo released their MCP100 model last month; it too has a total memory of 112K and all



the usual MSX goodies like the two joystick sockets, a printer interface plus an optional light pen. The light pen is great and really easy to use as it just plugs into the cartridge slot. The screen then becomes your canvas and you simply select a colour and point the pen at the screen. You can

MSX Network

At the recent launch of MSX computers, in the South of France, Basil Lane demonstrated the MSX Network. Using a Kuma RS232 serial interface and a modem, journalists were able to see network communication established

throughout the text – makes it simple to send the same letter personally addressed to lots of different people.

Bookless

Did someone forget to ask someone to write one or is it just too early to publish a book about

several introductory packages for individuals, schools, dealers and retailers whereby they can arrange for any breakdowns to be repaired through the third party group, Computeraid Services. (Part of THORN-EMI's Information Technology Division). The initial Repair-

Fingers fearlessly plunged into the throbbing nerves of MSX we fearlessly report THE TRUTH (without fear) about launches, sinkings, developments and anything else that we can be fearless about.

draw anything from a single dot to a huge block of colour. If you make a mistake you just rub it out with the pen. Within a few minutes, it is possible to learn to draw lines, fill triangles and circles with colour, and begin to become a computer artist. After about 30 minutes of practice the pictures drawn with the light pen are really good. The Sanyo MSX is supplied with a starter pack of four programs including a typing tutor to help newcomers to learn the keyboard and two great games "Exploding Atoms" and "Vicious Viper".

between MSX users in London, San Francisco and Nice. Look out for further news.

The Kuma Process

Dr Tim Moore and his staff at Kuma computers have been busy making all sorts of programs for MSX. One of the most interesting is their WDPRO, an easy to use word processor. It can be used with the ultra fast Toshiba HX-P570 which prints 105 characters in a second or with either the Toshiba or Sony plotter/printers.

Most wordprocessors use complex codes which take ages to learn. WDPRO uses easy codes like /p for a new paragraph and /d when you want double size letters for headings. /r79 means print 79 characters to the right and if you enter /j all subsequent text is right hand justified. WDPRO is great for producing letters and reports and your text can be saved to tape for future use. The /rep code lets you replace one word with another

things MSX?

Either way, MSX User was only able to find two tomes. One, by Century Communications, is MSX-An Introduction, by Jonathon Pearce and Graham Bland which has been out for a few months and is reviewed in this issue.

The other is believed to be sitting on a desk at Melbourne House. We were promised an unbound, original copy to review but somebody seems to have forgotten us. Oh well, them's the breaks.

No Worries – It's Fixed!

Ever felt like dealers plan their warranty to run out the day before something major goes wrong with your computer? Well worry no more MSXers.

A Micro Repair Club backed by one of the UK's largest independent maintenance companies has been formed to take up where the dealers' warranty leaves off.

The club has put together

Guarantee Package, which users can subscribe to when the manufacturers' warranty runs out, can run for a year minimum (£24.95 inc VAT) or for up to four years (£57.95 inc VAT). Schools with more than one micro can pay an initial £24.95 to cover all machines. Dealers and retailers will also get special deals for introducing customers.

If you'd like to know more about the Micro Repair Club ring Simon Jamison (01 946 7777) or Jim Anderson (0990 27111).

Wanted

The Activision Software Club wants you. In its second year, the club has titles ready for MSX and now manufactures cassettes, disks and cartridges for most major home computer systems.

Not only is membership free but you get a quarterly magazine and achievement prizes, won by sending in photos of on-screen scores. For details contact Kathy Leonard or Lorraine Vick on 0628 75171.

Disk Standard

A little bird tells us that the MSX Working Group have decided to make SONY'S 3½in disk drive the standard for MSX.

Most users, not to mention Sony, are generally pleased with the decision made at a meeting of the Group in the first week of October.

However, one lot who won't be too pleased is Hitachi, who intend to put out a 3in disk.



Sony's Smash

The Sony MSX model called the Hit Bit, has two cartridge slots and a special extra 16K ROM which holds a personal data bank program. This built in program keeps names, addresses, appointments, etc. A special optional 4K CMOS RAM pack can be plugged in to keep your information instantly available without the need to load a cassette.

Sony are the first to bring out an MSX disk, it uses their 3.5in size and has a formatted capacity of 360K – more than three times the storage of some other disk units. The disks have a metal sleeve which slides over the magnetic material to protect your programs from accidental damage. The disks themselves are not at all floppy like their older style predecessors. Stock control and accounts programs are already available on MSX disks.



software that's hard to beat...

MSX

TASWORD MSX The Word Processor

The highly acclaimed Tasword word processor is now available for MSX computers – Tasword MSX. The typewriter quality keyboards makes the MSX machine ideal for word processing and with Tasword MSX your MSX computer becomes a professional standard word processor.

Tasword MSX gives you up to 64 characters per line on your screen. This is ideal for standard A4 paper and TASWORD MSX prints your text just as it appears on the screen.

TASWORD MSX can drive full width printers via the MSX printer output port.

TASWORD MSX comes complete with a comprehensive manual and cassette. The cassette contains TASWORD MSX and TASWORD MSX TUTOR. This teaches you word processing using TASWORD MSX and allows you to explore and discover the powerful facilities that TASWORD MSX gives you.

Whether you have serious applications or simply want to learn about word processing, TASWORD MSX and TASWORD MSX TUTOR make it easy and enjoyable.

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ZX Spectrum MSX Amstrad CPC 464

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PASCAL

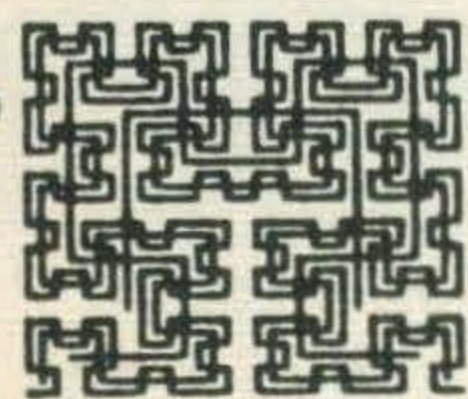
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A powerful and virtually full implementation of Standard Pascal. A valuable educational and development tool in an incredibly small size (19K) for such a complete language compiler, compiles directly to Z80 code which executes very quickly, typically at least 40 times faster than the BASIC equivalent. INTEGERS, REALS, CHARs, ARRAYS, SETs, RECORDs, POINTERs, IF . . . THEN . . . ELSE, CASE . . . OF, WHILE . . . DO, REPEAT . . . UNTIL, FOR . . . DO, fully recursive procedures and functions, value and variable parameters etc. etc. So much that you will not believe it. You MUST write for details.

DEV PAC

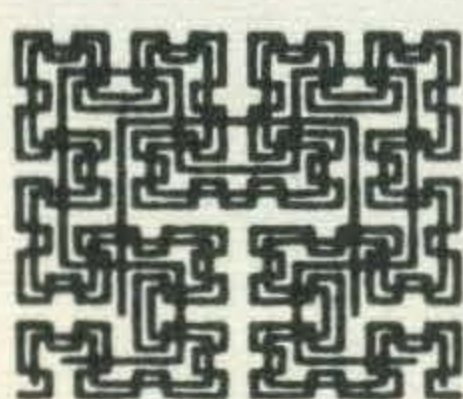
£19.95

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



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MSX

SOFTWARE

All prices, UK delivered, relate to MSX versions. Our software is available for many other Z80 machines e.g. Amstrad CPC 464, ZX Spectrum, Memotech, SHARP MZ700, NewBrain, CP/M etc. Please write for details.

We raise the standard – Graham Knight pulls the strings...

This series takes a closer look at the MSX standard. Over the next few issues I'll be describing all relevant features. This month we take a look at screen display handling, cassette interface and joystick ports.

Each MSX micro contains an extended version of Microsoft Basic in ROM. Switching on a typical MSX micro boots the BASIC, which occupies 32K of memory from 0000H to 7FFFH. The computer then finds the largest continuous block of RAM from FFFFH down to 8000H and assigns this for program and data storage. All MSX micros start up with white letters on a blue background. The following is displayed at the top left:

```
MSX BASIC version 1.0
Copyright by Microsoft
28815 Bytes free.
Ok
```

The start up display mode is SCREEN 0 (detailed later) and line 24 of the screen displays the words:

colour auto goto list run

to remind users of the initial definitions of the five function keys. This line changes to show:

color cloud cont list; run

when the shift key is pressed.

Function keys 1 to 5 become F6 to F10 when pressed with shift. This visual reminder of the key definitions can be switched off and on with the KEYOFF and KEYON commands.

Screen display

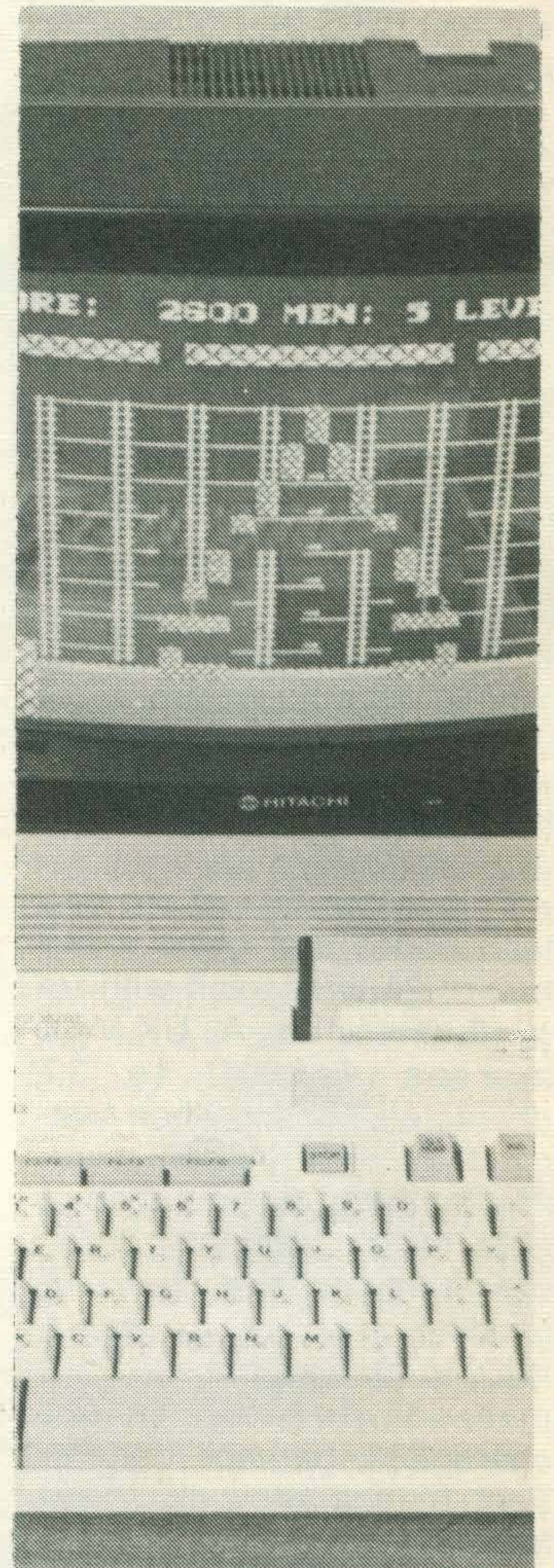
All MSX micros have 16K of built-in video RAM which is separate from the main memory, there is no reduction in the amount of memory free when you are in high-resolution or multi-

colour modes. There are four screen modes which are specified by the first parameter of the SCREEN command.

The 16 colours available are:

- 0 transparent
- 1 black
- 2 medium green
- 3 light green
- 4 dark blue
- 5 light blue
- 6 dark red
- 7 cyan
- 8 medium red
- 9 light red
- 10 dark yellow
- 11 light yellow
- 12 dark green
- 13 magenta
- 14 grey
- 15 white

Program 1 displays bars of all the 16 colours on the high-resolution screen. After a short delay, the computer returns to the text mode.



● Program 1 – displays bars of all 16 colours

```
100 COLOR 15,1,1:SCREEN 2
110 OPEN "GRP:"AS#1
120 PRESET (35,5)
130 PRINT #1,"A CORRECTLY ADJUSTED SE
T"
140 PRESET (35,15)
150 PRINT #1,"SHOWS 15 COLOURS & BLAC
K"
160 CLOSE #1
170 FOR G%=2 TO 15
180 COLOR G%
190 LINE (G%*16-15,30)-(G%*16,184),,B
F
200 NEXT G%
210 FOR D%=1 TO 12000:NEXT D%
```

Character set

Microsoft have obviously given a great deal of thought to the character set as it con-

tains all the usual letters and figures plus many languages, scientific, game and graphic shapes. The German umlauts, french accents, circumflexes and mathematical

symbols will be especially popular with schools.

Program 2 displays all the 256 characters on the screen.

● **Program 2 — shows all 256 characters**

```
100 COLOR 15,4,4:SCREEN 1
110 FOR F%=0 TO 19
120 FOR J%=0 TO 13
130 IF F%*14+J%<256 THEN VPOKE &H1842
+F%*32+J%*2,F%*14+J%
140 NEXT J%,F%
```

Screen 0

This is the first of the two text modes and gives a format of 24 lines each with up to 40 characters. All UK MSX micros default to 37 characters per line when switched on. The WIDTH command resets the number of characters per line. It is possible to get the full 40 characters by entering WIDTH 40. All Japanese MSX micros default to 40 characters, perhaps our Far East friends know that very few UK TV sets have a picture width control which can be adjusted by the customer and that many TVs therefore "overscan".

Each character displayed in this mode is made up to 6x8 pixels. The built-in character set stores 8x8 pixels, but in this mode the right-most 2 columns of pixels are not displayed. When the screen mode is changed to 0 or 1, the character set is copied from ROM (Read Only Memory) to RAM (Random Access Memory) so this makes it possible to redefine any of the 256 characters. This feature allows special characters to be displayed without going into high-resolution mode. Two of the sixteen colours can be used in this screen 0 mode — one for foreground and one for background.

Screen 1

This is the second of the text modes and gives a format of 24 lines each of up to 32 characters. Again the switch-on default width is less than the maximum possible — the default for screen 1 is 29

characters per line. To get the full number of characters per line enter WIDTH 32, but on nearly all UK TVs the left-most character would be off

the edge of the screen.

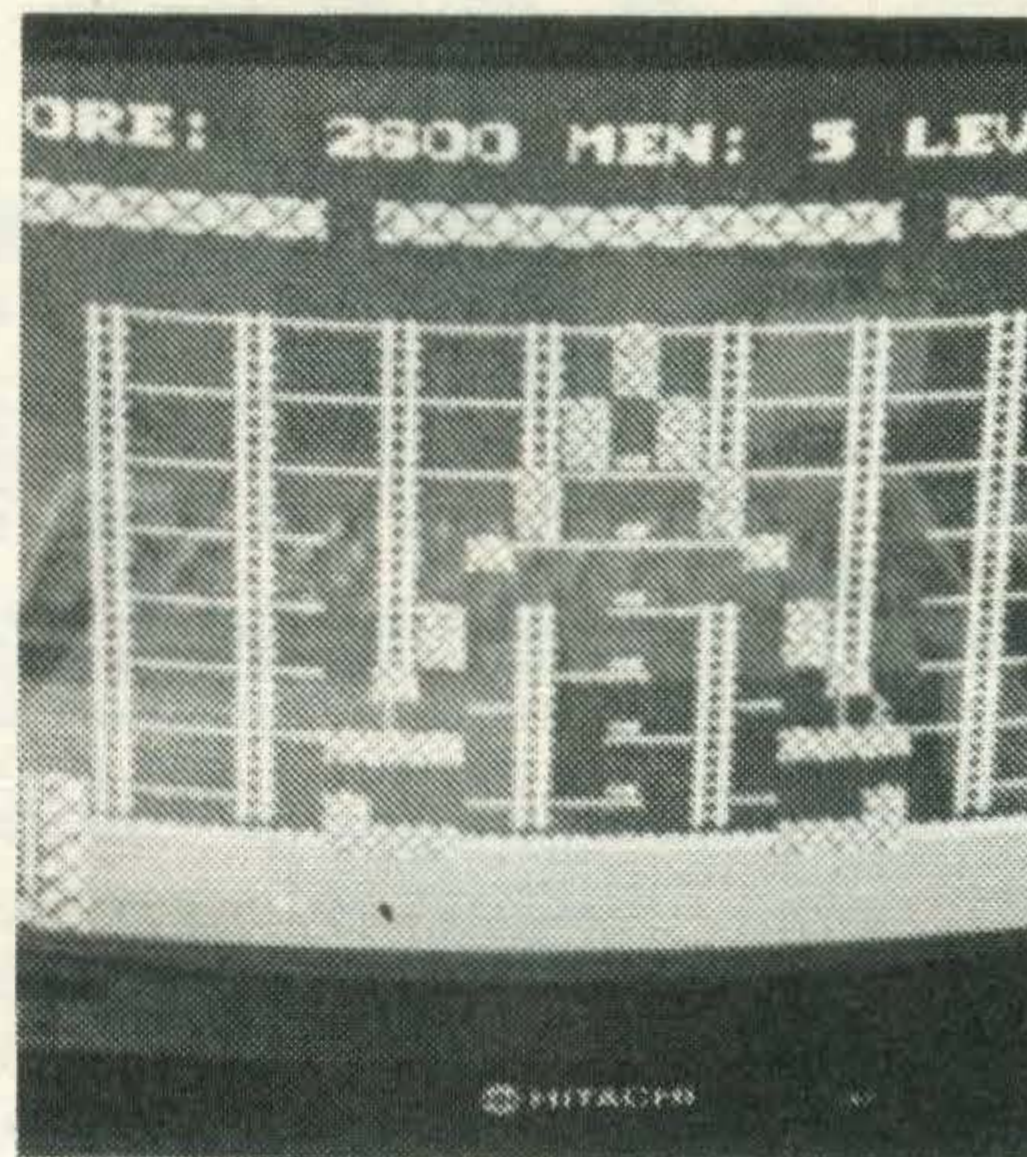
The MSX specification defines the use of the two colours in SCREEN 1 mode. In later issues of MSX User, we will describe a programming method which allows all 16 colours to be displayed in this mode. At present the character set is split up into 32 groups of 8 characters with the foreground and background colours giving the two colour display. Our method will show how to alter the foreground and background colour of all these 32 groups.

Remember it is also possible to redefine the shape of each character in screen 1 mode.

Screen 2

This is the high-resolution mode which has 256x192 Pixels definition. All 16 colours can be displayed at the same time. The horizontal colour resolution is 8 dots which means that in every group of 8 adjacent horizontal dots, there can only be one foreground colour and one background colour. Any two of the 16 colours can be used for each group of 8 dots. The vertical colour resolution is one pixel, therefore any of the 16 colours can be placed next to each other vertically. There are many commands for creating hi-resolution patterns and they are all very flexible.

Program 3 demonstrates the speed of the computer and also shows all the colours. First the computer is put into SCREEN 2 (hi-res modes) and then 100 boxes of random sizes and colours are displayed.



There is a command which allows printing of normal text on the hi-res screen. As the text can be placed anywhere on the 256x192 grid, this allows much greater control over where it is printed than in either of the text modes.

Sprites

MSX computers can display up to 32 sprites at the same time and can remember up to 256 'sprite patterns'. Sprites are combinations of characters whose shape, colour and position can easily be defined. They can be placed much more exactly than standard characters can and there are built-in collision detection routines for them. There are four sprite modes, these are specified by the second parameter of the SCREEN command.

The 4 sprite modes are combinations of large or small sprites and magnified or unmagnified sprites. The modes are as follows:

● **Program 3 — demonstrates the speed of MSX computers**

```
100 COLOR 15,1,1:SCREEN 2
110 FOR F%=1 TO 100
120 LINE (RND(1)*250,RND(1)*190)-(RND
(1)*250,RND(1)*190),RND(1)*14+2,BF
130 NEXT F%
```

Screen 3

This is the multi-colour mode and has 64x48 resolution. Each of the 3072 pixels on the screen can be in any of the 16 colours.

When text is printed to this screen, all the pixels that make up the characters turn on one of the SCREEN 3 pixels which are equivalent to a square of sixteen SCREEN 2 mode pixels. Since the letters are made up of 8x8 dots, and the screen has 64x48 pixels, you can get 6 rows of eight characters in this mode. This is useful for title pages etc.

Program 4 draws 200 lines at random positions on the screen and shows the size of the pixels in the SCREEN 3 mode.

● **Program 4 — draws 200 lines and shows SCREEN 3 pixel sizes**

```
100 COLOR 15,1,1:SCREEN 3
110 FOR F%=1 TO 200
120 LINE (RND(1)*256,RND(1)*192)-(RND
(1)*256,RND(1)*192),RND(1)*15+1
130 NEXT F%
```

- 0 : 8x8 unmagnified
- 1 : 8x8 magnified
- 2 : 16x16 unmagnified
- 3 : 16x16 magnified

these refer to the number pixels that make up the sprites e.g. a mode 2 sprite has 16x16=256 pixels. Magnified means that every pixel is expanded to the size of a square of four pixels.

When using an 8x8 size, the computer can store up to 256 sprite patterns. When using 16x16 this is reduced to 64. Remember — only 32 sprites can be displayed at one time.

Program 5 shows a sprite in the shape of a knight bouncing off the edges of the screen. To stop the program press the CTRL and STOP keys at the same

time. Try changing both '1's in line 160 '2' and note that the sprite moves faster.

2,400 baud and can have filename of up to six characters. At switch-on the

● **Program 5 — a knight-shaped sprite bounces off the screen edges**

```
100 COLOR 15,1,1:SCREEN 2,3
110 S$="":FOR F%=0 TO 31:READ A$
120 S$=S$+CHR$(VAL("&H"+A$)):NEXT F%
130 SPRITE$(0)=S$
140 DATA 0,1,6,1D,2A,2A,2A,1F,4C,F7,F
0,18,7,2,3E,FE,1B,8F,65,11,C9,A9,B1,F
3,7F,9F,31,41,81,81,F9,FD
150 X%=128:Y%=96
160 XS%=1:YS%=1
170 PUT SPRITE 0,(X%,Y%),13
180 X%=X%+XS%:Y%=Y%+YS%
190 IF X%<0 OR X%>210 THEN XS%=-XS%
200 IF Y%<0 OR Y%>156 THEN YS%=-YS%
210 GOTO 170
```

The cassette interface

Each MSX microcomputer has the same cassette recorder interface system. A standard 8-pin DIN socket is used to connect the micro to any audio recorder. The connections are shown in figure 1 for those wishing to make up their own leads. Ready made cables are easily obtained and these are usually supplied with red, white and black plugs which connect to mic, earpiece and remote sockets respectively on the cassette unit.

Once the remote lead is connected, the record and play functions of the recorder are controlled by the computer. The commands MOTOR ON and MOTOR OFF are used to switch the remote on and off. The command MOTOR on its own will slip the state of the motor — if it was on it will be turned off and vice versa. This is useful if the remote lead on the recorder being used also controls the fast forward and rewind buttons as they can then be used without having to unplug the remote lead.

The cassette uses the well known Frequency Shift Keying (FSK) modulation method and programs can be recorded on tape at 1,200 baud or

default rate is set to 1,200 baud and at this rate a 10K program is SAVED to tape in 104 seconds. The same program SAVES in just 58 seconds at the higher baud rate, often known as 'turbo' SAVE.

The following is the syntax for storing a program on tape:

```
CSAVE "Test 1"
```

This will SAVE the BASIC program currently in memory to tape at the default baud rate. To change the baud rate, a one or a two can be added to the end of the command as follows:

```
CSAVE "Test 2",2
```

This saves the program at the faster 2,400 baud rate.

We have already explained what the first and second parameters of the SCREEN command do (set the screen and sprite modes). The default baud rate can be changed by the fourth parameter of the SCREEN command. The example below sets the default to 2,400 baud.

```
Screen ,,2
```

Note that it is possible to miss out all the previous

parameters and just change the baud rate.

To retrieve programs that have been stored with CSAVE, the command is CLOAD. Typing CLOAD [RETURN] instructs the computer to retrieve the next program on the tape. If a particular program is required, a filename can be specified e.g.

```
CLOAD "Test 2" [RETURN]
```

When LOADING programs, the computer automatically checks whether the program was saved at 1,200 or 2,400 baud.

A third option is to SAVE a program to tape as an ASCII file — this takes 222 seconds for a 10K program. An ASCII file consists of the program 'untokenised' — the BASIC keywords are saved in full instead of using internal codes for the keywords. An ASCII file is saved in blocks which consist of a header tone followed by the data. This allows the computer to switch the motor off and on when a file is being loaded.

The following command will save a program as an ASCII file:

It is possible to use the 2,400 baud option with this command but since the header tones are not SAVED at double speed the time taken to store the program is not reduced as much as with the CSAVE command. To store an ASCII file the higher baud rate, the SCREEN command has to be used to change the default rate as ',2' cannot be added to the end of the SAVE command. Programs are normally only saved in ASCII format so that they can be joined to another program using the MERGE command.

```
Save "Test 3"
```

Merging programs

The MERGE command differs from the APPEND command on other computers in that we as well as being able to 'join' one program onto the end of another, MERGE can also, as the name suggests, 'merge' program lines together.

Programs 6 and 7 are two separate programs. To MERGE these programs, clear the memory by typing

NEW [RETURN] then type, in program 7 and SAVE it to tape as ASCII file using: SAVE "PROG 7" [RETURN].

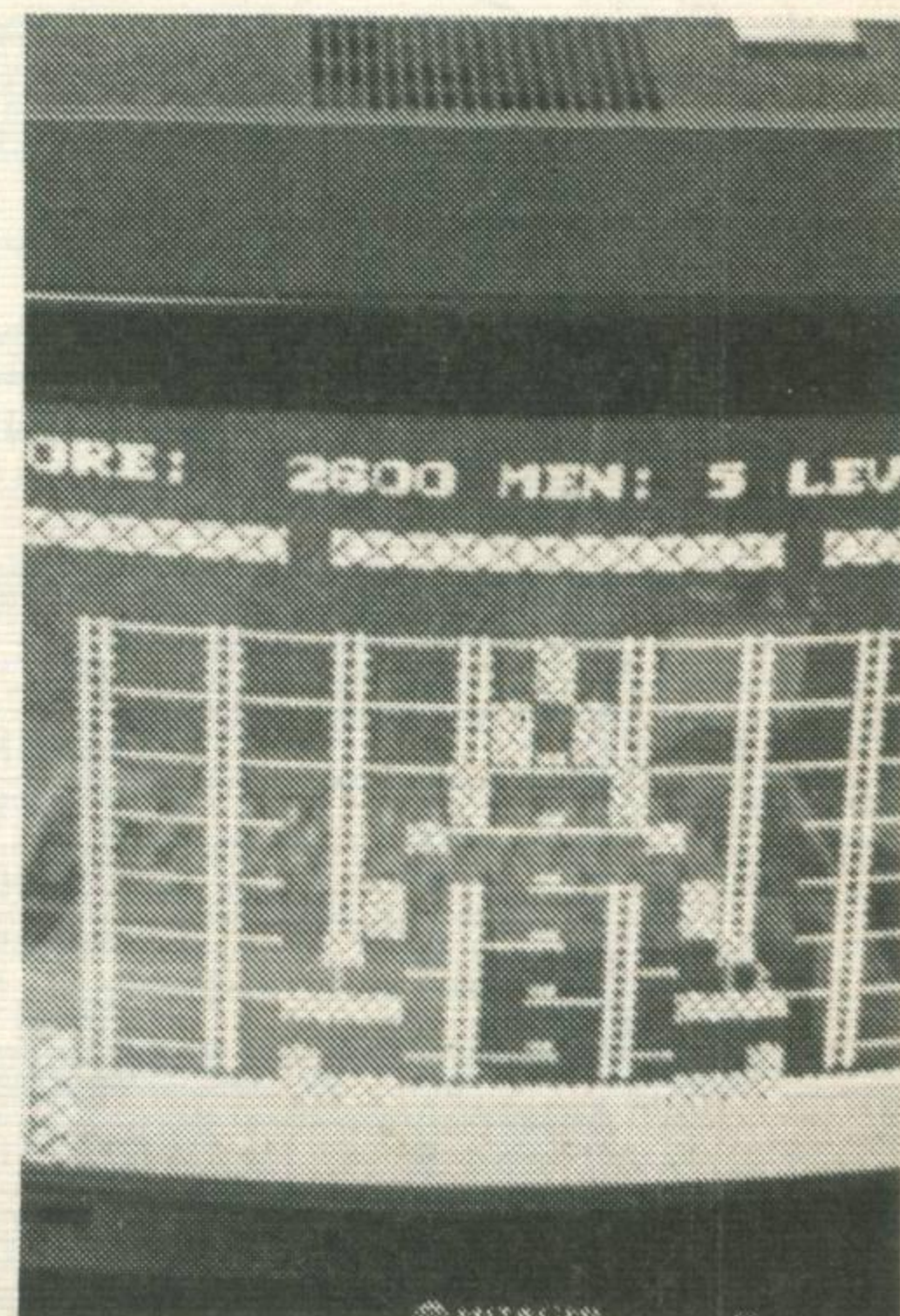
Then enter NEW again and type in program 6. Rewind the tape used to the start of PROG 7. Enter MERGE "PROG 7" and press RETURN. The computer will start the cassette motor and display when it has found the program on the tape. When the programs have been merged, Ok will be displayed. Enter LIST [RETURN] and the resulting program should be the same as program 8.

Note that the MERGED program has been interleaved between the lines of the program that was in memory. If a line number of the program being MERGED from tape is the same as one that is already in memory, the new one takes priority and the old one is deleted. This is really just the same as if the program being MERGED were typed in on the keyboard.

MERGE is most useful when there are some standard routines that you want to add on to many of your programs, for example, a header page. Note that after a program has been MERGED, it becomes a normal program and can be stored all in one piece with SAVE or CSAVE.

● **Program 6**

```
110 PRINT "MR SMITH"
130 PRINT "ABERDEEN"
140 PRINT "POSTCODE"
```



● Program 7

```
100 CLS
120 PRINT "20 THE STREET"
140 PRINT "AB2 4YW"
150 PRINT "U.K."
```

● Program 8

```
100 CLS
110 PRINT "MR SMITH"
120 PRINT "20 THE STREET"
130 PRINT "ABERDEEN"
140 PRINT "AB2 4YW"
150 PRINT "U.K."
```

Joystick ports

Each MSX computer has two joystick ports which are wired as in figure 2. Inside the joystick there are six switches – one for each of the four primary directions and two fire buttons. One fire button is on top of the joystick lever and one is at the side of the joystick. When the lever is pushed diagonally, two of the directional switches are activated and thus eight directions are possible.

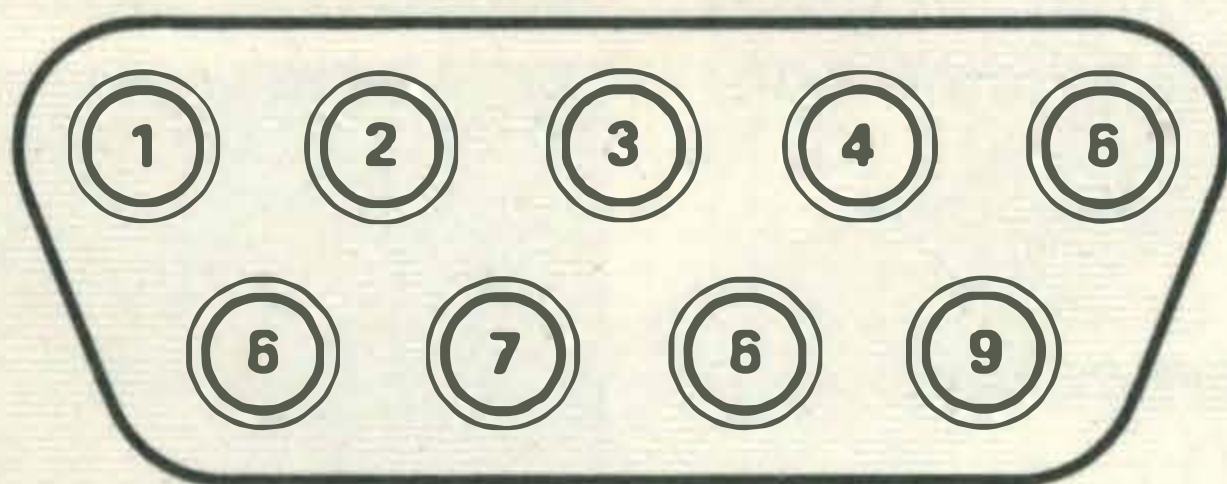
When a program reads the joystick position, a number between 0-8 is returned. Zero means that the stick is in the

centre position and the other numbers refer to the directions shown in figure 3.

The command STICK(n) looks at joystick number n, which can be in the range 0-2. Number zero is a unique feature of MSX BASIC which turns the four cursor keys into a joystick and uses the SPACE bar as a fire button. This means that to change a joystick program into one that uses the keyboard, only one parameter need be changed. It also makes it easier to write programs that use the cursor keys for movement.

If the number supplied in the STICK command is 1 or 2 then the computer looks at

Figure 1 THE JOYSTICK PORT



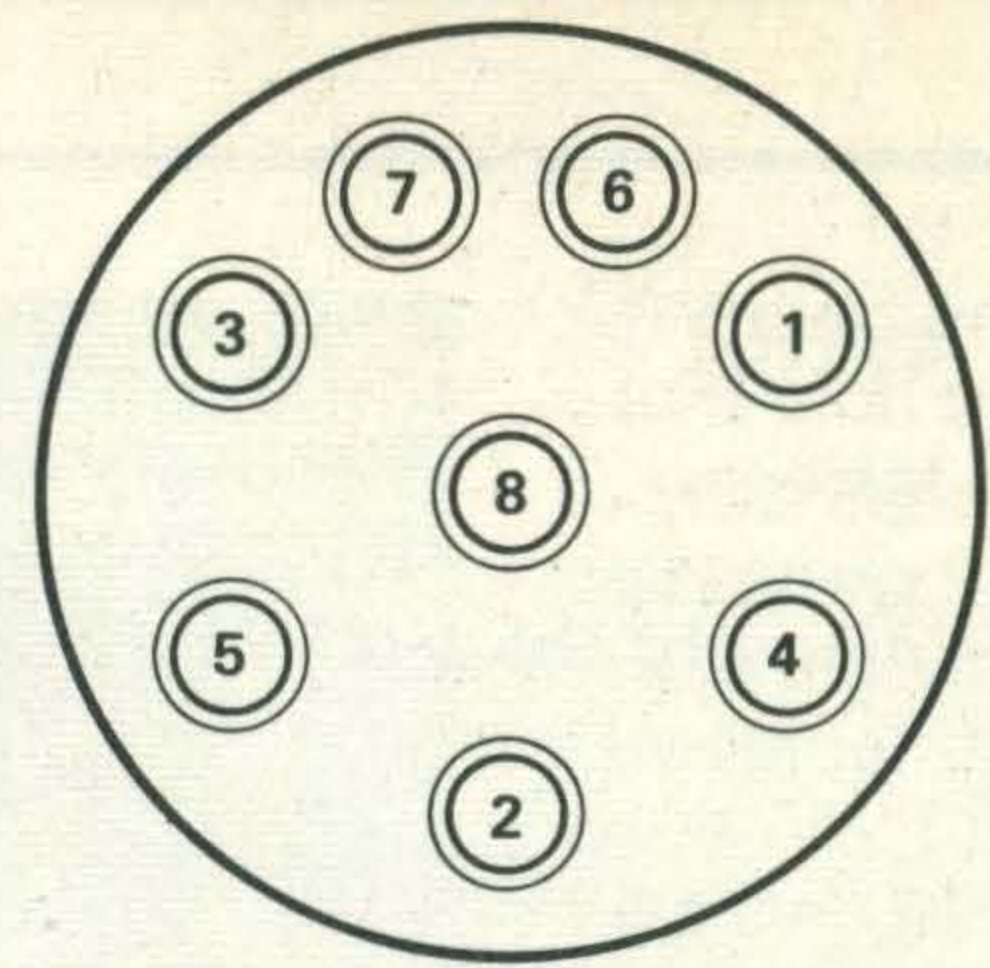
PIN CONNECTION

PIN NUMBER	SIGNAL NAME	DIRECTION
1	FWD	INPUT
2	BACK	INPUT
3	LEFT	INPUT
4	RIGHT	INPUT
5	+5V*	—
6	TRG1	INPUT/OUTPUT
7	TRG2	INPUT/OUTPUT
8	OUTPUT	OUTPUT
9	GND	—

*CURRENT CAPACITY IS 50mA

Figure 2

THE CASSETTE SOCKET



PIN CONNECTION

PIN NUMBER	SIGNAL NAME	DIRECTION
1	GND	—
2	GND	—
3	GND	—
4	CMTOUT	OUTPUT
5	CMTIN	INPUT
6	REM+	OUTPUT
7	REM	OUTPUT
8	GND	—

joystick 1 or 2 respectively.

The command STRIG(n) looks at the joystick buttons. Here is a list of which buttons the computer looks at for different values of n:

- 0 : space bar on the keyboard
- 1 : top button on joystick 1
- 2 : top button on joystick 2
- 3 : side button on joystick 1
- 4 : side button on joystick 2

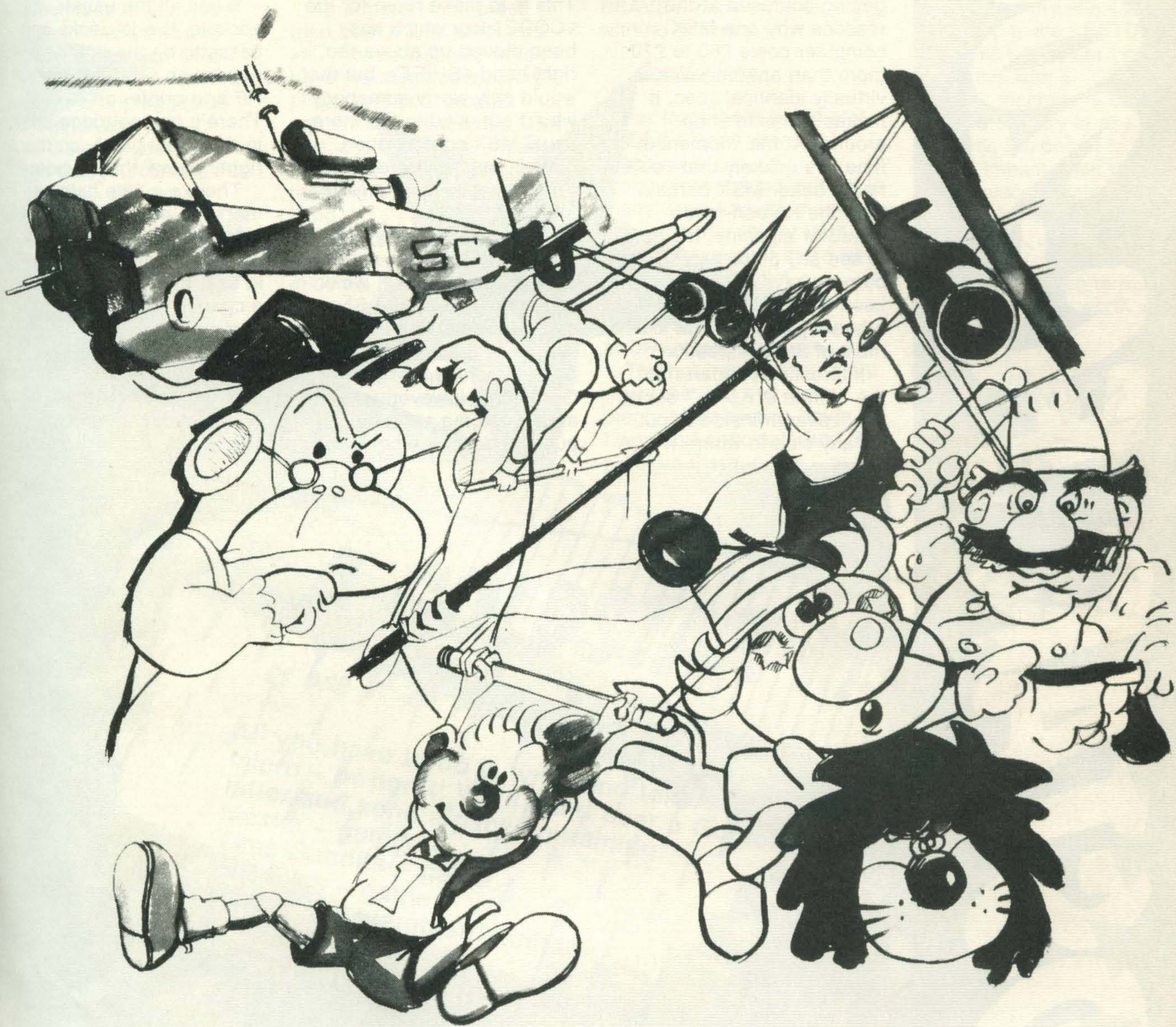
Program 9 use STICK and STRIG commands to let you draw on hi-res screen 2. When the program is RUN the display clears to black with a white dot in the centre. Use the cursor keys to move the dot around leaving a white trail behind it. Pressing the SPACE bar clears the screen back to black. If you change the STRIG and STICK values to 1, in lines 140 and 160, control is transferred from the cursor keys to joystick 1.

● Program 9

```
100 COLOR 15,1,1
110 SCREEN 2
120 X%=128:Y%=96
130 PSET (X%,Y%)
140 C%=STRIG(0)
150 IF C%<0 THEN CLS
160 M%=STICK(0)
170 IF M%=0 THEN 160
180 IF M%=1 THEN Y%=Y%-1
190 IF M%=2 THEN Y%=Y%-1:X%=X%+1
200 IF M%=3 THEN X%=X%+1
210 IF M%=4 THEN Y%=Y%+1:X%=X%+1
220 IF M%=5 THEN Y%=Y%+1
230 IF M%=6 THEN Y%=Y%+1:X%=X%-1
240 IF M%=7 THEN X%=X%-1
250 IF M%=8 THEN Y%=Y%-1:X%=X%-1
260 GOTO 130
```


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Karl Dallas gets starry-eyed reviewing the low cost MSX from Microdealer.

This is the one!

At a time when you'll be getting confused at the reasons why one MSX computer costs £60 to £70 more than another, with a virtually identical spec, it makes sense to shop around. At this moment in time, it's unlikely that you'll find a better MSX bargain than the Korean-made GoldStar machine. It's hard to see any place where corners have been cut to keep the price down - it has a healthy 64K of RAM like most of the competition.

Interestingly, apart from the "Made in Korea" sticker, you'll search inside or out for any clue to where it

competition - the same size as all the other keys, in fact. This is to make room for the <CODE> key which has been moved up above the right-hand <SHIFT>, but that would only worry somebody who'd got used to the more usual MSX configuration.

Well, the keyboard layout doesn't seem to be a fixed part of the MSX specification, anyway: the Toshiba has a £ key to the right of the <SHIFT>, which you won't find on the Sanyo, and the Sanyo has a <RESET> button, which isn't on the Toshiba (nor the GoldStar). However, you can always force a reset by pushing down the cover for

Connections

It has all the usual sockets: two joysticks and cassette on the right, expansion bus, video, audio, RF and printer on the rear. There's one cartridge socket in the usual place, on the right, above the keyboard.

There's a little hole marked "pen holder" by the side of this, presumably for parking a lightpen when not in use, though I didn't have a chance to try out how a pen would work.

Internal

The machine tends to run a little hot, and when you



comes from. The Z80A chip is from Zilog, as you might expect, there are others from NEC, but no other tell-tales. Is someone covering their tracks rather efficiently?

The Keyboard

The keyboard has a nice professional feel to it. The <RETURN> key is rather smaller than on the

the cartridge port (try it and see).

The GoldStar keys are colour-coded. The alpha keys and the 145mm-long space-bar are pale grey, the <GRAPH> and <CODE> keys are green, the nicely-shaped cursor keys are bright blue, the <STOP> key is bright red, and all the rest are a similar charcoal to the body of the machine.

unscrew the top, it's easy to see why: the whacking great transformer in the power supply, about four times the size of that in other MSX machines. Whether this is a heavy duty module that'll withstand continued use better than the more elegant solutions in the other machines, only time will tell.

The heat output is not exorbitant, so unless you're

Address: Microdealer, 29 Burrowfield, Welwyn Garden City, Herts.
Price: £229 in VAT

in the habit of burying your keyboard under piles of papers, it shouldn't be a problem.

In general, the interior layout is less tidy than I would like. Instead of a ribbon cable, the keyboard is connected to the main CPU by a multitude of individual wires, and the two-strand power lead between CPU and keyboard is so short that it came unplugged as I lifted the keyboard. But, again, there's nothing serious that you can fault in the interior - certainly nothing that would make servicing any kind of problem.

Compatibility

I tried CLOADing a number of cassette programs, and the only

problem I had was with a Sanyo demo which became garbled and wouldn't RUN. But that wouldn't RUN on the Sanyo, either, and the very excellent "Les Flics" from PSS worked a treat, especially with a Toshiba joystick.

As a matter of interest, I tried both a Quickshot and an Amstrad joystick, which have the same connecting plugs, and both worked equally well. Since non-MSX joysticks tend to be cheaper than those with the logo on them, this is worth bearing in mind.

I also connected a Japanese 3in Hitachi disk drive via the cart port, and it too worked perfectly (I had to power it via a transformer, natch), so the claim of MSX across-the-board compatibility seems to be justified, even at this end of

the market (at least with the GoldStar - Ed). The amount of available memory had dropped from 28815 to 23430 bytes, though, which is to be expected. I managed to BLOAD a machine-code program from tape into memory and then BSAVE it back on to disk, with no difficulty.

Conclusions

Far from there being any ulterior reason why this machine is so (comparatively) low-priced, in many ways I could imagine choosing this as *my* MSX machine - even if there were no price differential.

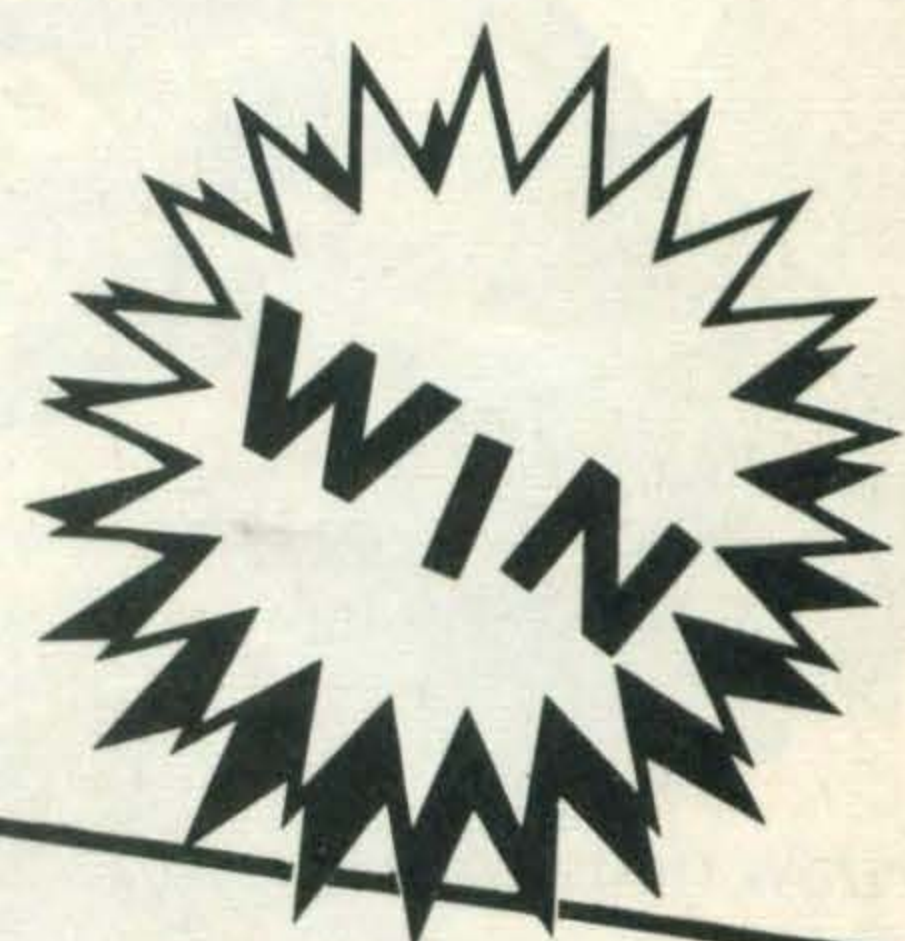
I like the colour-coded keys, especially the big, arrow-shaped blue cursors.

The hot transformer might worry me, but there are plenty of ventilation holes, so I wouldn't anticipate any real problem there, either.

I suspect it's slightly more rugged than some of the competition, and a little heavier, too, (thanks mainly to that transformer), but not so it becomes an arm-lengthening chore to lug it around: it's about half a kilo heavier than the 2½ kilo Toshiba on my office scales.

It's a pity the <RETURN> key is so small, but I guess I could live with it.

If this machine is coming into the country in any quantity, I expect it to have a strong impact upon the marketplace, forcing the price of the competition downwards, unless, like the Sony Hit-Bit, they have something unique to make the extra money worth while.



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Steve Lucas gives Toshiba a micro wave

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In a review of any MSX machine, there's little point in discussing the merits of the BASIC, because it's exactly the same in all machines (see MSXposed). The HX10, however, is likely to be the first bunch to hit the market and it will, therefore, set the pace for MSX machines at around the same price.

We've heard so much recently about all the extra goodies that will be available for the MSX machines such as robot arms, video interfaces and music synthesisers that you may be surprised to find that the HX10 offers none of them. What it does offer is a very solidly built machine with 64K of RAM at a price which compares favorably with non MSX standard opposition such as the COMMODORE 64.

The HX10 certainly couldn't be described as glamorous, but its workmanlike dark brown case does give the impression of a machine that's built to last. Placing the power supply for the machine inside the case means fewer trailing leads, which pleases my wife, and makes the machine heavier so that it doesn't tend to slide about on a polished surface in the way some micros do.

Hardware

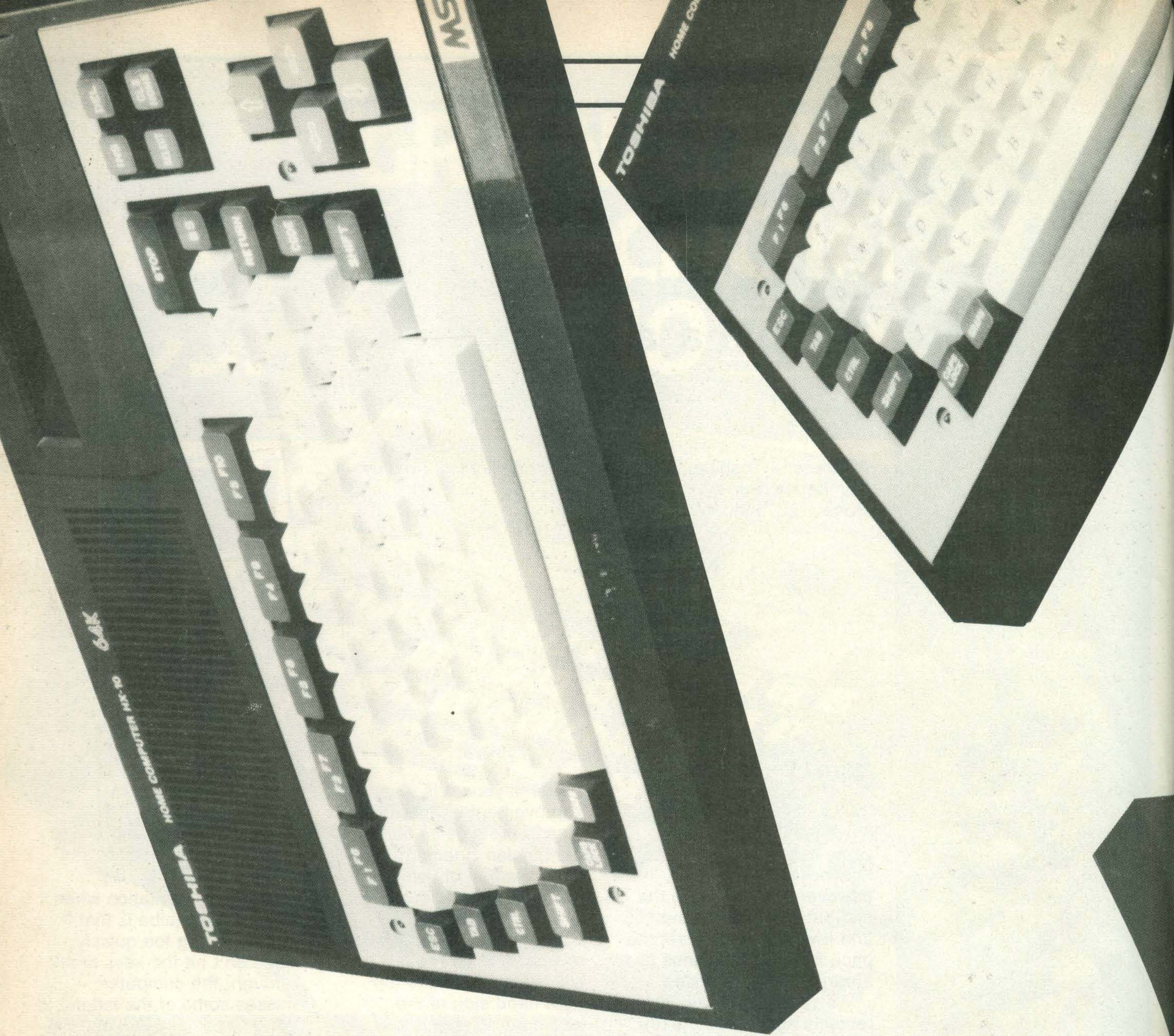
The keyboard is a vast improvement on the rubber membrane type as fitted to the Sinclair Spectrum, but lacks the feel of some of the better keyboards such as those found on the Commodore 64 and BBC micros. A large red STOP key is located at the top right hand side of the keyboard. Pressing this key once acts as a pause in the program or listing, pressing it again means continue. In order to BREAK out of a program, you need to press CONTROL and STOP together. Five of the 73 keys are 'Soft Keys', which are often referred to as function keys. Holding the shift key with a function key produces a further five functions which are numbered F6 to F10. All of these keys may be defined from BASIC using the keyword KEY. The character set contains a wealth of useful shapes and foreign letters and it's possible to enter these directly from the keyboard by holding down the bright green 'GRAPH' key to get the graphics characters or the brown 'CODE' key to get the foreign character sets. In this way you can type characters such as hearts directly into PRINT statements, but they will not

be reproduced when LISTED to a printer. There is one other key on the keyboard, which is located next to the right hand SHIFT. It's not labelled and prints a pound sign (£).

One major irritation when using the Toshiba is that if you try typing too quickly, and don't hit the keys firmly enough, the computer misses some of the letters. If you are using a TV set, this isn't too bad because there is a click from the speaker whenever a letter is entered, but when used with a monitor it's only when you try to RUN the program that you notice several letters are missing. This is irksome and, for my money, spoils an otherwise excellent machine. Another less important irritation is the placing of the backspace key right next to the STOP key, which I keep hitting by mistake. Perhaps the best thing about the keyboard is the positioning of the cursor keys in a group, common to all MSX micros, which can be interpreted as joystick (O) by using STICK(O). These are perfect for playing arcade games and a JOY to use!

As with all MSX machines, there is a full screen editor, which is one of the best editors of any micro on the market regardless of price. The cursor is moved to the

TOSHIBA HX10



line to be edited using the cursor control keys which are located at the bottom right of the keyboard and changes are made by overtyping or inserting. A further four editing keys are located at the top right hand side of the keyboard. These keys allow you to insert, delete, clear screen or home the cursor. When the line has been edited, pressing RETURN will enter it into memory, otherwise it will remain as before.

