An Argus Specialist Publication

MSX User

OCTOBER 1985
£1.25

Coming soon

M.U.D

MULTI USER DUNGEON

on your screens

Mitsubishi ambitions: company profile

Essential reading: bumper book roundup

More joy, less stick? Games controllers survey

PLUS

News and reviews

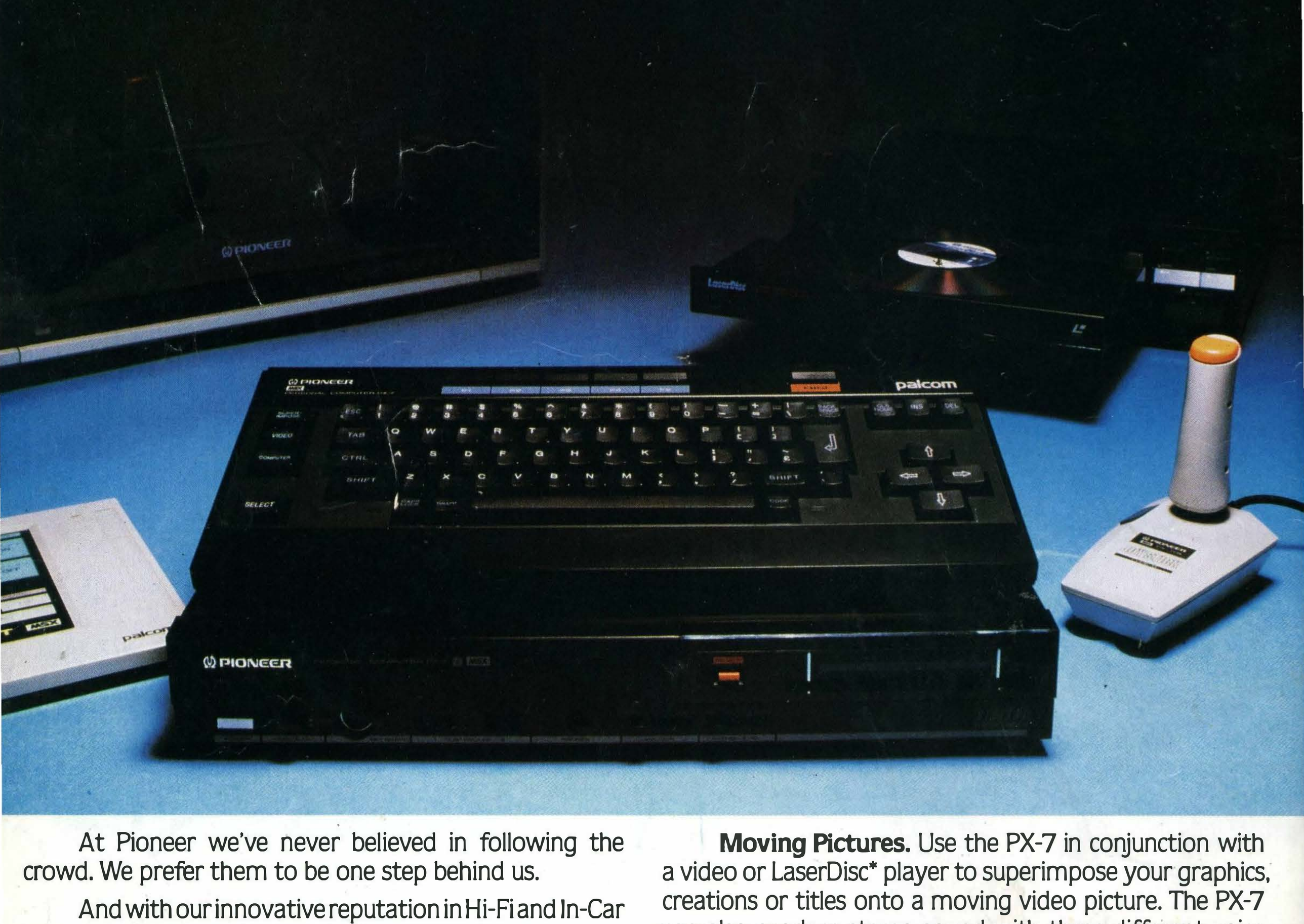
Business and games listings

Beginners' BASIC

Machine code answers

All MSX computers are built to the same standard.

That's what makes our first one different.



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

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

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

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

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

Moving Pictures. Use the PX-7 in conjunction with a video or LaserDisc* player to superimpose your graphics, creations or titles onto a moving video picture. The PX-7 can also produce stereo sound with three different voice patterns over eight octaves and superimpose them over other sound sources.

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

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

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

PIONEER® *LaserDisc™ The LaserVision trademark certifies compatibility with

Contents

REGULARS

5 Front — MSX conquers Moscow but will it succeed at Waterloo?
6 Pulse — News of the MSX world
10 East — Graham Knight orientates himself
52 First Aid — Steve Webb's guide to redefining your character set
54 Contact — Our A-Z of MSX software
58 Soft Options — A hard look at the software scene
64 Feedback — Our all-mail preserve

FEATURES

12 Mitsubishi Ambitions — An MSX company with peripheral vision
18 MUD On Your Screens — Nicole Segre dips into British Telecom's new game
20 Join the Jet Set — Paul O'Sullivan maps Willy's mansion.
25 Joy Ride — Eric Doyle gives games controllers some stick

PROGRAMMING

14 Pathfinder — Adventurer Steve Lucas battles with bugs and disguises his DATA
22 Grand Design — Planning a sketch pad program with Bob Maunder
42 Quick Answers — Supercharge your programs with Steve Webb's routines
44 MSXplained — Get your hooks into memory matters

REVIEWS

46 Heated Words — Alphacom's thermal printer hotly perused by Karl Dallas
48 First Editions — Book bonanza
62 Primary Aims — Conall Boyle tots up the score for Morwood's Puddles series

SPECIAL OFFER

17 Electric Shock — Cut price games from Electric Software

LISTINGS

28 Cash Accounts — A memory Bank
33 Game of Life — Microbe multiplication
34 Space Duel — Lasers at dawn
38 Mouse — Don't get trapped
66 Diary — Daily epistle

The contents of this publication including all articles, designs, plans, drawings and programs and all copyright and other intellectual property rights therein belong to Argus Specialist Publications Limited. All rights conferred by the Law of Copyright and other intellectual property rights and by virtue of international copyright conventions are specifically reserved to Argus Specialist Publications Limited and any reproduction requires the prior written consent of the Company. © 1985 Argus Specialist Publications Limited.

VOLUME 1 NUMBER 11 OCTOBER 1985

Editor
Nicole Segre

Editorial Assistant
Eric Doyle

Group Editor
Dave Bradshaw

Advertisement Manager
Ian Atkinson

Advertisement Copy Control
Lynn Collis

Publishing Director
Peter Welham

Origination and Design
Argus Design

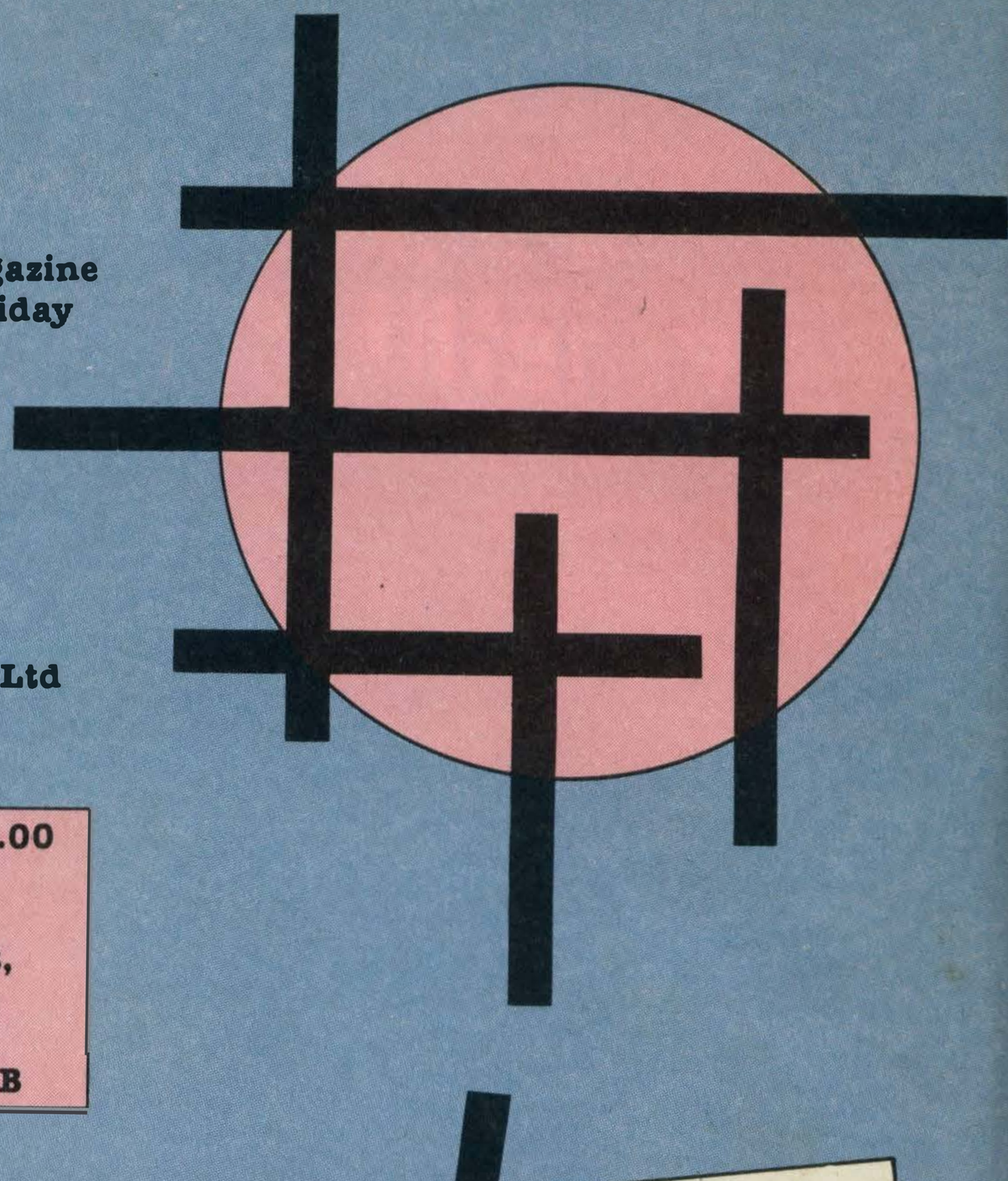
Editorial & Advertisment Office
No 1 Golden Square
London W1R 3AB
Tel: 01-437 0626
Telex: 8811896

MSX User is a monthly magazine appearing on the second Friday of each month

Distribution
SM Distribution Ltd
16-18 Trinity Gardens
London SW9 8DX

Printing
Alabaster Passmore & Sons Ltd
Tovil, Maidstone, Kent

UK Subscription rates £19.00 per annum. Worldwide on application to MSX User Subscriptions Department, Infonet Ltd, Times House, 179 The Marlowes, Hemel Hempstead, Herts. HP1 1BB



If you think that you have written a program as good as the ones we publish, why not turn your hard work into cash?

Send us a tape of the program along with a written description of the game, playing instructions, the main variables used and a brief explanation of your programming structure (see the Listings page for guidance). A printout of your program would be useful, but is not essential.

If we agree that your work is a masterpiece we will pay you £15-£50 on publication, depending on its length and complexity.

All programs and documentation should be sent to:

MSX User
Argus Specialist Publications Ltd
1 Golden Square
London W1R 3AB.

NEXT MONTH

Ten of the Best — Let our favourites be your guide to the best software buys
Profile — We talk to Computer Mates, the friendly business specialists
Pathfinder — Journey with Steve Lucas round Level 9's Red Moon
MSX on Display — We report in full on the PCW show

MSX

Front

The coming months may well determine the future of the British and the place of MSX within it.

In spite of widespread attempts to imbue home computers with a more 'serious' image, games continue to dominate the software scene, and Christmas continues to dominate the thoughts of manufacturers who rely on autumn nights and seasonal spending sprees for the bulk of their sales.

That, at least, is the Western tradition. The Japanese manufacturers of MSX computers have shown far less concern, not only with seasons but with boosting sales in the UK in general. The reason for this might seem increasingly clear. The recent announcement of an initial order of 4000 machines destined for the Soviet educational market, and the likely promise of bigger orders from the same source to follow (see Pulse), indicate that the big Japanese companies are more interested in the wide open spaces of the world market than in penetrating an already crowded British scene.

With a user base of roughly 1 million machines in Japan, and over 200,000 in Europe, the MSX makers have so far had little to worry about. They no doubt believe that as MSX establishes itself as a world standard, and as sales for the major British makes like Sinclair, Acorn and Commodore lose their momentum, Britain will eventually come to MSX as the mountain comes to Mohammed.

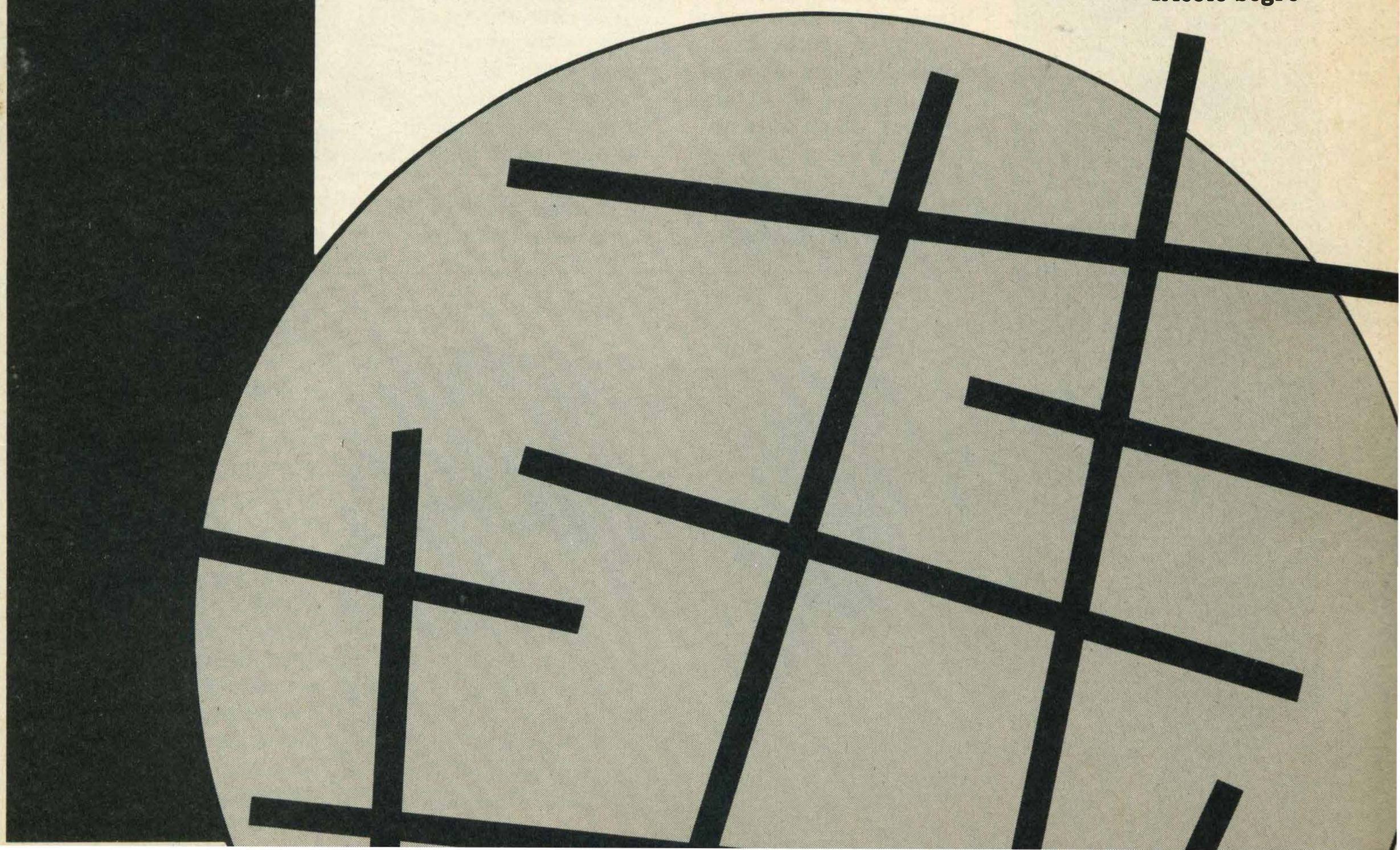
MSX observers have always been divided into two camps. There are those who say that MSX is bound to succeed because the Japanese never fail at anything. And there are those who say that this is the one time when the Japanese have got it wrong.

According to the pessimists, caution will be the undoing of the MSX manufacturers. By the time they make up their minds to actively promote and sell their wares, British add-on makers and software houses will have given up hope in MSX, other micros such as the Amstrad will be the new stars, and there will be no market to sell to.

The alternative view is that, still as shrewd as ever, the Japanese are well aware that British sales are important — not for so much for bulk as for prestige. If MSX is to be launched in the US — and the most likely estimate is that it will be in the shape of MSX Plus some time next year — it will do it no harm to arrive already equipped with a good British reputation. Therefore, at least some of the MSX manufacturers, if not the group as a whole, will be making strenuous efforts to grab a share of the British market this autumn, before it is too late.

So whichever camp you are in, now is the time to place your bets.

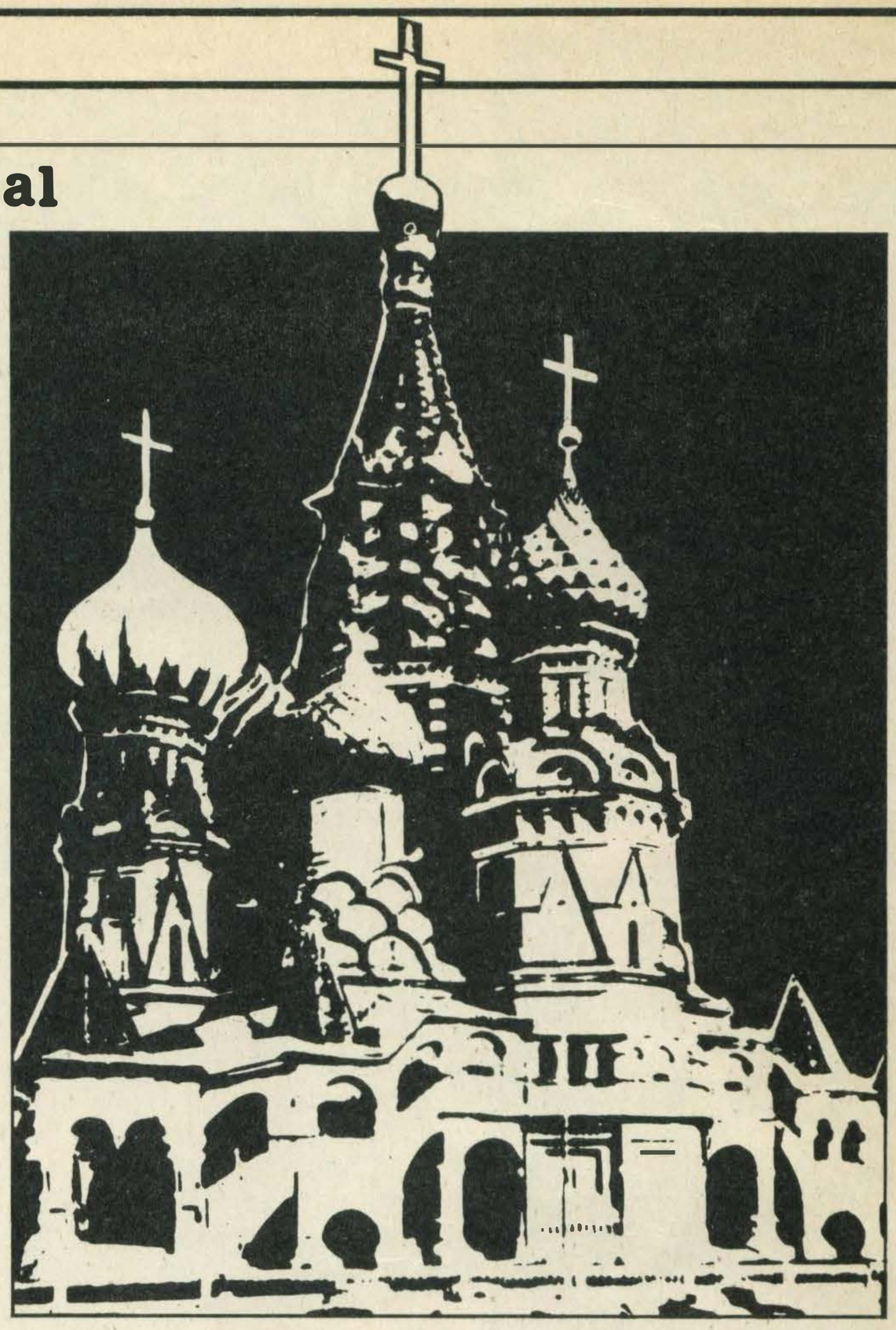
Nicole Segre



MSX

Pulse

Red square deal



Nippon Gaki Co, the Japanese manufacturer of Yamaha MSX computers, have won an order for 4000 micros destined for Russian schools. The deal is worth $1.3 million, and is thought to be just the start of a scheme which could involve up to 1 million MSX computers.

The order comes from the Soviet Institute of Science and Technology which will be testing the micros in 4000 schools before proceeding to equip educational establishments throughout the country. Star Micronics, the large Japanese printer company, is packaging the deal and supplying printers, video monitors and floppy disk drives to accompany the computers.

The MSX order has come as a bitter disappointment to British manufacturers like Acorn and Sinclair, both of which were hoping to capture the Soviet educational market.

Although an Acorn spokesman has dismissed the order as a 'short-term contract' which does not rule out the possibility of further orders going to his own company, it seems likely that the Russians will stick with MSX computers, whether from Yamaha or other suppliers.

'The Russians would not have gone for MSX unless they intended to standardise,' says John Locke of the MSX Working Group. 'This deal opens the door for all the MSX manufacturers.'

Toshiba is one of the companies said to be actively pursuing further contracts from the Russians.

The deal is not only another blow to British export prospects, but also lends new credibility to MSX. 'MSX was launched as a world standard,' comments John Locke. 'It now looks as if we are really beginning to see it as such.'

BBC MSX micro?

The benefits of the video chip used inside MSX computers can now be enjoyed by BBC micro owners and soon this will be extended to include Spectrum owners too. The chip is contained in a Sprite Board manufactured by Logotron and costing £179.95.

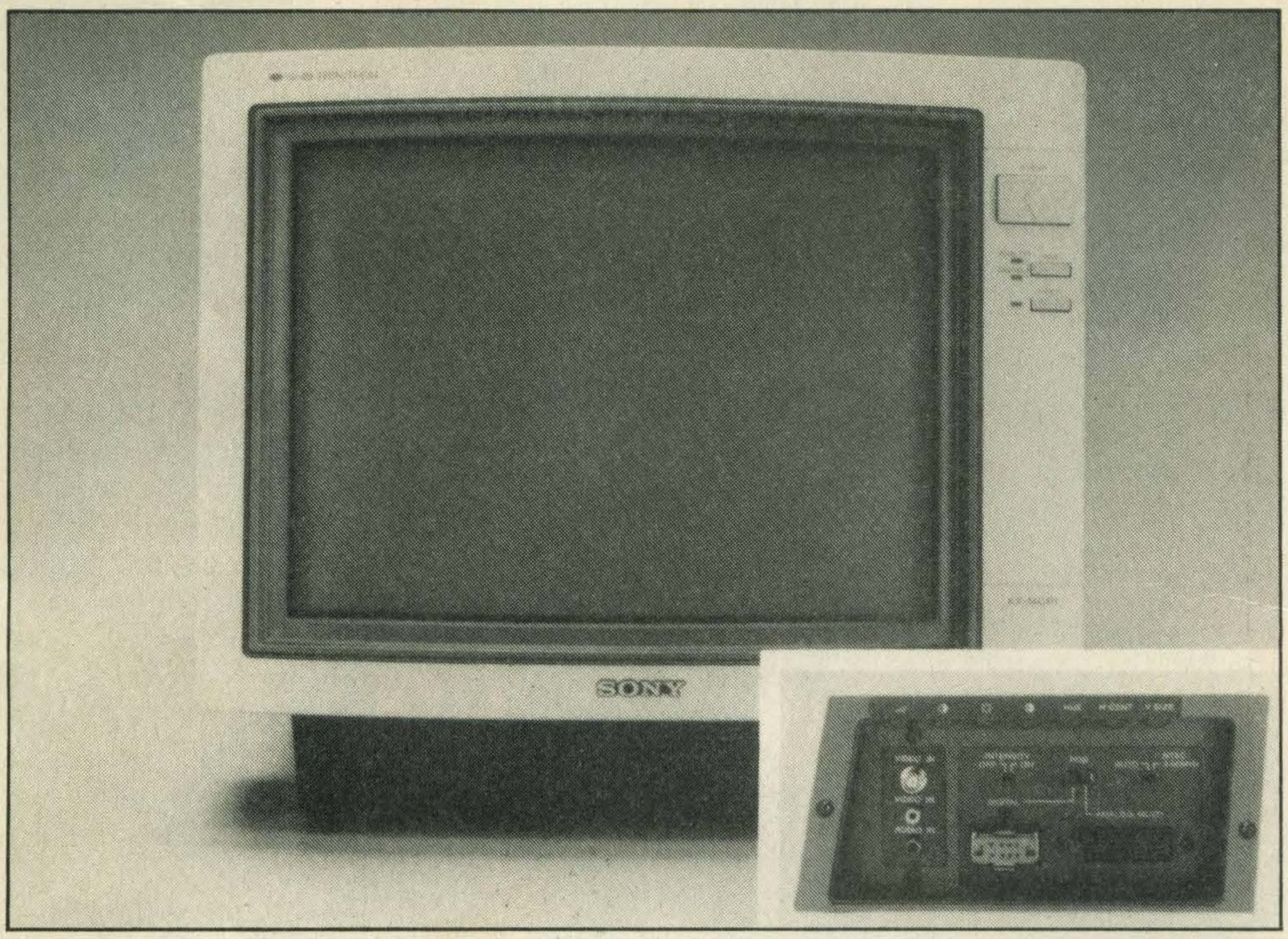
The Sprite Board is used with Logotron's full implementation of the Logo programming language. The chip runs in tandem with the host computers own video chip giving the facility for an MSX style graphics display while the resident processor in the machine displays text on a second monitor.

MSX mix up

A video camera mixer console by Unitron is being marketed under the name of the MSX Mini Studio even though it has nothing to do with the computer standard.

Throughout Unitron's advertising leaflet the unit is frequently referred to as 'the MSX' and the inclusion of Hitachi video cameras further confuses the issue. Microsoft are currently looking into the legal implications of the situation.

Top of the range



Sony have launched a top of the range personal computer monitor which is compatible with all four television systems.

Called the KX14CPI, the new monitor costs £400. It features Sony's Black Trinitron tube, which the company claims produces darker blacks and sharper contrasts. Inputs include 8 pin digital RGB, pin SCART with analog RGB, composite video and audio, separate BNC and phono composite video, and phone audio.

Sony Product Manager Simon Drury commented: 'The KX14CPI is for the true enthusiast. With its wide input capabilities and high resolution, it will be hard to beat in the small monitor market.'

Pocket package

A new low-price version of MicroPro International's well-known business packages, **WordStar** and **MailMerge**, has been launched in the UK.

Called **Pocket WordStar**, the word processing package is designed for home and small business micros, including all the MSX machines.

It is to be manufactured and marketed in the UK by Cumana, best known for their range of disk drives.

Pocket WordStar costs £149.

Microsoft manager

Microsoft, inventors of the MSX system, have appointed journalist Tom Sato to the new post of European MSX manager.

Based at Microsoft's UK headquarters at Windsor, Tom Sato's task will be to support European manufacturers and software houses with technical data.

The appointment is seen as a move towards encouraging and co-ordinating MSX activities in Europe and the UK.

New Club

The MSX Club of Tuxford, Notts, publishes a monthly newsletter which offers game tips, a mailbag, competitions, news and reviews. Subscriptions cost £3 for the first year and £1 for subsequent years.

For further details send a SAE to Lee Simpson, 3 Mayfair Place, Tuxford, Nr. Newark, Notts NG22 0GD.

X'Press release

The recently announced Spectravideo X'Press computer is not expected to be released in the UK until early 1986 according to Richard Sekula, the public relations officer.

'The machine we have in this country is a pre-production model and the specifications have yet to be finalised in Hong Kong,' says Sekula.

He added that the final production model would not vary greatly from the prototype but with nothing confirmed the version appearing in the shops could even be an MSX Plus.

The definite features of the machine will be the ability to switch between the three major disk operating systems: MSX-DOS, MS-DOS and CP/M. As an MSX machine the resident DOS will be MSX-DOS, with the other two systems being loaded from disk when required.

Spectravideo's unique MSX 80-column card will also be included in the X'Press and it is expected that an RS232C interface will be built into the machine.

The price is expected to be under £400 but Spectravideo are looking into the possibility of packaging the computer with a modem, printer and

Computer weekend

The *MSX User* Computer Weekend scheduled for November 22-25 at the South Mimms' Crest Hotel will be supported by Mitsubishi and negotiations are well under way with other manufacturers to ensure a wide range of the computers and peripherals currently available.

The weekend, organised in conjunction with Ardmore Adventure Ltd, will give MSX owners ample opportunity to improve their programming skills and to try out the latest MSX hardware and software.

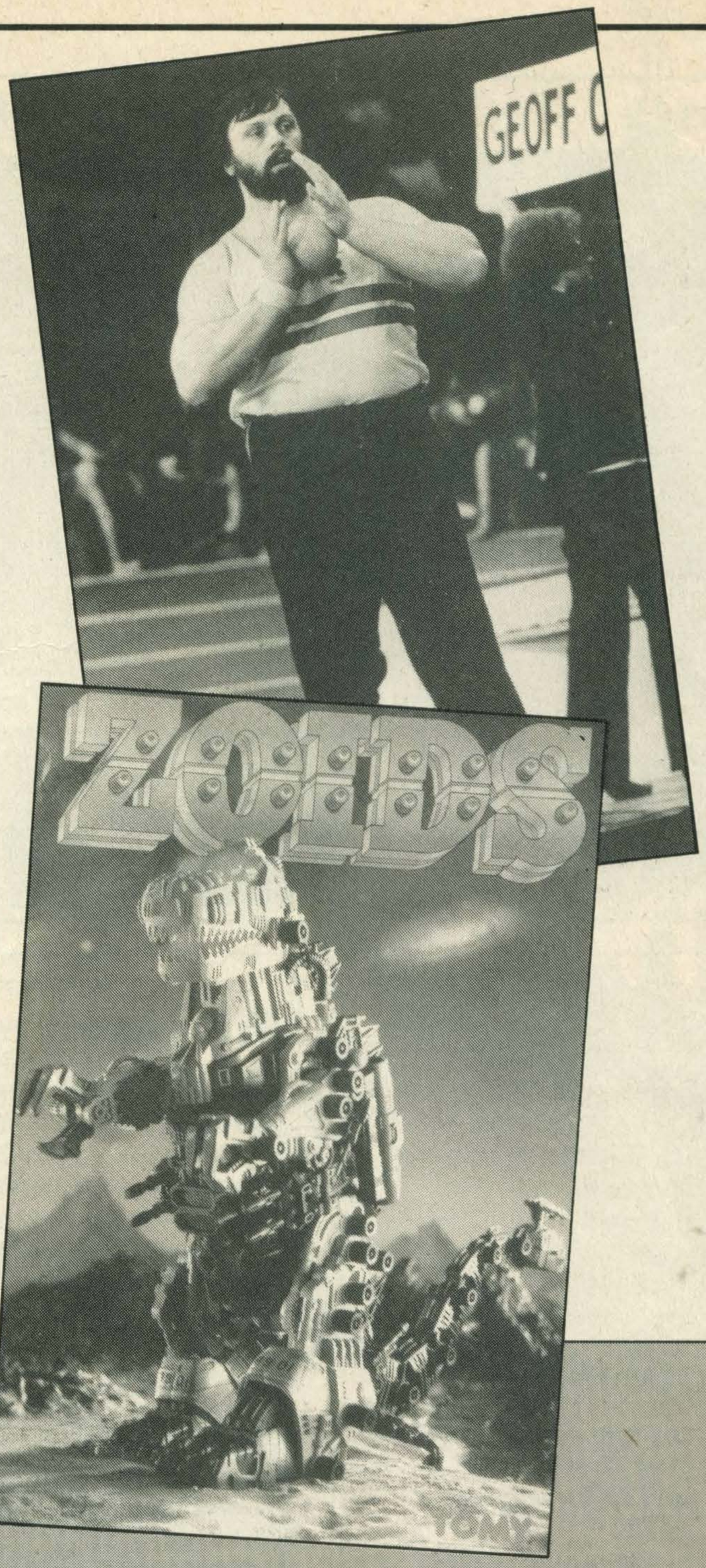
Further details are available from Ardmore Adventure, 23 Ramillies Place, London W1 (tel: 01-439 4461).

Strongarm tactics

Martech are muscling in on the MSX sports simulation scene with a new game based on the exploits of Geoff Capes, former Olympic shot putter and World's Strongest Man.

Although **Geoff Capes Strongman** does require a certain amount of joystick waggling, Martech claim that success depends on strategy, timing and quick reactions. One of the principal elements in the game is the pre-event training to bring Geoff up to his peak of fitness which will affect the outcome of the event itself.

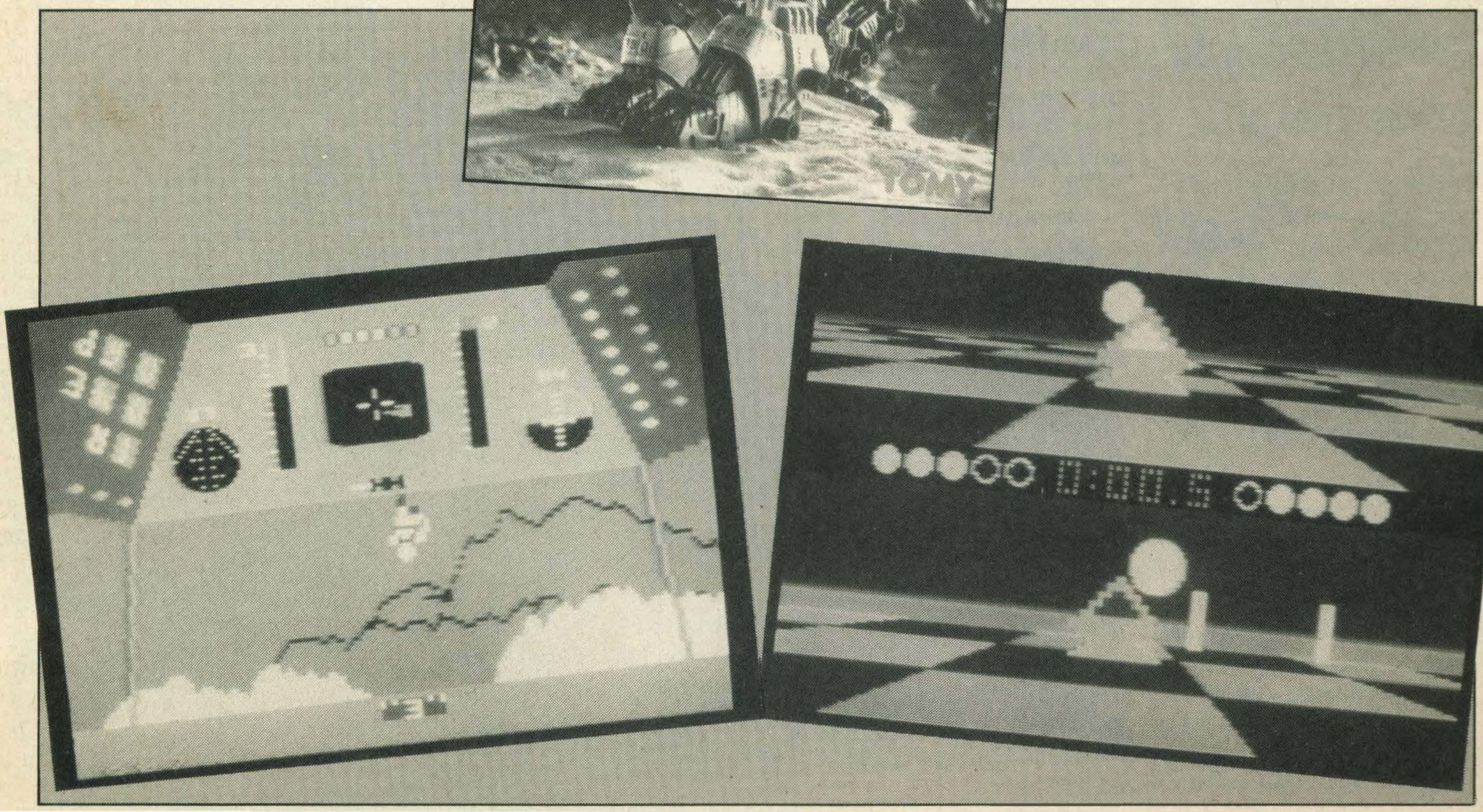
Martech are also producing a game based on the Zoid robot toy which is currently one of Tomy's most successful products. Zoids resemble robotic prehistoric monsters and Martech promise that **Zoids — the Battle Begins** will be set in 'one of the most hostile environments ever invented.'



Two new games from Activision are also in the pipeline. **Bullblazer** is an extremely fast-action ball game of the future in which two 'droids' try to score goals against one another. One player controls one droid and the other is controlled by either another player or the computer. The screen display is split horizontally and both droids' views are shown simultaneously.

Rescue On Fractalus is described as a strategy, action flight simulator. Flying your Valkyrie fighter, you scour the mountainous landscape in search of your comrades under fire from the inhabitants of the planet Fractalus.

The name of the planet is derived from the basic unit used to draw the landscape which is known as a fractal. Gregory Fischbach, Activision's President, admits that his programmers are having trouble with thir fractals on the MSX version and it is not known if the conversion will be successfully completed.