Connectors

One of the most important facilities of a micro is its ability to communicate with the outside world. Whilst not in the same league as the BBC micro in this respect, the Toshiba is provided with plenty of connections for the devices you're most likely to want. At the back are 3

phono sockets for connection to TV set, monitor and audio equipment. In addition, there is an 8 pin DIN socket for a cassette recorder and a bus connector which is rather vaguely labelled additional I/O slot connector. Although the DIN socket is identical to that used on Acorn and Oric computers, the cassette leads are not interchangeable because the connections are to different pins. I was disappointed to find that there is no connection for RGB colour monitors, although this isn't part of the MSX specification, RGB monitors are generally cheaper than composite monitors, offer a higher quality picture and, most importantly, I've got one but can't use it! The quality of screen displayed on an ordinary TV is excellent and certainly

equals the picture produced by the Commodore 64. When compared with the display on a monitor, though, it suffers from two major problems. Using a screen width of greater than 38 characters in SCREEN 0 results in the first two characters being off the edge of the TV's screen. Also, the sharpness of characters printed in some colours, particularly red, leaves room for improvement.

The right hand side of the case contains a further selection of sockets. The HX10 is fitted with two joystick ports which accept the standard D-type plugs found on most joysticks. The remaining socket is the printer port. This is a standard Centronics Parallel Port, which means that you can connect a whole range of dot matrix or daisy wheel

printers without any special adaptor. The socket used for this is a 14 pin Amphenol type, which is the same as those found on most printers, but with fewer pins. This is the standard connector for MSX machines, but it's surprisingly difficult to locate the equivalent cable connector in Britain at the moment! None of the major electronic wholesalers or retailers seem to stock them, although they are likely to become much more widely available when MSX machines hit the shelves of high street stockists.

The final connector is the all important cartridge slot, which is located in the top right hand corner. Just how often this socket will be used will depend to a large extent on the popularity of ROM cartridges as a medium for games and utilities. Cassette

and disk are far more popular than ROMs for games programs, mainly due to their relative costs, although ROMs have proved to be particularly useful for serious software such as wordprocessors and spreadsheets.

Features

At the moment, as the first in the market, the HX10 faces little competition from the other MSX machines before Christmas and until Sony, Sanyo etc bring their machines to Britain, the main competition will be from similarly priced non MSX computers. After about a months use, I am convinced that it's an excellent product, although there are a number of features lacking, such as an 80 column mode and the ability to PRINT text on the

high resolution SCREEN 2 without opening channel 1 as a graphics channel. On balance, it's very pleasant to use and is built to last. MSX BASIC is a delight to use in comparison with the Commodore 64. It offers the beginner better facilities to learn programming and a far more elegant method of handling Sprites. Although it is a 64K RAM machine, only 28K is available to the BASIC programmer. This isn't as bad as it sounds, because the graphics commands available mean that a single statement is all that's needed to perform functions which would take up a vast amount of memory on some rivals. When compared to the Acorn Electron/BBC micro's 7K remaining in the high resolution mode, it is a vast improvement.

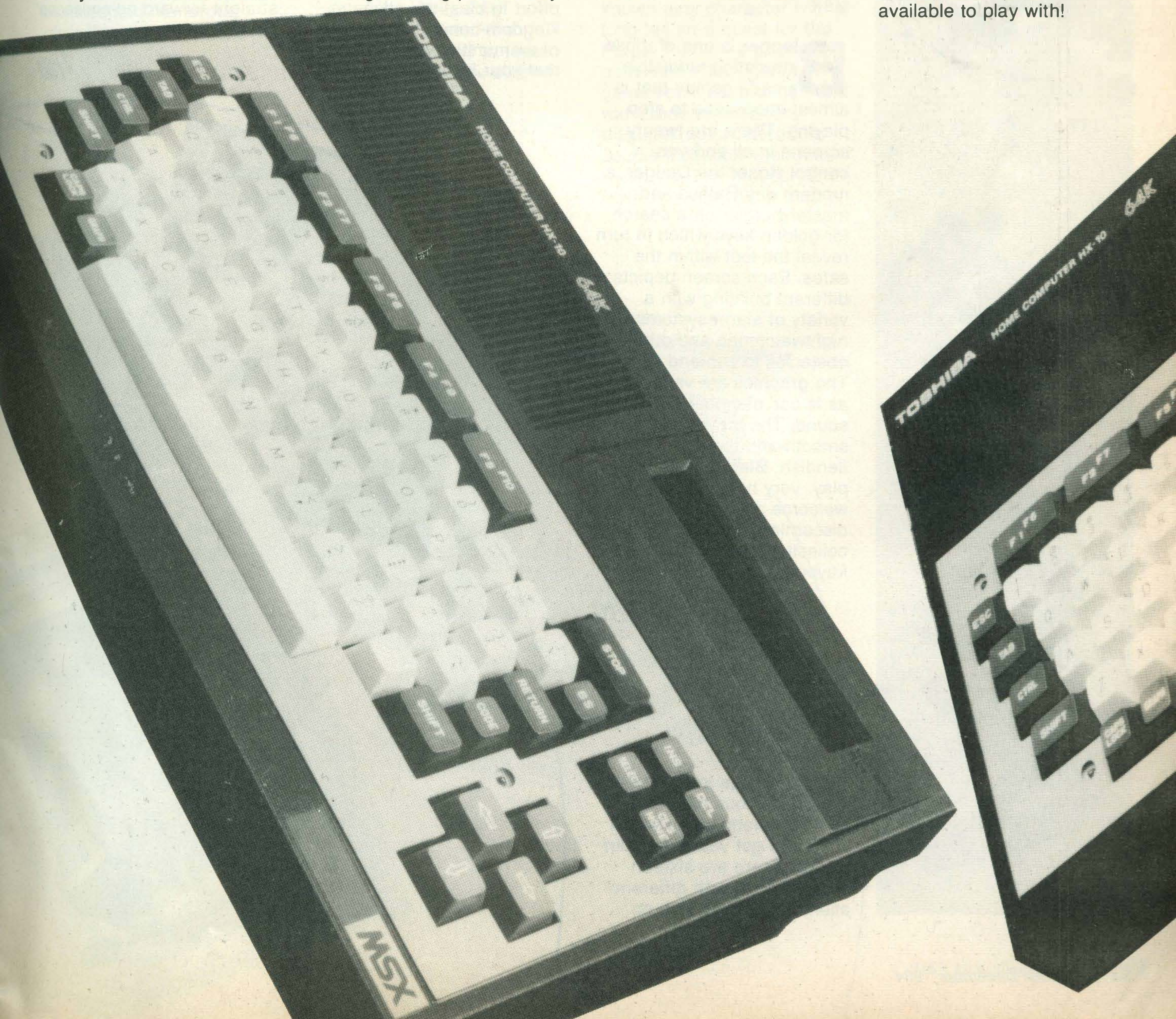
Programming purists may

be disappointed at the lack of procedures and REPEAT UNTIL loops which are available on Acorn micros, but in practice, the commands for handling of sound effects and graphics far outweigh the disadvantage. Probably the best feature of MSX is the extensive number of interrupts available from BASIC. To a beginner, this facility will seem to be of limited use, but once you have used interrupts to detect the collision of sprites or monitor the space bar without continually polling them, you'll wonder how you managed without them.

Conclusions

The Toshiba HX10 is a well made machine which will take a great deal of hammering from the kids. I suspect that the choice of

MSX will ultimately depend upon price, looks and the extras offered by the individual manufacturer. The Toshiba doesn't offer some of the extra goodies, but it's a tough, good looking micro with 64K of RAM at a sensible price. When compared with machines which don't use the MSX standard, it fares very well. It's a good deal nicer to use than the Commodore 64, a lot cheaper than the BBC micro and has a much better specification than the Sinclair Spectrum. Its main competitor, until the other MSX machines hit the market, is likely to be from the new AMSTRAD CPC464, which offers more RAM to the user, a built in cassette deck and a good version of BASIC, but then of course it doesn't offer compatibility with the MSX standard and there are no Sprites available to play with!



We run our eyes and ears over the software on offer from the professionals and issue bills of health, prescriptions and death certificates.

Less than 4/10 – Dead
4/10 – So So
7/10 – Healthy
8/10 – In the pink
9/10 – Effervescent
10/10 – Immortal!

overheat for if they do, you won't be able to resume firing until they've cooled down. Very fast reflexes are called for in this game and you may take refuge at the side of some of the screens whilst you plan your mode of attack. Each alien is colourful, well detailed and is painted on a starry scrolling back-drop. Sound is good and adds to the atmosphere of the game. **Maxima** is a good game that will appeal to zap freaks looking for a straight forward no-nonsense shoot-em-up.

BLAGGER

By Alligata
 Price 7.95
 MSX

Blagger is one of those infuriating, addictive arcade games that is almost impossible to stop playing. There are twenty screens in all and you control Roger the Dodger, a modern day Raffles and master burglar on a search for golden keys which in turn reveal the loot within the safes. Each screen depicts a different building with a variety of alarm systems, nightwatchmen and other obstacles to contend with. The graphics are very good as is use of colour and sound. The movement is smooth and the game-play fiendish. **Blagger** is easy to play, very hard to beat and a welcome addition to any discerning MSX user's collection. Control is via keyboard or joystick.

each sheet. Control **Maxima** – your space ship – with the keyboard or joystick in an effort to blast the aliens to kingdom-come. Careful use of ammunition will ensure that your lasers do not

7/10

8/10

MAXIMA

By PSS
 Price 6.95
 MSX

Maxima is a fast and furious multi-screen shoot-em-up which is sure to get your adrenalin racing. There are sixteen screens in all with different aliens to contend with on



PROGNOSIS

TIME BANDITS

By PSS
Price 6.95
MSX

Time Bandits is a shoot-em-up akin to **Defender** where you patrol a mountainous terrain in an effort to protect your convoy of trucks from airborne hazards. Scrolling is smooth, the graphics are good with colour and sound being used to good effect. Your ultra-modern aircraft should in theory be no match for the opposition with the first screen confronting you with helicopters that you must shoot before moving onto the next screen. Keep a careful eye on your fuel gauge as you'll need to re-fuel via the airborne sky tankers when your fuel level gets too low. Subsequent screens present a variety of aircraft including Zeppelins, biplanes and numerous other flying machines past

and present each with its own method of flight and attack. **Time Bandits** is an addictive and enjoyable arcade game that requires strategy and quick reflexes to achieve a hi-score.

7/10

DRILLER TANKS

By Kuma
Price 6.95
MSX

Driller Tanks is another straightforward multi-screen arcade game. The object of this game is to manoeuvre your tank around the maze taking care to avoid the fire-breathing Mamuks and tunnelling Skorks. Points are awarded for tunneling and destroying the Mamuks by freezing them with your special laser and then crushing them – easy eh!. Skorks however cannot be killed, only temporarily frozen. If a Mamuk is allowed to reach the palace atop the screen

then the game ends. If you collide with a Mamuk or a Skork you lose a life and an extra life is awarded with every 20,000 points scored. The graphics are quite good, as is use of colour and sound. Each subsequent screen has more nasties to contend with and therefore presents quite a challenge to the player. Control is via keyboard or joystick. **Driller Tanks** is another fairly easy addictive game that after a while becomes repetitive and may therefore appeal to the younger games player.

6/10

LES FLICS

By PSS
Price 6.95
MSX

Les Flics is a multi-screen arcade game in which you control a well known pink character with a long tail on a quest for the Purple Puma – a priceless gemstone. Throughout the game you'll have to contend with Gendarme Kaolin, disguised as Le Chef and of course Inspector Cleudeau heemself. The first screen confronts you with a map of

the town highlighting several buildings. You must drive your car whilst avoiding the patrolling police vehicles in an effort to reach the building of your choice. Once there, you may enter each building through the front door and are confronted with a ladders and levels screen in which you must collect items whilst avoiding the hazards. There's a dagger in each building which you'll need to stop **Les Flics** – the gendarmerie – from removing one of your three lives. Each different item can be used to help you in your quest for the Purple Puma, I'll leave you to work out how. The graphics are well detailed, colour has been used to good effect and the sound is good. Control is via keyboard or joystick and full game instructions appear on-screen, **Les Flics** is an amusing, addictive game, and a welcome addition to any gamer's collection.

7/10

DOG FIGHTER

By Kuma
Price 6.95
MSX

Dog Fighter is a fairly simple game in which you must track and destroy enemy aircraft. Your aircraft takes off from bottom right of the screen and flies over the enemy aircraft carrier. Upon being spotted by the ship, the enemy launch a squadron of fighters in an effort to remove you from the skies. A form of altimeter helps you gauge the height the enemy craft are flying at which is essential if you're to score a direct hit. If you manage to wipe out the whole of the enemy squadron, then they'll launch another and another until they remove your entire squadron from the sky. Movement is smooth, graphics are simple, as is use of colour and sound. The game however tends to be addictive and may well appeal to the younger game player who does not want too much of a challenge.

6/10



DISCOVERING MSX-DOS

When is the MSX standard not a standard? When it's a disk standard.

No, that's not quite fair.

The MSX disk standard *will* be a standard in the sense that MSX-DOS, as it's called, uses exactly the same commands whatever machine it's used on, and you can fit any company's disk drive into any other company's computer, as long as both carry the magic "MSX" logo. What you won't be able to do is to slide *every* MSX disk into every MSX disk drive and expect it to work, since it may not be the correct size.

Yeah, you heard me, there's no standard disk size within MSX (as yet - Ed).

It can be 3½in, like Sony's, it can be 3in like the Hitachi MSX disks coming in the spring (and like the disks being used by the new non-MSX machines from Amstrad and Tatung) and there's no earthly reason why it shouldn't be 5¼in or even 8in, as long as the way it accesses the disk and reads and writes conforms to the MSX standard. There's even a new little beastie called the Quick-Disk from Mitsumi. This is the smallest so far, measuring a mere 2.8in, and though it looks like a disk it's really more of a tape streamer, holding 64K of programs or sequential files on each of its two sides. It can't be used as a storage medium for random access files, because it's basically a sequential medium, like tape, though much faster: **LOADing** or **SAVEing** an entire side of 64K in eight seconds, including head-positioning time.

The reason for this lack of standardisation is that while the various companies have found it comparatively easy to agree on things like the dialect of BASIC to be used, the size and spec of cartridges and other peripherals, some of them have a lot of time and money invested in competing disk formats

Part one of a two part dissection. Karl Dallas swings the scalpel.

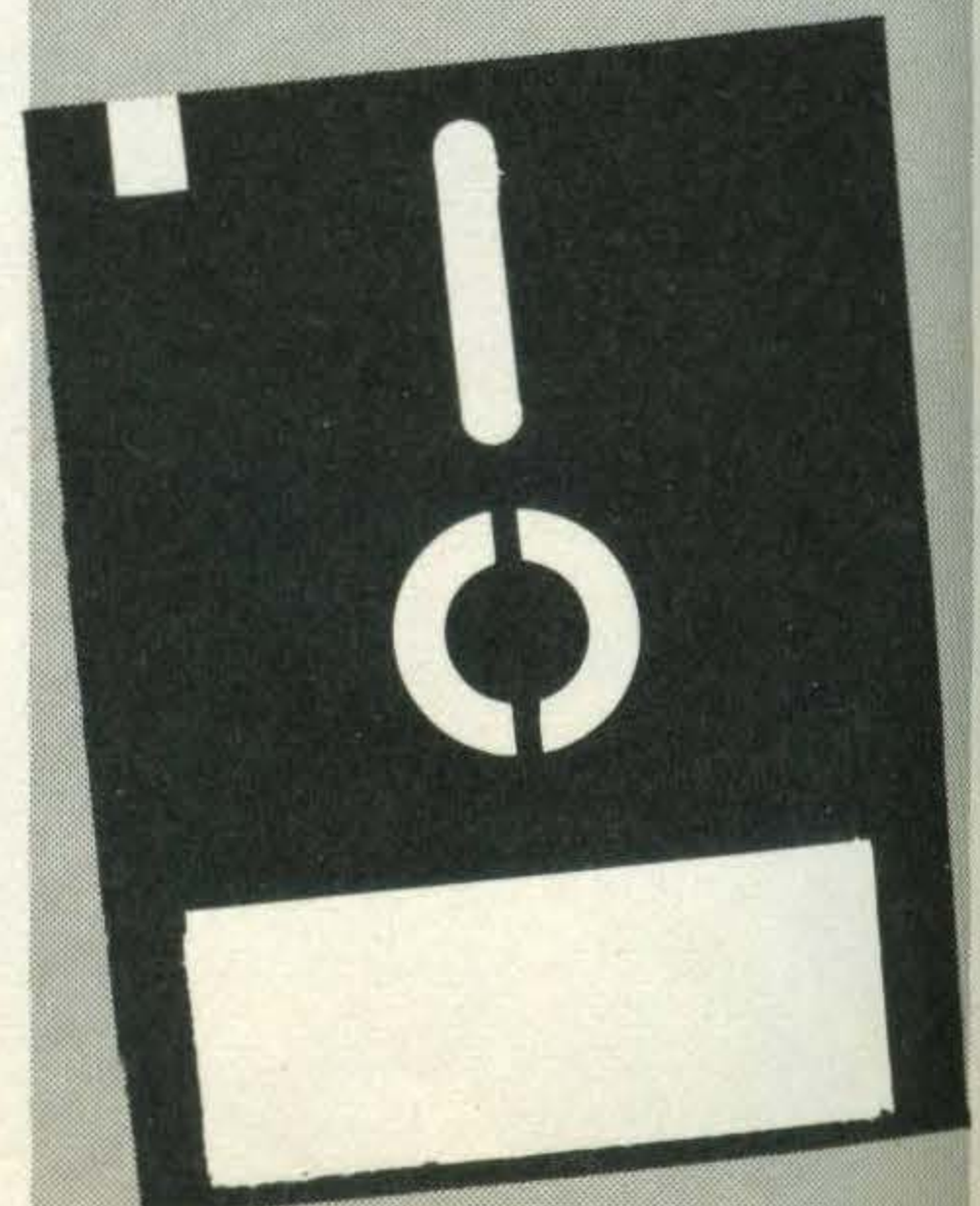
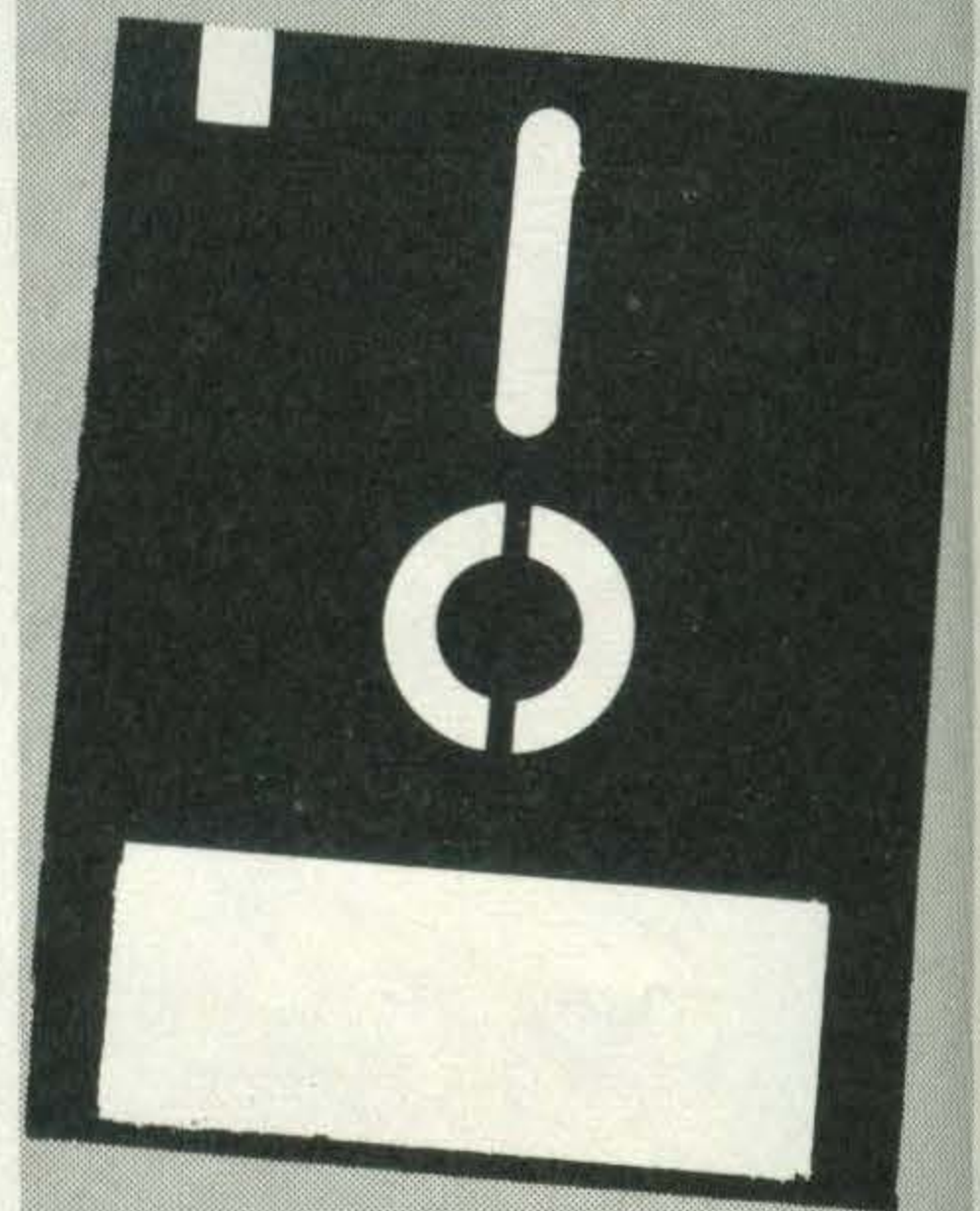
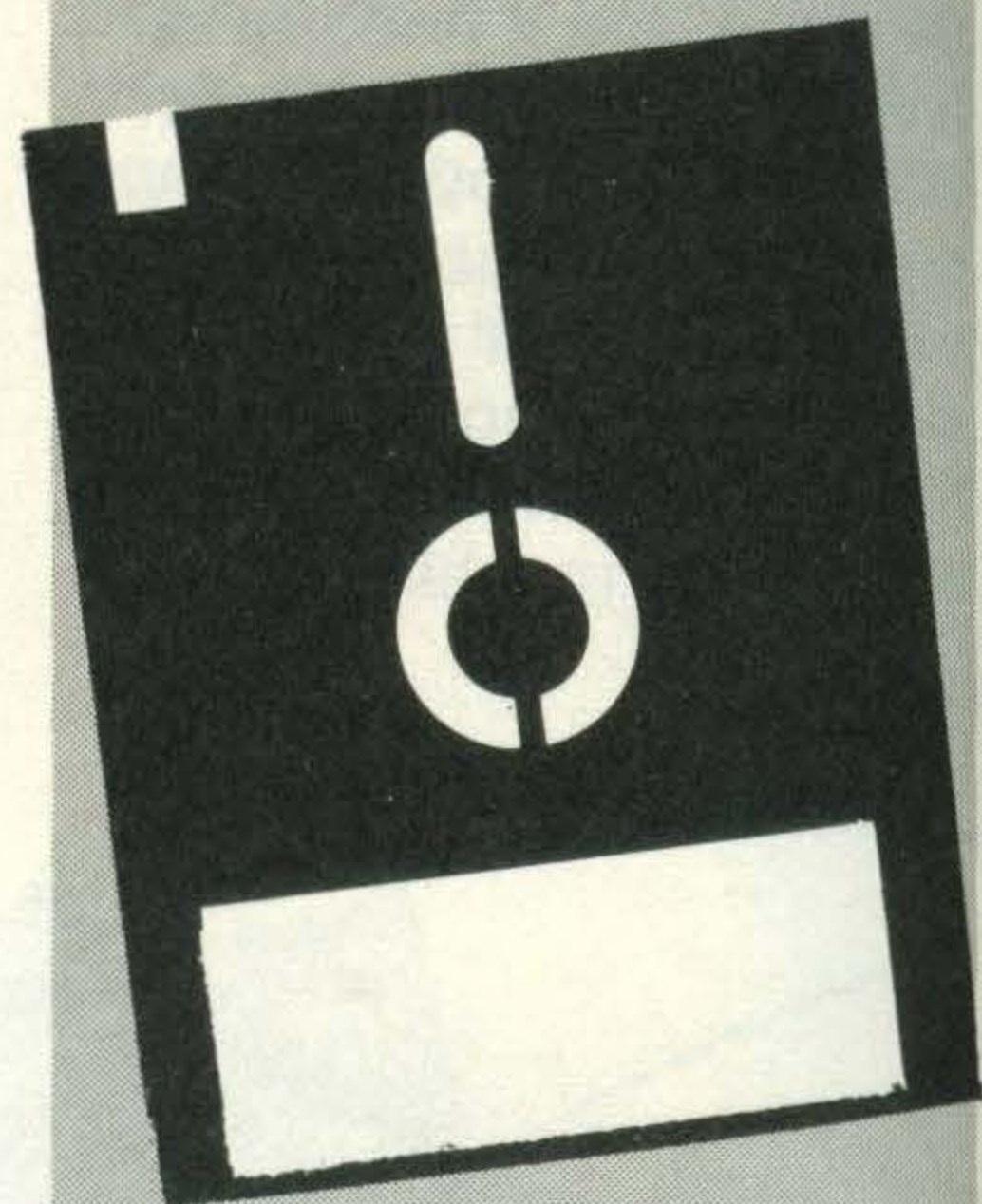
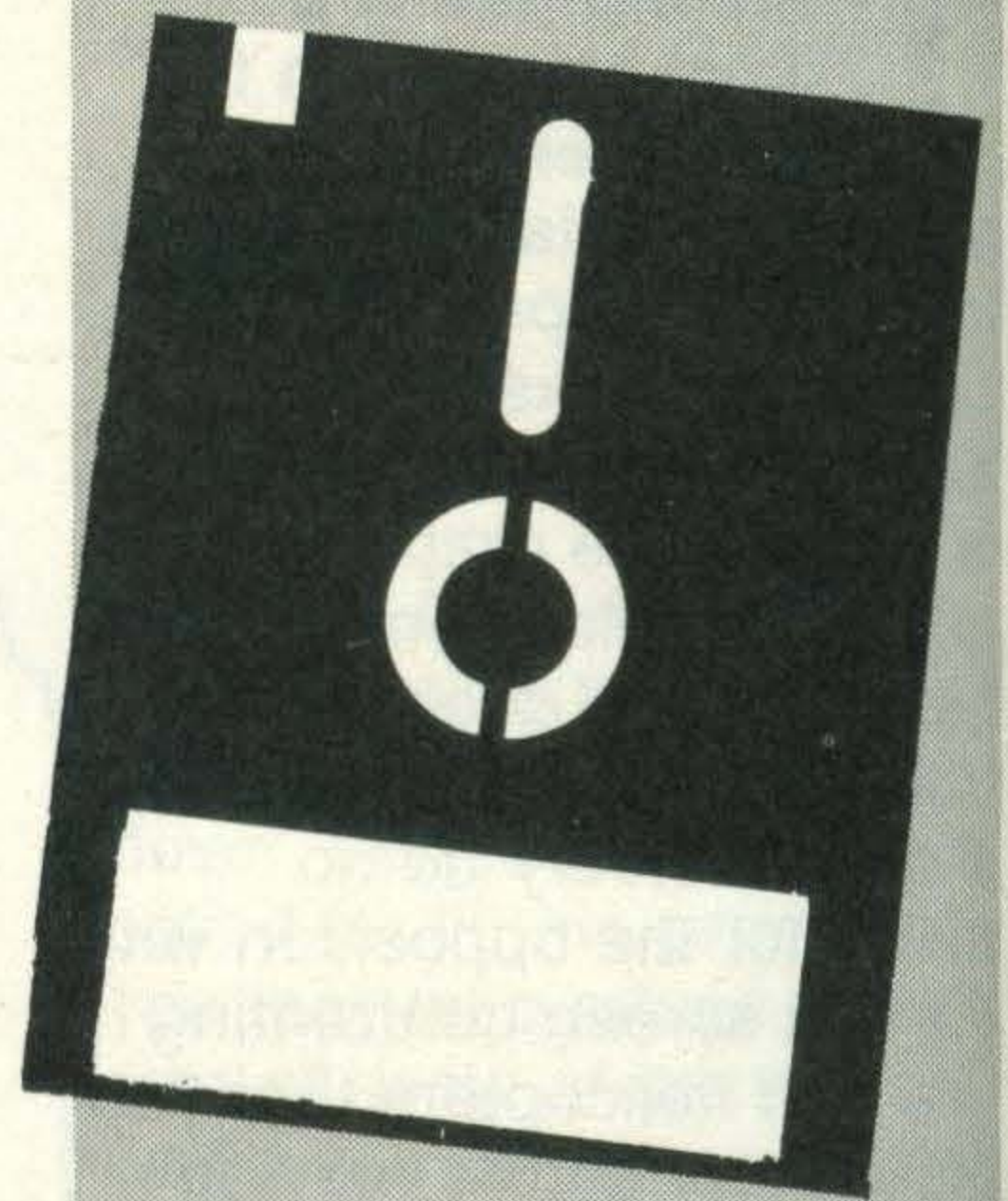
outside the MSX field, and it proved impossible for them to agree to abandon their own, say, in favour of the other guy's.

But, that's the end of the bad news.

The good news is that MSX-DOS is probably the most *professional* disk operating system in the home computer market, even without the CP/M option that's coming on to the system quite early on, with some extra-friendly screen handling and other commands that will make any MSX disk owner the envy of any professional still coping with the cumbersome nature of CP/M on the really big micro's. It'll certainly lick the much-touted CP/M cartridge recently announced for Commodore's CBM 64 machine into a cocked hat.

It won't surprise anyone who knows that the "MS" in "MSX" stands for MicroSoft to learn that MSX-DOS is very similar in the way it works to the famed MS-DOS which Microsoft's Tim Paterson wrote for the invincible IBM Personal Computer, which has become an industry standard. Indeed, one of the reasons why Sony's 3½in disk format is tending to be adopted rather than the 3in Matsushita drive espoused by Hitachi, is that rumour has it that IBM intends to go over to 3½in drives for its next generation of PCs. When *that* happens, you'll be able to take an IBM data disk out of an IBM and slot it into an MSX machine to **READ** the data, so long as you also have the appropriate software to do so.

The disk drive is connected to the computer via an interface, a rather bulky box which plugs into the cartridge port. The drive has to be connected to the mains power supply by its own lead. If it's connected and turned on, the computer detects its presence immediately on computer power-up, **LOADS** Disk



Basic and you're ready to go.

There are two kinds of disk programs that you can access, each of them with their own specific commands and the computer has two modes: MSX-DOS and MSX Disk BASIC. You can get into Disk BASIC by typing BASIC RETURN from MSX-DOS.

Disk BASIC

First, let's look at Disk BASIC programs and data, since these are likely to be closest to those you've already worked with on cassette.

A special kind of program, which must be named AUTOEXEC.BAS, can be written to custom-tailor what your system does when you boot Disk Basic. For instance, it could automatically LOAD and RUN a word processor, or any other program, ask you the date and time, or whatever.

Alternatively, if:

BASIC PROGNAME.TYP
RETURN is typed (note: no quotes), you'll get into BASIC and run the named program. To return to MSX-DOS, it's necessary to type CALL SYSTEM RETURN .

Before a disk can be used it must be FORMATTed, using the FORMAT command. This is the same in both MSX-DOS and Disk BASIC, though it's use differs slightly: in Disk BASIC the command is CALL FORMAT, but in MSX-DOS the single-word command FORMAT is used. In both cases, the command erases anything stored previously on the disk.

SAVE and LOAD

Some of the Disk BASIC commands will be familiar to the user from cassette-based Basic. SAVE and LOAD, BSAVE and BLOAD, INPUT and PRINT work much the same way as with cassette files, except that instead of the prefix "CAS:" to designate tape, you specify the device by the prefix "A:" or "B:" if there are two.

An MSX Disk BASIC

SAVE command should read as follows:

```
SAVE "DN:PROGNAME.TYP"
```

where DN is the device name (either A or B), PROGNAME a file name no longer than eight characters, and TYP is a program-type descriptor no longer than three letters. The descriptor can be omitted, but it's not a good idea, because often you want to link together program and data files with the same name, so that "ADDRESS.BAS" can be the name of a BASIC name and address listing program, and "ADDRESS.DAT" the relevant data file to go with it.

If you allocate a file name longer than eight characters, Disk BASIC will automatically insert a full stop after the eighth character, and assume the next three letters are a file descriptor. If there are more than 11 characters, the 12th and all subsequent characters will be ignored.

The first letter of the file name must be a letter, though you can include a number. For instance, "ADDRESS1.BAS" might be your first attempt at writing the address program, and revised versions could be "ADDRESS2.BAS", "ADDRESS3.BAS", etc. If you go above nine versions, you'll need to truncate the name somewhat, possibly to "ADDRESS10.BAS" etc, to stay within the eight character limit.

You can use capitals or lower case when you type in the file name and descriptor, but the computer will convert them to capitals if you call up a directory of the disk.

The LOAD syntax is identical to SAVE.

MERGE

Disk BASIC has a MERGE command for appending a new program at the end of an existing program in the computer memory, but this will only work with ASCII program files, which have been saved with the

```
SAVE "DN:PROGNAME.TYP",A  
command. In this case it's a
```

good idea to make the descriptor ".ASC", so that you won't try MERGEing an ordinary Basic file.

It's possible to MERGE programs with line numbers that overlap, but that way confusion lies. When in doubt, use the RENUM command on the program in memory to remove the overlap, *before* MERGEing.

Programs will RUN immediately they are LOADED, if RUN is used instead of LOAD, or ",R" is appended at the end of the LOAD command, thus:

```
LOAD "DN:PROGNAME.TYP",R
```

File juggling

To discover what is on a disk, the FILES command is used. If you have two drives, and want to see what's on the other disk, then FILES "DN" will get it for you. To erase files that are no longer needed, the KILL "PROGNAME.TYP" command will clear disk space for new material when it's getting full.

A file can be renamed with the NAME command, eg

```
NAME "PROGNAME.TYP" AS  
"NEWNAME.TYP"
```

Of course, the new name doesn't necessarily have to have the same descriptor as the old.

If you want to duplicate a file, this can be done with the COPY command, thus:

```
COPY "DN:PROGNAME.TYP"  
TO "DN:PROGNAME.TYP"
```

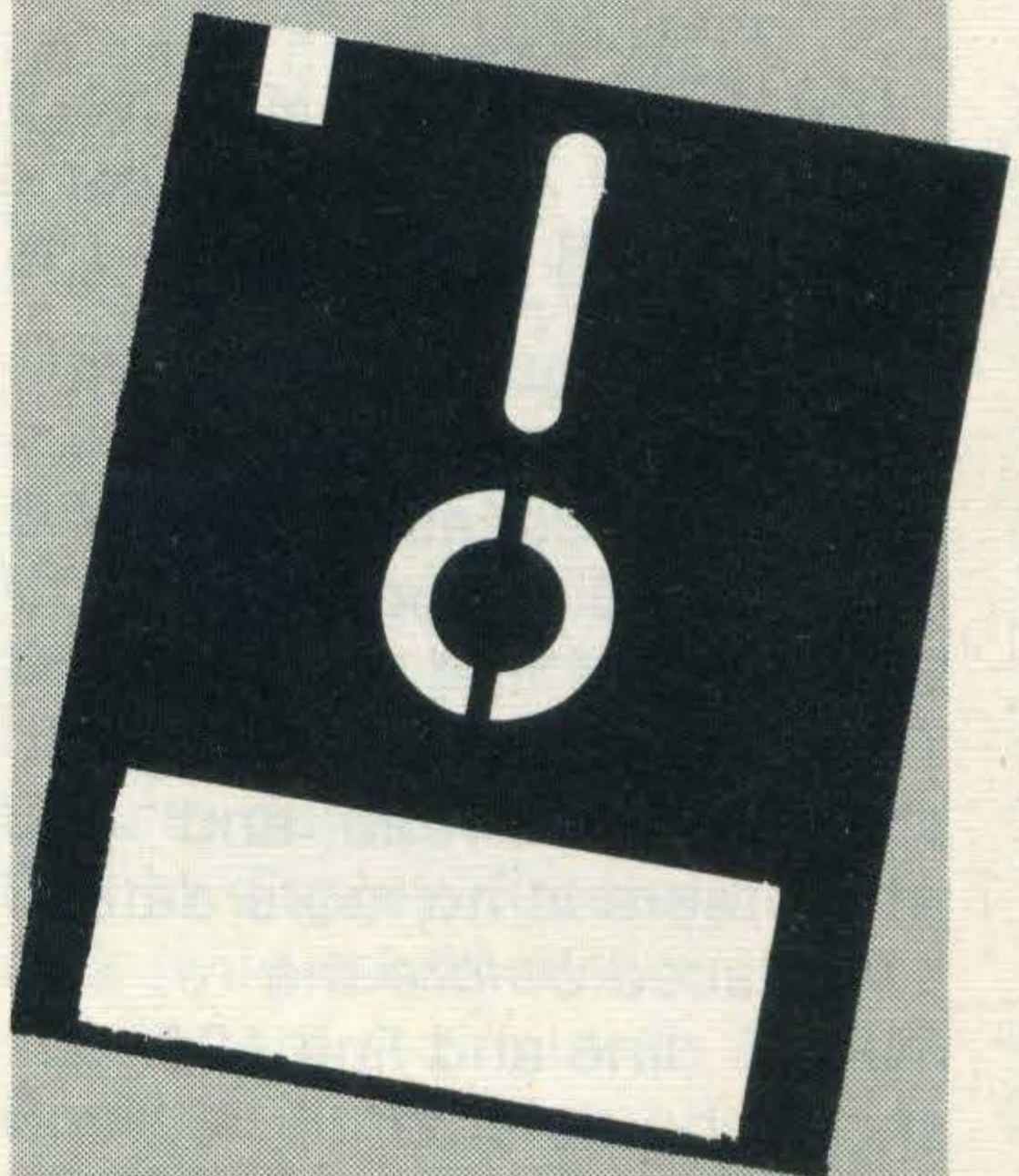
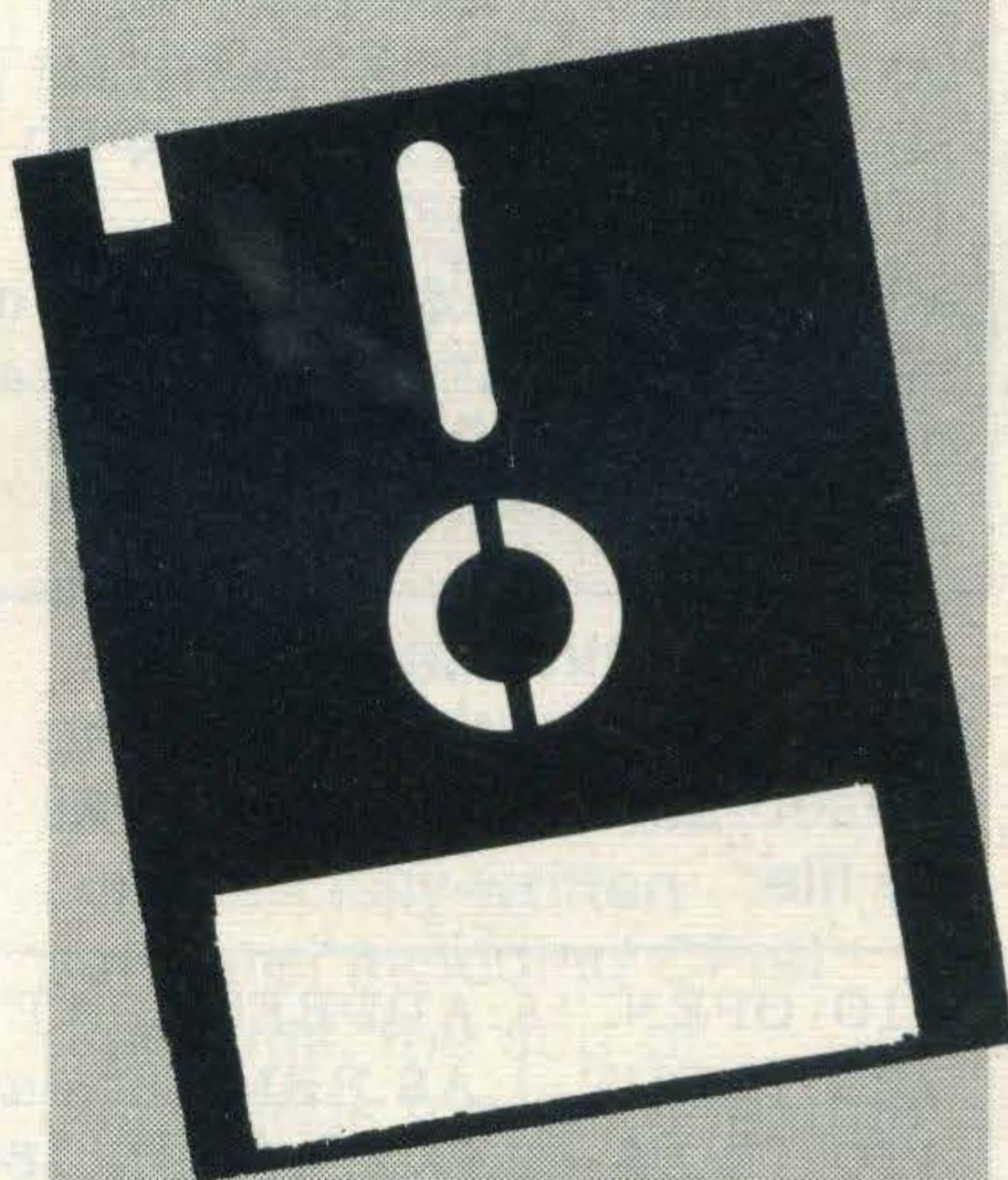
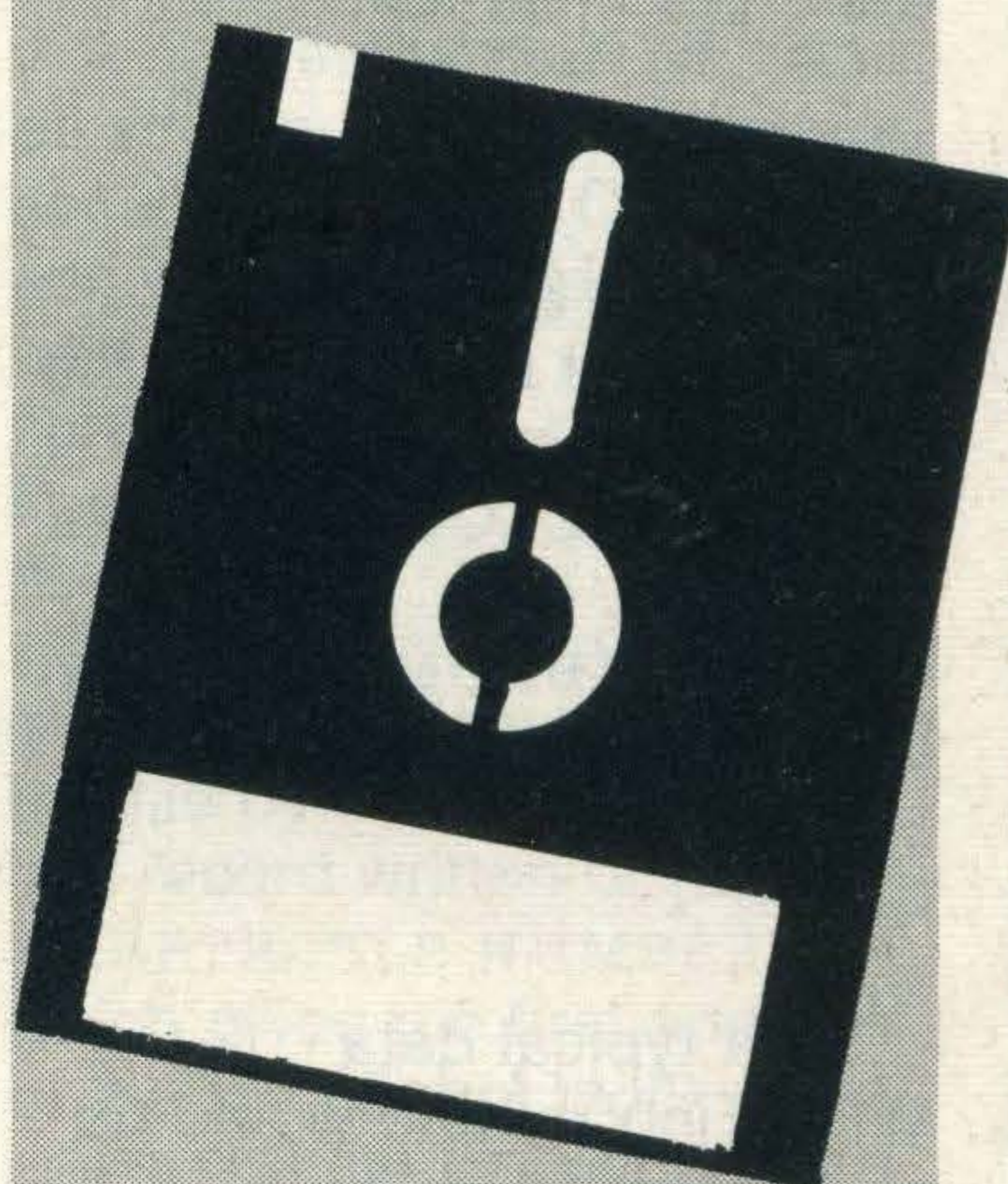
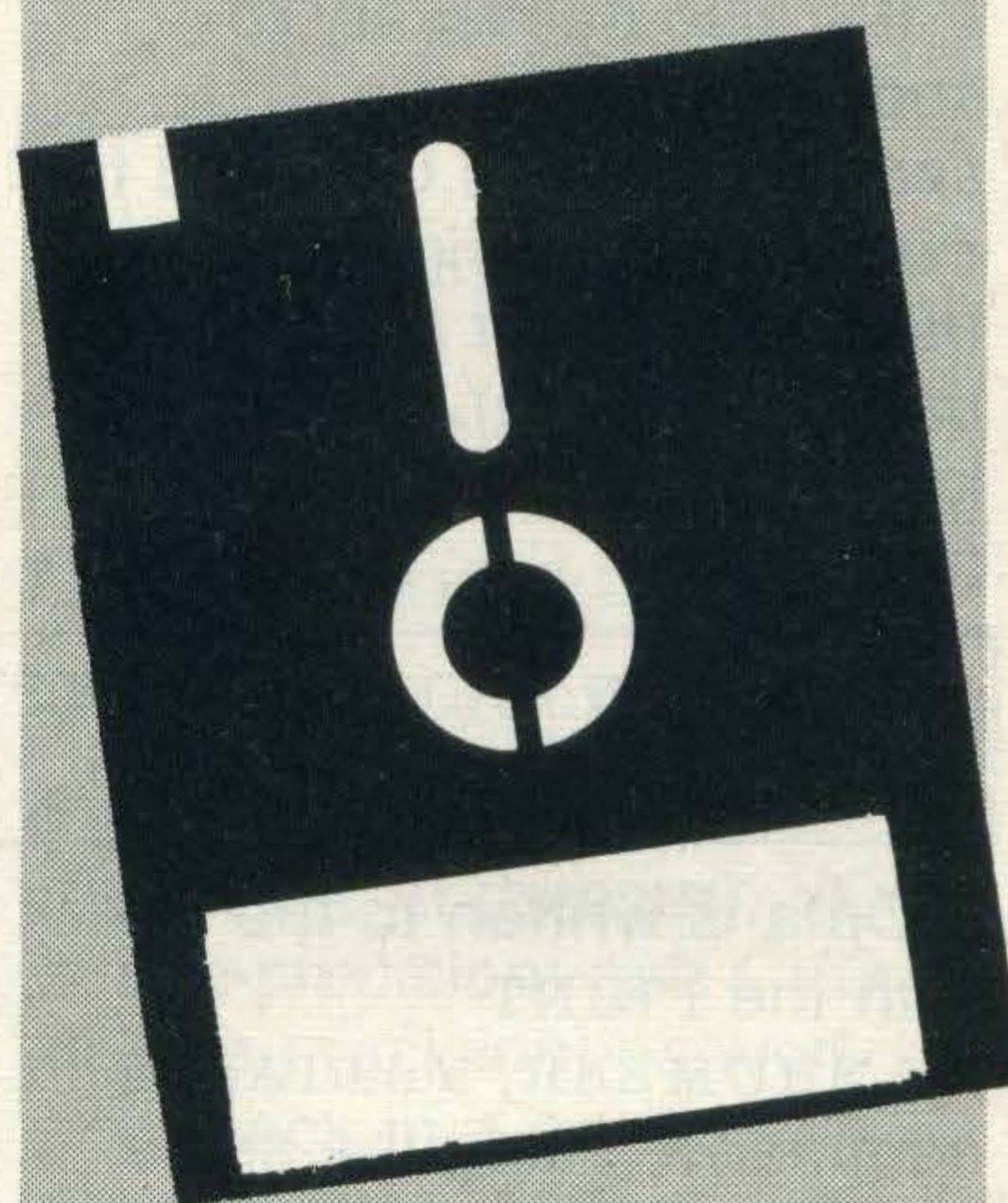
If the file is to be copied on to the same disk, of course, it will have to have a new name, but this command is used mostly to transfer a program or (more rarely) a data file across from a disk in one drive to one in the other.

More than one file can be copied at a time, using the wild-card symbols "?" and "*" .

Thus, COPY "A:*.BAS" TO B:

will copy all BASIC files from one disk drive to the other.

As with cassettes, there are BLOAD and BSAVE commands for machine language programs or data. The addition of ",R" to the



end of the BLOAD command will RUN it automatically after LOADING and ",S" at the end will LOAD data into the video RAM.

BSAVE requires specification of the top address and end address of the area of memory to be SAVED, with an execution address if wished. Otherwise the top address is regarded as the execution address. On BLOAD, an "offset" value can be added at the very end of the command which will offset the values BSAVED by the specified value.

Data files

The other Disk BASIC commands relate mainly to data files: both sequential and random access files are supported.

The difference between the two is that in the first, if you input data in alphabetical order you'd have to read all the way through A-Y to get to Z, while in the random access file there is a way of going direct to the data you want. You never get anything for nothing in this world, so while sequential files are easier to understand and operate, they're slower; while random access files are quicker, they're tougher to get to grips with. Both use the OPEN and CLOSE commands to begin and end the operation. It is possible to access a number of files at the same time - the maximum number possible is 15, but it can be limited with the MAXFILES command, because the more files you can OPEN, the more memory has to be set aside to act as a buffer for each file - and each file OPENed is distinguished by a file number. After a file number has been CLOSEd, the same number can be used to OPEN another file, giving it the same number. (Each buffer holds up to 255 bytes, and a file is only written to disk after the buffer is filled, or if the file is CLOSEd. The effect on the user is the same as if the

data were written immediately, however.)

It's also necessary to specify whether the sequential file is OPENed for *output* (WRITEing data to the file) or *input* (READING data from a file). This is known as the *mode*. The format is

```
OPEN "DN:PROGNAME.TYP" FOR MODE AS
FILENUMBER
```

Data is written to the file with the PRINT FILENUMBER, VARIABLE command, using the same number already specified for the file, and string variable, depending on the kind of data. For instance,

```
PRINT 1,A$
```

to output a character string to the file. After all the data has been written, the file is then CLOSEd with the command CLOSE FILENUMBER, again using the same number, eg

```
CLOSE 1
```

So a typical data WRITEing routine would go as follows:

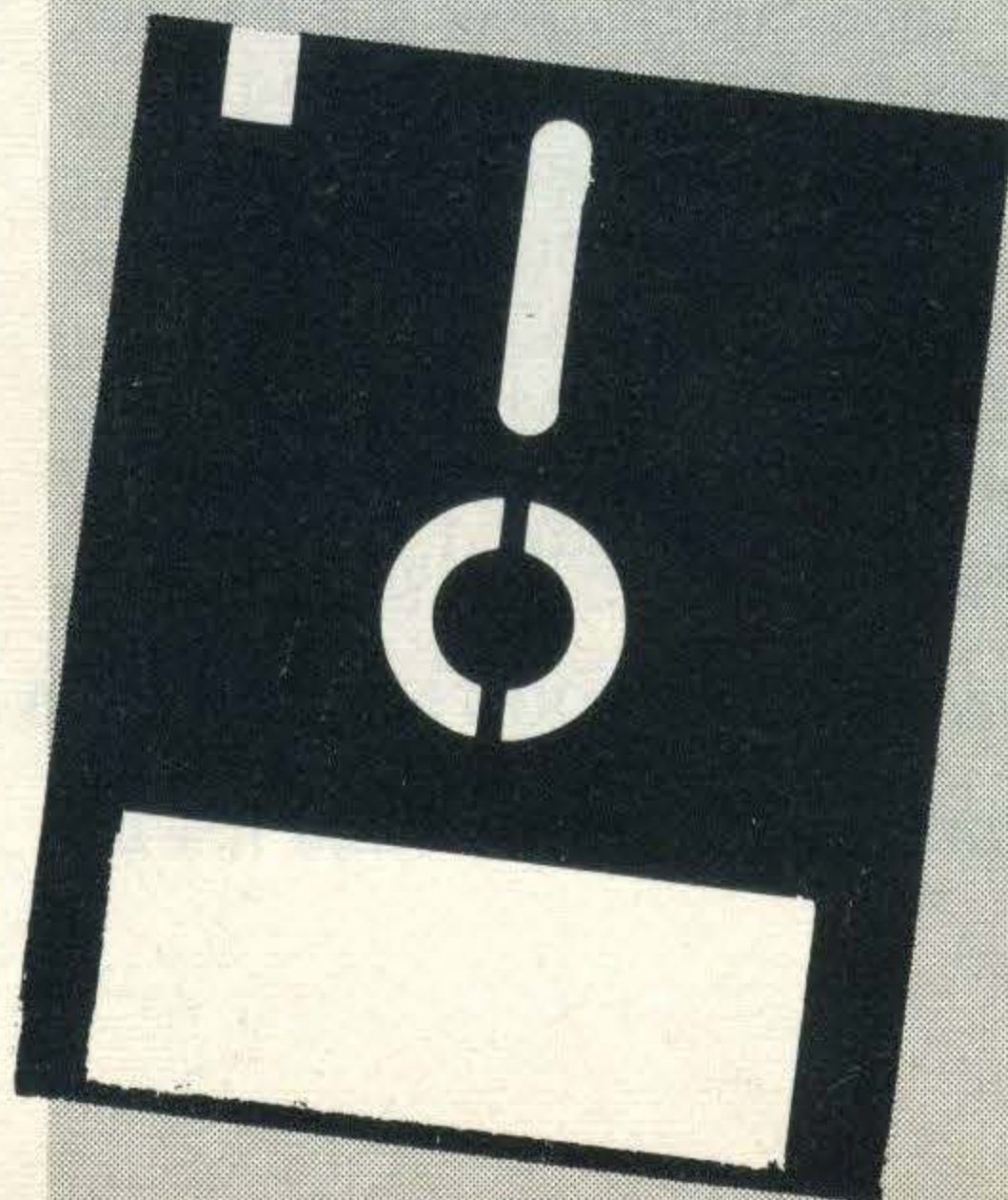
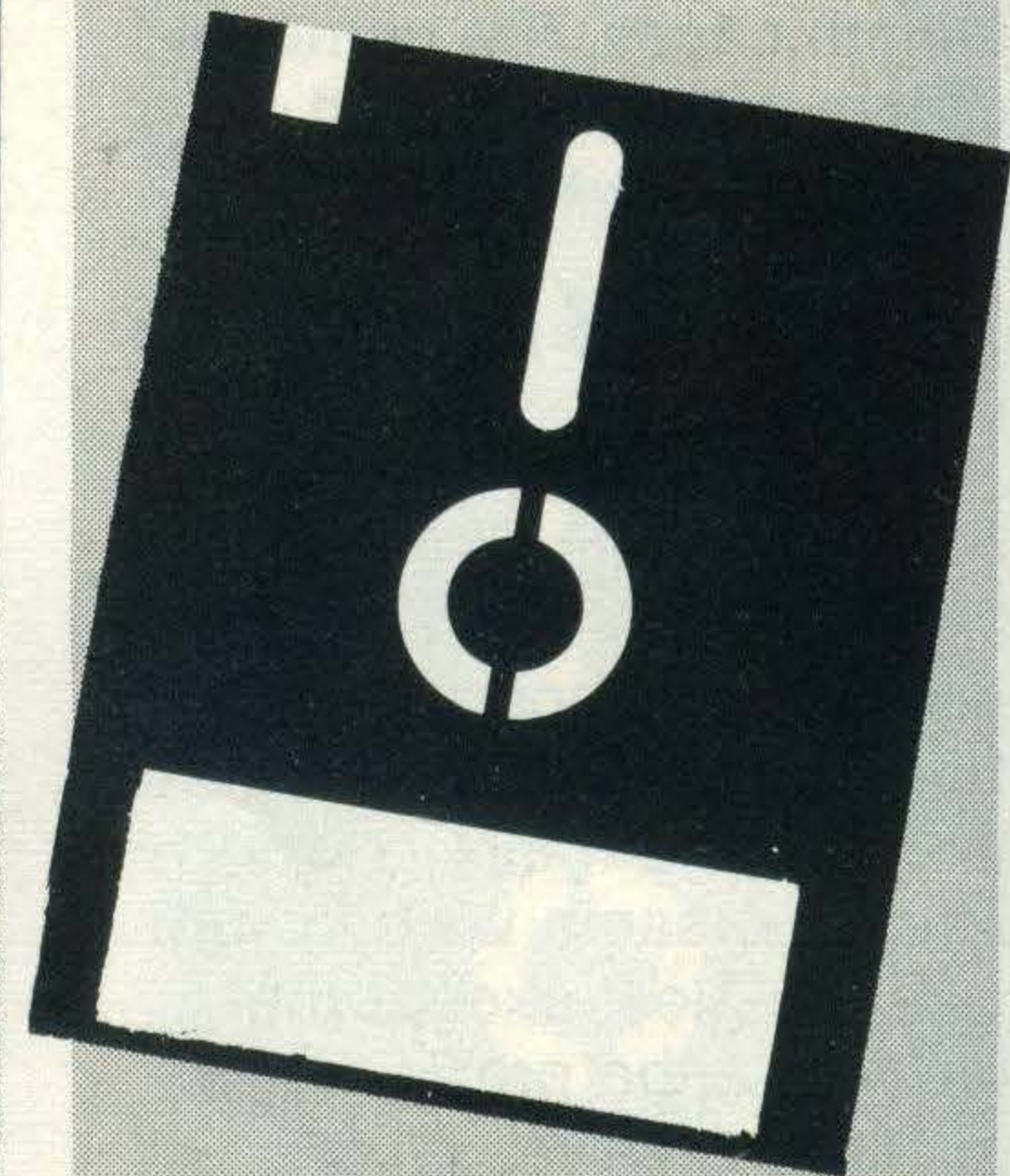
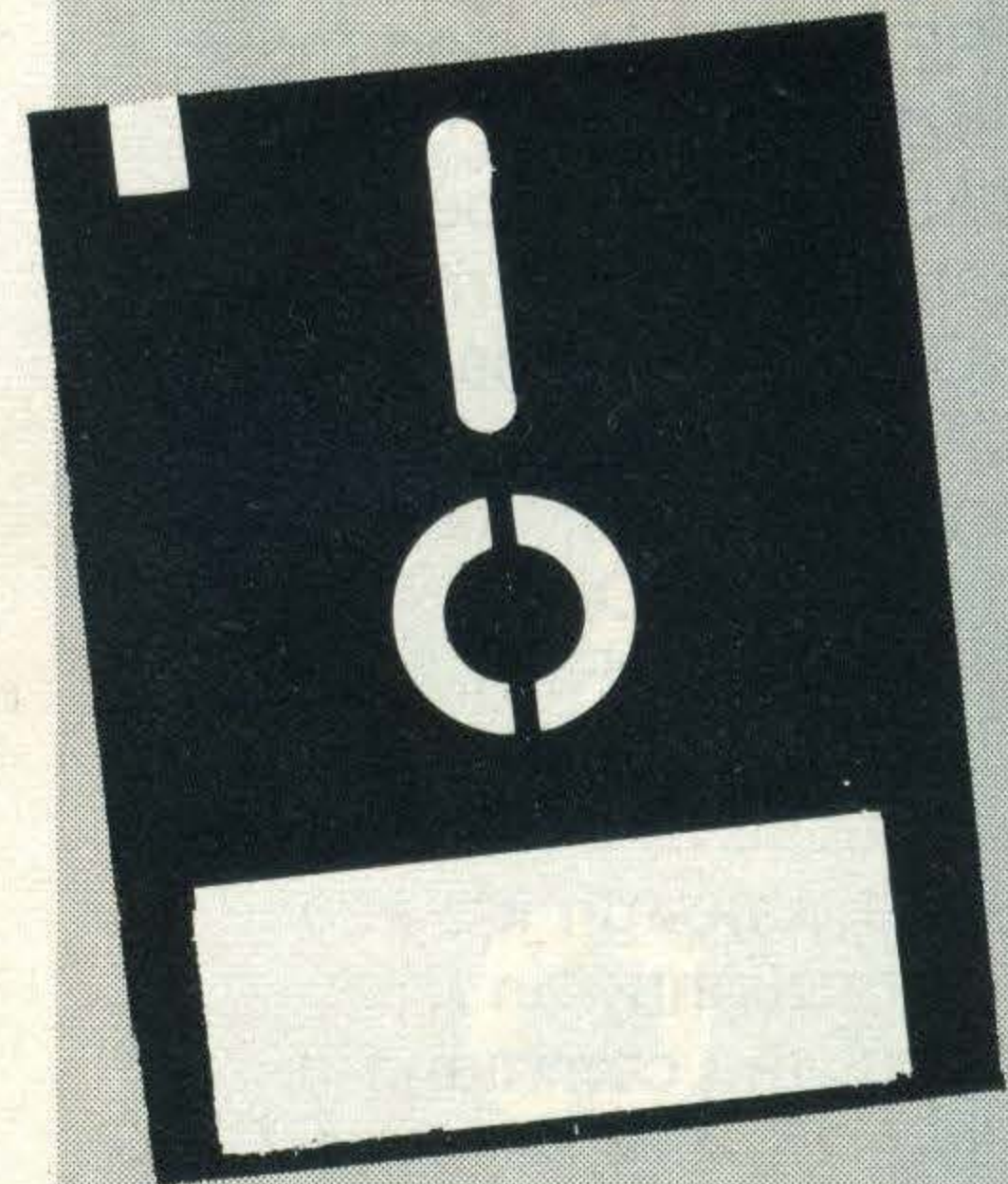
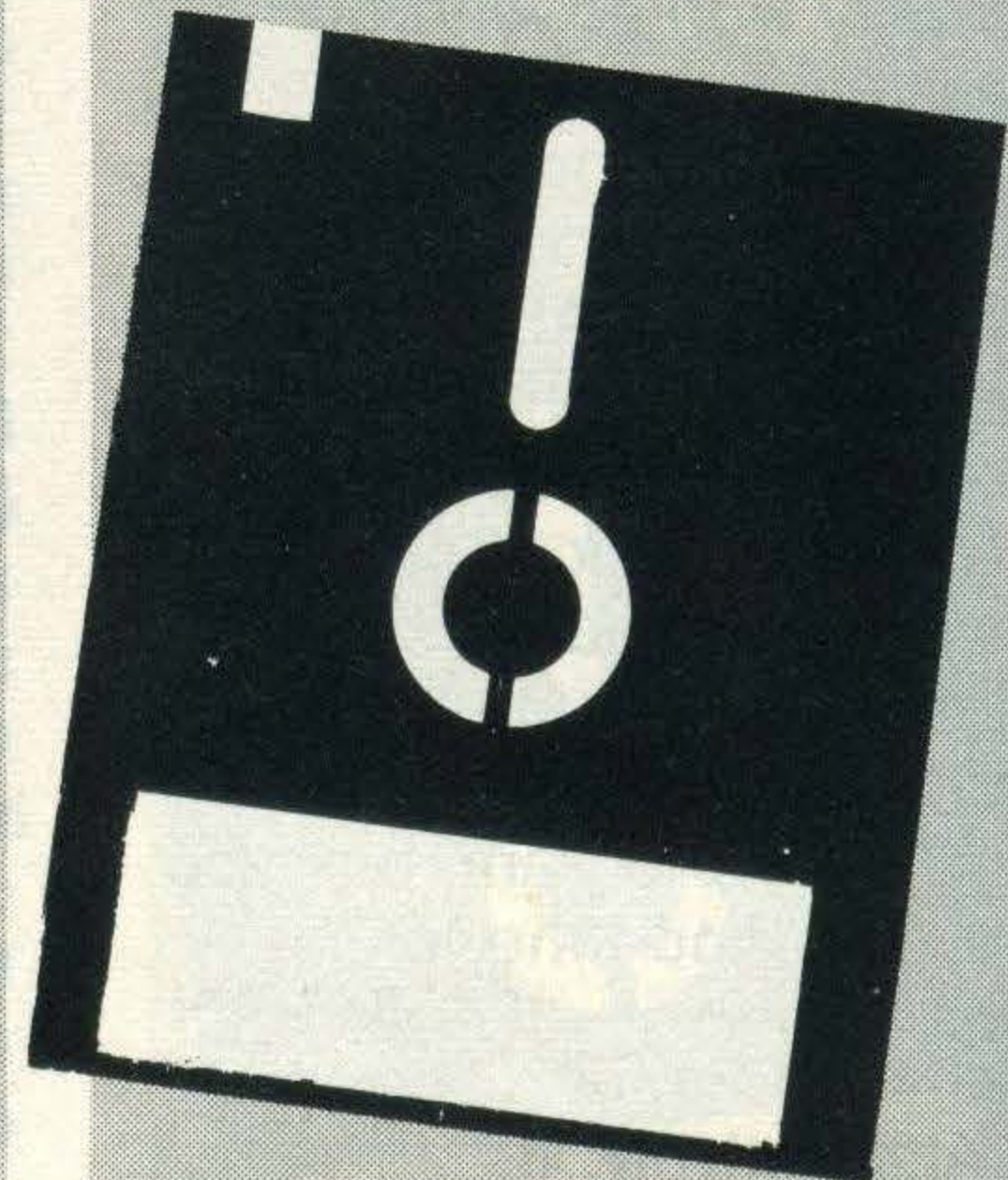
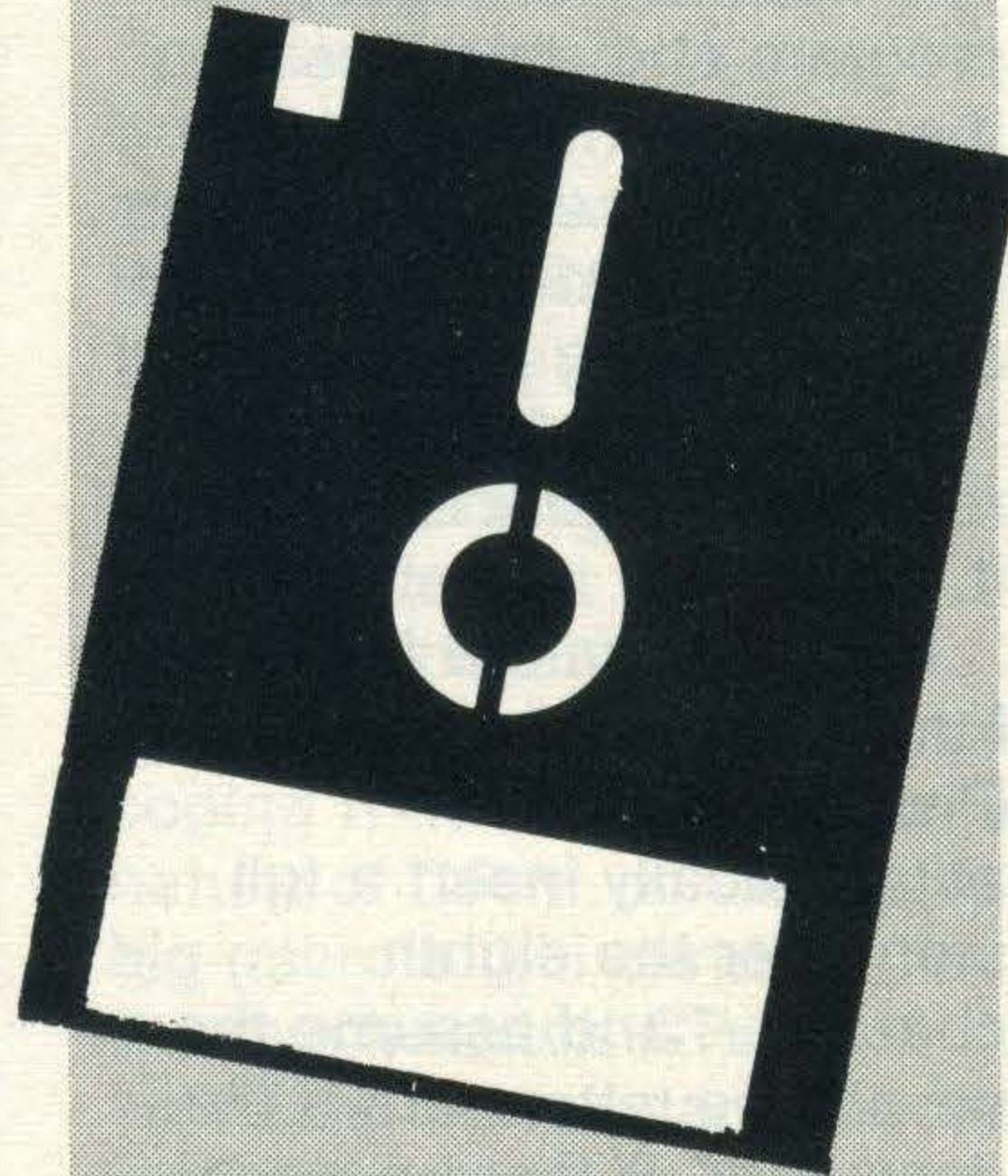
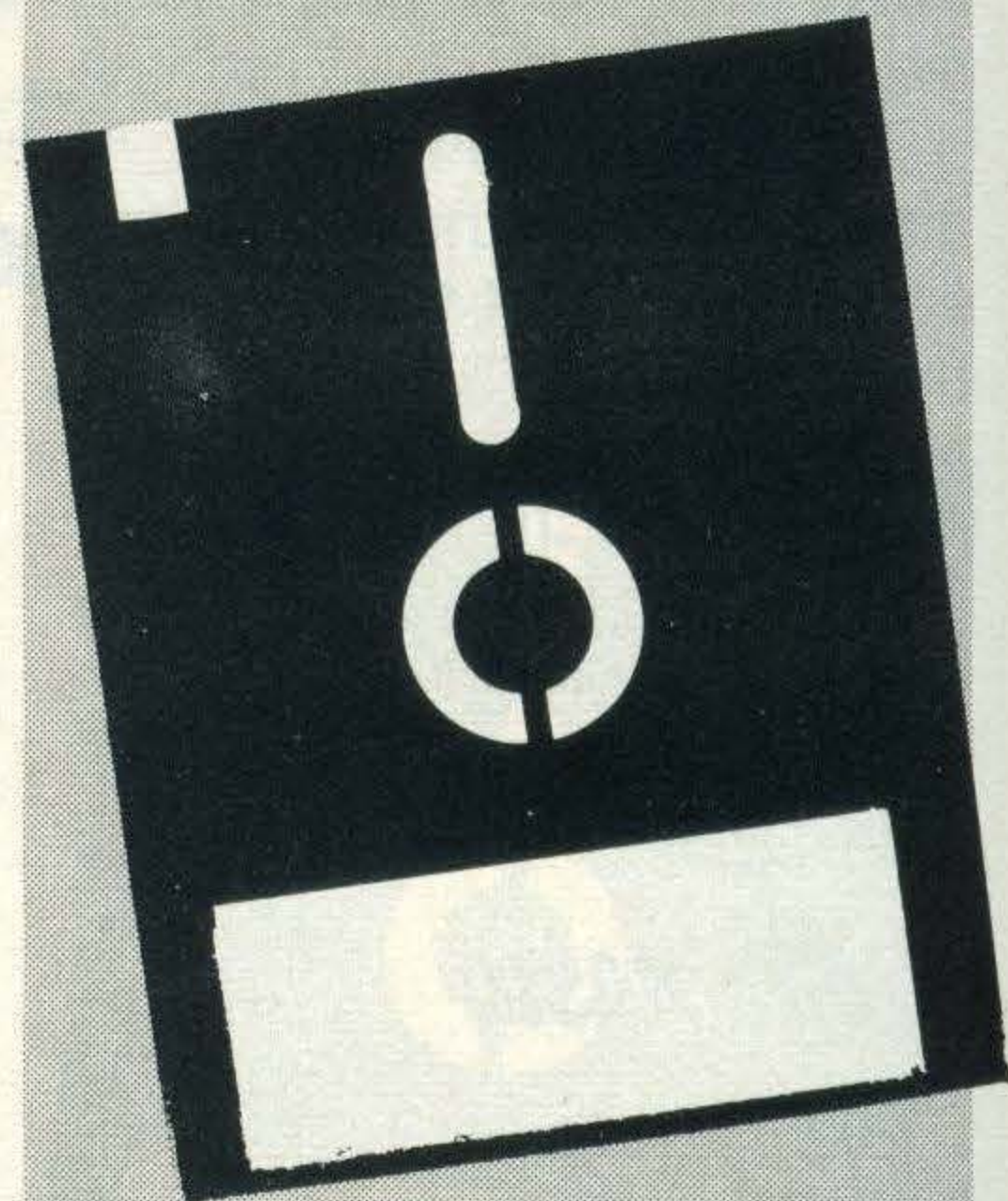
```
10 OPEN "A:ADDRESS.DAT" FOR OUTPUT AS 1
20 INPUT "DATA";A$:REM get data from keyboard
30 IF A$ = "XXX" THEN 60:REM test for end of keyboard
   data entry
40 PRINT 1,A$:REM write data to file
50 GOTO 20:REM repeat data entry from keyboard
60 CLOSE 1:REM close file
70 END
```

The input routine is similar, except that INPUT is used to read the data from the file:

```
110 OPEN "A:ADDRESS.DAT" FOR INPUT AS 1
120 INPUT 1,A$:REM get data from file
130 IF A$ = "XXX" THEN 160:REM test for end of file
   marker
140 PRINT A$:REM display input data on screen
150 GOTO 120:REM repeat data entry from file
160 CLOSE 1:REM close file
170 END
```

Line 130 is not really necessary, because MSX Disk BASIC supports the EOF (end of file) function. This reads 0 when there is still data to be read, and - 1 when there is no more data. It is placed *before* the INPUT line and line 130 should be deleted:

```
5 IF EOF(1) = - 1 THEN 160
```



DISKovering MSX-DOS

The number in brackets after EOF is, of course, the file number.

For adding data to existing files, the APPEND mode is used, making the appropriate program line:

```
180 OPEN "A:ADDRESS.DAT"  
FOR APPEND AS 1
```

The remainder of the program will follow a similar pattern to the output routine above.

With random access files, the mode doesn't have to be defined, but the length of each record can, with the "LEN = n" addition at the end of the OPEN command, thus:

```
210 OPEN "A:ADDRESS.DAT"  
AS 1,LEN = 50
```

If record length is not defined, Disk BASIC assumes it is 255 bytes.

For outputting data, Disk Basic has the FIELD command which defines the character length of each variable in a record. The syntax is:

```
FIELD FILE  
NUMBER,CHARACTER  
LENGTH AS STRING  
VARIABLE,CHARACTER  
LENGTH AS STRING  
VARIABLE [etc]
```

The data is written to the buffer with the LSET command and then written to the disk with PUT FILE NUMBER,RECORD NUMBER. The string variables used in the FIELD command must not be used in any other part of the program.

Data is read back using the GET FILE NUMBER,RECORD NUMBER command. The highest number record can be calculated by dividing the function LOF(FILE NUMBER) by the number of bytes per record. LOF stands for Length Of File.

The FIELD command can only handle string variables, and numeric variables must be converted in the LSET command, using the reserved variables MKI\$ (for integer variables), MKS\$ (for single-precision variables), and MKD\$ (for double-

precision variables), eg

```
LSET I$ = MKI$(I%)
```

```
LSET S$ = MKS$(S!)
```

```
LSET D$ = MKD$(D )
```

When READING back the data, the reserved numerical variables CVI (integer), VCS (single-precision) and CVD (double-precision) convert them back in a similar manner, eg

```
PRINT CVI(I$) [etc]
```

A sequential data file can be written to index a random access file. Other Disk Basic commands include:

DSKF (DN) which gives the space remaining on the disk in cluster units of 2 sectors per unit

LOC(FILE NUMBER) which gives the present position in the file by the number of the last record written or read

VARPTR(FILE NUMBER) which gives the first address of the file control block to which the file is assigned, expressed as an integer from -32768 to -1

There are 16 disk error messages, numbers 50 to 71, 13 of which apply also to MSX-DOS. FIELD OVERFLOW, SEQUENTIAL I/O ONLY and FILE NOT FOUND are specific to Disk BASIC.

Since most of the programs used under MSX-DOS will probably be commercially-written software, including CP/M programs, the sort of commands available tend to be simpler, unless one is going to delve into the depths of function requests in hex.

In alphabetical order, MSX-DOS commands include:

BASIC to boot Disk Basic

COPY to copy a file

DATE to display or change a date

DEL to delete file(s)

DIR to display directory of disk (wild cards are supported) - similar to Disk Basic's FILES

FORMAT to prepare a new disk

MODE to set screen width from 1 to 40 characters wide

REN to rename a file - similar to Disk BASIC's NAME

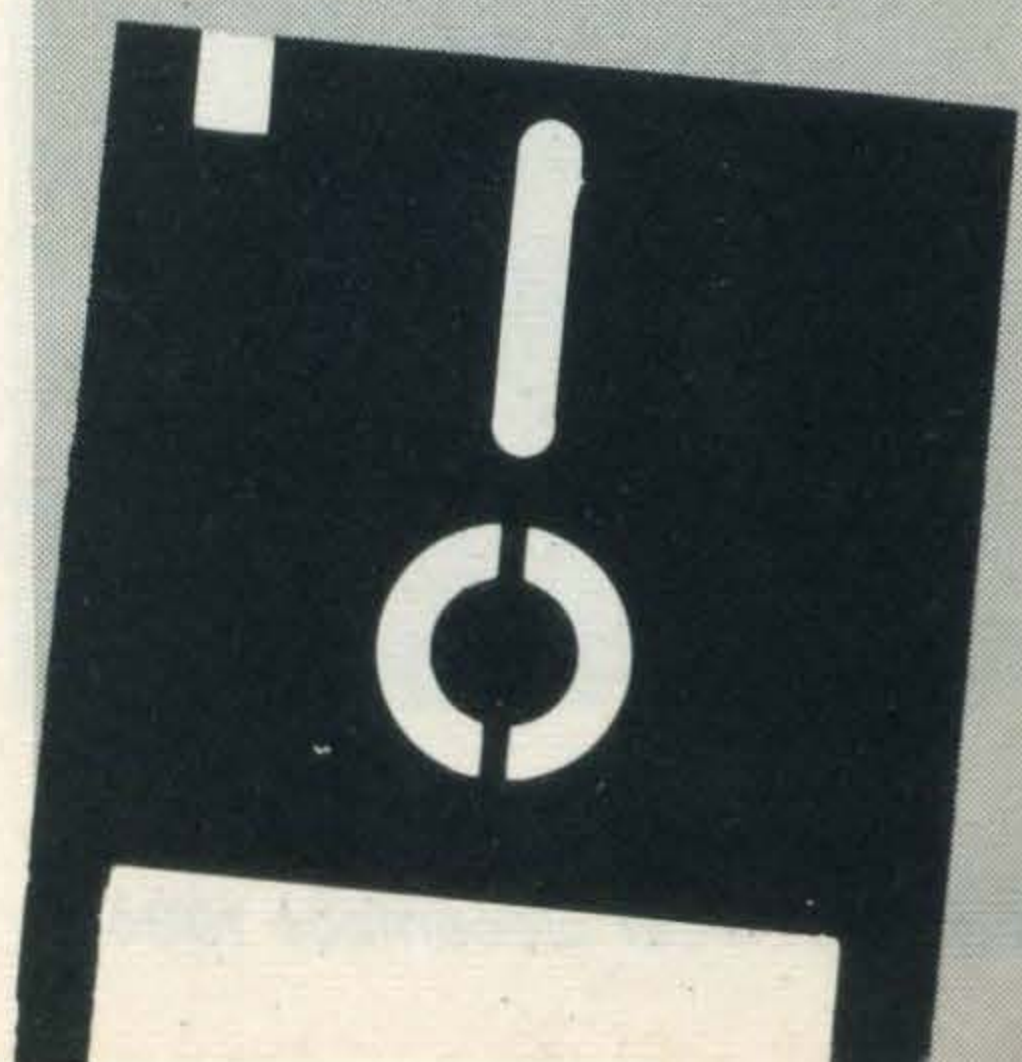
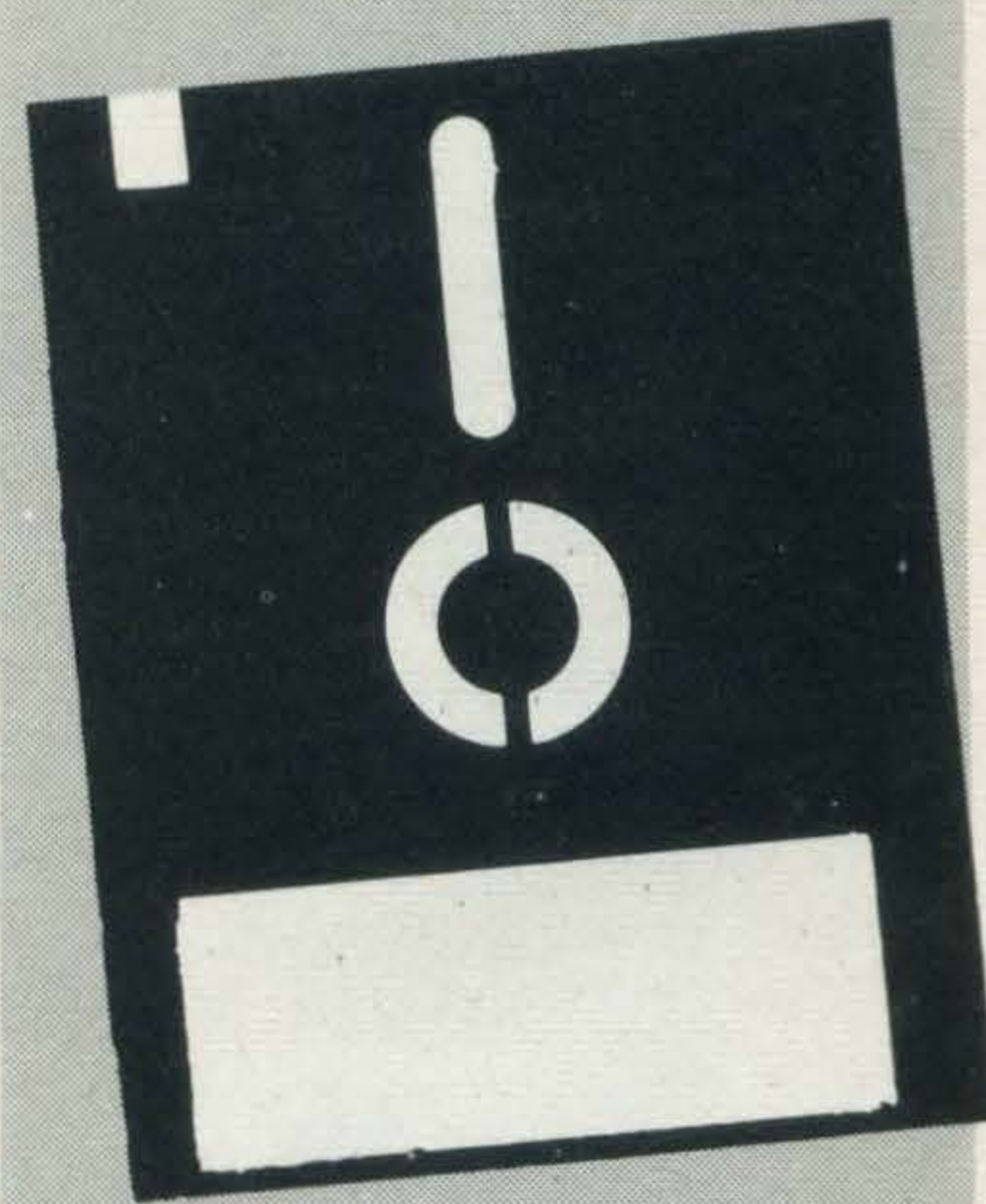
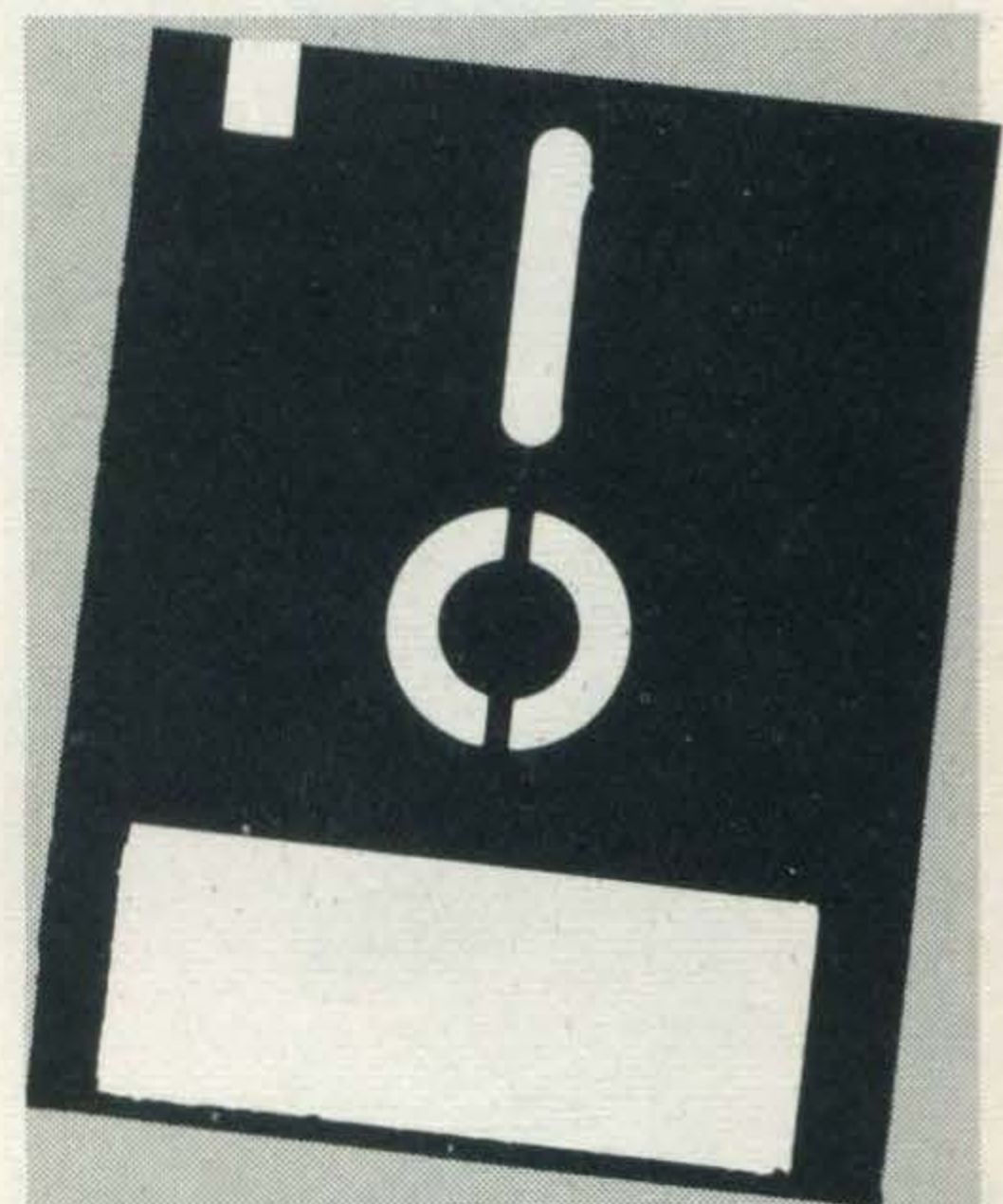
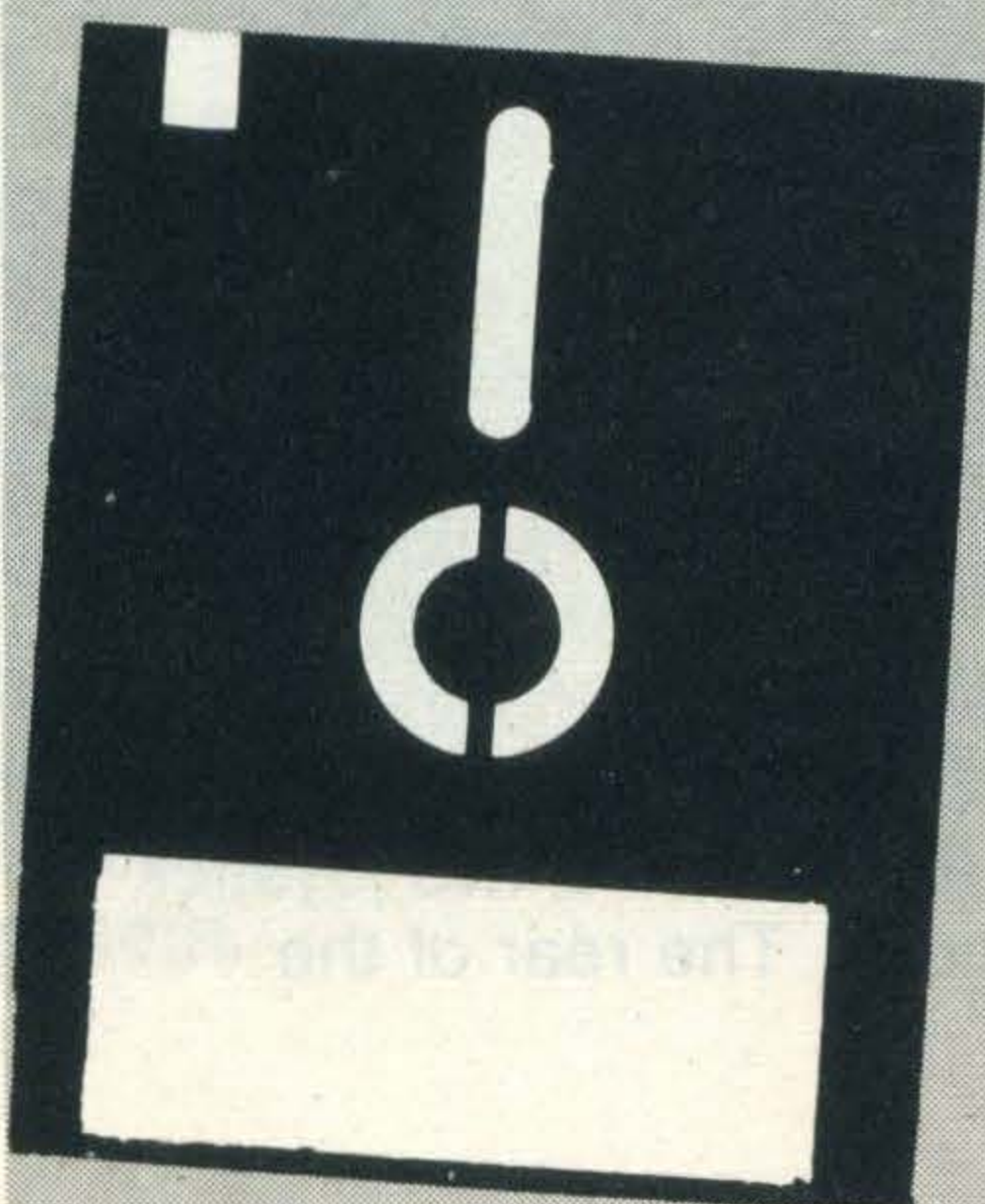
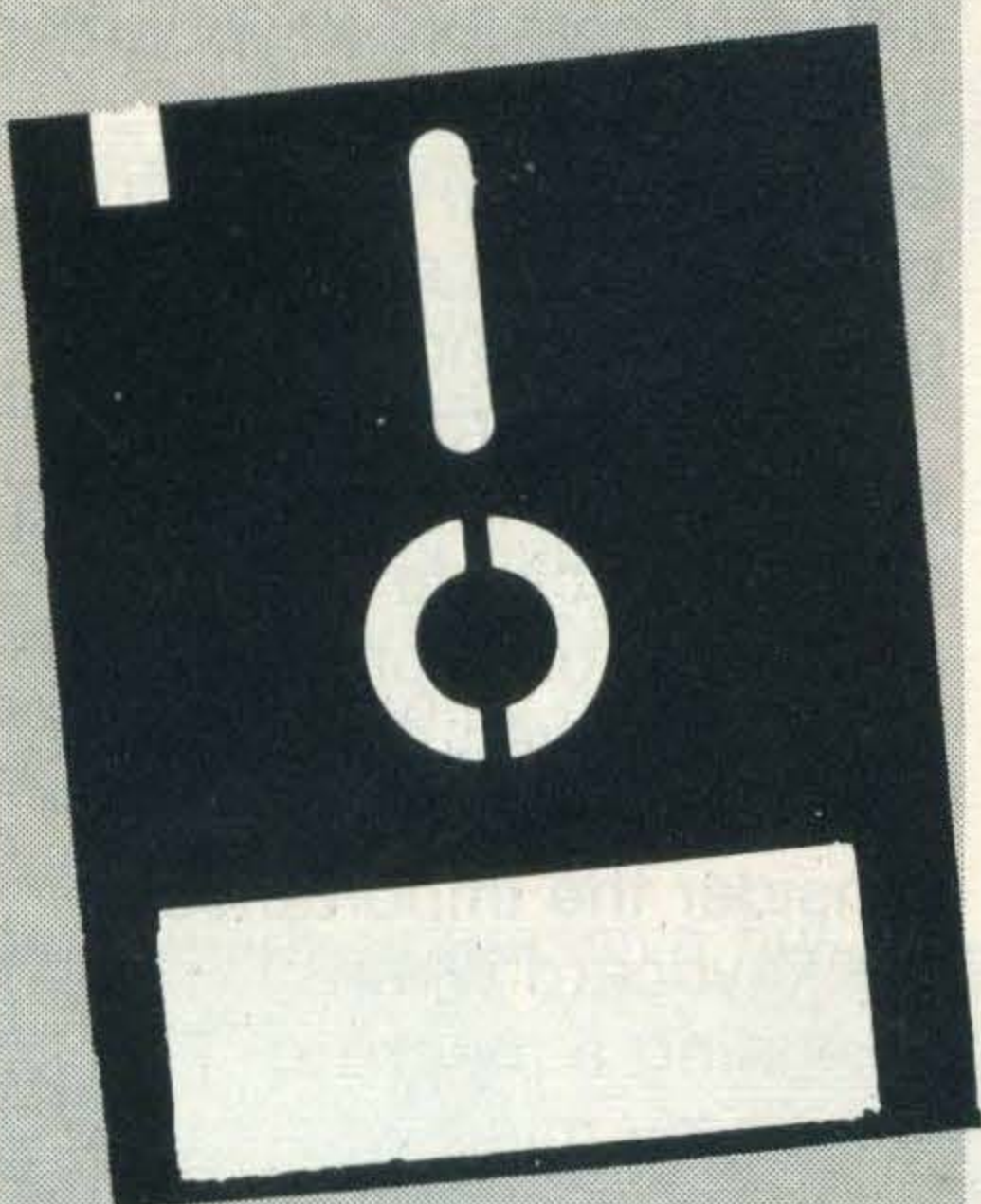
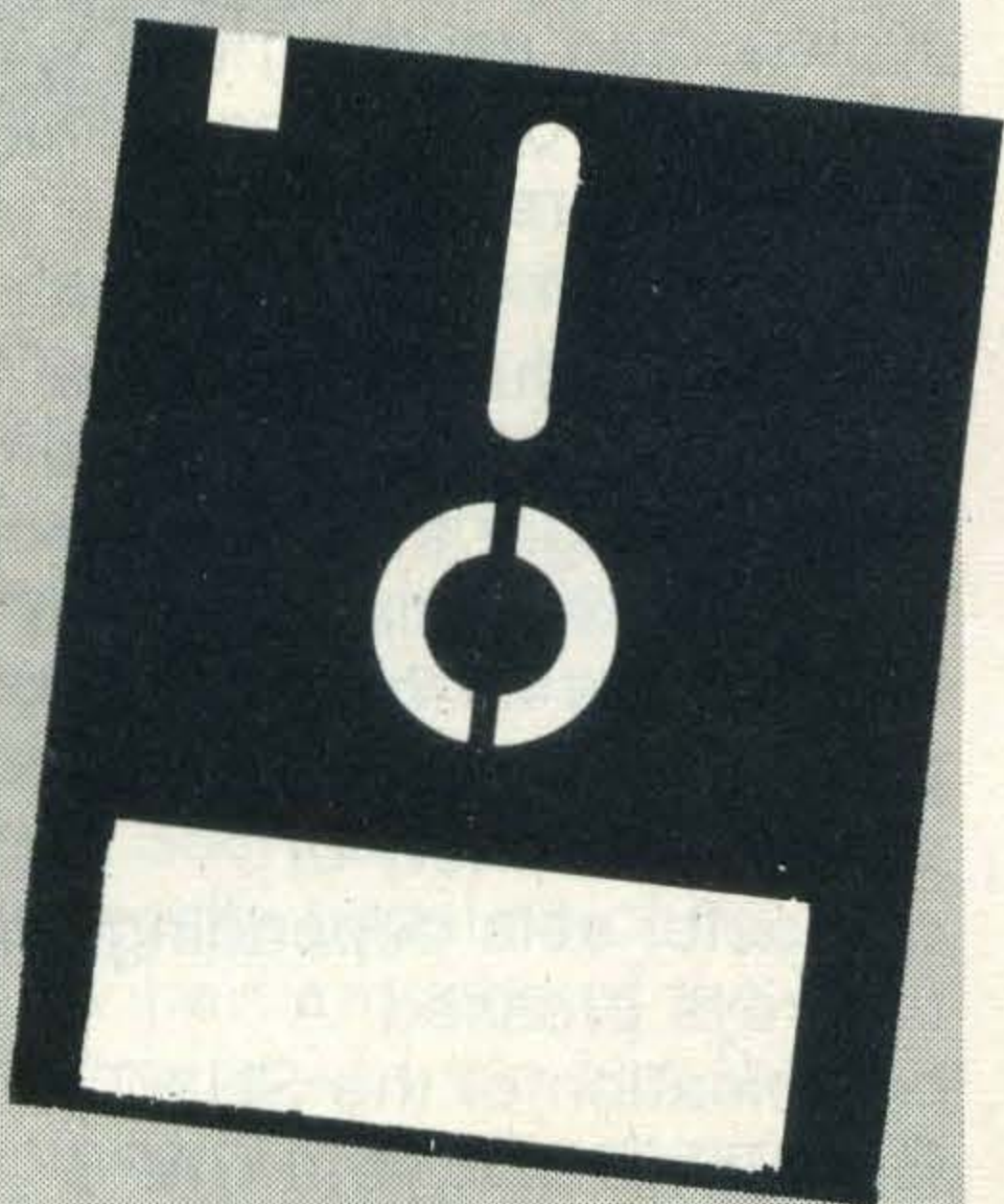
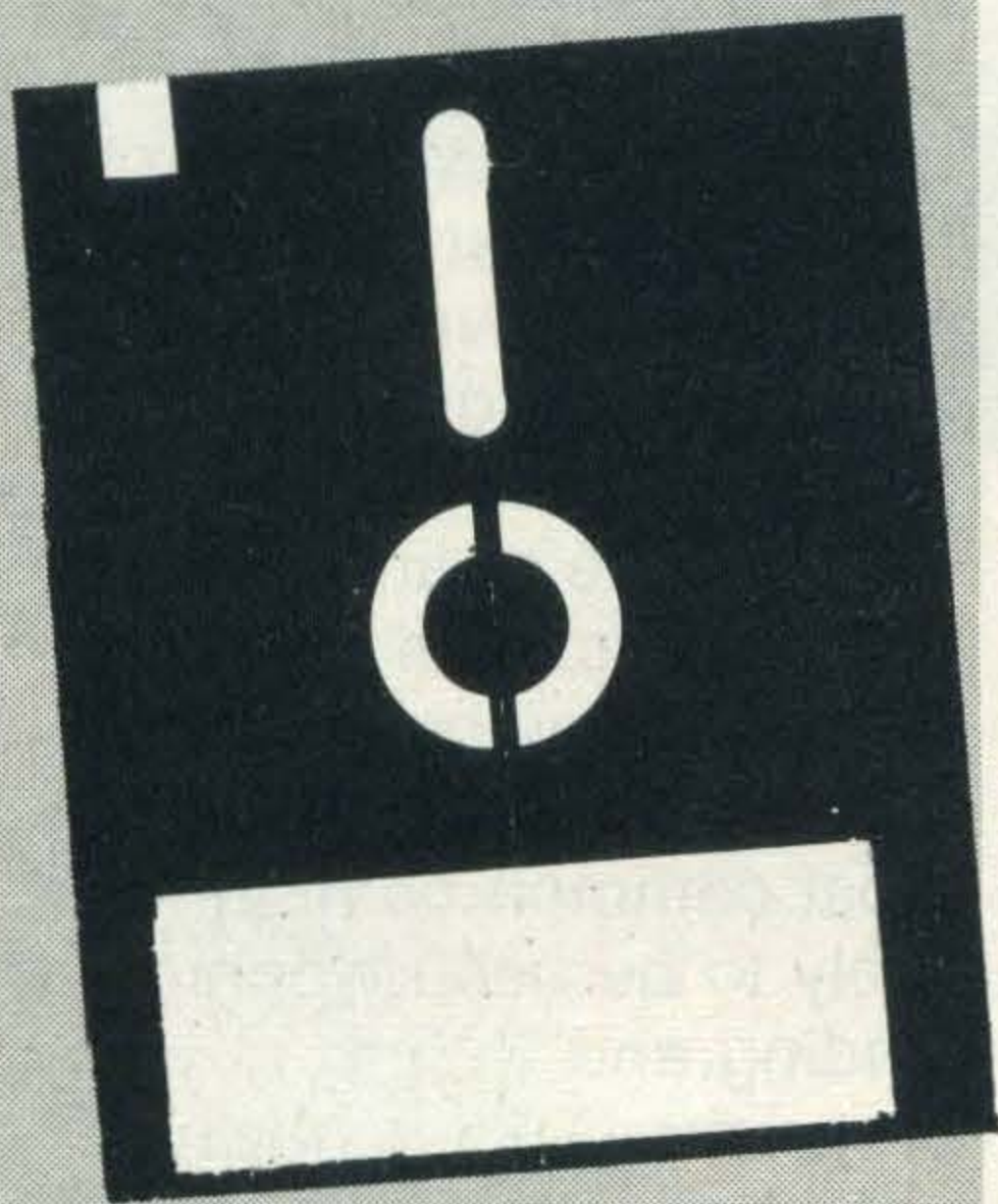
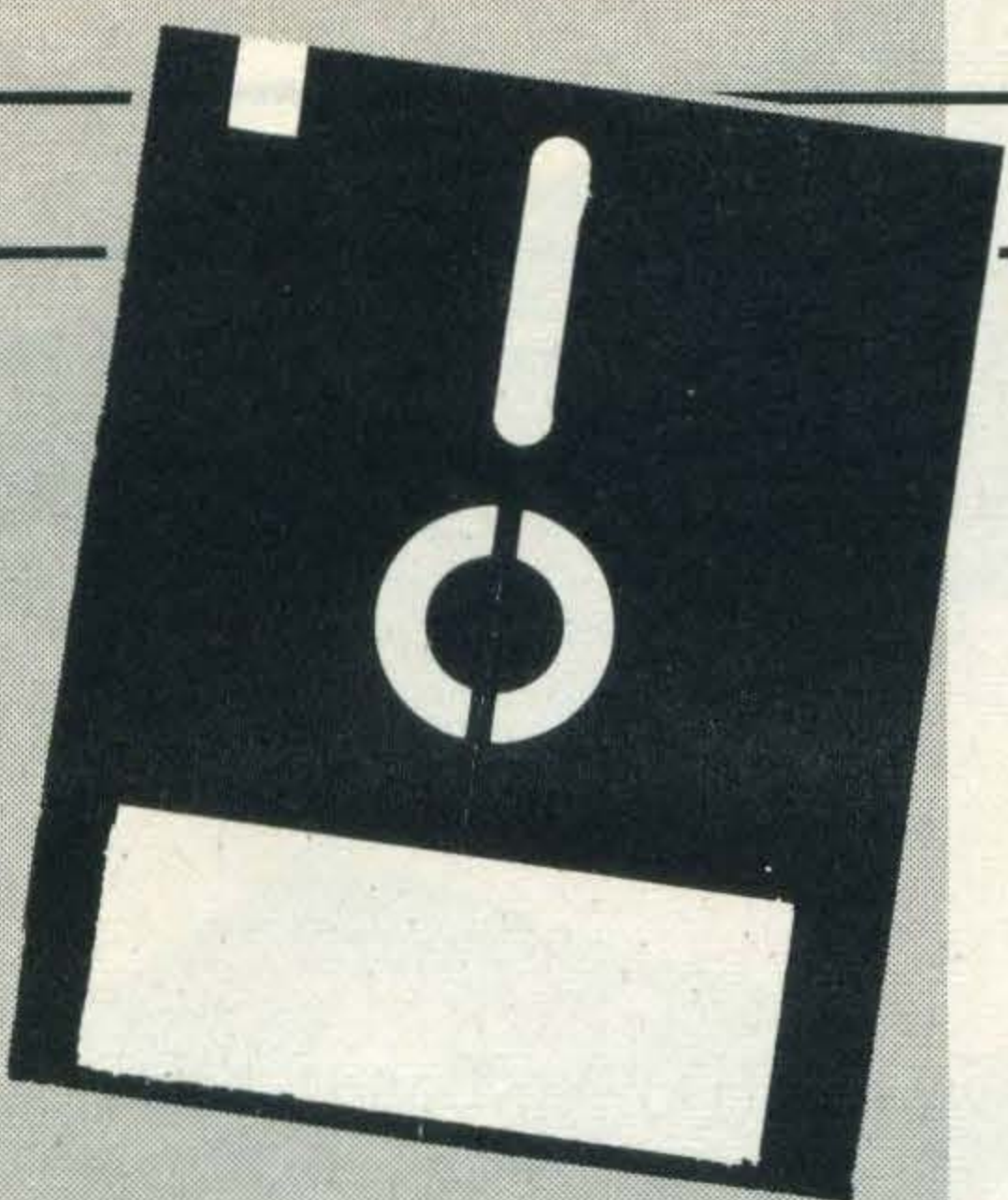
TIME to display or change the time

TYPE to display the contents of a file

PAUSE to wait for a key press during batch file execution (comments can be added)

REM to display a comment during batch file execution (unlike REM in Basic, which has no visible effect)

As I've said, the great virtue of MSX-DOS is that the way it works has already been made familiar by the way IBM has popularised its "Big brother", MS-DOS. A good guide, like "MS-DOS User's Guide" (Que Corporation, Indianapolis, available for about £9.75 in UK from specialist bookshops) is very handy. Next month, however, I'll explain some of its nicer features, like batch files!



Jeremy Vine sees Sanyo and decides

With so many of the well known consumer electronic firms making MSX computers, reviewing a machine which has so much in common with other computers is not the most exciting assignment. It would therefore be a pleasure to come across a machine that goes well beyond the MSX standard. The Sanyo MPC-100 on first sight didn't offer anything promising but with encouragement from the editor (go Jeremy, go - Ed) I duly set about my task.

The Sanyo MPC-100 computer is a full MSX spec machine and comes complete with two cassettes, two manuals and leads for connection to TV set and tape recorder. The only missing part was the plug which seems to be an expensive part for manufacturers to include.

My review copy was supplied with a complete range of peripherals and ROM cartridges to try out, though one hour after I received the machine, Sanyo phoned me to return two of the cartridges, as I had their entire collection. All five of them!

Construction

The MPC-100 is constructed from two moulded pieces of hard plastic, with no special design features worth shouting about. It's by no means the most eye-catching machine but it's a sturdy enough box. Though I would treat it with respect when moving around. The keyboard meets the MSX standard of 73 keys and is in resemblance similar to other MSX keyboard layouts such as the SONY HB-75.

Besides the expected QWERTY layout, which us one finger typists have learned to love, the keyboard has five function keys placed above the main

QWERTY keyboard, each of these keys being able to be used with the shift key therefore giving a total of 10 function keys. When the machine is first turned on these keys have certain functions assigned to them (See MSXposed) although they can be changed by the user. The choice of these functions has been well thought out and covers the most common commands likely to be used when loading and writing programs. This is always useful as most programmers are both lazy and bad typists, and anything that saves time or wear and tear to the fingers is to be greeted with enthusiasm.

The four cursor keys are to the right of the keyboard and are larger than the standard keys making them easy to use for games playing. The keyboard can produce a variety of character sets depending on the keys pressed. A combination of the SHIFT, GRAPH, CODE and CAPS keys will produce seven different possible keyboard character sets covering Greek lettering, European characters, accents and graphical symbols.

The keyboard hasn't the feel of a typewriter keyboard and would cause most typists fits of depression. It's a pity that manufacturers so often ignore or don't consider the importance of the keyboard when designing a machine. This one to my mind was tacky.

Layout

The rest of the machine is well laid out with a reset button set out of harms way on the side of the computer. It requires a very firm push to use, thus avoiding any accidental erasure of programs in memory. Next to the reset button on the right side are two joystick ports. The rear of the

machine displays the majority of ports which looking at the back from left to right are the expansion bus, which is a 50 pin slot, an 8 bit parallel printer port, cassette port, Audio out, Video out, RF out (to TV set) and the power switch.

On the right at the top of the machine there is a ROM cartridge port which is covered by a flap when not in use. Its most interesting feature was a little arm



inside the slot which detects the insertion of a cartridge and causes the machine to switch off until the cartridge is inserted properly or removed. This little feature should prevent the most careless person from ruining a ROM cartridge and demonstrates the true spirit of the MSX machines which are aimed in part at newcomers to computing.