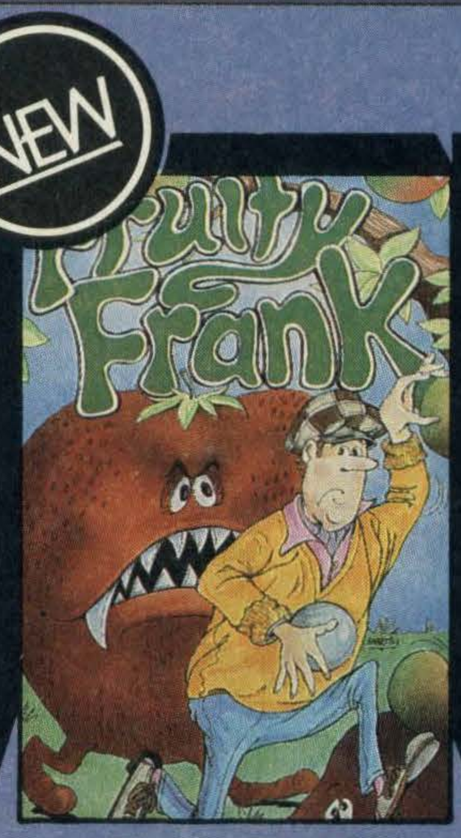


the first choice

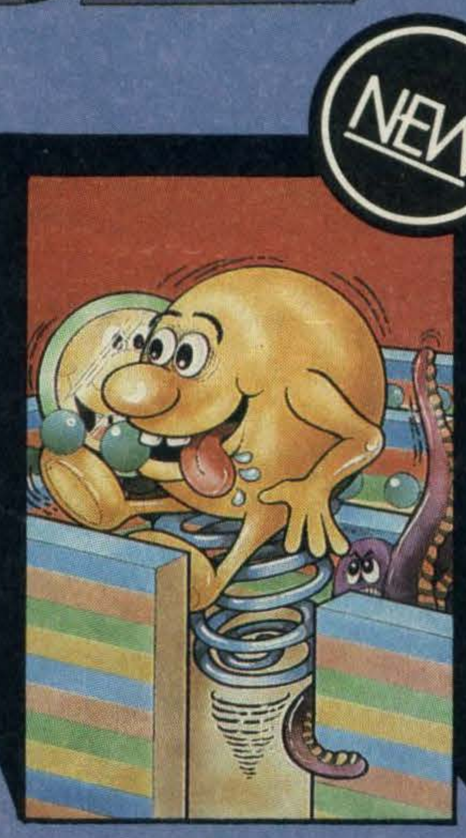
Kuma

Kubus

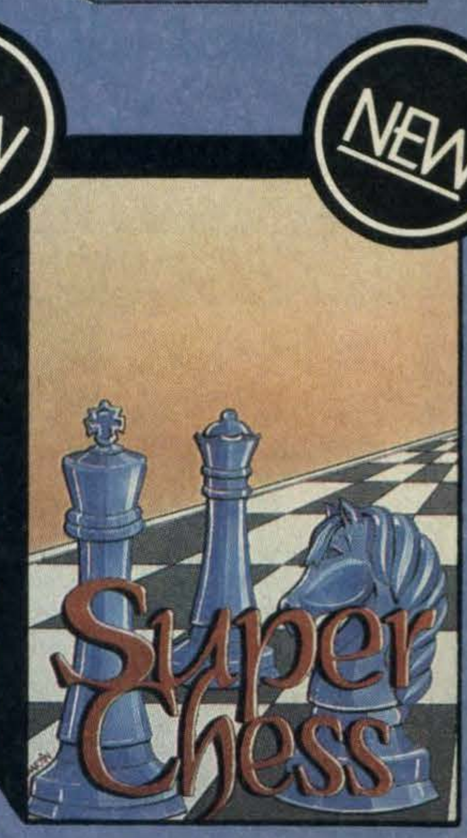
Spooks and Ladders



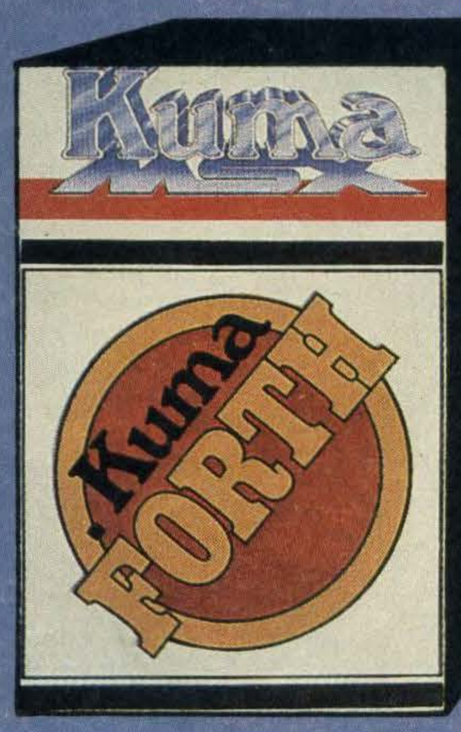
Fruity Frank



Shnax



Superchess

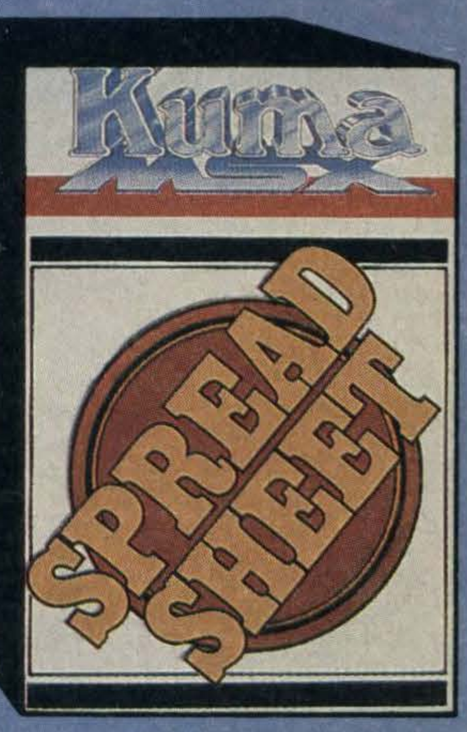


Kuma FORTH

Database

Zen Assembler

WDPRO



Spreadsheet

An outstanding selection from Kuma's rapidly expanding range of Entertainment and Application Software for the MSX Micro-computer.

- ***Behind the Screens of the MSX***
- ***Starting with the MSX***
- ***Starting Machine Code on the MSX***
- ***Programming in MSX Basic for serious and not-so-serious applications.***
- ***Ideas for MSX***

NEW TITLES *

ACCESSORIES

Visitors wishing to call at our Pangbourne Manufacturing and Distribution Centre are advised to phone 07357-4335 first for an early appointment.

Kuma Computers Ltd., Unit 12, Horseshoe Park, Horseshoe Road, Pangbourne, Berks RG8 7JW.

Please send full catalogue on MSX products.

Name .....

Address .....

.....

..... Phone.....

I own a .....MSX Computer.

MSX

Easy

New MSX computers and peripherals are pouring onto the Japanese market. Graham Knight reports

Yamaha Plus

Yamaha have released more than a dozen new MSX items including several new computers and a host of accessories. The top model from the new range is the Yamaha YIS604/128 which has now been on sale since June and is proving to be very popular with the more serious computer enthusiasts. This MSX Plus computer sells for the equivalent of £330 and has a total memory of 304K, made up from 48K for the BASIC ROM, 128K of RAM and 128K of video RAM.

The latest version of the popular Yamaha YIS503 retains the standard MSX specification, but now has two cartridge slots, and 64K of RAM memory. The new Yamaha CX11 music computer has the double cartridge slots, 32K of RAM, a programmable sound generator and R.G.B. video output.

Yamaha have released their own vertically styled, FD-05 floppy disk unit which can be used with all

MSX models. It uses the Sony 3.5 inch format and as it is double sided and double density it gives 720K of storage on a single disk. The disk unit sells for around £300 and has a socket on the back into which a second drive can be connected to give a total of 1.4 Megabytes of store.

The second disk drive is good value at around £220. To tie in with the release of the disk units Yamaha have released disk versions of their popular word processor, database, and mail list programs.

Yamaha music

On the music side Yamaha have announced the YRM-51 FM Music Macro MKII and the YRM-52 Voicing Program MKII — these latest versions can save data to disk.

Until now Yamaha have always released their Computer Music Collection on 'playcards'. These look like a sheet of music but have the data encoded on a strip at the foot of the page. The sheet is then passed through the CR-01 card reader and transferred into the computer memory.

Now that disks are available, Yamaha have released two 3.5 FM Voice Data programs on disk at just £10 each. They give a very effective demonstration of the synthesiser effects by playing everything from woodwind to percussion instruments.

The SFG-05 FM Sound Synthesiser Unit II is an updated disk version of the cassette based SFG-05. The new unit costs around £90 and the software has been changed to give a screen display which shows a full 49 key keyboard at the foot of the screen. The four selected voices are shown above the keys by a representation of four slider volume controls for each voice.

The 46 voices available include two strings, four organs, three pianos, four bass, harp, bells, oboe, clarinet, piccolo, trumpet, whistle, harpsichord, timpani, snare drum, percussion, vibraphone, storm effects, and more.

Until now there have been two keyboards which could be plugged into the SFG units. The existing smaller YK-01 44 key keyboard and the larger 49 key YK-10 have now been joined by a third keyboard. Designated the YK-20, this looks very professional. It has 49 full-size keys, and even has a stand for your old fashioned sheet music. As always the latest Yamaha MSX equipment is well to the front in the computer stores and is being extensively advertised on TV.

Casio comeback

Regular readers of this column will know that Casio recently stopped selling their £90 MSX computer. This PV-7 model has just 8K of RAM and although it sold well at the start of the year Casio ceased production when sales slowed down due to the release of new low memory models from Sanyo and Sony.

Casio have now made a comeback with a new model — the PV-16. It retains the rubber-type keyboard with the special 'hyper sports' buttons; it also has the usual cursor keys and is the only MSX

computer with a four position joy-pad. The price stays at £90 for the standard Casio which now has 16K of RAM. Plug-in memory cartridges allow the memory to be expanded to 32K or 64K.

Casio have also released a very competitively priced range of peripherals. They include the QD-7, a 2.8 inch, 64K per side Quick Disk unit at £110, and the IP-7 graphic tablet at £60. Other MSX products are Joysticks, a double slot expander and a data recorder — all available in the black styling which matches the PV-16 computer. Casio have an absolute winner in their CP-7 matching colour graphic printer which costs just £120.

Casio appear determined to take a big slice of the cheaper end of the market and the simultaneous launch of all these new products seems to have taken some of their competitors by surprise. Some thought that Casio had given up completely. As if to emphasise their commitment to MSX, Casio followed up the hardware release by announcing the availability of 20 Casio software cartridges — more than some makers have managed in the last two years.

Panasonic business

National Panasonic have released the CF-3300 MSX computer comprising a CPU unit which looks like a video unit and a separate detachable slimline keyboard. A built-in 3.5 inch disk unit is housed in the double-slot CPU unit and can be switched between single and double-sided operation. In the double-sided mode there is a total formatted disk storage of 720K.

The CF-3300 has 21-pin SCART connector for composite and RGB video outputs. One thoughtful feature is that the CPU unit has switched power sockets on the back into which peripherals can be plugged — thus reducing the spaghetti of cables. Users of the older CF-3000 model will be pleased to see that Panasonic have added a recessed reset key on the front panel — it was sadly missing from the CF-3000.

This MSX seems to be aimed at the business market as the detachable keyboard includes a numeric pad and each computer is supplied with the CP/M like MSX-DOS disk operating system. There are now over 100 Japanese business programs available which run on MSX-DOS. This integrated disk and computer system is remarkably efficient taking just 33 watts of power from the mains.

Colour printer

Sanyo's new MPT-10 colour printer is already selling well in the shops. Priced at around £230 this Sanyo printer uses a thermal transfer method which allows users to print pictures from MSX screens in vivid colours.

Most of the software to control the printer is contained in an MSX cartridge and the printer is connected to the computer via a standard printer cable. It is very easy to use and customers can adjust the intensity of the colours with a simple dark-light slider control.

Full-size Seiko

Previous issues of East detailed the success of Seiko with their small GP-50MX MSX printer which sells for £90. Seiko have now followed it up by releasing the GP-500MX, a full-size tractor-fed printer which takes paper up to 10 inches wide. It is one of the few printers which can print the full MSX character set in either 8 × 7 or 8 × 12 dot letters.

A special software tape is supplied which allows the user to copy high resolution MSX screens. The GP-500MX can also be used in conjunction with the Yamaha **Music Composer** cartridge to print out the music in sheet form. The GP500-MX is compact in size, weighs under 5Kg and costs around £150.

MSX fairytale

Like their European counterparts Japanese children used to read their fairytales from books and then colour in the illustrations with crayons or paint. This tradition is about to be changed by ASCII-Microsoft who have just released 25 MSX storybooks costing £12 each. These are cassette tapes which have been cleverly packaged to look like books and each is for a different children's fairytale.

The kids now load the Little Red Riding Hood cassette into the family computer and watch the story unfold on their TV screen. The most popular cassette seems to be Cinderella which has excellent colour graphics showing the princess scrubbing the stairs, travelling in the silver coach, dancing with the handsome prince, losing her slipper etc.

When the children reach the end of the story they are shown black and white pictures of the scenes whicht hey can then colour in using the cursor keys to control the paint brush. Thanks to the programmers at ASCII and MSX computers, the story of The Three Bears might never be the same again.

MSX

Pathfinder

Steve Lucas helps you to beat the cheats and banish the bugs in your games listings

After the flurry of activity over the last few months, no new MSX adventures have been seen recently, so I am taking the opportunity to take a closer look at assorted aspects of adventure programs.

I was first introduced to Level 9's adventures some three years ago on the BBC B, and one of the most exciting changes made to the MSX versions is the programming of the function keys. It really does make playing the game much easier if the most common adventure instructions are assigned to these keys. In fact I've now got into the habit of running a short program to define the ten keys (**listing 1**), before loading or running any adventure game in my Toshiba.

Listing 1

```
10  REM ** define keys for
    adventure games **
20  KEY ON
30  A$ = CHR$(13)
40  KEY 1, "north" + A$
50  KEY 2, "south" + A$
60  KEY 3, "east" + A$
70  KEY 4, "west" + A$
80  KEY 5, "inventory" + A$
90  KEY 6, "help" + A$
100 KEY 7, "score" + A$
110 KEY 8, "look" + A$
120 KEY 9, "examine" + A$
130 KEY 10, "search" + A$
140 RUN "CAS:"
```

Before you rush over to the keyboard to type it in, it is worth spending a few moments to consider which words you want to assign to the keys. Most people will want to store the words north, south, east and west in the first four keys. It makes most sense to use instructions which can be entered in one go such as 'inventory', 'examine', 'look' etc rather than words which need to be accompanied by other instructions such as 'get', 'eat' or 'open'.

Line 20 of the listing makes the computer display the key definitions at the bottom of the screen, but what is the purpose of A$? If you take a quick look at the ASCII codes at the back of your manual, you will see that character 13 corresponds to CR (Carriage Return), which, when added to the end of the key definitions, is equivalent to pressing the RETURN key. If you do decide to define keys for common words such as 'get', 'eat' and 'drop' do make sure that you don't add the ' + A$', or you won't be able to type in the second word of your instruction. The final line of this listing is used to load and run the main adventure. Once this program has been run, all you have to do to move around or ask for help is to press the appropriate function key.

A number of people have recently complained to me about adventure listings in magazines (not just this magazine I hasten to add). One person in particular claimed that it was possible to solve 99 percent of all adventures in magazines by examining the listings. Now that, to me, seems to defeat the point of an adventure and would certainly spoil the fun of playing a game.

Nevertheless, it does raise an interesting point: how can you make it more difficult to solve an adventure? You could, of course, write the game in machine code, but most magazines don't want to include machine code programs because assembly listings take too much space in the pages and straight machine code is a bind to type in. In any case, the ardent cheat can still solve the game by disassembling it.

Whatever language the game is written in, the author will still need to find some way to code the descriptions of objects and locations. Adventure listings in magazines usually contain a section where these descriptions, held in DATA statements, are read into the elements of an array. The typical listing would look something like:-

```
100 DATA in a small
    garden. A gate to the
    north leads into a
    dark forest., 100, 24,
    45, 34
110 DATA outside a small
    cottage. The door is
    open and I can see a
    fire burning in a grate
    inside.,78,56,45,33
```

What we need to do is to somehow encode the descriptions so that they don't make much sense to the reader. One method of achieving this is shown in **listing 2.**

Try typing this listing in and RUN it to see what happens. You should see the message:

"jo!b!tnbmm!gjfme!
pg!dpxt/!Uifsf!jt!bo!pme!
gbsnipvtf!up!uif!opsui!
boe!b!cpz!sjejoh!po!b!
usbdups!dbo!cf!tffo!
up!uif!fbtu/"

Even such a simple code is going to make life more difficult for the cheat. Most people will be able to spot that the letters have been shifted

```
10 rem ** illustrates coding descript
ions of locations in an adventure gam
e **
20 screen 0
30 read a$
40 rem ** data for the description **
50 data "in a small field of cows. Th
ere is an old farmhouse to the north
and a boy riding on a tractor can be
seen to the east."
60 b$="":c$=""
70 for x=1 to len(a$)
80 b$=mid$(a$,x,1):d=asc(b$)
90 c$=c$+chr$(d+1)
100 next x
110 print c$
```

Listing 2

along the alphabet by one so that a becomes b, b becomes c, and so on. To do this, the computer has READ the description of the location into the variable a$, looked up the ASCII code for each letter, added one to it and then stored the character associated with the new letter in the variable c$. In this way, the code for the space betweeen letters (ASCII code 32) is converted to! (ASCII code 33), which makes it fairly obvious what I have done. Note that when this program is run, all the variable names will be

```
10 rem ** decoder **
30 read a$
40 rem ** coded data **
50 data "jo!b!tnbmm!gjfme!pg!dpxt/!Ui
fsf!jt!bo!pme!gbsnipvtf!up!uif!opsui!
boe!b!cpz!sjejoh!po!b!usbdups!dbo!cf!
tffo!up!uif!fbtu/"
60 for x=1 to len(a$)
70 b$=mid$(a$,x,1):d=asc(b$)
80 c$=c$+chr$(d-1)
90 next x
100 print c$
```

Listing 3

converted to upper case by your MSX computer. Thus a$ becomes A$, b$ becomes B$ etc. This makes no difference to the operation of the program.

This short listing shows how you can code the data, but you still have the arduous task of rewriting the descriptions of the locations into the new, coded form. The easiest way of doing this is to get the computer to code each one in turn and then copy the coded version into the DATA, one line at a time. Having done this, you will then need to devise a method of decoding the data so that the description given to the player makes sense.

Listing 3 illustrates how to do this. It is, in effect, an exact mirror image of the other program, where you would subtract one from the ASCII code rather than adding it. The program would, of course, need to be modified so that it uses the array chosen in your game rather than just a$, b$ and c$ before it can be included within the framework of the main game.

Adding one to the ASCII code will delay the cheat for a short while, but it is certainly not the most difficult code to crack. There's no reason at all why you should not shift the letters by 2, 3 or even 24 positions, but do be careful that you don't shift the letters by so much that the coded version contains ASCII codes greater than 255 or less than zero, as these will cause the computer to throw up errors.

The first thing a codebreaker will do is to look for obvious characters which identify the ends of words. If these are easily identified, it is a total giveaway to the cheat. For that reason, it makes most sense to shift the letters so that the space between words becomes a letter of the alphabet, thus making it more difficult to spot. A space has the ASCII code 32, whilst the letter A is 65 and a is 97, so shifting the letters by adding 33 or 65 will change the space to letter A or a respectively.

There are many other ways of coding the DATA in an adventure so that it becomes much more difficult to solve without actually playing the game. One of the most effective methods is to compress the data using a code like that used by Level 9. Such methods are, however, unlikely to be effective in BASIC because the computer will spend so much of the time decoding the descriptions that the response time will suffer. If you have found a method of coding data which is both fast and effective, do write in and let me know.

Despite the complaints from one or two people about how easy it is to solve a game from the listing alone, the vast majority of complaints about adventure listings comes from people who are having difficulty getting the program to work in the first place. A magazine has to cater for all of its readers and if it were to include listings in which the data lines were coded, far more people would have problems.

Many of the readers of this magazine will be new to computing and to be faced with the task of typing in a long listing in which the data doesn't make much sense must be a daunting experience. There is nothing more frustrating to a beginner than spending ten or more hours typing a listing from the pages of a magazine only to find that it it won't work. To an expert, it is comparatively easy to locate the source of that SYNTAX error in line 1270, which is really due to typing a full stop instead of a comma in a DATA statement in line 4000, but a newcomer is unlikely to be able to trace this sort of mistake.

While on the subject of debugging adventure listings, it is worth spending a little time looking at the most common causes of errors. Although it is not unknown for magazine listings to contain errors, the vast majority of letters and phone calls I've had from readers having problems with adventure listings are due to mistakes made when typing in the DATA lines. Descriptions of locations are usually READ into arrays and if the DATA is not typed in exactly as it appears in the listing, then the computer will generate an error in the line where the data is read and *not* in the line where the mistake occurs. Consider the following example showing part of an adventure game which refuses to work.

```
110  FOR X = 1 TO 100
120  READ A$(X)
130  FOR Y = 1 TO 4
140  READ S%(X,Y)
150  NEXT Y,X
160  DATA on a road
     leading into the
     park,2,3,4,5
170  DATA in a zoo.3,5,6,
     3,4
180  DATA by the lion's
     cage, 4,3,,4,6
190  . . . . . etc.
```

There are three mistakes in the DATA lines and when the program is run, it will show either an out of data error or a syntax error. If you look at the lines between 110 and 150, you will notice that it is trying to read the DATA for 100 different locations into the two arrays, A$(X) and S%(X,Y). For each value of X, the computer will read the description of the location into the array A$(X) and the four numbers corresponding to the directions into the array S%(X,Y). The computer is thus expecting to find five items of DATA on each line and these must each be separated by a comma.

Moreover, the data *must* be in the order of description followed by four numbers and if the computer finds any discrepancy, it will throw up an error. To the trained eye, it is fairly easy to see where the errors have occurred, but to the beginner this can be something of a nightmare.

The first error occurs in line 170, where the description of the location is separated from the first number by a full stop rather than a comma. A second fault is to be found in this line as well: there are five numbers instead of the four the computer is expecting. The error in line 180 is where there are two commas separating the numbers instead of just one. This is a very common mistake, due to holding the key down for too long. Of all the problems I've had referred to me, most have been due to the incorrect placement of commas in the DATA lines, so do take extra care when typing in these lines.

Finally, it is well worth while checking that the DATA is being read into the array correctly by inserting a couple of extra lines immediately after the data has been read:-

```
125  PRINT A$(X)
and
45   PRINT S%(X,Y)
```

When the program is RUN, the computer will print out the description and the four numbers, which can then be compared with the listing to ensure accuracy. Once you are sure that this section works correctly, you can then delete these two lines.

MSX

Electric Shock

Special Offer

Make the most of your chance to buy six great games at bargain prices

Bargain prices for computer software are few and far between in the MSX world but Electric Software are offering *MSX User* readers 20% off six of their popular games. As an added bonus, if you have four of the other six titles and you can even have **Norseman** for free.

These are the titles available:

Buzz Off — Guide the bee to the fruit while avoiding the spider's web.

Shark Hunter — Save your fish farm from the ravages of sharks and ice floes.

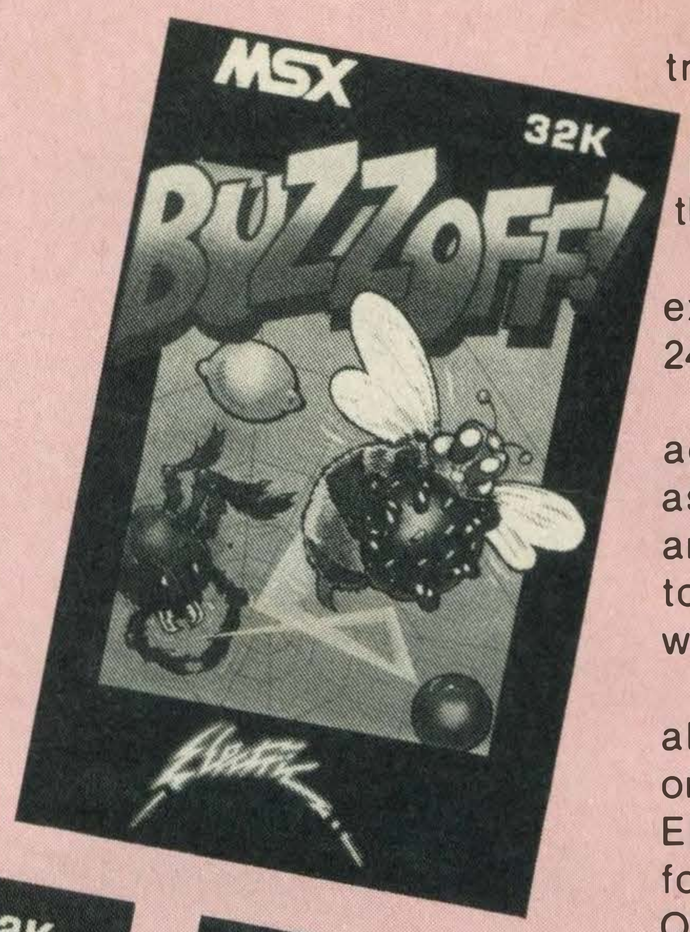
Norseman — Collect helmets and battle with trolls on a hexagonal-celled board.

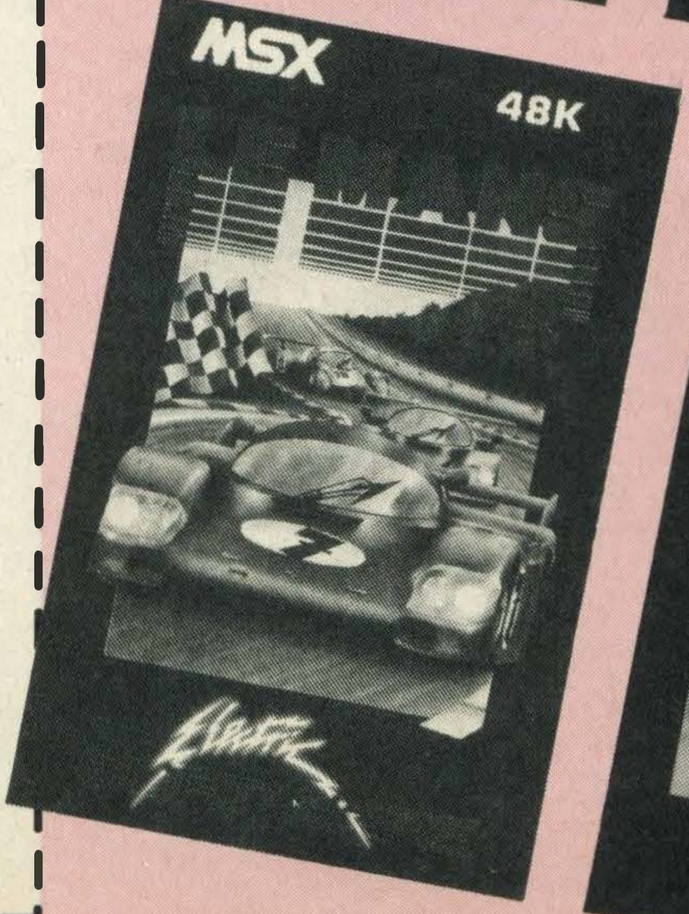
Backgammon — The traditional boardgame which allows you to practice your skills against the computer.

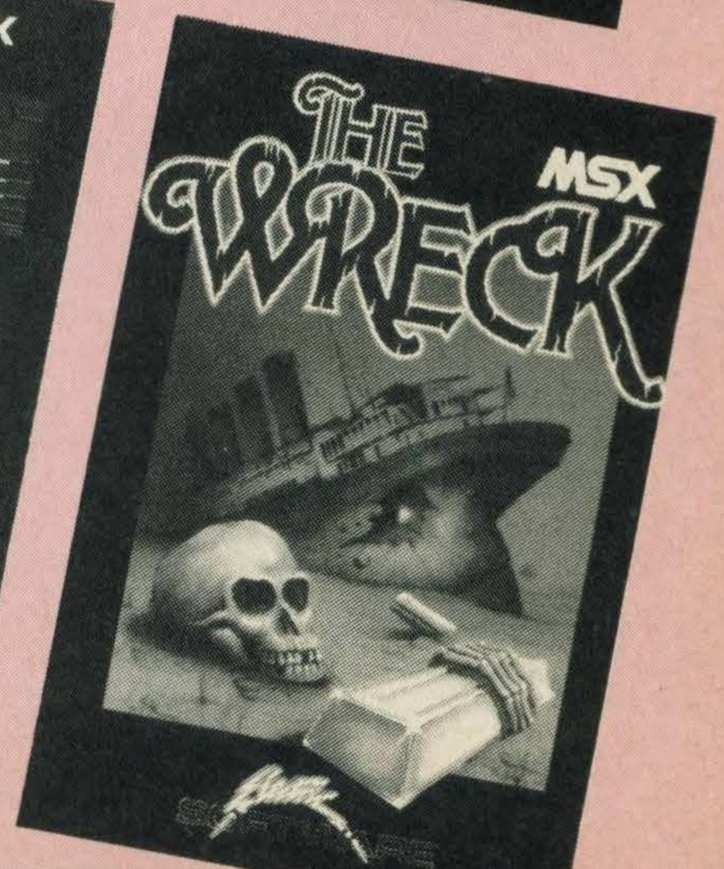
Le Mans — All the excitement of the famous 24-hour race in 3D action.

The Wreck — Battle against guardian jellyfish as you solve the 3D mazes and find the combinations to the safes on board the wreck of the bullion ship.

The offer is available to all UK readers only and orders must be received by Electric Software on the form provided by 31st October, 1985.







Title	Format	Normal Price	Special Offer	Quantity	Total
Buzz Off	cass	£7.95	£6.35		£
Shark Hunter	cass	£8.95	£7.15		£
Norseman	cass	£8.95	£7.15		£
Backgammon	cass	£9.95	£7.95		£
Le Mans	cass	£9.95	£7.95		£
The Wreck	cart	£14.95	£11.95		£
				P/P	£0.50

I enclose a cheque/postal order for the sum of £

I have selected four titles and claim a free copy of Norseman

Name .....

Address .....

.....

Postcode .....

Send your coupon to Electric Software, 91 High Street, Longstanton, Cambridge CB4 5BS.

MSX

Screens on your MUD

Is British Telecom's new MUD pack offer merely cosmetic? Nicole Segre ventures forth to find out

By this time this issue of MSX User appears on your newsagent's shelves, British Telecom will have launched MUD upon an unsuspecting world. What is MUD? How does it affect the MSX owner? And why is British Telecom involved with it?

To obtain the answers to these and related questions, I spoke to Mike Anderiesz of New Information Services, the sub-section of British Telecom charged with perpetrating the folly, as some might think, that is MUD.

MUD stands for Multi-User Dungeon and is an interactive real-time role-playing adventure game for children in the older age group — say around 35. Players must have a home computer — any make will do — plus a modem enabling them to access the game via the telephone line. They must also have nothing better to occupy them between the hours of 6pm and 8pm or at weekends.

The original version of MUD was the product of the fevered imagination of a computer studies undergraduate at Essex University called Roy Trubshaw. Like many of his fellows back in 1979, Trubshaw used to spend much of his free time playing Colossal Caves, the daddy of all adventure games, on the University's DEC-10 mainframe computer.

Much as he liked the game, Trubshaw felt that there were several ways in which it could be improved. The main drawback he saw was that only one person could play. Since the DEC-10 had a timesharing facility, why not arrange it so that several people could log on simultaneously and share the fun?

Trubshaw started writing MUD as part of his final year project and developed a special language for it which has become known as MUDDLE. The game caught the fancy of one of his tutors, Richard Bartle, who took over where Trubshaw left off. Bartle has been embellishing and purifying MUD ever since.

Meanwhile, MUD became so popular at Essex University that access to the adventure had to be restricted to the period between midnight and 7am. Today these unsociable hours do not deter some 2000 regular subscribers from competing fiercely with each other to log on every night, 30 at a time, in order to resume their adventuring.

A Compunet version, for Commodore owners, has proved just as successful, even though it costs around £3.50 an hour, where the Essex University version is free. (However, Richard Bartle cheerfully admits that the Essex game crashes more often, due to his own propensity for changing the game whenever he feels like it.)

In 1984, Richard Bartle, Roy Trubshaw and publisher Simon Dally set up a company called MUSE (Multi-User Entertainments) whose purpose was to market MUD. Last April, MUSE signed a deal with British Telecom to co-publish MUD and any possible future MUSE productions. As a result, MUD was translated for a British Telecom VAX 750.

British Telecom boast that the version of MUD that is about to burst upon the screens of eager micro owners everywhere is the biggest interactive computer game in the world. As in the prototype, the aim of the game, if it can be defined at all, is to pursue items of treasure through a chequered landscape, and to rise in status by the accumulation of points. A new player will start as a novice and nope to proceed through such conditions as hero, champion, super-hero and legend to achieve the ultimate rank of wizard, or witch, or wiz if you prefer.

Because it has had the benefit of 50,000 hours of writing and testing, the BT version of MUD has a much greater variety of locations — 1000 compared to 400 at Essex — as well as many more spells and commands. The VAX 750 host computer can also accommodate more people — up to 100 at a time.

Players might find themselves ranging back and forth in time, exploring an Indian temple or ascending to a cloud in a hot air balloon. They might slay fiendish opponents, or they may even be killed themselves, only to be resurrected and start all over again as novices.

But even such variety and excitement is not the chief attraction of the game, according to Mike Anderiesz. 'MUD is a means of communication with other people, an electronic forum,' he says. 'Other players have to be reckoned with. They might steal some piece of treasure from right under

your nose, or they might be feeling magnanimous and give you a helping hand. Even though players assume false names, after a while youg et to know who is who and what they are up to.'

With luck, you might find a particularly friendly character who is willing to take you aside and give you some much needed advice. Wizards have special powers; they can enter closed rooms, kill mortals or transport them to a different place, and animate objects.

Wizards are also immortal, and enjoy the privilege of two commands not available to mortals. One is SNOOP, which enables them to spy on everyone while remaining invisible. And the other is FORCE, which allied with SHOUT can oblige some unfortunate player to have a message such as "I am a total wally" displayed on every other player's screen.

As a result, wizards are valuable as allies but much to be feared as foes. Some, like the notorious Century on the Essex system, make themselves hated by everyone, so that players must form posses in order to restrain them.

'Wizards can muck about,' says Mike Anderiesz, 'but they also police the game. For example, you had better watch your language while playing or a wizard might FOD you.' FOD stands for Finger Of Death, and is not used too often because it is 'not done'.

To add to the complications of all this interaction, the new MUD has computer-generated characters, known as intelligent mobiles. Anderiesz promises that these alarming products of artificial intelligence will often be indistinguishable from real players.

How does an MSX owner join in this mayhem? If you have already purchased a modem in order to access something sensible like Prestel or Telecom Gold, all you need now is a MUD pack. Available only by mail order, the pack costs £20 and consists of a map, a security card and instructions on how to play.

It also includes 30 credits allowing two hours of free introductory play. Thereafter, credits must be purchased in advance in batches of 50. Each credit provides six minutes of play and costs 20 pence, so playing MUD for one hour costs £2. Telephone charges must be added to this and can range from about 40p an hour local rate — since MUD can only be played during off-peak hours — to about £4 an hour using PSS.

British Telecom have devised their pre-payment system to make sure that MUD addicts do not suddenly find themselves running up a fortune in the heat of the moment. 'It is in their interest as well as ours,' says Mike Anderiesz.

If you do not already own a modem, then the cost of playing MUD will be even higher. There are a number of modems on the market, ranging in price from £50 to £200.

Your troubles will still not be over, however, because you will probably need an RS232 interface to plug into your cartridge port. Computer Mates do an interface and communications software package (which also includes a word processor and card index) for a mere £229. The Toshiba HX-R700 costs £99, and Kuma's interface costs £99.95, plus £19.95 for the software.

Clearly, playing MUD is going to be an expensive hobby. But British Telecom is confident that it will more than pay its way.

'Modems are currently selling at the rate of around 3-4000 a week, says Mike Anderiesz, 'and this already offers scope for promoting MUD mania.' Among existing modem owners, BT are taking special aim at some of the Essex University players who might be lured by the wider possibilities offered in the new version. The fact that the Essex computer recently had people logging on from as far afield as Japan, San Francisco and New York on the same morning, and that the 60-odd wizards on the system include a 13-year old schoolboy, are some indication of widespread dedication to the sport.

A survey of MUD players has also revealed that over 50% played almost every night and that the average duration of play was 3½ hours. 'It certainly is addictive,' comments Mike Anderiesz.

BT are also hoping that MUD will be the spur to encourage people to buy modems and in this way be lured into the wider world of communications, making more use of BT's own viewdata systems.

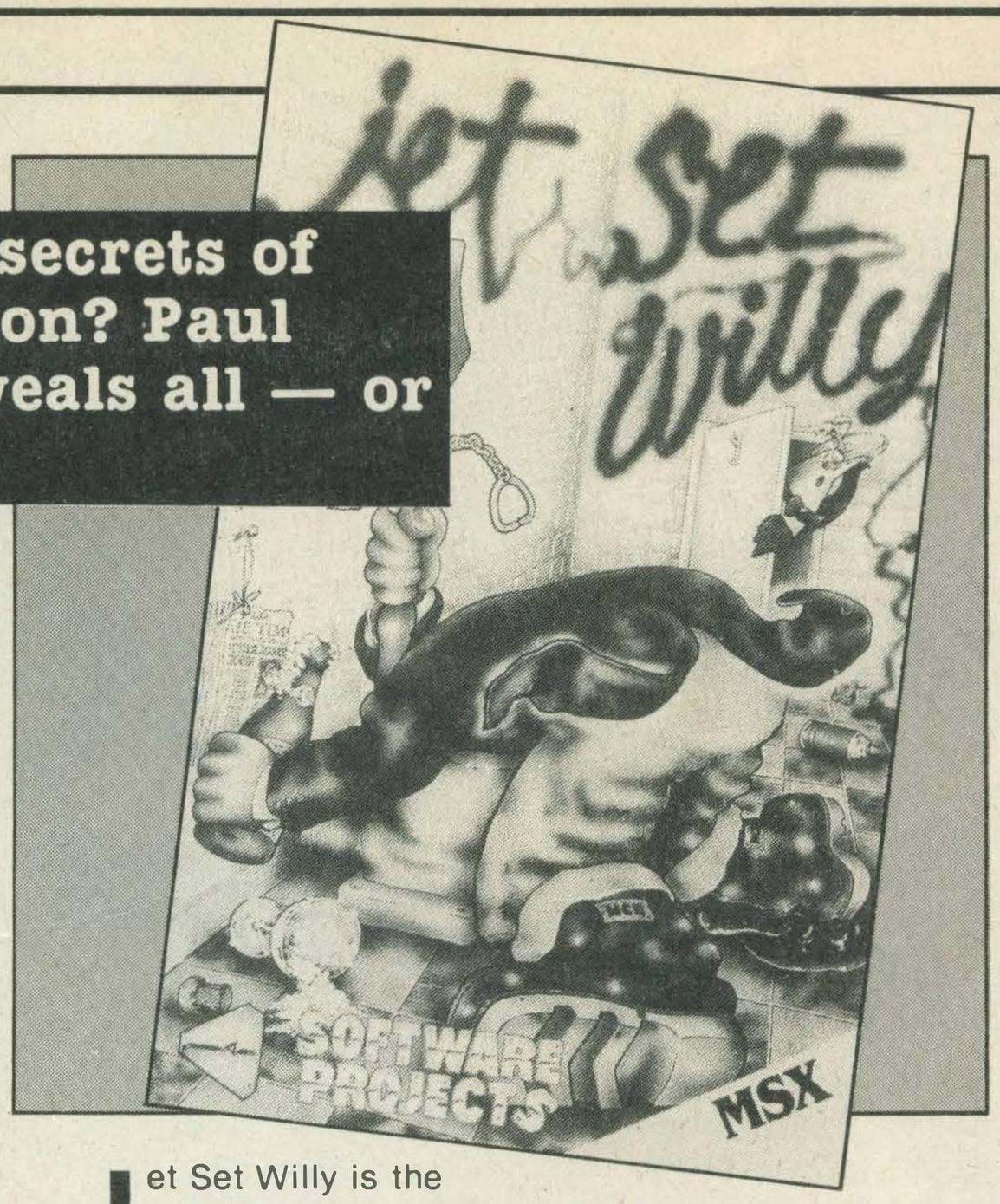
As part of the launch of the game, BT will be staging a grand MUD Spectacular, with players slugging it out for a prize in typically indecorous fashion, on November 5th at the London Dungeon. A special offer allows early buyers of the MUD pack to explore the game and learn the ropes without using up their credits. But on November 6th, the date of the official start of the game, all these players will be returned to the rank of novice, however far they have got.

So if you think you might be mad about MUD, this could be the time to ring the special MUD line on (01) 608 1173.

MSX

Jet Set Willy

What are the secrets of Willy's mansion? Paul O'Sullivan reveals all — or nearly



Jet Set Willy is the follow up to Manic Miner and tells the tale of the dissolute life that miner Willy leads after making his fortune in the mines. After a particularly wild party, his wife refuses to let him go to bed until he has gone through their weird mansion and cleaned up all the mess.

The game consists of 60 rooms containing various obstacles and although this article does not aim to give away all the secrets of Willy's house, it does provide a useful 'tourist' guide to the game.

Rooms are normally entered by walking off the side of the screen and Willy reappears entering the next room. Other exits take the form of trapdoors and ropes. Willy simply falls down the trapdoors but the ropes require a little skill.

Rope swings

These appear in rooms 3, 6, 25, 35 and 48. To ascend a rope swing, the joystick must be moved in the opposite direction to the one in which the rope is swinging. For example, if the rope is swinging left to right then the joystick should be moved to the left to ascend. To descend the opposite rule applies, and in the example given the joystick should be moved to the right.

If you wish to fall back onto a rope from either room 5 or room 18 you must walk left as the rope swings left. If you move right you will loose a life as Willy misses the swing.

In rooms 3 and 48 the swing cannot be fully ascended. To appear at the bottom of room 3, for example, you must wait until the rope swings fully right or left and then jump. This is all a matter of timing and may mean the loss of several lives before the technique is perfected.

Warping

Warping is possible from rooms 5 and 8. In room 5 you must go the highest point, via the diagonal line, and then jump. Willy reappears in room 57.

In room 8, after collecting both of the objects, jump when Willy is on the edge of the conveyor belt and he will reappear in room 40.

On a deathly note

It is not advisable to 'Rescue Esmerelda', as the name of room 8 implies, because it causes Willy to lose another life despite his chivalrous act.