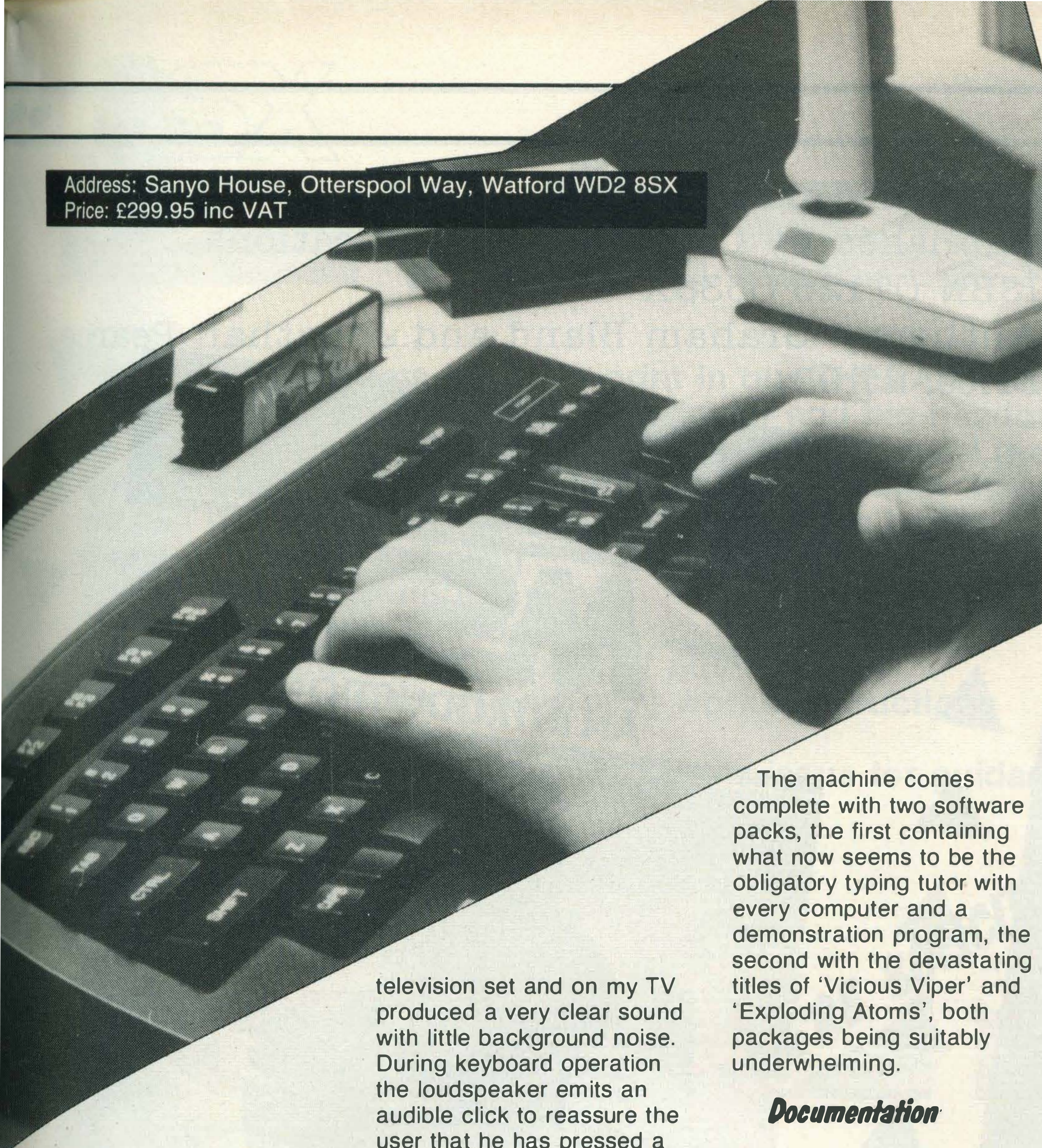
Memory

Next to the cartridge port there is a small circular emblem proclaiming the machine to be 64K. My heart leapt with joy at this amount of memory to play with. That is until I turned on the computer and discovered the message informing me that there was 28815 Bytes free! Less than half of what the label told me I had. Well, what's 36K of RAM anyway?!

The total built in memory is 112k and splits into three

SANYO MPC-100

Address: Sanyo House, Otterspool Way, Watford WD2 8SX
Price: £299.95 inc VAT



main areas: The main program storage memory of 64k RAM: the system memory, which is 32k ROM and contains the BASIC language, and finally the video memory of 16k RAM. No real surprises here. Sanyo producing as much as most other MSX manufacturers and no more.

Internal

The case is easily opened by removing five screws and this splits the machine into two halves, the upper section being the keyboard and the lower half the printed circuit board, both connected by a ribbon cable. The power supply is on the left hand side of the machine and during operation became warm but nothing that was noticeable. The sound generator chip which produces 3 sound channels over a range of 8 octaves (MSX standard) was the AY-3-8910. The sound is directed through the

television set and on my TV produced a very clear sound with little background noise. During keyboard operation the loudspeaker emits an audible click to reassure the user that he has pressed a key. Such assurance is a necessity because of the poor performance of the keyboard and the fact that you can't be sure whether you've pressed the key or not!

Performance

The MPC-100 once turned on performs well, and I found no problems with the screen display and the few programs I used gave an adequate display of the machines' talents. The sound effects were particularly impressive but this is due to the MSX Design specifications. All text can be typed in lower case with the BASIC keywords being converted to upper case when a program is listed.

The machine has four screen display modes (See MSXposed) covering two text and two graphic modes. Up to 32 sprites can be used on the screen at any one time, the sprites being made up from an eight by eight dot pattern.

The machine comes complete with two software packs, the first containing what now seems to be the obligatory typing tutor with every computer and a demonstration program, the second with the devastating titles of 'Vicious Viper' and 'Exploding Atoms', both packages being suitably underwhelming.

Documentation

Having been supplied with the accepted industry standard for a review – photocopied proofs of the final manuals – I won't mention the mistakes as I can only assume they are being dealt with. However the manuals were very much the near-final versions (no index 'though) and were of a reasonable quality. The smaller of the two was the operating instructions guide and this is a clear precise guide to setting up the computer, showing all the appropriate connections. It was pleasing to see the seven possible keyboard layouts clearly shown, these being obtainable by using (or not) varying combinations of the SHIFT, GRAPH, CAPS and CODE keys.

LOADING and SAVEing programs is also covered and the manual also supplies details of all the terminal connections and machine specifications including a rough memory map. All things considered this guide should get all owners to the stage of a

machine ready for action. The next problem is whether they can make any use of their computer.

If they have to rely on the programming manual I don't give them much chance! Well let's be fair, little chance if they haven't programmed before. As a reference guide for the experienced user I rate it highly. It has good sections explaining interrupts, sprites and the creation of sound and music, with good examples such as overlapping sprites. The BASIC keyword guide is excellent for reference with each keyword well defined and supplemented by a BASIC program example. However, it is not a teaching guide to MSX BASIC. There is a feeble attempt at introducing MSX BASIC but it falls a long way short of the mark. Considering the publicity behind MSX machines being for the beginner, Sanyo have made little effort in catering for this market in their guide. The programming manual is nothing of the sort and should be renamed as a reference guide.

Conclusions

The Sanyo MPC-100 is a micro which meets the MSX standard requirements and as a machine performed well. But, overall it has to be said that Sanyo haven't gone overboard to add to the MSX specification and for the money it may well be overpriced. For the same amount the Sony machine looks to be a better buy and £300.00 is a lot for a machine that offers little above other comparable machines in both the MSX and non-MSX markets. Overall, a good competent machine from a company already selling micros in the business market, but overpriced.

And the final comment is straight from the horses mouth. Sanyo, when asked about the selling points of the MPC-100 over the competition, replied that they could think of none except that their machine was made in a computer dedicated factory. Nuff said!

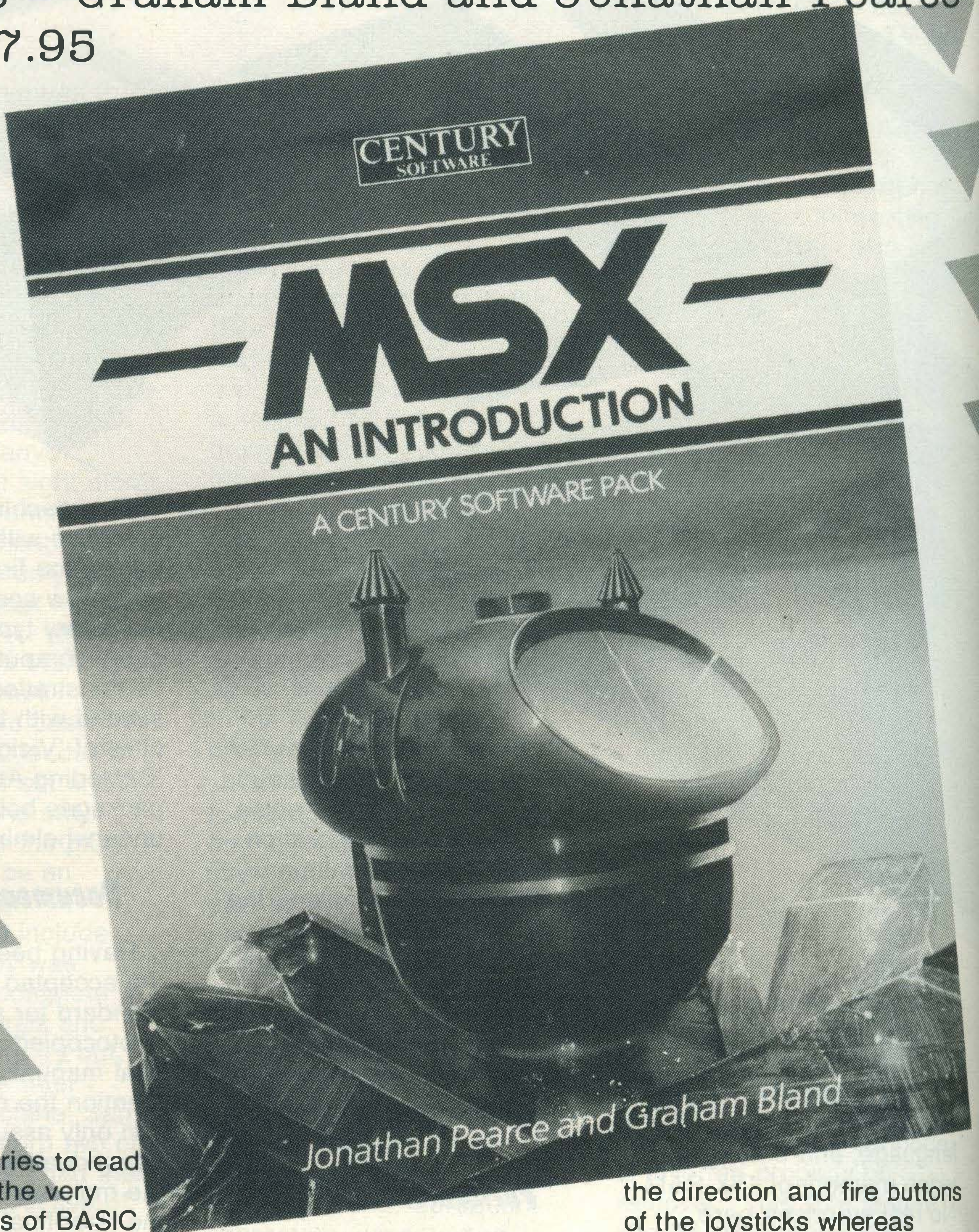
MSX an introduction

Published by Century Communications

ISBN 07126 0538X

Authors - Graham Bland and Jonathan Pearce

Price: £7.95



This book tries to lead you from the very beginnings of BASIC programming to the complexities of Sprite graphics and sound facilities in 166 pages. Much of the first section deals with an explanation of computer terms and standard BASIC programming. I should have preferred the book to have concentrated on the special features of MSX BASIC, leaving attempts to introduce standard Microsoft BASIC to other publications.

The chapters on graphics and sound commands are very well thought out and accompanied by some excellent examples. In fact, the final program listing is one of the best computer 'artist' programs I've seen available for any microcomputer (including several commercial

programs costing twice as much as the book alone) and I would buy the book just for that reason. Unfortunately, there's no index provided and I found it very consuming trying to find a reference I needed. My other criticism is that there are one or two slightly misleading statements. This is probably due to the fact that the authors wrote the book at a time when only the Spectravideo computer was available and that machine was not completely MSX compatible. Spectravideo now market a full MSX Micro, the 728.

The book suggests that STRIG (0) and STICK (0) test

the direction and fire buttons of the joysticks whereas MSX requires STICK (1) and STRIG (1).

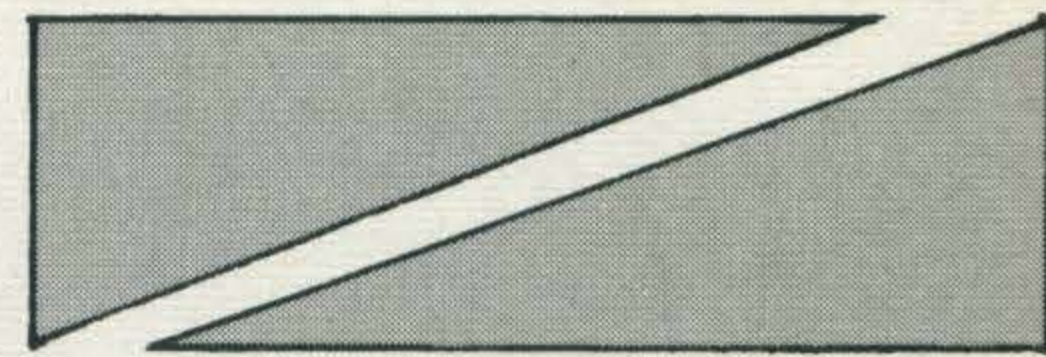
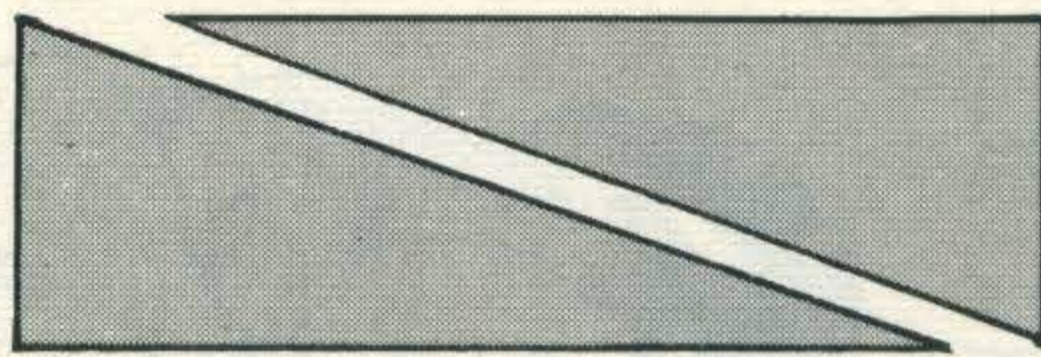
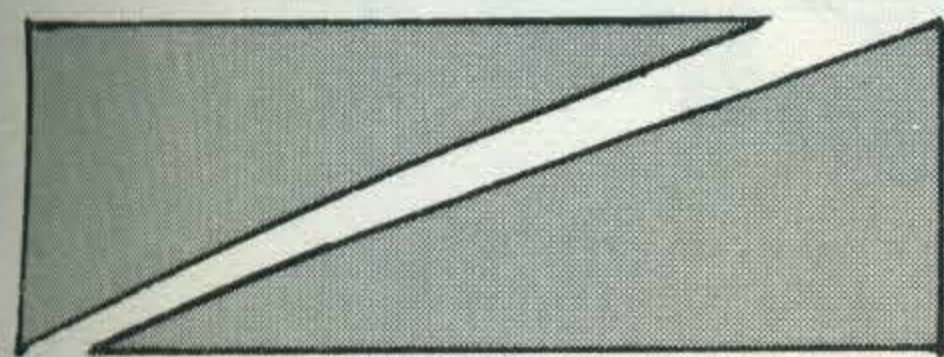
STICK (0) tests the cursor keys! In addition, it suggests that the interrupt driven ON STRIG command will test for the fire button whereas MSX will ignore this command and you can only have an interrupt driven test for the space bar. It is, of course, possible to test for the fire button with STRIG (1).

Despite these criticisms, the book is a reasonable, 'though hurriedly written, introduction to the facilities of MSX BASIC and can be recommended, bearing in mind that it is the first to appear.

A tape containing the best programs is available from the publishers at a cost of £6.

MSX

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Supply - Cassette of prog

List of variables used

Brief explanation of program flow

Printer listing of prog (if possible)

Explanation of how prog works/instructions

Check out the THERAPY feature in this issue for guidance.

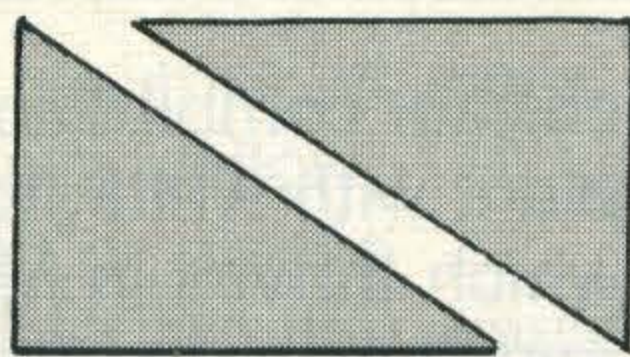
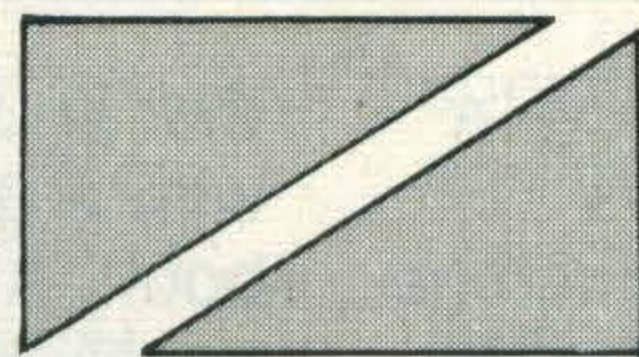
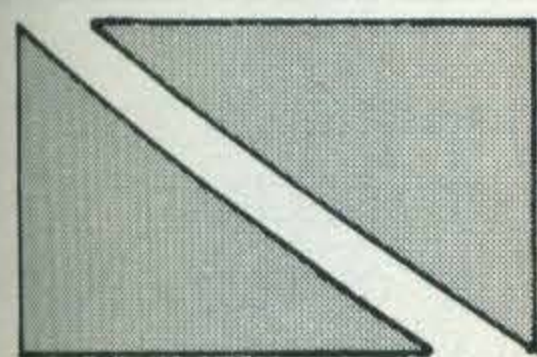
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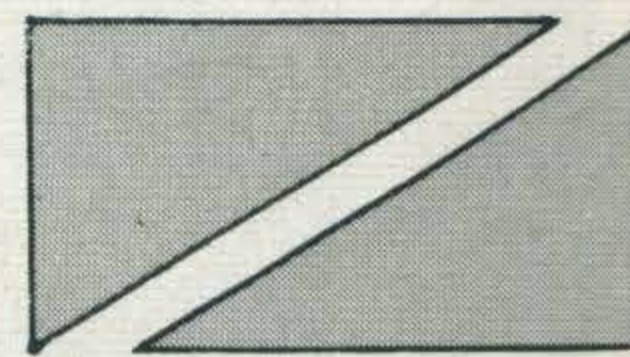
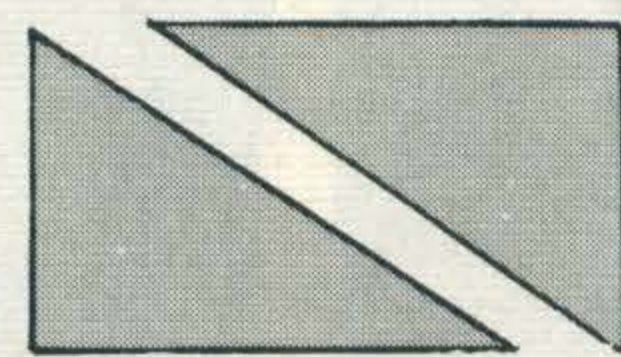
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Dear Microfans,

We have used MSX since its release in Japan last year, you will have read the articles in MSX USER about us going to Japan to meet the inventor of MSX & see the MSX manufacturers. We are acknowledged as experts in Japanese computers by TOSHIBA, SANYO, MITSUBISHI, & SHARP who all buy MSX's programs. We are also enthusiasts & will always help you - no other firm can match us for service or value for money.

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happy computing, Graham Knight & Neil Hunter

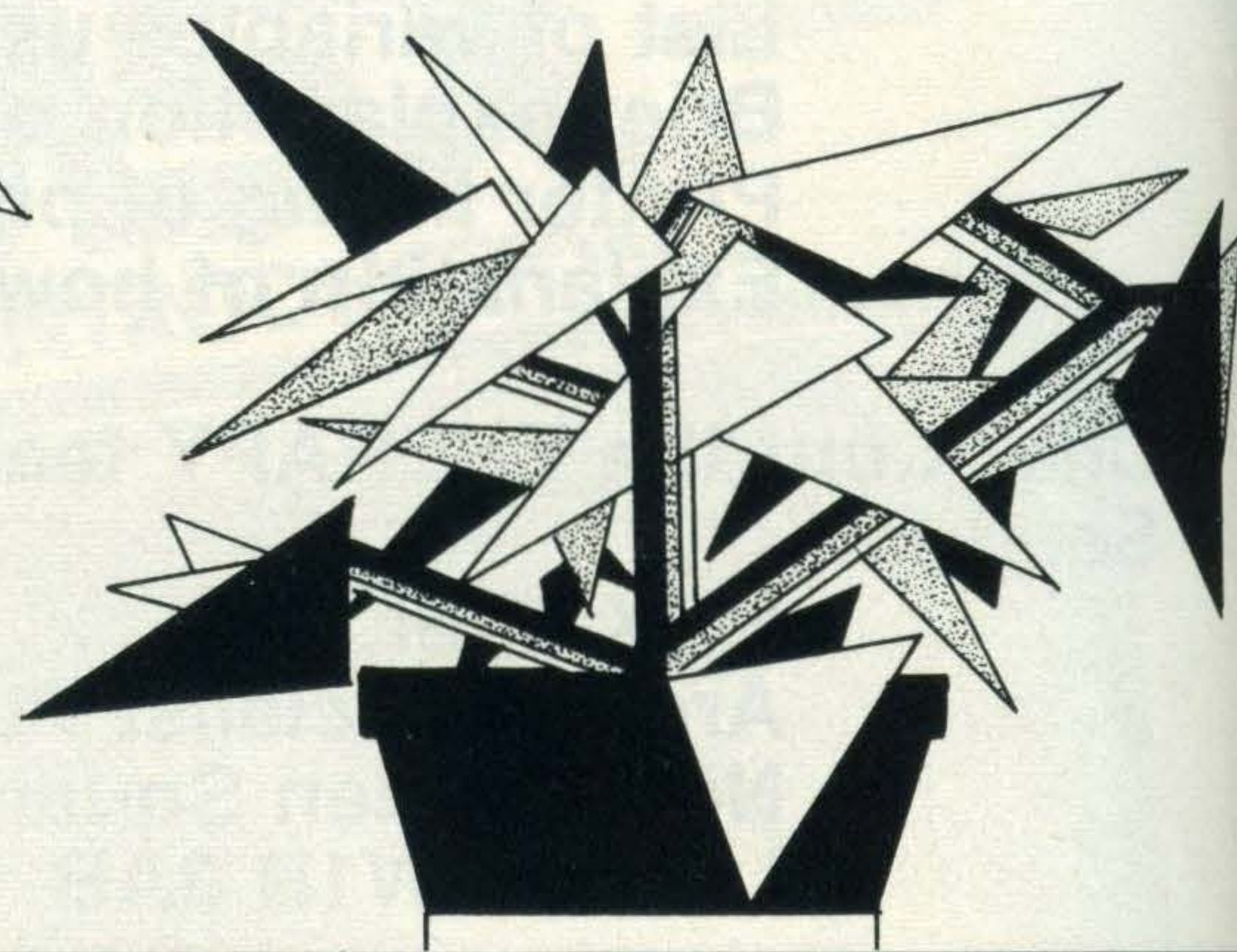
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Steve Lucas kicks off programs lovingly



HOUSEPLANT EXPERT

This program helps you select a houseplant suitable for cultivation in different positions in your home. When the program is RUN, you will be asked a series of questions. Respond by pressing the keys requested.

NOTE: if you choose to look up information on a particular plant, you *must* enter its name in CAPITAL letters, as the first four letters of the name you enter is checked against the first four letters of the plant names in the DATA lines (1790-2910).

Improvements

The program was written with the intention of being easily expanded so as to include details of many more houseplants. To do this delete line 2910 and add extra data lines. The final line of DATA must be a row of seven lower case letter 'x's. (see line 2910), as the program checks for this before returning to the menu.

As the program stands at the moment, you'll probably find that the computer is unable to help you select

certain combinations (eg: a plant with white flowers which thrives in full sunshine and likes to be kept dry). I would strongly recommend

that you spend a little time with a good houseplant book. A couple of suggested books are included below.

As an example, suppose

How to expand the program

Each data line has seven fields which are separated by commas.

Fields

1. plant name (in capital letters)
2. summer temperature range
3. winter temperature range
4. light level
5. watering information
6. colour of flowers
7. method of propagation

The information held in fields 1,2,3, and 7 is stored as words, whereas fields 4,5, and 6 use codes

Codes used

field 4 - light level

- b** = bright light out of direct sunshine
- s** = semi shade
- v** = full sunshine
- t** = fairly tolerant

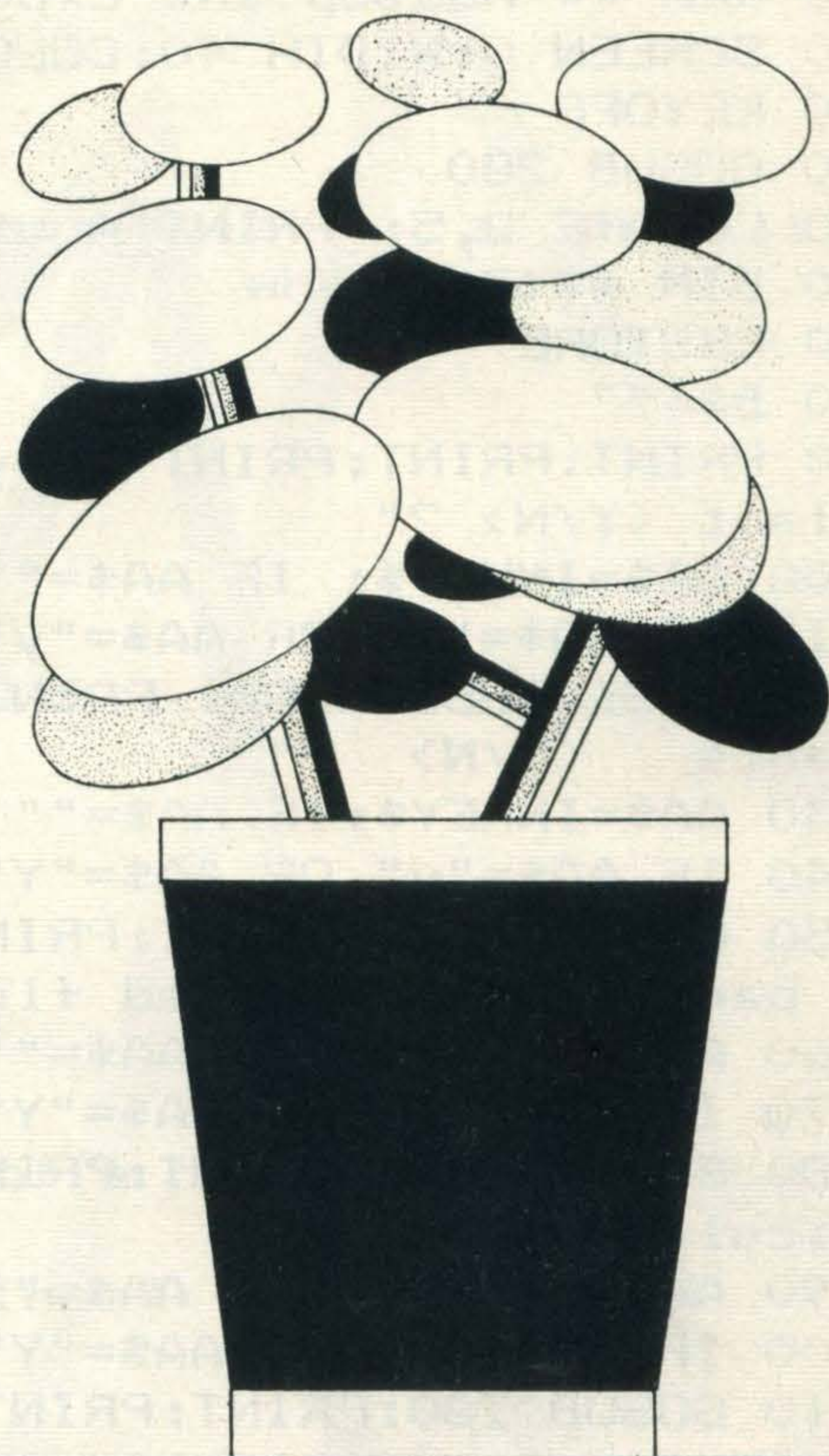
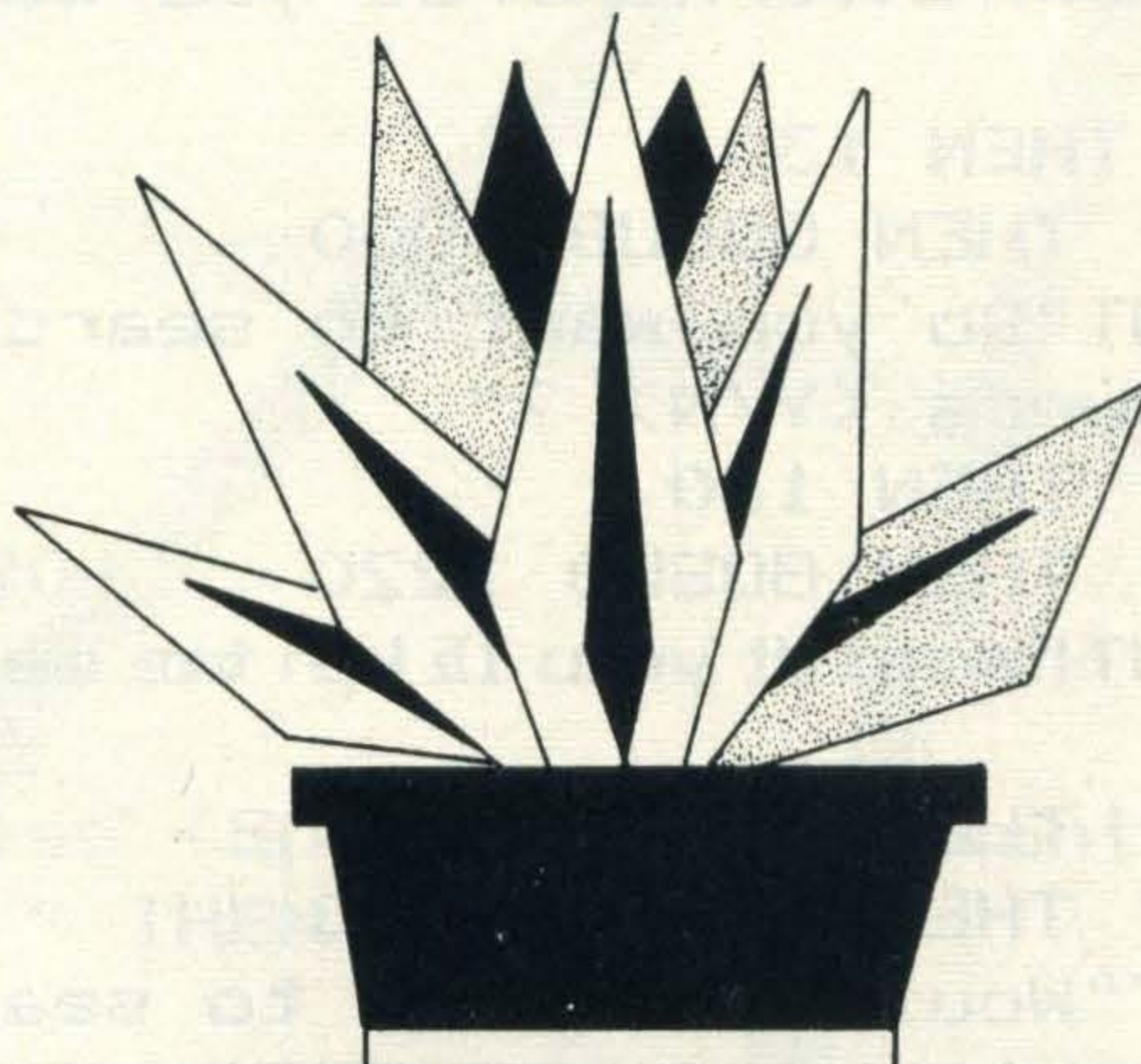
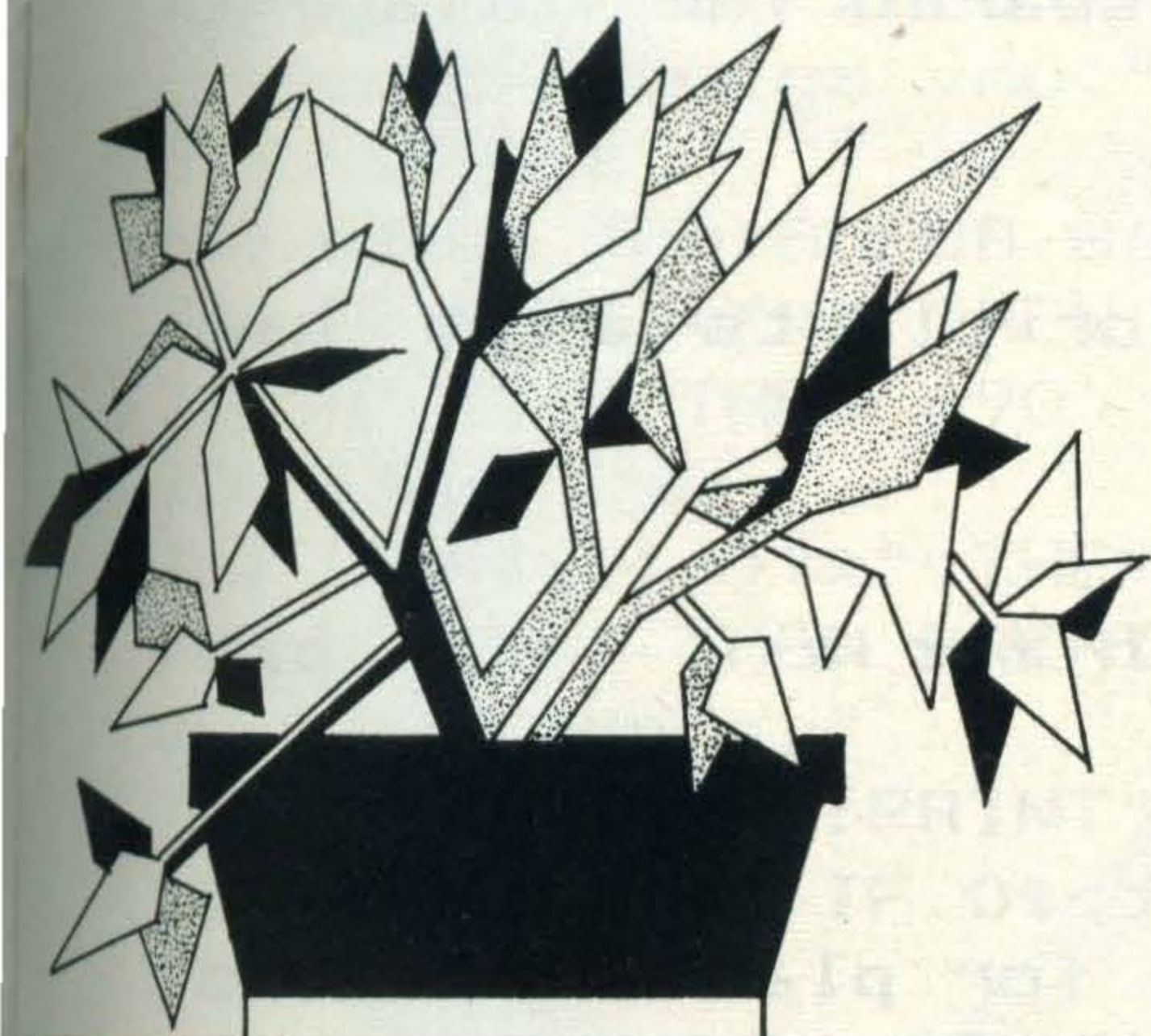
field 5 - moisture

- m** = keep moist at all times
- d** = water only when dry

field 6 - colour

- f** = a foliage plant
- r** = red flowers
- b** = blue flowers
- w** = white flowers
- p** = purple flowers
- y** = yellow flowers
- a** = pink flowers
- o** = orange flowers

*Therapy section with nine
 pd-out on his Toshiba.*



that you want to add details of SALPIGLOSSIS, which needs to be kept cool in summer, 50-65 in winter, bright light with direct

sunshine, moist at all times and can have yellow, orange, red or purple flowers. The data line would look like: 3000 DATA

SALPIGLOSSIS, cool-average, 50-65,v,m,yorp, seed.

You could, of course,

expand the program to include checks for additional factors like air and moisture content.

Program Breakdown

20	selects mode, screen width and colour
30	turns messages off
40-50	titles
60-80	initialises
90-270	main control loop
280-1780	sub menus
1790	data lines

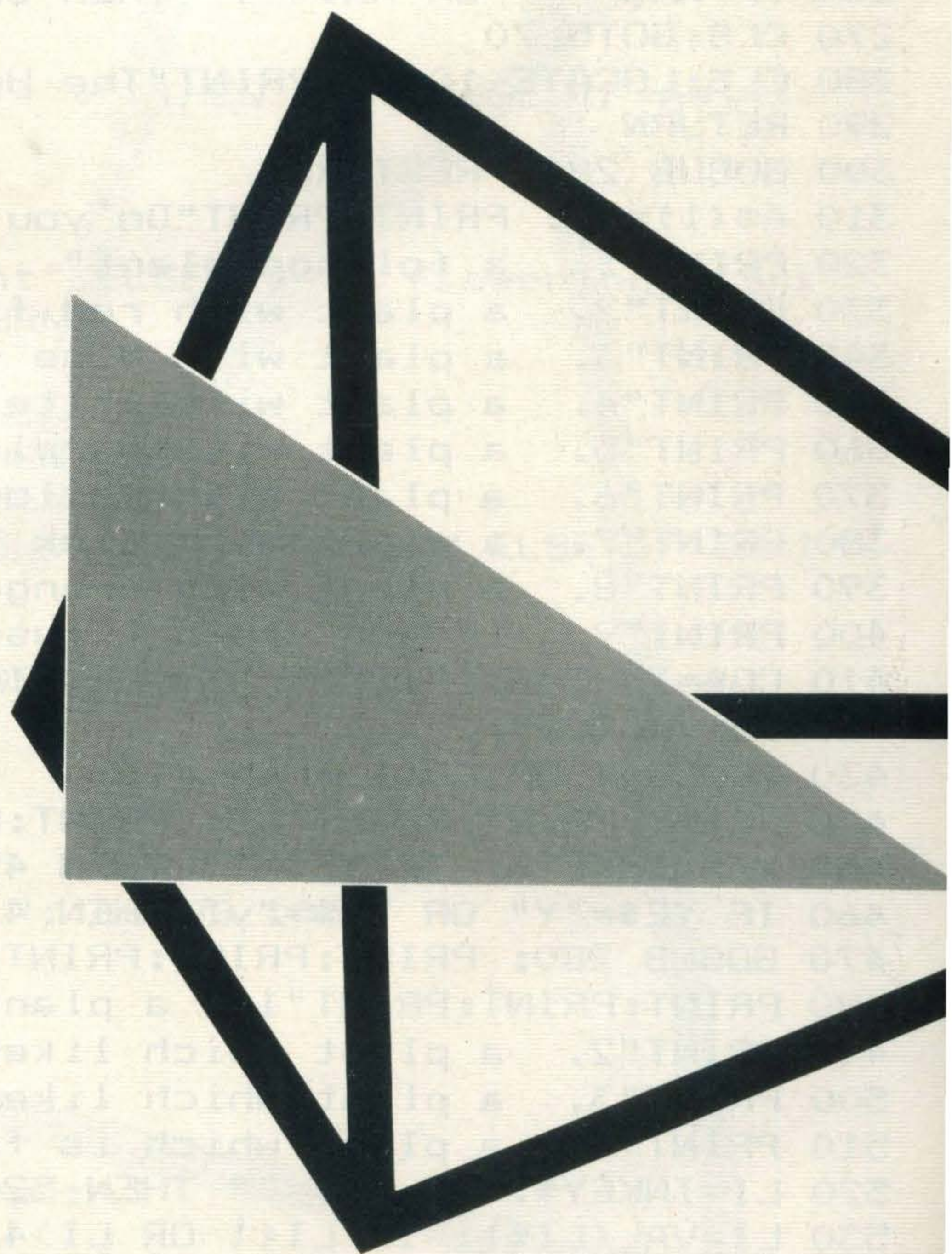
Variables used

x	general variable
CO,CO\$	colour code
MO,MO\$	moisture of soil
A\$(X)	data for plants
LI,LI\$	light level
PL\$	plant choice
A%	flag variable

BOOK LIST

1. The Houseplant Expert: DR D G Hessayon (PBI Pubs).
2. Be Your Own Houseplant Spotter: DR D G Hessayon (PBI).
3. The Complete Book of Houseplants and Indoor Gardening: (Octopus, prepared in association with the House of Rochford).

There are many other useful books on the subject.




```

10 REM ** Houseplant Expert for MSX Computers **
20 SCREEN 0:WIDTH 40:COLOR 15,4
30 KEYOFF
40 GOSUB 280
50 LOCATE 2,5: PRINT"A utility program for MSX Computers."
60 DIM A$(7)
70 RESTORE
80 B$=""
90 PRINT:PRINT:PRINT"Do you want the computer to help you to select a
plant <Y/N> ?"
100 AA$=INKEY$: IF AA$="" THEN 100
110 IF AA$="Y" OR AA$="y" THEN GOSUB 300
120 CLS: GOSUB 280: PRINT:PRINT:PRINT"Do you want search for foliage p
lants <Y/N> ?"
130 AA$=INKEY$: IF AA$="" THEN 130
140 IF AA$="y" OR AA$="Y" THEN GOSUB 1000
150 GOSUB 280: PRINT:PRINT"Do you want to search for plants which hav
e particular coloured flowers <Y/N> ?"
160 AA$=INKEY$: IF AA$="" THEN 160
170 IF AA$="y" OR AA$="Y" THEN GOSUB 1220
180 GOSUB 280: PRINT:PRINT"Would you like to search for a          par
ticular plant ?"
190 AA$=INKEY$: IF AA$="" THEN 190
200 IF AA$="y" OR AA$="Y" THEN GOSUB 1430
210 GOSUB 280:PRINT:PRINT"Would you like to search for plants        whic
h thrive in particular light          conditions <Y/N> ?"
220 AA$=INKEY$: IF AA$="" THEN 220
230 IF AA$="y" OR AA$="Y" THEN GOSUB 1550
240 GOSUB 280:PRINT:PRINT"Do you want me to print details of all the
plants I know about <Y/N> ?"
250 AA$=INKEY$: IF AA$="" THEN 250
260 IF AA$="y" OR AA$="Y" THEN GOSUB 1720
270 CLS:GOTO 70
280 CLS:LOCATE 10,2: PRINT"The Houseplant Expert"
290 RETURN
300 GOSUB 280: RESTORE
310 A$(1)="": PRINT:PRINT"Do you want :-"
320 PRINT"1.  a foliage plant"
330 PRINT"2.  a plant with red flowers"
340 PRINT"3.  a plant with blue flowers"
350 PRINT"4.  a plant with white flowers"
360 PRINT"5.  a plant with purple flowers"
370 PRINT"6.  a plant with yellow flowers"
380 PRINT"7.  a plant with pink flowers"
390 PRINT"8.  a plant with orange flowers"
400 PRINT"9.  if you are not fussy "
410 CO$=INKEY$: IF CO$="" THEN 410
420 CO=VAL(CO$)
430 IF CO>9 OR CO<1 THEN 410
440 PRINT:PRINT:PRINT CO: PRINT:PRINT"Is this correct <Y/N> ?"
450 YE$=INKEY$: IF YE$="" THEN 450
460 IF YE$="Y" OR YE$="y" THEN 470 ELSE GOTO 300
470 GOSUB 280: PRINT:PRINT:PRINT"Do you want :-"
480 PRINT:PRINT:PRINT"1.  a plant which likes full sunshine"
490 PRINT"2.  a plant which likes bright light"
500 PRINT"3.  a plant which likes semi-shade"
510 PRINT"4.  a plant which is fairly tolerant"
520 LI=INKEY$: IF LI$="" THEN 520
530 LI=VAL(LI$): IF LI<1 OR LI>4 THEN 520
540 PRINT:PRINT LI

```



```

550 PRINT:PRINT"Is this correct <Y/N> ?"
560 YE$=INKEY$: IF YE$="" THEN 560
570 IF YE$="y" OR YE$="Y" THEN 580 ELSE 470
580 GOSUB 280:PRINT:PRINT:PRINT"Do you want :-"
590 PRINT:PRINT"1. a plant which needs to be kept moist at all times"
600 PRINT"2. a plant which needs watering only when dry"
610 WA$=INKEY$:IF WA$="" THEN 610
620 WA=VAL(WA$): IF WA>2 OR WA<1 THEN 610
630 PRINT:PRINT WA
640 PRINT:PRINT"Is this correct <Y/N> ?"
650 YE$=INKEY$:IF YE$="" THEN 650
660 IF YE$="Y" OR YE$="y" THEN 670 ELSE 580
670 A%=1:GOSUB 280: PRINT:PRINT"Please wait whilst I select a suitable
houseplant for you."
680 RESTORE
690 GOSUB 780:GOSUB 860
700 IF A$(1)="x" THEN 730
710 IF C%=0 THEN 690
720 GOSUB 890
730 IF A$(1)<>"x" THEN 690
740 IF A%=1 THEN PRINT"I'm sorry I can't think of a plant which would s
uit your needs."
750 LOCATE 5,20:PRINT"Press <Space Bar> to continue"
760 D$=INKEY$: IF D$<> " " THEN 760
770 RETURN
780 IF A$(1)="x" THEN RETURN
790 X=1
800 READ A$(X)
810 X=X+1: IF X<8 THEN 800
820 IF A$(1)="x" THEN RETURN
830 IF A$(5)="m" THEN MO=1 ELSE MO=2
840 IF WA<>MO THEN 790
850 RETURN
860 IF A$(4)="b" THEN BI=2 ELSE IF A$(4)="v" THEN BI=1 ELSE IF A$(4)="
s" THEN BI=3 ELSE BI=4
870 IF BI<>LI THEN C%=0 ELSE C%=1
880 RETURN
890 IF A$(6)="f" THEN X$="a foliage plant" ELSE X$="a flowering plant"
900 IF CO=9 THEN A%=2 : GOSUB 1050: RETURN
910 IF CO=2 THEN CO$="r"
920 IF CO=3 THEN CO$="b" ELSE IF CO=4 THEN CO$="w"
930 IF CO=5 THEN CO$="p" ELSE IF CO=6 THEN CO$="y"
940 IF CO=7 THEN CO$="a" ELSE IF CO=8 THEN CO$="o"
950 IF CO=1 AND A$(6)="f" THEN A%=2: GOSUB 1050 : RETURN ELSE IF CO=1
THEN RETURN
960 FOR X= 1 TO LEN(A$(6))
970 IF MID$(A$(6),X,1)=CO$ THEN A%=2: GOSUB 1050:X=9:RETURN
980 NEXT
990 RETURN
1000 CLS: GOSUB 280:RESTORE
1010 FOR X=1 TO 7:READ a$(X):NEXT X
1020 IF A$(6)="f" THEN X$="Foliage Plant": GOSUB 1050
1030 IF A$(1)<>"x" THEN 1010
1040 CLS:RETURN
1050 CLS: GOSUB 280
1060 LOCATE 13,3: PRINT X$
1070 LOCATE 5,4: PRINT A$(1)
1080 LOCATE 1,6 :PRINT"Summer Temperature :-"
1090 LOCATE 5,8: PRINT A$(2)
1100 LOCATE 1,10: PRINT"Recommended Winter Temperature :-"

```



```

1110 LOCATE 5,12: PRINT A$(3)
1120 LOCATE 1,14: PRINT "Light Level :-"
1130 LOCATE 5,16
1140 IF A$(4)="b" THEN PRINT"Bright Light (out of direct sunshine" ELSE IF A$(4)="s" THEN PRINT"Semi-Shade" ELSE IF A$(4)="v" THEN PRINT"Likes some full sunshine" ELSE IF A$(4)="t" THEN PRINT"fairly tolerant"
1150 LOCATE 1,18: PRINT"Watering Information"
1160 LOCATE 5,20
1170 IF A$(5)="m" THEN PRINT"Keep moist at all times" ELSE PRINT"Water sparingly"
1180 PRINT:PRINT" Press the <Space Bar> to continue";
1190 AA$=INKEY$: IF AA$<>" " THEN 1190
1200 CLS :PRINT"Please wait a second"
1210 RETURN
1220 GOSUB 280: PRINT:PRINT"Which colour do you want to search for ?"
1230 PRINT:PRINT"1. Red"
1240 PRINT"2. Blue"
1250 PRINT"3. White": RESTORE
1260 PRINT"4. Purple"
1270 PRINT"5. Yellow"
1280 PRINT"6. Pink"
1290 PRINT"7. Orange"
1300 CO$=INKEY$:IF CO$="" THEN 1300
1310 CO=VAL(CO$):IF CO>7 OR CO<1 THEN 1300
1320 IF CO=1 THEN CO$="r" ELSE IF CO=2 THEN CO$="b" ELSE IF CO=3 THEN CO$="w" ELSE IF CO=4 THEN CO$="p" ELSE IF CO=5 THEN CO$="y"
1330 IF CO=6 THEN CO$="a" ELSE IF CO=7 THEN CO$="o"
1340 FOR X=1 TO 7:READ A$(X):NEXT
1350 FOR X=1 TO LEN(A$(6))
1360 IF MID$(A$(6),X,1)=CO$ THEN GOSUB 1050
1370 NEXT
1380 IF A$(1)<>"x" THEN 1340
1390 GOSUB 280: LOCATE 5,15:PRINT"There are no more plants in my data!"
1400 LOCATE 5,20: PRINT"Press <Space Bar> to continue."
1410 AA$=INKEY$: IF AA$<>" " THEN 1410
1420 RETURN
1430 GOSUB 280:PRINT:PRINT"What is the name of the plant you would like me to search for ";
1440 INPUT PL$
1450 GOSUB 280:PRINT:PRINT"Please wait whilst I search for ":PRINT PL$
1460 RESTORE:A%=0
1470 FOR X=1 TO 7:READ A$(X):NEXT
1480 IF A$(1)="x" AND A%=0 THEN GOSUB 280: PRINT:PRINT:PRINT"Sorry ... I don't have that plant in my DATA lines!": GOSUB 1520: RETURN
1490 IF A$(1)="x" THEN 1510
1500 IF LEFT$(PL$,4)=LEFT$(A$(1),4) THEN LET A%=1: GOSUB 1050
1510 IF A$(1)<>"x" THEN 1470
1520 LOCATE 5,20: PRINT"Press <Space Bar> to continue."
1530 AA$=INKEY$: IF AA$<>" " THEN 1530
1540 RETURN
1550 GOSUB 280:PRINT:PRINT"Which of the following do you want me to search for :- ?"
1560 PRINT:PRINT"1. Plants which thrive in bright light"
1570 PRINT"2. Plants which survive in semi-shade"
1580 PRINT"3. Plants which survive in full sun"
1590 PRINT"4. Plants which are fairly tolerant "
1600 LI$=INKEY$:LI=VAL(LI$)
1610 IF LI>4 OR LI<1 THEN 1600
1620 IF LI=1 THEN LI$="b"

```



```

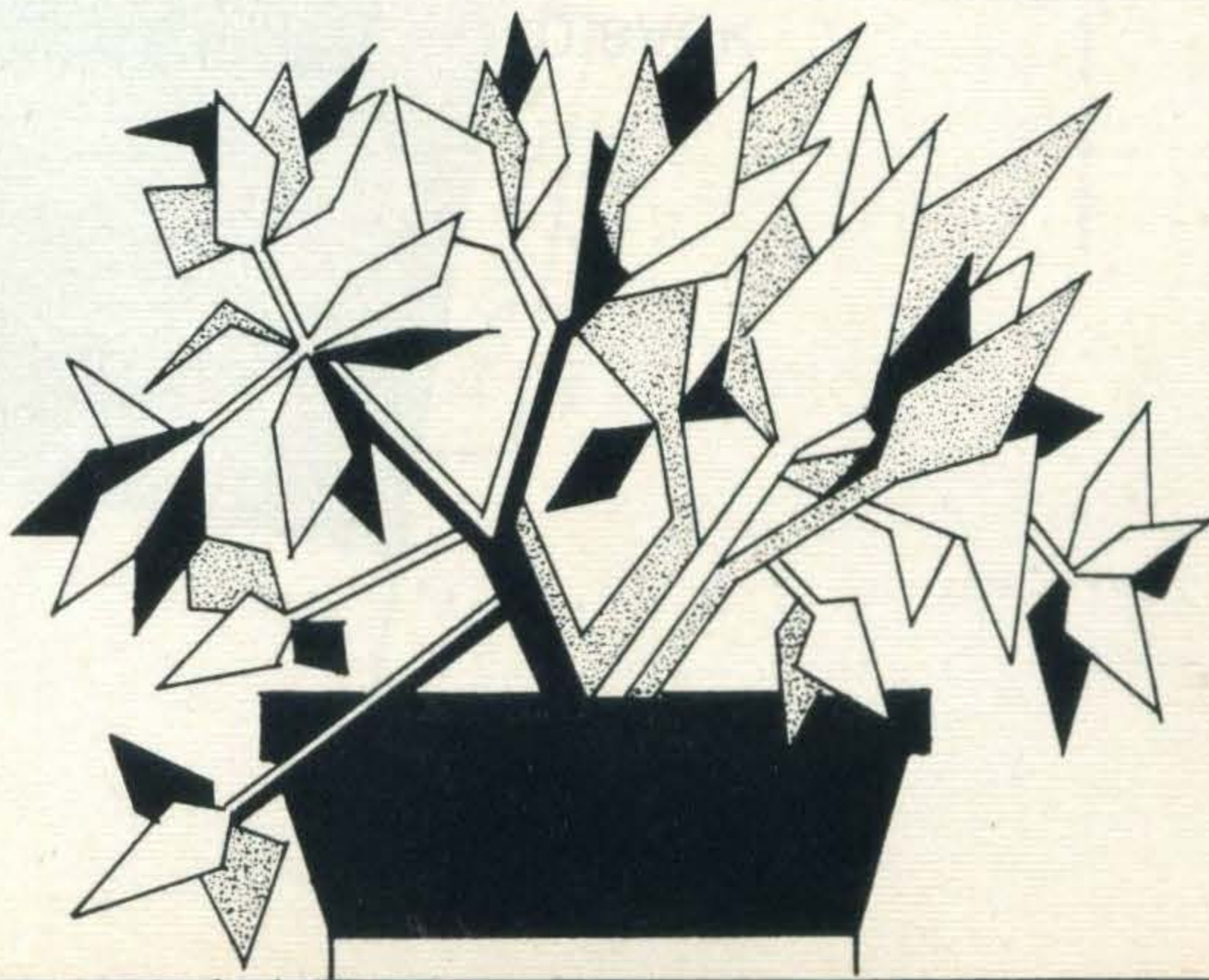
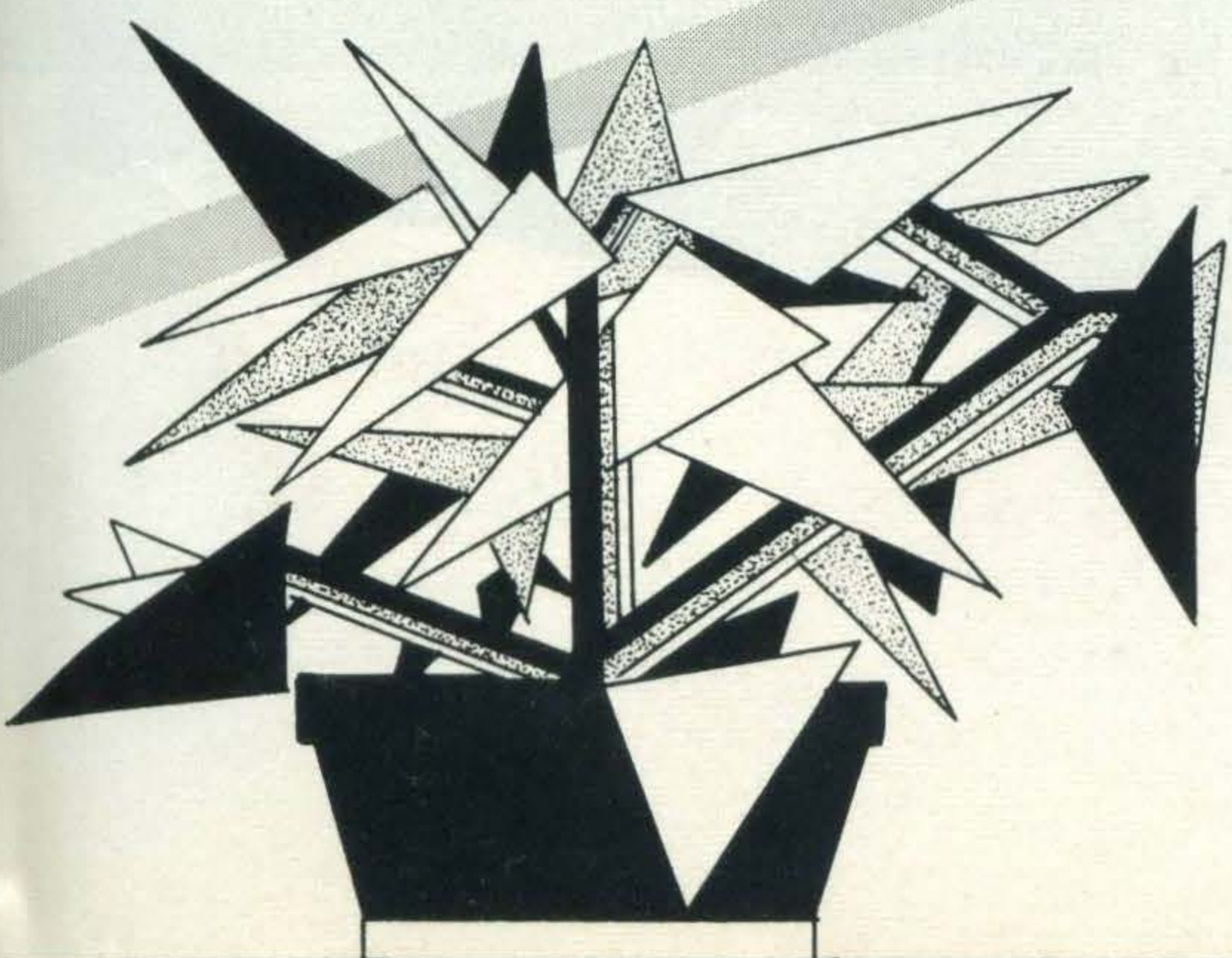
1630 IF LI=2 THEN LI$="s"
1640 IF LI=3 THEN LI$="v"
1650 IF LI=4 THEN LI$="t"
1660 RESTORE
1670 FOR X=1 TO 7:READ A$(X):NEXT
1680 IF A$(6)="f" THEN X$="a foliage plant" ELSE X$="a flowering plant"
"
1690 IF LI$=A$(4) THEN GOSUB 1050
1700 IF A$(1)<>"x" THEN 1670
1710 GOSUB 1520: RETURN
1720 RESTORE.
1730 FOR X=1 TO 7:READ a$(X):NEXT
1740 IF A$(6)="f" THEN X$="a foliage plant" ELSE X$="a flowering plant"
"
1750 GOSUB 1050
1760 IF A$(1)<>"x" THEN 1730
1770 CLS:PRINT"Sorry there are no more plants in my      DATA lines"
1780 GOSUB 1520:RETURN
1790 DATA CLERODENDRUM (bleeding heart vine),average-warm,min 55,b,m,w
,stem cuttings
1800 DATA CALCEOLARIA,cool,50-60,b,m,yorw,seed
1810 DATA SCHIZANTHUS,average-cool,50-65,v,m,m,seed
1820 DATA SMITHIANTA,average-warm,min 60,b,m,yoar,divide rhizomes
1830 DATA ZANTEDESCHIA (arum lily),average,min 50,v,m,w,divide rhizome
s
1840 DATA VELTHEIMIA,average,50-60,b,m,m,plant offsets
1850 DATA THUNBERGIA,average,min 50,v,m,yo,seed
1860 DATA SOLANUM (winter cherries),cool,50-60,v,m,or,seed
1870 DATA SCINDAFSUS,average,min 50,w,m,f,stem cuttings
1880 DATA SENICIO (cape ivy),average,min 50,t,m,f,stem cuttings
1890 DATA SELAGINELLA (creeping moss),average,min 55,s,m,f,stem cuttin
gs
1900 DATA YUCCA,average,min 45,v,m,f,stem cuttings
1910 DATA TRADESCANTA,average,min 45,t,m,f,stem cuttings
1920 DATA PHILODENDRON,average,min 55,s,m,f,stem cuttings
1930 DATA SCHEFFLERA (umberella tree),average,min 55,b,m,f,seed or ste
m cuttings
1940 DATA SAINTPAULIA (african violet),average,min 60,b,m,bapr,leaf cu
ttings
1950 DATA SANSEVIERIA (mother in laws tongue),average,min 50,t,d,f,rem
ove offsets
1960 DATA SAXIFRAGA (mother of thousands),average-cool,40-45,b,m,f,peg
down plantlets
1970 DATA LANTANA,average,min 55,b,d,yr,seed or stem cuttings
1980 DATA ROCHEA,average-cool,min 45,b,m,a,stem cuttings
1990 DATA FUCHSIA,average-cool,50-60,b,m,pwra,stem cuttings
2000 DATA GLORIOSA,warm,min 60,b,m,yr,remove offsets
2010 DATA PLUMBAGO,average-cool,min 45,v,m,b,seed or stem cuttings
2020 DATA GLOXINIA,average,min 60,b,m,rapw,seed or leaf cuttings
2030 DATA JACOBINIA,average,min 55,b,m,a,stem cuttings
2040 DATA AMARYLLIS,average,65,b,d,waor,plant offsets
2050 DATA IXORA,warm - average,min 60,b,m,r,stem cuttings (often diffi
cult,!)
2060 DATA MANETTIA (firecracker plant),average-warm,min 50,v,m,r,stem
cuttings
2070 DATA HIPPEASTRUM,average,65,v,d,roaw,plant offsets
2080 DATA GERANIUM (pelargonium),average,min 45,v,m,rpaw,seed or stem
cuttings
2090 DATA ORCHIDS,warm,cool nights (frost free),b,m,arw,divide plants
2100 DATA HYDRANGEA,cool,min 45,b,m,rpb,not practical

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2110 DATA OPHIOPOGON, average, min 35, s, m, f, divide plant
 2120 DATA NICODEMIA, average, min 55, b, m, f, stem cuttings
 2130 DATA OPLISMENUS, average, min 45, b, m, f, stem cuttings
 2140 DATA PANDANUS, average, min 55, b, m, f, remove base suckers
 2150 DATA PIPER, average, min 55, w, m, f, stem cuttings
 2160 DATA PELLIONIA, average, min 55, s, m, f, divide plants
 2170 DATA PELARGONIUM, average, min 45, b, m, rowa, stem cuttings or seed
 2180 DATA PASSION FLOWER, average, 40-50, v, m, b, seed or stem cutting
 2190 DATA BROMELIADS, average-high (for flowering types), min 50, b, d, f, plant offsets
 2200 DATA CESTRUM (night jasmine), average, min 45, b, m, r, stem cuttings
 2210 DATA PASSIFLORA (passion fruit), average, 40-50, v, m, b, seed or stem cuttings
 2220 DATA ARAUCARIA, average, keep cool, t, m, f, difficult to propagate at home
 2230 DATA GARDENIA (cape jasmine), average, min 60, b, m, w, stem cuttings in spring
 2240 DATA LILIUM (lily), cool, min 35, b, m, pry, bulbs
 2250 DATA MYRTUS (myrtle), average-cool, min 40, b, m, w, stem cuttings
 2260 DATA CAPE PRIMROSE (streptocarpus), average, min 55, b, m, wrbap, divide plants
 2270 DATA NERENE, average, min 50, v, m, raw, plant offsets
 2280 DATA NERETA (bead plant), cool, min 40, v, m, o, divide plants
 2290 DATA STREPTOCARPUS, average, min 55, b, m, wrbap, divide plants
 2300 DATA PACHYSTACHYS (lolipop plant), average, min 55, b, m, y, stem cuttings in spring or summer
 2310 DATA OXALIS, average-cool, max 70, v, d, y, remove offsets
 2320 DATA POINSETTA, average, min 55, b, d, r, stem cuttings
 2330 DATA EUPHORBIA (crown of thorns), average, min 55, b, d, r, stem cuttings
 2340 DATA PRIMULA, cool, 55-60, b, m, wapy, seed
 2350 DATA PUNICA, average, min 40, v, m, r, stem cuttings
 2360 DATA ROSA (minature rose), average, 50-70, v, m, yrp, stem cuttings
 2370 DATA CROWN OF THORNS (euphorbia), average, min 55, b, d, r, stem cuttings
 2380 DATA SALFIGLOSSIS, average-cool, keep between 50 and 65 degrees at all times, v, m, roy, seed
 2390 DATA PEPEROMIA, average, 50 min, b, d, f, stem or leaf cuttings
 2400 DATA CHRYSANTHEMUM, cool, 50-60, b, m, wyor, stem cuttings
 2410 DATA SPARMANNIA, cool, min 45, b, m, w, stem cuttings in summer
 2420 DATA CARISSA (natal plum), average, min 55, v, m, w, stem cuttings in summer
 2430 DATA EXACUM, average-cool, 50-70, b, m, p, seed
 2440 DATA PENTAS (egyptian star cluster), average, min 50, v, m, rwa, stem cuttings
 2450 DATA ANGELS WINGS (caladium), above 70, min 60, b, m, f, pot up tubers
 2460 DATA ARDISIA (coral berry), average, min 45, b, m, r, seed or stem cuttings
 2470 DATA CAMPANULA, average-cool, min 45, b, m, bp, divide plant or stem cuttings
 2480 DATA STEPHANOTIS, average, 55-60, b, m, w, stem cuttings
 2490 DATA AZALIA, cool, 50-60, b, m, aorw, ""
 2500 DATA CITRUS (calamondin orange), average, min 50, v, d, o, sow pips or stem cuttings
 2510 DATA HYPOCYRTA (clog plant), average, min 50, b, d, o, stem cuttings in spring
 2520 DATA CUPHEA (cigar plant), average, min 45, v, m, r, stem cuttings
 2530 DATA COLUMNEA, average, min 50, b, m, yor, stem cuttings
 2540 DATA ERICA, cool, 40-55, v, m, pa, stem cuttings

2550 DATA ASPIDISTRA, average, keep cool but frost free, t, m, f, divide plant
 2560 DATA EPISCIA, average, min 55, b, m, ow, layer runners
 2570 DATA DUCHESNEA (indian strawberry), average-cool, cool but frost free, b, m, y, layer runners
 2580 DATA CELOSIA, cool, 50-60, b, m, roy, seed
 2590 DATA LIPSTICK VINE (aeschynanthus), average, min 55, b, m, r, stem cuttings
 2600 DATA STAPELLA (carrion flower), average, min 50, b, d, y, cuttings
 2610 DATA ARDISIA (coral berry), average, min 45, b, m, r, seed or stem cuttings
 2620 DATA BIRD OF PARADISE (strelitzia), average, 55-60, b, d, or, divide plants
 2630 DATA BROWALLIA, cool, 50-60, b, m, b, seed
 2640 DATA ROSE OF CHINA (hibiscus), average, min 55, b, m, aroyw, stem cuttings
 2650 DATA HOYA, average, min 50, b, m, w, stem cuttings
 2660 DATA BEGONIA, average, min 55, b, m, wroy, ""
 2670 DATA HELIOTROPIUM, average-cool, 40-50, b, m, pw, stem cuttings
 2680 DATA DIPLADENIA, warm, min 55, b, m, a, stem cuttings
 2690 DATA CLIANTHUS, average, keep cool but frost free, v, m, r, seed or stem cuttings
 2700 DATA ACALYPHA (red hot catstail), warm, min 60, s, m, r, stem cuttings in spring
 2710 DATA APHELANDRA (zebra plant), average, min 45, b, m, y, stem cuttings in spring
 2720 DATA ASTILBE, cool, min 55, b, m, arw, divide plant
 2730 DATA ACACIA (kangaroo thorn), average, min 40, v, d, y, stem cuttings
 2740 DATA CORDYLINE (dracaena), average, min 55, s, m, f, air layering
 2750 DATA SPATHIPHYLLUM, average-warm, min 55, s, m, w, divide plant
 2760 DATA CROSSANDRA, average, min 55, b, m, o, seed or stem cuttings
 2770 DATA PEPPERS, cool, min 55, b, m, pry, seed
 2780 DATA AUCUBA, average, keep cool but frost free, b, m, f, stem cuttings

 2790 DATA AFRICAN VIOLET, average, min 60, b, m, barp, leaf cuttings
 2800 DATA VALLOTA, average, 60-55, v, m, raw, divide plant
 2810 DATA BUXUS, average - below average, keep cool in winter, b, d, f, stem cuttings
 2820 DATA CAPSICUM (peppers), cool, min 55, b, m, yrp, seed
 2830 DATA AGAPANTHUS (blue african lily), average, min 45, v, m, b, divide plant in spring
 2840 DATA CYTUSUS, cool, min 40, b, m, y, stem cuttings
 2850 DATA KALANCHOE, average, min 50, s, d, oyr, cuttings
 2860 DATA JASMINUM, average-cool, min 45, b, m, wa, stem cuttings
 2870 DATA CODIAEUM (croton), warm, min 50, b, m, f, stem cuttings in spring
 2880 DATA UMBERELLA PLANT (cyperus), not fussy, min 50, b, m, f, divide plant
 2890 DATA ASPARAGUS, average, min 50, s, m, f, divide plant
 2900 DATA BEAUCARNEA, average, min 50, v, m, f, plant offsets
 2910 DATA x, x, x, x, x, x, x: REM ** TERMINATE DATA WITH LINE OF 7 LOWER CASE X'S



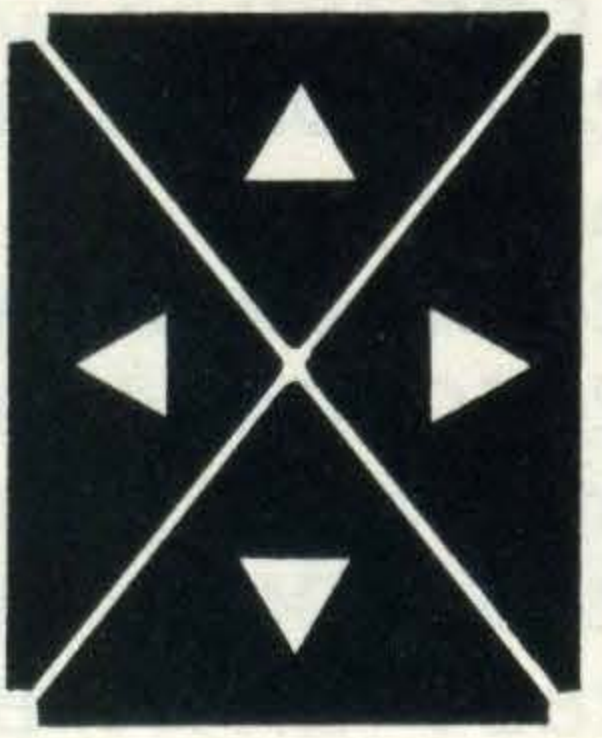
CENTRE

FOLD BACK FOLD FOLD FOLD GLUE TAB

FOLD FOLD FOLD FOLD GLUE TAB

• MSX

STOP	F1/F6	F2/P7	F3/F8	F4/F9	F5/F10	H/CLS	INS	DEL	SELECT				
ESC	1	@ 2	# 3	\$ 4	% 5	^ 6	& 7	* 8	(9) 0	! 1	! 2	BACK SPACE
TAB	Q	W	E	R	T	Y	U	I	O	P	[]	
CTRL	A	S	D	F	G	H	J	K	L	;	"	'	~ £
SHIFT	Z	X	C	V	B	N	M	<	>	,	.	/	SHIFT
	CAPS LOCK		GRAPH										CODE



FOLD

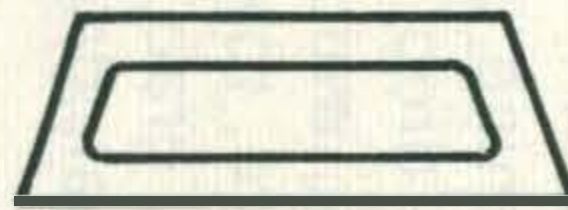
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AND GLUE

FOLD BACK
AND GLUE



GLUE TAB

CENTRE.

In each issue of MSX User we'll feature the most vital and interesting info and opinions in CENTRE. The most important aspect of the fledgling MSX standard is the lack of machines to be a User of! Never mind. Stick this page on some thin card, cut and fold appropriately ("Here's one I've already prepared. Get down Shep!") and you have an MSX micro that would fool most of our hardware reviewers from about four feet away! (The keyboard action is a little spongy but this should improve with use. Also, I couldn't get the cartridge port door open.). A night out with 'Scoop' Johnston for the most interesting suggestion as to what you can do with it. Two nights...

JUNGLE SEARCH

I've always wanted to travel the world so when the chance came to join an expedition to search for the legendary Sea of Blue Water, I took the challenge. I'm not convinced I did the right thing, for when the party leader sent me in search of food, I got utterly lost. You can help me find my way back to base camp by giving me instructions in the form of two word sentences like EAT FOOD. NOTE all instructions must be given in lower case

Here is a list of some of the words I understand ÷ go, s, w, e, n, up, down, in, out, pray, help, examine, search, swim, talk, say, drop, leave, inventory, score, wait, dig, throw, jump, dive, row, cut, chop, get, take, grab, make, open, unlock, eat, drink, sail, look, rub.

Hints

These should be read only if you are completely stuck.

1. You could cut your way through a thicket if you have a sharp instrument, maybe even more than one way.

2. Don't kill friends, but you could try killing crocodiles (Not with your bare hands though).

3. You can go UP or

DOWN ropes or vines.

4. If you keep falling into a trap, you could drop something over it.

5. I wouldn't try swimming in deep water, but maybe you could make a boat. (You need something to do that with though).

Variables used

Integer variables have

P%
AA%-AZ%
S%(X,Y)
B%(X)
A\$(X)
Z\$
B\$,C\$
L\$
E%,F%,E
G\$(X)
N%(X)
N\$(X)

been widely used as they occupy less memory space than real variables.
current location
flags to check that you have solved problems
map
pointer to locations
descriptions of locations
input strings
substrings
second word of input
Flags
descriptions of objects
pointer to words understood
words understood

Program Breakdown

50	messages of
60	initialise screen mode/colours etc
70	start location
80	titles
90-130	fill arrays
140-470	main control loop
480-490	win game
500-550	instructions
560-800	data for game
810	subroutines for actions



JUNGLE SEARCH

```
10 REM ** JUNGLE SEARCH **
20 REM ** AN ADVENTURE GAME FOR MSX MACHINES **
30 REM ** BY Steve W. Lucas **
40 REM *** <C> August 1984 ***
50 KEYOFF
60 CLEAR 910:SCREEN 0:WIDTH 37:COLOR 12,15
70 P%=2
80 GOSUB 500
90 DIM S%(24,4),Q%(24),X%(40),G%(30),V%(3),B%(30),N%(30),N%(30)
100Y$=""
110 FOR X=1 TO 24:READ Q$(X):FOR Y=1 TO 4:READ S%(X,Y):NEXT Y,X
120 FOR X=1 TO 14:READ G$(X),B%(X):NEXT X
130 FOR X=1 TO 18:READ N$(X),N%(X):NEXT X
140 CLS
150 IF P%=10 AND AG%<>1 THEN X$="I fall into a deep hole beneath some
e straw... It must have been a trap!!!":GOSUB 1450
160 PRINT"I am :-":PRINTQ$(P%)
170 A$="":IF S%(P%,1)>0 THEN A$="North"
180 IF S%(P%,2)>0 AND LEN(A$)>0 THEN A$=A$+",South" ELSE IF S%(P%,2)
>0 THEN A$="South"
190 IF S%(P%,3)>0 AND LEN(A$)>0 THEN A$=A$+",East" ELSE IF S%(P%,3)>
0 THEN A$="East"
200 IF S%(P%,4)>0 AND LEN(A$)>0 THEN A$=A$+",West" ELSE IF S%(P%,4)>
0 THEN A$="West"
210 PRINT:PRINT:PRINT"I can go :-":PRINT A$:PRINT
220 E=0:FOR T=1 TO 14:PP%=0:IF B%(T)=P% THEN PP%=1
230 IF PP%=1 THEN 250
240 NEXT:T:GOTO 280
250 IF E=0 THEN PRINT"I can see:-"
260 PRINT:PRINT G$(T):E=E+1:GOTO 240
270 IF P%=11 THEN PRINT Y$
280 PRINT:PRINT"What do you think I should do ":INPUT Z$
290 B$=LEFT$(Z$,2):C$=LEFT$(Z$,3):CLS:BEEP:K=0
300 IF C$="loo" THEN K=1 ELSE IF C$="sco" THEN PRINT"What do you thi
nk this is....some sort of game?":K=1
310 IF C$="rub" THEN PRINT"Don't be silly!":K=1
320 IF (B$="n" OR LEFT$(Z$,4)="go n") AND S%(P%,1)<>0 THEN P%=S%(P%,
1):K=1
330 IF (B$="s" OR LEFT$(Z$,4)="go s") AND S%(P%,2)<>0 THEN P%=S%(P%,
2):K=1
340 IF (B$="e" OR LEFT$(Z$,4)="go e") AND S%(P%,3)<>0 THEN P%=S%(P%,
3):K=1
350 IF (B$="w" OR LEFT$(Z$,4)="go w") AND S%(P%,4)<>0 THEN P%=S%(P%,
4):K=1
360 IF K=0 AND (B$="n" OR B$="s" OR B$="e" OR B$="w" ) THEN PRINT"I c
an't go that way!":K=1
370 IF C$="row" OR C$="sai" OR LEFT$(Z$,4)="go r" THEN GOSUB 1770
380 IF C$="dri" THEN PRINT"I can't see anything to drink!":K=1 ELSE
IF C$="eat" THEN PRINT"There's nothing to eat!":K=1
390 IF B$="up" THEN GOSUB 1280 ELSE IF C$="dow" THEN GOSUB 1310 ELSE
IF C$="in" THEN GOSUB 1590 ELSE IF C$="out" THEN GOSUB 1620 ELSE IF C
$="unl" THEN GOSUB 1640
400 IF C$="rea" THEN GOSUB 1570 ELSE IF C$="ope" THEN GOSUB 1670
410 IF C$="cut" THEN GOSUB 1180 ELSE IF C$="cli" THEN GOSUB 1370 ELS
E IF C$="jum" OR C$="div" THEN GOSUB 1350 ELSE IF C$="cho" OR C$="fel"
THEN GOSUB 1700
420 IF C$="wai" THEN GOSUB 1800 ELSE IF C$="dig" THEN GOSUB 1270 ELS
E IF C$="thr" THEN GOSUB 1830 ELSE IF C$="say" OR C$="tal" OR C$="ask"
THEN GOSUB 1840
430 IF C$="hel" THEN GOSUB 1230 ELSE IF C$="pra" THEN GOSUB 1260 ELS
E IF C$="swi" THEN GOSUB 1390 ELSE IF C$="bui" OR C$="mak" OR C$="con"
THEN GOSUB 1740
440 IF C$="kil" OR C$="des" OR C$="att" OR C$="sta" OR C$="hit" THEN
GOSUB 1510
450 IF C$="get" OR C$="gra" OR C$="tak" THEN GOSUB 810
460 IF C$="dro" OR C$="lea" THEN GOSUB 1050 ELSE IF C$="inv" THEN GO
SUB 1140 ELSE IF C$="exa" OR C$="sea" THEN K=1:PRINT"I don't see anyt
hing special!"
470 IF P%<>24 THEN 150
480 CLS:PRINT:PRINT"WELL DONE!!!":PRINT"You have solved this adventu
re!"
490 END
500 CLS:LOCATE 10,3:PRINT"JUNGLE SEARCH"
510 LOCATE 6,6:PRINT"<C> 1984 S.W. Lucas"
520 PRINT:PRINTTAB(10);"Please help me !"
530 PRINT:PRINT"I am a member of the 1984 expedition which has come t
o Africa in search of thesea of blue water."
540 PRINT:PRINT"The party leader has sent me in search of food,
but I seem to have got lost. Help me to find my way backto safety."
550 RETURN
```



```

560 DATA at the bottom of a sheer cliff face.,0,0,2,0
570 DATA on a muddy footpath,0,0,3,1
580 DATA in thick undergrowth,0,0,0,2
590 DATA by a cave entrance,0,0,5,3
600 DATA in a dark cave. Water is dripping      down the slimy walls.,
0,6,0,4
610 DATA by an old wooden door.,5,0,0,0
620 DATA in a narrow passage.,8,0,0,6
630 DATA in a secret laboratory. There is a  large lizard in a wood
en cage here.,0,7,0,0
640 DATA on a straw covered footpath.,3,10,0,0
650 DATA amongst several very tall trees. The floor here is covered
with straw.      There is a deep pit here.,9,11,0,0
660 DATA on the banks of a fast flowing river.,10,0,0,0
670 DATA on a raft in the middle of a fast      flowing river.,0,0,0,0
680 DATA in a sheltered cove,0,14,16,0
690 DATA in a steamy swamp,13,0,15,0,in a steamy swamp,16,15,15,14,i
n a steamy swamp,16,15,17,16
700 DATA in a steamy swamp. A rope hangs down from an overhanging tr
ee.,0,0,0,16
710 DATA at the top of a rope. A large monkey can be seen amongst th
e branches of  the tree,0,0,19,0
720 DATA amongst the branches of a very tall tree. A creeping vine
seems to be      firmly attached to the tree.,0,0,0,18
730 DATA on a narrow plateau. A creeper hangs from above. Spires of
smoke can be      seen in the distance.,0,0,21,0
740 DATA on a narrow plateau. ,0,0,0,20
750 DATA on a mountain track. The track is      soft underfoot. The pa
th crumbles to the West.,0,0,23,0
760 DATA by a river. There is a camp on the      far side.,0,0,0,22
770 DATA in the expedition's camp.,0,0,0,0
780 DATA a sharp knife,1,a plank of wood,7,a small key,9,a small spi
der,15,a giant lizard,16,a monkey,19,a pile of bones,10
790 DATA an axe,5,a coil of rope,8,a strange looking plant,4,a nativ
e on the river bank,12,a piece of paper,21,a crocodile,23,Tarzan...swi
nging from tree to tree,14
800 DATA knife,1,plank,2,wood,2,key,3,spider,4,lizard,5,monkey,6,bon
es,7,axe,8,coil,9,rope,9,plant,10,flower,10,native,11,paper,12,piece,1
2,crocodile,13,tarzan,14
810 K=1:GOSUB 980
820 IF L<>1 THEN RETURN
830 E%=0
840 FOR H=1 TO 14:IF B%(H)=P% AND B%(N%(R))=P% THEN E%=1
850 NEXT
860 IF E%=0 THEN PRINT"I can't see it here!":RETURN
870 IF R=1 THEN AA%=1 ELSE IF R=4 THEN AF%=1 ELSE IF R=9 THEN AH%=1
880 IF R=5 THEN X$="It bites me...It's venom surges through my blood
:GOSUB 1450
890 IF R=6 THEN X$="The stupid thing...It jumps at my throat":GOSUB
1450
900 IF R=12 OR R=13 THEN X$="I fall into a stupor as the flower      s
ends a jet of strange pollen into my face":GOSUB 1450
910 IF R=17 THEN PRINT"Don't be stupid!!!!":RETURN
920 IF R=18 OR R=14 THEN PRINT"How am I supposed to do that!":RETURN
930 IF R=15 OR R=16 THEN AD%=1
940 E%=0:FOR D=1 TO 3:IF V$(D)="" THEN V$(D)=G$(N%(R)):E%=1:D=5
950 NEXT
960 IF E%=0 THEN PRINT"I'm sorry I can't carry any more!":K=1:RETURN
970 B%(N%(R))=0:RETURN
980 L$="":FOR H=1 TO LEN(Z$)
990 IF MID$(Z$,H,1)=" " THEN L$=RIGHT$(Z$, (LEN(Z$)-H)):H=H+40
1000 NEXT
1010 R=0:L%=0:IF LEN(L$)<2 THEN RETURN
1020 FOR H=1 TO 18:IF LEFT$(N$(H),LEN(L$))=L$ THEN L%=1:R=H
1030 NEXT
1040 RETURN
1050 GOSUB 980
1060 K=1:IF L<>1 THEN PRINT"I can't see a ";L$:RETURN
1070 E%=0
1080 FOR D=1 TO 3:IF V$(D)=G$(N%(R)) THEN V$(D)="":E%=1
1090 NEXT:IF E<>1 THEN PRINT"I haven't got it!":RETURN
1100 B%(N%(R))=P%
1110 IF R=1 THEN AA%=0 ELSE IF (R=15 OR R=16) THEN AD%=0 ELSE IF R=4
THEN AF%=0 ELSE IF R=9 THEN AH%=0
1120 IF R=2 AND P%=9 THEN AG%=1:PRINT"I slide the plank over the lion
trap"
1130 RETURN
1140 K=1:PRINT"I have :-":F%=0
1150 FOR H=1 TO 3:IF V$(H)<>"" THEN PRINTV$(H):F%=1
1160 NEXT:IF F%=0 THEN PRINT"Not a thing!"
1170 PRINT:RETURN

```



```

1180 K=1:IF AAZ<>1 THEN PRINT"I have nothing to do that with!":RETURN
1190 IF PZ<>3 THEN PRINT"There's nothing here to cut!!!":RETURN
1200 IF ABZ=0 THEN ABZ=1:PRINT"That's done the trick!":SZ(3,2)=9:RETU
RN
1210 IF ABZ=1 THEN ABZ=2:PRINT"I have managed to cut a way through!":
SZ(3,3)=4:RETURN
1220PRINT"nothing happened!":RETURN
1230 K=1:IF PZ=3 THEN PRINT"I think I can see a way through!":RETURN
1240 IF PZ=9 THEN PRINT"I'd watch out!":RETURN
1250 PRINT"Sorry I don't have a clue!":RETURN
1260 K=1:PRINT"O.K.That made me feel better!":RETURN
1270 K=1:PRINT"I need a spade!":RETURN
1280 K=1: IF PZ=17 THEN PZ=18:PRINT"O.K.":RETURN
1290 IF PZ=22 THEN PRINT"It's too far to jump!":RETURN
1300 PRINT"I can't do that here!":RETURN
1310 IF PZ=18 THEN PZ=17:PRINT"O.K.":RETURN
1320 IF PZ=19 THEN PRINT"O.K.":PZ=20:RETURN
1330 IF PZ=21 THEN PRINT"There's no ladder you know!":RETURN
1340 PRINT"not here!!!":RETURN
1350 IF PZ=21 THEN PRINT"Made it. The ground is soft here!":PZ=22:RET
URN
1360 PRINT"I can't do that here you know!":RETURN
1370 K=1:IF PZ=20 THEN PZ=19:PRINT"O.K.!!!":RETURN
1380 PRINT"Not here !!!":RETURN
1390 K=1:IF PZ=23 THEN GOSUB 1420:IF ACZ=1 THEN PRINT"O.K. Made it
!!!":PZ=24:RETURN
1400 IF PZ=11 OR PZ=12 THEN X$="I fall into a deep whirlpool and d
rown":GOSUB 1450
1410 PRINT"Don't be silly!":RETURN
1420 K=1:IF ACZ<>1 THEN X$="The crocodile bites a large chunk outof m
e!":GOSUB 1450
1430 RETURN
1440 REM ** lose game **
1450 CLS: LOCATE 1,2:PRINT X$
1460 LOCATE 2,20:PRINT"Would you like to play again <Y/N>?"
1470 A$=INKEY$:IF A$="" THEN 1470
1480 IF A$="Y" OR A$="y" THEN RUN
1490 IF A$="N" OR A$="n" THEN PRINT"Goodbye. Thank you for playing":E
ND
1500 GOTO 1470
1510 K=1:IF PZ=23 AND AAZ<>1 THEN PRINT"Too slow!...":X$="It moves ov
er and kills me!":GOSUB 1450 ELSE IF PZ=23 THEN PRINT"O.K...":G$(13)="
a dead crocodile":ACZ=1:RETURN
1520 IF PZ=15 OR PZ=16 THEN PRINT"It's too fast for me!":RETURN
1530 IF PZ=19 THEN X$="It didn't like that!":GOSUB 1450
1540 IF PZ=12 THEN PRINT"He's too far away!":RETURN
1550 IF PZ=14 THEN X$="Tarzan doesn't like that!":GOSUB 1450
1560 PRINT"Who's a silly billy then?":RETURN
1570 K=1:IF ADZ<>1 THEN PRINT"I've not got anything to read":RETURN
1580 PRINT"The paper bears the message.":PRINT:PRINT""BEWARE OF CROCO
DILES!!!!":RETURN
1590 K=1:IF PZ<>6 THEN PRINT"Not here!!!":RETURN
1600 IF AEZ<>1 THEN PRINT"The door is locked!":RETURN
1610 PRINT"O.K.":PZ=7:RETURN
1620 K=1:IF PZ=7 THEN PZ=6:RETURN
1630 PRINT"How can I go out when I'm not IN!!!":RETURN
1640 K=1:IF PZ<>6 THEN PRINT"Don't be stupid!":RETURN
1650 IF AFZ<>1 THEN PRINT"No key!!!!":RETURN
1660 PRINT"The key turns and the door opens with a distant rumble!":
AEZ=1:RETURN
1670 K=1:IF PZ<>6 THEN PRINT"Don't be stupid!":RETURN
1680 IF AEZ<>1 THEN PRINT"The door is locked!":RETURN
1690 PRINT"It's already open.....!":RETURN
1700 K=1:IF PZ<>10 THEN PRINT"how am I supposed to do that here dummy
":RETURN
1710 IF AHZ<>1 THEN PRINT"I have no axe!":RETURN
1720 PRINT"I chop the trees down and now have a pile of logs.":AIZ=1:
Q$(10)=Q$(10)+" There is a pile of logs here."
1730 RETURN
1740 K=1:IF PZ<>10 THEN PRINT"I can't do that here!":RETURN
1750 IF AIZ<>1 THEN PRINT"I can't do that just yet!":RETURN
1760 PRINT"I build a raft and push it down to the river.":PZ=11:Y$
="There is a raft here.":AJZ=1:RETURN
1770 K=1:IF PZ<>11 THEN PRINT"don't be silly":RETURN
1780 IF AJZ<>1 THEN PRINT"I can't do that just yet!":RETURN
1790 PZ=12:PRINT"O.K.":RETURN
1800 K=1:PRINT"O.K.":FOR X=1 TO 1000:NEXT X
1810 IF PZ<>12 THEN RETURN
1820 PZ=13:PRINT"The raft comes to a rest!":RETURN
1830 K=1:PRINT"I can't do that !!!":RETURN
1840 K=1:PRINT"O.K....nobody seems to be listening !":RETURN

```


ODD WORD OUT

This is an education game written to help 5-7 year olds with word recognition. Most children of this age are not familiar with the layout of a QWERTY keyboard and therefore I decided to write the program in such a way that the only keyboard response needed is to press the space bar when the cross is next to the word you want to select.

Each child is presented with a sequence of ten questions and at the end their score is displayed. Each question consists of four words which are shown in the four boxes at the top of the screen. A cross moves across the screen and the child must press the space bar when it is underneath the "ODD WORD OUT".

NOTES

1. The printer used to produce this listing prints the hash sign as £ and therefore you should enter (SHIFT 3) whenever the pound sign appears in the listing.

2. Very young children may find that the cross moves too quickly for them and you should change line 1160 to:

```
1160 FOR X = 1 TO 1000:NEXT
```

Program Breakdown

10-80	initialise program screen mode/colours etc
90	define channel 1 as printing on the hiresolution screen
100-170	titles/read data into arrays
180	seed random number generator
190-230	random start question
250-300	set ten questions
310-350	end of game
360-950	data for questions
960-1000	define sprite
1010-1050	draw boxes
1060-1120	set questions
1130-1240	move sprite
1250-1290	wrong answer
1300-1320	correct answer

Variables used

SC	= score
S\$	= sprite definition
A\$(x,y)	= questions
B(x)	= number of correct answer
Z	= position of sprite
D\$,F\$	= check for space
F	= number of your answer


```

10 REM ** Word Games **
20 REM ** an educational program for 5-7 year olds **
30 REM ** for MSX computers **
40 REM ** Steve Lucas September 1984 **
50 REM ** for MSX USER magazine **
60 SCREEN 2,2:KEYOFF:COLOR 15,1
70 COLOR 15,1
80 TIME=0
90 OPEN"Grp:" FOR OUTPUT AS £1
100 PRESET(75,17):PRINT£1,"Word Games."
110 PRESET(16,50):PRINT£1,"An educational program for"
120 PRESET(65,75):PRINT£1,"MSX Computers"
130 PRESET(5,150):PRINT£1,"<C> Steve W. Lucas Sept 1984"
140 DIM A$(60,4),B(60),C(10):FOR X=1 TO 60:FOR Y=1 TO 4:READ A$(X,Y)
:NEXT Y:READ B(X):NEXT X
150 GOSUB 970
160 PRESET(20,180):PRINT£1,"Press <Space Bar> to start."
170 D$=INKEY$:IF D$<>" " THEN 170
180 FOR X=1 TO TIME STEP 10:G=RND(1):NEXT
190 CLS
200 FOR X=1 TO 10
210 C(X)=INT(RND(1)*49)+1
220 IF C(X)>1 AND (C(X)=C(X-1)) THEN 210
230 NEXT
240 SC=0
250 FOR TT=1 TO 10
260 GOSUB 1010
270 GOSUB 1060
280 GOSUB 1130
290 GOSUB 1300
300 NEXT
310 CLS:PRESET(90,10):PRINT£1,"You scored "
320 PRESET(1,10,50):PRINT£1,SC
330 PRESET(5,180):PRINT£1,"Press <Space Bar> to play again"
340 F$=INKEY$:IF F$<>" " THEN 340
350 RUN
360 DATA cat,sat,bat,let,4
370 DATA eat,meat,rub,seat,3
380 DATA cot,dot,not,set,4
390 DATA hill,ball,call,fall,1
400 DATA miss,put,nut,hut,1
410 DATA hiss,miss,mat,kiss,3
420 DATA can,pan,tin,ran,3
430 DATA ham,put,Sam,Fam,2
440 DATA tap,lap,map,bat,4
450 DATA hid,rid,put,Sid,3
460 DATA rod,rid,mad,sad,2
470 DATA hod,rat,pod,cod,2
480 DATA bake,cake,rake,plate,4
490 DATA late,ball,hate,gate,2
500 DATA Jill,Bili,call,pill,3
510 DATA shell,well,pull,bell,3
520 DATA pull,bull,hull,call,4
530 DATA hop,shut,shop,pop,2
540 DATA shed,bed,red,hop,4
550 DATA pop,lip,pip,rip,1
560 DATA dad,bad,hop,lad,3
570 DATA lad,hit,pit,sit,1
580 DATA fan,sun,run,bun,1
590 DATA lid,hid,bun,kid,3
600 DATA face,pace,plate,race,3
610 DATA meat,heat,seat,ride,4
620 DATA fair,hair,chair,chap,4
630 DATA lid,bin,pin,tin,1
640 DATA cut,fish,hut,put,2
650 DATA take,cake,lake,hunt,4
660 DATA car,far,call,bar,3
670 DATA wake,pin,rake,bake,2
680 DATA pan,pen,hen,men,1
690 DATA ant,pant,hen,rant,3
700 DATA last,mast,fish,past,3
710 DATA lock,vest,rock,sock,2
720 DATA lamp,vest,ramp,camp,2
730 DATA vest,rest,pest,lock,4
740 DATA nine,mine,pine,kite,4
750 DATA pram,ham,land,Sam,3
760 DATA land,sand,hand,lit,4
770 DATA hop,pin,pop,top,2
780 DATA mark,park,lark,sand,4
790 DATA pond,jet,pet,met,1
800 DATA ride,side,tide,land,4
810 DATA play,clay,say,pet,4
820 DATA can,pan,plug,ran,3
830 DATA pad,mad,dad,cat,4
840 DATA map,cap,sap,pat,4
850 DATA late,hate,Kate,cat,4
860 DATA Tate,cap,gate,rate,2
870 DATA car,far,bar,ball,4
880 DATA cat,bike,like,Mike,1
890 DATA late,plank,hate,plate,2
900 DATA bank,pull,plank,rank,2
910 DATA shade,blade,glade,glad,4
920 DATA chop,cop,cot,shop,2
930 DATA wait,wake,bake,take,1
940 DATA lake,full,make,rake,2
950 DATA shut,run,rut,nut,2
960 REM ** define sprite **
970 FOR X=1 TO 8:READ B$:S$=S$+CHR$(VAL("&B"+B$))
980 NEXT:SPRITE$(0)=S$
990 DATA 10000001,01000010,00100100,00011000,00011000,00100100,01000
010,10000001
1000 RETURN
1010 LINE(10,10)-(64,50),10,BF
1020 LINE(70,10)-(124,50),7,BF
1030 LINE(130,10)-(184,50),14,BF
1040 LINE(190,10)-(244,50),3,BF
1050 RETURN
1060 G=B(A):A=C(TT)
1070 COLOR 1
1080 PRESET(15,25):PRINT£1,A$(A,1)
1090 PRESET(75,25):PRINT£1,A$(A,2)
1100 PRESET(135,25):PRINT£1,A$(A,3)
1110 PRESET(195,25):PRINT£1,A$(A,4)
1120 RETURN
1130 Z=37
1140 PUT SPRITE 1,(Z,100),15,0
1150 COLOR 15
1160 FOR T=1 TO 330:NEXT
1170 Z=Z+60
1180 IF Z>240 THEN Z=37
1190 F$=INKEY$:IF F$=" " THEN RETURN
1200 GOTO 1140
1210 SC=SC+1:PRESET(100,150):PRINT£1,"Correct!"
1220 PRESET(5,180):PRINT£1,"Press <Space Bar> to continue"
1230 K$=INKEY$:IF K$<>" " THEN 1230
1240 CLS:RETURN
1250 PRESET(50,150):PRINT£1,"Wrong!..it was "
1260 PRESET(190,150):PRINT £1,A$(A,B(A))
1270 PRESET(5,180):PRINT£1,"Press <Space Bar> to continue"
1280 K$=INKEY$:IF K$<>" " THEN 1280
1290 CLS:RETURN
1300 IF Z=37 THEN F=4 ELSE IF Z=97 THEN F=1 ELSE IF Z=157 THEN F=2 EL
SE F=3
1310 IF F=B(A) THEN GOSUB 1210 ELSE GOSUB 1250
1320 RETURN

```


KUMA KONNECTION

Pangbourne. A sleepy town in the wilds of Berkshire. The last place you expect to find one of Britain's best established software outfits (silicon hollow? – Ed). It's one of those awfully well preserved English upper-middle class niches that US TV stations love to highlight in features on British lifestyles. Where mock-tudor vies with real tudor and the single car showroom deals in Mercedes only. (must be near Whicker Island. Get on with it Hearnton! – Ed).

Kuma, of course, made their name, fame and fortune with a range of software for Sharp MZ micros. More recently they've launched themselves at MSX with a vengeance sporting a catalogue of twenty or so titles to coincide with the appearance of the first MSX machines. This is why I found myself wandering about in the rain searching for 12, Horseshoe Park, Kuma abode and reluctant hosts to yours truly.

'Just past the fire station' offered an old dear, confidently. As they say (who? – Ed), computers embrace all age groups. Horseshoe Park turned out to be one of those hidden away identi-industrial estates that Britain's remaining industries seem to be devolving to – Maggie's Farm, you might say. No 12 is a prefabricated two story structure presumably chosen for availability rather than architectural merit. When I arrived the builders were in. Ancient Japanese proverb say 'suffer now for better tomorrow'. Ah So!

Players

Kuma HQ is mainly concerned with the marketing and administrative aspects of the business and although a certain amount of

software design takes place on site (two full-time programmers employed) much is subcontracted to freelancers as is the artwork, advertising and most of the cassette duplication.

The intrepid duo behind Kuma are Tim Moore (MD, known to his mates as T.W.) and Jon Day, Sales Manager. They've been together since 1977 when both worked for the ill-fated Newbury Laboratories which they left (after establishing one of the first British micro stores – NewBear) in 1982 to found Kuma. For those interested in the reasoning behind labels people give themselves Kuma is Japanese for bear and bear-

under-financed, under-researched and under-marketed" as evidence. Strong words indeed, but with the collapse of Dragon Data, the QL fiasco and the non-appearance of the much-talked about Enterprise, who can argue? It's not surprising, therefore, that Kuma decided it was better to become a collaborator rather than one of the vanquished.

Plot

Tim says... "As soon as the various MSX computers became available in Japan we imported a few from one of our contacts over there, so

Sam Hearnton runs an eye over Kuma Computers – major supporters of MSX in the UK. MD Tim Moore gets taped.

like would be an excellent description of T.W. who drew the short straw and found himself trying to talk to me and a tape recorder at the same time. Nobody survives the MSXU inquisition... (Yawn – Ed).

Tim is a bit like an expanded Uncle Clive, a bearded and bespectacled graduate representing the saner side of software house management as opposed to the 'Neil-like' examples that abound in the smaller set-ups. Tim thinks that Japanese domination of the home micro hardware market is inevitable, citing the fact that "All home-grown micros have been

that we could have a look at them. We're a very independent bunch and like to solve our own problems so we were determined to have a very, very high presence in the MSX field, with or without manufacturer support."

Having seen all the machines except Yamaha's low-profile and specialised CX5M, Tim believes that any differences to be found between the machines are simply minor variations in cosmetics and specification; "It's a bit like a bicycle, they've all got two wheels a saddle and handle bars. Really, I think that availability is going to be

the deciding factor rather than manufacturer."

He's very enthusiastic about MSX and even a cynic like myself has to admit that his enthusiasm seems very genuine. He thinks that the whole MSX 'scene' (man) is a very much a team effort;

"There's been a great deal of co-operation. It's like a breath of fresh air, I've never seen anything like it before in the industry. I'm deeply impressed that so many huge manufacturers could actually get into bed together(!). No other country could organise or manage what's happened except Japan," he enthuses.

Give me one good reason why MSX is going to conquer the world.

"One reason people are going to accept MSX into their homes the way they've accepted tape recorders, videos and TV sets, is - it's a standard. Everything can be linked together. Sophisticated hi-fi units and videos are crying out for strong central control which MSX provides beautifully. It's natural, instead of operating everything individually, everything will be integrated into one system."

Somehow, I don't think that was what old Marx had in mind when he preached collective control. Still, enough of that.

Some of the programs that are available for MSX machines were converted from those written originally for the Sharp MZ700, like the WDPRO word processor program and the Zen assembler/editor. Did you have any particular problems?

"No. The internal architecture of the MSX is very clean - that's one of the reasons we like it, it's got an extremely well defined operating system that's better than most we've seen. Sliding programs across and linking them in was quite easy. The main thing that's necessary to understand is the TI 9918 Avideo chip. All our programmers know how to use this chip (and

the sound chip) and knew what clean architecture looked like, so we had very little problem converting our existing software to MSX. We haven't had to go back to Microsoft for any significant technical support at all, something we're all very proud of."

Production

How do you originate software? Presumably the way a program is written is very much dependent on the programmer involved?

"That's correct. I regard getting programs to publish very much like sowing seeds in a field. First you dig your ground very carefully, and make sure the grounds well looked after. Then you sow the seeds, water them, supply all the nutrients they need and hope the sun shines and that a lot of seeds come up and bear fruit."

That's quite a flowery metaphor. Don't you ever get, er, bad apples?

"You don't get a 100% yield that's for sure! Quite often we start with one program and end up with a completely different one. Sometimes we get a superb product such as Hyper Viper and sometimes the end users needs are so severe, the product has to be recycled."

"The more programs a programmer writes, the easier he finds it. Well structured programs tend to be easily translated and

TW and wall

easily maintained. Sometimes, people write highly unstructured programs in a violent burst of creative energy which are totally unmaintainable but superb. The only criteria is 'Will the end user like it?' and if the inside is inelegant but works well we don't find that any restriction on publishing."

I see. So your commercial decisions are based on an end user evaluation. How do you write the programs you produce in-house? In modules?

"Sometimes. It depends what the program is. An arcade game is written in one way, a communications package another and so on."

"Usually, we use internal

"It's a bit like a bicycle, they've all got two wheels, a saddle and handle bars."

compilers. Often software is originated on a host machine but with the target machine in mind, so we use quite sophisticated ways of generating product."

"We have internal graphics compilers and languages which are not very well documented because, although they're very effective, they're specialist by nature and of limited use. They're not a marketable product but they're enormously useful to us. They allow games programs to be written to a

level of sophistication which would not be possible otherwise."

The first of Kuma's programs should be in the shops as you read this (see *Contact*, page) and they're a pretty mixed bunch, ranging from established format games like Dogfighter, Fire Rescue and Hyper Viper to advanced programs like the WDPRO Wordprocessor and Database packages. There's also a well proven Forth language;

"Lots of people like hacking them out but very few like writing manuals!", Tim laughs. "We've got very good manuals, though".

Another piece of software that's been converted for MSX use from Kuma's MZ

range is the Zen Machine Code Programming System, as Tim explains;

"Originally, it was a language but we've extended it quite considerably now so we call it a programming system. It's an Assembler and Disassembler, it's got a machine code monitor and a good editor."

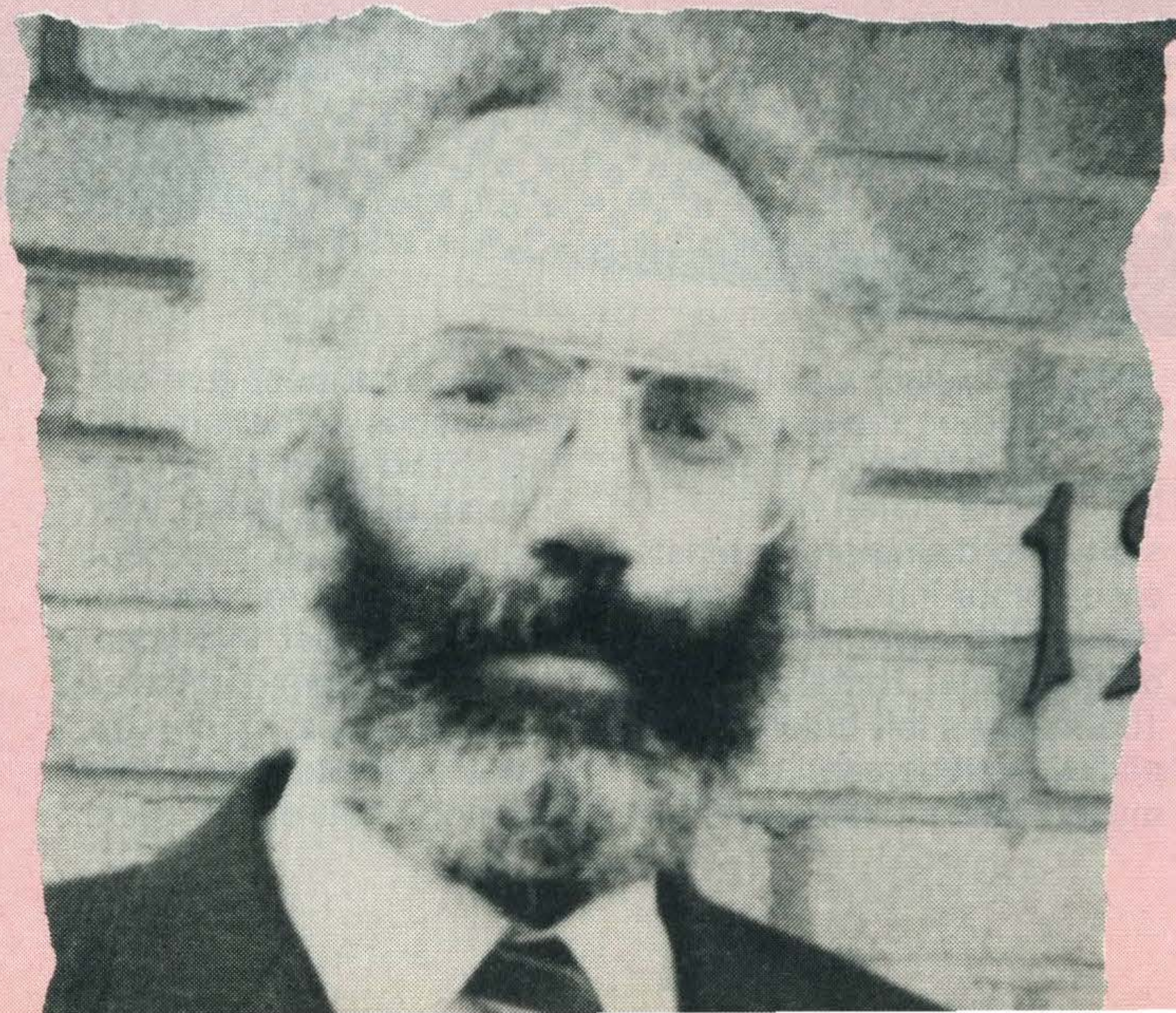
"It's a programmer's program - a professional programmer would hold it up to his students and say 'Hey, if you're going to write software, write it like this.' There's not a spare byte of badly written code in it anywhere and it's very easy to use as well."

Networks

Perhaps the most interesting of Kuma's offerings is Communications with Viewdata. This allows you to access Prestel, Telecom Gold and Viewdata.

They also manufacture a parallel interface board, for control purposes.

Kuma will have a second wave of software out by late December when it's hoped they'll have a total of fifty different MSX products. And this is just the beginning?



ESCAPE FROM ALPHA CENTURI

Please help me. I've lived on the planet Alpha Centuri II all my life, but the planet has started to disintegrate. Most of the other inhabitants have already left and I must try to do the same. There are only 100 minutes left before the planet explodes and each move I make takes one

minute. You must give me instructions in the form of one or two word sentences such as LIGHT LAMP. My English isn't very good and if I don't seem to understand you, try another instruction.

Words understood include - n, w, s, e, go, in, out, up, down, get, take, grab, leave, inventory, eat, drink, swim,

paddle, wade, unlock, insert, wear, fill, jump, climb, repair, mend, fix, help, start, fire, wait, land, press, push, crawl, pull.

NOTE all responses should be in lower case, so make sure that the CAPS lock light isn't lit.