You get a similar, but more disastrous, result at the 'Entrance to Hades', room 58. On entry to the room, Willy falls to his death on chattering skull and this repeats and repeats until all the remaining lives are used up. No wonder the words 'Die Mortal' are emblazoned across the screen.

Do not jump directly on the rope in room 48 unless you want Willy to catch an arrow in his eye and die like King Harold.

Resist the temptation to jump on the toilet in the first room no matter how desperate you are because a flash in the pan later you will be minus another life.

And finally . . .

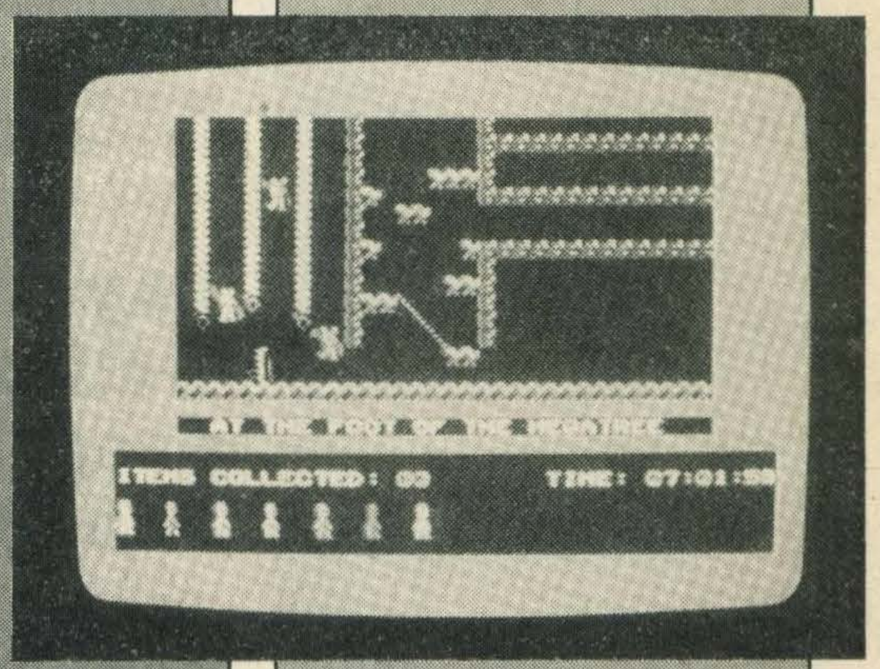
Take great care when entering a new room. If possible, position yourself in a safe place and study the movements of the nasties because they always follow a pattern. Taking a little extra time in this way can save a life which you will be grateful for later.

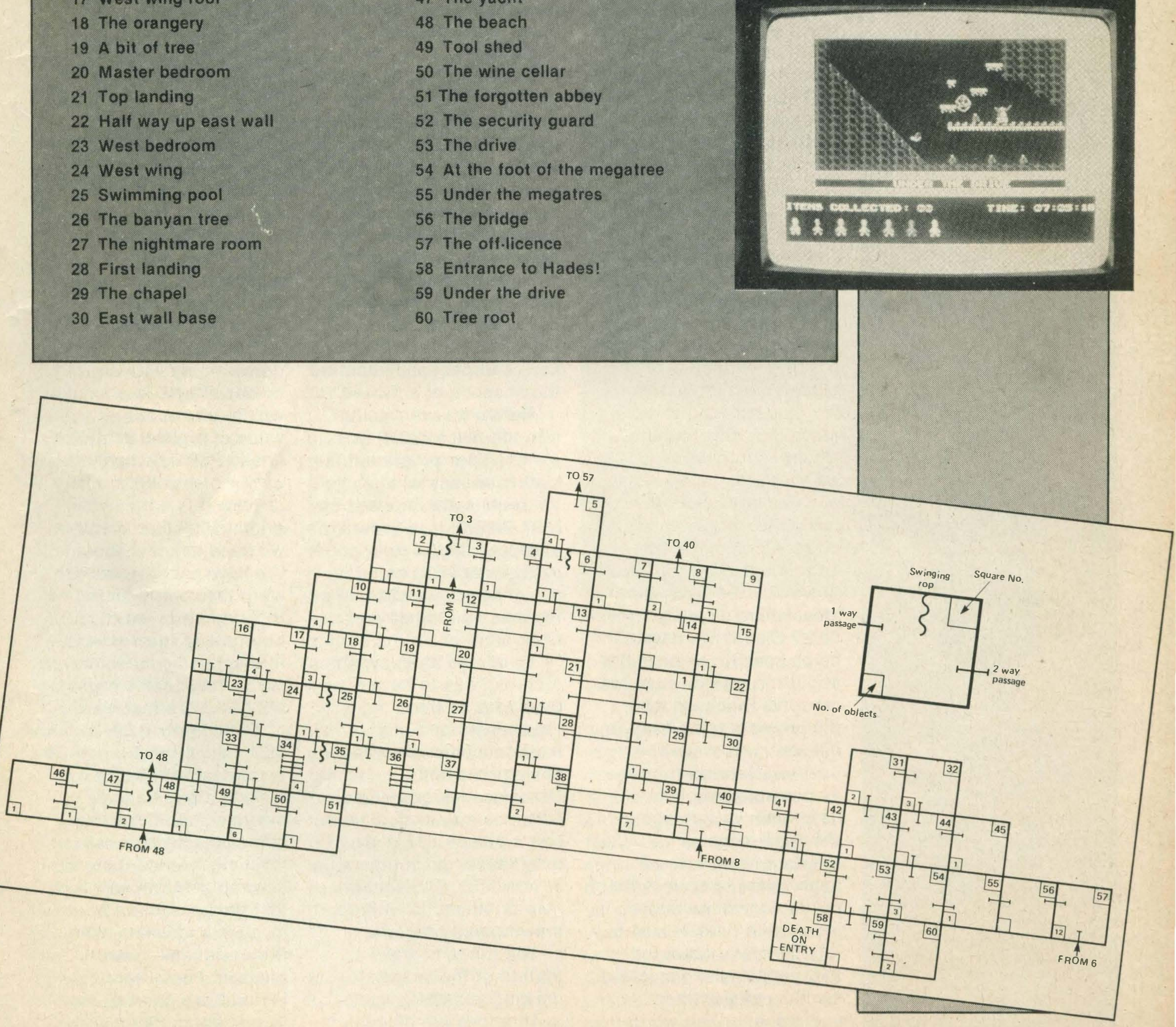
I have yet to complete Jet Set Willy and my attempts have caused me great frustration, but it has also given me hours of pleasure. If anyone knows of any 'magic' POKEs which will give me a better chance, then I'd be pleased to hear from you via the letter's page.

I hope that exploring the rooms will give you the same satisfaction that it has given me, even if it is just the knowledge that you can pass the room which traps all of your friends. Good luck and see if you can beat my hi-score of 48 objects retrieved.

Solution ••

1 The bathroom
2 Nomen lumni
3 On the roof
4 Up on the battlements
5 The watchtower
6 We must perform a Quirk a Fleeg
7 I'm sure I've seen this before
8 Rescue Esmerelda
9 Top of the house
10 Conservatory roof
11 Under the roof
12 The attic
13 Dr Jones will never believe this
14 Emergency generator
15 Priest's hole
16 Above the west bedroom
17 West wing roof
18 The orangery
19 A bit of tree
20 Master bedroom
21 Top landing
22 Half way up east wall
23 West bedroom
24 West wing
25 Swimming pool
26 The banyan tree
27 The nightmare room
28 First landing
29 The chapel
30 East wall base
31 Out on a limb
32 Tree top
33 Back door
34 Back stairway
35 Cold store
36 West of kitchen
37 The kitchen
38 To the kitchen/main stairway
39 Ballroom west
40 Ballroom east
41 The hall
42 Front door
43 On a branch over the drive
44 Inside megatrunk
45 Cuckoo's nest
46 The bow
47 The yacht
48 The beach
49 Tool shed
50 The wine cellar
51 The forgotten abbey
52 The security guard
53 The drive
54 At the foot of the megatree
55 Under the megatres
56 The bridge
57 The off-licence
58 Entrance to Hades!
59 Under the drive
60 Tree root





MSX

Grand Design

Lay the foundations of a well-planned drawing pad program with part 2 of Bob Maunder's series

This month we are going to produce a detailed design for a program from the idea stage. We saw in the first episode of this series how the method of top-down design can help us produce a well-structured program that is easier to test and implement. We also looked at a type of diagram called a hierarchy chart which illustrates the layout of modules in the program being designed.

These theoretical bones will start to develop some flesh as we follow a practical case study right through to seeing the working program in the next few episodes.

The program we are going to plan is a graphics drawing pad. The MSX micro has some very nice graphics facilities, but they are only of full use to the experienced programmer. It would be good to have a piece of software that would enable the novice to create patterns, pictures and designs without having to get his hands dirty on complex code. That is our aim.

So now we have the idea, where do we go from here? Clearly we need to be as specific as possible about the general features required. Since we want the program to be easy to use we must make the user interface as friendly as possible. Whole books have been written about the 'man-machine interface' and it is not appropriate to go into the psychology of computer interaction here. However it is generally accepted that people find pictures or symbols easier to comprehend than words, and also that moving a pointer is easier than keying in text.

Of course these ideas are fundamental to the new breed of micros now on the market, like the Macintosh and the Atari 520ST. These use icons or symbols to illustrate concepts, pull-down menus to give the user a choice of actions, and a mouse to point to the action required.

Now the MSX micro is not a WIMP system (for wimps who are not up with the times, WIMP stands for Window-Icon-Mouse-Pull-down menu). But we can make a fair attempt at pretending it is. Our drawing pad will show user choices by means of icons, and we will try and keep user entries simple by using the cursor movement keys and the space bar, in the absence of a mouse.

Before we start going into too much detail in planning our program it is best to assess what limitations are imposed by MSX BASIC. It is generally accepted that to be a good systems analyst or designer, you need to be a reasonable programmer first.

To use an analogy, an architect has to have a clear idea of the capabilities of building materials before he starts designing a house. Otherwise his grandiose schemes may end up as just a pile of rubble. So let's have a quick glance at how MSX BASIC can help or hinder us with our drawing pad program.

The fundamental feature of the program is drawing so MSX graphics instructions are of particular interest. To have a reasonable level of detail we will need to use the high resolution graphics produced by the SCREEN2 instruction. This gives a grid of 256 x 192 points, as shown in **figure 1.** Most of the instructions we now consider refer to points on the grid by an x and y position (x,y).

The keywords that we need to understand are CIRCLE, COLOR, DRAW, LINE, PAINT, POINT and PRESET. CIRCLE can draw circles, arcs or ellipses on the screen. COLOR specifies what colour is required for the foreground, background and screen border from a list of 16 values, as shown in **figure 2.**

DRAW is a very powerful command and has its own mini instruction set. Basically it provides for the drawing of lines in vertical, horizontal or diagonal directions and even includes scaling and rotating features. LINE draws straight lines or rectangles. PAINT fills in a drawn figure with a given colour. POINT is a function which returns the colour value of a given point and finally PSET changes the colour of a point.

Now it is not only graphics instructions that we need to know about. We have said that we don't want the user to be forced to type in masses of text, but instead to be able to interact using cursor keys. Is this reasonable given MSX BASIC's facilities?

Fortunately it is. The MSX micro makers put in a great deal of thought to making a good games machine, and of course games machines need joysticks. Hence there are several instructions which test the position of a joystick and whether the fire button has been pressed. These same instructions can be used to test the cursor keys.

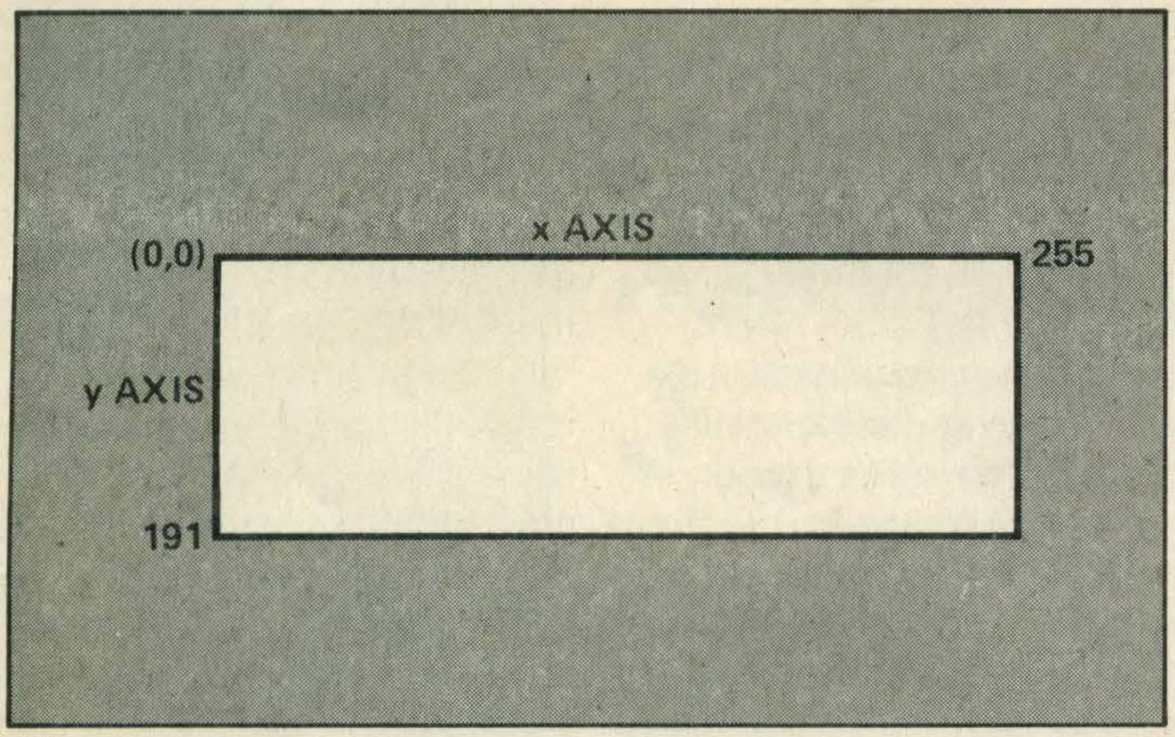


Figure 1. The MSX SCREEN 3 Mode

0 Clear	8 Red
1 Black	9 Bright red
2 Green	10 Yellow
3 Light green	11 Light yellow
4 Dark blue	12 Dark green
5 Light blue	13 Purple
6 Dark red	14 Grey
7 Sky blue	15 White

Figure 2.
Table of Colour Codes

In particular the STICK function returns a value between 0 and 8 depending upon the direction input, as shown in **figure 3.** Now as readers may have noticed there are only four cursor keys on the keyboard, so how are diagonal directions entered?

Nothing could be simpler — just press the two arrow keys for a joint direction. For example to go diagonally upwards to the right, press right — arrow and up-arrow together. STICK understands the simultaneous pressing of these keys to mean a diagonal direction.

As a complement to STICK, the STRIG function (short for stick trigger) tests whether the fire button of a joystick, or in our case the space bar, has been pressed. This can be used to generate interrupts which a program can act upon by the ON STRIG GOSUB instruction.

To complete our MSX BASIC package tour, we mention function keys. These five keys at the top of the keyboard can simplify the entry of commonly used keywords when entering a program. They can also be a very powerful way of interacting with a program when it is executing. Any of the function keys can be enabled so that when they are pressed while a program is running, an interrupt can be generated. This can be acted upon by the ON KEY GOSUB statement, very much as for STRIG.

Suitably armed with this arsenal of MSX BASIC features, let us return to the design of the drawing pad system. As we have said, we are aiming to produce an interactive sketch pad in which user options are displayed by symbols and menus, and entries are made through the function or cursor keys.

To get down to detail, there are ten function keys so we can have ten basic functions in the program. Each of them can have further options if necessary, but first we must produce a list of the essentials:

1. Move the drawing position
2. Draw a line
3. Change the drawing colour
4. Draw a rectangle
5. Draw a rectangle
6. Paint an enclosed area
7. Display some text
8. Rub out an area
9. Clear the screen
10. Exit the program

It would seem sensible to assign these functions to the function keys F1 to F10 respectively. We will have a module of our program which will contain the processing for each of the ten choices. Some will be very straightforward, such as 9 and 10, while others such as 3 will need a lot of code and probably subsidiary modules.

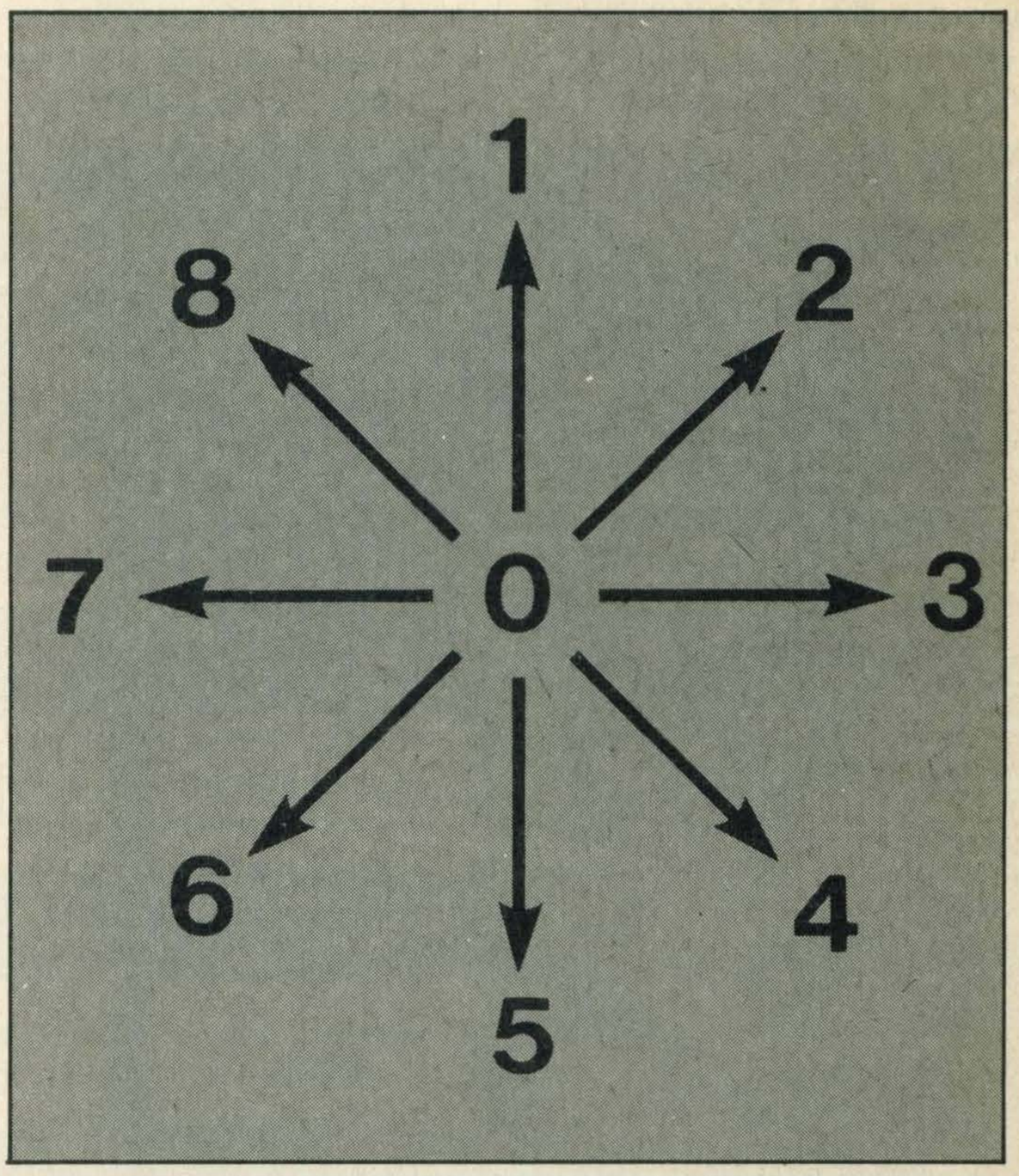


Figure 3. Direction Codes from the STICK Function

It may be useful to analyse this list in more depth. To move the drawing position we will let the user press the arrow keys. However, this means we have to clearly show the current drawing position on the screen by a cursor or other indicator. We insist that no trail be left, since we are not drawing yet. Also we must ensure that the user cannot go outside the limits of the pad size, either off-screen or into areas set aside for on-screen menus.

Drawing a line will be quite similar, except this time a trail is left behind the cursor as it is moved. We need to be able to specify how thick the drawing line is, and what colour. It will probably be best to have a concept of current drawing colour and current line thickness in the program, and only change them when required.

The third function is changing the drawing colour, and applies not only to lines, but also to circles and the paint option. Here it would be best to display the drawing colour as an indicator somewhere on the scrfeen, and perhaps cycle through the possible colours until the user finds the one he wants.

Drawing a circle entails determining how big the radius is going to be by some means, and then plotting the circle with its

and is the most robust style of switch, offering long life because wear and fatigue are minimised.

I found that the hand grip of the stick had a good feel to it, and another attractive feature is the use of rubber sucker feet which can be used to attach the unit firmly to a flat surface. One fire button is mounted at the top of the grip, the other being base-mounted, and for left handed users the position of the base-mounted button could prove awkward.

Atari's own make of joystick is obviously not a true MSX stick but it does have the advantage of being very cheap. It uses four 'bubble' switches which rely on the stick pressing down on metal plates which connect two terminals on each switch position. Each metal plate is spring loaded because it is arched over the contacts. As the stick brings pressure to bear on the plate, it flattens out and shorts the contacts. When this pressure is released the plate springs back into its hemispherical shape and contact is broken. After a while metal fatigue sets in and the plates may not spring back so readily, causing control problems for the user.

Atari produce replacement boards which can easily be inserted into the casing. These boards cost just over half of the retail price of the joystick. My own Atari stick is my favourite, despite the fact that the grip is not ergonomically designed to fit the hand comfortably and that it is shorter than most grips. The single fire button is base-mounted and not well positioned for left handed users.

Voltmace's MSX joystick is rapidly replacing the Atari as my personal choice, though adapting to its extremely small grip has taken me some time. This stick uses two variable resistors (potentiometers) set at right angles to read the position of the grip but it does not have the necessary A/D converter to 'read' the degree of movement of the stick. This is the same principle as the MSX manufacturers' joysticks and the inclusion of the complex linking to move the 'pots' explains the relatively high cost of this type of stick. The use of pots make it highly responsive and the mid-pole position detection is the best available, though some people may find this responsiveness a drawback.

The base boasts three fire buttons positioned in an inverted triangle formation. The two forward positioned buttons are duplicates of the generally used fire button making it equally suitable for left or right handed users. Because both types of fire button are base mounted the stick would be difficult to use for applications which employ each button separately.

The Stick, from John Hall GmbH, looks peculiar because it has no base. It detects joystick orientation by the use of mercury tilt switches mounted inside the grip. This means that it may be held in the hand and dipped in the required direction. This causes the liquid mercury to flow, connecting two contacts 'making' the switch.

At first I found the Stick difficult to use, but after delving inside its case I found that the title switches could be bent to a steeper angle making them slightly less sensitive to movement.

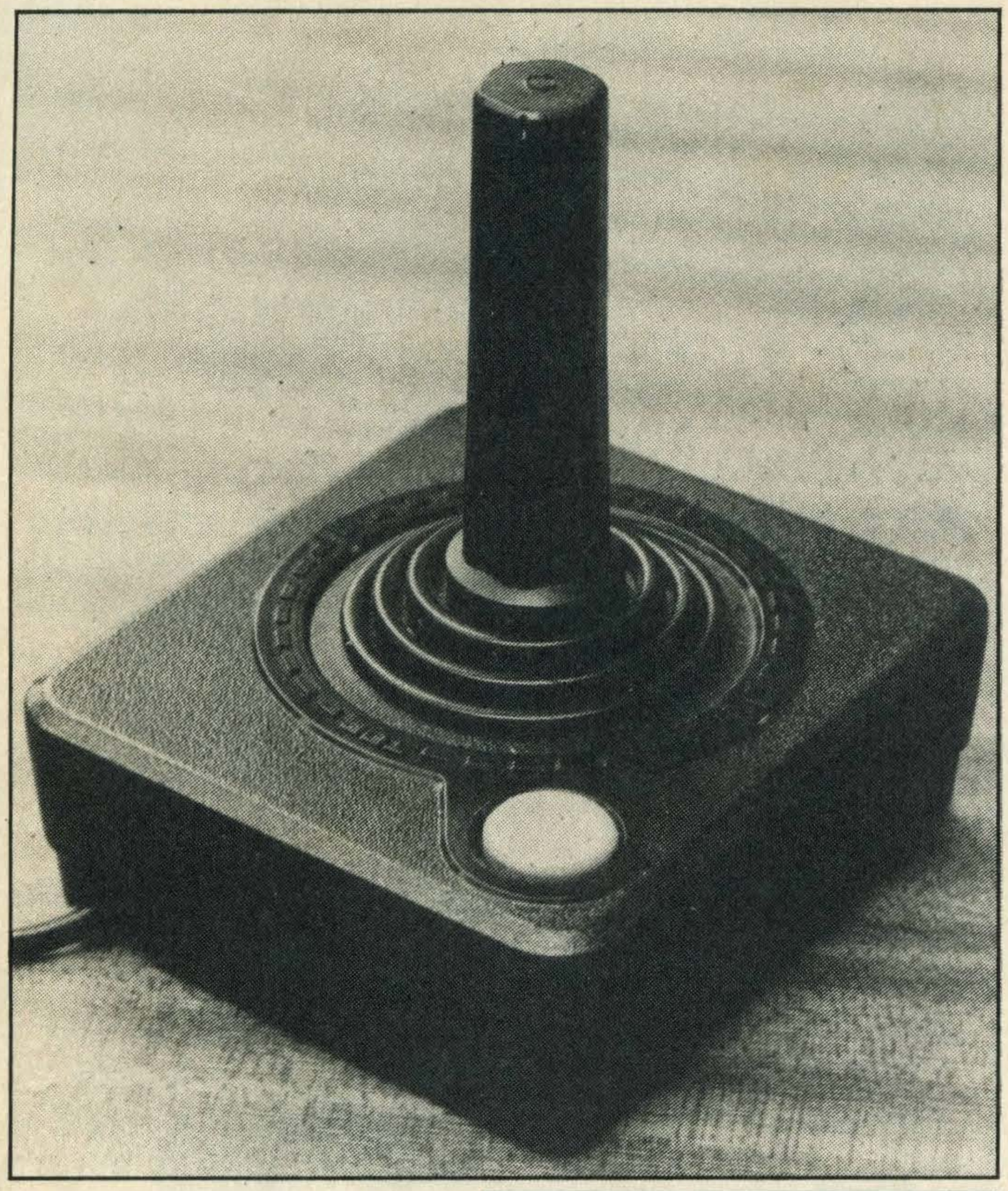
The stick can be mounted on a rubber sucker which can readily be attached to most computer casings, and the natural spring in the rubber gives an automatic return to the central position. I did find that with frantic action games the stick came adrift from its sucker, but for most games this was not a problem.

The Stick is an Atari/C64 type, and despite the superficial appearance of two fire buttons, both of the buttons are linked to the same internal switch. The Stick is suitable for left or right handed users and I found it particularly good for the frantic sports simulation programs from Activision and Konami.

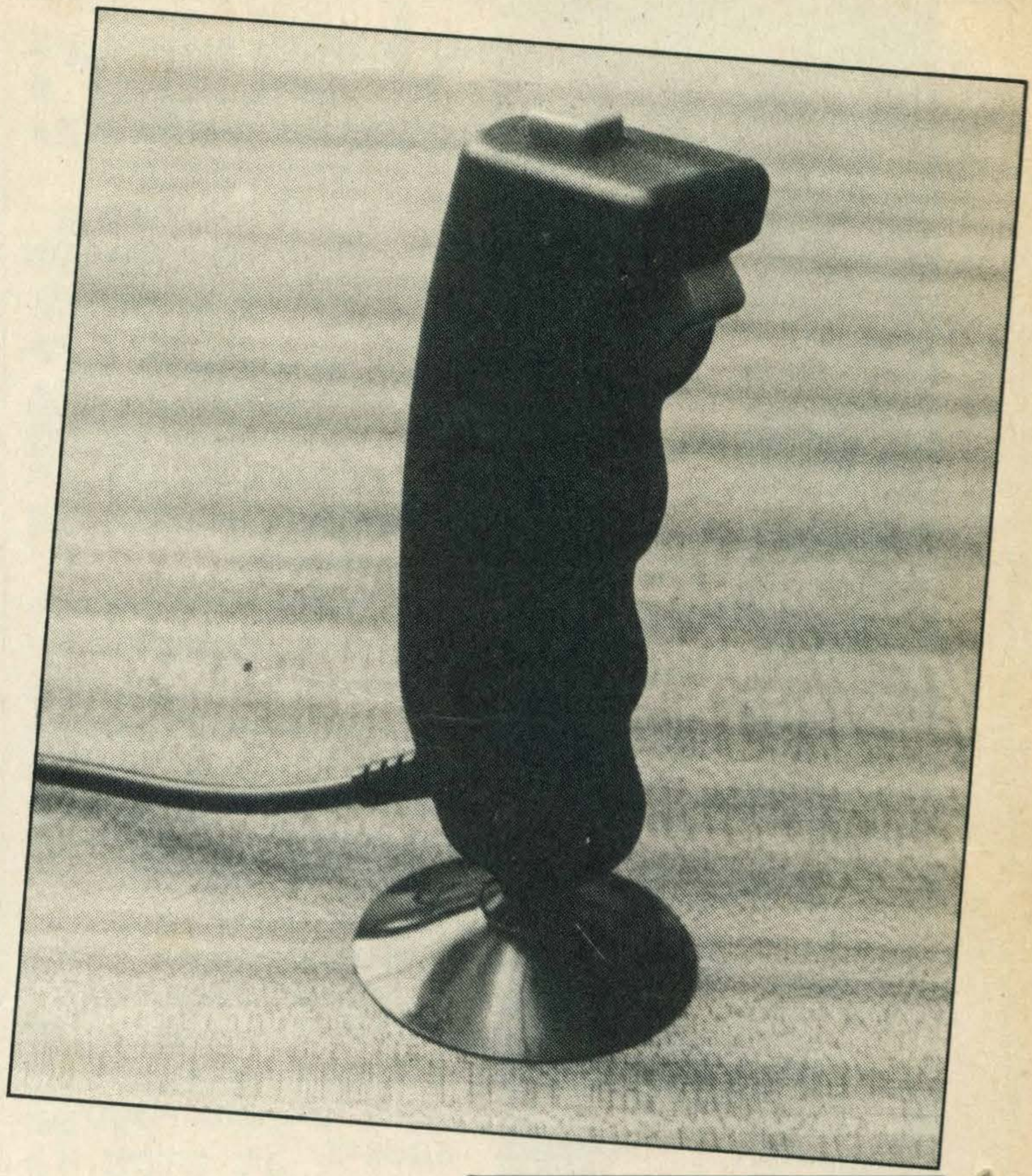
Talking of Konami brings me finally to their own Hyper Shot controller which, though not a joystick, does save wear and tear if sports games are your forte. It consists of two buttons which can take a long, hard beating. The casing of the unit is so strong that it can happily take a weight of ten stones without breaking. I know because I tried standing on it and this caused no problem to the unit whatsoever. Thoughtfully Konami have printed the function of the keys both ways up so users can merely turn the unit around to get the buttons positioned in a way that suits them best.

Vulcan Gun Shot, £12.95 from Vulcan Electronics, 200 Brent Street, Hendon, London NW4.

Joy Ride



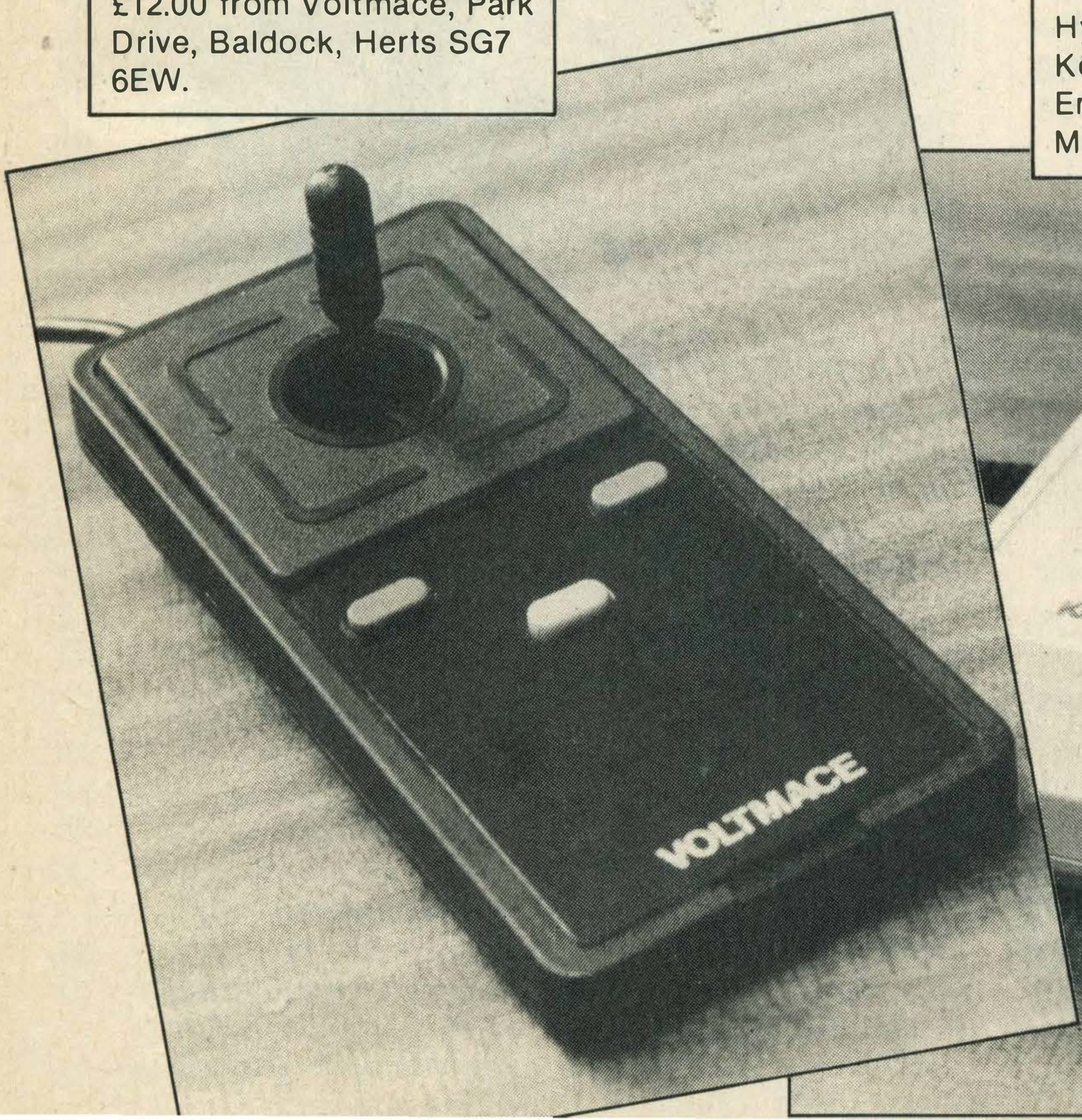
Atari Joystick, £7.90, Atari Joystick Repair Kit, £2.75 from The Silica Shop, 1-4 The Mews, Hatherley Rd., Sidcup, Kent DA14 4DX.

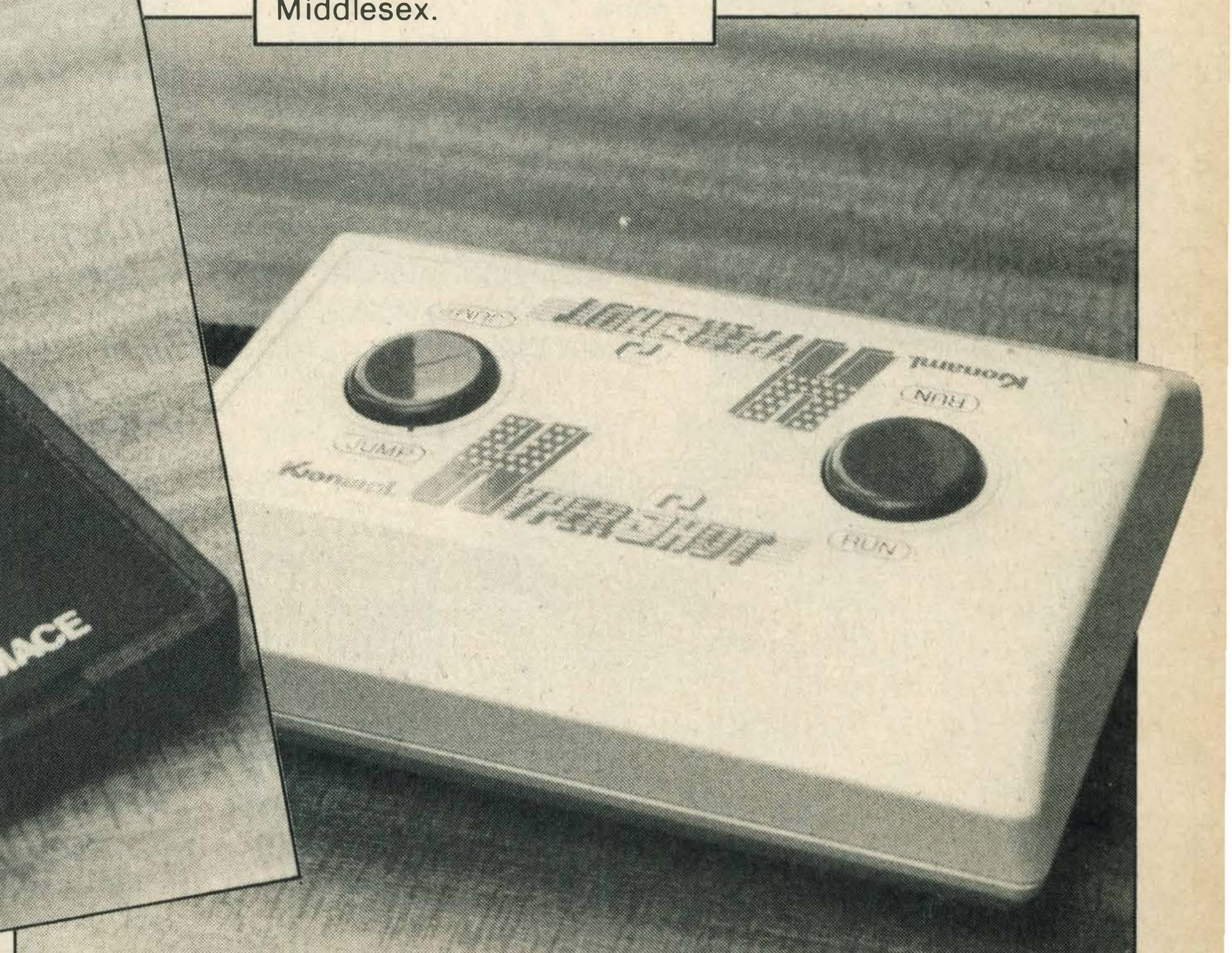


The Stick, £12.99 from Lightwave Leisure Ltd, 2 Maldwyn Rd, Liscard, Wirral, Merseyside L44 1AL.

Voltmace MSX Joystick, £12.00 from Voltmace, Park Drive, Baldock, Herts SG7 6EW.

Hyper Shot, £15.20 from Konami Limited, 269 Field End Road, Eastcote, Middlesex.





MSX

Cash Account

Jo Stork originally created this simple cash recording program as a favour to a friend who runs a small company. It has since been taken up by two other organisations including a sports club. The column headings in lines 45 and 80, plus the strings in lines 81-5, 101-5, 169-73, 306, 310 and the instructions are the only changes made for the later users.

Whether or not changes are made, it is important to remember that the first columns, currently headed REVENUE and EXPENSES, are for cash received by the organisation, while the other three, headed SUPP'S, TRAVEL and OTHER, are for the organisation's spending.

The sports club has changed them to SUBS, TEAS, GROUND, FOOD, EQUIP'T.

The last of these columns (OTHER) is slightly different in that it requests the entry of a percentage. This arises because one often has a receipt, not all of which may be charged to the organisation. The following example will illustrate this point.

A total of £10 has been spent in a shop, on two items for £5.50 and £4.50. The former is a private purchase and only the latter can be claimed 'on the business'. Auditors need receipts to match against the accounts and would naturally reject a posting of £4.50 in the company records for which no such appropriate receipt could be found.

The program does not use the % column, other than to provide an indication to the auditors that the amount registered will be found on a receipt for a larger amount; in our example 45% and £4.50 would have them looking to reconcile the value with a £10.00 receipt.

Whereas the % is only documentary, VAT is computed. The program asks the user whether the amount being entered is including or excluding VAT. The correct values are then registered according to the reply.

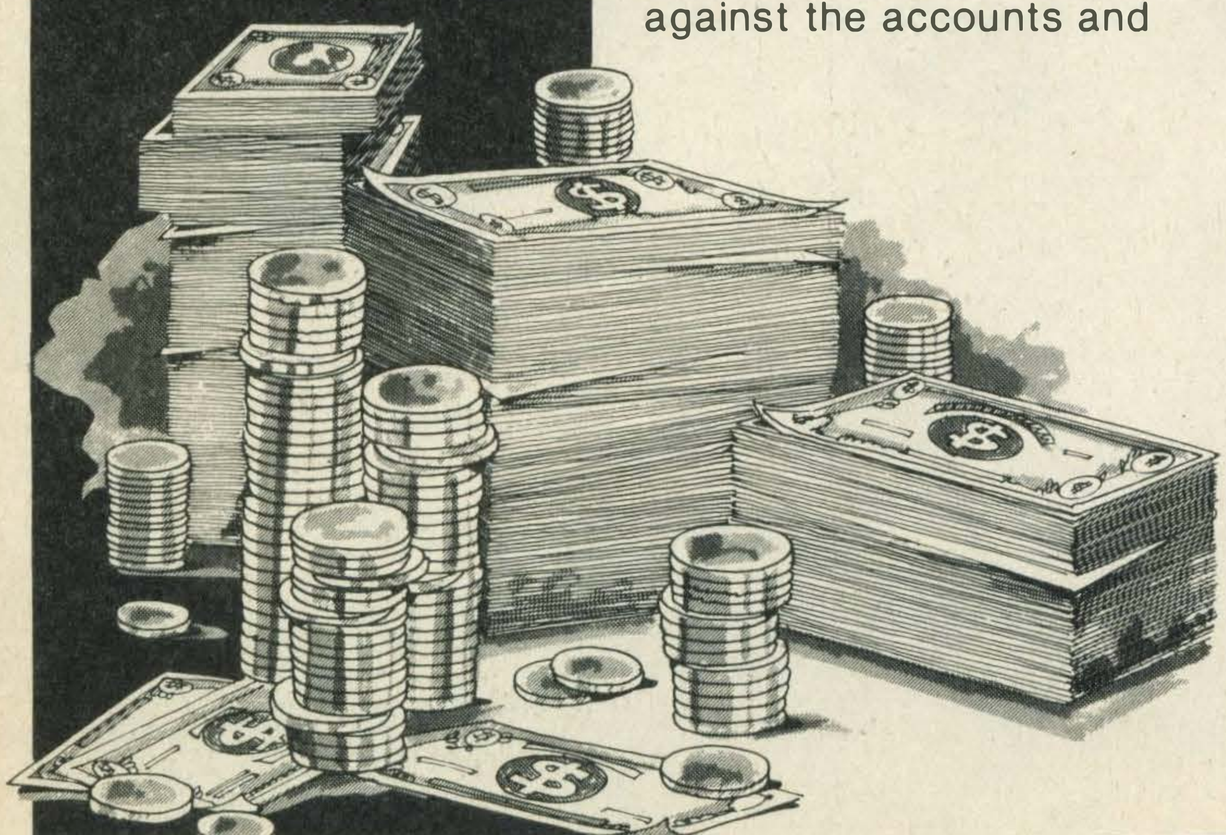
The remainder of the program's operation is self-evident, since the code is riddled with instructions, prompts and REMs. Note that the only normal exit from the program is after a BACK-UP has been made. The back-up file is given the same name as the normal one, in order that the program need not be amended if the security copy ever needs to be used. *Always make this back-up on a different tape to the original.*

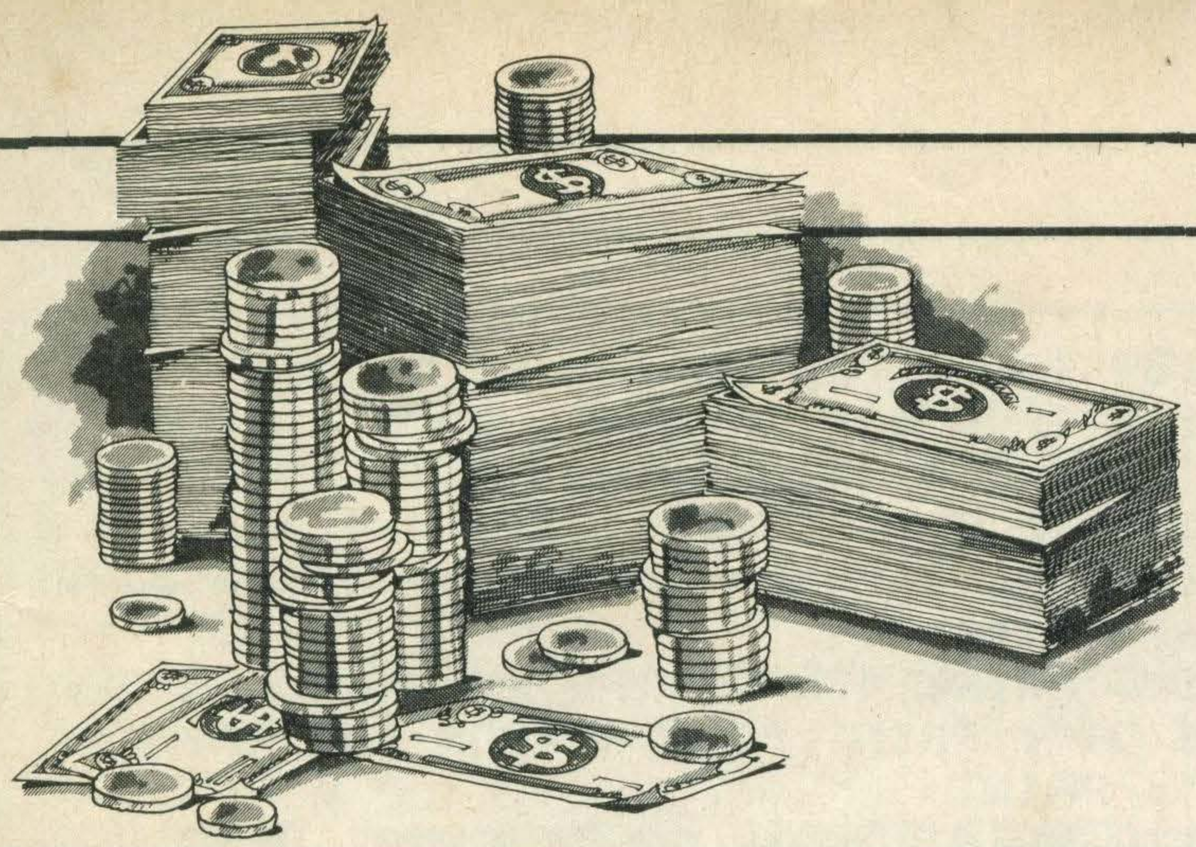
Program breakdown

1-15	set up variables and display instructions
16-34	read datafile
35-95	print out account sheet
96-144	enter posting
145-192	modify posting
193-247	save postings and backup
248-277	principal menu
278-302	instructions
303-311	page header routine

Main variables

PV$	description or purpose of the entry
DT$	date of the entry
PC	percentage (see text)
VL	value of entry
VT	VAT entry (see text)
N	flag indicating to which column VL refers
T(n)	totals
VI	total VAT received
VO	total VAT spent
O	menu option chosen
A$	user's response





```
1 REM**** SIMPLE CASH RECORDING PROG
2 REM**** (C)LITTLE STORK
3 REM**** LSCC       -        FEB 1985
4 CLEAR 1000: CLS
5 PRINT "      BOOK-KEEPING PROGRAM"
6 PRINT "      ---------------------";
PRINT
7 GOSUB 278
8 FOR I = 1 TO 12
9 READ D$
10 C$ = C$ + CHR$(VAL("&H"+D$))
11 NEXT I
12 LPRINT C$
13 DIM PV$(450),DT$(450),PC(450),VL(4
50),VT(450),N(450)
14 DATA 1B,45,1B,42,1B,76,38,38,2C,30
,38,2E
15 ON ERROR GOTO 263
16 REM**** READ DATAFILE
17 REM****
18 REM****
19 I = 1
20 PRINT "READING - 'CAS:ACCDAT'."
21 OPEN "CAS:ACCDAT" FOR INPUT AS 1
22 INPUT#1,PV$(I)
23 INPUT#1,DT$(I)
24 INPUT#1,PC(I)
25 INPUT#1,VL(I)
26 INPUT#1,VT(I)
27 INPUT#1,N(I)
28 I = I + 1: GOTO 22
29 CLOSE#1: PRINT I;" RECORDS READ FR
OM 'CAS:ACCDAT'"
30 PRINT "INPUT TODAY'S DATE IN THE F
ORM"
31 INPUT "DD-MM-YY. EG. 25-12-84";DA$
32 INPUT "ARE YOU SURE 'Y/N'";A$
33 IF A$ <> "Y" THEN 31
34 GOTO 248
35 REM**** PRINT ACCOUNTS
36 REM
37 REM
38 CLS
39 T(1)=0:T(2)=0:T(3)=0:T(4)=0:T(5)=0
:T(6)=0:VI=0:VO=0
40 PRINT: PRINT: PRINT
41 PRINT "SET PRINTER TO HOF."
42 INPUT "ENTER 'R' WHEN READY";A$
43 IF A$ = "R" THEN 44 ELSE 42
```

```
44 PRINT "PRINTING WILL NOW COMMENCE
@ 12 CPI."
45 LPRINT"SOURCE/PURPOSE/REF.
    DATE        %    REVENUE   XPNSE
 SUPP'S  TRAVEL   OTHER      VAT"
46 LPRINT
47 JJ = 0
48 FOR J = 1 TO (I-1)
49 JJ = JJ + 1
50 IF JJ > 72 THEN GOSUB 303
51 ON N(J) GOTO 52,57,62,67,72
52 LPRINT USING "\
          \\              \#,###.##
                                ##.##";P
V$(J);DT$(J);VL(J);VT(J)
53 T(1) = T(1) + VL(J)
54 T(6) = T(6) + VT(J)
55 VI = VI + VT(J)
56 GOTO 76
57 LPRINT USING "\
          \\                      \##
.##                             ##.##";P
V$(J);DT$(J);VL(J);VT(J)
58 T(2) = T(2) + VL(J)
59 T(6) = T(6) + VT(J)
60 VI = VI + VT(J)
61 GOTO 76
62 LPRINT USING "\
          \\
      \##.##                    ##.##";P
V$(J);DT$(J);VL(J);VT(J)
63 T(3) = T(3) + VL(J)
64 T(6) = T(6) - VT(J)
65 VO = VO - VT(J)
66 GOTO 76
67 LPRINT USING "\
          \\
                \##.##          ##.##";P
V$(J);DT$(J);VL(J);VT(J)
68 T(4) = T(4) + VL(J)
69 T(6) = T(6) - VT(J)
70 VO = VO - VT(J)
71 GOTO 76
72 LPRINT USING "\
          \\       \###\
                      \##.## ##.##";P
V$(J);DT$(J);PC(J);" ";VL(J);VT(J)
73 T(5) = T(5) + VL(J)
74 T(6) = T(6) - VT(J)
75 VO = VO - VT(J)
76 NEXT J
77 PRINT: PRINT: PRINT "LISTING NOW C
OMPLETE."
78 FOR J = 1 TO 2500: NEXT J
79 LPRINT
80 LPRINT"SOURCE/PURPOSE/REF.
    DATE        %         FEE   XPNSE
 SUPP'S  TRAVEL   OTHER      VAT": LPR
INT
```

```
81 LPRINT USING "TOTAL REVENUE RECEIP
TS                =       ##,###.##";T(1
)
82 LPRINT USING "   TOTAL EXPENSES REC
EIPTS             =                 #,###
.##";T(2)
83 LPRINT USING "     TOTAL SUPPLIES P
AYMENTS           =
    #,###.##";T(3)
84 LPRINT USING "       TOTAL TRAVEL P
AYMENTS           =
             #,###.##";T(4)
85 LPRINT USING "         TOTAL OTHER
PAYMENTS          =
                   #,###.##";T(5): L
PRINT
86 LPRINT USING "           TOTAL VAT
RECEIVED          =
                        #,###.##";VI:
 LPRINT
87 LPRINT USING "           TOTAL VAT
ISSUED            =
                        #,###.##";VO:
 LPRINT
88 LPRINT USING "           TOTAL VAT
LIABILITY         =
                           #,###.##"
;T(6): LPRINT
89 T(7) = T(1) + T(2)
90 LPRINT USING "TOTAL RECEIPTS     =
##,###.##";T(7): LPRINT
91 T(8) = T(3) + T(4) + T(5)
92 LPRINT USING "TOTAL PAYMENTS     =
##,###.##";T(8): LPRINT
93 T(9) = T(7) - T(8) - T(6)
94 LPRINT USING "         GROSS PROFIT
 (EX VAT)   = ##,###.##";T(9)
95 RETURN 248
96 REM**** ENTER POSTING
97 REM****
98 REM****
99 CLS: PRINT: PRINT: PRINT
100 PRINT "ENTRY OF NEW POSTING TO AC
COUNTS.": PRINT
101 PRINT "ENTER 1 - REVENUE POSTING.
   (RCPT)"
102 PRINT "       2 - EXPENSES POSTING
.  (RCPT)"
103 PRINT "       3 - SUPPLIES POSTING
.  (PYMT)"
104 PRINT "       4 - TRAVEL POSTING.
   (PYMT)"
105 PRINT "       5 - OTHER POSTING.
   (PYMT)"
106 PRINT
107 PRINT "***    9 - EXIT POSTING ENT
RY.    ***"
108 PRINT: PRINT: PRINT "POSTING ";I;
" AWAITING ENTRY.": PRINT
109 INPUT "ENTER 1-5 OR 9";O
110 IF O > 9 OR O = 8 OR O = 7 OR O =
 6 OR O < 1 THEN 108
111 IF O = 9 THEN 141
112 PRINT "**************************
**********"
113 PRINT "INPUT THE SOURCE OF REVENU
E OR": PRINT "THE REASON FOR PAYMENT.
": PRINT
114 PRINT "MAX. OF 30 CHRS. DESC'N---
-------V"
115 INPUT PV$(I)
116 DT$(I) = DA$: N(I) = 0
117 PRINT :
118 PRINT "ENTER AMOUNT TO BE POSTED"
119 INPUT "*NO NEGATIVE AMOUNT8*";VL(
I)
120 IF VL(I) <.01 THEN 118
121 INPUT "ARE YOU SURE 'Y/N`?";A$
122 IF A$ <> "Y" THEN 113
123 PRINT: PRINT "ENTER 'I` IF AMOUNT
 INCLUDES VAT": PRINT "ENTER 'E` IF A
MOUNT EXCLUDES VAT": INPUT "ENTER 'Z`
 IF AMOUNT ZERO RATED";A$
124 IF A$ <> "I" AND A$ <> "E" AND A$
 <> "Z" THEN 123
125 INPUT "ARE YOU SURE Y/N?";B$: IF
B$ <> "Y" THEN 123
126 IF A$ = "Z" THEN 132
127 IF A$ = "E" THEN 131
128 VT(I) = (VL(I)*15/115)+5E-03
129 VL(I) = (VL(I)*100/115)+5E-03
130 GOTO 132
131 VT(I) = VL(I) * .15
132 ON O GOTO 139,139,139,139,133
133 PRINT: PRINT
134 PRINT "WHAT %AGE OF TOTAL BILL IS
 BEING"
135 INPUT "POSTED? MAX = 100%";PC(I)
136 IF PC(I) < 1 OR PC(I) > 100 THEN
133
137 INPUT "ARE YOU SURE 'Y/N`";A$
138 IF A$ <> "Y" THEN 113
139 PRINT: PRINT
140 PRINT "ENTRY OF POSTING COMPLETE"
: I = I + 1: PRINT: PRINT "**********
**************************": GOTO 101
141 PRINT: PRINT:
142 PRINT "ENTRY OF POSTINGS COMPLETE
D."
143 FOR J = 1 TO 2500: NEXT J
144 RETURN 248
145 REM**** MODIFY POSTING
146 REM****
147 REM****
148 CLS
149 PRINT "MODIFY/DELETE OF FALSE POS
TING.": PRINT
150 PRINT "ENTER 'SOURCE/PURPOSE` CUR
```

```
RENTLY"
151 PRINT "HELD ON FILE.": INPUT SP$
152 PRINT "ENTER 'DATE' CURRENTLY HEL
D ON FILE."
153 INPUT CD$
154 FOR J = 1 TO I
155 IF PV$(J) = SP$ AND DT$(J) = CD$
THEN 158
156 NEXT J
157 PRINT "---NO SUCH RECORD FOUND---
": PRINT: BEEP: INPUT "Press return w
hen ready";A$:GOTO 192
158 PRINT "ENTER NEW 'SOURCE/PURPOSE'
-30 CH MAX.": PRINT "ENTER '***DELETE
D***' IF CANCELLING"
159 INPUT PV$(J)
160 PRINT: PRINT "ENTER CORRECT DATE,
 OR": PRINT "ENTER TODAY'S DATE IF DE
LETING."
161 INPUT "FORMAT DD-MM-YY";DT$(J)
162 PRINT: PRINT "ENTER NEW VALUE OF
POSTING.": PRINT "***NO -IVE AMOUNTS*
**": PRINT "ENTER '0.00' IF CANCELLIN
G."
163 INPUT VL(J)
164 IF VL(J) < 0! THEN 162
165 IF VL(J) > 0! THEN 168
166 VT(J) = 0!: PC(J) = 0!
167 GOTO 189
168 PRINT: PRINT "ENTER TYPE OF POSTI
NG :-"
169 PRINT "      1 = REVENUE"
170 PRINT "      2 = EXPENSES"
171 PRINT "      3 = SUPPLIES"
172 PRINT "      4 = TRAVEL"
173 INPUT "      5 = OTHER";N(J)
174 IF N(J) > 5 THEN 168
175 IF N(J) < 0 THEN 168
176 IF N(J) < 5 THEN 178
177 PRINT: INPUT "ENTER %AGE - OTHER.
";PC(J)
178 PRINT: INPUT "ARE YOU SURE 'Y/N'"
;A$
179 IF A$ <> "Y" THEN 158
180 PRINT: PRINT "ENTER 'I' IF AMOUNT
 INCLUDES VAT": PRINT "ENTER 'E' IF A
MOUNT EXCLUDES VAT": INPUT "ENTER 'Z'
 IF AMOUNT ZERO RATED";A$
181 IF A$ <> "I" AND A$ <> "E" AND A$
 <> "Z" THEN 180
182 INPUT "ARE YOU SURE Y/N?";B$: IF
B$ <> "Y" THEN 180
183 IF A$ = "Z" THEN 189
184 IF A$ = "E" THEN 188
185 VT(J) = (VL(J)*15/115)+5E-03
186 VL(J) = (VL(J)*100/115)+5E-03
187 GOTO 189
188 VT(J) = VL(J) * .15
189 PRINT: INPUT "ARE YOU SURE 'Y/N'"
;A$
190 IF A$ <> "Y" THEN 158
191 PRINT "MODIFY/DELETE COMPLETE"
192 RETURN 248
193 REM**** SAVE POSTINGS
194 REM****
195 REM****
196 CLS
197 PRINT: PRINT: PRINT
198 PRINT "SAVING OF ACCOUNTS TO CASS
ETTE.": PRINT
199 PRINT "ON COMPLETION THE PROGRAM
WILL"
200 PRINT "     *** S T O P ***": PRI
NT
201 PRINT "READY CASSETTE FOR RECORDI
NG.": PRINT
202 PRINT "ENTER 'R' WHEN READY"
203 INPUT "       'C' TO CANCEL 'SAVE'
.";A$
204 IF A$ = "C" THEN 243
205 IF A$ = "R" THEN 207
206 GOTO 202
207 PRINT: PRINT: PRINT
208 PRINT "SAVING OF 'CAS:ACCDAT'": P
RINT
209 OPEN "CAS:ACCDAT" FOR OUTPUT AS 1
210 FOR J = 1 TO (I-1)
211 PRINT#1,PV$(J)
212 PRINT#1,DT$(J)
213 PRINT#1,PC(J)
214 PRINT#1,VL(J)
215 PRINT#1,VT(J)
216 PRINT#1,N(J)
217 NEXT J
218 PRINT "***SAVE OF ACCOUNTS COMPLE
TE***": PRINT: PRINT: CLOSE#1
219 PRINT "BACK-UP SAVE TO FOLLOW"
220 FOR I = 1 TO 20
221 BEEP
222 FOR II = 1 TO 500
223 NEXT II:NEXT I
224 PRINT: PRINT: PRINT
225 PRINT "SAVING OF 'CAS:ACCDAT'": P
RINT "   *** B A C K - U P ***": PRIN
T
226 PRINT "READY ***NEW*** TAPE FOR R
ECORDING."
227 INPUT "ENTER 'R' WHEN READY";A$
228 IF A$ <> "R" THEN 227
229 OPEN "CAS:ACCDAT" FOR OUTPUT AS 1
230 FOR J = 1 TO (I-1)
231 PRINT#1,PV$(J)
232 PRINT#1,DT$(J)
233 PRINT#1,PC(J)
234 PRINT#1,VL(J)
235 PRINT#1,VT(J)
236 PRINT#1,N(J)
237 NEXT J
```

```
238 PRINT "***SAVE OF BACK-UP COMPLET
E***": PRINT: PRINT: CLOSE#1
239 FOR J = 1 TO 2500: NEXT J
240 CLS
241 PRINT "*** NORMAL PROGRAM TERMINA
TION ***"
242 STOP
243 PRINT: PRINT
244 PRINT "SAVE OPTION CANCELLED"
245 PRINT "RETURN TO NORMAL OPTION SE
LECT."
246 FOR J = 1 TO 2500: NEXT J
247 RETURN 248
248 REM**** SELECT ACCOUNT ACTION.
249 REM****
250 REM****
251 CLS
252 PRINT: PRINT: PRINT:
253 PRINT "ENTER 1 - LIST POSTINGS."
254 PRINT "       2 - ENTER NEW POSTIN
GS."
255 PRINT "       3 = MODIFY/DELETE PO
STINGS."
256 PRINT "       4 = SAVE/BACKUP POST
INGS."
257 PRINT "THE ONLY 'NORMAL` EXIT FRO
M THIS": PRINT "PROGRAM IS VIA '4`."
258 INPUT "CHOICE";O
259 IF O > 4 OR O < 1 THEN 258
260 INPUT "ARE YOU SURE 'Y/N`";A$
261 IF A$ <> "Y" THEN 258
262 ON O GOSUB 35,96,145,193
263 REM**** ERROR HANDLING ROUTINE
264 REM****
265 REM****
266 IF ERR = 55 THEN 29
267 E = EOF(1): IF E = -1 THEN 29
268 FOR I = 1 TO 8
269 READ D$
270 C$ = C$ + CHR$(VAL("&H"+D$))
271 NEXT I
272 LPRINT C$
273 LPRINT "ALIGN THIS LINE TO THE HO
F.                                  P
RINTER NOW SET UP."
274 DATA 1B,76,36,36,2C,30,36,2E
275 PRINT ERL: PRINT ERR
276 PRINT: PRINT: PRINT "---S T O P
 O N   E R R O R---": PRINT: BEEP
277 FOR I = 1 TO 2500: NEXT I: STOP
278 REM**** INSTRUCTIONS
279 REM****
280 REM****
281 PRINT "THIS PROGRAM HAS 4 OPTIONS
."
282 PRINT "THESE ARE :- LIST POSTINGS
."
283 PRINT "                ENTER NEW POS
TINGS."
284 PRINT "                MODIFY/DELETE
 POSTINGS."
285 PRINT "                SAVE POSTINGS
.": PRINT
286 PRINT "UPTO 450 POSTINGS CAN BE M
ADE BEFORE"
287 PRINT "A NEW FILE MUST BE CREATED
.": PRINT
288 PRINT "POSTINGS ARE MADE UNDER TH
E HEADINGS"
289 PRINT "BELOW :-": PRINT
290 PRINT "REVENUE    EXPENSES    SUP
PLIES"
291 PRINT "TRAVEL     OTHER       VAT
": PRINT: PRINT "IF YOU MIS-TYPE A RE
PLY, YOU WILL BE": PRINT "GIVEN MANY
OPPORTUNITIES TO CORRECT": PRINT "THE
 ERROR BEFORE DATA IS FILED.": PRINT
292 INPUT "Press return when ready.";
A$: CLS
293 PRINT "WHEN POSTING 'OTHER`, A %A
GE IS"
294 PRINT "ENTERRED, SINCE NOT ALL TH
E AMOUNT"
295 PRINT "MAY BE ELIGEABLE  FOR POST
ING.": PRINT
296 PRINT "VAT IS AUTOMATICALLY POSTE
D @ 15%,"
297 PRINT "IN RESPONSE TO REPLIES INP
UT WHEN"
298 PRINT "ENTERING THE AMOUNT.": PRI
NT
299 PRINT "REVENUE AND EXPENSES ARE '
RECEIPTS`.": PRINT:  PRINT "SUPPLIES,
 TRAVEL AND OTHER ARE": PRINT "'PAYME
NTS` MADE.": PRINT: PRINT "VAT IS EIT
HER A 'RCPT` OR 'PYMT`": PRINT "DEPEN
DING ON THE TYPE OF POSTING.": PRINT:
 PRINT: PRINT
300 PRINT "READY 'CAS:ACCDAT` FOR INP
UT.": PRINT
301 INPUT "Press return when ready.";
A$: PRINT
302 RETURN
303 REM**** HEAD OF PAGE ROUTINE
304 REM****
305 REM****
306 LPRINT: LPRINT"SOURCE/PURPOSE/REF
.              DATE        %    REVENUE
  XPNSE   SUPP'S  TRAVEL   OTHER
VAT"
307 JJ = 0
308 HF$ = CHR$(VAL("&H0C"))
309 LPRINT HF$
310 LPRINT"SOURCE/PURPOSE/REF.
     DATE        %    REVENUE   XPNSE
  SUPP'S  TRAVEL   OTHER      VAT": LP
RINT
311 RETURN
```

Game of Life

Steve Lucas of Cheadle Hulme has based his version of Life on the original program devised by John Conway in 1970.

The game consists of a colony of cells on a grid, which live and die according to fixed rules:

1. Each cell on the grid has eight possible neighbours
2. A cell with only one neighbour will die
3. All cells with two or three neighbours will survive into the next generation
4. A cell with three and only three neighbours will give birth to a new cell
5. A cell which has four or more neighbours will die due to overpopulation

The game is played on a 15 × 15 grid but first you must insert the starting co-ordinates of the cells you want to start with. Different starting positions will result in different patterns. Once you've entered the starting positions, just sit back and watch the ever changing patterns. After about five generations, the patterns will become quite startling.

You could, of course, test out the patterns on a chess board, but the process of working out the rules will take so long that it is much easier to just let the computer do this for you. Reading this description will give you no idea of just how effective the game is at producing startling patterns, so get typing.

Program breakdown

20	turn off function key messages
30	set string for musical notes
40	select text/colour
50	dimension arrays
60	call subroutine to set up board
70-90	main control loop
110-200	set up starting colony
210-390	display the colony
400-550	check out the rules and work out the next colony

Major variables

X(x,y), Y(x,y)	holds details of the colony
C	used to check the rules
X,Y,E	general variables
G%	generation
F	holds the colour
P	random number
ST	number of cells at the start

```
10 REM ** LIFE **
20 KEY OFF
30 A$="abcdefg"
40 SCREEN 0:WIDTH 37:COLOR 15,4
50 CLS:DIMX(15,15),Y(15,15)
60 GOSUB 110
70 GOSUB 220
80 GOSUB 410
90 GOTO 70
100 END
110 CLS:LOCATE 1,3:INPUT"How many cel
ls at the start ";ST
120 IF ST<1 THEN GOTO 110
130 FOR E=1 TO ST
140 PRINT"Please enter cell number ";
E
150 INPUT X,Y
160 IF X>14 OR Y>14 OR X*Y=0 THEN PRI
NT"Cell out of range!":GOTO 140
170 IF X(X,Y)>0 THEN PRINT"That cell
is already occupied!":GOTO 140
180 X(X,Y)=1:Y(X,Y)=X(X,Y)
190 NEXT E
200 CLS:G%=0:RETURN
210 REM ** display colony **
220 COLOR 1,15:SCREEN 2:P=RND(-TIME)
230 OPEN "grp:" FOR OUTPUT AS #1
240 LINE(0,0)-(255,20),11,BF
250 FOR P=1 TO 3
260 A=INT(RND(1)*7+1):PLAY"132"+MID$(
A$,A,1)
```

```
290 F=1
300 PSET(80,8):PRINT#1,"Generation ";
G%
310 FOR X=1 TO 14:FOR Y=1 TO 14
320 X(X,Y)=Y(X,Y)
330 F=F+1:IF F>13 THEN F=1
340 PSET(X*8+40,Y*8+40),15
350 COLOR F
360 IF X(X,Y)=0 THEN PRINT#1," "; ELS
E PRINT#1,"*";
370 NEXT Y,X
380 CLOSE #1
390 RETURN
400 REM ** update generation **
410 G%=G%+1
420 FOR X=2 TO 14:FOR Y=2 TO 14
430 C=0
440 IF X(X-1,Y-1)=1 THEN C=C+1
450 IF X(X-1,Y)=1 THEN C=C+1
460 IF X(X-1,Y+1)=1 THEN C=C+1
470 IF X(X,Y+1)=1 THEN C=C+1
480 IF X(X,Y-1)=1 THEN C=C+1
490 IF X(X+1,Y-1)=1 THEN C=C+1
500 IF X(X+1,Y)=1 THEN C=C+1
510 IF X(X+1,Y+1)=1 THEN C=C+1
520 IF X(X,Y)=1 AND C<>2 AND C<>3 THE
N Y(X,Y)=0
530 IF X(X,Y)=0 AND C=3 THEN Y(X,Y)=1
540 NEXT Y,X
550 RETURN
```

MSX

Space Duel

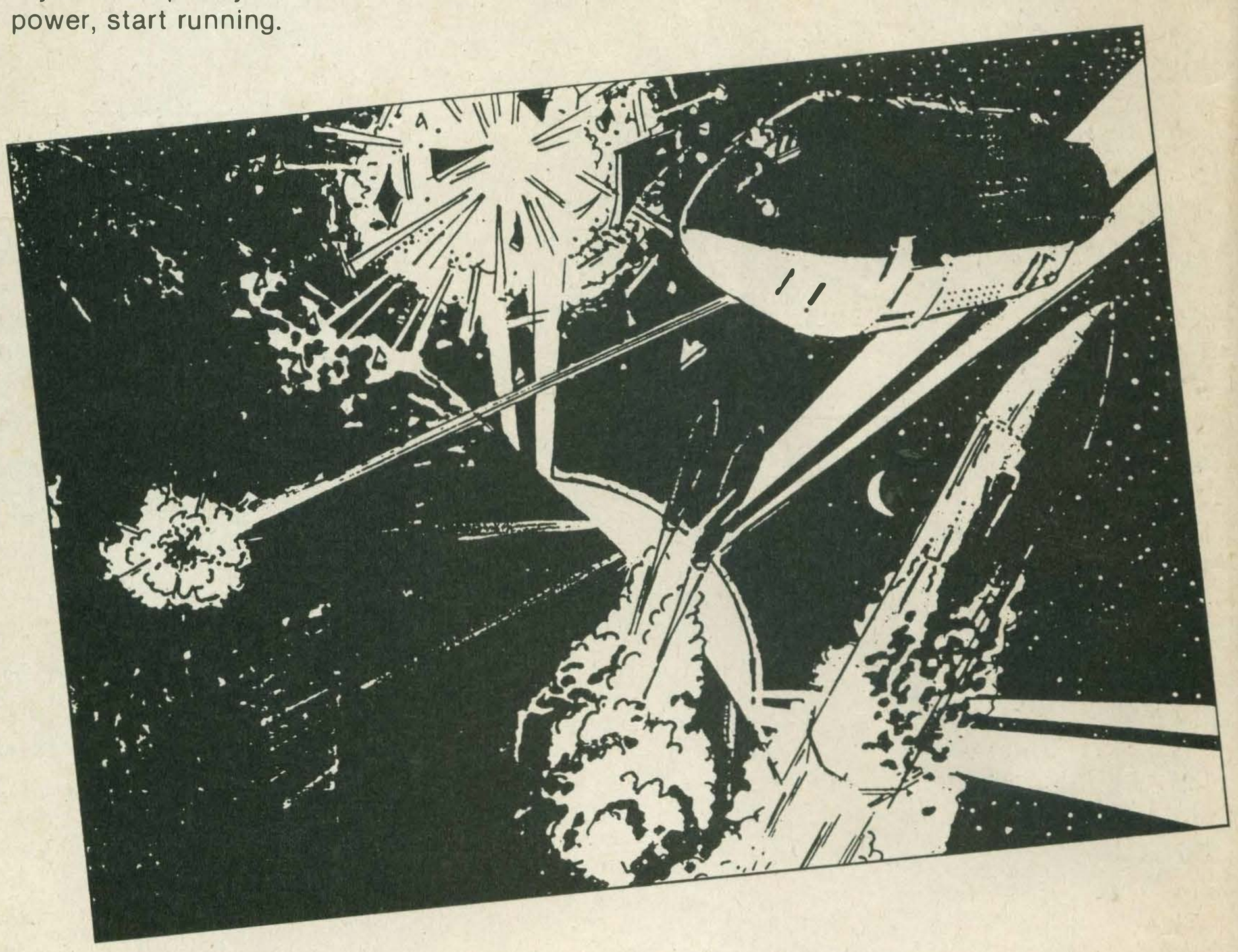
Enjoy a bit of drama in deep space with this two-player arcade game by Andrew Hay of Denny in Stirlingshire.

Each player controls his craft with a joystick in an attempt to destroy his opponent's ship with a blast from the laser gun. The game uses a wrap around screen so if you disappear off the edge of the screen you re-appear at the other side instantly.

There is a fixed time limit for the engagement and only enough charge in each laser for 20 blasts so if you use up all your laser power, start running.

Program breakdown

10-170	initialise program, interrupts and variables
180-240	main loop
330-410	move player one sprite
490-550	move player two sprite
630-690	update time, check X,Y co-ordinates are on screen
770-880	decrease number of bullets goto firing routines
1050-1060	player one fire
1130-1140	player two fire
1210-1320	player one dead
1400-1510	player two dead
1590-1630	collision routine
1710-1780	finish of game
1870-2140	print titles, set up sprites and print instructions



Alternatively, you can try ramming your opponent. This will result in the destruction of both craft but no points will be awarded.

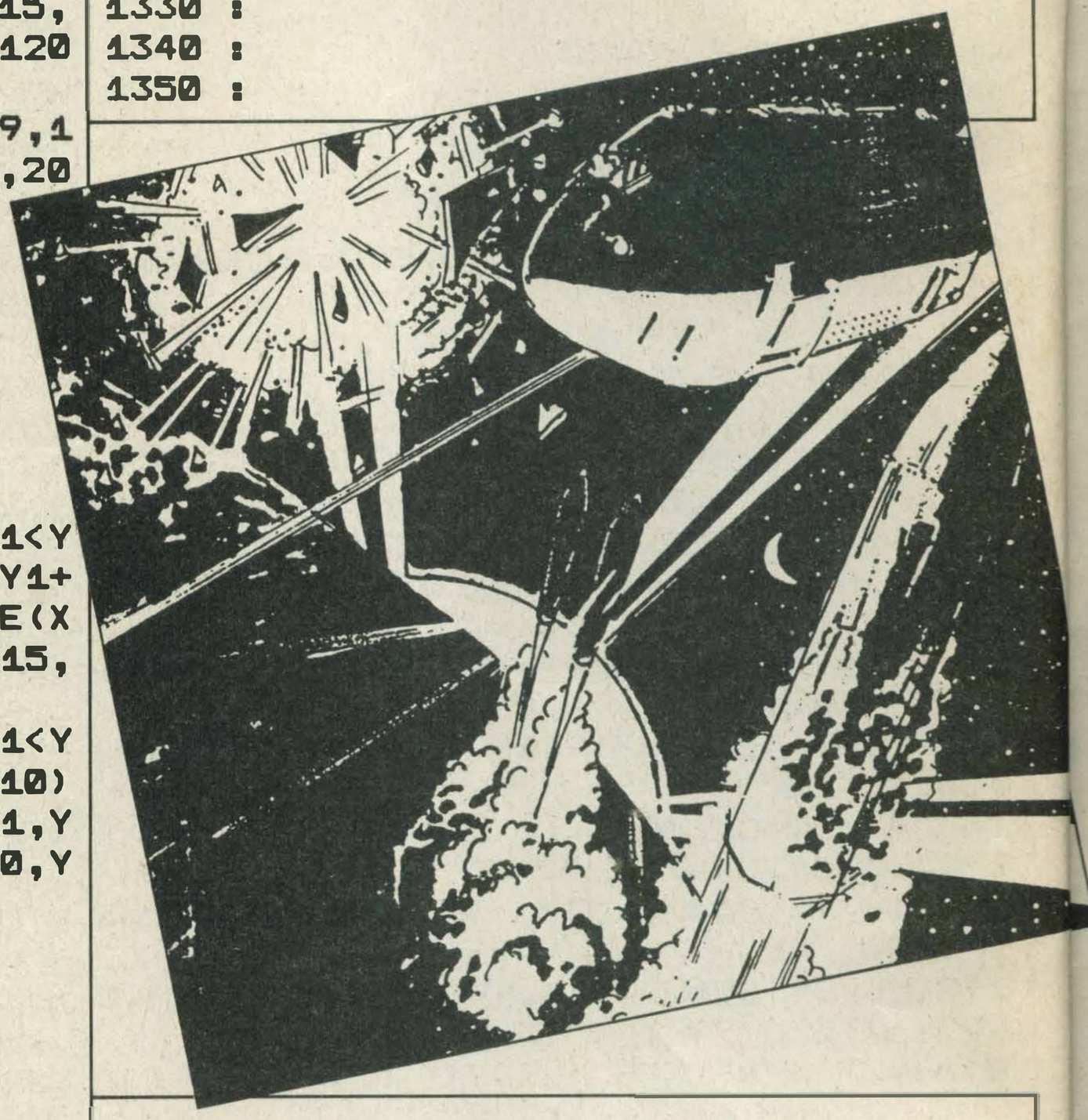
Those who only have access to one joystick can easily modify one of the craft to keyboard control by changing the figure 2 to 0 in the STRIG(2) and STICK(2) commands.