```

10REM ** Escape from Alpha Centuri **
20REM ** an adventure game for MSX computers **
30REM *** <C> Steve Lucas      August 1984 **
40KEYOFF
60CLEAR 1000
70SCREEN 0:WIDTH 37
80GOSUB 1810
90DIM Q$(30),S$(30,4),X$(40),G$(40),B$(40),N$(40),NZ(40)
100FOR X=1 TO 28:READ Q$(X):FOR Y=1 TO 4:READ S$(X,Y):NEXT Y,X
110FOR X=1 TO 18:READ G$(X),B$(X):NEXT
120FOR X=1 TO 27:READ N$(X),NZ(X):NEXT
130F%=1:M%=0
140PRINT:PRINT:PRINT:PRINT
150IF AF=1 THEN S$(9,1)=25 ELSE S$(9,1)=0
160ID P%=6 AND AK<>1 THEN PRINT"I trip and fall in the dark!":GOSUB
1070
170COLOR 12,15:PRINT"There are only ";100-M%;" moves left!"
180PRINT"I am ":PRINTQ$(P%):A$=""
190IF S$(P%,1)>0 THEN A$="North"
200IF S$(P%,2)>0 AND LEN(A$)>0 THEN A$=A$+",South" ELSE IF S$(P%,2)>
0 THEN A$="South"
210IF S$(P%,3)>0 AND LEN(A$)>0 THEN A$=A$+",East" ELSE IF S$(P%,3)>0
THEN A$="East"
220IF S$(P%,4)>0 AND LEN(A$)>0 THEN A$=A$+",West" ELSE IF S$(P%,4)>0
THEN A$="West"
230IF P%=27 THEN A$="Out"
240IF A$="" THEN A$="Nowhere obvious"
250PRINT:PRINT"I can go :-":PRINTA$
260F=FRE("")
270E=0:FOR X=1 TO 18:PP%=0:IF B$(X)=P% THEN PP%=1
280IF PP%=1 THEN 310
290NEXT:GOTO 330
300 PRINT:PRINT
310 IF E=0 THEN PRINT:PRINT"I can see :-"
320 PRINTG$(X):E=E+1:GOTO 290
330PRINT:PRINT:PRINT"what should I do now ":INPUT Z$
340CLS:PRINT CHR$(7):PRINT"Hold on a second"
350B$=LEFT$(Z$,2):C$=LEFT$(Z$,3):D$=LEFT$(Z$,4):M%=M%+1
360IF C$="loo"THEN K=1:PRINT"I don't see anything unusual"
370IF C$="say" OR C$="tal" OR C$="ask" THEN PRINT"I'm not going to t
alk to myself you know!":K=1
380IF (B$="n" OR B$="N" OR D$="go n") AND S$(P%,1)>0 THEN K=1:P%=S$(
P%,1)
390IF (B$="s" OR B$="S" OR D$="go s") AND S$(P%,2)>0 THEN K=1:P%=S$(
P%,2)
400IF (B$="e" OR B$="E" OR D$="go e") AND S$(P%,3)>0 THEN K=1:P%=S$(
P%,3)
410IF (B$="w" OR B$="W" OR D$="go w") AND S$(P%,4)>0 THEN K=1:P%=S$(
P%,4)
420IF C$="get" OR C$="tak" OR C$="gra" THEN GOSUB 740
430IF C$="dro" OR C$="put" OR C$="lea" THEN GOSUB 950
440IF C$="inv" THEN GOSUB 1030
450IF C$="eat" THEN PRINT"There's nothing here to eat!":K=1
460IF C$="dri" THEN PRINT"I'm not thirsty thank you":K=1
470IF C$="rub" THEN PRINT"Don't be stupid!":K=1
480 IF C$="swi" THEN GOSUB 1080
490 IF C$="pad" OR C$="wad" THEN GOSUB 1120
500 IF C$="unl" OR C$="ins" THEN GOSUB 1160
510 IF C$="sco" THEN PRINT"what do you think this is a game?":K=1
520IF C$="wea" THEN GOSUB 1190
530 IF C$="in" OR D$="go i" OR D$="go l" THEN GOSUB 1230
540IF C$="out" OR D$="go o" THEN GOSUB 1260
550IF C$="fil" THEN GOSUB 1290 ELSE IF C$="jum" THEN GOSUB 1320
560IF C$="cli" OR C$="up" THEN GOSUB 1340
570IF C$="rep" OR C$="men" OR C$="fix" THEN GOSUB 1350
580IF C$="hel" THEN GOSUB 1390 ELSE IF C$="sta" OR C$="fir" THEN GOS
UB 1440
590IF C$="wai" THEN GOSUB 1500
600IF C$="lan" THEN GOSUB 1520
610IF C$="pre" OR C$="pus" THEN GOSUB 1540
620IF C$="cra" OR D$="go v" THEN GOSUB 1570
630IF C$="pul" THEN GOSUB 1600
640IF F%=28 OR M%=100 THEN 650 ELSE 150
650CLS:IF M%>99 THEN PRINT"You ran out of time!":GOTO 1070
660LOCATE 10,5:PRINT"W E L L   D O N E"
670LOCATE 1,10:PRINT"You have escaped from Alpha Centuri"
680PRINT:PRINT:PRINT:PRINT
690PRINT"Would you like another game <Y/N>?"
700F$=INKEY$:IF F$="" THEN 700
710IF F$="Y" OR F$="y" THEN RUN
720IF F$="N" OR F$="n" THEN PRINT"Goodbye":END
730GOTO 700
740K=1:GOSUB 900
750IF LZ<>1 THEN RETURN
760EZ=0:FOR X=1 TO 18:IF B$(X)=P% AND B$(NZ(R))=P% THEN EZ=1
770NEXT:IF EZ=0 THEN PRINT"I don't see it here!":RETURN
780IF R=2 OR R=3 THEN PRINT"AAAAGGGHH the agony. I've broken my bac
k with the strain!":GOSUB 1070
790IF R=1 THEN AJ=1 ELSE IF R=4 THEN PRINT"The dust blows up into my
face and   chokes me":GOSUB 1070

```



```

800IF R=5 OR R=6 THEN PRINT"Don't be silly!":RETURN
810IF R=9 THEN PRINT"The stupid thing bit me!":GOSUB 1070
820IF R=10 OR R=12 THEN PRINT"Now then don't be ridiculous":RETURN
830IF R=16 OR R=17 THEN AB=1 ELSE IF R=18 THEN AC=1 ELSE IF R=20 OR
R=21 THEN AD=1 ELSE IF R=22 OR R=23 THEN AE=1 ELSE IF R=25 OR R=24 THE
N AF=1
840IF R=27 THEN PRINT"How am I supposed to do that ?":RETURN
850IF R=26 AND AD<>1 THEN PRINT"I need something to put it in!":RETU
RN
860IF R=26 AND AD=1 THEN PRINT"I fill the can with the fuel!":AG=1:R
ETURN
870E%=0:FOR D=1 TO 3:IF V$(D)="" THEN V$(D)=G$(N%(R)):E%=1:D=6
880NEXT:IF E%=0 THEN PRINT"Sorry my hands are full!":K=1:RETURN
890B%(N%(R))=0:K=1:RETURN
900L$="":FOR H=1 TO LEN(Z$)
910IF MID$(Z$,H,1)=" " THEN L$=RIGHT$(Z$, (LEN(Z$)-H)):H=90
920NEXT:R=0:L%=0:IF LEN(L$)<2 THEN K=1:RETURN
930FOR H=1 TO 27:IF LEFT$(N$(H),LEN(L$))=L$ THEN L%=1:R=H
940NEXT:RETURN
950K=1:GOSUB 900:IF L%<>1 THEN PRINT"I can't see a ";L$:RETURN
960E%=0:FOR D=1 TO 3:IF V$(D)=G$(N%(R)) THEN V$(D)="" :E%=1
970NEXT:IF E%<>1 THEN PRINT"I don't have it!":RETURN
980B%(N%(R))=P%
990IF R=1 THEN AJ=0 ELSE IF R=16 OR R=17 THEN AB=0 ELSE IF R=18 THEN
AC=0
1000IF R=20 OR R=21 THEN AD=0 ELSE IF R=22 OR R=23 THEN AE=0 ELSE IF
R=24 OR R=25 THEN AF=0
1010IF AG=1 AND (R=20 OR R=21) THEN AG=0:PRINT"The fuel spills to the
floor"
1020RETURN
1030PRINT"I have :-":F%=0:FOR H=1 TO 3
1040IF V$(H)<>"" THEN PRINTV$(H):F%=1
1050NEXT:IF F%=0 THEN PRINT"Nothing at all"
1060PRINT:PRINT:K=1:RETURN
1070PRINT:PRINT:PRINT:PRINT"With friends like you who needs enem
ies ?":PRINT:PRINT:PRINT:GOTO 690
1080K=1:IF P%=18 THEN P%=12:PRINT"O.K.":RETURN
1090IF P%=12 THEN P%=18:PRINT"O.K.":RETURN
1100IF P%=16 OR P%=19 THEN PRINT"The water's not deep enough!":RETURN
1110PRINT"Don't be absurd!":RETURN
1120K=1:IF P%=12 OR P%=18 THEN PRINT"The water's too deep and I drown
!":GOSUB 1070
1130IF P%=16 THEN PRINT"O.K.":P%=19:RETURN
1140IF P%=19 THEN PRINT"O.K.":P%=16:RETURN
1150PRINT"Don't be absurd!":RETURN
1160IF P%<>10 THEN PRINT"Why do you always have to be stupid!":K=1:RE
TURN
1170K=1:IF AC<>1 THEN PRINT"I don't have the key!":RETURN
1180PRINT"O.K.":S%(10,1)=24:Q$(10)=LEFT$(Q$(10),25):RETURN
1190IF AJ=1 THEN PRINT"I'm already wearing the helmet"
1200IF AF=1 THEN PRINT"I've already put them on"
1210K=1:IF AF=0 AND AA=0 THEN PRINT"Don't be silly!"
1220RETURN
1230K=1:IF P%=1 THEN P%=27:PRINT"O.K.":RETURN
1240IF P%=17 THEN P%=21:PRINT"O.K.":RETURN
1250PRINT"Silly!":RETURN
1260IF P%=27 THEN P%=1:PRINT"O.K.":RETURN ELSE IF P%=18 THEN P%=17:RE
TURN
1270IF P%=21 THEN P%=17:RETURN
1280PRINT"Don't be silly":RETURN
1290K=1:IF P%<>17 THEN PRINT"I can't fill the rocket yet":RETURN
1300IF AG<>1 THEN PRINT"I have no fuel":RETURN
1310PRINT"O.K. I fill the fuel tank!":AH=1:RETURN
1320IF P%<>25 THEN PRINT"Not here!":RETURN
1330K=1:P%=26:PRINT"O.K.":RETURN
1340K=1:IF P%<>26 THEN PRINT"Don't be absurd!":RETURN ELSE P%=25:RETU
RN
1350K=1:IF P%<>17 THEN PRINT"I don't see anything in need of rep
air!":RETURN
1360IF AE<>1 THEN PRINT"I need the repair manual!":RETURN
1370PRINT"I follow the manual and repair the spaceship.":Q$(17)=LEF
T$(Q$(17),46):AI=1
1380RETURN
1390K=1:IF P%=17 THEN PRINT "Why not repair it!":RETURN
1400IF P%=21 THEN PRINT"Why not start the engine!":RETURN
1410IF P%=22 THEN PRINT"All you can do is WAIT !":RETURN
1420IF P%=23 THEN PRINT"why not land on that planet I see over the
re!":RETURN
1430PRINT"I'm sorry I don't have a clue!":RETURN
1440IF P%<>21 THEN PRINT"How can I do that here ?":RETURN
1450IF AI<>1 THEN PRINT"The ship is still broken !":RETURN
1460IF AH<>1 THEN PRINT"I'm out of fuel!":RETURN
1470IF AC<>1 THEN PRINT"I have no keys!":RETURN
1480IF AJ<>1 THEN PRINT"I need a space helmet!":RETURN
1490P%=22:PRINT"The engine fires":RETURN
1500K=1:PRINT"O.K.":FOR X=1 TO 1000:NEXT:IF P%=22 THEN P%=23
1510RETURN
1520K=1:IF P%<>23 THEN PRINT"Don't be stupid!":RETURN
1530PRINT"O.K. I land the spaceship safely!":P%=28:RETURN
1540K=1:IF P%=7 THEN S%(7,2)=8:PRINT"Something happened!":RETURN

```



```

1550IF P%=5 THEN PRINT"Something happened!":AK=1:Q$(6)=LEFT$(Q$(6),22
):RETURN
1560PRINT"Don't be silly !":RETURN
1570K=1:IF P%=2 THEN P%=3:PRINT"O.K.":RETURN
1580IF P%=3 THEN P%=2:PRINT"O.K.":RETURN
1590PRINT"Don't be daft!":RETURN
1600K=1:IF P%<>7 THEN PRINT"Not here!":RETURN ELSE S%(7,2)=8:PRINT"O.
K.":RETURN
1610DATA in a glass walled corridor. There's a supply shop to my lef
t.,0,0,2,0
1620DATA in a narrow corridor. A tiny air vent leads to the North.,0,5
,0,1
1630DATA in a small tool room. A large bench in the centre is covere
d with wood shavings. An air vent leads South.,0,0,4,0
1640DATA in an empty storeroom. Cobwebs hang from the ceiling.,0,0,0,
3
1650DATA at the entrance to the jet black room,2,0,6,0,in the jet bla
ck room. I can't see a thing!,0,7,0,5
1660 DATA by a large statue. There is a small lever on the wall.,6,0
,0,0
1670DATA on a narrow undulating walkway.,7,0,9,10,at the edge of a la
rge muddy field. I'd need a pair of Wellies to cross it!,0,0,0,8
1680DATA outside the Spacex Library. The door is firmly locked.,0,11,
8,0,by the Kolonian Furitur Fountain.,10,12,13,0
1690DATA in a small harbour. There is an island only a short dis
tance away.,11,17,14,0,outside the Alpha Bank. There is a cash dispe
nser here.,0,14,0,11
1700DATA outside the Voltex souvenir shop. It's locked!,13,0,15,12,
on a wooden bridge crossing the fast flowing river Volta.,0,16,0,14
1710DATA on the banks of the river. A small island can be seen in t
he middle.,15,0,0,0,in the space port. The spaceship Polais here but i
t is broken.,12,0,0,0,on a small island. There is a large stand which
holds the keys.,0,0,0,0
1720DATA on an island. A rare Logor plant is growing here. The mainla
nd is to the North.,0,20,0,0
1730DATA in a scrapyard full of rusting SPACORS,19,0,0,0,in the cockp
it of the spaceship.,0,0,0,0,flying above the clouds. The dials all
show red.,0,0,0,0
1740in outer space. The planet has just exploded.,0,0,0,0,in the lib
rary. There are few books here as most information is held on hologr
ams.,0,10,0,0
1750on a very narrow ledge.,0,9,0,0,in a fuel station. A rope hangs f
rom above.,0,0,0,0,in the supply shop. Rows of oxygen cylinders lin
e the walls.,0,0,0,0,in the spacestation URALUTIVA,0,0,0,0
1760REM ** data for items to be found
1770DATA a space helmet,4,a polvar extractor,3,a pile of dust,2,a pre
ssure pad,5,a golden ring,6,a tiny spider,7,a poor beggar,8,a plank,,a
keyhole,10
1780DATA a toffee paper,11,a sailboard,12,a purse full of coins,13,a
bunch of keys,18,some flowers,19,a petrol can,20,a repair manual,24,a
pair of WELLIES,27,a coin operated rocket fuel pump,26
1790DATA helmet,1,polvar,2,extractor,2,dust,3,pressure,4,pad,4,gold,5
,ring,5,spider,6,beggar,7,plank,8,hole,9,toffee,10,paper,10
1800DATA sailboard,11,purse,12,coins,12,keys,13,flowers,14,petrol,15,
can,15,repair,16>manual,16,wellies,17,boots,17,fuel,18,pump,18
1810CLS:LOCATE 4,2:PRINT"Escape from Alpha Centuri"
1820LOCATE 2,5:PRINT"An adventure game for MSX machines"
1830LOCATE 2,7:PRINT"<C> Steve Lucas August 1984"
1840PRINT:PRINT:PRINT"Please help me to escape from my planet bef
ore it explodes by giving me instructions such as START ENGINES"
1850PRINT:PRINT:"Most of the inhabitants have already escaped and the
re are only 100 minutes left."
1860RETURN

```

Variables

P%	current location
S%(X,Y)	holds map
B%(X)	holds pointer to object's location
Q\$(X)	holds descriptions of locations
G\$(X)	holds descriptions of objects
N\$(X)	holds words understood
N%(X)	pointers
AA-AK	flags
V\$(X)	holds items carried
Z\$,B\$,C\$,D\$	input actions and substrings
M%	number of moves

Program Breakdown

40	turns off messages at bottom of screen
60	clears enough string space
70	select mode and screen width
80	call titles
90-120	fill arrays
130	initialise variables
150-650	main control loop
660-730	win game
740	subroutines for actions

VEGETABLE PLANNER

This program was written to help the amateur gardener plan their vegetable plot. Every year I seem to manage to plant my tomatoes too late to get a good crop and my beetroot too early so that the frost gets'em. This year I was determined to do something about it. I make no claims that the program will be of any use to the expert gardener, but it should help to remind you of jobs to be done in the garden.

When this program is RUN, it displays a diagram showing the plots used for crop rotation. This is followed by a menu which allows you to query the data held on the 33 different types of vegetables.

Menu

- A. To look at the details of a particular vegetable
- B. To list the vegetables to be sown in a given month
- C. To list the plants which should be planted in a given plot
- D. To list the vegetables to be harvested in a given month

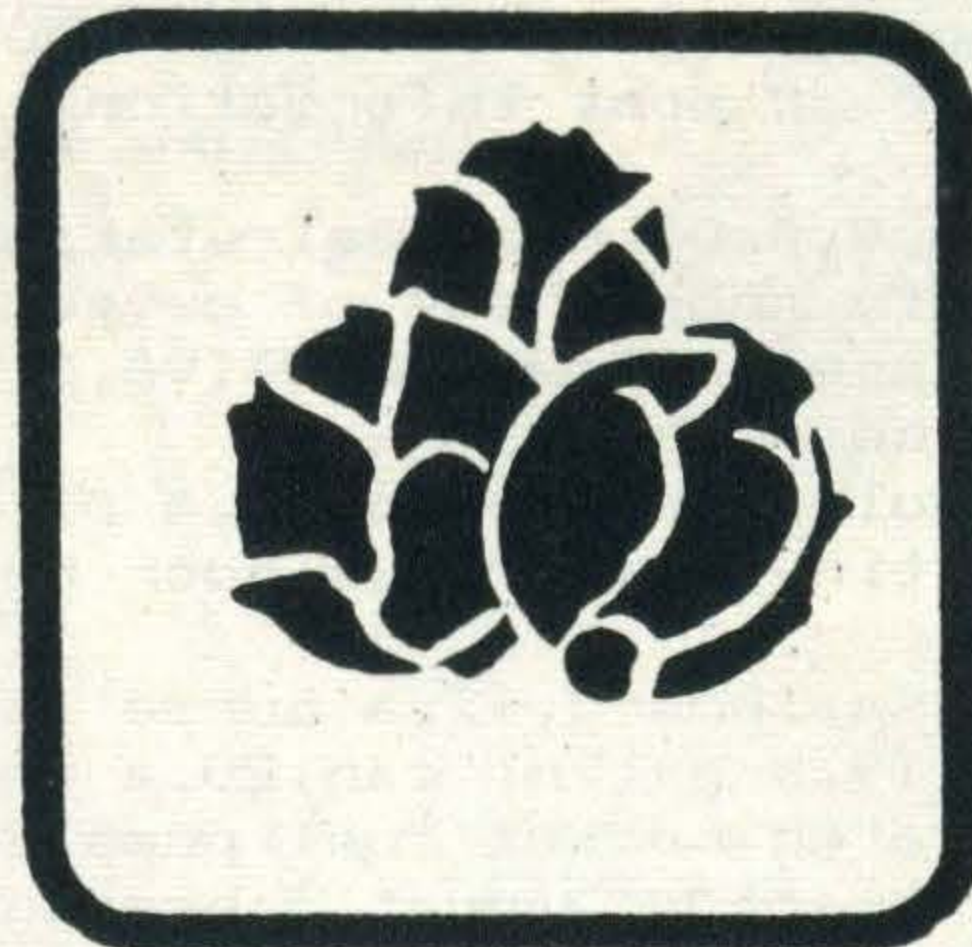
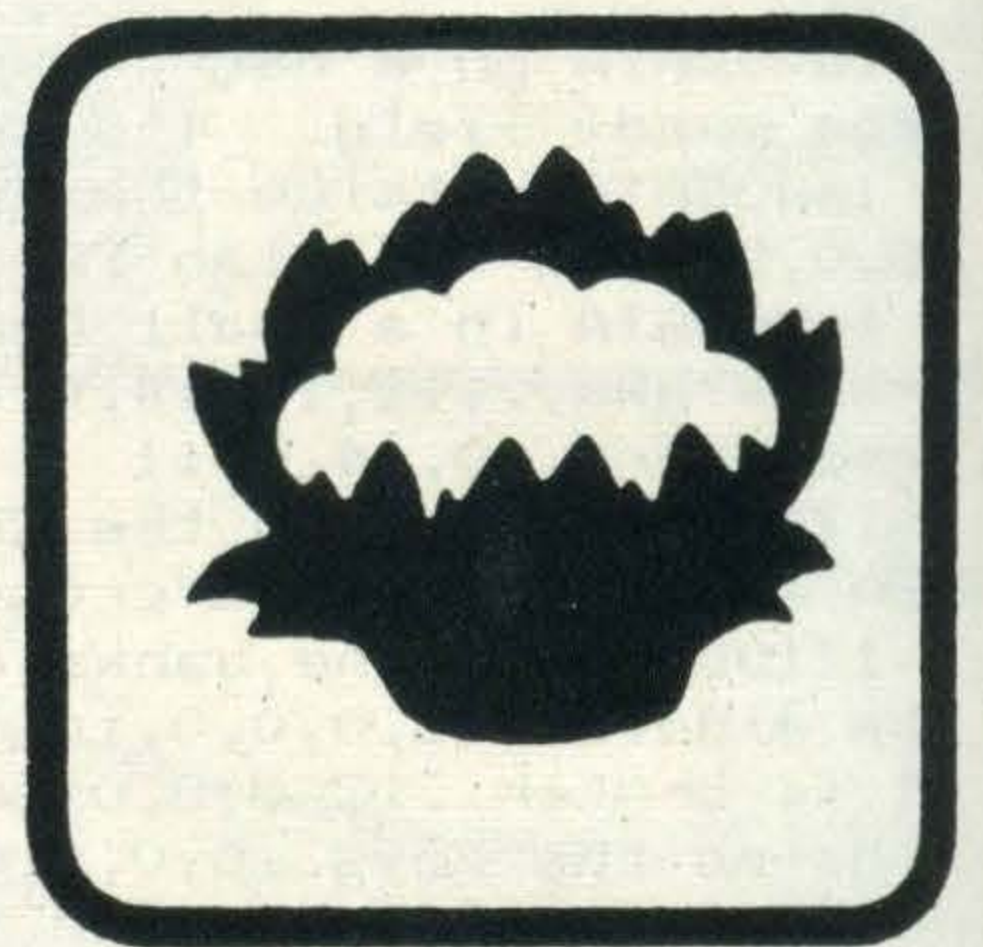
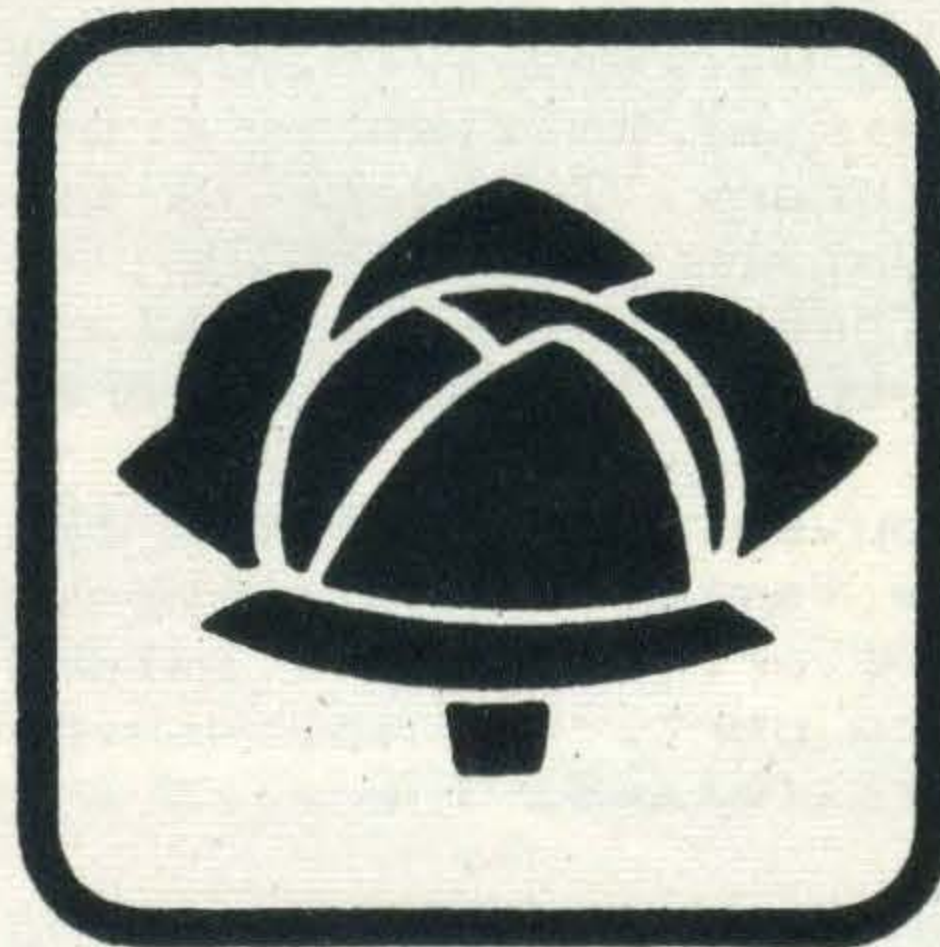
Adding extra data to the program

If you want to add details of extra vegetables, this may be done by inserting DATA lines between 340 and 660. Each line contains the following items:

1. vegetable
2. s = seed, t = tubers, a = sets
3. months of sowing/planting
4. plot
5. months of harvesting

NOTE

The printer used to list this program prints the hash sign - (Shift 3) as £ (pound). Please make sure that you type it in as a hash sign or the program won't work!



Program breakdown

10-50	titles
60-200	draw plots and label them
210-330	menu
340-670	data for vegetables
680-690	headings
700-750	search for plant
760-890	print cultivation details
900-920	wait for space bar
940-1060	select plant by month of sowing
1070-1100	plants to sow in particular month
1130-1240	plants selected by plot
1250-1370	plants to be harvested
1390-1420	print only 12 plants

Variables used

L%	check for 12 plants
B\$	plant name
C\$	seed/tubers etc
D\$	months of sowing/planting
E\$	plot
F\$	months of harvesting

VEGETABLE PLANNER

```
10 KEYOFF:SCREEN 0:COLOR 11,4:WIDTH 40
20 LOCATE 10,2:PRINT"Vegetable Planner"
30 LOCATE 10,5:PRINT"A Utility Program"
40 LOCATE 6,20:PRINT"<C> Steve W. Lucas 1984"
50 FOR X=1 TO 2000:NEXT:CLS
60 SCREEN 2
70 OPEN "GRP:" FOR OUTPUT AS #1
80 LINE (10,100)-(60,150),2,BF
90 LINE (60,100)-(110,150),6,BF
100 LINE (110,100)-(160,150),10,BF
110 LINE (160,100)-(210,150),13,BF
120 FRESET (1,5):PRINT#1,"Vegetable crops must be rotated"
130 FRESET (1,20):PRINT#1,"Plot a :- peas, beans etc"
140 FRESET (1,30):PRINT#1,"Plot b :- root vegetables"
150 FRESET (1,40):PRINT#1,"Plot c :- Brassicas"
160 FRESET (1,50):PRINT#1,"Plot d :- leave in same bed"
170 FRESET (35,90):PRINT#1,"a" :FRESET (85,90):PRINT#1,"b"
180 FRESET (135,90):PRINT#1,"c" :FRESET (185,90):PRINT#1,"d"
190 FRESET(0,160):PRINT#1,"Press <Space Bar> to continue"
200 F#=INKEY#:IF F#<>" " THEN 200
210 SCREEN 0:COLOR 11,4:WIDTH 40
220 CLS
230 GOSUB 680
240 PRINT:PRINT:PRINT"Do you want :-":PRINT:PRINT:PRINT"A. To look
up a particular vegetable"
250 PRINT:PRINT"B. To list the vegetables to be sown in a given
month."
260 PRINT:PRINT"C. To list the plants suitable for a given pl
ot."
270 PRINT:PRINT"D. To list the vegetables ready for harvesti
ng in a given month."
280 A#=INKEY#:IF A#="a" OR A#="b" OR A#="c" OR A#="d" OR A#="A" OR A
#="B" OR A#="C" OR A#="D" THEN 290 ELSE 280
290 IF A#="a" OR A#="A" THEN GOSUB 690
300 IF A#="c" OR A#="C" THEN GOSUB 1120
310 IF A#="b" OR A#="B" THEN GOSUB 930
320 IF A#="d" OR A#="D" THEN GOSUB 1250
330 GOTO 230
340 DATA asparagus,c,4,d,45
350 DATA runner beans,s,456,a,789
360 DATA dwarf beans,s,3456,a,6789
370 DATA french beans,s,3456,a,6789
380 DATA broad beans,s,3412,a,5678
390 DATA artichokes,o,4,d,789
400 DATA beetroot,s,34567,b,89a
410 DATA brussels sprouts,s,234,c,89abc12
420 DATA cabbage (summer),s,23,c,6789a
430 DATA cabbage (autumn),s,45,c,bc12
440 DATA cabbage (spring),s,8,c,456
450 DATA carrots,s,23456,b,6789a
460 DATA cauliflower,s,12345,c,12345678
470 DATA broccoli,s,123,c,12345
480 DATA celery,s,34,a,9abc123
490 DATA chicory,s,45,a,bc12
500 DATA cucumber,s,234,a,89a
510 DATA endive,s,56789,a,9abc
520 DATA kale,s,45,c,bc1234
530 DATA leek,s,123,a,89abc123
540 DATA lettuce,s,3456,a,3456789ab
550 DATA marrow,s,456,a,789
```



```

560 DATA onions,s,a,c1234,b,9a
570 DATA shallots,a,4,b,9a
580 DATA spring onions,s,2345678,b,6789abc
590 DATA parsnips,s,23,b,abc
600 DATA peas,s,3456,a,56789a
610 DATA potatoes,t,34,b,6789a
620 DATA radish,s,3456789,a,456789a
630 DATA spinach,s,23456789,a,6789ab
640 DATA sweet corn,s,45,a,89
650 DATA tomatoes,s,34,a,89ab
660 DATA swedes,s,4567,b,abc12
670 DATA x,x,x,x,x
680 CLS:PRINTTAB(10);"Vegetable Planner":RETURN
690 GOSUB 680
700 PRINT:PRINT:PRINT"Enter the name of the vegetable ":INPUT VE$
710 CLS:B%=0:A%=1:RESTORE
720 B%=B%+1:READ B$,C$,D$,E$,F$
730 IF LEFT$(VE$,5)=LEFT$(B$,5) OR B%=34 THEN 740 ELSE 720
740 IF LEFT$(VE$,5)=LEFT$(B$,5) THEN GOSUB 760 ELSE PRINT"Sorry that
vegetable is not available!":FOR T=1 TO 1000:NEXT:RETURN
750 RETURN
760 GOSUB 680
770 PRINT:PRINTB$:PRINT
780 PRINT"Plant in plot ";E$
790 IF E$="a" THEN PRINT:PRINT"needs rich freshly manured/fertilised
soil." ELSE IF E$="b" THEN PRINT:PRINT"Should be planted in soil ma
nured for a previous crop."
800 IF E$="c" THEN PRINT:PRINT"Best planted in soil manured for a
previous crop. Likes a dressing of lime."
810 IF E$="d" THEN PRINT"Should not be rotated but left in its own
bed."
820 PRINT:PRINT:PRINT"grown from :- ";IF C$="s" THEN PRINT"Seed" EL
SE IF C$="c" THEN PRINT"Crowns" ELSE IF C$="o" THEN PRINT"Offsets" EL
E IF C$="sa" THEN PRINT"Seed or Sets"
830 IF C$="t" THEN PRINT"Tubers" ELSE IF C$="a" THEN PRINT"Sets"
840 PRINT:PRINT"Sow / Plant in"
850 FOR X=1 TO LEN(D$):X$=MID$(D$,X,1)
860 IF X$="1" THEN PRINT"Jan " ELSE IF X$="2" THEN PRINT"Feb " ELSE
IF X$="3" THEN PRINT"Mar " ELSE IF X$="4" THEN PRINT"Apr " ELSE IF X$=
"5" THEN PRINT"May "
870 IF X$="6" THEN PRINT"Jun " ELSE IF X$="7" THEN PRINT"Jul " ELSE
IF X$="8" THEN PRINT"Aug " ELSE IF X$="9" THEN PRINT"Sep "
880 IF X$="a" THEN PRINT"Oct " ELSE IF X$="b" THEN PRINT"Nov " ELSE
IF X$="c" THEN PRINT"Dec "
890 NEXT
900 PRINT:PRINT:PRINT" Press the <Space Bar> to continue."
910 J$=INKEY$:IF J$<>" " THEN 910
920 CLS:RETURN
930 D%=0:CLS:GOSUB 680
940 PRINT:PRINT"Enter the month as a number (1-12) ";:INPUT MO
950 IF MO<1 OR MO>12 THEN PRINT"Don't be silly!":GOTO 940
960 IF MO<10 THEN MO$=STR$(MO):MO$=RIGHT$(MO$,1)
970 IF MO=10 THEN MO$="a" ELSE IF MO=11 THEN MO$="b" ELSE IF MO=12 T
HEN MO$="c"
980 RESTORE:CLS
990 READ B$,C$,D$,E$,F$
1000 FOR X=1 TO LEN(D$):IF MID$(D$,X,1)=MO$ THEN D%=1:GOSUB 1070
1010 NEXT
1020 IF B$<>"x" THEN 990
1030 IF D%=0 THEN PRINT"There are no seeds to sow this month"

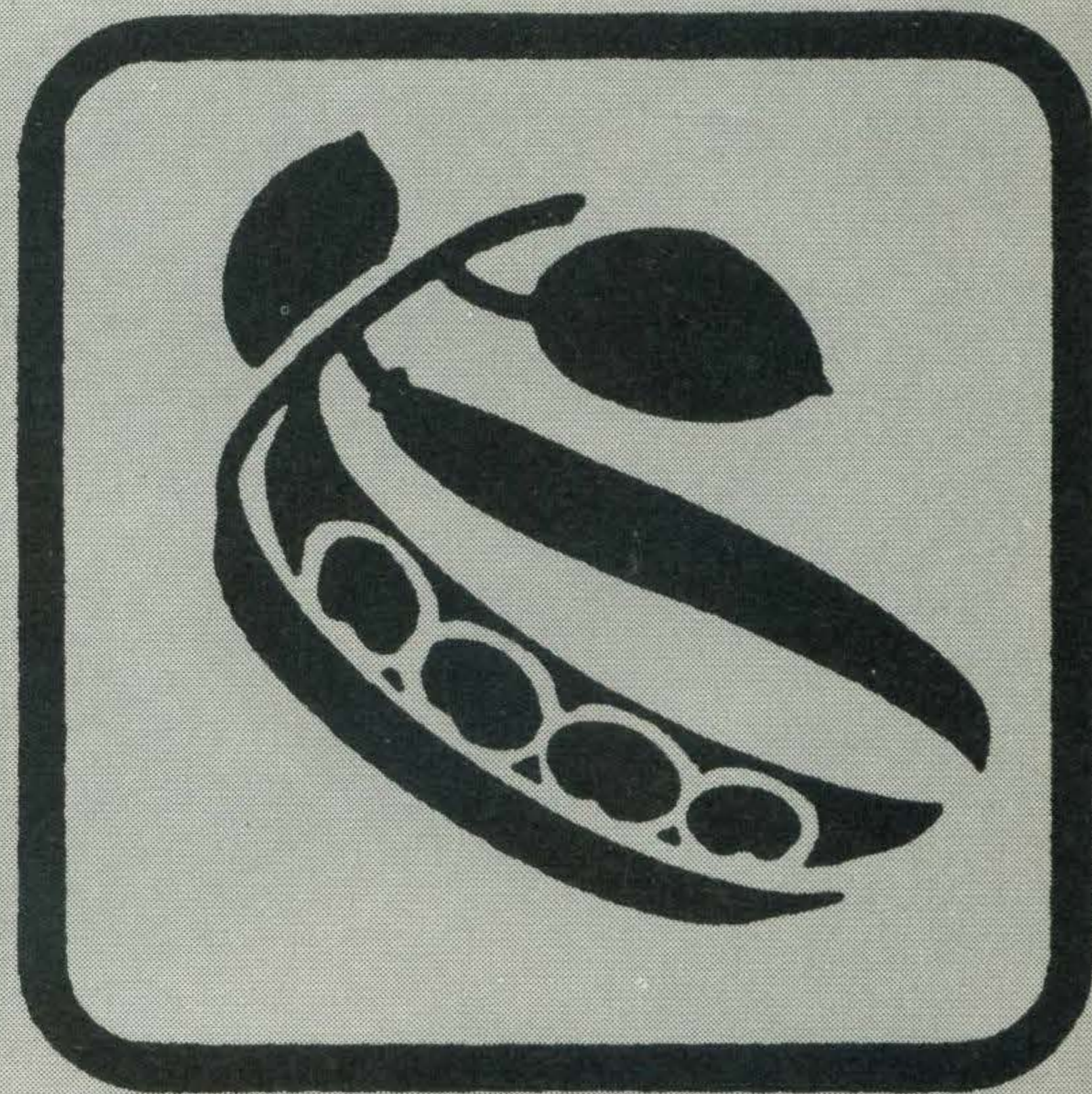
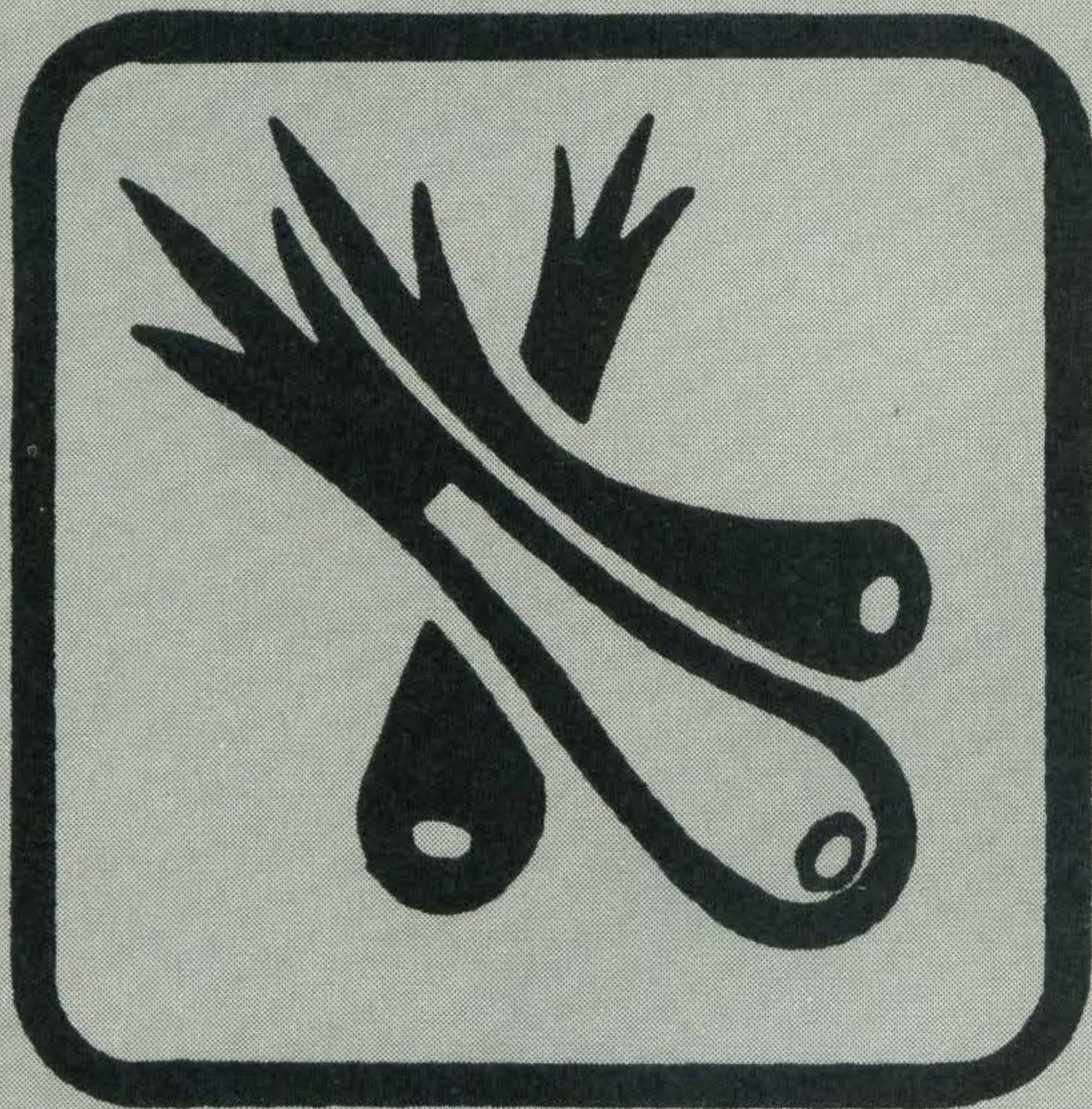
```



```

1040 PRINT:PRINT"    Press the <Space Bar> to continue."
1050 G$=INKEY$:IF G$<>" " THEN 1050
1060 RETURN
1070 L%=L%+1:PRINT"Sow :-";B$
1080 IF L%>12 THEN PRINT:PRINT"    Press the <Space Bar> to continue."
1090 IF L%>12 THEN K$=INKEY$:IF K$<>" " THEN 1090
1100 IF L%>12 THEN L%=1
1110 RETURN
1120 CLS:GOSUB 680
1130 PRINT:PRINT:PRINT:PRINT"Which plot do you wish to examine ?":PRI
NT:PRINT:PRINT"A.  peas, beans etc"
1140 PRINT"B.  root vegetables"
1150 PRINT"C.  brassicas":PRINT"D.  others"
1160 G$=INKEY$:IF G$="a" OR G$="b" OR G$="c" OR G$="d" THEN 1170 ELSE
1160
1170 RESTORE:CLS:GOSUB 680
1180 PRINT:PRINT"Plot  ";G$:PRINT
1190 READ B$,C$,D$,E$,F$
1200 IF E$=G$ THEN PRINT B$
1210 IF B$<>"x" THEN 1190
1220 PRINT:PRINT"    Press the <Space Bar> to continue."
1230 H$=INKEY$:IF H$<>" " THEN 1230
1240 RETURN

```



```

1250 CLS:GOSUB 680
1260 PRINT:PRINT:PRINT"Enter the month as a number (1-12) ";:INPUT MO
1270 IF MO<1 OR MO>12 THEN PRINT"Don't be silly!":GOTO 1260
1280 IF MO<10 THEN MO$=STR$(MO):MO$=RIGHT$(MO$,1)
1290 IF MO=10 THEN MO$="a" ELSE IF MO=11 THEN MO$="b" ELSE IF MO=12 T
HEN MO$="c"
1300 RESTORE:CLS:L%=1:D%=0
1310 READ B$,C$,D$,E$,F$
1320 FOR X=1 TO LEN(F$):IF MID$(F$,X,1)=MO$ THEN D%=1:GOSUB 1380
1330 NEXT
1340 IF B$<>"x" THEN 1310
1350 PRINT:PRINT"    Press the <Space Bar> to continue."
1360 J$=INKEY$:IF J$<>" " THEN 1360
1370 RETURN
1380 L%=L%+1:PRINT"Harvest :-";B$
1390 IF L%>12 THEN PRINT:PRINT"    Press the <Space Bar> to continue."
1400 IF L%>12 THEN K$=INKEY$:IF K$<>" " THEN 1400
1410 IF L%>12 THEN L%=1
1420 RETURN

```


**Graham Knight
scrutinises the
inscrutable Japs.**

**Kay Nishi, MSX
inventor, gives his
all.**

they have now released MSX in Italy. France, Germany and other European countries will soon follow. MSX will be available in South Africa, Australia and New Zealand before the end of the year. America will get MSX in 1985".

All the staff at ASCII were very young. Kay Nishi, at 28, was one of the older employees. The staff have no fixed working hours and noticed two teenage employees asleep at their MSX computers - Kay said "Don't worry, they haven't been home for three days!" Everyone was working on developments which will plug into any MSX micro.

Japanese MSX shops

Most Japanese computer shops devote a whole floor to MSX micros. Almost every store has MSX connected up to laservision discs with games like Monaco Grand Prix being displayed on huge 8 foot TV screens. Most of the development work for this type of video game has been done at the ASCII headquarters. This combination of the computer graphics with laser disc graphics means that MSX can play games at home just like the latest laser games in the arcades. This ability to interface MSX with other audio visual entertainment products is just a part of the concept behind MSX. Kay Nishi is very enthusiastic about MSX being a computer system for

manufacturers to agree to make micros to the standard he designed - MSX. Kay has a staff of 40 at the ASCII headquarters in Tokyo. The multi-storey building houses the three large mainframe computers which were used to develop the MSX system. The ASCII building is really the centre of the MSX World. All the licensing of manufacturers and all future developments are controlled from there by Kay Nishi and his staff.

Kay says he thought of the MSX concept while he was working on the BASIC for the IBM PC. "I realised that our IBM BASIC would be the standard for business and that lots of manufacturers would make micros that were IBM compatible. Now there are lots of technically similar business computers using our Microsoft Basic. I thought we could take that concept further in the home market. MSX will soon become a World standard. We already have 40% of the Japanese home computer market and we release in the UK in October. Philips are the first European manufacturer to join and

Inventor of MSX

Most MSX users know that the letters MSX stand for Microsoft Extended. Microsoft is the BASIC which has become the industry standard and is used on masses of computers up to the IBM business machine. This BASIC was extended to MSX for ASCII of Japan and Mr Kay Nishi is the brain behind the MSX project. Kay Nishi is the person who got all the Japanese

EAST

today and the future. He says "The idea of the MSX standard is that once a standard has been agreed with a large number of manufacturers - almost anything is possible. The cost of developing peripherals for MSX is low because any add on product works on more than 20 makes. Once MSX is available worldwide the manufacturers will be able to spread their development costs over a large volume of sales."

Musical MSX

The shops in Japan already sell a large range of add ons for MSX computers, including musical, home security, and card reading interfaces. The main electrical shopping area in Tokyo is called Akihabara and the streets there are closed to traffic at weekends to allow all the computer enthusiasts to walk freely from store to store. The Yamaha MSXs (see page 16) are often used in these street demonstrations to show the MSX being used as a musical synthesiser. This Yamaha unit is known as a MIDI (Musical Instrument Digital Interface) and allows an MSX micro to synthesise 32 different instruments including, piano, drums, guitar, clarinet, harmonica, timpani etc. These demonstrations were done by girls playing on the keyboard and boys singing with both the music and vocals being amplified by a large speaker system.

As well as the keyboard interface for MSX, Yamaha also have a music card reader which plugs into any MSX cartridge slot. A stiff sheet of music has the actual notes coded at the foot of the page. The sheet is slid over the card reader and the tune is then programmed into the computer. The user can then adjust the mix of the melody, obligato, rhythm, add sustain and change tempos. Up to twenty tunes can be read into the memory and played in sequence. If MIDI and a keyboard is also plugged in - you can select an instrument and play along with the group sounds coming from your computer system.

MSX Robots

It is easy to see that Kay Nishi's idea of a standard is catching on fast in Japan when you are shown the Mitsubishi system which can control the double cassette hi-fi system and switch on the TV set to a selected channel at a specified time. MSX computers are taking over the control of the whole family's entertainment! Mitsubishi also have two robots for MSX - one is quite small and is great fun, the other is larger and can have quite serious industrial applications.

Quick Disk

Quick Disk is another MSX accessory which is catching on fast in Japan. The disk is 2.8 inches in diameter and takes up to 64K of programmes on each side. It takes just 8 seconds to load any program and many of the games load just about as quick as cartridges. The Quick Disk unit costs about £120 which is about a third of the price of the Sony 3.5 inch disk unit which stores 360K per disk.

MSX Speech synthesis

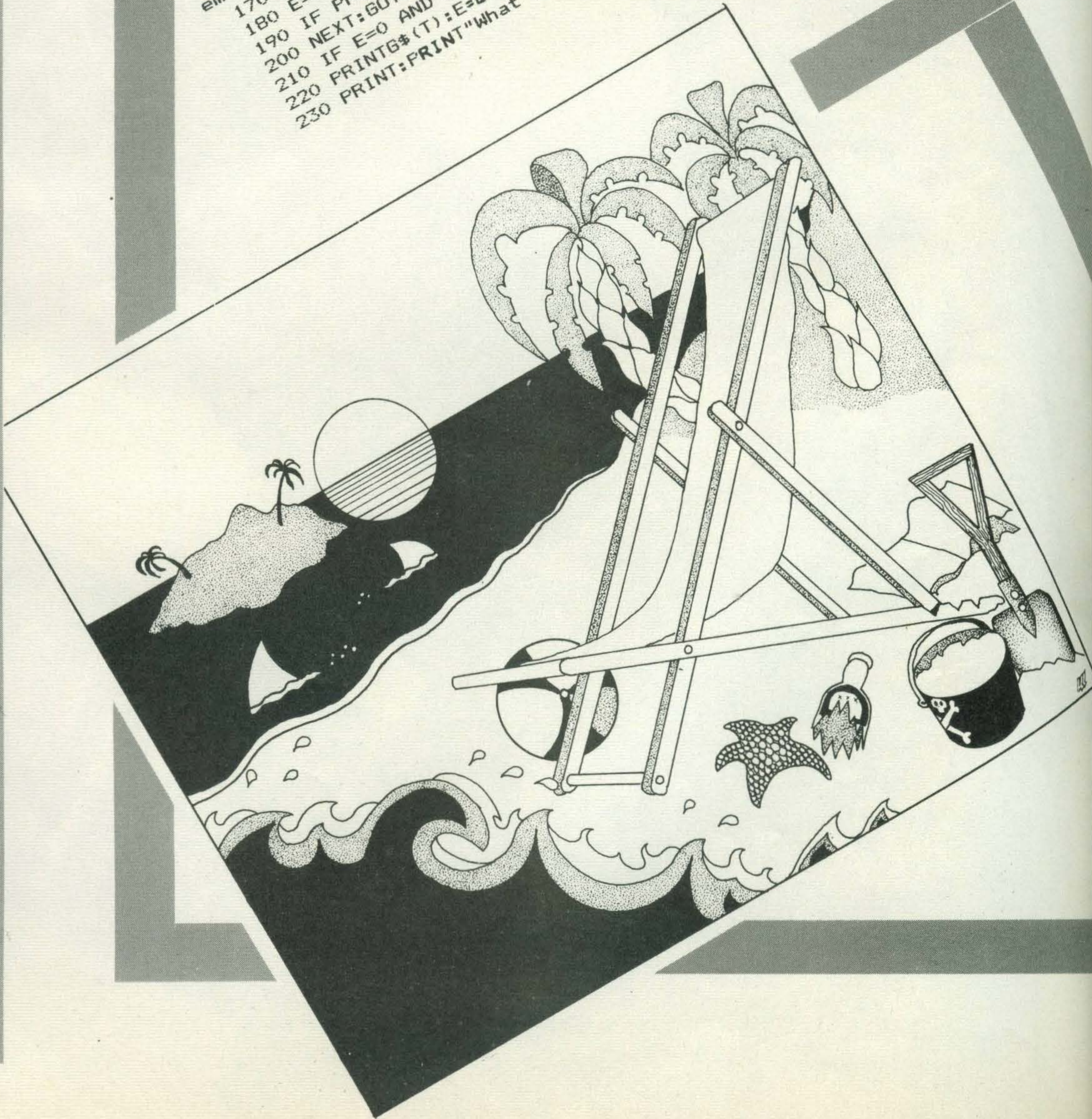
Speech synthesis is the latest MSX development in Japan with two program cartridges appearing on the market which give proper speech without the need for any extra speech boards - more details next month.

HOLIDAY ON DANGER ISLAND

```

10 REM ** Holiday on Danger Island **
20 REM ** An adventure for MSX Computers **
30 REM ** Steve W. Lucas September 1984 **
40 SCREEN 0:WIDTH 40:KEYOFF:COLOR 12,15
50 GOSUB 550
60 DIM Q$(50),G$(50),S%(50,4),V$(4),B%(60),N$(60),X$(30),N%(60)
70 X$="":P%=1:RESTORE:GOSUB 710:GOSUB 800
80 CLS
90 PRINTCHR$(7):PRINT"I am :-":Q$(P%):A$="":A=FRE(""):IF S%(P%,1)>0
100 THEN A$="North"
110 GOSUB 710
120 IF S%(P%,3)>0 AND LEN(A$)>0 THEN A$=A$+",East" ELSE IF S%(P%,1)>0
0 THEN A$="East"
130 IF S%(P%,2)>0 AND LEN(A$)>0 THEN A$=A$+",South" ELSE IF S%(P%,3)>
0 THEN A$="South"
140 IF A$="" THEN A$="nowhere obvious!"
150 IF A%=8 THEN CLS:LOCATE 10,2:PRINT"W e l l D o n e":PRINT:PRIN
160 IF S%(P%,4)>0 AND LEN(A$)>0 THEN A$=A$+",West" ELSE IF S%(P%,2)>
0 THEN A$="West"
170 PRINT:PRINT"You have found all 8 items of treasure and exchange
em for your passage home":END
180 E=0:FOR T=1 TO 19:PP%=0:IF B%(T)=P% THEN PP%=1
190 IF PP%=1 THEN PRINT:PRINT"I can see :-"
200 NEXT:GOTO 230
210 IF E=0 AND G$(T)<>" THEN PRINT:PRINT"I can see :-"
220 PRINTG$(T):E=E+1:GOTO 200
230 PRINT:PRINT"What shall I do now ";:INPUT Z$:B$=LEFT$(Z$,2):C$=LE

```



HOLIDAY ON DANGER ISLAND

Variables used

S%(P%,x)
P%
G\$(x)
N%(x)
N\$(x)
B%(x)
A%
AA-AZ
Z\$
B\$,C\$,D\$
L\$
E%,L%,F%

holds the map
current location
holds items to be found
pointer to words understood
words understood
pointer to location of items
score
flags
input string
first few letters of instruction
second word of input
flags

Program breakdown

40
50
60-90
100-540
100-170
180-220
230
240-540
550-590
600-700
710-719
800-830
840-1290

set screen mode/size/colours
titles
read data and initialise game
main control loop
describe location/directions
describe items
input action
select correct subroutine/action
instructions
data
score
fill arrays
subroutines for actions