Main variables

X1,Y1	x,y co-ordinates of player one
X2,Y2	X,Y co-ordinates of player two
T	time left
P1	player one score
P2	player two score
B1	player one bullets left
B2	player two bullets left
S (n)	sprite shapes
S1	joystick one input
S2	joystick two input

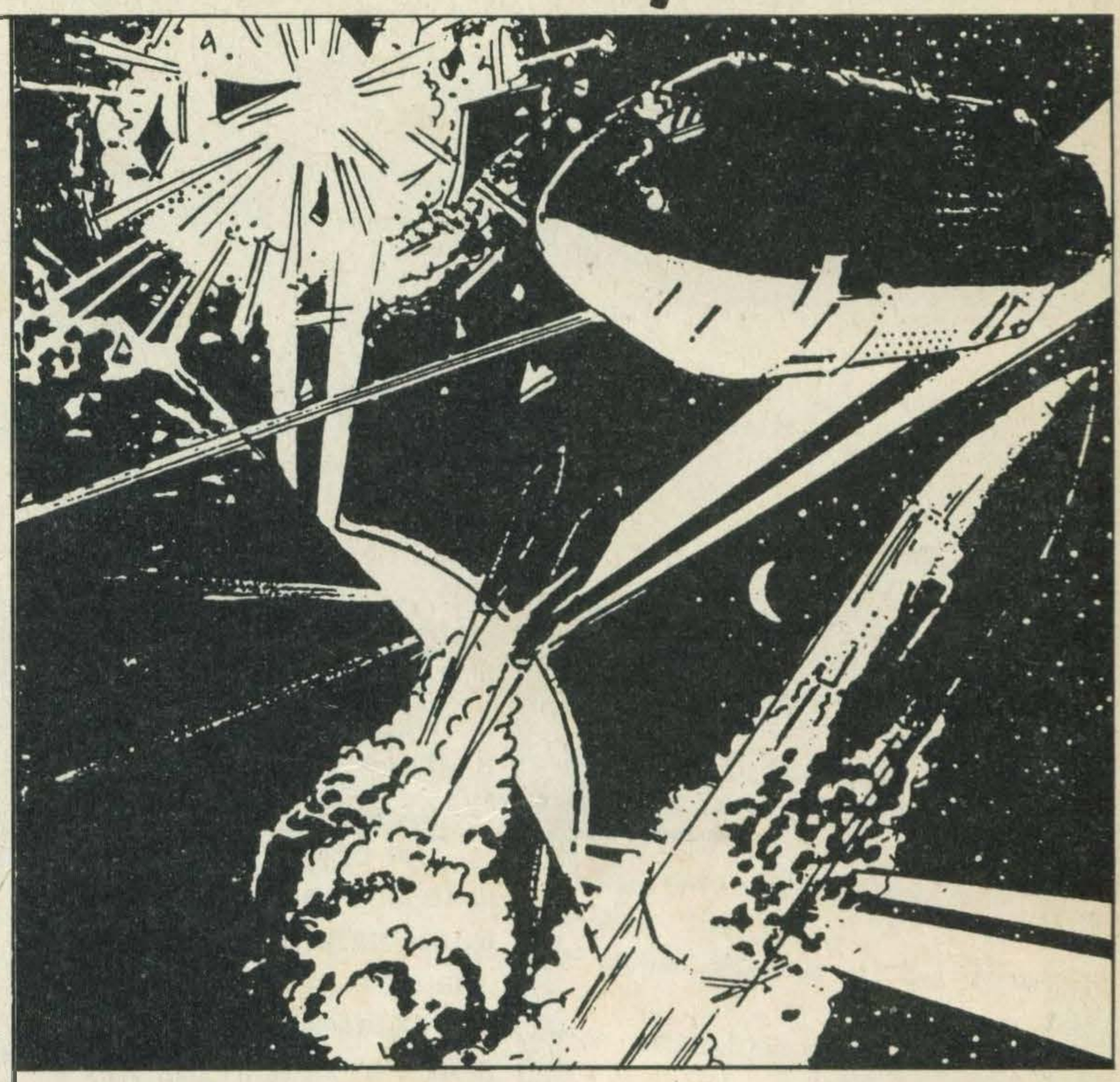
```
1 ' ****************
2 ' *                *
3 ' *  SPACE DUEL    *
4 ' *                *
5 ' *     by         *
6 ' *                *
7 ' *  ANDREW HAY    *
8 ' *                *
9 ' ****************
10 GOSUB 1870
20 T=251:P1=0:P2=0:B1=20:B2=20
30 SCREEN 2:STRIG(1)OFF:STRIG(2)OFF:S
PRITEOFF
40 SPRITE$(0)=8$(0)
50 FOR A=1 TO 80
60 X=RND(1)*255:Y=RND(1)*191
70 PSET(X,Y)
80 NEXT
90 ON INTERVAL=15 GOSUB 590:INTERVAL
OFF
100 ON SPRITE GOSUB 1600
110 ON STRIG GOSUB ,860,730
120 LINE (50,0)-(T-1,5),8,BF
130 SPRITE$(2)=S$(3)
140 PRESET(9,0):PRINT#1,"TIME:"
150 PRESET (20,183):PRINT#1,"PLAYER 1
:";P1:PRESET(150,183):PRINT#1,"PLAYER
 2:"P2
160 Y1=RND(1)*191:X1=20:Y2=RND(1)*191
:X2=220
170 STRIG(1)ON:STRIG(2)ON:SPRITEON:IN
TERVAL ON
180 S1=STICK(1)
190 S2=STICK(2)
200 ON 81 GOSUB 330,340,350,360,370,3
80,390,400
210 ON S2 GOSUB 410,490,500,510,520,5
30,540,550
220 PUT SPRITE 0,(X1,Y1),7,0
230 PUT SPRITE 1,(X2,Y2),12,2
240 GOTO 180
250 :
260 :
270 :
280 :
290 '   MOVE PLAYER 1
300 :
310 :
320 :
330 Y1=Y1-3:RETURN
340 SPRITE$(0)=S$(0):X1=X1+3:Y1=Y1-3:
RETURN
350 SPRITE$(0)=8$(0):X1=X1+3:RETURN
360 SPRITE$(0)=8$(0):X1=X1+3:Y1=Y1+3:
RETURN
370 Y1=Y1+3:RETURN
380 SPRITE$(0)=8$(1):Y1=Y1+3:X1=X1-3:
RETURN
390 SPRITE$(0)=S$(1):X1=X1-3:RETURN
400 SPRITE$(0)=8$(1):X1=X1-3:Y1=Y1-3:
RETURN
410 Y2=Y2-3:RETURN
420 :
430 :
440 :
450 '    MOVE PLAYER 2
460 :
470 :
480 :
490 SPRITE$(2)=S$(2):X2=X2+3:Y2=Y2-3:
RETURN
500 SPRITE$(2)=S$(2):X2=X2+3:RETURN
510 SPRITE$(2)=S$(2):X2=X2+3:Y2=Y2+3:
RETURN
520 Y2=Y2+3:RETURN
530 SPRITE$(2)=8$(3):X2=X2-3:Y2=Y2+3:
RETURN
540 SPRITE$(2)=S$(3):X2=X2-3:RETURN
550 SPRITE$(2)=S$(3):X2=X2-3:Y2=Y2-3:
RETURN
560 :
570 :
580 :
590 '     UPDATE TIME
600 :
610 :
620 :
630 IF T<47THEN GOTO 1710
640 IF X1<0 THEN X1=255 ELSE IF X2<0
THEN X2=255
650 IF Y1<0 THEN Y1=191ELSE IFY2<0 TH
EN Y2=191
660 IF Y1>191 THEN Y1=0 ELSE IF Y2>19
1 THEN Y2=0
670 IF X1>255THEN X1=0 ELSE IF X2>255
THEN X2=0
680 T=T-.5:LINE(T-.5,0)-(T,5),1,BF
690 RETURN
700 :
710 :
720 :
730 '    PLAYER 1 FIRE
740 :
750 :
760 :
770 IF B1=0 THEN RETURN ELSE B1=B1-1
780 IF SPRITE$(2)=8$(2) THEN GOSUB 11
30:RETURN ELSE GOSUB 1140:RETURN
790 :
800 :
810 :
820 '     PLAYER 2 FIRE
830 :
840 :
850 :
860 IF B2=0 THEN RETURN ELSE B2=B2-1
870 IF SPRITE$(0)=8$(0) THEN GOSUB 10
50:RETURN ELSE GOSUB 1060:RETURN
```

```
880 RETURN
890 :
900 :
910 :
920 '    DATA FOR SPRITES
930 :
940 DATA 0,128,192,224,240,254,195,97
,48,31,63,127,192,128,0,0,0,0,0,0,0,0
,0,128,192,254,192,128,0,0,0,0
950 DATA 0,0,0,0,0,0,0,1,3,127,3,1,0,
0,0,0,0,1,3,7,15,127,195,134,12,248,2
52,254,3,1,0,0
960 DATA 0,0,48,152,204,102,51,31,15,
31,51,102,204,152,48,0,0,0,0,0,48,120
,108,230,227,230,108,120,48,0,0,0
970 DATA 0,0,0,0,0,12,30,54,103,199,1
03,54,30,12,0,0,0,0,6,12,25,51,102,20
4,248,240,248,204,102,51,25,12
980 :
990 :
1000 :
1010 '    FIRING ROUTINES
1020 '      PLAYER 1 FIRE
1030 :
1040 :
1050 IFX1<X2AND(Y1=Y2ORY1>Y2-7ANDY1<Y
2ORY1>Y2ANDY1<Y2+8)THENLINE(X1+16,Y1+
10)-(X2+8,Y1+10),9:GOTO1400ELSELINE(X
1+15,Y1+10)-(255,Y1+10),9:LINE(X1+15,
Y1+10)-(255,Y1+10),1:RETURN
1060 IFX1>X2AND(Y1=Y2ORY1>Y2-7ANDY1<Y
2ORY1>Y2ANDY1<Y2+8)THENLINE(X1,Y1+10)
-(X2+8,Y1+10),9:GOTO1400ELSELINE(X1,Y
1+10)-(0,Y1+10),9:LINE(X1,Y1+10)-(0,Y
1+10),1:RETURN
1070 :
1080 :
1090 :
1100 '    PLAYER 2 FIRE
1110 :
1120 :
1130 IFX2<X1AND(Y2=Y1ORY2>Y1-8ANDY2<Y
1ORY2>Y1ANDY2<Y1+6)THENLINE(X2+16,Y2+
10)-(X1+8,Y2+10),9:GOTO1210ELSELINE(X
2+15,Y2+10)-(255,Y2+10),9:LINE(X2+15,
Y2+10)-(255,Y2+10),1:RETURN
1140 IFX2>X1AND(Y2=Y1ORY2>Y1-8ANDY2<Y
1ORY2>Y1ANDY2<Y1+6)THENLINE(X2,Y2+10)
-(X1,Y2+10),9:GOTO1210ELSELINE(X2,Y2+
10)-(0,Y2+10),9:LINE(X2,Y2+10)-(0,Y2+
10),1:RETURN
1150 :
1160 :
1170 :
1180 '       PLAYER 1 DEAD
1190 :
1200 :
1210 STRIG(1)OFF:INTERVAL OFF:SOUND 8
,0:SOUND 7,55:8OUND 6,30:SOUND12,50:8
OUND11,0:SOUND13,1:SOUND 8,16
1220 FOR A=1 TO 10
1230 R=RND(1)*50
1240 LINE(X1+8,Y1+8)-STEP(R,-50),7
1250 R=RND(1)*50
1260 LINE(X1+8,Y1+8)-8TEP(R,50),7
1270 R=RND(1)*50
1280 LINE(X1+8,Y1+8)-STEP(-R,-50),7
1290 R=RND(1)*50
1300 LINE(X1+8,Y1+8)-STEP(-R,50),7
1310 NEXT
1320 P2=P2+1:GOTO 30
1330 :
1340 :
1350 :
```



```
1360 '     PLAYER 2 DEAD
1370 :
1380 :
1390 :
1400 STRIG(2)OFF:INTERVAL OFF:SOUND 8
,0:SOUND 7,55:SOUND 6,30:SOUND 12,50:
SOUND 11,0:SOUND 13,1:SOUND 8,16
1410 FOR A=1 TO 10
1420 R=RND(1)*50
1430 LINE(X2+8,Y2+8)-STEP(R,50),12
1440 R=RND(1)*50
1450 LINE(X2+8,Y2+8)-STEP(-R,50),12
1460 R=RND(1)*50
1470 LINE(X2+8,Y2+8)-STEP(R,-50),12
1480 R=RND(1)*50
1490 LINE(X2+8,Y2+8)-STEP(-R,-50),12
1500 NEXT
1510 P1=P1+1:GOTO 30
1520 :
```

```
1530 :
1540 :
1550 '   SPRITE COLLISION
1560 :
1570 :
1580 :
1590 P2=P2+1:GOTO40
1600 STRIG(1)OFF:STRIG(2)OFF:INTERVAL
 OFF:SPRITEOFF:FOR A=1 TO 50
1610 CIRCLE(X1+16,Y1+16),A,9,,,1.3
1620 NEXT
1630 GOTO30
1640 :
1650 :
1660 :
1670 '      OUT OF TIME
1680 :
1690 :
1700 :
1710 STRIG(1)OFF:STRIG(2)OFF:INTERVAL
 OFF
1720 SOUND 7,&B111000:SOUND 8,0:SOUND
 9,0:SOUND 10,0:SOUND 13,1:SOUND 12,1
90:SOUND 11,0
1730 SOUND 1,2:SOUND 0,100:SOUND 3,2:
SOUND 2,110:SOUND 5,2:SOUND 4,105:SOU
ND 6,1
1740 SOUND 8,16:SOUND 9,16:SOUND 10,1
6
1750 SCREEN 1:LOCATE 10,6:PRINT"TIME
UP!!"
1760 IF P1>P2 THEN PRINT:PRINT"Player
 1 has won,hard lines  player 2." ELS
E IF P2>P1 THEN PRINT:PRINT"Player 2
has won.hard lines  player 1."ELSE IF
 P1=P2 THEN PRINT:PRINT"It's a draw."
1770 PRINT:PRINT"PLAYER 1 SCORED:";P1
:PRINT"PLAYER 2 SCORED:";P2
1780 PRINT:PRINT"Press any key to pla
y again."
1790 IF INKEY$="" THEN 1790 ELSE RUN
1800 :
1810 :
1820 '  USER INSTRUCTIONS
1830 :
1840 :
1850 :
1860 :
1870 COLOR 15,1,1:SCREEN 3,2:KEYOFF
1880 OPEN"grp:"AS 1
1890 R=RND(-TIME)
1900 DIM S$(3):DEFINT A-Z
1910 FOR A=0 TO 3
1920 FOR B=1 TO 32
1930 READ D:A$=A$+CHR$(D):NEXT
1940 SPRITE$(A)=A$:S$(A)=A$:A$=""
1950 NEXT
1960 COLOR 4:PRESET(50,20):PRINT#1,"S
PACE"
```



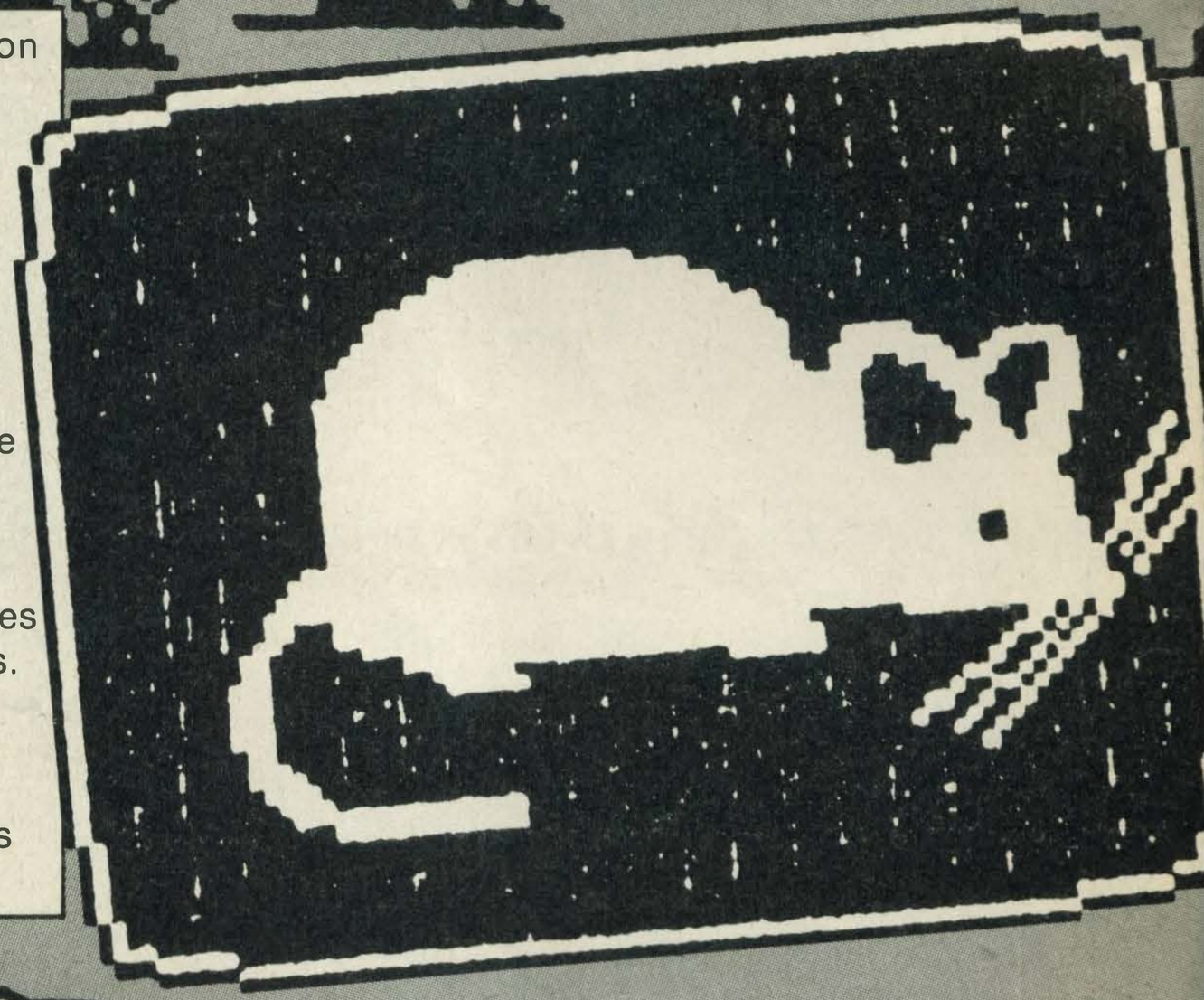
```
1970 COLOR 13:PRESET(70,100):PRINT#1,
"DUEL"
1980 SOUND 7,62
1990 PLAY"v13o418ed+ed+eo3bo4dco3a4.c
eab4.eg+o3bo4c4.o3eo4ed+ed+eo3bo4dco3
a4.ceab4.eo4co3ba1"
2000 FOR A=0 TO 1900:NEXT
2010 FOR A=1 TO 180
2020 LINE(RND(1)*255,RND(1)*191)-STEP
(10,10),RND(1)*14+1,BF
2030 NEXT
2040 SCREEN 1:COLOR 15
2050 PRINT"   S P A C E    D U E L":P
RINT
2060 PRINT"The object of this game is
   simple:":PRINT"Blow away the other
 player   before he blows you away."
2070 PRINT"Each player can move his s
hipin any direction,but can onlyfire
horizontally."
2080 PRINT"Both players have 20 charg
es of his laser each."
2090 PRINT"Your ship can move through
   the sides,top or bottom of   the s
creen and will appear   on the opposi
te side."
2100 PRINT"If the players collide bot
h  will be annihilated."
2110 PRINT"The time left is shown by
thebar at the top of the screen."
2120 PRINT"Press any key to play,and
maythe best man win!"
2130 IF INKEY$="" THEN 2130 ELSE SCRE
EN 2
2140 RETURN
```

MSX

Mouse Trap

This is an MSX version of a listing which appeared in *A & B Computing*. The original program was written by Eifion Jewell and the conversion was made by Ken Goodman of Colchester.

The object of the game is to use the cursor keys to move the mouse from one side of the screen to the other through the holes which appear in the walls. Before the mouse can pass through a hole a piece of cheese must be eaten. Use the arrow keys to move the mouse.

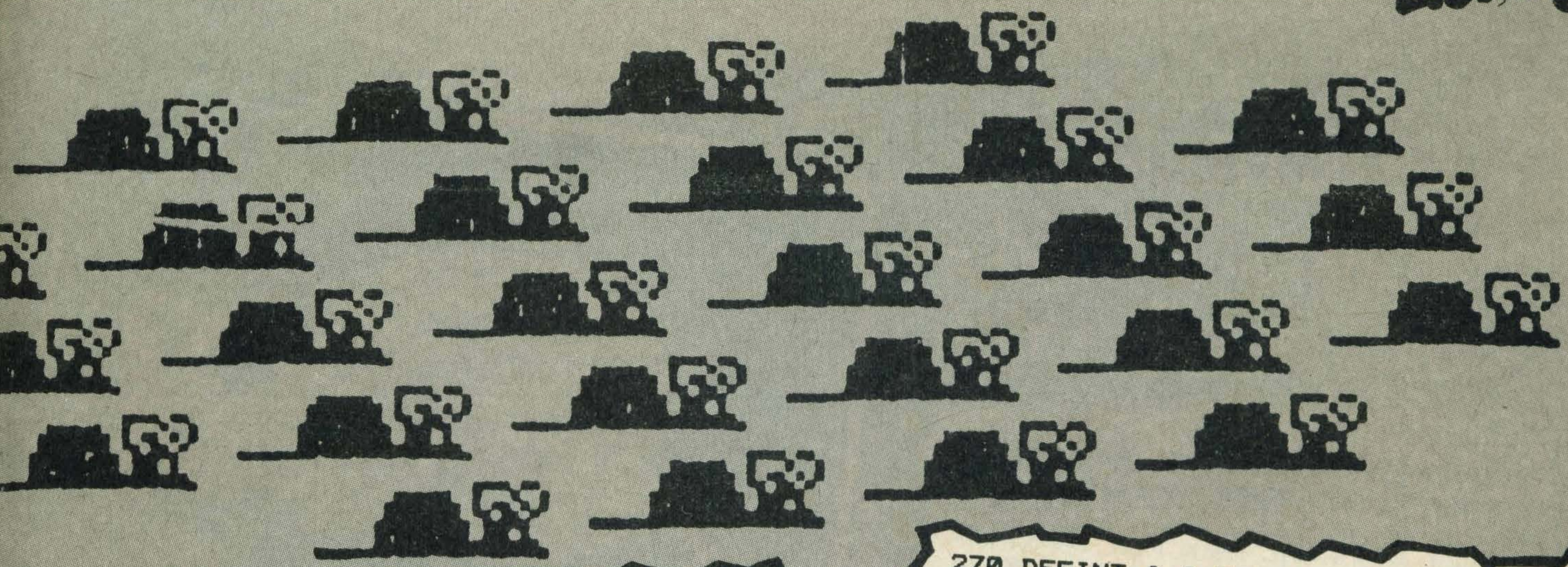


Program breakdown

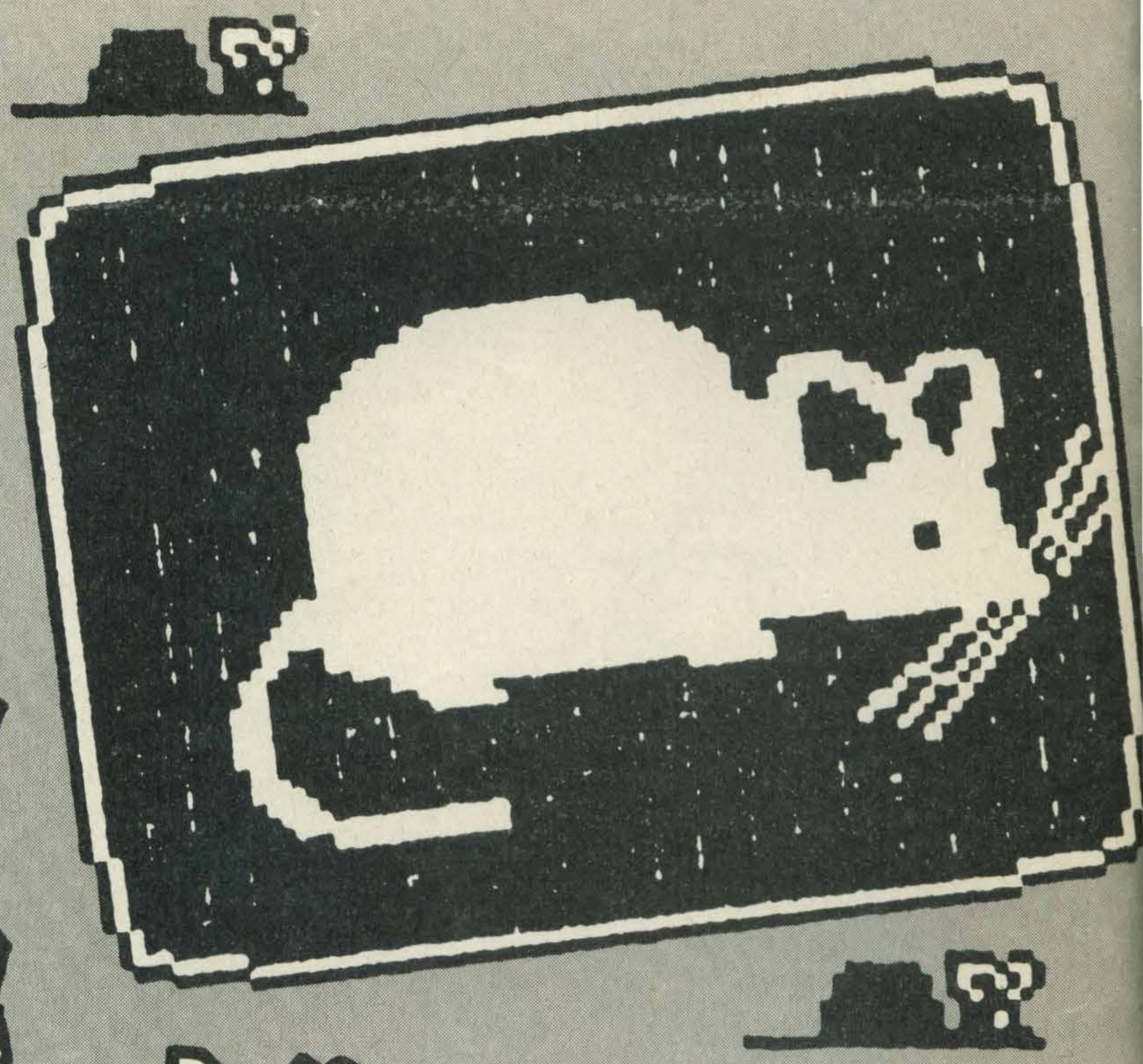
10-230	title screen
240-410	instructions
420-470	initialise variables
480-530	set up sprites
540-620	reset score etc. and draw screen
630-680	start the run
690-820	mouse movement across the screen etc.
830-890	reached the end, reset time, start new screen
900-1020	time expired, print score
1030-1070	update time and print it
1080-1150	create a hole
1160-1190	update score and print it
1200-1240	next cheese position
1250-1300	sprite DATA

Main variables

SC	score
HS	high score
TT	time allowed for each screen
SH	screen number
CC	colour number
R	current column number
H	position of mouse on column
F	position of cheese
G	position of hole
EE	cheese eaten indicator



```
1 '                    MOUSE
2 '
3 '
4 '          By Eifion Jewel
5 '
6 '    Re-coded for MSX by Ken Goodman
7 '
8 '
9 '
10 OPEN"GRP:" AS #1:KEY OFF
20 SOUND 7,60:SOUND 0,80:SOUND 8,16:S
OUND 12,2:SOUND 13,8
30 COLOR ,1,1:BASE(7)=&H2800
40 SCREEN 1:SCREEN 3,1:VDP(6)=5
50 FOR I=0 TO 184:PUTSPRITE 0,(I,24),
10,2:NEXT
60 FOR I=24TO80:PUTSPRITE 0,(184,I),1
0,2:NEXT
70 FOR DL=1 TO 200:NEXT:PUTSPRITE 0,(
184,209):PRESET(176,80):COLOR 10:PRIN
T#1,"E"
80 SOUND 0,150:SOUND 13,10
90 FOR I=0 TO 152:PUTSPRITE 0,(I,168)
,3,207:NEXT
100 FOR I=168 TO 88 STEP-1:PUTSPRITE
0,(152,I),3,206:NEXT
110 FOR DL=1 TO 200:NEXT:PUTSPRITE 0,
(152,209):PRESET(144,80):COLOR 3:PRIN
T#1,"8"
120 SOUND 0,55:SOUND 13,12
130 FOR I=0 TO 88:PUTSPRITE 0,(120,I)
,13,85:NEXT
140 FOR DL=1 TO 200:NEXT:PUTSPRITE 0,
(120,209):PRESET(112,80):COLOR 13:PRI
NT#1,"U"
150 SOUND 0,30:SOUND 13,14
160 FOR I=256 TO 88 STEP-1:PUTSPRITE
0,(I,24),7,10:NEXT
170 FOR I=24 TO 88:PUTSPRITE 0,(88,I)
,7,10:NEXT
180 FOR DL=1 TO 200:NEXT:PUTSPRITE 0,
(88,209):PRESET(80,80):COLOR 7:PRINT#
1,"O"
190 SOUND 0,190:SOUND 13,12
200 FOR I=256 TO 56 STEP-1:PUTSPRITE
0,(I,168),8,2:NEXT
210 FOR I=168 TO 88 STEP-1:PUTSPRITE
0,(54,I),8,2:NEXT
220 FOR DL=1 TO 200:NEXT:PUTSPRITE 0,
(54,209):PRESET(48,80):COLOR8:PRINT#1
,"M"
230 SOUND 8,0:FOR DL=1 TO 2500:NEXT
240 '
250 'Instructions
270 DEFINT A-Z:COLOR,1,1:SCREEN 2,1
280 COLOR 8:PRESET(72,16):PRINT#1,"MU
NCHING MOUSE"
290 COLOR 3:PRESET(0,40):PRINT#1,"  T
he object of the game is to
300 PRINT#1,"guide the mouse from one
 side"
310 PRINT#1,"of the screen to the oth
er
320 PRINT#1,"through the holes in the
 walls.
330 COLOR 11:PRINT#1,:PRINT#1,"  Befo
re being able to pass
340 PRINT#1,"through a hole, a piese
of
350 PRINT#1,"cheese must be eaten.
360 COLOR 13:PRINT#1,:PRINT#1,"  This
 is done by passing the
370 PRINT#1,"mouse over the cheese.
380 COLOR 7:PRINT#1,:PRINT#1,"Use the
 arrow keys to move
390 PRINT#1,"the mouse.
400 COLOR 15:PRESET(72,168):PRINT#1,"
Press SPACE"
410 IFNOT STRIG(0) THEN 410
420 '
430 'Set starting values etc.
440 '
450 ZZ=RND(-TIME)
460 ON INTERVAL=50 GOSUB 1060
470 DEFFNX(N)=(N-1)*24+16:DEFFNY(N)=(
N-1)*16
480 '
490 'Load Sprite data
500 '
510 RESTORE 1270:COLOR,1,1:SCREEN 2,1
520 S$="":FOR J=0 TO 3:FOR I=1 TO 8:R
EAD D:S$=S$+CHR$(D):NEXT
530 SPRITE$(J)=S$:S$="":NEXT
540 '
550 'Reset score etc. and draw screen
 blocks
560 '
570 SC=0:TT=40:SH=1
580 CC=RND(1)*12+2
590 LINE(16,0)-(248,0),CC:LINE(248,0)
-(248,176),CC
600 LINE(16,176)-(248,176),CC:LINE(16
,0)-(16,176),CC
610 FOR X=32TO224 STEP24:LINE(X,0)-(X
+7,176),CC,BF:NEXT
620 PRESET(32,184):COLOR3:PRINT#1,"SC
ORE"SC;:PRESET(144,184):PRINT#1,"TIME
"TT;
```



```
630 '
640 'Start the run
650 '
660 R=1:H=7:F=3:TIME=0:INTERVAL ON:ZZ
=TT
670 PUTSPRITE 0,(FNX(1),FNY(H)),4:PUT
SPRITE 3,(FNX(1),FNY(F)),11
680 GOSUB 1110:REM Knock a hole
690 '
700 'Do this to the end of the row or
 time up
710 '
720 D=STICK(0):IF D=1 THEN PUTSPRITE
0,(FNX(R),FNY(H)),4,0:H=H-1:IF H<1 TH
EN H=1
730 IF D=1 AND H<>1 THEN FOR I=FNY(H+
1) TO FNY(H) STEP-4:PUTSPRITE 0,(FNX(
R),I):NEXT
740 IF H=1 THEN PUTSPRITE 0,(FNX(R),F
NY(H)),4,0
750 IF D=5 THEN PUTSPRITE0,(FNX(R),FN
Y(H)),4,1:H=H+1:IF H>11 THEN H=11
760 IF D=5 AND H<>11 THEN FOR I=FNY(H
-1) TO FNY(H)STEP4:PUTSPRITE 0,(FNX(R
),I):NEXT
770 IF H=11 THEN PUTSPRITE 0,(FNX(R),
FNY(H)),4,1
780 IF D=3 AND EF AND H=6 THEN PUTSPR
ITE 0,(FNX(R),FNY(H)),4,2:R=R+1:PUTSP
RITE 0,(FNX(R),FNY(H)),4,2:EF=0:GOSUB
1110:GOSUB 1230:PUTSPRITE 3,(FNX(R),F
NY(F)),11:GOSUB 1190:GOTO720
790 IF R=10 THEN 860 ELSE IF ZZ<=0 TH
EN 890
800 IF D<>1 AND D<>3 AND D<>5 THEN 72
0
810 IF H=F THEN EF=-1:PUTSPRITE 3,(FN
X(R),209):PLAY"O3L16V8B":F=0
820 PLAY"O7L64V8B":GOTO 720
830 '
840 'End of sheet-reduce time-start a
nother
850 '
860 PUTSPRITE 0,(FNX(R),209),4,2:PUTS
PRITE 3,(FNX(R),209),11,3
870 TT=TT-3:SH=SH+1:SC=SC+ZZ*SH*10:ZZ
=0:INTERVAL OFF
880 FOR DL=1 TO 5000:NEXT:CLS:GOTO 58
0
890 A$="S14M1000T255L4R204GO5ER4GER40
4GO5ER4GER2FGFDR4GCR2R4EC"
900 '
910 'Time expired-print scores
920 '
930 ZZ=0:INTERVAL OFF:PLAY A$
940 FORDL=1 TO 3000:NEXT:COLOR 7:SCRE
EN 0
950 LOCATE 9,5:PRINT"YOU TOOK TOO LON
G!!"
960 LOCATE 9,8:PRINT"YOUR SCORE WAS"S
C
970 IF HS<SC THEN HS=SC
980 LOCATE 12,13,0:PRINT"HISCORE ="HS
990 LOCATE 0,20:PRINT"Press SPACE to
play again, E to end."
1000 IF INKEY$<>"" THEN 1000
1010 GG$=INKEY$:IF GG$="" THEN 1010
1020 IF GG$=" " THEN SCREEN 2,1:GOTO
510 ELSE CLS:END
1030 '
1040 'Update time print
1050 '
1060 PRESET(184,184):COLOR 1:PRINT#1,
STRING$(4,CHR$(200));
1070 ZZ=ZZ-1:PRESET(176,184):COLOR 15
:PRINT#1,ZZ;:RETURN
1080 '
1090 'Knock a hole
1100 '
1110 G=RND(1)*11+1
1120 PRESET(FNX(R)+16,FNY(G)):COLOR 1
:PRINT#1,CHR$(219);
1130 PRESET(FNX(R)+16,FNY(G)+8):COLOR
 1:PRINT#1,CHR$(219);
1140 IF G=1 OR G=11 THEN LINE(16,0)-(
248,0),CC:LINE(16,176)-(248,176),CC
1150 RETURN
1160 '
1170 'Update the score
1180 '
1190 SC=SC+10:PRESET(72,184):COLOR 1:
PRINT#1,STRING$(6,CHR$(200));:PRESET(
72,184):COLOR15:PRINT#1,SC;:RETURN
1200 '
1210 'Next cheese
1220 '
1230 IF R<10 THEN F=RND(1)*11+1:IF F=
H THEN 1230
1240 RETURN
1250 '
1260 '
1270  DATA102,102,126,24,60,60,60,62
1280 DATA62,60,60,60,24,126,102,102
1290 DATA6,6,102,124,124,102,70,102
1300 DATA28,28,52,60,122,110,118,118
```

PANACEA SOFTWARE
105 GAINSBOROUGH DRIVE
WESTCLIFF-ON-SEA
ESSEX
TEL.0702 333476

SOUND GENERATOR 5.95

THE SOUND GENERATOR PRODUCES IS A FULL GRAPHIC DRIVEN DISPLAY THAT SHOWS AND CONTROLS THE CONDITION OF THE COMPUTERS OWN SOUND REGISTERS. THESE CAN BE ALTERED BY YOU AND THE SOUND TESTED. WHEN YOU HAVE CREATED THE SOUND YOU REQUIRE THE SOUND REGISTER DATA CAN THEN BE INCLUDED IN YOUR OWN PROGRAMS.

SPRITE GENERATOR 5.95

THE SPRITE DESIGNER ENABLES ON-SCREEN PRODUCTION OF SPRITES AND INCLUDES A HOST OF COMMANDS TO MAKE YOUR LIFE EASY. INVERT,ROTATE,SAVE,LOAD,SIZE,COLOUR,STORE. ANIMATE (ANIMATE YOUR SPRITES) BEFORE PLACING IN PROGRAMS. ALSO PROGRAM (GENERATES THE DATA AND SPRITE PRODUCTION ROUTINE IN BASIC).

RAVAGES OF TIME 5.95

RAVAGES OF TIME IS A MULTI-LEVEL TEXT ADVENTURE FEATURING INTREGAL ARCADE STYLE GAMES. THE COMPLETE GAME CONSISTS OF MULTI-GAMES THAT ARE AUTO-LOADED AS THE PREVIOUS STAGES ARE COMPLETED. THIS SYSTEM GIVES YOU GREAT VALUE FOR MONEY.

CODE OF HAMMURABI 5.95

CODE OF HAMMURABI, IT'S 1726 B.C. AND KING HAMMURABI WISHES TO CONQUER THE SUMERIENS,AMORITES AND ASSYRIANS. IF HE CAN CONTROL THE ANCIENT MIDDLE EAST HE CAN BUILD TEMPLES,CANNALS,A MONETARY SYSTEM AND BRING ABOUT A NEW WAY OF LIFE. UNDER THE CODE OF HAMMURABI.

BEDLAM 5.95

BEDLAM GIVES YOU MULTI-SCREEN ACTION. RUN,JUMP AND CLIMB AROUND COLLECTING YOUR TREASURES. LOOK OUT FOR THE MEANIES. CHAOS CAN BE FUN.

BAZOOKA BANSHEE 5.95

BAZOOKA BANSHEE IS INVADERS,ATTACKERS,THINGS FROM SPACE. THEY ARE ALL HERE. FAST,NOISY,FLASHING ACTION, ALL YOU HAVE TO DO IS SHOOT THEM DOWN BUT LIFE MAY NOT BE THAT EASY. IF YOU LIKE BLASTING, YOU WILL LIKE THIS.

It's easy to complain about advertisements. But which ones?

Every week millions of advertisements appear in print, on posters or in the cinema.

Most of them comply with the rules contained in the British Code of Advertising Practice.

But some of them break the rules and warrant your complaints.

If you're not sure about which ones they are, however, drop us a line and we'll send you an abridged copy of the Advertising Code.

Then, if an advertisement bothers you, you'll be justified in bothering us.

The Advertising Standards Authority.
If an advertisement is wrong, we're here to put it right.

ASA Ltd, Dept 2 Brook House, Torrington Place, London WC1E 7HN

This space is donated in the interests of high standards of advertising.

ASK FOR OUR FULL SOFTWARE LIST

YOUR No 1 MSX CENTRE

ONLY A SMALL SELECTION OF OUR SOFTWARE

SYSTEM

LATE NIGHT OPENING WEDNESDAYS UNTIL 8pm

KONAMI
SUPER COBRA....£16.95
COMIC BAKERY....£16.95
TRACK AND FIELD 1....£16.95
HYPER SPORTS 1....£16.95
ANTARCTIC ADVENTURE....£16.95
TENNIS....£16.95
MOPI RANGER....£16.95
SKY JAGUAR....£16.95
GOLF....£16.95
CIRCUS CHARLIE....£16.95
TIME PILOT....£16.95
TRACK AND FIELD 2....£16.95
ATHLETIC LAND....£16.95
MONKEY ACADEMY....£16.95
HYPER SPORTS 2....£16.95
YIE AR KUNG-FU....£16.95
KINGS VALLEY....£16.95
HYPER SHOT....£15.85

SOFTWARE PROJECTS
JET SET WILLY....£7.95
MANIC MINER....£7.95

GST/ELECTRIC
ZAXXON....£11.95
LE MANS....£9.95
BUCK ROGERS....£11.95
THE WRECK....£14.95
BACKGAMMON....£9.95

LEVEL 9 COMPUTING
COLOSSAL ADVENTURE....£9.95
ADVENTURE QUEST....£9.95
LORDS OF TIME....£9.95
EMERALD ISLE....£6.95
SNOWBALL....£9.95
DUNGEON ADVENTURE....£9.95
RETURN TO EDEN....£9.95

COMPUTER MATES
CARDS FILING SYSTEM....£49.95
MAILSHOT, WORDPROCESSOR & CARDS....£99.95
SPREADSHEET....£49.95
WORDPROCESSOR....£49.95
CASH ACCOUNTS....£128.95

MELBOURNE HOUSE
THE HOBBIT....£14.95
BOOK-MSX EXPOSED....£6.95
BOOK-MSX PROG'S REF. GUIDE....£14.95
CLASSIC ADVENTURE....£6.95
BOOK MSX GAMES BOOK....£6.95

SHIELD
CHEMISTRY O-LEVEL EXAMINER....£9.95
PHYSICS O-LEVEL EXAMINER....£9.95
MATHS O-LEVEL EXAMINER....£9.95

ACTIVISION
BEAM RIDER....£11.99
PITFALL II....£11.99
GHOSTBUSTERS....£11.99
DECATHLON....£11.99
RIVER RAID....£11.99
HERO....£11.99

VIRGIN GAMES
SORCERY....£8.95
USEFUL UTILITIES FOR MSX....£2.99
PRACTICAL MSX MACHINE CODE....£4.95

D.K. TRONICS
MINDER....£9.95

RITTOR MUSIC
P.S.G. MUSIWRITER....£20.85
ODYSSEY K....£9.95

ORPHEUS
BOLDERDASH....£6.95

TERMINAL
LAZY JONES....£8.95

PHONE US NOW FOR OUR SPECIAL SUMMER OFFERS ON MSX COMPUTERS

BUY FROM THE EXPERTS — WITH CONFIDENCE

ALL SOFTWARE NORMALLY STOCKED AND DESPATCHED BY RETURN

TAVISTOCK HI-FI LTD

21 THE BROADWAY, BEDFORD MK40 2TL
Tel: Bedford (0234) 56323

ORDER

TOTAL £

All prices include VAT and post and packaging. All items include a full year guarantee. Products are stocked and usually despatched within 2 days. Overseas customers add £4 post and packing. Cheques (with cheque Card No.), Postal Order, etc., payable to TAVISTOCK HI-FI LTD. Telephone orders (0234) 56323. Please debit my Access/Barclaycard.

Card Number
Signature
Name
Address

MSXU10/85

MSX

Machine code routines can extend the functions available on your MSX. Steve Webb shows you how

Quick Answers

This month I will be showing three machine code routines which you can use to enhance your BASIC programs. To enter these routines you will need to have typed in the HEXENT program from last month's issue.

Listing 1 allows you to display characters at eight times their normal size. Before using this routine you must set up the following parameters.

Location 62029 must contain the column number where you wish the character to be printed. This number must be in the range of 1 to 25. Location 62030 must contain the row number where the character is to be printed and must be in the range 1 to 17.

Location 62031 must contain the ASCII value of the character to be printed. For example the number 65 represents the capital letter A and 90 represents the capital letter Z.

Name: CHARX8

Function: Display characters at eight times their normal size.

Start address: 57000

End address: 57147

Sum check: 15560

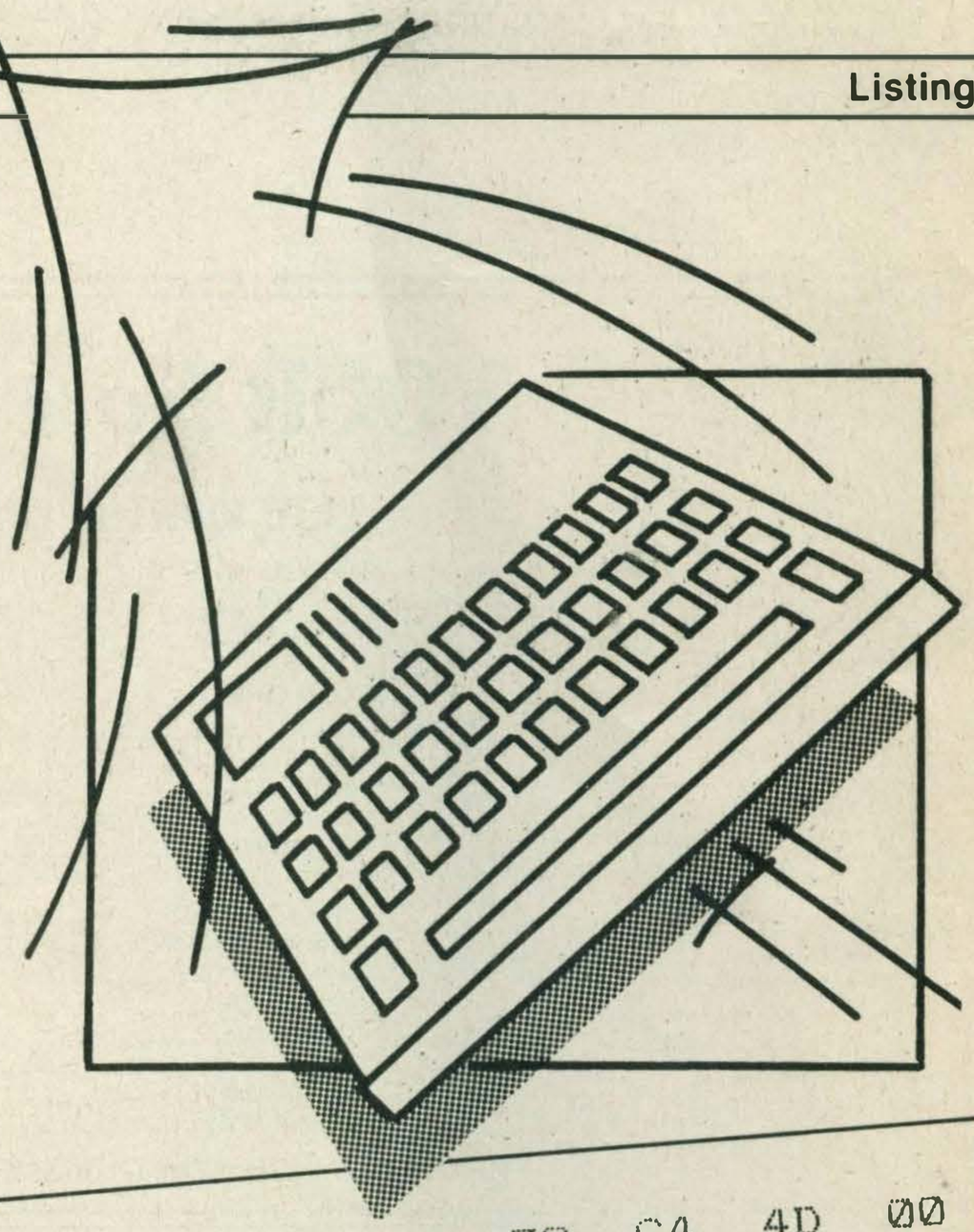
Limitations: Use only in screen mode 1

When you have typed in and saved the above routine you can test it with the BASIC program in **Listing 2.**

Listing 3 will probably be of use to those of you who write programs which produce a lot of text on the screen. This routine

```
5 SCREEN 1
10 DEF USR = 57000!
20 POKE 62030!,5
30 POKE 62029!,3
40 POKE 62031!,77
50 A = USR (0)
60 POKE 62029!,13
70 POKE 62031!,83
80 A = USR (0)
90 POKE 62029!,23
100 POKE 62031!,88
105 POKE 62026!,15
110 A = USR (0)
115 POKE 62028!,5
120 DEF USR =56900!
130 A = USR (0)
```

Listing 2



```
21 F0 07 01 08 00 3E FF
CD 56 00 01 08 00 3A 4F
F2 3C 21 00 00 3D CA C5
DE 09 C3 BD DE 11 5B F2
CD 59 00 3A 4E F2 01 20
00 21 00 00 3D CA DC DE
09 C3 D4 DE 11 00 00 3A
4D F2 5F 19 ED 5B 22 F9
19 11 5B F2 3E 08 F5 1A

47 3E FE CB 78 C4 4D 00
23 3E FE CB 70 C4 4D 00
23 3E FE CB 68 C4 4D 00
23 3E FE CB 60 C4 4D 00
23 3E FE CB 58 C4 4D 00
23 3E FE CB 50 C4 4D 00
23 3E FE CB 48 C4 4D 00
23 3E FE CB 40 C4 4D 00
23 3E FE CB 09 C4 3D C2
13 01 19 00 M F1
EE DE C9 0E
```

Listing 1

will allow you to clear a specified area without destroying the rest of the text on the screen. The following parameters need to be set up before using the routine.

Location 62025 must contain the column number of the top left hand corner of the area to be cleared.

Location 62026 must contain the row number of the top left hand corner of the area to be cleared.

Location 62027 must contain the height of the area to be cleared.

Location 62028 must contain the width of the area to be cleared.

Name: CLAREA

Function: Clear a specified area of the screen

Start address: 56900

End address: 56969

Sum check: 7829

Limitations: Use only in screen modes 0 and 1

The BASIC program in **Listing 4** will demonstrate the clear screen routine. The screen will first be filled with characters, then after a short pause, an area of 5 characters wide by 8 characters will be cleared, the top left hand corner of which is at column 10 and row 15.

The final routine this month, **Listing 5,** is a slightly oddity but I'm sure that it will be of use to many of you. The routine is to be used in screen mode 1 and it swops over the background and foreground colours of all the characters. When you first switch on the computer the background colour is blue, and the foreground colour is white. By accessing this routine the foreground will become blue and the background white. This may not sound a particularly useful routine, but please type it in and run the demonstration program and I think that you will be impressed by what you see.

Name: REVCOL

Function: Swop the background and foreground colours of the characters.

Start address: 56700

End address: 56744

Sum check: 4757

Limitations: Use only in screen mode 1.

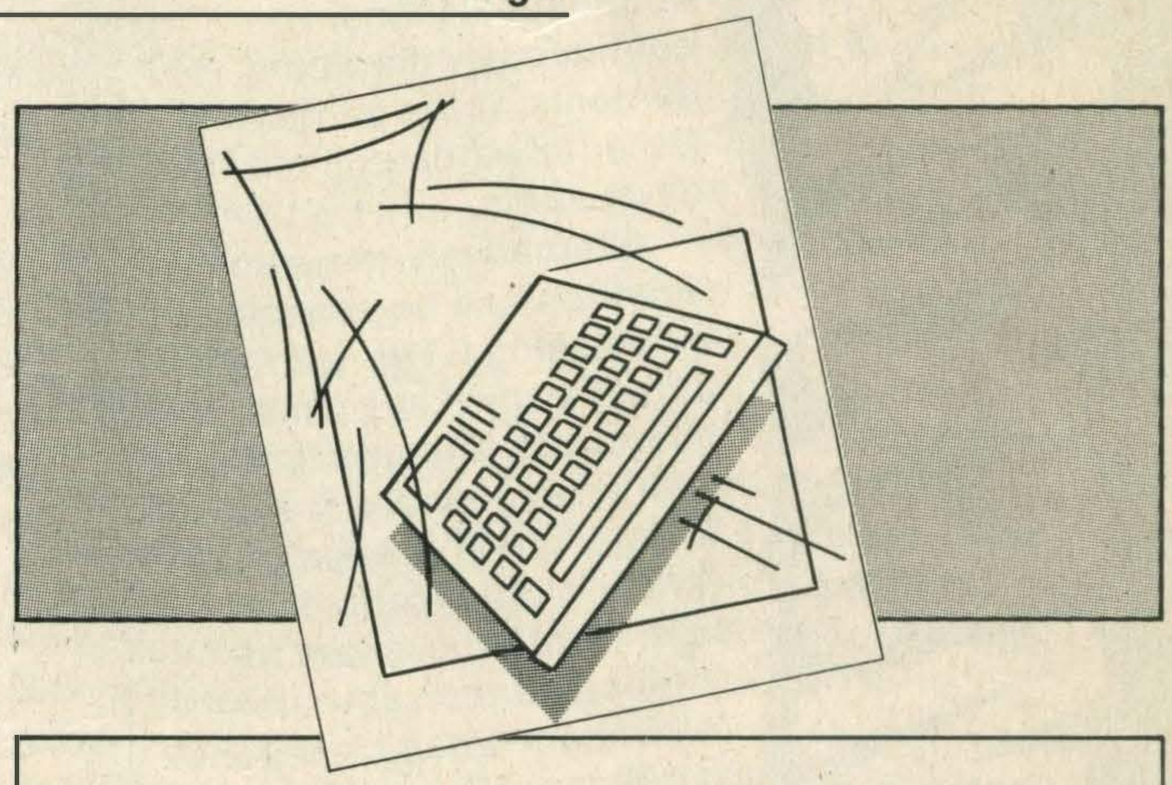
Use **Listing 6** to demonstrate the routine to reverse colours.

If you missed last month's issue with details of how to use these and future routines you can obtain a copy of the article by sending a self addressed, stamped envelope to Steve Webb, *c/o MSX User,* 1 Golden Square, London W1R 3AB.

If you have any ideas for routines that you would like me to have write in machine code please do not hesitate to let me know.

```
10 SCREEN 1
20 LET X = 0
30 FOR A = 6144 TO 6911
40 VPOKE (A),X
50 X = X + 1
60 IF X = 256 THEN LET X = 0
70 NEXT A
100 POKE 62025!,10
105 POKE 62026!,15
110 POKE 62027!,8
115 POKE 62028!,5
120 DEF USR =56900!
130 A = USR (0)
```

Listing 4



```
21 00 00 01 20 00 3A AF
FC 3D CA 54 DE 01 28 00
3A 4A F2 3D CA 5F DE 09
C3 57 DE 11 00 00 3A 49
F2 3D 5F 19 EB 5B 22 F9
19 3A 4B F2 ED 3A 4C F2
E5 F5 3E 20 F5 4D 00 23
F1 3D C2 75 CD E1 09 F1
3D C2 70 DE C9 0D M
```

Listing 3

```
21 00 20 3E 20 F5 CD 4A
00 E6 0F 47 CD 4A 00 CB
0F CB 0F CB 0F CB 0F E6
0F CB 00 CB 00 CB 00 CB
00 B0 CD 4D 00 23 F1 3D
C2 81 DD C9 0A M
```

Listing 5

```
10 SCREEN 1
20 X = 0
30 FOR A = 6144 TO 6911
40 VPOKE (A),X
50 X = X + 1
60 IF X = 256 THEN LET X = 0
70 NEXT A
80 X =17
90 FOR A = 0 TO 31
100 VPOKE (8192+A),X
110 X = X + 3
120 NEXT A
130 FOR X = 1 TO 1000: NEXT X
140 DEF USR = 56700!
150 A = USR (0)
160 FOR X = 1 TO 300: NEXT X
170 GOTO 150
```

Listing 6

MSX

MSX explained

Graham Knight and Dick Sham get hooked on screen scrolling and cursor routines

We have written **program 1** in response to readers who have requested a routine to scroll the screen information. By selecting the appropriate starting address in memory, the program allows the user to automatically and continuously scroll the contents of the screen either upwards or downwards.

Alternatively the scroll direction can be controlled by pressing CTRL with the cursor arrow keys. This program is suitable for use with screen modes 0 and 1. Scrolling is needed in a variety of applications from word processors to games and the subroutine in program 1 can be saved in ordinary MSX BASIC or as a block of machine code which can then be incorporated into your own programs.

The machine code program 1 is written into the memory from MSX BASIC using the routines in lines 10-60 to POKE the DATA into memory. Remember to take great care in entering the program exactly, paying particular attention to the difference between the letter 'O' and the figure zero. Always SAVE your entered program to tape or disk before RUNning, as it is then much easier to correct an error than to re-enter the program all over again.

Test program

To check that you have entered the scrolling routine correctly, LOAD and RUN program 1. It will start by changing the screen background colour to red. Next enter NEW to clear program 1 from the memory. Then LOAD and RUN the short test sequence listed under **program 2.** Note that the screen colour will change to a blue background first and that the Ok message takes just a few moments to appear. Pressing the CTRL key with the cursor up key will now scroll the information on the screen upwards. Similarly pressing CTRL with the down cursor key will scroll the text downwards. If these keys are held down the information on the screen is revolved like a rotating cylinder.

The execution address of the test program is set by the DEFUSR command in line 50. Check the other scrolling facilities by changing this address in line 50 from &HDE00 to &HDE14 and then RUNning the modified program. The

PROGRAM 1

```
10 KEYOFF:SCREEN 1:COLOR15,6,6
20 CLEAR 200,&HDDFF
30 AD=&HDE00
40 READ A$
50 IF A$="**" THEN 70
60 POKE AD,VAL("&H"+A$):AD=AD+1:GOTO 40
70 END
1000 DATA 3E,06,CD,41,01,CB,4F,C0
1010 DATA 3E,08,CD,41,01,CB,77,28
1020 DATA 06,CB,6F,C0,AF,18,02,3E
1030 DATA 01,32,C4,FA,3A,AF,FC,21
1040 DATA B3,F3,47,B7,28,0A,FE,04
1050 DATA 30,06,11,0A,00,19,10,FD
1060 DATA 5E,23,56,EB,22,C2,FA,3A
1070 DATA C4,FA,B7,28,0E,11,98,03
1080 DATA 3A,AF,FC,FE,01,20,03,11
1090 DATA E0,02,19,22,C0,FA,11,C5
1100 DATA FA,01,28,00,3A,CF,FA,FE
1110 DATA 01,20,03,01,20,00,CD,59
1120 DATA 00,3A,C4,FA,B7,28,0F,21
1130 DATA BF,03,3A,AF,FC,FE,01,20
1140 DATA 03,21,FF,02,18,0D,21,28
1150 DATA 00,3A,AF,FC,FE,01,20,03
1160 DATA 21,20,00,ED,5B,C2,FA,19
1170 DATA 01,C0,03,3A,AF,FC,FE,01
1180 DATA 20,03,01,00,03,E5,C5,CD
1190 DATA 4A,00,11,28,00,F5,3A,AF
1200 DATA FC,FE,01,20,03,11,20,00
1210 DATA 3A,C4,FA,B7,28,03,19,18
1220 DATA 03,B7,ED,52,F1,CD,4D,00
1230 DATA C1,E1,3A,C4,FA,B7,28,03
1240 DATA 2B,18,01,23,0B,78,B1,20
1250 DATA CC,2A,C0,FA,3A,C4,FA,B7
1260 DATA 28,06,ED,5B,C2,FA,18,0F
1270 DATA 11,98,03,3A,AF,FC,FE,01
1280 DATA 20,03,11,E0,02,19,EB,21
1290 DATA C5,FA,01,28,00,3A,AF,FC
1300 DATA FE,01,20,03,01,20,00,CD
1310 DATA 5C,00,C9,00,00,00,00,00,**
```

```
PROGRAM 2

10 REM UP AND DOWN SCREEN SCROLL
20 REM WHEN THE CTRL  AND CURSOR
30 REM KEYS ARE PRESSED TOGETHER
40 KEYOFF: COLOR 15,4,4
50 DEFUSR=&HDE00
60 GK=USR(0):GOTO 60
```

screen will now automatically scroll upwards without the need for the user to press any keys at all.

When the address in line 50 is modified to &HDE17 and the program is again RUN, the screen will automatically scroll downwards. By calling the appropriate start addresses the screen contents can be revolved backwards and forwards or round and round.

When you have successfully RUN the test program at the three execution addresses you can be certain that the DATA in program 1 has been entered and saved correctly from BASIC. You can now progress to using the following method to save the data as a proper machine code program.

LOAD and RUN program 1.

Wait till Ok appears on the screen.

Type BSAVE"SCROLL", &HDE00,&HDEFF

This machine code can then be loaded using the BLOAD command and the routine can then be linked in with your programs and called by the same three start addresses. The machine code is totally re-locatable and can be placed in any area of free memory to avoid conflict with your own routines. For example if the code is relocated to occupy from &HC000, then the three execution addresses are: &HC000, &HC014, and &HC017.

MSX hooks

Even though the BASIC language and the MSX operating system are permanently programmed into a ROM (Read Only Memory) chip — they can still be altered by careful programming. MSX computers have special 'hooks' at the top of RAM (Random Access Memory) which are intended for expansion units such as disks and serial interfaces. These hooks can be used to modify the ROM routines. This facility is not available on many other personal computers and confirms the flexibility of the MSX system.

Flashing cursor

Regular MSX programmers will know that the cursor appears on the screen as a white block shaped character. If the cursor is moved into the text in a program line its position is indicated by inversing the foreground and background colours. After prolonged periods of programming, spotting the cursor position in a screen full of text can be difficult and some readers have requested a routine which would make the cursor flash and easy to see.

Program 3 uses the MSX hooks to flash the cursor and it also allows the user to redefine the cursor shape. The routine in lines 10-60 POKES the machine code contained in lines 1000-1070 into the computer memory. Line 70 defines the execution address of the machine code routine. The USR call in line 80 starts the program.

Once program 3 has been entered correctly and executed the cursor will flash on and off and it will be much easier to use than the standard stationary MSX square. Similarly the cursor position for the insert is changed to a flashing character with a dot — making it much easier to see. You can now concentrate on your programming instead of wasting time looking for the cursor or the insert position in your program lines.

Users can speed up the flashing rate of the cursor by entering POKE &HD9F5,1 directly on the keyboard. Changing this to POKE &HD9F5,46 will cause the flashing rate to slow down. Experiment by altering the POKE value between 1 and 255 and note the results.

You can also customise the actual shape of the cursor by changing the value stored at location &HD9DE. For example POKE&HD9DE,1 gives a face shaped cursor. The value 14 is a musical note and the value 15 gives an asterisk. To change the character used to indicate insert mode insert a value between 1 and 255 in location &HD9E2.

Entering the line POKE&HD9DE,&HFA will return the flashing cursor to the familiar white shape and POKE&HD9E2,&HDA restores the flashing centre dot to the usual insert character. The entire routine can be disabled and your MSX returned to standard mode by entering POKE&HFDC2,&HC9 directly on the keyboard.

```
PROGRAM 3

10 KEYOFF:SCREEN 1:COLOR 15,6,6
20 CLEAR 200,&HD9BF
30 AD=&HD9C0
40 READ A$:IF A$="**" THEN 70
50 POKE AD,VAL("&H"+A$):AD=AD+1
60 GOTO 40
70 DEFUSR=&HD9C0
80 GK=USR(0)
1000 DATA 11,CD,D9,21,C2,FD,3E,C3
1010 DATA 77,23,73,23,72,2A,DC,F3
1020 DATA CD,F2,0B,CD,4A,00,57,3A
1030 DATA A8,FC,B7,20,04,3E,DB,18
1040 DATA 02,3E,FA,CD,4D,00,CD,F3
1050 DATA D9,7A,CD,4D,00,CD,F3,D9
1060 DATA 28,E5,C9,01,00,0F,CD,9C
1070 DATA 00,C0,0B,78,B1,20,F7,C9,**
```

Related Words

You win some, you lose some, says Karl Dallas reporting on a new budget-priced thermal printer

ALPHACOM thermal printer
Dean Electronics
£75

It has been truly said that a computer without a printer is rather like having a phone but no hook-up to the exchange network. The only trouble is that printers are *s-o-o* expensive, and it is all a bit confusing — all this stuff about parallel and serial, and tractor feeds and dot matrix and daisywheels.

Here, however, comes a printer that doesn't cost you an arm and a leg, and you just plug it into your MSX computer and away you go.

First, the bad news.

It won't print out MSX graphics, because it doesn't carry the MSX logo — which isn't to say that one of you bright young genii out there won't figure out a way to get good graphics out of it; but it does need a bit of hacking.

And though the text output of your MSX is fairly standard Centronics-type parallel (I'll explain what that means in a moment), for some reason they put a non-standard D-shaped socket on the back, so to fit this, or indeed any other non-MSX parallel printer to it, you'll need someone to make up a short adaptor lead, with a female Centronics socket on one end, and a D-plug on the other. It should cost you about £15.

Like I say, blame the computer for this, not the printer, because it is a problem common to all non-MSX printers hooked up to MSX computers.

The other bad news is the fact that it uses thermal paper, which can cost about £5.75 for 100 sheets or so.

So it is cheap to buy, but more expensive to run. You win some, you lose some.

First, a bit of background about printers.

There are four basic printing mechanisms, all of which are available for MSX:

thermal
dot matrix
pen plotter
daisywheel

Dot matrix is probably the most widely used mechanism. Each letter is made up of a sort of grid of wires which come closer to the paper in order to print out a letter.

Since each letter is made up of dots, it doesn't look like real printing, but its main advantage is that it is very fast: speeds of 120 characters a second are quite common, and 80 characters a second is regarded as quite slow.

At the opposite end of the scale are daisywheels, which are rather like a typewriter. Quality-wise, they are superb, but they tend to be slow: 40 characters a second is fast for a daisywheel, and the Sanyo MSX daisywheel printer chugs along at a mere 10 characters a second.

As their name implies, pen plotters don't really print, they *write,* and so they are really more appropriate to applications where graphics are important. There are some MSX printer plotters around, so if you have lots of charts you want to print out (in four colours), then they are for you.

But if you are fairly penniless and want a reasonable quality of print at a reasonable speed, then the Alphacom could be a good buy.

Thermal printing

As the name implies, a thermal printer makes its image by burning into the paper. Just under the surface of the special paper you have to use is a layer of pigment, which is revealed by the action of the heated head as it passes over the sheet.

Some thermal printers use a snazzy — and very expensive silver-coated paper, but you'll be pleased to learn that the Alphacom uses paper that doesn't look too different from ordinary non-thermal stuff. The paper supplied with the printer is on a roll, and the print comes out a rather fancy light blue.

However, if you don't like that, you can get

paper that prints out black from any shop stocking the Brother EP44 typewriter, which is also a thermal printer. A roll will cost you £5.75 — and if you prefer your paper in sheets, a folder of about 100 will cost you the same.

As you can see from the examples, the print is clear and easy to read. Better than most dot-matrix printers, as a matter of fact.

Thermal paper has a slightly slippery, slightly unpleasant feel to some people (a bit like the paper used in some photo-copiers), so if this puts you off, then you should avoid it.

Speedwise, it is no racehorse. The print head progresses across the paper with a funny, jerky movement which makes it difficult to time, but I doubt that it is much faster than 15 characters a second — though it is faster than the aforementioned Brother, which I keep as a stand-by typewriter, as a matter of fact.

It is also very quiet.

I know people who are driven crazy by the sound of a dot matrix — which is not unreminiscent of someone scraping their fingernails down a blackboard — and most daisywheels clatter away like Isambard Kingdom Brunel's steam engine.

This one is so quiet you can easily conduct a conversation by the side of it without raising your voice.

The boxes

The printer itself is small, but that is because it doesn't have its own power supply, but has to be connected to the mains via a large black transformer.

The roll of paper fits away neatly inside the body of the beast, where it sits quietly until you suddenly discover that you've run out. Rule one: always make sure you have a spare roll, because you are bound to run out on a Bank Holiday, or when you are miles away from the nearest computer stationer's.

Why they have been able to keep the price down is because the basic box is the same whatever computer it is used with: the connecting lead between printer and computer includes a small oblong interface, which clips into the back of the printer so neatly that you might almost forget it was there.

MSX computers all have a parallel printer port — sometimes known as a Centronics port — which means they can be plugged into most dot matrix printers. On the other hand, to plug into a serial printer, you either need an RS232 interface or, if you can wait until the autumn a computer like Toshiba's upcoming HX-22, which has built-in parallel and serial sockets.

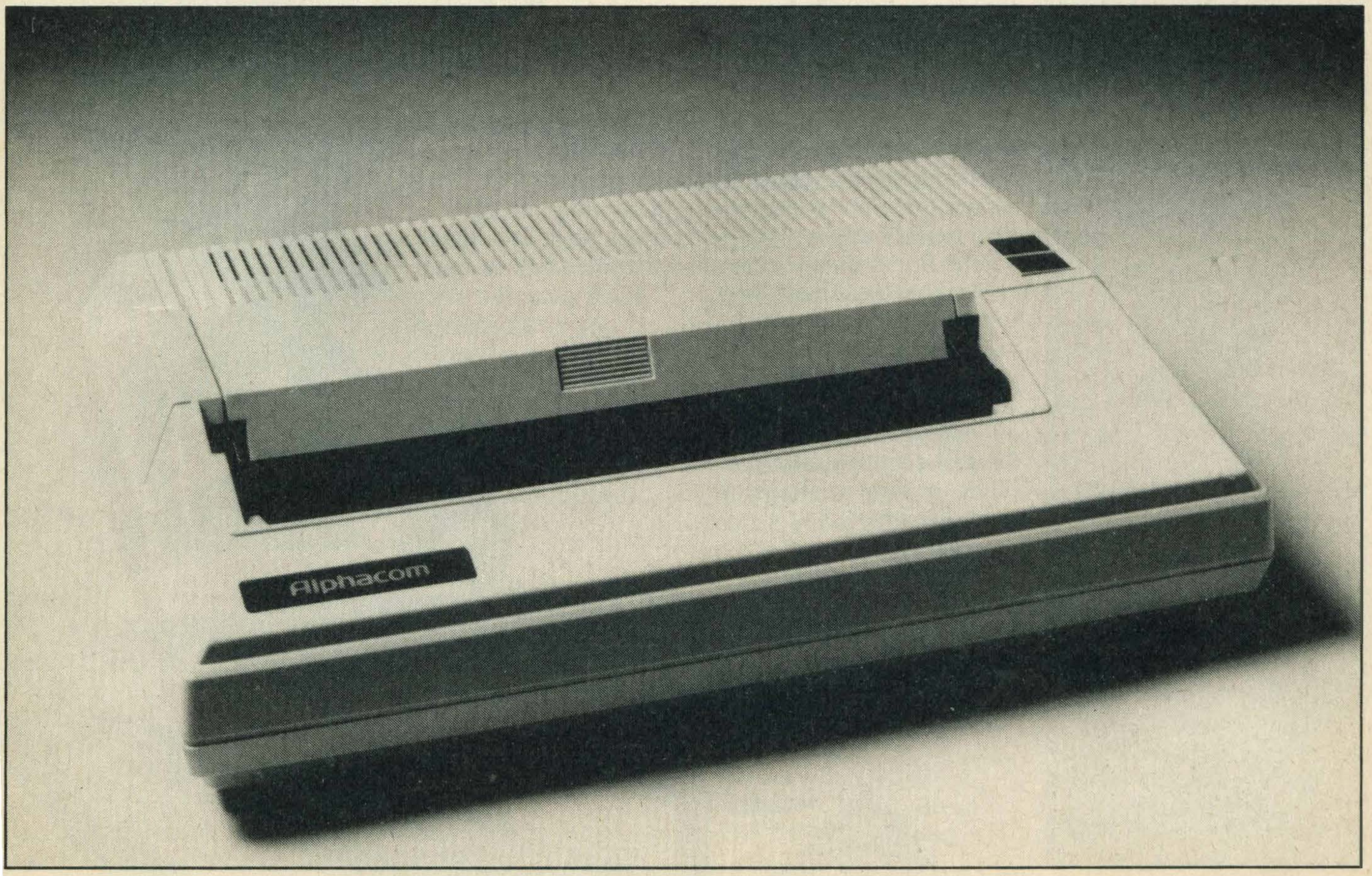
What makes the Alphacom design so neat is the fact that the only difference between one of their printers working with a parallel port on an MSX computer or another one connected to the serial port on, say, a Commodore 64, is that connecting cable with its built-in interface.

In fact, if you are one of those plutocrats with a 64 *and* an MSX, you can use the same printer with both, and all you need is two different interface cables.

However, with the rising yen, they are likely to be going up in price with the next shipment, so if what I've said interests you, then it is best to contact the people concerned rather sharpish.

Tell them you read about it in MSX User and they might push you to the head of the queue, because it is going to be strictly a case of first come, first served, I understand.

Don't say you weren't warned.



MSX

First Editions

With the release of more books for MSX users it is time to review the situation.

Very Basic BASIC
by Derek Ellershaw and Peter Schofield
Century Communications
£2.95

On the whole this book forms a good introduction to MSX BASIC. I particularly like its honest style with no pretensions to being a definitive work. Taking the readers from basics of setting up the equipment, it covers a lot of ground in a concise but unhurried way using copious small example programs to help the novice to understand keywords and their uses.

Some of the areas are only covered in sketchy manner and I was rather disappointed with the section on the DRAW command. The authors lead you to the impression that there are only four directional commands available and give no hint of the flexibility of the Graphics Macro Language.

Considering that the Music Macro Language is covered in eight pages, only a half page for GML seems rather stingy.

Another weakness lies in the fact that numerical variables are not explained until page 43 even though they are used in the earlier sections of the book. Several sections refer the reader to later sections of the book which is pointless unless the concept of variables is understood.

The authors only claim to cover enough information for the first 15 hours with your computer. This claim is akin to the Play in a Day book which Bert Weedon wrote in the early days of the guitar boom and belies the wealth of information which the book contains. Anyone who succeeds in covering this book in a mere 15 hours probably did not need it in the first place.

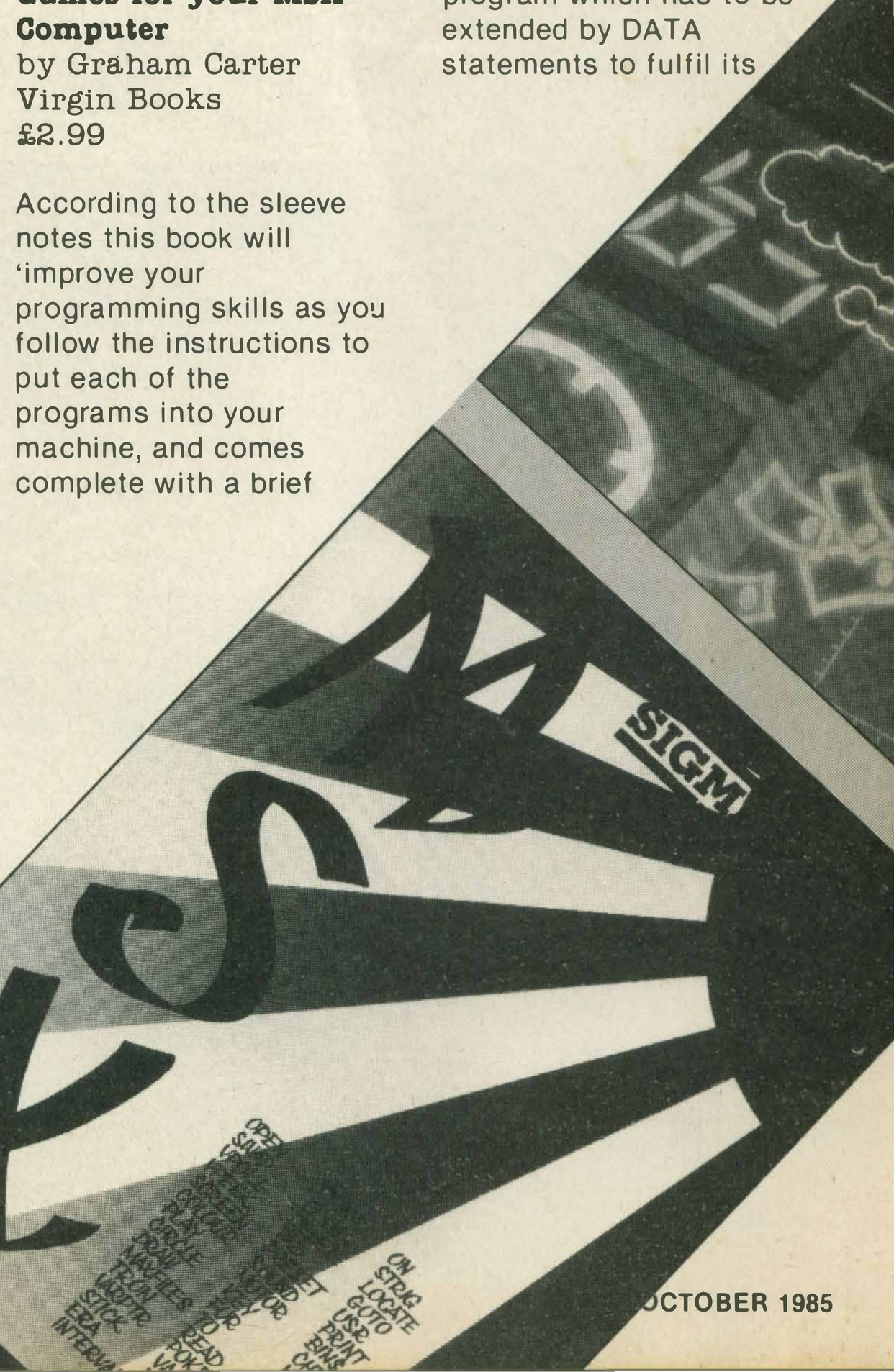
If you have problems understanding the manual supplied with your computer then this book provides an excellent introduction to MSX programming at a very modest cost.

Games for your MSX Computer
by Graham Carter
Virgin Books
£2.99

According to the sleeve notes this book will 'improve your programming skills as you follow the instructions to put each of the programs into your machine, and comes complete with a brief dictionary of computer terms, a selective bibliography and some hints on how to improve and extend the programs in the book'.

Using this claim as the yardstick by which the book is to be judged, it fails miserably. The instructions are minimal, consisting of two very short paragraphs. One merely tells you to refer to your computer manual to find which key to press for the graphics symbols used in the listings while the other explains that the listing lines should look the same on the screen as they do in the book.

Hints on how to improve the programs are virtually non-existent (three listings have hints, the other 20 do not) and the only reference to extending a program was the Telephone Book program which has to be extended by DATA statements to fulfil its



purpose as a directory. The only real help in the book is a short article by Tim Hartnell, the series editor, on how to write better programs.

The brief dictionary and bibliography at the end of the book are quite useful but do not really form a cohesive part of the book.

The listings themselves are rudimentary and only

one of these programs, my editor suggested that it would rival watching grass grow as a spectator sport. After two and a half hours of waiting for the screen plotting to finish I have to agree.

At just under £3 this book is hardly overpriced but neither is it the bargain of the month.

12 of the 23 are games, the rest being utilities such as a darts scorer, calendar generator, bubble sort and several graphics demonstration programs.

All the programs work but some of the graphics programs are painfully slow. While I was running

A Programmer's Guide to the MSX System
by C. I. Burkinshaw and R. Goodley
Sigma Press
£7.95

For those users who have bought an MSX after becoming proficient on a different make of computer, this book provides an excellent bridge to the new range of possibilities now open to you.

This is not a book for the total novice but is for the serious programmer who is already familiar with a dialect of BASIC and now wishes to gain a deeper understanding of the MSX system.

The book is divided into two sections: an overview of the system and machine code on an MSX. The overview describes the layout of the chips and associated memory along with a comprehensive assessment of all of the BASIC keywords written in a bright, business-like manner.

Similarly, the machine code section does not set out to teach programming but to educate the user in the use of assembly language within an MSX environment with special emphasis on accessing the video chip.

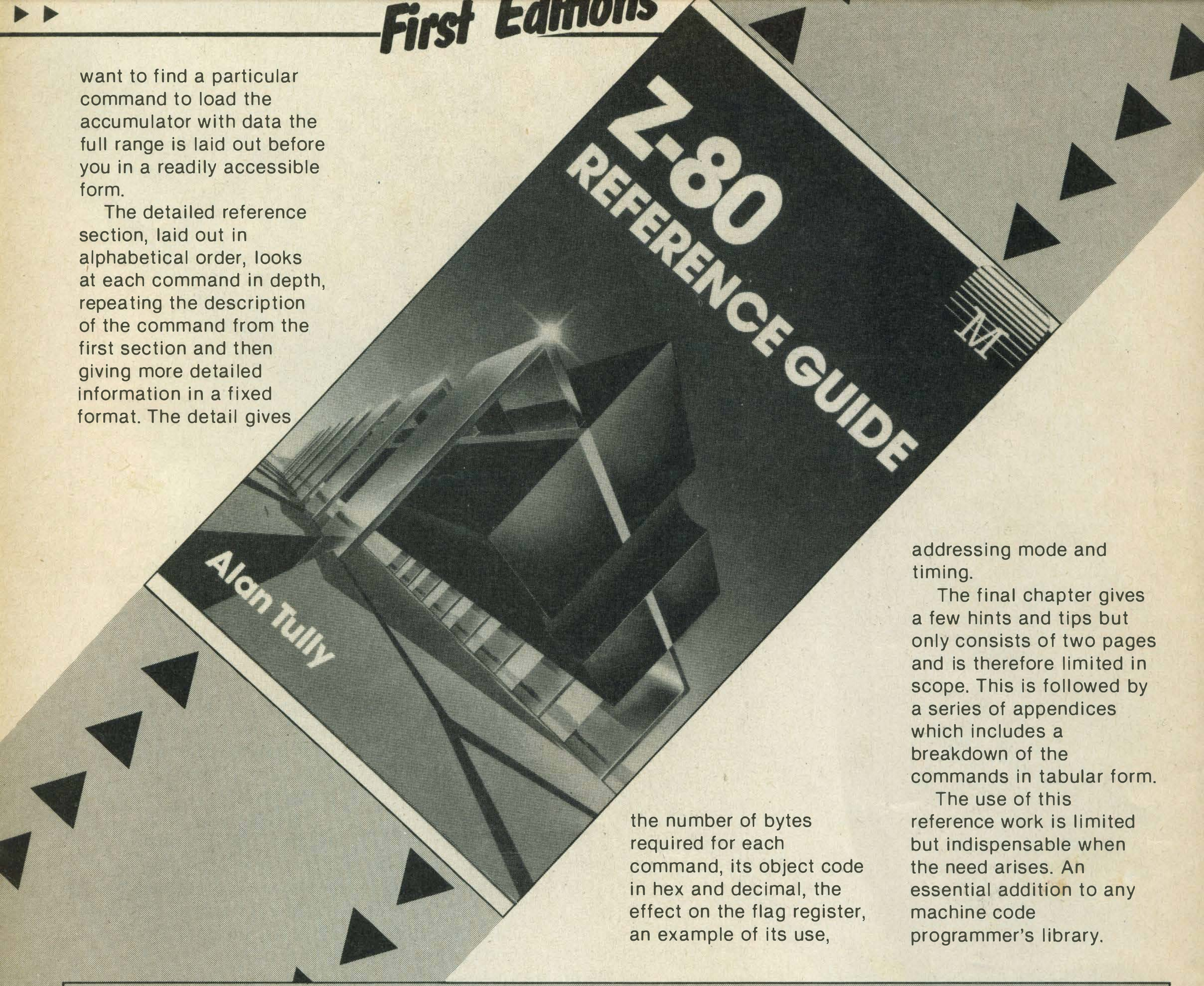
Both sections of the book contain useful subroutines and listings, including a 21-page disassembly of a program to define characters and sprites. These sections are followed by six appendices, two of which give copious technical information about the video and sound processors.