```

FT$(Z$,3):D$=LEFT$(Z$,4):CLS:
240 IF D$="go i" OR C$="in" THEN PRINT"I can't do that!":GOTO 100
250 IF D$="go o" OR C$="out" THEN PRINT"I can't do that here!":GOTO 100
260 IF D$="go i" OR C$="in" THEN PRINT"I can't do that!":GOTO 100
270 IF D$="go o" OR C$="out" THEN PRINT"I can't do that here!":GOTO 100
100 IF B$="go" THEN PRINT"Just use the directions N,S,E,W!":GOTO 100
280 IF C$="s" OR C$="n" OR C$="e" OR C$="w" THEN PRINT"pounds and
need 8 pounds.":GOTO 100
300 IF B$="n" AND S%(P%,1)>0 THEN P%=S%(P%,1):GOTO 100
310 IF B$="s" AND S%(P%,2)>0 THEN P%=S%(P%,2):GOTO 100
320 IF B$="e" AND S%(P%,3)>0 AND P%<>17 THEN P%=S%(P%,3):GOTO 100
330 IF B$="e" AND P%=17 AND AB$>1 THEN PRINT"The dog won't let me!":
GOTO 100
340 IF B$="e" AND P%=17 THEN P%=S%(P%,3):GOTO 100
350 IF B$="w" AND S%(P%,4)>0 THEN! P%=S%(P%,4):GOTO 100
360 IF B$="n" OR B$="e" OR B$="w" THEN PRINT"I can't go th
at way!":GOTO 100
370 IF B$="fu" OR B$="le" OR B$="pu" THEN GOSUB 820:GOTO 100
380 IF C$="dro" OR B$="le" OR B$="pu" THEN GOSUB 820:GOTO 100
390 IF C$="inv" OR B$="le" OR B$="pu" THEN GOSUB 820:GOTO 100
400 IF C$="cli" AND P%=10 THEN P%=10:PRINT"O.K.":GOTO 100 ELSE IF C$="swi" THEN 1080
420 IF B$="up" AND P%=22 THEN P%=22:GOTO 100 ELSE IF C$="swi" THEN 1080
430 IF C$="jum" AND P%=22 THEN 1090 ELSE IF C$="swi" THEN 1080
440 IF C$="dow" AND P%=22 THEN 1090 ELSE IF C$="swi" THEN 1080
450 IF C$="eat" THEN PRINT"I'm not hungry at the moment thank you!":
GOTO 100
460 IF C$="dri" THEN PRINT"There's nothing here to drink!":GOTO 100
470 IF C$="hel" THEN PRINT"I can't solve this for you know!":GOT
O 100
480 IF C$="exa" THEN PRINT"I see nothing special!":GOTO 100
490 IF C$="sea" THEN 1200 ELSE IF C$="dig" THEN 1230 ELSE IF C$
500 IF C$="dig" AND P%=23 THEN 1230 ELSE IF C$="dig" THEN PRINT"Not
here!":GOTO 100
520 IF C$="giv" THEN 1250
530 PRINT"I'm sorry I don't understand you":GOTO 100
540 END
550 CLS:LOCATE 7,2:PRINT"Holiday on Danger Island":PRINT:PRINT
to the pawnbrokers"
560 PRINT:I am on holiday on 'Danger Island' and have run
f one or two word sentences such as 'eat food'. Note all instructio
ns should be in lower case!"
580 FOR X=1 TO 2000:NEXT X
590 RETURN
600 DATA on a narrow footpath with trees on either side.,0,0,2,
0,on the shores of a cold lake.,0,3,0,1,on a mountain track.,2,4,0,0,a
t the top of a mountain. I can see for miles.,3,0,5,6
610 DATA by a waterfall.,0,10,0,4,on a narrow mountain track. It is
very misty here.,0,7,4,0,by a rock fall. There are boulders every
where.,6,8,0,0
620 DATA by a cave question. 7,0,9,0,in a vast cavern. There are sta
lagtites and stalagmites everywhere.,5,11,0,0
630 DATA in the waterfall.,0,0,0,11,8,by the waterfall. There
is a very tall tree here.,5,11,0,0
ranche here.,10,0,12,9,at the other side of the waterfall.,0,13,0,11,on

```

Why did I choose "Danger Island" for my holiday? I've only had bad luck since I arrived and now I've run out of money! My fare home is eight pounds and somehow I must find a way to earn money. An old lady I came across told me that there's a pawnbroker's shop on the island and they give you £1 for each piece of treasure supplied. Please help me in my hour of need by giving me instructions in the form of two word sentences such as EAT FOOD etc. You only need to enter N.S.E.W in order to move in those directions. If I don't seem to understand you, try another approach!

a footpath.,12,14,0,0
 640 DATA at the bottom of a mountain. There is a small village here.
 13,16,15,17,on a main road.,18,0,0,14,outside the village blacksmiths
 . It is closed.,14,0,0,0,by some houses. There is an old lady here.
 0,0,14,0
 650 DATA on a road bridge.,0,15,19,0,on the main road.,20,0,0,18,by
 a pawnbroker's shop.,0,19,0,0,inside the pawnbroker's shop. A sign
 here reads "Drop your treasures here.. 1 pound each",0,0,0,0
 660 DATA an empty beer can,12,some algae,11,a small boy,4,"",7,a tin
 large lake.,0,0,0,0
 670 DATA ** GOLD ** nugget,9,a lucky ** HORSESHOE **,16,a ** TEAPOT **,17
 Y ** GOLD **,23,a ** WEDDING RING **,23,a valuable Chinese ** KITE **
 680 DATA "",23,a squirrel,13,nuts,1,a shovel,23,a hammer,16,a
 22,pebbles,11,stones,7,a
 vicious dog,17,some dog food,1
 690 DATA a large boulder,8,beer,1,can,1,algae,2,boy,3,swiss,3,badge,
 4,rolls,4,gold,5,nugget,5,horseshoe,6,shoe,5,teapot,7,silver,8,needle,
 8,wedding,9,ring,9
 700 DATA chinese,10,kite,10,pebbles,11,stones,12,squirrel,13,nuts,14
 shovel,15,hammer,16,dog,17,food,18,boulder,19
 710 A%=0:IF B%(3)=21 THEN A%=A%+1
 720 IF B%(4)=21 THEN A%=A%+1
 730 IF B%(5)=21 THEN A%=A%+1
 740 IF B%(6)=21 THEN A%=A%+1
 750 IF B%(7)=21 THEN A%=A%+1
 760 IF B%(8)=21 THEN A%=A%+1
 770 IF B%(9)=21 THEN A%=A%+1
 780 IF B%(10)=21 THEN A%=A%+1
 790 RETURN
 800 FOR X=1 TO 23:READ G\$(X):FOR Y=1 TO 4:READ S%(X,Y):NEXT Y,X
 810 FOR X=1 TO 19:READ G\$(X),B%(X):NEXT:FOR X=1 TO 27:READ N\$(X),N%(X):NEXT:RETURN
 820 GOSUB 920:IF L%=1 THEN 840
 830 RETURN
 840 E%=0:FOR H=1 TO 19:IF B%(H)=P% AND B%(N%(R))=P% THEN E%=1
 850 NEXT:IF E%=0 THEN RETURN
 860 IF R=23 THEN AA=AA+1
 870 IF (R=4 OR R=5) AND AC<>1 THE PRINT"I can't do that dummy!":GOTO
 RN 880 IF R=25 THEN PRINT"it has savagely attacked me...AAGGGHHHH":GOTO
 1100
 890 E%=0:FOR D=1 TO 3:IF V\$(D)="" THEN V\$(D)=G\$(N%(R)):E%=1
 900 NEXT:IF E%=0 THEN PRINTX\$(30):RETURN
 910 B%(N%(R))=0:RETURN
 920 L\$="":FOR H=1 TO LEN(Z\$)
 930 IF MID\$(Z\$,H,1)="" THEN L\$=RIGHT\$(Z\$, (LEN(Z\$)-H)):H=90
 940 NEXT:R=0:L%=0:IF LEN(L\$)<2 THEN RETURN
 950 FOR H=1 TO 27:IF LEFT\$(N\$(H),LEN(L\$))=L\$ THEN L%=1:R=H
 960 NEXT:RETURN
 970 GOSUB 920:IF L%=1 THEN 990
 980 PRINT"I don't see a ";L\$:GOTO 100
 990 E%=0:FOR D=1 TO 3:IF V\$(D)=G\$(N%(R)) THEN V\$(D)="" :E%=1
 1000 NEXT:IF E%=1 THEN AA=0
 1010 PRINT"I've not got it dummy!":GOTO 100
 1020 B%(N%(R))=P%:IF R=23 THEN AA=0
 1030 IF P%=17 AND R=26 THEN AB=1:PRINT"it's busy eating. I think I ca
 n escape!"
 1040 GOTO 100
 1050 PRINT"I am carrying :-":F%=0:FOR H=1 TO 3:IF V\$(H)<>"" THEN PRIN
 TV\$(H):F%=1
 1060 NEXT:IF F%=0 THEN PRINT"Nothing at all!"
 1070 PRINT:RETURN
 1080 IF P%=2 THEN P%=23:PRINT"O.K.":GOTO 100 ELSE IF P%=23 THEN P%=2:
 PRINT"O.K.":GOTO 100 ELSE PRINT"I can't swim here IDIOT!":GOTO 100
 1090 CLS:LOCATE 0,10:PRINT"I fell and broke my neck !!!!!!!!!!!!!!!"
 1100 PRINT:PRINT"I am dead. Do you want to play again ?"
 1110 A\$=INKEY\$:IF A\$="y" OR A\$="Y" THEN RUN
 1120 IF A\$="n" OR A\$="N" THEN PRINT"Goodbye":PRINT:PRINT:END ELSE GOT
 0 1110
 1130 GOSUB 920:IF L%=1 THEN 1150
 1140 PRINT:PRINT"I can't see a ";L\$: GOTO 100
 1150 E%=0:FOR D=1 TO 3:IF V\$(D)=G\$(N%(R)) THEN V\$(D)="" :E%=1
 1160 NEXT:IF E%=1 THEN 1180
 1170 PRINT"I've not got it dummy!":GOTO 100
 1180 IF P%<23 THEN B%(N%(R))=P%+1 ELSE B%(N%(R))=P%
 1190 PRINT"O.K.":GOTO 100
 1200 IF P%=7 THEN 1210 ELSE PRINT"I can't find anything!":GOTO 100
 1210 G\$(4)="a ** BADGE ** from a ROLLS ROYCE":IF AZ<>0 THEN PRINT"The
 re's nothing else here":GOTO 100
 1220 PRINT"I have found something!":AZ=1:GOTO 100
 1230 IF AA<>1 THEN PRINT"I don't have anything to dig with!":GOTO 100
 1240 PRINT"I've found something!":G\$(8)="a ** SILVER ** needle":AQ=2:
 GOTO 100
 1250 GOSUB 920:IF L%=1 THEN 1270
 1260 GOTO 100
 1270 IF P%=4 AND R=22 THEN PRINT"He takes a few and offers me somethi
 ng in exchange and then runs off singing.":G\$(3)="a ** SWISS ARMY KN
 FE **":N\$(4)="knife":AC=1:GOTO 100
 1280 IF P%=21 AND R=22 THEN PRINT"The squirrel doesn't like them!":GO
 TO 100
 1290 PRINT"I don't seem to understand you!":GOTO 100

Words understood

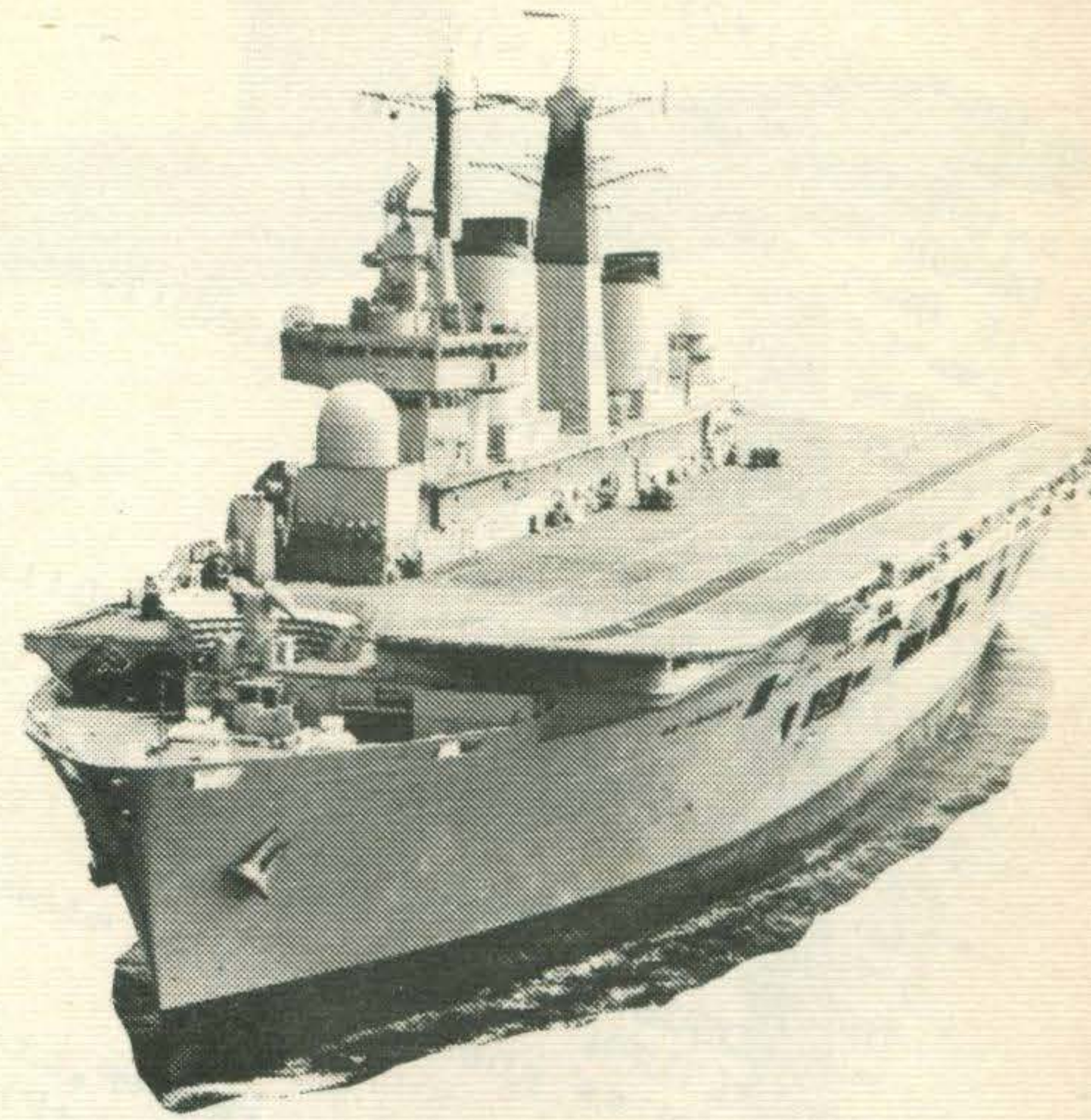
include:-
 go, in, out, score, n, s, e, w,
 get, take, grab, drop, leave,
 put, inventory, swim, climb,
 up, down, jump, look, eat,
 drink, help, examine, search,
 dig, give.

NOTE

Please enter instructions in lower case letters.

Hints

- Read these only if you are really stuck!
1. The little boy is very fond of his food... you could try giving him some!
 2. You can climb trees
 3. The lake is not too deep!
 4. Make sure that you take something to calm the dog, or he won't let you escape and you might as well give up!
 5. You'll need the spade if you want to dig



```

10 REM ** BATTLESHIPS ... a game for MSX computers **
20 REM ** <C> Steve W. Lucas September 1984 **
30 TIME=0
40 SCREEN 0:WIDTH 40
50 KEYOFF
60 DIM A$(9,9),B$(9,9),C$(6)
70 C$(1)="Destroyer
80 C$(2)="Submarine
90 C$(3)="Cruiser
100 C$(4)="Battleship
110 C$(5)="Aircraft Carrier"
120 GOSUB 1910
130 REM ** plot numbers across top of screen **
140 FOR X=1 TO 9
150 LOCATE X*2,1:PRINTCHR$(48+X)
160 LOCATE X*2+19,1:PRINTCHR$(48+X)
170 NEXT
180 REM ** draw centre line on screen
190 FOR X=2 TO 20
200 LOCATE 19,X:PRINTCHR$(213)
210 NEXT
220 REM ** plot letters down side of screen **
230 FOR X=1 TO 9
240 LOCATE 0,X*2+1:PRINTCHR$(64+X)
250 NEXT
260 LOCATE 0,20:PRINTSTRING$(40,CHR$(197))
270 GOSUB 430
280 GOSUB 940
290 GOSUB 1590
300 GOSUB 1750
310 IF CC=20 OR YC=20 THEN 340
320 GOTO 300
330 IF CC=20 THEN A$="I win" ELSE A$="You win !!!"
340 LOCATE 16,10:PRINT"Do you want to play another game <Y/N>?"
350 CLS:LOCATE 0,20:PRINT"Goodbye...thank's for playing"
360 A$=INKEY$:IF A$="y" THEN RUN
370 IF A$="y" OR A$="n" THEN CLS:PRINT"Goodbye...thank's for playing"
380 IF A$="n" OR A$="n" THEN CLS:PRINT"Goodbye...thank's for playing"
390 IF A$="n" OR A$="n" THEN CLS:PRINT"Goodbye...thank's for playing"

```

BATTLESHIPS

This is a version of the traditional schoolboy game which is usually played on paper. Your opponent is the computer and I have deliberately made the computer play only an average game. (Otherwise you would stand little chance of winning!)

If you would like the computer to play a better game, you'll need to change the algorithm by which the computer fires its shots after a direct hit (lines 1830-1880). You must hide five ships

Ship coordinates are entered as a letter followed by a number (eg: f5 and not 5f) and the letter MUST be in lower case (the normal default condition of MSX computers)... make sure the CAPS light is off.

Ship sizes (in squares)

- = 6
- = 5
- = 4
- = 3
- = 2

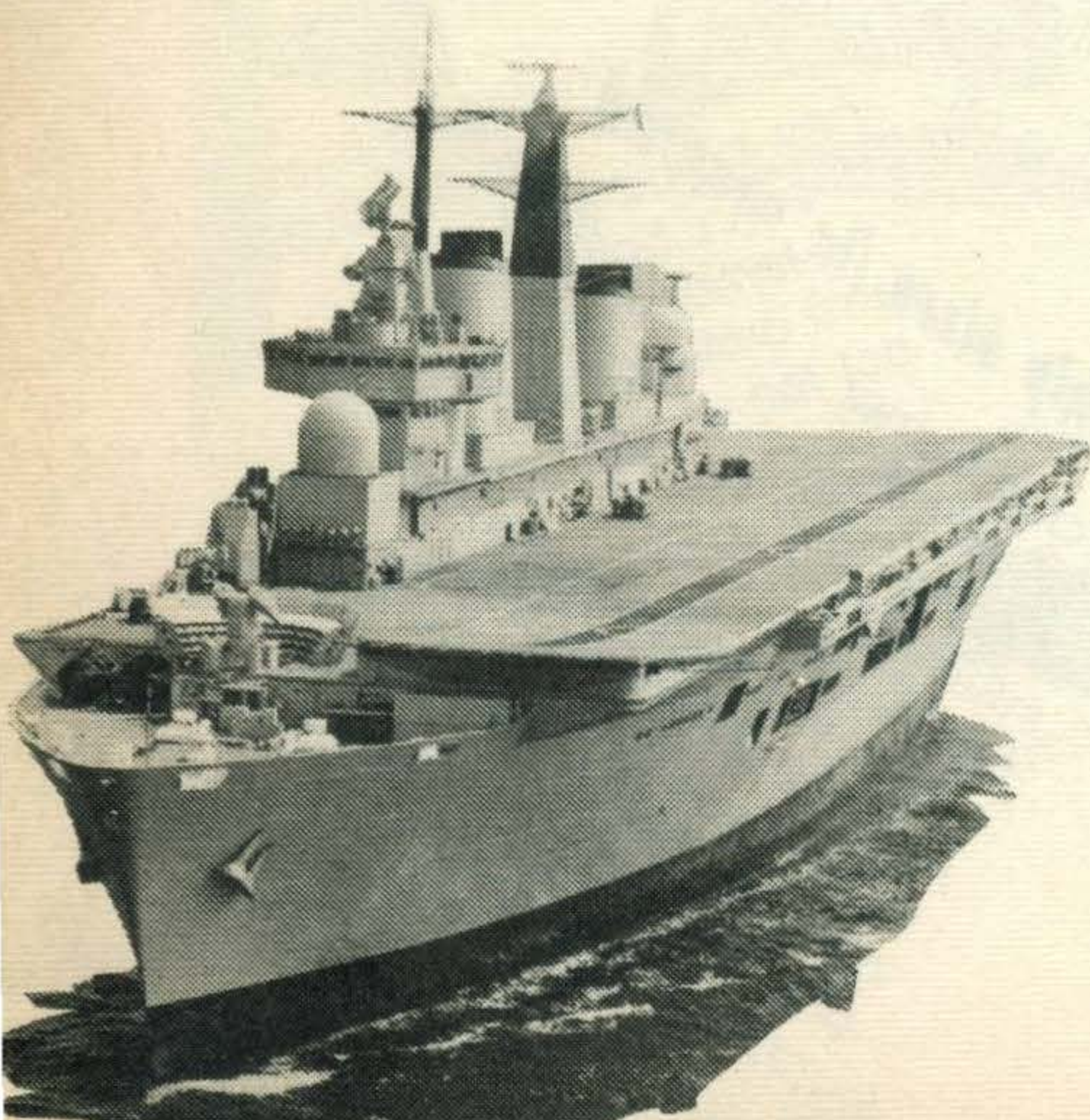
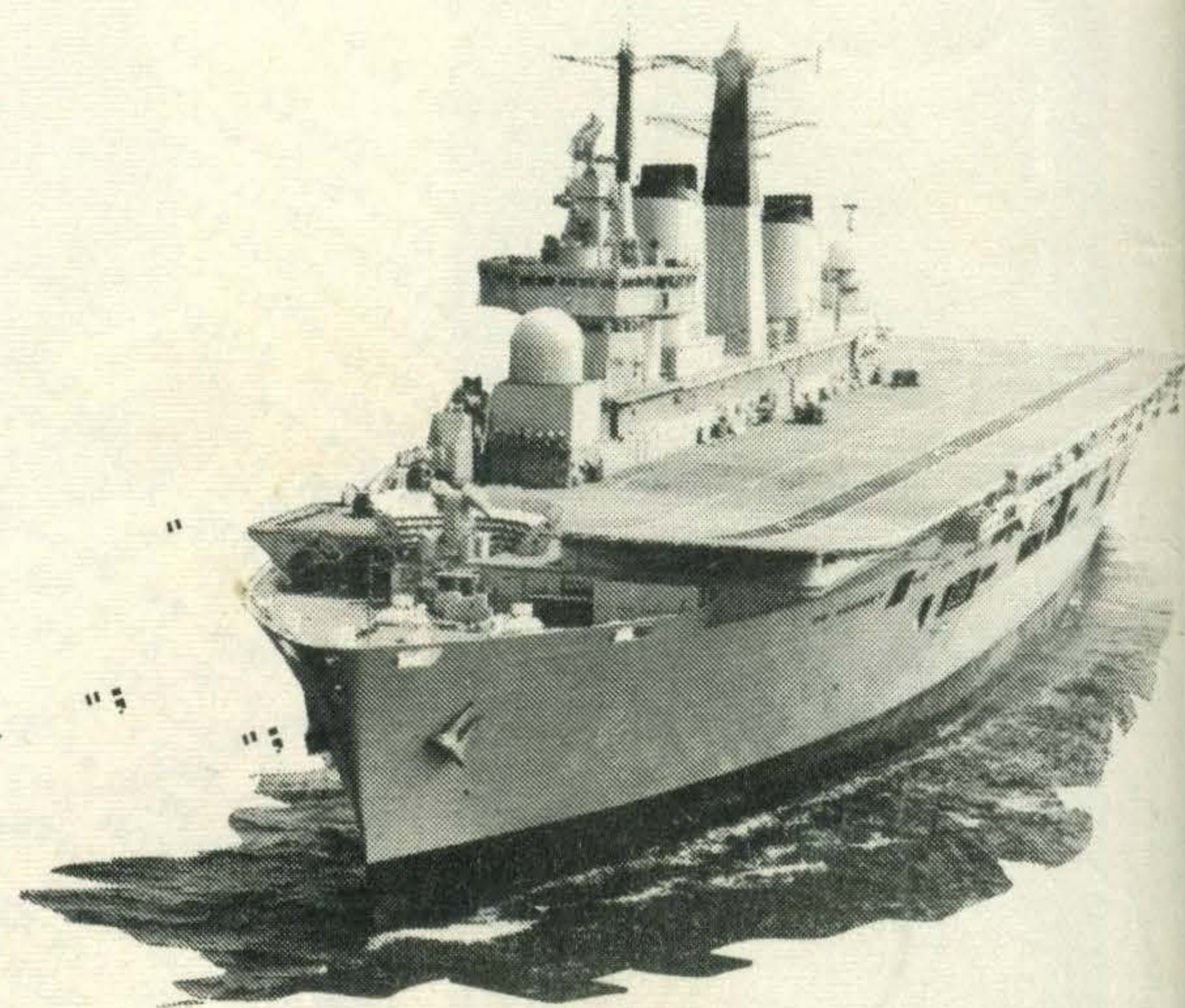
- aircraft carrier
- battleship
- cruiser
- submarine
- destroyer

You will then take turns with the computer to fire torpedos at your opponents grid and the winner is the one who sinks all their opponents ships first.

MSX

```
600 A=INT(RND(1)*2)
610 X=4
620 K=INT(RND(1)*5)+1:L=INT(RND(1)*5)+1
630 GOSUB 820
640 IF AA=1 THEN 620
650 Z$="C"
660 GOSUB 880
670 A=INT(RND(1)*2)
680 X=3
690 K=INT(RND(1)*6)+1:L=INT(RND(1)*6)+1
700 GOSUB 820
710 IF AA=1 THEN 690
720 Z$="S":GOSUB 880
730 A=INT(RND(1)*2)
740 X=2
750 K=INT(RND(1)*7)+1:L=INT(RND(1)*7)+1
760 GOSUB 820
770 Z$="D"
```

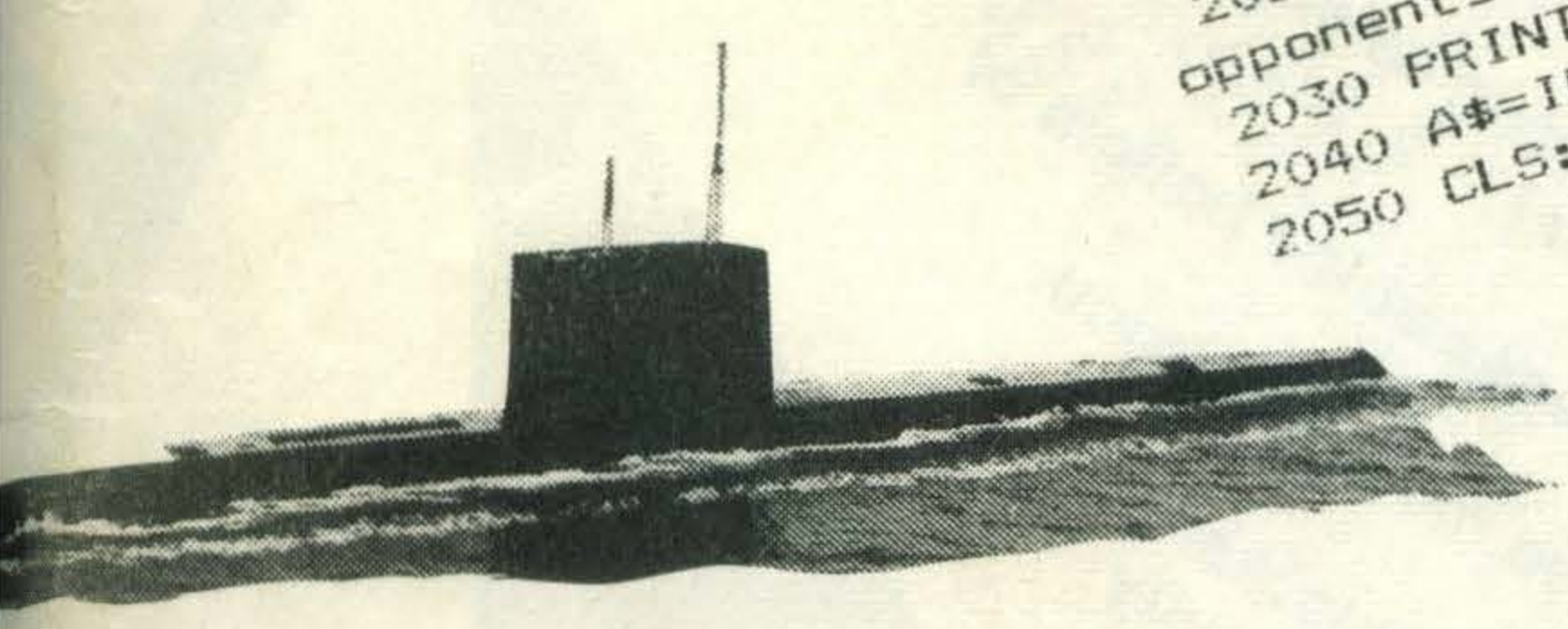
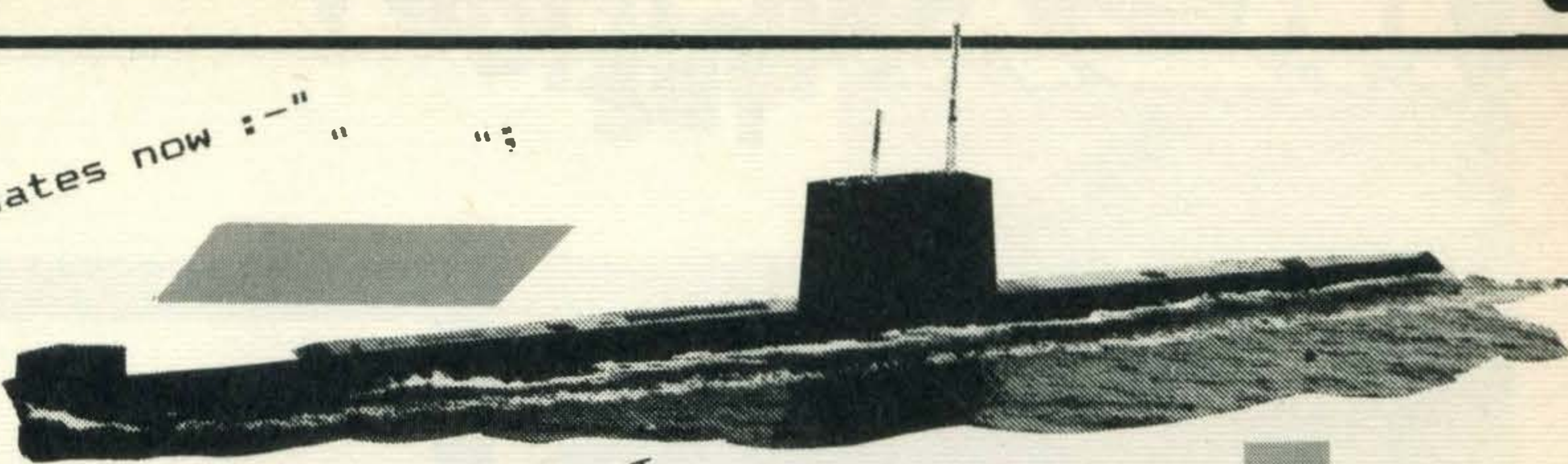
```
780 IF AA=1 THEN 750
790 GOSUB 880
800 RETURN
810 REM ** check if array element is empty **
820 AA=0
830 FOR P=0 TO X
840 IF A=0 THEN IF A$(K+P,L)<>"" THEN AA=1
850 IF A=1 THEN IF A$(K,L+P)<>"" THEN AA=1
860 NEXT
870 RETURN
880 FOR P=1 TO X
890 IF A=0 THEN A$(K+P,L)=Z$
900 IF A=1 THEN A$(K,L+P)=Z$
910 NEXT
920 RETURN
930 REM ** set up your board **
940 FOR P=6 TO 2 STEP -1
950 K$="Ship Size="+STR$(P)
960 LOCATE 0,21:PRINT
970 LOCATE 0,21:PRINTK$;
980 AB=0
990 LOCATE 0,22:PRINT"Enter the bow position of your
1000 LOCATE 0,23:PRINTC$(P);:FOR PL=1 TO 1000:NEXT
1010 LOCATE 0,21:PRINT"
1020 E=24
1030 FOR A=1 TO 2
1040 D$(A)=INKEY$:IF D$(A)="" THEN 1050
1050 LOCATE E,23:PRINTD$(A);
1060 E=E+2
1070 NEXT
1080 LOCATE 24,23:PRINT"
1090 GOSUB 1250:Y1=Y:X1=X:REM ** check if point on board **
1100 IF AB<>0 THEN 950
1110 LOCATE 0,22:PRINT"Enter the stern position of your
1120 LOCATE 0,23:PRINTC$(P);:E=24
1130 FOR A=1 TO 2
1140 D$(A)=INKEY$:IF D$(A)="" THEN 1150
1150 LOCATE E,23:PRINTD$(A);:E=E+2
1160 NEXT:FOR PP=1 TO 330:NEXT
1170 LOCATE 0,21:PRINT"
1180 GOSUB 1250:Y2=Y:X2=X:REM ** check validity of points
1190 IF Y1=Y2 THEN GOSUB 1330:GOTO 1230
1200 IF X1=X2 THEN GOSUB 1330:GOTO 1230
1210 LOCATE 0,21:PRINT"You have made a mistake !":AB=1:GOTO 990
1220 LOCATE 0,21:PRINT"
1230 NEXT
1240 RETURN
1250 Y=ASC(D$(1))-96
1260 IF Y<1 OR Y>9 THEN GOSUB 1300
1270 X=VAL(D$(2))
1280 IF X<1 OR X>9 THEN GOSUB 1300
1290 RETURN
1300 LOCATE 0,21:PRINT"Incorrect co-ordinates:- try again";:AB=1
1310 FOR KK=1 TO 300:NEXT
1320 RETURN
1330 L=X1-X2:IF L<1 THEN L=X2-X1
1340 L=L+1
1350 IF L<>P THEN GOSUB 1300:P=P+1:RETURN
1360 IF L=6 THEN ZZ$="A" ELSE IF L=5 THEN ZZ$="B" ELSE IF L=4 THEN ZZ
$="C" ELSE IF L=3 THEN ZZ$="S" ELSE IF L=2 THEN ZZ$="D"
1370 REM ** check if location is occupied **
1380 IF X1>X2 THEN SWAP X1,X2:REM swap coordinates round if wrong way
1390 FOR S=X1 TO X2:IF B$(S,Y1)<>"" THEN GOSUB 1300:P=P+1:RETURN
1400 NEXT S
1410 FOR S=X1 TO X2
1420 REM ** display choice **
1430 LOCATES*2,Y1*2+1:PRINTZZ$
1440 NEXT S
1450 RETURN
1460 L=Y1-Y2:IF L<1 THEN L=Y2-Y1
1470 L=L+1
1480 IF L<>P THEN GOSUB 1300:P=P+1
1490 IF L=6 THEN ZZ$="A" ELSE IF L=5 THEN ZZ$="B" ELSE IF L=4 THEN ZZ
$="C" ELSE IF L=3 THEN ZZ$="S" ELSE IF L=2 THEN ZZ$="D"
1500 REM ** check if location is occupied **
1510 IF Y1>Y2 THEN SWAP Y1,Y2
1520 FOR S=Y1 TO Y2:IF B$(X1,S)<>"" THEN GOSUB 1300:P=P+1:RETURN
```




```

1530 NEXT S
1540 FOR S=Y1 TO Y2: B$(X1,S)=ZZ$:NEXT
1550 FOR S=Y1 TO Y2
1560 LOCATE X1*2,S*2+1:PRINT ZZ$
1570 NEXT
1580 RETURN
1590 LOCATE 0,21:PRINT"Enter your missile coordinates now :-"
1600 LOCATE 0,22:PRINT"
1610 E=24:LOCATE 0,23:PRINT"
1620 AB=0
1630 FOR A=1 TO 2
1640 D$(A)=INKEY$:IF D$(A)="" THEN 1640
1650 LOCATE E,23:PRINT D$(A);E=E+2:NEXT
1660 GOSUB 1250:REM check if point is valid
1670 IF AB=1 THEN FOR H=1 TO 300:NEXT:GOTO 1590
1680 REM ** check if you have already guessed location **
1690 IF A$(X,Y)="" THEN LOCATE 0,21:PRINT"Already tried !":FOR H=1 T
0 330:NEXT:GOTO 1590
1700 REM ** check if computer has ship there **
1710 IF A$(X,Y)="" THEN LOCATE X*2+19,Y*2+1:PRINT"+":SOUN
D 8,15:FOR H=1 TO 10:NEXT:SOUND 8,0:RETURN
1720 REM ** now display location **
1730 LOCATE X*2+19,Y*2+1:PRINT A$(X,Y):A$(X,Y)="+":YC=YC+1:SOUND 8,15
:FOR H=1 TO 10:NEXT:SOUND 8,0
1740 RETURN
1750 IF AZ=0 THEN X=INT(RND(1)*9)+1
1760 LOCATE 0,21:PRINT"Hold on while I think out my move !
1770 LOCATE 0,22:PRINT"
1780 IF AZ=0 THEN Y=INT(RND(1)*9)+1
1790 FOR LP=1 TO 330:NEXT
1800 IF B$(X,Y)<>" " AND B$(X,Y)<>"+" THEN LL$=B$(X,Y)
1810 IF AZ=0 AND B$(X,Y)<>" " THEN LL$=B$(X,Y):B$(X,Y)="+":GOTO 1900
1820 IF AZ=0 AND B$(X,Y)<>"+" THEN LL$=B$(X,Y):LOCATE X*2,Y*2+1:PRINT"+
":SOUND 8,15:FOR H=1 TO 20:NEXT:SOUND 8,0:RETURN
1830 IF AZ=0 AND B$(X,Y)="" THEN B$(X,Y)="+":LOCATE X*2,Y*2+1:PRINT"+
1840 FOR P=1 TO 9:FOR Q=1 TO 9
1850 IF B$(P,Q)=LL$ THEN X=P:Y=Q:P=11:Q=11:GOTO 1870
1860 NEXT Q,P
1870 IF P=11 THEN AZ=0: GOTO 1800
1880 AZ=0:GOTO 1780
1890 RETURN
1900 LOCATE X*2,Y*2+1:PRINT"+":CC=CC+1:SOUND 8,15:FOR H=1 TO 20:NEXT:
SOUND 8,0:RETURN
1910 COLOR 4,15
1920 CLS:LOCATE 8,2:PRINT"B a t t l e s h i p s"
1930 PRINT:PRINT:" <C> Steve W. Lucas September 1984"
1940 PRINT:PRINT:"This is a computerised version of the traditional
game. "
1950 PRINT:PRINT:"This game is played on a 9x9 grid. Each point on the
grid is identified by a "
1960 PRINT:"coordinate such as a4."
1970 PRINT:"In this version, your opponent is the computer. The comp
uter will hide 5 shipson the grid and you must do the same."
1980 PRINT:PRINT:" Press the <Space Bar> to Continue."
1990 A$=INKEY$:IF A$<>" " THEN 1990
2000 FOR T=1 TO TIME STEP 10:P=RND(1):NEXT:REM randomise start
tion of your opponents
2010 CLS:PRINT:"You will take turns with the computer toguess the loca
opponents ships first."
2020 PRINT:PRINT:"The winner is the one who locates all their
opponents ships."
2030 PRINT:PRINT:"Press the <Space Bar> to start the game"
2040 A$=INKEY$:IF A$<>" " THEN 2040
2050 CLS:RETURN

```



Variables used

X,Y
B\$(X,Y) and
A\$(X,Y)
CC
YC
A

screen coordinated
hold board for computer and player
computers score
your score
dedices if the ship is vertical or
horizontal
Other variables used to control loops etc.

Breakdown

30

40
50
60-120
130
140-270
280-330
340-410
420-790
800-860
870-910
920-1230
1240-1280
1290-1310
1320-1450
1460-1570
1580-1730
1740-1890
1900

sets TIME to zero...time is used to seed
the random number generator so that
the computer always plays a different
board
selects mode and screen width
turns messages off screen
initialise arrays
titles
draw board
main program control loop
win or lose game
set up computers board
check if array is empty
puts ships into array
set up your board
error check
display error message
display your board
select ship type & swap coordinates
fire missile
computer fires missile at your board
titles and instructions

SIMPLE SIMON

```

10 REM ** Simple Simon **
20 REM ** for MSX computers ** September 1984 **
30 REM ** <C> Steve W. Lucas
40 CLEAR 3000
50 DIM A$(6),M$(6):FOR X=1 TO 6:READ M$(X):NEXT X
60 DATA "Watch", "Now Repeat", "Correct", "Wrong!", "The Correct Sequence was :-", "Too Slow!"
70 SCREEN 0:WIDTH 40
80 KEYOFF
90 GOSUB 740
100 FOR X=1 TO 6:CHR$(200):H$=""
110 HH#=STRING$(6,CHR$(B))+STRING$(6,CHR$(B))+HH#:NEXT:HH#=H$
120 COLOR 12,15
130 LOCATE 5,10:PRINT "Press Z$="Z$ THEN X%=40 ELSE IF sequence
140 Z$=INKEY$:IF Z$="" THEN X%=40 ELSE IF sequence **
150 IF Z$="1" THEN X%=40 ELSE IF sequence **
160 SC=0:AC=0:B$="" :REM b$ holds to sequence **
170 GOSUB 300:REM ** add letter to display sequence **
180 GOSUB 360:REM ** try to repeat sequence **
190 GOSUB 450:REM CLS:LOCATE 5,10:COLOR 12,15:PRINTM$(6):AC=1:GOT
200 IF TI>=X%*4 THEN CLS:COLOR 11,4:LOCATE 5,10:PRINTM$(4)
210 IF AA$<>MID$(B$,ZX,1) THEN CLS:COLOR 11,4:LOCATE 5,10:PRINT "Press the
220 IF AA$<>MID$(B$,ZX,1) THEN CLS:COLOR 11,4:LOCATE 5,10:PRINT "Press the
:AC=1:GOTO 250
230 SC=SC+1
240 LOCATE 2,15:PRINT "You scored :-";SC:LOCATE 1,21:PRINT "Press the
250 LOCATE 2,15:PRINT "You scored :-";SC:LOCATE 1,21:PRINT "Press the
<Space Bar> for a new game." " THEN 260
260 AA$=INKEY$:IF AA$<>" " THEN 260
270 RUN
280 REM ** subroutine to select a random letter and add it to b$ **
290 A=INT(RND(1)*4)+1
300 IF A=1 THEN A$="r" ELSE IF A=2 THEN A$="y" ELSE IF A=3 THEN A$="
310 IF A=4 THEN A$="b"
320 IF A=0 THEN PRINT "Program has crashed!":END

```

Program Breakdown

- 40 clears enough memory space for the
- 50 string variables
- 60-70 set time to zero (used as seed for
- 80 random sequences)
- 90 set messages
- 100 turn off messages at the bottom of
- 110-120 the screen
- 130-160 select screen mode and width
- 170-240 titles
- 250-280 create graphic blocks
- 290-340 select level of difficulty
- 350-450 main control loop
- 460-560 lose game
- 570-730 choose random sequence
- 740-850 display sequence
- repeat sequence
- draw blocks & select sounds
- instructions

Variables used

B\$
AA\$
TI
ZX
X%
SC
A
HH\$

holds sequence
your input response
time limit
counter for substrings
difficulty level
score
random number
graphic blocks

This is a version of the familiar game of SIMON, in which a series of blocks are displayed on the screen (accompanied by different notes). You must try to repeat the sequence using the keys

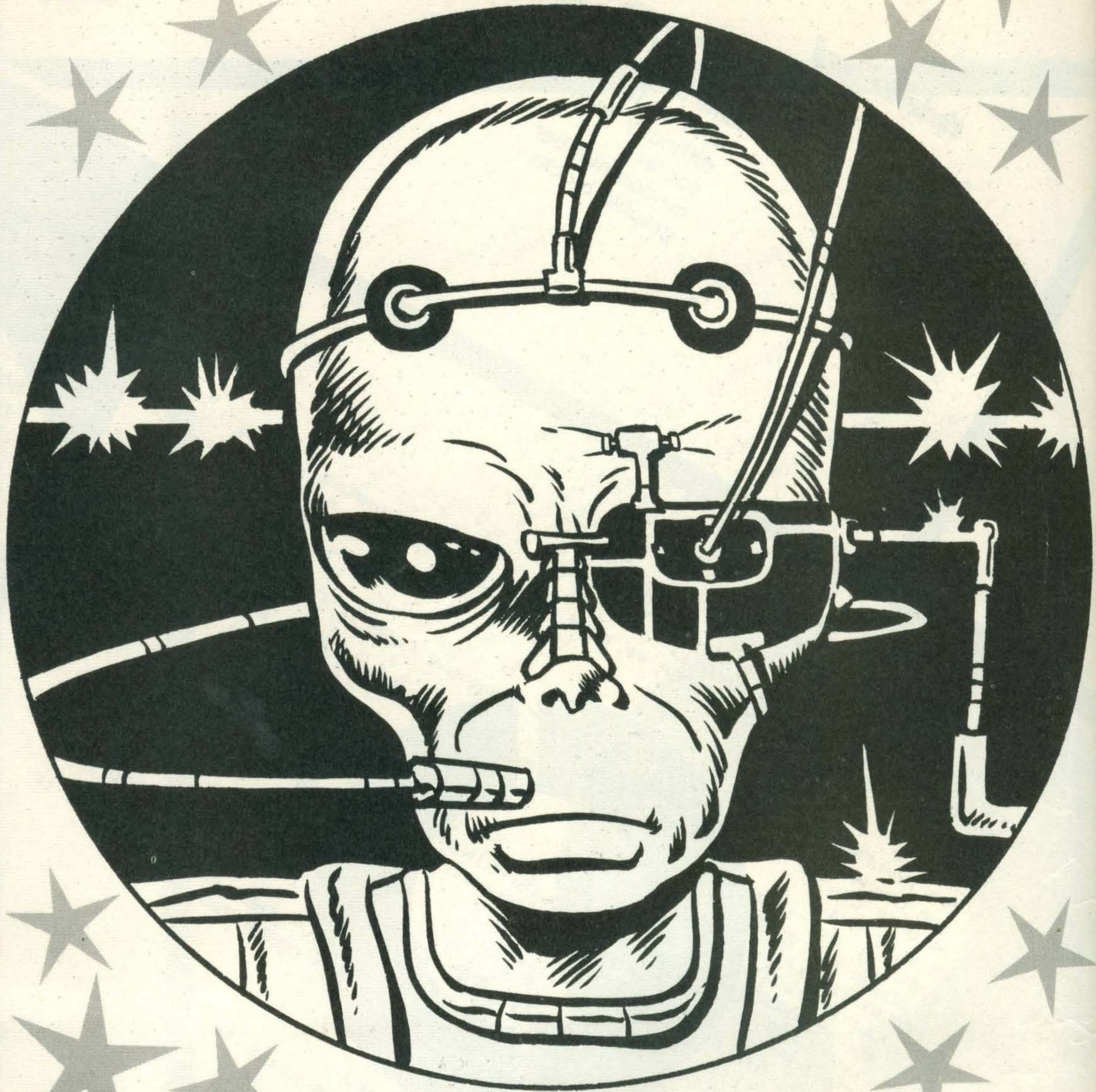
r y
c b

Each time you complete the sequence, it gets longer and more difficult to remember. There are two levels of difficulty (level 2 giving you less time).

```

330 LET B$=B$+A$:F=FRE("")
340 RETURN
350 REM ** display the sequence **
360 CLS:LOCATE 7,10:PRINTM$(1)
370 FOR X=1 TO 1000:NEXT X:REM ** time delay may be adjusted to suit
**
380 CLS
390 XY=LEN(B$):XX=0
400 C$=MID$(B$,XX+1,1)
410 IF C$="r" THEN S=1 ELSE IF C$="y" THEN S=2 ELSE IF C$="c" THEN S
=3 ELSE S=4
420 IF S=1 THEN GOSUB 580 ELSE IF S=2 THEN GOSUB 620 ELSE IF S=3 THE
N GOSUB 660 ELSE GOSUB 700
430 XX=XX+1
440 IF XX<XY THEN 400
450 RETURN
460 CLS:COLOR 12,15:LOCATE 5,10:PRINTM$(2)
470 FOR X=1 TO 300:NEXT X:REM adjust time delay to suit yourself
480 TI=TI+1
490 AA$=INKEY$
500 IF AA$="r" AND AA$<>"y" AND AA$<>"c" AND AA$<>"b" THEN 550
510 ZX=ZX+1
520 IF AA$="r" THEN GOSUB 580 ELSE IF AA$="y" THEN GOSUB 620 ELSE IF
AA$="c" THEN GOSUB 660 ELSE IF AA$="b" THEN GOSUB 700
530 IF MID$(B$,ZX,1)<>AA$ THEN 560
540 RETURN
550 REM ** draw graphics blocks **
560 CLS:COLOR 12,1:REM ** green on black **
570 LOCATE 10,2:PRINTM$(1)
580 PLAY"L303CD4":FOR C=1 TO X%*10:NEXT C
590 RETURN
600 CLS:COLOR 4,1:REM ** blue on black **
610 LOCATE 10,15:PRINTM$(1)
620 PLAY"L304CD4":FOR C=1 TO X%*10:NEXT C
630 RETURN
640 CLS:COLOR 6,1:REM ** red on black **
650 LOCATE 10,15:PRINTM$(1)
660 PLAY"L305CD4":FOR C=1 TO X%*10:NEXT C
670 RETURN
680 CLS:COLOR 9,2:PRINT"SIMPLE SIMON"
690 PRINT"Steve w. Lucas September 1984"
700 PRINT"Watch the screen while coloured squares flash in a r
andom sequence."
710 PRINT"Press the <Space Bar> to start the
following keys :-"
720 PRINT"r y"
730 PRINT"c b"
740 PRINT"Watch the screen while coloured squares flash in a r
andom sequence."
750 PRINT"Press the <Space Bar> to start the
following keys :-"
760 PRINT"r y"
770 PRINT"c b"
780 PRINT"Watch the screen while coloured squares flash in a r
andom sequence."
790 PRINT"Press the <Space Bar> to start the
following keys :-"
800 PRINT"r y"
810 PRINT"c b"
820 REM ** start random number generator at random position **
830 FOR X=1 TO TIME STEP 10:P%=RND(1):NEXT
840 CLS:RETURN
850

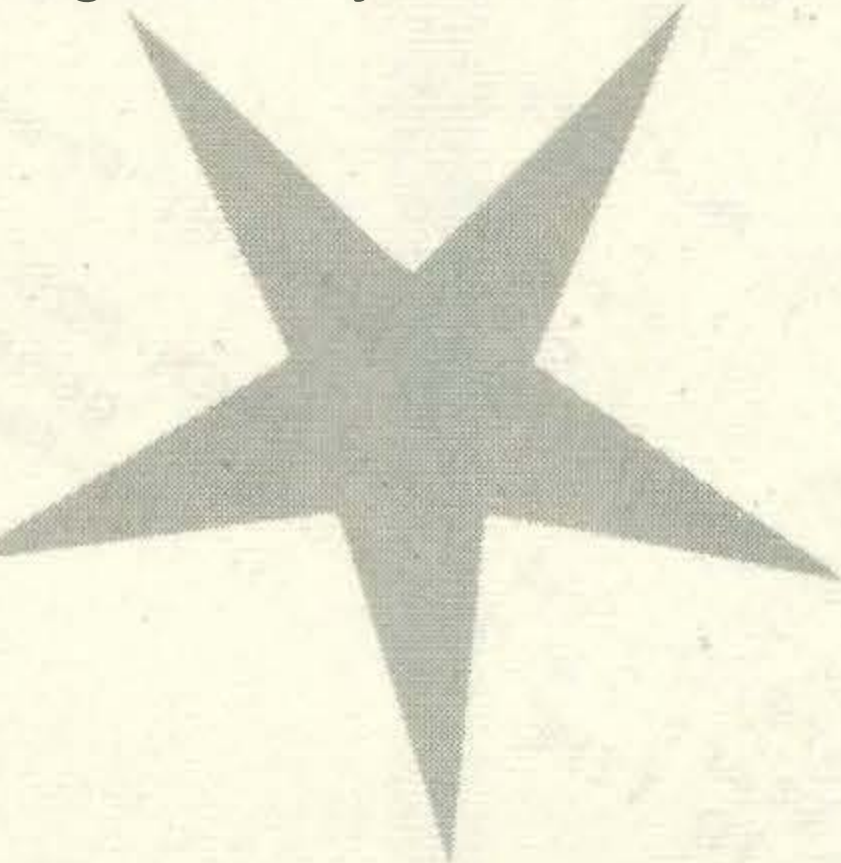
```

ALIEN CHASER

Jump on your light cycle and chase the Alien Craft using the cursor keys. Each hit will score one point and the Alien will run away. Unfortunately, your light cycle will leave a deadly exhaust trail behind it and if you move into it, you'll die.

As the game progresses, it gets more and more difficult to avoid the vapour trail. You shouldn't try to reverse directions or you'll move straight into your own trail.



Conversion to joysticks

Change line 240 to 240
A = STICK (1)

Program Breakdown

40	define erase character
50-70	initialise
80-130	define sprite
140-150	display sprite at random position
160	set start of light cycle
170-230	draw graphics
240	test cursor keys
260-340	move light cycle
350-390	test for collision
400-430	move sprite
450-490	lose game
500	hit alien

Variables used

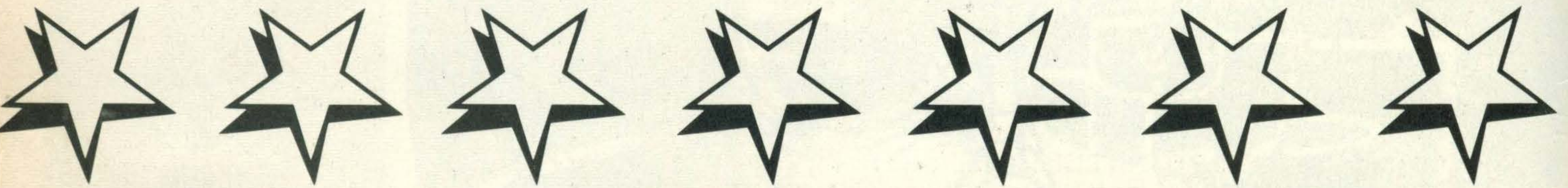
X,Y	coordinates of light cycle
AA\$	test for space bar
SC%	score
U%,V%	coordinates for sprite
A	test for cursor keys
P	check colour of pixel
ER\$	erase character


```

10 REM ** Alien Chaser **
20 REM ** a game for MSX computers by S.W. Lucas **
30 REM ** <C> Argus Publications September 1984 **
40 ER$=STRING$(4,CHR$(219))
50 SC%=0
60 KEYOFF:SCREEN 2,2
70 COLOR 15,4
80 FOR C=1 TO 32:READ S$:T#=T#+CHR$(VAL("&b"+S$)):NEXT C
90 SPRITE$(0)=T$
100 DATA 11110000,11110000,11000000,01000010,01000111,01001010
110 DATA 01111111,01101011,01101010,01111111,01001010,01000111,01000
000,11000000,11110000,11110000,00001111,00001111
120 DATA 00000011,10000010,11100010,01010010,11111110,01010110,01010
110,11111110,01010010
130 DATA 11100010,10000010,00000011,00001111,00001111
140 U%=INT(RND(1)*175)+5:V%=INT(RND(1)*50)+5
150 PUT SPRITE 1,(U%,V%),11,0
160 X=125:Y=99
170 LINE (0,0)-(255,192),6,B
180 LINE (1,0)-(1,192),6:LINE (254,0)-(254,192),6
190 LINE (0,170)-(255,192),6,B
200 OPEN "GRP:" FOR OUTPUT AS #1
210 PRESET(40,175):PRINT #1,"Alien Chaser"
220 PRESET(170,175):PRINT #1,"Score"
230 PRESET(220,175):PRINT #1,SC%
240 A=STICK(0)
250 F=0
260 XX=X:YY=Y
270 IF A=1 THEN Y=Y-1
280 IF A=2 THEN Y=Y-1:X=X+1
290 IF A=3 THEN X=X+1
300 IF A=4 THEN Y=Y+1:X=X+1
310 IF A=5 THEN Y=Y+1
320 IF A=6 THEN Y=Y+1:X=X-1
330 IF A=7 THEN X=X-1
340 IF A=8 THEN Y=Y-1:X=X-1
350 P=POINT(X,Y)
360 IF XX<>X OR YY<>Y THEN F=1
370 IF P=6 THEN GOSUB 450
380 IF P=15 AND F=1 THEN GOSUB 450
390 IF X>U%-5 AND X<U%+5 AND Y>V%-5 AND Y<V%+5 THEN GOSUB 500
400 PSET (X,Y),15
410 F%=INT(RND(1)*4)+1:IF F%=1 THEN U%=U%+5 ELSE IF F%=2 THEN U%=U%-
5 ELSE IF F%=3 THEN V%=V%+5 ELSE V%=V%-5
420 IF V%>191 THEN V%=185 ELSE IF V%<0 THEN V%=5
430 PUT SPRITE 1,(U%,V%),11,0
440 GOTO 240
450 SCREEN 0:LOCATE 5,10:PRINT"Crash!"
460 LOCATE 10,15:PRINT"You scored "+SC%
470 LOCATE 1,20:PRINT"Press the Space Bar to play again"
480 (AA$=INKEY$:IF (AA$<>" ") THEN 485
490 RUN
500 SC%=SC%+1
510 COLOR 0:PRESET(220,175):PRINT"LIVES"
520 PLAY"C"
530 COLOR 15:PRESET(220,175):PRINT #1,SC%
540 U%=INT(RND(1)*175)+5:V%=INT(RND(1)*70)+5
550 RETURN
560 IF X%>U%-10 AND X%>U%+10 AND V%<V%-5 AND Y%>V%+5 THEN BEEP:GOSUB
500:RETURN
570 RETURN

```


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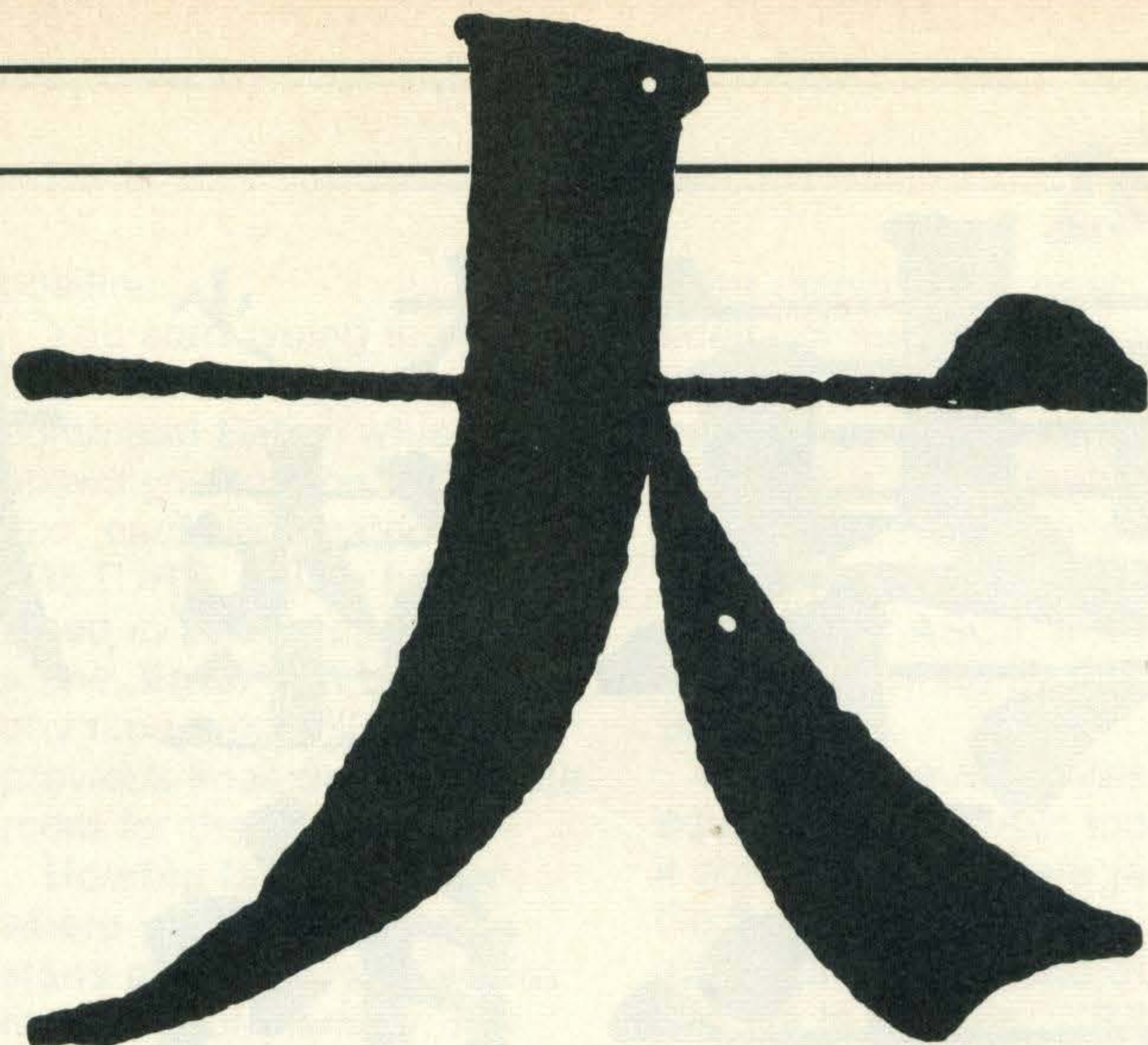
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Guru Karl Dallas seeks enlightenment for all.

According to "MSX an introduction", by Jonathan Pearce and Graham Bland (Century Communications, £7.95), assembly-language programming is "very difficult and cumbersome to program with".

This is a widely-held view, and there's a certain amount of truth in it. It might be said with equal justification that the French language is "very difficult and cumbersome to speak", so why not just plod on with good old Anglais and expect the natives to pick up the gist of what you mean? You know, they really understand, as long as you shout loud enough. Any suggestion to the contrary is just plain old Gallic pig-headedness.

Your MSX is actually smarter than most Frenchmen (careful - Ed), because it is born with a capacity to handle not one but three languages. Its natural lingo is machine code, and it's true that can be a bit impenetrable for the beginner. Most first-time users speak to it in BASIC, which has the advantage

that it looks like English, even if some of its statements seem to run against common logic ($X = X + 1$, for instance).

But speaking BASIC to your computer is a bit like travelling around a foreign country with a human interpreter. Every time you want anything, you'd say it in English to your interpreter, he'd translate it into French (say'), the Frog would reply, he would translate back into English ... and so on ... and so on.

Now *that's* cumbersome, if you like!

An alternative for the first-time traveller might be to carry around a phrase book, and assembly language is a bit like that. The computer doesn't actually understand it, but the assembler you use can translate what you want into machine code rather faster than a BASIC interpreter and once it's done, the computer will always know what you want if you SAVE the translated version (what's known as the object code) on to tape or disk and then BLOAD it back as a binary file when you need it.

The Concept

At first sight, an assembly-language program seems almost as forbidding as machine code, though there are some words in it that look as you might be able to understand what they mean: ADD, AND, BIT, CALL, HALT, OUT, POP, PUSH and SET, for instance. Some mean what they seem to say, but others are far from self-explanatory. Is POP something to do with writing computer music for a hit single? I hear you ask. (It's not.)

And anyway, even if you find a listing that does what you want, how the hell do you type it in? You can't enter it from the keyboard like a BASIC program. Try it and the computer will generate more SYNTAX ERRORS than you've had hot dinners.

You need an assembler, which is a bit of special software generally available from a third-party company (ie not the computer manufacturer) and has to be LOADED from cassette or disk. It is easier to understand than machine

ZEN ASSEMBLER

code because it uses what are known as mnemonics (the first "M" is silent, as in "cash"), which look like real words, or abbreviations. LD, for instance, means "load".

These mnemonics are the same for a wide range of computers, as long as they all use the same chip. MSX uses Zilog's Z80 chip, so you'll find the same mnemonics in assemblers for the Sinclair Spectrum, the Amstrad CPC 464, the Tatung Einstein and any others that use the Z80, including the "second processor" on the BBC, the CBM 64's so-called CP/M cartridge, and so on.

This means that as long as it's not too machine-specific (eg regarding graphics, sound etc), you should be able to type in a simple program for the Spectrum, say, and have it work on your MSX. However, different firms produce different assemblers for the same machine, and (confusingly) the same assembler for different machines, and each firm's assembler will function in a rather different way. So, you can get Kuma's Zen for the Amstrad, the Einstein and various Sharps as well as for MSX, while a firm called HiSoft does an Amstrad assembler and McGraw-Hill also do a Spectrum assembler.

Because assemblers work at a rather profound level, they don't access the machine's special facilities like graphics, sound and disk operating system as such, but get there via the Z80 chip, which instructs other parts of the machine's firmware, like the Texas Instruments TMS-9918A video chip, or the General Instruments AY-3-8910 sound chip, to do their thing.

Getting to know how to do this can be quite complicated.

Why bother with assembler? Well, it's ironic that it's needed for the sort of things most beginners would like to be able to do - like writing games. Apart from adventures, most games need more speed than is possible with BASIC.

Also, once you begin to

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get to grips with assembly language you'll just have to start really understanding what's going on inside the heart of your CPU in a way that BASIC will never teach you.

Kuma's ZEN is a fine example of what can and (perhaps, more important) what can't be done with an assembler. It's well documented, as far as it goes, and works well ... but.

But?

Yes, but it's not very much help to the absolute beginner, because there are no examples or exercises to work through. For that, you'll need a companion book not quite ready at presstime, but expected to be out by November for about £7.

You'd also need a complete guide to MSX firmware, the machine-specific commands which would allow the Z80 to tell the rest of the computer

how to do all the things that are only possible on the MSX.

The Way

Before loading ZEN, you have to lower the top of memory so that it can coexist with BASIC, using the command

```
CLEAR 200,&H9FFF
```

Since it's a binary program, you LOAD and RUN it with the command

```
BLOAD "ZEN",R
```

The suffix ",R" causes a LOAded or BLOAded program to RUN immediately it's in memory.

The opening menu tells you one of the nicest things about ZEN: that it uses memorable single-character commands, which barely

need any explanation:

The **disassemble** instruction is interesting, because it allows you to examine the way programs work - yes, including ZEN itself, and the MSX Basic commands in ROM. They can be LISTed to the screen or to a printer or other external device.

The **unscramble** is similar, but only looks at eight Z80 instructions. For instance, if you want to know what the top of BASIC looks like, type

```
uO RETURN
```

(the lower case "u" is essential, to avoid confusion with Up).

Though it comes first alphabetically, **Assemble** is actually the final command you'll use, after you've finished putting together your "source code", a text file consisting of the Z80 mnemonics, and want to produce the "object code" in machine language, which is what you actually SAVE (though in this assembler you need to use the command **Write**). As in **dissassemble**, you can have it display what it's doing either on the screen, printer or other device. As you might expect, this generates reams of stuff, which you don't have to see if you don't want, because there's

A - Assemble	O - Out
B - Bye	P - Print
C - Copy	Q - Query
D - Down	R - Read
E - Enter	S - Sort
F - Fill	T - Target
G - Goto	U - Up
H - Howbig	V - Verify
I - In	W - Write
K - Kill	X - eXamine
L - Locate	Z - Zap
M - Modify	d - disassemble
N - New	u - unscramble

a "null" output option. This speeds up the operation considerably.

Bye is the next command you'll need, returning you to Basic when everything's done. If you do it in error, don't worry, because you can get back to where you were with

```
DEFUSR = &HA000:A = USR(0)
```

Copy moves a block of memory. You have to define the **START** and **STOP** parameters and the **DESTINATION** you want it moved to; the value may be decimal, hexadecimal (with an "H" at the end) or octal ("0" at the end). No suffix assumes a decimal figure.

Some assemblers use line numbers for help in finding your way around (though line numbers really have no meaning away from BASIC) but while ZEN uses them, they don't have a great deal of significance to you. Instead, commands like **Up** and **Down** move the appropriate number of lines in the appropriate direction, so U30 will display the line 30 lines above the previous

position.

You start typing in your instructions with the command **Enter**, which allows you to type in lines of text, each terminated with

RETURN, until a full stop is typed in as first character of a line. **Enter** can be used at any time, and will move the previous lines down to make room for the new lines.

Howbig lets you know where your ZEN text file starts and ends, and where is the top of memory. **Kill** erases the text file and is the equivalent of **NEW** in BASIC, but **New** in assembler doesn't mean the same thing: it lets you edit the current line.

Likewise, **Locate** has nothing to do with the cursor-positioning command in MSX BASIC: it is really a "find" to look for the first occurrence of a string. (Presumably, they'd have used "Find" if they hadn't needed **Fill** to fill a block of data with a given **DATA** value.)

Modify is like **New**, but allows you to define the start address in memory that you want to examine and edit.

Print displays the next line(s) in memory of the screen, depending how many lines are specified. One line is the default.

Query is similar, but it displays 64 bytes of memory in HEX and ASCII, from the current line if no parameter is specified.

Read is the assembler equivalent of **LOAD**, though it actually **MERGEs** a text file from cassette and appends it to the end of the text file in memory. "**RB**" will read a binary file into memory, either at the address defined when the file was **BSAVEd**, or a start address can be defined.

CTRL STOP will abort **Read**, **Write** and other I/O operations, such as **Out** and **In**, which output or input data to or from a specified I/O port.

Enlightenment

ZEN is well documented, containing the full Z80 instruction set, an assembly-language listing of ZEN itself, plus an alphabetical index of where all its instructions can be found, and a clear, concise guide to

each of its special instructions.

Grammatical purists may find its author's difficulty in distinguishing between "its" and "it's" an unnecessary irritation, likewise the use of commas where semi-colons or full stops would be more appropriate, but this is a common fault in computer-oriented literature.

ZEN is a tool, and a good tool, but just as you wouldn't let a kid loose in a Formula 1 racer down the M1, it needs care and understanding if you're to get the full use out of it. The lack of any worked examples may hamper the absolute beginner who wants fast access to some of the more sophisticated facilities of MSX, but then that was never its intention.

Some indication of how to drive the sound and graphics firmware via the Z80 might have been useful, however.

One thing, of course: you can experiment as much as you like, but as long as you don't **Write** any over the program cassette modifications you might try to ZEN (my pre-production tape was unprotected), you can't do any damage either to the program or your computer, though you might hang it up, and would have to turn everything off and back on to return to square one.

If you are serious about wanting to get into assembly language, you'll need some help besides ZEN and the promised examples book already mentioned. You'll also need a copy of the MSX "Red Book", containing the full hardware and firmware specification and shortly to be published commercially (Kuma, £8.95).

A good guide to the Z80 chip and its instruction set will also be invaluable, either Rodney Zaks' 624-page "Programming the Z80" (Sybex, £13.95) or the almost equally-massive, but less forbidding "Z80 Assembly Language Programming", by Lance A Leventhal (Osborne/McGraw Hill, £13.95). Good computer books don't come cheap, you'll observe.

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Contract Bridge - game - £9.95*
Disc Warrior - game - £7.95*

ANIROG, 8 The High St, Horley, Surrey, RH6 7AY:

Flightpath 737 - game - £7.95*

ARTIC, Brandesburton, Driffield, North Humberside, YO25 8RL:

Mr Wongs Loopy Laundry - game - £6.95

A.S.K., London House, 68 Upper Richmond Rd, London, SW15 2RP:

Number Painter - educational, 5-14 years.

B

BUBBLE BUS, 87 High St, Tonbridge, Kent, TN9 1RX:

Hustler - game - £6.99*

C

CDS MICROSYSTEMS, Silver House, Silver St, Doncaster, Sth Yorkshire:

French Is Fun - educational
German Is Fun - educational
Italian Is Fun - educational
Spanish Is Fun - educational - £7.95 ea.

COMPUTER MATES, PO Box 2, Stockbridge, Hampshire:

Word Processor - business - £49*
Cards System - business - £49*
Cash Accounts System - business - £99*
Double Entry Accounts - business - £99*
Word Processing & Cards System combined - business - £75*

CRL, CRL House, 9 Kings
Yard, London, E15 2HD:

Glug Glug – game – £7.95
War Of The Worlds –
game – £7.95

D

D.K. TRONICS, Saffon
Walden, Essex, CB11 3AQ:

Minder – game
Popeye – game
Hagar The Horrible –
game – £5.95 ea.

G

G.S.T./ELECTRIC
SOFTWARE, 8 Green St,
Willingham:

Buzz Off – game – £8.95*
Shark Hunter – game –
£9.95*

H

HEWSON, 56B Milton
Trading Estate, Milton,
Abingdon, Essex, OX1 4RX:

Bazam – game*

HI-SOFT, 180 High St Nth,
Dunstable, Beds, LU6 1AT:

Devpac – utility – £19.95
Pascal Compiler – utility –
£29.95

K

KONAMI, Television House,
269 Fieldend Rd, Eastcote,
Middlesex:

Super Cobra – game*
Athletic Land – game*
Circus Charlie – game*
Antarctic Adventure –
game*
Cosmic Bakery – game*
Monkey Academy –
game*
Time Pilot – game*
Hyper Olympic 1 – game*
Hyper Olympic 2 – game*
Hyper Sports 1 – game –
£14.99 ea.*

KUMA, 12 Horseshoe Park,
Pangbourne, RG7 7JW:

Binary Land – game –
£8.95*
Eric & The Floaters –
game – £8.95*
Hyper Vipers – game –
£7.95*
Spooks & Ladders – game
– £6.95*
Holdfast – game – £5.95*
Home Budget – business
– £14.95
WDPRO-Wordprocessor –
business – £29.95
Database – business –
£19.95
Starting With The MSX –
utility – £5.95*
The MSX Red Book –
utility – £8.95*

L

LLAMASOFT, 429 Mt
Pleasant, Tadley, Hants:

Grid Runner – game – £5

M

MICRO-AID, 25 Fore St,
Praze Camborne, Cornwall,
TR14 0JX:

Cashbook – business –
£14.95*
Memo-Calc – business –
£14.95*
Payroll – business –
£29.95*

MR MICRO, 69 Partington
Lane, Swinton, Manchester,
M27 3AL:

Punchy – game*
Humphrey – game*
Cubit – game*
Crazy Golf – game*
Zakil Wood – game* –
£6.90 ea.

MORWOOD, Maple Walk,
Bexhill, East Sussex:

Cannon Fighter – game
Panic Junction – game
Super Mind – game
Super Maze – game
Super Puzzle – game –
£6.95 ea.
Intro. To Numbers –
educational
Calculation 1 –
educational
Calculation 2 –
educational
Memory – educational
Reasoning – educational
Reflexes – educational –
£14.95 ea.

P

PREMIER
MICROSYSTEMS, 208
Croydon Rd, London, SE20
7YX:

Wordmate – business –
£24.95

Cribbage – game – £6.95
MSXMON – utility – £9.95
Home Accounts –
business – £7.95
Spelling – educational –
£6.95
Plant – educational –
£6.95
French Verbs –
educational – £7.95
Gambling Pack – game –
£6.95
Maths Games Pack –
educational – £7.95
House Of Horrors – game
– £6.95
Cabins of Doom – game –
£6.95
Dragon Tower – game –
£7.95
Dungeon of Death – game
– £7.95
Adventure Plus – game –
£7.95

PSS, 452 Stoney Stanton
Rd, Coventry, CV6 5DG:

Champ – utility – £12.95*
Maxima – game – £7.95*
Time Bandits – game –
£7.95*
Les Flics – game – £7.95*

Q

QUICKSILVA, Palmeston
Hse, Palmeston Rd,
Southampton, SO1 1LL:

Games Designer – utility –
£9.95
Ant Attack – game
The Snowman – game
Fred – game
Bugaboo – game – £7.95
ea.

T

TASMAN, Springfield
House, Hyde Terrace,
Leeds, LS2 9LN:

Tasword – business –
£13.90
Tasprint – utility – £9.90

OUTSIDE

Want to know about MSX related equipment not included in the standard? Go OUTSIDE.

We've looked at Yamaha's CX5M (see page 16) in the light of the other MSX computers, but it's by no means certain as yet that it will turn up in the UK other than in its very specialised form – as a music computer. The addition of a synthesizer module underneath the CX5 PCB puts £250-350 on the price, so the machine is unlikely to be taken up by anyone except a prospective or established musician, despite the fact that it can run all the standard MSX games and other software.

This is largely the reason

Yamaha's pricey CX5M pleads a dual role as MSX/pro music gear. Mark Jenkins seeks harmony.

of notes from a single key, but the sound production system – called Subtractive Synthesis – relies on creating new waveforms by filtering down relatively rich oscillator sounds.

Yamaha's FM or Frequency Modulation system reverses this entirely by building up

produce most of the same sounds, with a further application of miniaturisation allowing its basic circuitry to fit into the CX5 computer's add-on module. The FM synths excel at sharp, percussive, metallic sounds, but can give devastating



why Yamaha aren't advertising their wares in conjunction with Sony, Sanyo, JVC, Canon and the rest – they aren't even sure whether to market their machine through music shops or computer stores. Considering the havoc their introduction of FM synthesizers caused in the music world, such caution is hardly surprising.

A word, then, about FM synthesis. Conventional synthesizers use relatively simple analogue circuitry to produce a basic oscillator sound, filter it, shape its envelope and add various effects before playing it under the control of a standard, piano-like keyboard. Microprocessors may be used to memorise the settings needed to reproduce certain sounds, or to give special facilities such as playing chords or series

complex sounds from the simplest wave possible – the sine wave. Each sine wave generator in the DX synths can be a Carrier – actually producing a sound – or an Operator, acting on the Carriers to modulate their pitch at different speeds (hence Frequency Modulation – easy, yes?). The advantages are enormous – much cleaner, more complex sounds which can reproduce "real" instruments more easily because of the amount of sound 'movement' which can be programmed into every setting.

Yamaha use vast amounts of VLSI (Very Large Scale Integration) chips to produce instruments like the DX7, which has 147 different programmable parameters in every sound. The smaller DX9 lacks the DX7's touch-responsive keyboard but can

impressions of anything from flutes to steam engines (complete with steam, bell and whistle on one infamous DX7 preset sound patch). The clarity of FM synthesis produced enormous interest in the music world, although the complexities of programming a new sound using FM continues to defeat many musicians who had more than adequately mastered conventional synths, though packages available for the CX5M make things a bit simpler.

Obviously, finding the equivalent of an £800 DX9 inside a tasty new computer which can run all sorts of games and utilities at a cost of only £600 will be a bonus to musicians and non-musicians alike. Yamaha's

YAMAHA CX5M MUSIC

YAMAHA CX5M MUSIC

initial idea is to market the CX5 with a miniature 3½ octave piano-like music keyboard, with a full-size keyboard as an option. Other accessories include a Playcard reader (for feeding in complete 'pop classics' on magnetic strips), a MIDI serial/parallel interface, a micro floppy drive and a series of cartridge software packages.

The MIDI interface needs a further mention. MIDI (Musical Instrument Digital Interface) is intended to be a universal serial link which allows all suitably equipped synthesizers, sequencers, drum machines, computers and even guitar synthesizers to control each other.

Yamaha have been particularly sloppy in the implementation of the standard on their synths, but this one takes the proverbial biscuit. The CX5's MIDI isn't even serial! Because it feeds to the computer rather than to the synth unit built into it, it's a parallel port and a separate serial/parallel converter has to be used to bring the CX5 under the control of MIDI keyboards, synths and sequencers'. This will be called SMD-01, but its availability remains a mystery.

The initial software packages available for the CX5 are as follows:

YRM 11 Music Macro

Allows you to control the CX5's synth voices using a BASIC-type language. Adds special commands to MSX BASIC and lets you use FM synth sounds within games and other programs, taking full advantage of the sound and graphics facilities of the CX5.

Additionally the YRM 12 FM Voicing Program is expected to be included on the package price of the computer and keyboard.

YRM 14 DX9 Voicing Program

As above, but for the smaller DX9 which is around £500 cheaper than the DX7 at £800.

YRM 12 FM Voicing

Allows you to select and control the 8FM voices in the CX5 using any combination from 45 sounds. Adds a simple rhythm backing with a selection of patterns and a basic real time sequencer to record performances from the music keyboard. Splits the keyboard into a monophonic and polyphonic section with portamento on the mono section and allows you to transfer sounds from one position to another in memory or dump them to tape.

Getting down to the hard financials, the projected costs are as follows;

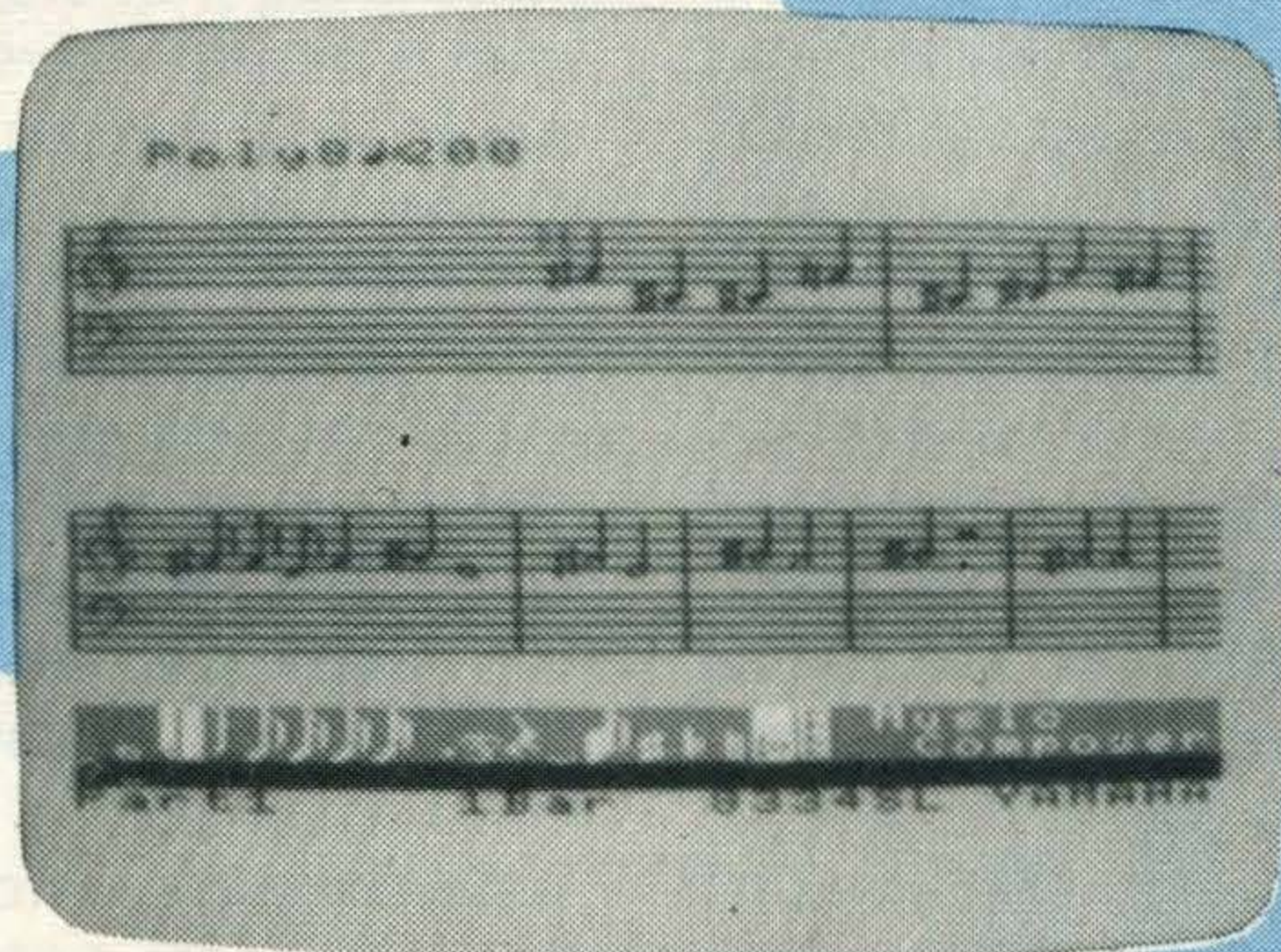
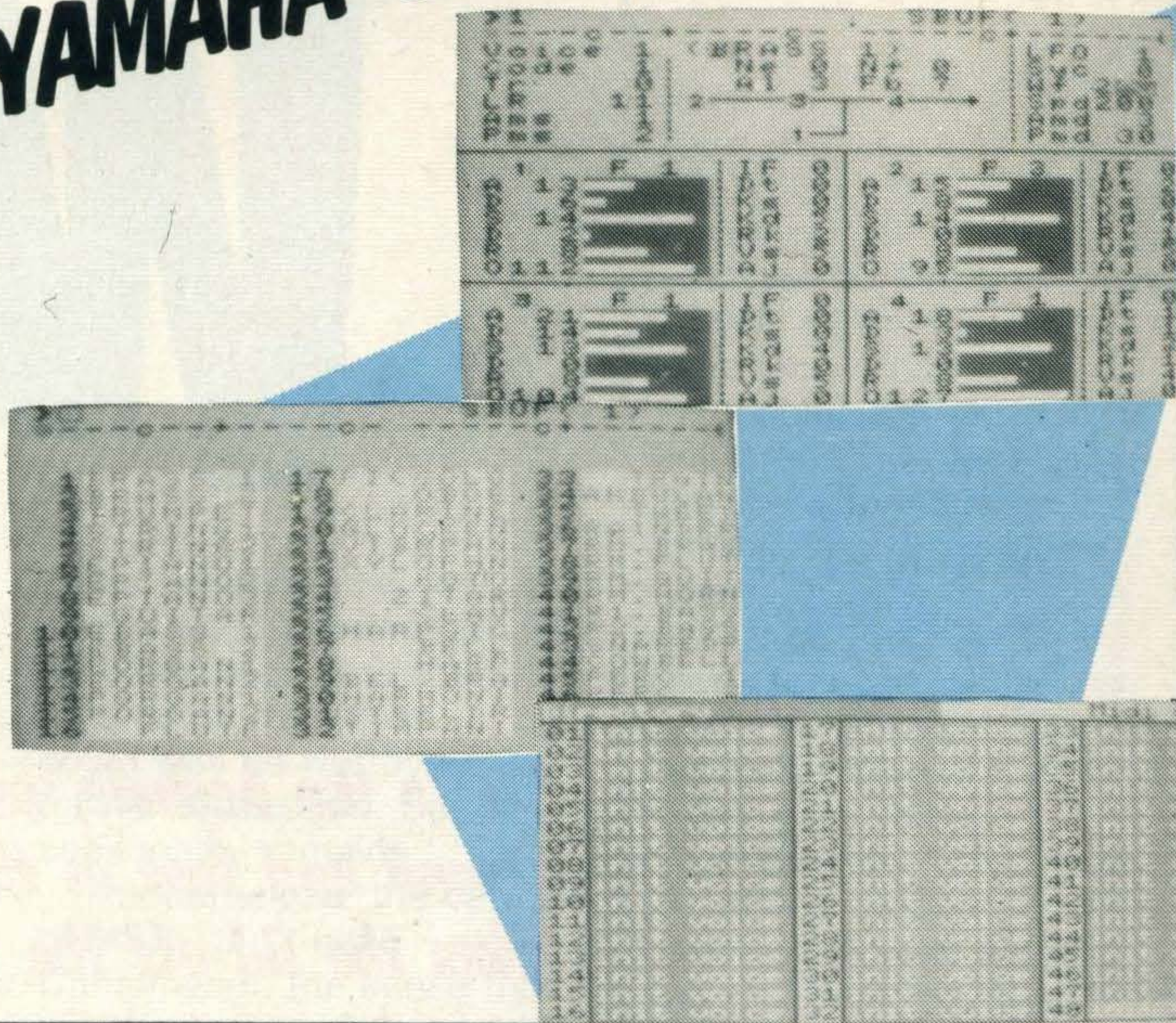
CX5M, YRM 12 ROM and mini keyboard;	£631.35 in VAT
YRM 13, 14, 15;	£49 each
YK 10 Full-size keyboard;	£poa

Availability is quoted by Yamaha as December/January.

The CX5 has certainly stirred up the music world, which has been struggling to integrate computers for some time and will welcome one which already has a top-quality synthesizer built in. The sounds, it's worth repeating, are like nothing you've heard from any computer chip - full strings, percussive electric pianos, powerful brass and bizarre digital effects are all yours with the CX5.

The only question is whether it will make much of an impression on the non-musical micro world. Yamaha's own demonstrator would prefer to see the CX5 sold through music shops purely as a musical instrument, and clearly it's a lot more expensive than any other MSX micro - is that extra expense justifiable to a mere musical dabbler, especially considering that you'd be unlikely to find any games or other non-music software making use of the FM synth facilities?

Still, once MSX has established itself (as it's sure to do) it'll be good to know that, with the CX5 about, any owners who feel the musical urge will find the right machine for the job ready and waiting.



YRM 15 Music Composer

A compositional package which will reproduce 8 monophonic lines or tracks, programmed by the user in full musical notation. The cursor selects note or space length plus, of course, pitch and notes can be entered via the computer or the music keyboard. Different sounds can be chosen for each track and very complex pieces can be built up with programmable looping (for repeating sections), tempo

YRM 13 DX7 Voicing Program

With the CX5M connected to a DX7 synth via MIDI, this brings the DX7 synth's 147 parameters under computer control with colour graphic displays of all sound shaping changes. Envelope shapes

and so on. The main fault is that while each track is programmed, previously recorded tracks are neither visible (on screen) nor audible, so a fairly high-powered appreciation of musical theory and notation is almost a pre-requisite to keep track of where you are in a piece. It's possible to synchronise to an external drum machine through MIDI, or you could use some of the very respectable drum sounds in the CX library - or create some yourself.

are displayed as an oscilloscope-like curve and changes made on the computer are instantly heard on the synth. A huge bonus for those who find the DX7's LCD display too cryptic to help in creating new sounds. It also contains a bank of sounds as starting points.

WEST

Eye to the keyhole, ear to the ground and foot in the door, contortionist Jim Gregory takes the lid off the UK and European MSX scene.

THE CURVE

There's a well known business and training phenomena known as the 'Learning Curve'. Theory holds that when any new idea or product has to be understood in depth, learning is difficult to begin with and easier later on. "Wow!" I hear you exclaim. "This is hardly earthshattering news." The fact is, many people forget the learning curve and assume that everyone can accept new knowledge instantly. MSX is a new way

of looking at the micro computer world and has its own learning curve. Just because standard, well understood components, such as the Z80 microprocessor, are incorporated it doesn't mean that software is easier to develop for MSX than any other new micro. Even so, MSX manufacturers were initially planning to supply machines to software houses only two months pre-launch! As any of the computer cognicenti will tell you, 'No software - No sales'. As it is, they came to their senses and MSX is in the privileged position of having between 100 and 200 titles from launch due to frenzied program conversions and midnight-oil coding.

It should be noted that without sensible programming 'tools', this would have been impossible; so, much praise to people like Hi-soft and Kuma for their assemblers, without which... etc, etc.

Software Style

Unfortunately, some software writers adopted a cavalier attitude to the difficulties. In particular, the special techniques needed to efficiently use the MSX display system have only been grasped by a few programmers. The 'learning curve' period has produced a number of programs from Britain which are graphically naive but very playable. In contrast the products which originate from the East offer faster movement and more cartoon style animation, but often very little long term playability.

For the first time in the history of the micro world a reasonable amount of software is available at the same time as the microcomputer system itself. From what I've seen, MSX owners should be very happy with the range. This doesn't mean that products can't improve within the next six months and I expect software houses to clamber up the learning curve and produce some of the best software in the world. The first steps in software evolution must be the amalgamation of the Eastern

style of animation and graphics, with the better game scenarios that the British, in particular, are able to devise. The next developments could well result from more experience with the MSX sound chip.

Sophisticated, synthesized music is, of course, being developed by software houses for incorporation into their programs and it's well known that the Yamaha machine has greater aspirations in the sound stakes.

Success!

Although the steepness of the learning curve and the time it would take for UK software houses to climb it were underestimated, the fact is – the industry has succeeded. Thanks to the fact that machines were made available earlier than planned and to the surprising amount of technical support given by the MSX Group. All that's needed is an equally healthy amount of MSX machines to ensure good software sales. It's regrettable that, so far, demand looks like exceeding supply. Of the pitifully small MSX advance movement, it seems that few will be able to get sufficient numbers into retail outlets in time for Santa to collect them. The major brand names are each declaring very low availability (less than 10,000

each) and often not until very close to December. So who can meet the Christmas rush?

I doubt whether a company called 'GoldStar' will ring any consumer awareness bells. That's because GoldStar haven't been investing money for 10 years in 'UK Corporate Image Enhancement', unlike Sony, Canon, Hitachi, Sanyo and Toshiba. That doesn't mean that GoldStar are small. On the contrary, they have a turnover as big as an international telephone number and have been known to make products which later appear with the names of certain high profile companies stencilled neatly on the front. At the end of the day it should be remembered that an MSX machine is...an MSX machine. So stand by for hard decisions like: should I pay £60 more for a machine which bears a well-advertised brand name or go for an unknown? Well, if it's MSX, it should be the same.

A look at the GoldStar is included in this issue and having seen it in action and tickled its keyboard I can report that it's going to be a major race contender.

The Christmas Dash

The fact that a race exists is undoubted. The peak in the Western micro computer market has become dangerously seasonal. Christmas and the months leading up to it account for a staggering per cent of sales. Everything, it seems, has to happen in time to benefit from the year-end spending

spree. Whether this is a consumer originated pattern or is assumed, and therefore created by the industry, could well be worthy of further discussion. But the seasonality remains.

The Japanese, the catalyst of MSX, don't have Christmas in the sense that the West does. This could perhaps account for their apparent indifference to Western haste. Maybe they have a master plan to help shift the present purchasing peak or even spread it over a longer period. This much is certain; they don't see the introduction of this standard as a short-lived quicky. They intend to stabilise the market and provide a sound framework that can be built on for perhaps the next eight years, taking updates in the standard into account.

This frame-work will also help support other products that we associate with the Japanese. An MSX car or motorbike may be some time off, but links with Hi-Fi and video are already being forged. The system intends to settle, take root and to grow.

MSX

In these early days there has been the expected 'anti-MSX' camp who want to strangle the idea at birth and stop any chance of growth. The sources of 'anti-MSX' comments have included the mail-order genius Sir Clive and some magazines which have vested interests. Many of the derogatory remarks revolve around the charge that MSX is 'old hat'. It's because the system is designed as a standard that people say this, but the computers are worthy when compared feature for feature, pound for pound, with any current best selling Micro. It should be

remembered that a standard actually allows you to do something which is uneconomical in isolation. The jargon is 'Interfacing' (the ability to interconnect computers and computer systems via the telephone system or directly). Interfacing can be used to evolve the standard into the next generation or to link it to any other related developments. This means that MSX products shouldn't become outdated but can, and will, form the foundation of future developments in consumer computing.

Soon

The peripherals we now expect will of course exist in great numbers. Printers of the dot matrix type, the daisy wheel and plotters can be plugged straight in the parallel centronics port. Software to dump screen displays will soon be available. Disk drives will probably settle eventually into a 3.5 inch standard, but no doubt all formats will be catered for if there is enough demand. Light pens have been announced and so many joysticks and track balls are available that you can spend a month just trying a couple a day. The more recent peripherals such as the 'mouse' and 'touch tablets' are waiting in the wings ready to enter as the size of the market warrants promotion. There is current development work on products that'll bring networking and video text systems to MSX. There's also important pioneering in the use of Laser Disks as games/education/ or entertainment peripherals.

Other general areas which will doubtless one day be MSX linked include voice recognition, robotic control, appliance control and amateur radio. The list is seemingly endless, which is great because I'm looking forward to charting the progress of the most exciting computing idea since sliced silicon!

Simon Rockman drops his throbbing 'phone and gives the lowdown

This was intended to be a complete list of all the MSX Computers to be launched in Britain. However as we went to press, many of the manufacturers were still unsure of their plans. All these machines meet or exceed the minimum MSX specification:

A Z80A processor running at 3.58 Mhz
32K ROM including an MSX Basic interpreter
BK or more RAM
A Texas Instruments 9918 Video Display Processor (VDP) or equivalent (A 9929 is used for the UK television system)
An AY-3-8910 programmable sound generator
An MSX standard cartridge port
A modulated TV signal output
A Centronics parallel printer interface
A 1200/2400 baud cassette interface with automatic speed selection
Ten function keys
A standard cluster of four cursor keys

Yamaha CX5

Perhaps the most exciting MSX machine (and the most expensive). This is more a synthesiser with a computer thrown in than the other way around. The CX5 is based on the DX9 synth, as seen on Top of the Pops. A good example of MSX being put to work and is probably of more interest to musicians than to programmers. The computer has a MIDI interface to allow it to be connected to other synthesisers. The CX5 is unusual in only having 32K RAM, however this is used to the full in exploiting the synth. The 2½ octave mini-music keyboard, which forms part of the package, can be used in conjunction with educational software to

teach music. The sound producing parts of the device can be used from BASIC in conjunction with a special cartridge which adds commands to BASIC.

Philips (not in UK)

Despite the lack of interest in the UK market it is interesting to see a non-Oriental company producing an MSX computer. There may be a UK launch some time in the future.

Panasonic (UK) Ltd CF2700

Panasonic are playing a waiting game; any machines imported this year are simply to test the water. The machine has no special features and price will be all important. This 64K machine will be fairly well supported by a disk, joystick, plotter and cassette which will be available from launch.

Toshiba HX-10

The HX-10 is the only machine which will be freely available this Christmas. The price is a little disappointing but for anyone eager to get into MSX this is probably the first crack you'll get at the whip. This year there will be a cassette and joystick with a printer and disk drive to follow next year.

Hitachi H80

This was announced earlier in the year at £199, however no UK standard machines have appeared and the computer will not be launched until spring '85. This computer has two cartridge ports, both on the top of the case. The H80 is following the trend towards built in software, although what form this will take is not yet clear.

Goldstar FC-200

This computer is manufactured in Korea and has proved to be something of a dark horse. Goldstar will not be producing any MSX peripherals; however the importer, Microdealer, will be distributing peripherals made by Shado, a large Korean company.

Mitsubishi ML-F48 and ML-F80

Mitsubishi are taking the unusual step of introducing 32K and 64K machines. Future developments will include battery backed up RAM cartridges.

Sony HB-75

The Sony HB-75 seems to be one of the best thought out of the MSX micros. It integrates nicely with the Sony Profeel range of TVs and monitors, and this is the reason for the standard RGB and audio outputs. Sony make the 3.5in disk drives and will probably be the first manufacturer to have MSX disk units available. Other hardware available from launch includes a plotter, cassette deck and two joysticks, one a conventional wired joystick and an infrared, cordless model. A dot-matrix printer may be launched in 1985. The most impressive feature of the HB-75 is the built in software which forms a schedule diary/memo/address book. This can be used to SAVE the data to disk or cassette but is best used with a Data Cartridge. A battery backed-up CMOS (low power) RAM cartridge which can be accessed instantly. These cartridges are fairly pricey (£30ish) for the amount of store they provide but are great to use. The HB in the name stands for HitBit.

MSXboxed

	approx price	standard memory size (RAM)	max. screen resolution	clock speed/processor	no. of sound channels	max. no colours	notes
MSX	£200-£300	8-1024K	256 x 192	3.5MHz Z80A	3	16	Lots of variations
Atari 800 XL	£169	64K	320 x 192	1.9MHz 6502	4	256	Good value for money. - Poor BASIC
BBC B	£399	32K	640 x 256	2MHz 6502	3	8 + flash	Very fast. Best BASIC around
Commodore 64	£199	64K	320 x 200	1.2MHz 6510	3	16	Cheap. Poor BASIC
Electron	£199	32K	540 x 256	2MHz 6502	1	8 + flash	Slow, Uses BBC BASIC
Oric Atmos	£170	48K	240 x 200	1.2MHz 6502A	3	8 + flash	
Spectrum 48K	£130	48K	256 x 176	2MHz Z80A	1	8 + flash & bright	Best software availability
VIC-20	£140	3.5K	160 x 128	1.2MHz 6502	3	8	Screen & memory memory limited
QL	£399	128K	512 x 256	7.5MHz 68008	1	8 + flash & stipple	Includes two Microdrives
Amstrad	£230	64K	640 x 200	4MHz Z80A	3	27 + flash	Includes monitor

The competition

Manufacturer	Machine	Price	Number in UK Pre Christmas	Launch Date
Yamaha	CX5	£549	1,000	16th OCT
Philips	not being sold in the UK			
Panasonic	CF2800	£249-299	5,000	Pre Xmas
Toshiba	HX-10	£280	10,000	Pre Xmas
Canon	V-20	£280	not known	not known
Hitachi	H80	£199	none	April '85
Goldstar	FC-200	£229	6/9,000	Mid Nov
Mitsubishi	ML-F48	£249	3,500	1 Nov
Mitsubishi	ML-F80	£299	6,500	1 Nov
Sony	HB-75	£299	10,000	1 Oct
Sanyo	MCP-100	£299	5,000	not known
JVC	HC-7GB	£280	3,000	not known

Current MSX Line-up

MSX BASIC – All commands, statements and functions.

AUTO

Generates line numbers automatically after every carriage return.

CONT

Continues program execution after BREAK or STOP in execution.

DELETE

Deletes program lines from memory.

LIST

Lists all or part of a program.

LLIST

Lists all or part of the program to the printer.

NEW

Deletes the entire program from memory and resets all the variables.

RENUM

Renums the program lines.

RUN

Executes the program.

TRON

Turns on the tracing of execution of program statements. An aid to debugging.

TROFF

Turns off trace function.

CLEAR

Sets all numeric variables to zero, all string variables to null, closes all open files, and optionally sets the end of memory.

DATA

Stores the numeric and string constants that are accessed by the program's READ statements.

DIM

Specifies the maximum values for array variable subscripts and allocates storage accordingly.

DEFINT

Declares variable type as integer.

DEFSNG

Declares variable type as single precision.

DEFDBL

Declares variable type as double precision.

DEFSTR

Declares variable type as string.

DEF FN

Defines and names a function that is written by the user.

DEFUSR

Specifies the starting address of an assembly language subroutine.

ERASE

Eliminates program execution, closes all files and returns to command level.

ERROR

Simulates the occurrence of an error, or allows error codes to be defined by the user.

FOR..NEXT..STEP

Allows a series of instructions to be performed in a loop a given number of times.

GOSUB

Branches to a subroutine.

GOTO

Branches unconditionally out of the normal program sequence to a specified line number.

IF..THEN..ELSE

Makes a decision regarding the program flow based on the result returned by an expression.

INPUT

Allows input from the keyboard during program execution.

LINE INPUT

Allows an entire line (up to 254 characters) to be input to a string variable, without the use of delimiters.

**MSX
BASIC**

LET

Assigns the value of an expression to a variable. Optional.

**LPRINT
LPRINT USING**

Prints data on a line printer.

MID\$

Replaces a portion of one string with another string.

ON ERROR GOTO

Enables error trapping and specifies the first line of the error handling subroutine.

**ON..GOTO
ON..GOSUB**

Branches to one of several specified line numbers, depending on the value returned when an expression is evaluated.

POKE

Writes a byte into a memory location.

PRINT

Outputs data to the console.

PRINT USING

Prints strings or numerics using a specified format.

READ

Reads values from a DATA statement and assigns them to variables.

REM

Allows explanatory remarks to be inserted into a program.

RESTORE

Allows DATA statements to be reread from a specified line.

RESUME

Continues program execution after an error recovery procedure has been performed.

RETURN

Returns from a subroutine.

STOP

Terminates program execution and returns to command level.

SWAP

Exchanges the value of two variables.

Functions

ABS(X)

Returns the absolute value of the expression X.

ASC(X\$)

Returns a numerical value that is the ASCII code of the first character of the string X\$.

ATN(X)

Returns the arctangent of X in radians.

BIN\$(n)

Returns a string which represents the binary value of the decimal argument.

CDBL(X)

Converts X to a double precision number.

CHR\$(I)

Returns a string whose one element is the ASCII code for I.

CINT(X)

Converts X to an integer number by truncating the fractional portion.

COS(X)

Returns the cosine of X in radians.

CSNG(X)

Converts X to a single precision number.

CSRLIN

Return the vertical coordinate of the cursor.

ERL/ERR

When an error handling subroutine is entered, the variable ERR contains the error code for the error, and ERL contains the line number of the line in which the error was detected.

EXP(X)

Returns e to the power of X. X must be less than 145.06286085862.

INT(X)

Returns the integer part of X (fraction truncated). FIX(X) is equivalent to SGN(X)*INT(ABS(X)).

**FRE(O)
FRE''''**

Arguments to FRE are dummy arguments. FRE returns the number of bytes in memory not being used by BASIC. The first version gives the memory available for program text etc. The second gives the bytes available for string space.

HEX\$(X)

Returns a string which represents the hexadecimal value of the decimal argument.

INKEY\$

Returns either one-character string containing a character read from the keyboard or a null string if no key is pressed.

INPUT\$(X)

Returns a string of X characters, read from the keyboard.

INSTR([I,]X\$,Y\$)

Searches for the first occurrence of string Y\$ in X\$ and returns the position at which the match is found. Optional offset I sets the position for starting the search.

INT(X)

Returns the largest integer less than or equal to X.

LEFTS(X\$,I)

Returns a string comprising the leftmost I characters of X\$.

LEN(X\$)

Returns the number of characters in the string. Non-printing characters and blanks are counted.

LOG(X)

Returns the natural logarithm of X.

LPOS(X)

Returns the current position of the line printer print head within the screen line buffer.

MID\$(X\$,I[,J])

Returns a string of length J characters from the string beginning with the Ith character.

OCT\$(n)

Returns a string which represents the octal value of the decimal argument.

PEEK(I)

Returns the byte (decimal integer in the range 0 to 255) read from memory location I. PEEK is the complementary function to the POKE statement.

POS(I)

Returns the current cursor position. The leftmost position is zero.

RIGHT\$(X\$,I)

Returns the rightmost I characters from the string.

RND(X)

Returns a random number between 0 and 1. The same sequence of random numbers is generated each time the program is run. If X is less than zero, the random generator is re-seeded for any given X.

SGN(X)

Returns a 1 if X is greater than zero, a zero for X equal to zero, and - 1 for X less than zero.

SIN(X)

Returns the sine of X.

SPACE\$(X)

Returns the string of spaces of length X.

SPC(I)

Prints blanks on the screen, SPC may only be used with PRINT and LPRINT statements.

SQR(X)

Returns the square root of X. X must be positive.

STR\$(X)

Returns a string representation of the value of a numeric.

**STRING\$(I,J)
STRING\$(I,X\$)**

Returns a string of length I whose characters all have the ASCII code J or the first character of the string X\$.

TAB(I)

Spaces to position I on the console.

TAN(X)

Returns the tangent on X.

USR[digit](X)

Calls the user's assembly language subroutine with argument X. The digit defines which DEFUSR is called.

VAL(X\$)

Returns the numerical value of the string.

**VARPTR(variable name)
VARPTR(file number)**

Returns the address of the first byte of data identified with the variable, or the starting address of the file control block.

Expanded Statements

SCREEN [mode] [,sprite size] [,key click switch] [,cassette baud rate] [,printer option]

Assigns the screen mode, sprite size, key click, cassette baud rate and printer option.

WIDTH

Sets the width of the display in text mode.

CLS

Clears the screen. Valid in all screen modes.

LOCATE

Locates the character position for PRINT.

COLOR

Defines the foreground, background and border colours.

PUT SPRITE

Sets up the sprite attributes.

CIRCLE

Draws an ellipse with specified centre and radius. A segment may also be drawn.

DRAW

Draws a figure according to the graphics macro language (commands contained in a string).

LINE

Draws a line connecting two specified coordinates.

PAINT

Fills an arbitrary graphics figure with colour.

PSET PRESET

Sets or resets the specified coordinate.

KEY

Sets a string to a specified function key.

KEY LIST

Lists the contents of all function keys.

**MSX
BASIC**

KEY ON/OFF

Turns the function key display on the 24th display line on or off.

ON KEY GOSUB

Sets up a group of line numbers for BASIC to trap to when the function keys are pressed.

KEY (fn key) ON/OFF/STOP

Activates or deactivates the trapping of the specified function key in a BASIC program.

ON STRIG GOSUB

Sets up a group of line numbers for BASIC to trap when the trigger button is pressed.

STRIG(n) ON/OFF/STOP

To activate or deactivate the trapping of trigger buttons of joysticks in a BASIC program.

ON STOP GOSUB

Sets up a line number for BASIC to trap to when the Ctrl-STOP key is pressed.

STOP ON/OFF/STOP

To activate or deactivate the trapping of a Ctrl-STOP.

ON SPRITE GOSUB

Sets up a line number for BASIC to trap to when the sprites coincide.

SPRITE ON/OFF/STOP

To activate or deactivate the trapping of a sprite in a BASIC program.

ON INTERVAL GOSUB

Sets up a line number for BASIC to trap to on a time interval.

INTERVAL ON/OFF/STOP

To activate or deactivate the trapping of time intervals in a BASIC program.

VPOKE

POKEs a value to the specified location of video RAM.

BEEP

Generates a beep sound.

MOTOR

Changes the status of the cassette motor switch.

SOUND

Writes a value directly to the sound generator registers.

PLAY

Plays music according to the music macro language.

MAXFILES

Specifies the maximum number of files that can open at one time.

OPEN

Allocates a buffer for I/O and sets the mode that will be used with that buffer.

PRINT PRINT USING

Writes data to the specified channel.

INPUT

Reads data items from the specified channel and assigns them to program variables.

LINE INPUT

Reads an entire line, up to 254 characters, without a delimiter.

INPUT\$

Returns a string of characters read from a file.

CLOSE

Closes the specified channel and releases the buffer associated with it.

SAVE

Saves a BASIC program file to a specified device.

LOAD

Loads a BASIC program file from the specified device.

MERGE

Merges the lines from an ASCII program file into the program currently in memory.

BSAVE

Saves a memory image at the specified memory location to the device (currently cassette only).

BLOAD

Loads a machine language program from the specified device (currently only cassette).

ES Functions

POINT

Returns colour of a specified pixel.

VPEEK

Returns the value in the video RAM location specified.

STICK

Returns the direction of a joystick.

STRIG

Returns the status of a trigger button of a joystick.

PDL

Returns the value of a paddle.

PAD

Returns the status of the touch pad.

PLAY

Returns the status of a music queue.

EOF

Returns -1 if the end of a sequential file has been reached. Otherwise returns a value of zero.

Special Variables

TIME

The system interval timer. It is incremented by 1 every 60th of a second provided the interrupts are enabled.

SPRITE\$

The pattern of a sprite.

VDP

Specifies either the current value of the video display processor's write only register, or the read only status register.

BASE

Current base address for each table in the video display processor.

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Mike Johnston
Editorial Assistant
MSX User

Dear Mike

re: Ethics

I've been thinking about the hassle of filling the BACK letters page for the launch ish. Usually, the editorial staff make up a load of ~~the~~ nonsense that's supposed to pass for the real thing. As the image of the mag is to ~~be~~ suave, sophisticated and ~~box~~ on-the-ball I'm not sure that cover tactics are ethical for a team of dedicated journalists like us. Our readers will expect to be treated with the ~~same~~ respect they deserve and they'll instantly see through any attempt to pull the wool over their ears. I think we should make a stand for the 4th Estate. The Press have a responsibility to their public to report the Facts without bias or discolouration. Please let me know my thoughts on the subject soonest.

Yrs
Lizzy
Lizzy

P.S. Got any spare t/writer correction ribbons?

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Liz Coley
Editor
MSX User

Dear Lizzy

re: Your letter - ethics

Firstly, what's ethics? If you're trying to come the raw prawn and say you gave them to me to file I'll ^{see} on the Holy Thesaurus that you didn't!

Secondly, I had enough trouble stapling the cardboard boxes together for me desk so I'm not making a stand for yours or anyone else's 4th Estate. I know my writes. I'm classed as office staff, not a ~~box~~ carpenter.

If your short of letters I enclose one I got from me mate Bunga back home but the fourth paragraph got a few blue stains and if you use it I'd be chuffed if you left out the bit about the Sellotape and the budget. I'm over this now and I promised me Mum that no more'd be said.

Cheers

Mike
Mike

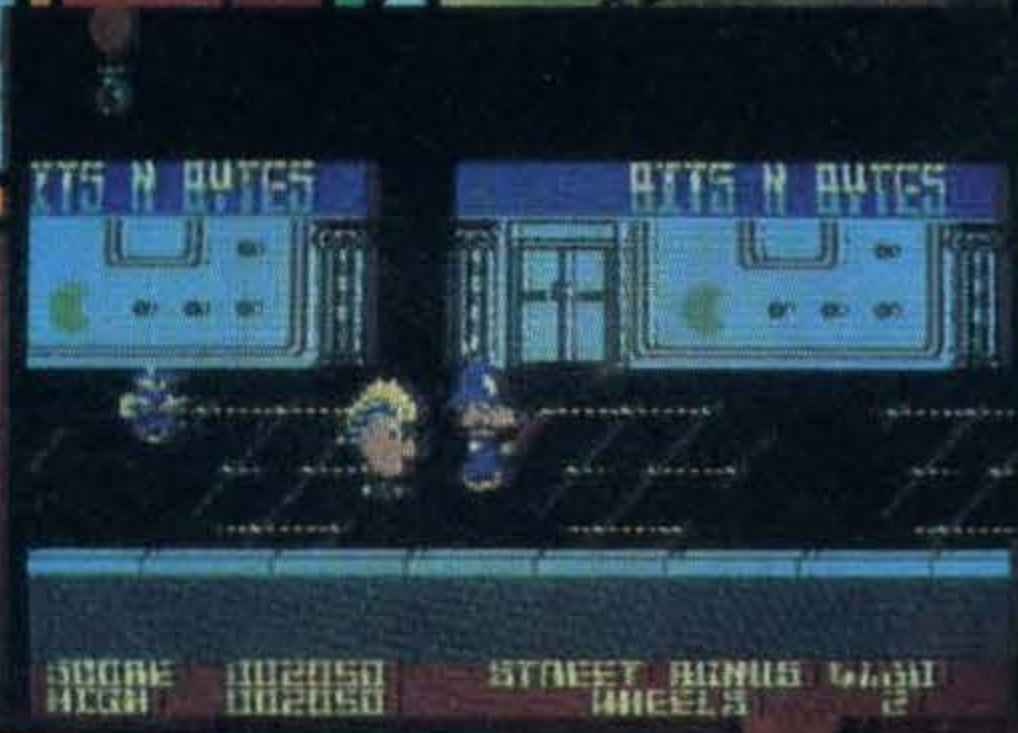
PS I've got a box of correction ribbons but no one can find ~~the~~ ~~box~~ an engineer to put them in.

BACK

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