For the serious programmer this book offers excellent value for money, giving advice and information which offers a short cut to professional programming.

Z-80 Reference Guide
by Alan Tully
Melbourne House
£9.95

Reviewing a reference guide is just about as exciting as reviewing a dictionary. This book is no exception and yet it is as essential to a machine code programmer as a dictionary is to an author.

The book initially covers the range of assembler commands supported by the Z-80 with a brief description of each and a cross reference which indicates where more detailed information can be found in the second section. Each command is grouped according to type which means that if you



want to find a particular command to load the accumulator with data the full range is laid out before you in a readily accessible form.

The detailed reference section, laid out in alphabetical order, looks at each command in depth, repeating the description of the command from the first section and then giving more detailed information in a fixed format. The detail gives the number of bytes required for each command, its object code in hex and decimal, the effect on the flag register, an example of its use, addressing mode and timing.

The final chapter gives a few hints and tips but only consists of two pages and is therefore limited in scope. This is followed by a series of appendices which includes a breakdown of the commands in tabular form.

The use of this reference work is limited but indispensable when the need arises. An essential addition to any machine code programmer's library.

MSX Bookshelf

Title	Author	Publisher	Price
Behind the Screens of the MSX	Tony Marriot	Kuma Computers	£5.95
The Complete MSX Programmer's Guide	Sato, Mapstone & Muriel	Melbourne House	£14.95
Games for Your MSX Computer	Graham Carter	Virgin Books	£2.99
Getting More from MSX	Brian Boyde-Shaw	Sigma Press	£7.95
Introducing MSX Assembly Language & Machine Code	Ian Sinclair	Collins	£8.95
Introducing MSX BASIC	Paul Kuczora & Christine King	Micro Books	£6.95
An Introduction to MSX BASIC	R A & J W Penfold	Bernard Babani	£2.50
MSX — An Introduction	G Bland & J Pearce	Century Comms.	£7.95
The MSX Computer Program Book	Vince Apps	Phoenix	£5.95
MSX Exposed	Joe Pritchard	Melbourne House	£7.95
MSX Games Book	Andrew Lacey	Melbourne House	£5.95
Practical MSX Machine Code Programming	Steve Webb	Virgin Books	£4.95
A Programmer's Guide to the MSX System	C I Burkinshaw & R Goodley	Sigma Press	£7.95
Starting Machine Code on the MSX	G P Ridley	Kuma Computers	£7.95
Starting With MSX	Tony Marriot	Kuma Computers	£5.95
Useful Utilities for Your MSX	Steve Webb	Virgin Books	£2.99
Very Basic BASIC	Derek Ellershaw & Peter Schofield	Melbourne House	£2.95
Z80 Reference Guide	Alan Tully	Melbourne House	£9.95

Your Local MSX Software Stockists

Software City

The UK's No. 1 Software dealer Limited. Programs, peripherals, disks and accessories, plus a selection of books and magazines.

382 Kings Road
Chelsea SW3
Tel: 01-352 9220

14 Thames Street
Kingston-Upon-Thames, Surrey
Tel: 01-541 4911

47 Cheap Street
Newbury, Berks RG14 5BX
Tel: 0635 31696

WARD AND WILLIAMS LTO

Romiley, Cheshire.
Tel: 061-430 2934

Over 50 different titles in stock.

FRENCH

52 Dordon Road
Dordon
Tamworth, Staffs
Tel: (0827) 892252

COLLINGWOOD TV SERVICES

Northamptons largest range of MSX software. Also stockists of Mitsubishi, Sanyo and Goldstar MSX computers, light pens, joysticks, Data Recorders and colour monitors.

17 Collingwood Road, Northampton.
Tel: (0604) 714770

R & J TELEVISIONS

8 Summer Street,
Lostwithial,
Cornwall PL22 0DH
Tel: (0208) 872103
Contact us for all your MSX software needs.

J. KOCZUR

185 Yorkshire Street,
Rochdale,
Gtr Manchester.
Tel: (0706) 42107

SUDBURY MICRO SYSTEMS

64 North Street, Sudbury.
Tel: (0787) 311839

Excellent selection of MSX software, joystics, books. etc.

ELECTRICAL DISCOUNT CENTRE

138 Pelham Road,
Gravesend,
Kent Da11 0JH
Tel: (0474) 26600

J & H RUSSELL

(Kidderminster Ltd)
21-22 Coventry Street,
Kidderminster,
Worcestershire.
Tel: (0562) 2686

HOWES OF SOUTHBOROUGH LTO

Tunbridge Wells,
Kent.
Tel: (0892) 28682/37288

REYNOLDS COMPUTER CENTRE

79 Orsett Road,
Grays,
Essex RM17 5NH
Tel: (0375) 5948

PORTOGRAM

212 High Street
Barnet
Hertfordshire
Tel: (01) 449-4183

MSX in Birmingham

BULLOCKS HI-FI AND VIDEO

884 Washwood Heath Road
Ward End,
Birmingham 88 2NB
Tel: 021-783 2809
Contact: Matthew Bullock

MSX in Cheshire

SWIFT OF WILMSLOW

St Anns Parade,
Wilmslow, Cheshire.
Tel: (0625) 526213

GAMER

71 East Street,
Brighton.
Tel: (0273) 728681

S.P. ELECTRONICS

48 Linby Road,
Hucknall, Nottinghamshire.
Tel: (0602) 640377

PATERSONS

6 Hamilton Place,
Edinburgh.
Tel: 031-225 1771

Is your county represented — if not why not?

UnitSoft (MSX)

AFFORDABLE PRODUCTS UNIT 6,
136 INGRAM STREET, GLASGOW G1

MSX

Shnax	£5.25
Bolderdesh	£6.00
A View To A Kill	£8.00
Elidon	£6.00
Lazy Jones	£7.50
Roller Ball	£12.00
Hole In One	£12.00
Wonderbolt	£9.25
Eddie II	£21.00
Ninja	£5.25
Star Seeker	£7.75
Red Moon	£5.95
Colour Fantasia	£7.75
Vicious Viper	£4.95
Shark Hunter	£6.95
Dog Fighter	£5.25
Star Avenger	£6.95
Anty	£5.25
Ghostbusters	£8.75
Decathlon	£7.75
Beamrider	£7.75
Zenji	£7.75
Pitfall II	£7.75
River Raid	£7.75
Mr Wong's Laundry	£6.25
Blagger	£6.25
Flight 737	£7.75
Chuckie Egg	£5.25
Time Bandits	£6.25
Colossal Adventure	£7.75
Adventure Quest	£7.75
Dungeon & Adventure	£7.75
Lords of Time	£7.75
Snowball	£7.75
Return to Eden	£7.75
The Hobbit	£10.00*
Jet Set Willy	£6.25
Hero	£9.25
Zaxxon	£9.25
Buck Rogers	£9.25
Sorcery	£7.50
Emerald Isle	£5.25
Pshydelia	£5.25
Special Operations	£5.25
Disc Warrior	£6.25
Le Mans	£7.50
Crazy Golf	£6.25
Punchy	£6.25
Hunchback	£6.25
Manic Miner	£6.25
Eric And The Floaters	£4.95
Fire Rescue	£6.25
Hot Shoe	£4.95
Hustler	£5.25
Oh Mummy	£4.95
Panic Junction	£5.25
The Wreck	£11.25*
Panzer Attack (new)	£6.25
Classic Adventure (new)	£5.25
3D Golf (new)	£6.25
Pinball (new)	£6.25
Polar Star (new)	£6.25
Piramids Warp (new)	£6.25
The Snowman (new)	£6.25
Booga-Boo (The Flea) (new)	£6.25

KONAMI ROM CARTRIDGES
All £14.75

Tennis
Golf
(New) Ping Pong
Antartic Adventure
Monkey Academy
Track and Field I
Track and Field II
Hyper Sports I
Hyper Sports II
MOPI Ranger
Yier Kung-Fu £14.25*
Kings Valley
Sky Jaguar
Circus Charlie
Athletic Land
(New) Time Pilot
(New) Comic Bakery
(New) Super Cobra

PERIPHERALS

Quick Disk	x£115.00
RB II Tracker Ball	x£85.00
Joy Card	£5.95
Konami's Hypershot	£14.25
Quickshot II	£5.95

*While stocks last xOperating Software included.

Postage included UK. Overseas orders add £1.00 per item. All cheques payable to: Unitsoft.

ASTROLOGY

for beginners

Teach yourself astrology using your MSX computer

A Starter Pack comprising a simple program to calculate a horoscope, an introductory booklet and 2 self-teaching programs (how to interpret the horoscope).

Only £11.50
No previous knowledge required.

Also many other programs for more experienced astrologers.

Please send me the Astrology Starter Pack for my MSX. I enclose a cheque/PO, U.K. for £11.50 (inc p&p). Outside UK add 50p; or, I enclose a large sae for free catalogue.

Name .....

Address .....

.....

ASTROCALC (Dept MSX) 67 Peascroft Road,
Hemel Hempstead, Herts HP3 8ER. Tel: 0442 51809

MSX

First Aid

Steve Webb explains how to reform the characters of your computer

A lot of people have been asking how can they redefine the normal character set to create special characters for games. So this month I will go into great depth on how this can be done.

There are many ways of redefining characters and I must point out that if you wish to do a lot of redefining then you should purchase a character designing programs or type in a listing such as the one in a book titled A Programmers Guide to the MSX System by C I Burkinshaw & R Doodley (Sigma Press).

I will show you how to redefine the characters from A to Z. The method is quite slow and tedious but will cost nothing other than your time.

In **diagram 1** you will see an 8 × 8 grid. The rows of the grid are numbered from 0 to 7 on the left hand side and above the columns are eight numbers. Down the right hand side of the grid is a series of numbers which represent the values of each of the rows. It is these values which are stored in memory to make the actual shape of the character.

So how are the eight values obtained? If you look at row 0 you will see that it has a value of 124. This is obtained by adding the numbers above the squares that are filled in. In row 0 the numbers to add are 64,32,16,8,4. The values of the other seven rows are calculated in the same way.

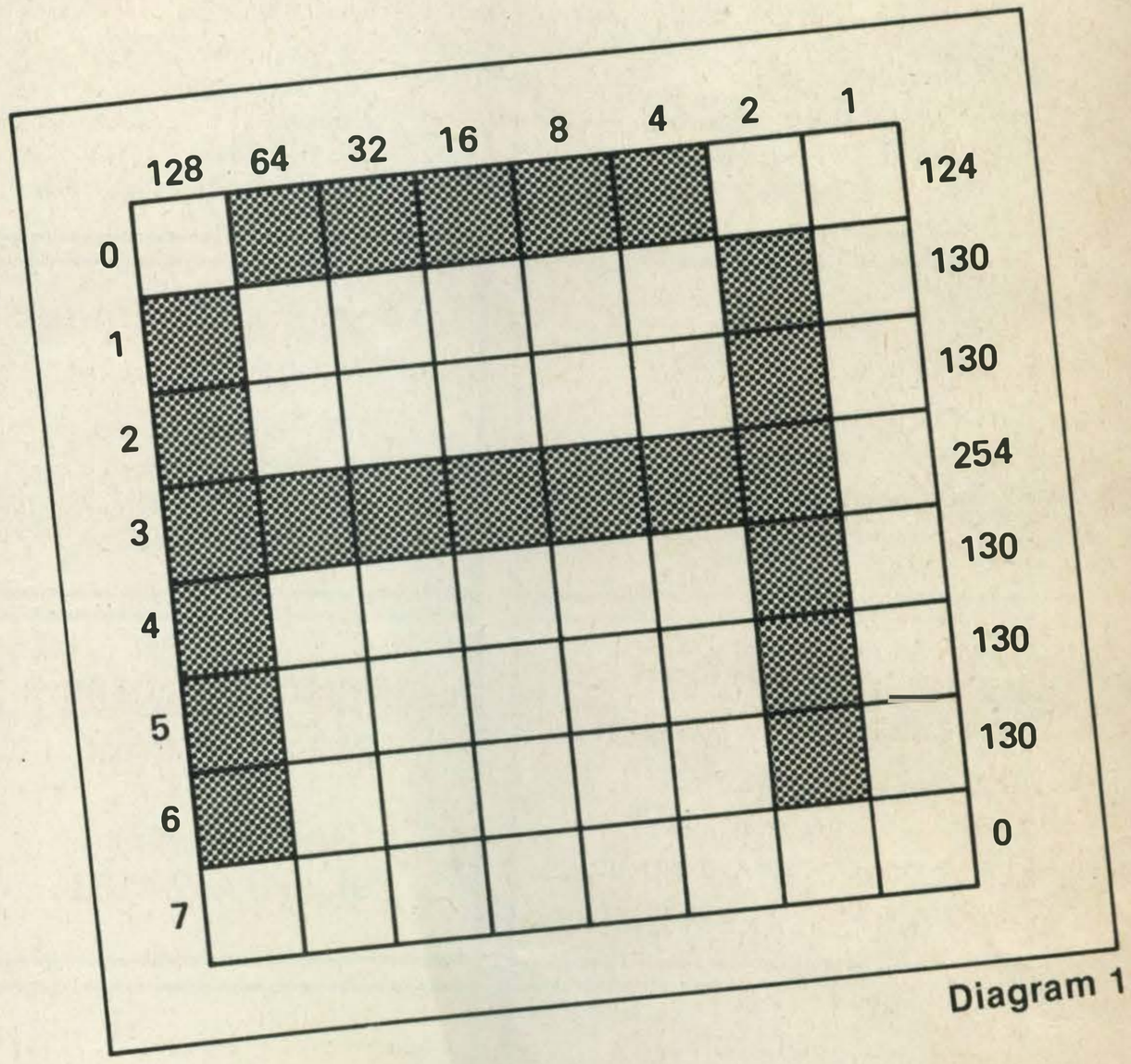


Diagram 1

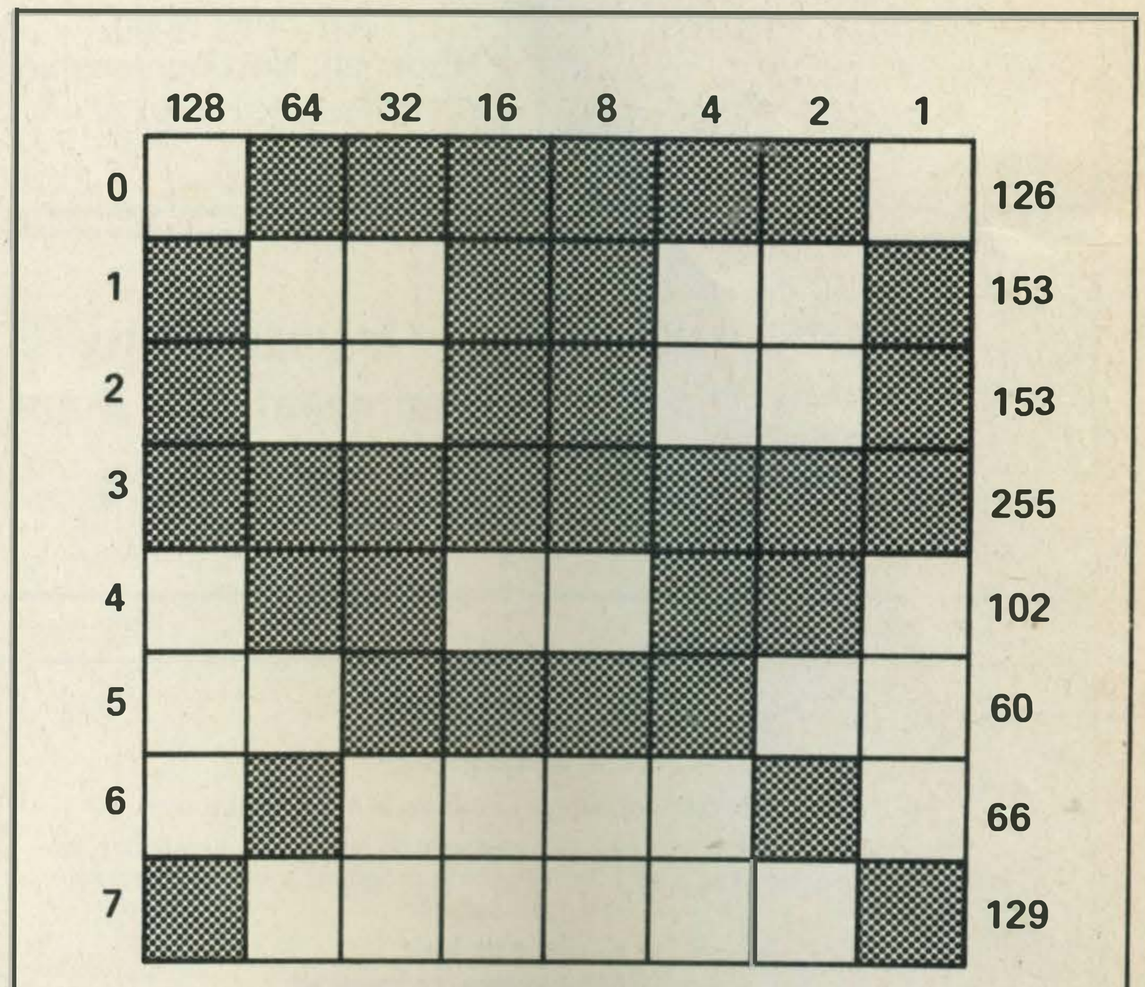


Diagram 2

To design your own characters you will need to draw 26 grids. You then draw the characters in the grids by filling in the appropriate squares. In the grid in **diagram 2** I have designed a little Space Invader.

All eight rows of the characters have to be converted into their numerical values which I have written down the right hand side of the grid.

To see the effect of a character being redefined try the following example. Put the CAPS LOCK on

because we are redefining the upper-case alphabet. Ensure that you are in screen mode 1 using the SCREEN 1 command and type in the following lines pressing the RETURN key after each one.

```
VPOKE 520,126
VPOKE 521,153
VPOKE 522,153
VPOKE 523,255
VPOKE 524,102
VPOKE 525,60
VPOKE 526,66
VPOKE 527,129
```

The locations 520 to 527 in VRAM are where the eight values for the upper-case A are normally stored. We have just redefined these values, so each time that you press key A you will see the little Space Invader on the screen instead of the letter A.

Having designed your characters on the grids and calculated their values you now need a method of getting them into the computer and for saving them to tape. You can enter the values by using the following program:

```
10 CLEAR 200,49999
20 FOR X=50000 TO 50207
30 INPUT A
40 POKE X,A
50 NEXT X
```

This program will allow you to input the 208 row values of the 26 characters which you have designed. To use the program just RUN it and then input each of the numbers one at a time. When you have entered the 208 values the program will stop and you can save the characters to tape with the following command.

BSAVE "CAS:CHARS", 50000, 50207

When you wish to load the characters at a future date you will need to type the following two commands.

```
CLEAR 200,49999
BLOAD"CAS:CHARS"
```

You will still not have seen your newly designed characters on the screen. To do this you must enter and run the following program.

```
5 SCREEN 1
10 FOR A=0 TO 207
20 VPOKE(A+520),PEEK(A+50000)
30 NEXT A
```

By typing any of the capital letters from A to Z you will now see your characters. Do not type a screen command such as SCREEN 0 because your characters will be wiped out and you will have to enter and RUN the program again to transfer them back from normal user memory into the VRAM.

You can now write or load a program which will show off your new characters.

In a future article I will be giving details of how to use your redefined characters in the hi-res mode of SCREEN 2.

SUBSCRIBE

Cut out and SEND TO:

MSX User

Subscriptions,
Infonet Ltd,
Times House,
179 The Marlowes,
Hemel Hempstead,
Herts HP1 1BB

SUBSCRIPTION RATES

(tick ☐ as appropriate)

£19.00 for 12 issues UK	☐
£21.00 for 12 issues overseas surface mail	☐
£53.00 for 12 issues overseas airmail	☐
$29.50 for 12 issues USA surface mail	☐

Subscription Order Form

Please commence my subscription to MSX User with the very next issue.

I am enclosing my (delete as necessary) cheque/Postal Order/International Money Order for £:.....
(made payable to ASP Ltd)
OR
Debit my Access/Barclaycard (*delete as necessary)*

We welcome Access

VISA

Please use BLOCK CAPITALS and include post codes.

NAME (Mr/Mrs/Miss) .....

ADDRESS .....

.....

.....*POSTCODE*.....

Signature .....

Date .....

MSX

Contact

A

ACTIVISION
15 Harley House
Marylebone Rd
London NW1

A&F SOFTWARE
8 Canalside Ind. Estate
Woodbine St East
Rochdale
Lancs OL16 5LB

ALALAMIAH ARABIC SOFTWARE
PO Box 8196
Salmiah
Kuwait
TLX: 46973

ALLIGATA
1 Orange St
Sheffield S1 4DW

ANIROG
8 The High St
Horley
Surrey RH6 7AY

ARTIC
Brandesburton
Driffield
N. Humberside
YO25 8RL

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

B

BUBBLE BUS
87 High St
Tonbridge
Kent TN9 1RX

C

CABLE SOFTWARE
Cape House
52 Limbury Rd
Luton
Beds LU3 2PL

CDS MICROSYSTEMS
Silver House
Silver St
Doncaster
S. Yorkshire

COMPUTER MATES
PO Box 2
Stockbridge
Hampshire

D

DK'TRONICS
Unit 6
Shirehill Industrial Estate
Saffron Walden
Essex CB11 3AQ

E

ECLIPSE
Longman House
Burnt Hill
Harlow
Essex CM20 2JE

ELECTRIC SOFTWARE
91 High St
Longstanton
Cambs.

H

HAL LABORATORIES
Maple Walk
Bexhill
E. Sussex

HI-SOFT
180 High St North
Dunstable
Beds LU6 1AT

K

KEMP
43 Muswell Hill
London N1D 3PN

KNIGHTS TV & COMPUTERS
108 Rosemount Place
Aberdeen

KONAMI
Television House
269 Fieldend Rd
Eastcote
Middlesex

KUMA
12 Horseshoe Park
Pangbourne RG7 7JW

L

LEVEL 9 COMPUTING
PO Box 39
Weston-Super-Mare
Avon BS24 9UR

LIVEWIRE SOFTWARE
Royal London House
198 Deansgate
Manchester M3 3NE

LLAMASOFT
429 Mt Pleasant
Tadley
Hants

LOTHLORIEN
56A Park Lane
Poynton
Stockport
Cheshire SK12 1RE

M

MASTERTRONIC
Park Lorne
Park Rd
London NW8 7JL

MEGACYCAL SOFTWARE
PO Box 6
Birkenhead
Merseyside L43 6XH

MELBOURNE HOUSE
Castle Yard House
Castle Yard
Richmond TW10 6TF

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

MR MICRO
69 Partington Lane
Swinton
Manchester M27 3AL

MIRRORSOFT
Holborn Circus
London ECP 1DQ

MORWOOD
Maple Walk
Bexhill
E. Sussex

O

OCEAN SOFTWARE
6 Central Street
Manchester M3 5FD

ORPHEUS SOFTWARE
The Smithy
Church Farm
Hatley St George
Sandy
Beds SG19 3HP

P

PANASONIC (UK) LTD
300-318 Bath Rd
Slough
Berks

PSS
452 Stoney Stanton Rd
Coventry CV6 5DG

Q

QUICKSILVA
Liberty House
222 Regent Street
London W1R 4DB

R

RITTOR MUSIC
24 Broomsgrove Gdns
Edgware
Middlesex

S

SOFTCAT
Woodbridge Rd
Derby Green
Blackwater
Camberley
Surrey

SOFTWARE PROJECTS
Bear Brand Complex
Allerton Rd
Woolton
Liverpool L25 7SF

SONY
Sony House
South Street
Staines
Middlesex

STELL SOFTWARE
36 Limefield Ave
Whalley
Lancs

T

TERMINAL SOFTWARE
Derby House
Derby Street
Bury BL9 0NW

TOSHIBA
Toshiba House
Frimley Rd
Frimley
Camberley
Surrey

TASMAN
Springfield House
Hyde Terrace
Leeds LS2 9LN

V

VIRGIN GAMES
2-4 Vernon Yard
Portobello Rd
London W11

Arcade Games

Name	Price	Format	Supplier
Alpha Blaster	£1.99	cass	Livewire
Ant Attack	£7.95	cass	Quicksilva
Antarctic Adventure	£17.40	cart	Konami
Anty	£6.95	cass	Morwood
Athletic Land	£17.40	cart	Konami
Battle Cross	£17.95	cart	Sony
Battleship Clapton II	£7.95	cass	Toshiba
Beamrider	£11.99	cass	Activision
Binary Land	£8.95	cass	Kuma
Blagger	£7.95	cass	Alligata
Booga-boo the Flea	£7.95	cass	Quicksilva
Boulderdash	£6.95	cass	Orpheus
Breakout	£18.00	cart	Panasonic
Buck Rogers	£11.95	cass	Electric
Buzz Off	£7.95	cass	Electric
Cannon Fighter	£6.95	cass	Morwood
Chuckie Egg	£7.90	cass	A&F
Circus Charlie	£17.40	cart	Konami
Coco in the Castle	£6.95	cass	Kuma
Comic Bakery	£17.40	cart	Konami
Crazy Golf	£7.95	cass	Mr Micro
Crazy Train	£17.95	cart	Sony
Cubit	£7.95	cass	Mr Micro
Disc Warrior	£7.95	cass	Alligata
Dog Fighter	£6.95	cass	Kuma
Dorodon	£17.95	cart	Sony
Driller Tanks	£8.95	cass	Kuma
Eric & the Floaters	£8.95	cass	Kuma
Exploding Atoms	£5.95	cass	Knight
Fairy	£7.95	cass	Morwood
Finders Keepers	£1.99	cass	Mastertronic
Fire Rescue	£7.95	cass	Kuma
Fred	£7.95	cass	Quicksilva
Galaxia	£6.95	cass	Kuma
Ghostbusters	£11.99	cass	Activision
Gridtrap	£1.99	cass	Livewire
H.E.R.O.	£11.99	cass	Activision
Highway Star	£18.80	cart	Panasonic
Holdfast	£5.95	cass	Kuma
Hot Shoe	£5.95	cass	Eclipse
Humphrey	£7.95	cass	Mr Micro
Hunchback	£6.90	cass	Ocean
Hyper Viper	£7.95	cass	Kuma
Jet Set Willy	£7.95	cass	Software Projects
Juno First	£17.95	cart	Sony
King's Valley	£17.40	cart	Konami

Name	Price	Format	Supplier
Lazy Jones	£8.95	cass	Terminal
Les Flicks	£7.95	cass	PSS
Manic Miner	£7.95	cass	Software Projects
Marine Battle	£18.80	cart	Panasonic
Maxima	£7.95	cass	PSS
Mean Streets	£6.95	cass	Kuma
Minder	£9.95	cass	Dk'tronics
Monkey Academy	£17.40	cart	Konami
Mopiranger	£17.40	cart	Konami
Mouser	£17.95	cart	Sony
Mr Ching	£14.95	cart	HAL Labs
Mr Wong's Loopy Laundry	£6.95	cass	Artic
Ninja	£6.95	cass	Kuma
Norseman	£8.95	cass	Electric
Oh Mummy!	£5.95	cass	Eclipse
Panic Junction	£6.95	cass	Morwood
Pineapplin'	£7.95	cass	Morwood
Pitfall II	£11.99	cass	Activision
Polar Star	£7.95	cass	Toshiba
Popeye	£9.95	cass	Dk'tronics
Punchy	£7.95	cass	Mr Micro
Pyramid Warp	£7.95	cass	Toshiba
River Raid	£11.99	cass	Activision
Shark Hunter	£8.95	cass	Electric
Shnax	£6.95	cass	Kuma
Skramble	£1.99	cass	Livewire
Sky Jaguar	£17.40	cart	Konami
Smash Out	£5.95	cass	Knight
Sorcery	£8.95	cass	Virgin
Space Walk	£1.99	cass	Mastertronic
Spooks & Ladders	£6.95	cass	Kuma
Squish 'em	£18.80	cart	Panasonic
Star Avenger	£8.95	cass	Kuma
Step Up	£14.95	cart	HAL Labs
Stop the Express	£6.95	cass	Kuma
Super Cobra	£17.40	cart	Konami
Super Snake	£14.95	cart	HAL Labs
Tele-bunnies	£18.80	cart	Panasonic
The Snowman	£7.95	cass	Quicksilva
The Wreck	£14.95	cart	Electric
Time Bandits	£7.95	cass	PSS
Time Pilot	£17.40	cart	Konami
Vicious Viper	£5.95	cass	Knight
Zakil Wood	£7.95	cass	Mr Micro
Zaxxon	£11.95	cass	Electric

Utilities

Name	Price	Format	Supplier
Arabic Characters	£32.00	cart	Alalamiah
Champ Assembler	£12.95	cass	PSS
Colour Fantasia	£9.95	cass	Kuma
Communications	£19.95	cass	Kuma
Devpac	£19.95	cass	Hi-soft
Forth	£39.95	disk	Kuma
Forth	£39.95	cass	Kuma
Games Designer	£9.95	cass	Quicksilva
Graphic Designer	£14.95	cass	Cable
Logo Turtle-Graphics	£19.95	cass	Kuma
MSX Demonstrator	£5.95	cass	Knight
MSX Graphics	£5.95	cass	Knight
Machine Code Language	£28.75	cass	Knight
Odyssey-K	£10.95	cass	Rittor
P.I.C.A.S.S.O.	£7.95	cass	Morwood
PSG Musiwriter	£20.95	cart	Rittor
Pascal Compiler	£29.95	cass	Hi-soft
Psychedelia	£5.00	cass	Llamasoft
Sprite Editor	£7.95	cass	Cable
Typing Tutor	£5.95	cass	Knight
Zen Assembler	£19.95	cass	Kuma

Business

Name	Price	Format	Supplier
Zen Assembler	£29.95	disk	Kuma
Budget Accounts	£28.75	cass	Knight
Cards	£39.95	cart	Computer Mates
Cash Accounts	£99.00	cart	Computer Mates
Cashbook	£14.95	cass	Micro-aid
Database	£39.95	disk	Kuma
Database	£19.95	cass	Kuma
Double Entry Accounts	£99.00	cart	Computer Mates
Home Budget	£14.95	cass	Kuma
Home-Writer	£24.95	disk	Sony
Memo-Calc	£14.95	cass	Micro-aid
Payroll	£29.95	cass	Micro-aid
RS232 Communications	£99.95	cart	Computer Mates
Spreadsheet	£39.95	disk	Kuma
Spreadsheet	£29.95	cass	Kuma
Stock Control	£34.95	cass	Kemp
Tasword	£13.90	disk	Tasman
Tasword	£13.90	cass	Tasman
WDPRO	£39.95	disk	Kuma
WDPRO	£29.95	cass	Kuma
Word Proc + Cards	£69.95	cart	Computer Mates
Word Processor	£39.95	cart	Computer Mates

Education

Name	Price	Format	Supplier
Arabic/English Tutorials	£32.00	cart	Alalamiah
Calculation 1	£9.95	cass	Morwood
Calculation 2	£9.95	cass	Morwood
Challenge My Bluff	£9.95	cass	Softcat
First Steps with the Mr Men	£7.95	cass	Mirrorsoft
French is Fun	£7.95	cass	CDS
Fun Words	£9.95	cass	Softcat
German is Fun	£7.95	cass	CDS
Introduction to Numbers	£9.95	cass	Morwood
Italian is Fun	£7.95	cass	CDS
Junior Maths	£5.95	cass	Knight
Kriss Kross Kquiz	£9.95	cass	Softcat
Let's Go MSX	£9.95	cass	Softcat

Name	Price	Format	Supplier
MSX BASIC Tutorial	£16.95	cass	Knight
Maths Invaders	£7.95	cass	Stell
Memory	£9.95	cass	Morwood
Number Painter	£8.95	cass	ASK
Reasoning	£9.95	cass	Morwood
Reflexes	£9.95	cass	Morwood
Revise Physics	£8.50	cass	MegaCycal
Spanish is Fun	£7.95	cass	CDS
Star Seeker	£9.95	cass	Mirrorsoft
Super Maze	£6.95	cass	Morwood
Super Mind	£6.95	cass	Morwood
Super Puzzle	£6.95	cass	Morwood
Teach Yourself Electricity	£9.20	cass	MegaCycal

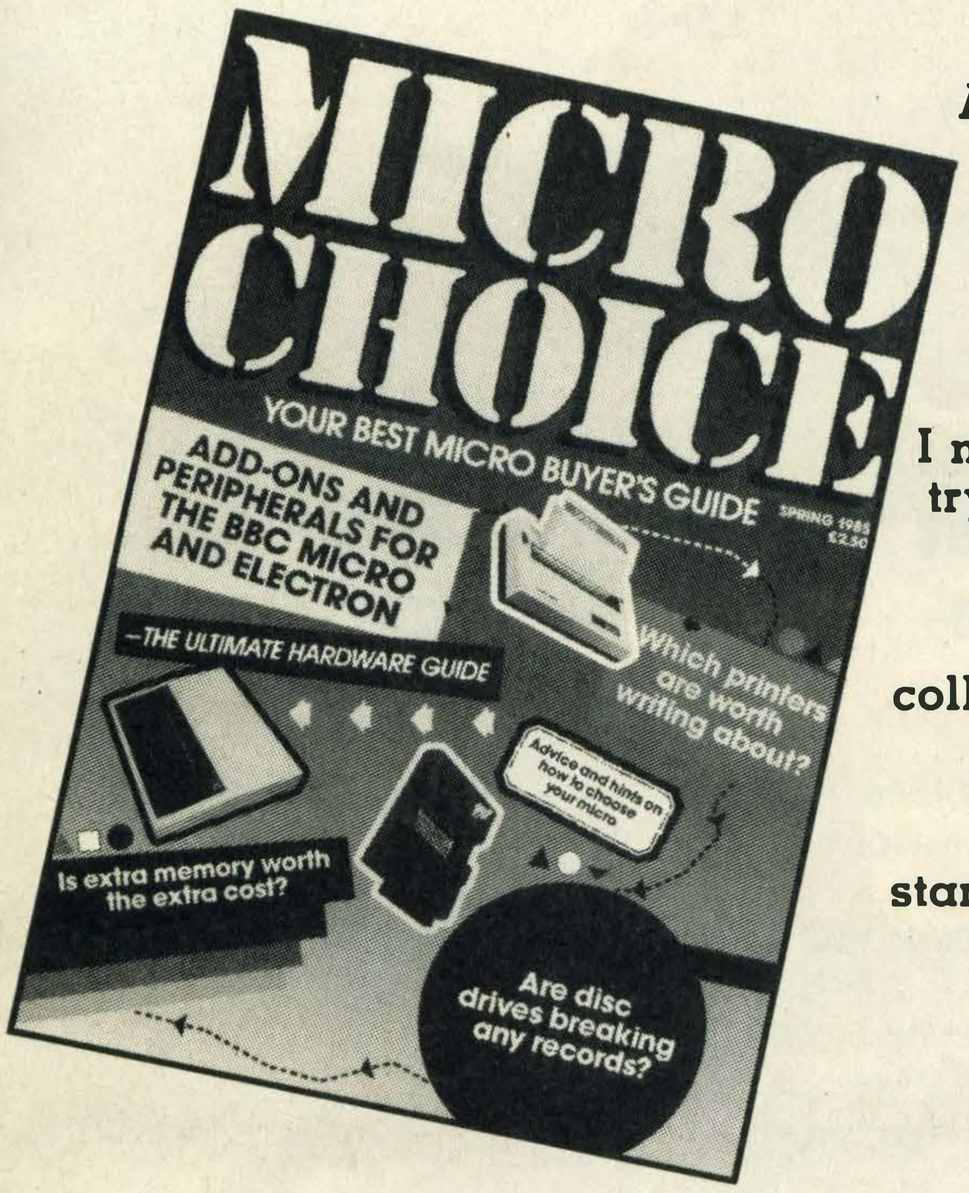
Sport & Simulations

Name	Price	Format	Supplier
3D Golf	£7.95	cass	Toshiba
737 Flight Simulator	£9.95	cass	Mirrorsoft
Backgammon	£9.95	cass	Electric
Boardello	£6.99	cass	Bubble Bus
Contract Bridge	£9.95	cass	Alligata
Cribbage	£5.95	cass	Kuma
Flightpath 737	£7.95	cass	Anirog
Golf	£17.40	cart	Konami
Golf	£18.80	cart	Panasonic
Hole in One	£14.95	cart	HAL Labs
Hustler	£6.99	cass	Bubble Bus
Hyper Olympic 1	£17.40	cart	Konami
Hyper Olympic 2	£17.40	cart	Konami
Hyper Sports 1	£17.40	cart	Konami
Hyper Sports 2	£17.40	cart	Konami
Le Mans	£9.95	cass	Electric
Othello	£5.95	cass	Knight
Pinball	£7.95	cass	Toshiba
Rollerball	£14.95	cart	HAL Labs
Starship Simulator	£18.80	cart	Panasonic
Super Billiards	£14.95	cart	HAL Labs
Super Chess	£8.95	cass	Kuma
Tennis	£17.40	cart	Konami
Yie Ar Kung Fu	£17.40	cart	Konami

Adventure & Strategy

Name	Price	Format	Supplier
Adventure Quest	£9.95	cass	Level 9
Cave Adventure	£5.95	cass	Knight
Classic Adventure	£6.95	cass	Melbourne House
Colossal Adventure	£9.95	cass	Level 9
Darkwood Manor	£7.95	cass	Kuma
Death Valley Goldrush	£7.95	cass	Kuma
Dungeon Adventure	£9.95	cass	Level 9
Emerald Isle	£6.95	cass	Level 9
Galactic Mercenaries	£7.95	cass	Kuma
Gods of the Tomb	£9.20	cass	MegaCycal
Gumshoe Logic	£9.20	cass	MegaCycal
Lords of Time	£9.95	cass	Level 9
North Sea Bullion	£7.95	cass	Kuma
Panzer Attack	£7.95	cass	Lothlorien
Red Moon	£6.95	cass	Level 9
Return to Eden	£9.95	cass	Level 9
Shadow of the Bear	£7.95	cass	Kuma
Snowball	£9.95	cass	Level 9
Special Operations	£7.95	cass	Lothlorien
The Hobbit	£14.95	cass	Melbourne House

You cannot be serious!!



About software, that is! Or at least you can't until you've made an intelligent decision about hardware.

Computers? Printers? Disc drives? Joysticks? Peripherals? Extra RAM?

I mean, there's a serious danger of going crazy just trying to understand the choices. Let alone coming to an intelligent decision.

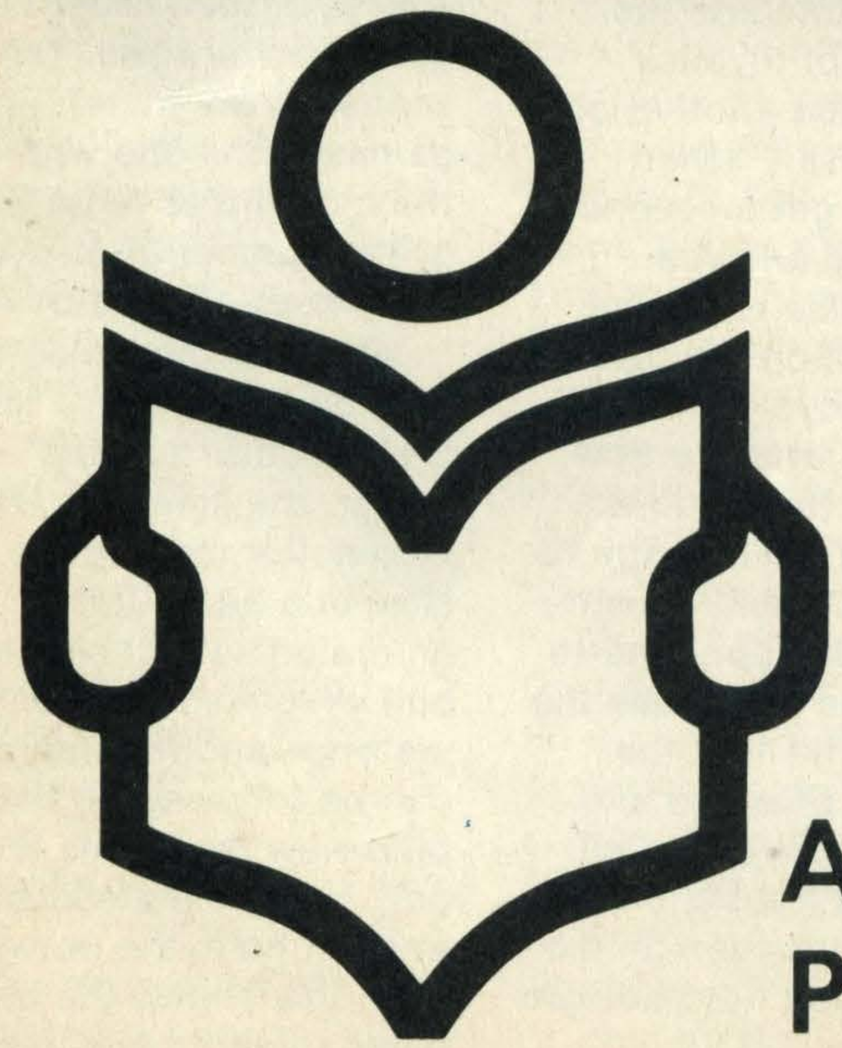
Micro Choice is your answer. Every quarter it collects a range of hardware reports so that you can make your own choice of micro or add-ons.

Then you can forget about being too serious and start having fun. Easy when you think about it, isn't it?

MICRO CHOICE

For help with Reading and Writing

☎ 01-405 4017



Since 1975, 350,000 adults have been helped to read and write better.

If you want help look for this sign.

For further information

Adult Literacy & Basic Skills Unit

PO Box 213 London WC1V 7ET

MSX

Software Options

Our reviewers let their fingers do the walking through the latest batch of software releases

SHNAX
Kuma
£6.95
Cassette

Maybe I'm old fashioned but my one regret about new computers is that no-one seems to bother about producing the good old games of my misspent youth. Space Invaders and Pacman appear to have been lost in the mists of time. **Shnax** is an attempt to redress the balance by updating Pacman using a more complex maze with angled channels as well as the more usual horizontal and vertical ones.

The graphics are quite good and, in addition to the usual power pills which enable the dot gobbler to eat the aliens, there are several useful objects which appear at the top of the screen each time a pill is swallowed. If the gobbler can reach these objects safely they give him extra powers such as the ability to leap over the aliens, teleport to the home position which he started from or to warp to a place which mirrors his previous position in the maze.

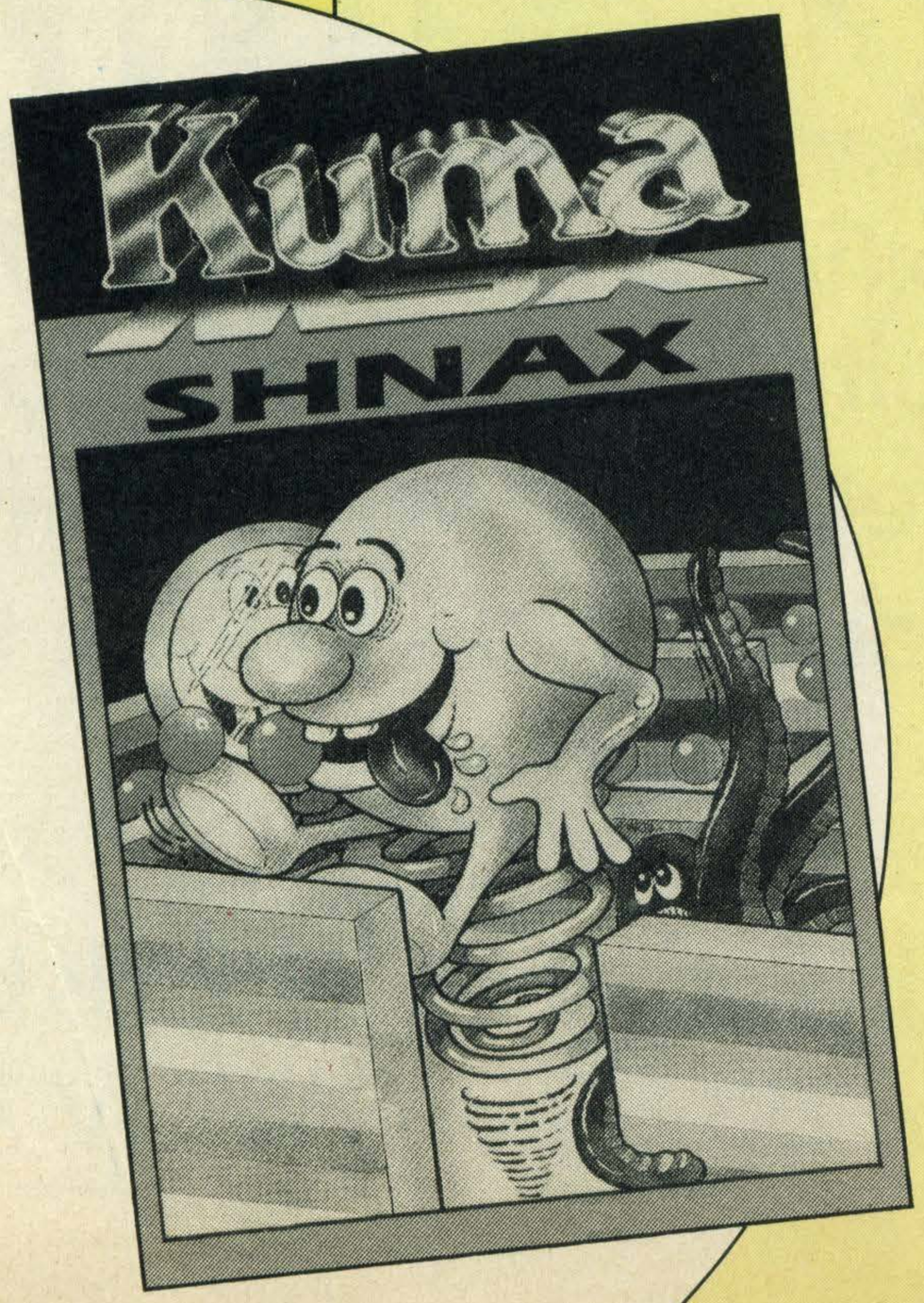
These facilities are essential if all of the dots are to be reached because there is an exceptionally mean alien who patrols a small area of the maze at high speed. This creature is immune to the gobbler even if he has eaten a power pill and the only way to get out of his way is to use the warping capabilities picked up elsewhere.

The game is fast and furious and even the first level is difficult to complete. This difficulty level is not helped by the rather poor responses to the joystick movements which has costs me many a life. To eliminate the possibility of joystick failure, I tried another one but to no avail. I then decided to get a second opinion and allowed someone else to try the game but soon the curses about the joystick response started to flow.

Despite this serious drawback I did manage to reach the second screen but I was disappointed to see that the maze was the same. I admit that the aliens had changed and that they were faster but having had trouble moving around this screen on the previous level I did not last long.

My overall opinion is that this game has great potential which will not be realised until something is done about the controller routines.
ED

5/10



GOLF
Konami
£17.40
Cartridge

A cursory glance at the range of software emanating from Japan soon reveals an obsession with the game of golf. Of all the golfing simulations Konami's is the best available. Covering nine holes in each round, the game not only shows a plan view of each hole but also a 3D representation of the scene as each stroke is played.

The game allows the usual options contained in all of the other golf games. This means that clubs may be selected to suit the circumstances and that the power and direction of each shot can be selected, allowing for wind direction and speed. The two player version of the game can be either stroke or match play. In stroke play the winner is the player who goes around the par 36 course in the fewest number of strokes. The winner of the match play games is the one who wins the most holes regardless of the number of strokes taken over all nine holes.

After initially selecting your club for the tee shot, the direction and the power, the screen shows a lady golfer making the shot in a beautifully animated sequence. The ball whistles into the distance and its progress can be followed on the plan view map. This is the only fully animated scene at each hole; the fairway play only shows the ball flying towards a suitably

Alpha Blaster

Skramble

designed background depending on the terrain. When the green is reached you even lose the 3D scene in favour of an enlarged aerial view showing your relative position to the hole and the lie of the grass.

It did not take too long to get used to the qualities of the various clubs available, principally because of the full information given in Konami's booklet. It gives a breakdown of the length of each hole and the par. Each club is listed beside the average length of shot available with it.

ED

9/10

FIRST STEPS WITH THE MR MEN

Mirrorsoft
£8.95
Cassette

Roger Hargreaves' Mr Men stories have been a favourite with children for many years and this program increases their field of operation into state-of-the-art teaching methods.

There are four games contained on the tape but all are loaded into the computer at the same time and a simple picture menu is used to select which game will be played next. This theme of simplicity is further developed by the inclusion of stick-on Mr Clever labels which indicate the functions of the five keys needed to operate the games.

In the first game Mr Greedy must be directed to an ice-cream which appears in a corner of the screen. Starting at the centre of the screen, Mr Greedy can be controlled by either the cursor keys or the function keys. When he reaches the ice-cream the screen fills up with cones and the next level begins.

This time Mr Greedy has two extra barriers to negotiate and as higher levels are reached the number and complexity of the barriers increase until the final screen.

Success at this level rewards the child with a nursery tune and Mr Greedy appears instead of each of the original ice-creams. The second game involves Mr Silly who is looking for a hat. Beside Mr Silly are four rows of hats in various styles and colours. A speech bubble appears which contains a picture of one of the hats and the child must control an arrow cursor to indicate which hat Mr Silly wants. A correct choice means that the hat will move across the screen and land on Mr Silly's head; otherwise nothing happens. Perhaps some sound effect to indicate that the choice was wrong would have been useful because it is difficult to know if the computer has accepted the key press.

The third and fourth games are essentially the same except that one uses symbols and the other uses lower-case letters. In both cases Mr Forgetful has stored things in his wardrobes and the aim is to help him find a pair of objects by guiding him to a wardrobe, opening it and then moving to find a matching object in another cupboard. If the match is made the cupboards stay open, if not they both close.

As educational primers go, this proved to be a great success with a friend's seven-year-old child.

The graphics characters are eminently recognisable and the package contains a little booklet of instructions which a parent can read to the child while the program loads.

ED

7/10

SKRAMBLE

Live Wire
£1.99
Cassette

Although this version of **Skramble** is very similar to the 'Industry Standard' Scramble I didn't like it as much as I liked Alpha Blaster.

The first screen has you piloting a rocket ship that flies up and down over a right-left scrolling landscape. The idea is to bomb and blast as many of the enemy installations on the ground as possible. To make this harder the enemy launch ground-to-air rockets at you which must either be dodged or

blasted. If you survive this, the enemy send a swarm of purple bugs at you. The bugs attempt to crash into you and thus terminate your mission. They weave about but can be destroyed by the lasers.

The next level is not so easy as you fly into a meteor storm. The meteors fly in straight lines but cannot be destroyed by the lasers and must therefore be dodged. This involves a lot of skilful low level flying, ducking below the mountain tops and popping up again when a gap presents itself. In the unlikely event that you survive this level the programmers have supplied a killer on the end. This takes the form of a maze which must be flown through without touching the walls while blasting objects that block the way. Suffice it to say, it is not easy.

As I said the game follows the standard very closely. My niggles are with the programming. For instance when the purple bugs appear the missiles are not launched any more, making this level very easy indeed all one has to do is fly straight and keep blasting. This same fault is repeated on the meteor screen.

These are minor points but they do mar an otherwise excellent game — but for £1.99 it is still a bargain!

JD

6/10

ALPHA BLASTER
Live Wire
£1.99
Cassette

If you were asked to review a piece of MSX software that only costs £1.99, I am sure that you would be expecting some awful BASIC creation written in someone's back room. In fact Alpha Blaster is a respectable Gorf-like game with all the features which one would expect.

The first level is quite easy, requiring you to wipe out a small wave of mildly agressive butterfly-like things. The butterflies move in small circles and are thus easily eliminated.

The second level is somewhat harder as the aliens (Alphas?) charge down the screen at you one at a time. They also drop bombs and if one of these is released just before you zap him then your chances of survival are minimal. After negotiating this difficulty you must pilot your ship through an asteroid storm. The asteroids can't be zapped and thus must be avoided. This involves a great deal of dodging backwards and forwards. Just to add interest in between the asteroids are fuel pods. These must be shot in order to gain the fuel because the ship does not have enough on board to make it through.

If you have the skill to pass this test then you are given the chance to dock with the supply ship. This naturally requires the ships to be lined up accurately and an error in the alignment is fatal. Once docked the ship is refuelled and more ammunition is loaded. You then return to battle the Alpha but each time you do they get harder to beat.

I rather liked this game as it comes as a welcome break from all the recent hi-brain games and allowed me to indulge in a little mindless Alien blasting, just like old times. So if you fancy a spot of saving the Galaxy then rush out with two quid and get this.

JD

7/10

STAR SEEKER
Mirrorsoft
£9.95
Cassette

All the excitement of the London Planetarium on your own home computer screen? Not quite, but this package does have many features of interest for astronomers and those who would like to learn more about the stars and planets.

Computers have always been associated with the stars and space travel both in fantasy and reality. Adventure games which involve whizzing through imaginary galaxies have always been popular. And the real space flights to the Moon would never have been possible without on-board computers. So a program to help you learn abou the real stars and planets with the aid of your computer gets off to a flying start. The Sky at Night becomes the sky at any time of the day you fancy, and you don't have to wait for the clouds to clear either!

Star Seeker is two different programs: one which shows maps of the stars and the other which homes in on the solar system. Whichever program you choose, your first task is to say where on planet earth you are positioned — in other words feed in your latitude and longitude. In case you are not sure of these, the 26-page booklet gives details for various U.K. and European cities.

Using the Star Seeker program, you specify

Star Seeker

direction of view and then a section of the star map is shown. You can then choose various options: construct the constellations, get information on a star, show the constellations by joining them up with lines, follow the progress of the stars as they move through the night, get a star map for the southern hemisphere, and finally get a printout of this information (if you have a printer, of course). Another use of the booklet is to give information about the constellations.

The second program, **Solar System,** is on side two of the tape. (Both sides take a long time to load, so neither program is designed for casual viewing). Yet again you have to input your position on the planet, together with a date and a time.

The map of the solar system has rather poor graphics; the sun is shown as a cross and the planets are shown as dots. On the screen you can watch the planets orbiting the sun. The inner planets are very close together, so to adjust for this you can change the scale to make the positions of these planets clearer.

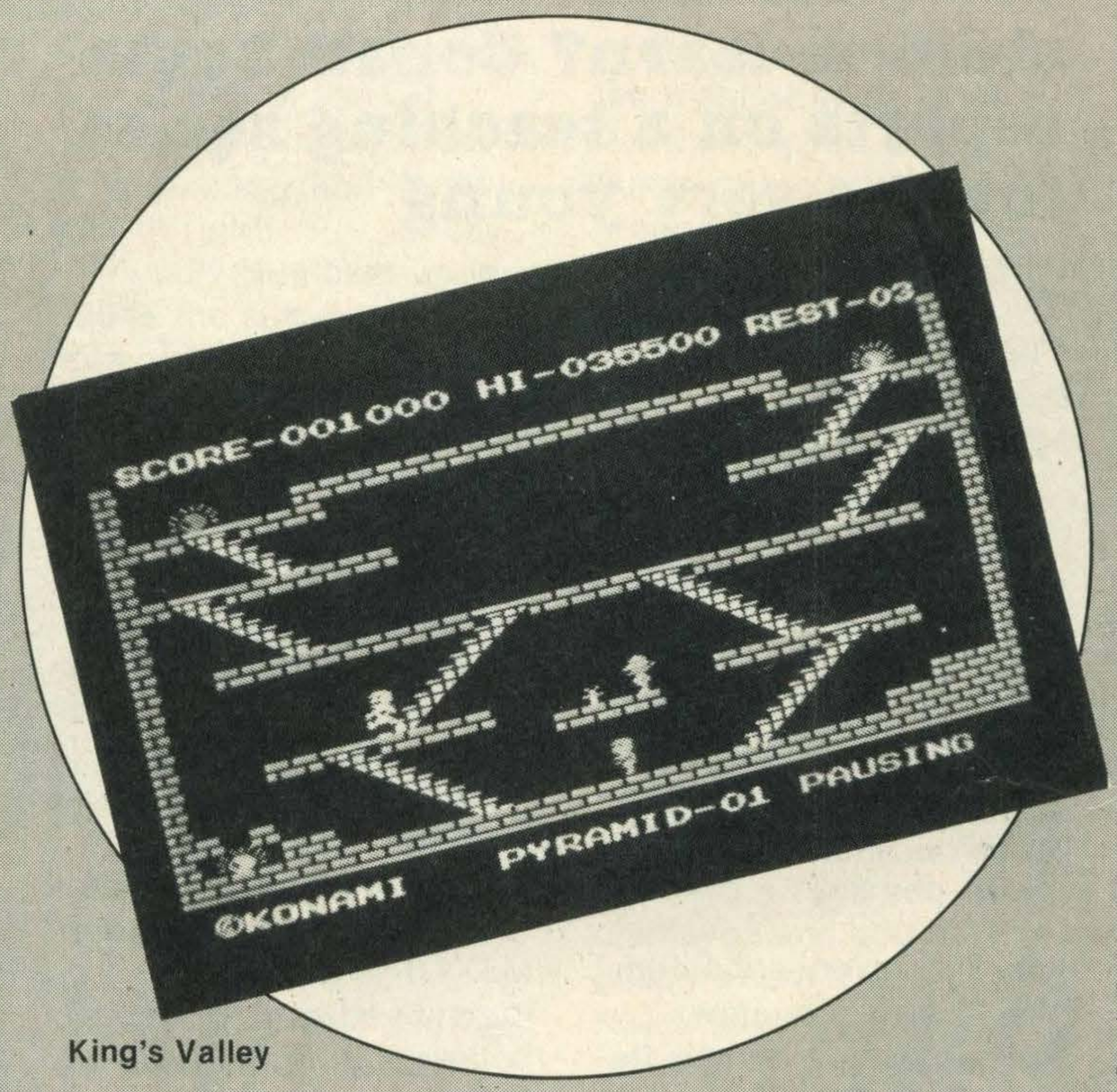
If you want to know any information about the planets, you should move the cursor over the planet (or the sun) and press the return key. It tells you its distance from the sun and orbital information.

As well as the planets, you can find out about Halley's Comet and the Earth's moon in this program. This includes whether the moon is full, half or quarter out, as shown on the screen. As with all the displays, this can be printed out, so it would be a useful reference document for astronomers and almanac compilers.

This cassette is grouped under the 'home discovery series' on the Mirrorsoft label, and I think they deserve credit for pushing back the frontiers of home computing, boldly going where no programmer has been before. But I'm afraid to say that this program will hardly set skies alight. The graphics are slow and uninspiring, and the loading time is a big drawback. But it will still have appeal to amateur astronomers.

MB

7/10



King's Valley

KING'S VALLEY

Konami
£17.40
Cartridge

The curse of the pyramids is upon you as you investigate the secrets of the pharoahs' tombs in this platform game from Konami. As you guide Vick the archaelogist through the various levels of an ancient tomb in the Valley of the Kings' the spirits of the dead re-enter the pharoahs' mummies and they rise in anger to prevent you from taking the Mystery Jewels which hold the key to eternal life in the Kingdom of Ra, the Sun God.

As Vick wanders around the tomb he must find pickaxes with which to dig out the jewels buried in the walls of the tomb. Each pickaxe can only be used once and the ardent adventurer must be careful not to trap himself in a deep hole without a spare pick to dig his way out with, if he is not to lose one of his five lives.

Vick's life is not made any easier by the wandering spirits of the mummies who are fated to guard the jewels throughout eternity. These troublesome mummies can be dispelled by throwing sacred swords at them but first a sword must be collected. This involves running the gauntlet against the ghosts. Luckily, Vick is a bit of an athlete and he can jump over the mummies but he would obviously prefer to avoid any form of contact with them so he often has to follow a circuitous path around the tomb.

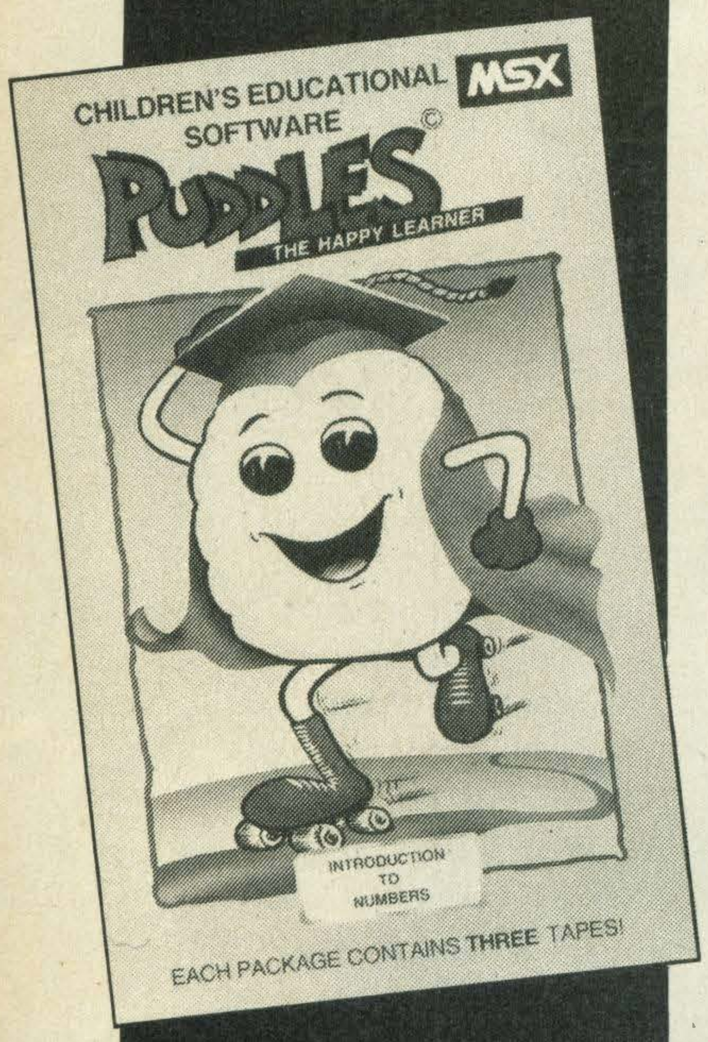
This game is one of the best platform games available for the MSX because it involves careful planning and quick thinking for success. Each pickaxe can only be used once and there is a finite number of them available. Often it is necessary to dig a hole through to a jewel and then search the tomb for another pick before entering the hole you have made. In this way you ensure that you can escape once you have retrieved the jewel. The problem is that Vick cannot jump when he is in possession of a pick. The only way that he can drop it is to dig a hole which means that the tool is lost forever.

Some of the tombs only fill a single screen but others spread across two which means our hero often has to cover a lot of ground to complete his task. Even when all of the jewels have been collected he must make his way to the exit and open the door to the next tomb which will certainly contain more traps. Walls suddenly descend to trap him on the higher levels and there are doorways which will only operate one way. These doors are both a blessing and a curse because the mummies cannot pass through them but because they only operate one way, you must make sure that you can get out again.

I thoroughly enjoyed my trip to the tomb, but, there again, I always was a mummies boy!

ED

8/10



Can your MSX help your child to learn? Conall Boyle reports on a teaching series for the very young

PUDDLES EDUCATIONAL SOFTWARE

Set 1: Introduction to Numbers
Set 2: Calculation I
Set 3: Calculation II
Set 4: Memory
Set 5: Reasoning
Set 6: Reflexes
Morwood Software
£9.95 per set

Since every school in Britan is by now supposed to have its own micro, then it seems obvious that the micro must be an essential piece of educational equipment, and not just a toy. But can the enthusiasm of the kids for game-playing on your home MSX really be chanelled into some useful learning? it will all depend on the software.

In this article I will be having a look at the Puddles series, which is the most comprehensive set of educational programs available to date for the MSX.

Don't get carried away by all this micro-in-every-school hysteria. Ask any teacher, and they will probably agree that things have fallen far short of expectations. It is not just that one micro between a class of 30 means very poor access for each pupil. the main snag with using micros in schools is that so much of the software available is so lousy.

The size and nature of the market is the main problem for educational software houses. Games producers can plan for markets of hundreds of thousands; selling to schools you would be lucky to sell a few thousand. To add insult to injury, the teachers will probably make lots of copies as well. Software houses cannot afford to invest in the development of educational titles of the same quality as the big-selling games.

But even if there was a lot of good software available, could you learn much with the help of your MSX? There are many (outside education) who believe that in the near future computers will replace teachers, that we can dial up a course of lessons on any subject at any time, and that the computer will be the bringer of Universal Enlightment. Expecting so much makes what is available now look pretty pathetic.

But if you approach the available educational software realistically, then it can fulfill a useful function. There *are* things which can be learned or re-inforced with the help of your MSX. The computer can even take you intro areas of learning which were not possible in the classroom. But useful though these topics might be, they can never add up to a course of learning.

Strong claims

The Puddles educational series includes some of the best educational software I have seen. It is aimed at the home market, and makes some strong claims: 'Puddles deals with Numerical Ability, Spatial Ability, Memory, Perception and Reasoning'. Phew!

There are six sets of titles in the series, each containing three cassettes. Each set comes in a handy video cassette box, which looks good. Attractiveness is an important feature in luring the young child into trying the software, and Puddles pulls out all the stops. There are smiling suns, risng balloons, cuddly penguins that quiver with excitement when you get an answer right. There are bleeps and bongles to keep the enthusiasm going.

All 18 programs use the same graphics, and follow the same pattern. At the start of each program you must select how many quizzes you want to do (there are 10 questions in most quizzes), what level of difficulty 1-10, and what your target score is. In Puddles you score by getting the right answer, but there is also a time penalty; if you take too long you start to lose points.

As the quiz proceeds, you answer questions by pressing the right number key, followed by a RETURN. You cannot correct a mistaken keystroke. Get the right answer and a sun comes out, a balloon rises, the penguin waves his little arms, and of course a jolly tune is played. Get the wrong answer and it's bleeps, sinking balloons and clouds over the sun.

At the end of each quiz

there are more graphics to tell you how you have done. This time it is a car which sets off to one of three destinations: 'Very Good' represented by a smiling sun, 'Good' a sun in a cloud, and 'Study More' shown by clouds. There are sound effects to match.

When you have completed a series of quizzes, a multi-coloured bar chart shows how you have done on right answers, wrong answers and on timing, compared to your target.

Adults would find all this a bit patronising, so to test the effect on the intended users, I enlisted the aid of Alex, my 7-year-old. He quite enjoyed all the sound and graphics effects. Puddles described these programs as suitable for 4- to 8-year-olds, and indeed Alex could manage most of them.

One thing was not clear on many programs — what the quiz was about. The on-screen instructions were often very little help, and in many cases figuring out what was meant was an adventure in itself. Needing to have an adult in attendance is *not* the sign of good software, so low marks to Puddles for poor user instructions.

The programs

There are 18 programs in all, and what follows is a brief review of each. Many thanks to young Alex, who should, if Puddles publicity is to be believed, be near genius level after trying all these programs. (He still prefers the Beano.)

Set 1: Introduction to Numbers. Overall this is an unexciting collection.

Part 1 is **Learn to Count:** you count the number of objects in a box on the screen. Simple for the beginner.

Next is **Numbers up to 10.** A car travels along a row of poles; you have to count how many are to the left or right of the car. Confusing as it involves both numbers and hands (left or right).

Finally **Numbers up to 120** is the same, but with lots of things in the box. This one seems difficult and pointless.

Set 2: Calculation 1. This covers a very popular area for educational software — exercises in mental arithmetic. Of its kind, this set and the next one are not very good.

Calculate the missing number has a very strange layout which caused a lot of head-scratching; it might have something to do with Modern Maths.

The next two programs deal with addition and subtraction. Ordinary sums are thrown up with random variations.

Set 3: Calculation II. Comments same as for Calculation I. This deals with addition and subtraction only. Multiplication and division exercises are not to be found in this series.

Part 1 is **Count the missing objects**, with simple sums, but given in a complex framework.

The second program, **Number size and sequences** covers a lot of ground. At the simple end it asks 'Is 8 bigger than 6?'At the difficult end it asks 'Fill in the missing value — 23 19 __ 11 7', which is a bit beyond most 7-year-olds!

We couldn't get **Calculate using a grid** to load. It appears to involve adding rows or columns of numbers.

Set 4: Memory. This consists of two fiendishly difficult programs, way beyond most adult minds, and one nice simple program. Buying this set could bring on brain-storms!

Memory game. This was the most difficult of all. Pairs or triplets of numbers are scattered around a 4 x 6 grid; the numbers are then taken away, and you have to remember the position of each pair.

Numbers and alphabet is much easier. A short sequence is shown, then re-displayed with one number or letter missing. You remember the missing item.

Shapes and numbers. Five weird geometric shapes are shown and removed. One is re-displayed and you have to guess where it was in the row of five. Not quite as bad as the first program in this set, but way beyond a 7-year-old.

Set 5: Reasoning. At last! Something which we can wholeheartedly recommend. Suitable for children of all ages, it covers arithmetic and the use of co-ordinates.

Assigned values 1. Bricks of different sizes are given values of 10, 5 or 1. You then do sums involving various bricks. You might find the graphics a bit confusing — the 10 brick is not twice the size of the 5 brick.

Assigned values 2. Like the last one, but with simple shapes and colours replacing the bricks.

Points on a graph. Of all the Puddles programs, this is my favourite. A space-ship moves to a point on a grid marked like a map — you have to read off the co-odinates and type them in. A super exercise in map reading, it re-inforces the oft-confused point that Northings follow Eastings. This program teaches a lesson in the best possible way — without you realising it!

Set 6: Reflexes. This is the best set of them all. If you only buy one set this is the one to get. It is what a good educational program ought to be — simple, easy to use, encouraging, teaching you something useful, but in an indirect way.

The game in these programs is to match things — hence the title. But the real lesson is to develop familiarity with the keyboard. For this reason it is an ideal starting point.

Exercises with numbers. A number appears on the screen; you press the same number key. Is it a game of reactions, or is it a crafty way of familiarising you with the number keys? Answer: it is both.

Exercises with the alphabet. Same as the last one, but this time using letters of the alphabet, so it is much more complex. This program could also be used for learning to touch type.

Exercises with shapes. This is a pure reflex game. Ten different items are displayed and numbered. One of them is shown separately; you have to key in its number.

One major misgiving I have about all of these Puddles programs is the time penalties. 'Do 50 hard sums in 20 minutes' is a favourite method of grinding down pupils in school. I wish software writers didn't feel the need to copy the worst aspects of classroom teaching.

All these Puddles programs are good value — you or your child will learn something from each and every one of them. Puddles is certainly among the best educational software available today, but that is not saying a lot.

Of the six sets currently available I would especially recommend Reflexes. Reasoning would be worth having as well.

Feedback

MSXpectations

Dear Sir,
Please allow me to express some thoughts on the world of MSX computing through the Feedback pages of your publication.

As MSX users, ie people who have spent hard earned/saved/borrowed money to buy MSX machines, we have expectations and assume the manufacturers will face up to their responsibilities.

In my opinion, we should demand the following:

Lower prices especially on peripherals. Who ever heard of £345 for a disk drive? If Cumana can afford to market disk drives for the BBC at £100 (retail inclusive) so can MSX manufacturers.

Better end user service and dealership. Whether it be North, South East or West, we all need good knowledgeable dealers.

National MSX user club with free membership on proof of purchase or intent of purchase; regular mailing of news and accurate dates of launching of new products and prices; special offers on both software and hardware to members etc.

Better advertising campaign co-ordinated. Also financial support via ads for independent MSX user publications (eg *MSX User*).

In conclusion, if MSX is to become a household name and pay tribute to its inventor's aspiration, manufacturers must put customers before profits. All I can say is: remember Henry Ford's marketing revolution. He did not starve to death, did he?

For your information I am sending copies of this letter to JVC, Canon, Sanyo, Toshiba, Sony, Spectravideo etc. In the meantime I am asking all your readers who agree with me to make their views public. I can assure you every little bit helps.

Alternatively, if there are readers that would like to form a national pressure group to open dialogue with the manufacturers' representatives in the UK as well as importers, they can write to me at the address below stating, name, address, make and model of MSX machine, together with at least one SAE for early reply.

C. Kardasopoulos
6 Dryden Strteet
Southwick
Sunderland SR5 2JY

Disagreement

Dear Sir,
I do not agree with your views on **Ghostbusters** (August issue).

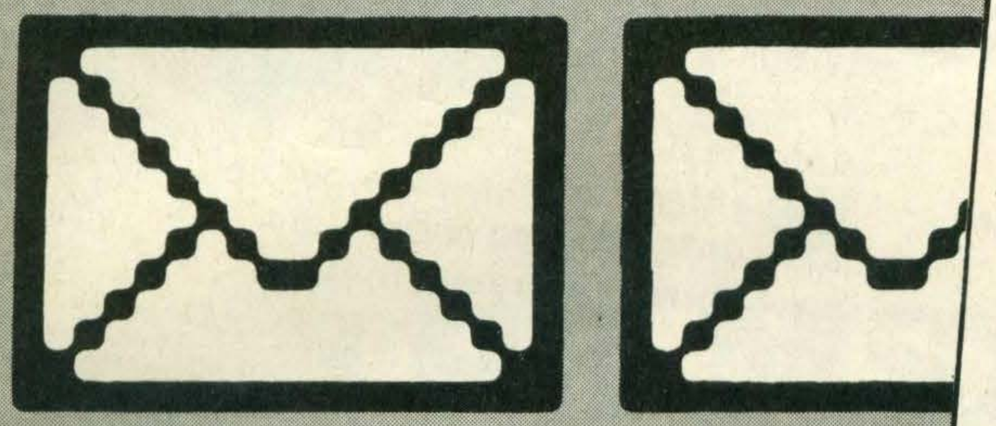
I have played Ghostbusters on my own MSX computer, and also on a friend's Spectrum.

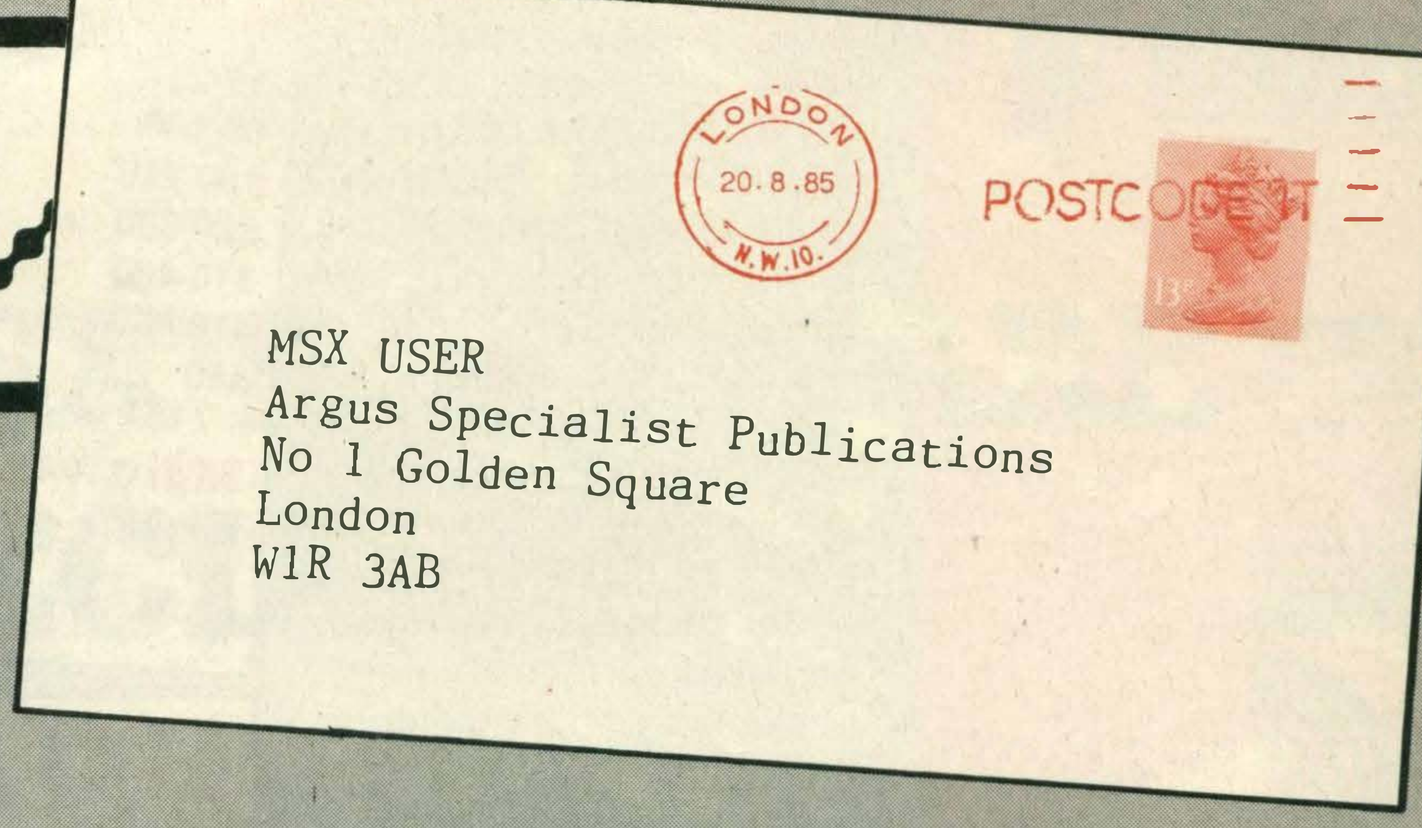
The Spectrum sound for 'Ghostbusters!' and, 'I've been slimed' are so muffled that you cannot understand what is being said.

On the Spectrum, there is no music throughout the game, and it is played in complete silence.

On the MSX, the tune is repeated throughout the game, and the graphics are much clearer. It is obvious from your views that you haven't really studied the differences between the versions, and from your comments, you have not given much thought to the finer points of the game.

B. Torrance (Miss)
Bury
Lancs





Smooth Path

Dear Sir,
In case anybody else has experienced difficulty in loading **Flight Path 737** (Anirog), they might like to try the following:

BLOAD "CAS:",R

instead of the instruction given with the tape.

K. M. Nesbitt (Miss)
Edinburgh

Bonus

Dear Sir,
Having purchased a Yamaha CX5M for its musical capabilities, I was pleased to find that I had a bonus in the way of a useful general purpose computer. Your magazine helped me to locate MSX software, which is thin on the ground in these parts, but then I faced the bad news. The 28K + memory is insufficient for some of the programs I want to use.

I had given up hope of extending the memory until I read the article East in your July issue. Is it possible now to get any significant extra memory for the CX5M, and if so where?

Les Emmans
Allestree
Derbyshire

Although 32K memory extender cards for the Yamaha and other computers are available in Japan, we know of no such products in the UK at present. Knowledgeable sources say that they may start appearing over here some time next year.

Rights Down Under

Dear MSX User,
We are a fledgling company seeking distribution rights for all MSX products. Any firms looking for an Australian representative should write to the address below stating their product range, description and prices.

MSX in Australia is in very short supply. We are in the position to establish user groups and can duplicate both tape and disk.

We will also be seeking within 'Oz' quality software for overseas distribution.

Would you please publish this letter to help further the future of MSX.

Neville R. Wright
Sunshine Software
PO Box 1319
Southport
Q 4215
Australia

Ice champion

Dear Ed,
After two hours and three minutes of skating around the Antartic, I finally clocked up the mind-boggling score of 313550 on Konami's brilliant Antartic Adventure.

Am I the unchallenged champion or can anybody beat me and my joystick?

Duncan Larkman
Ormesby
Middlesbrough

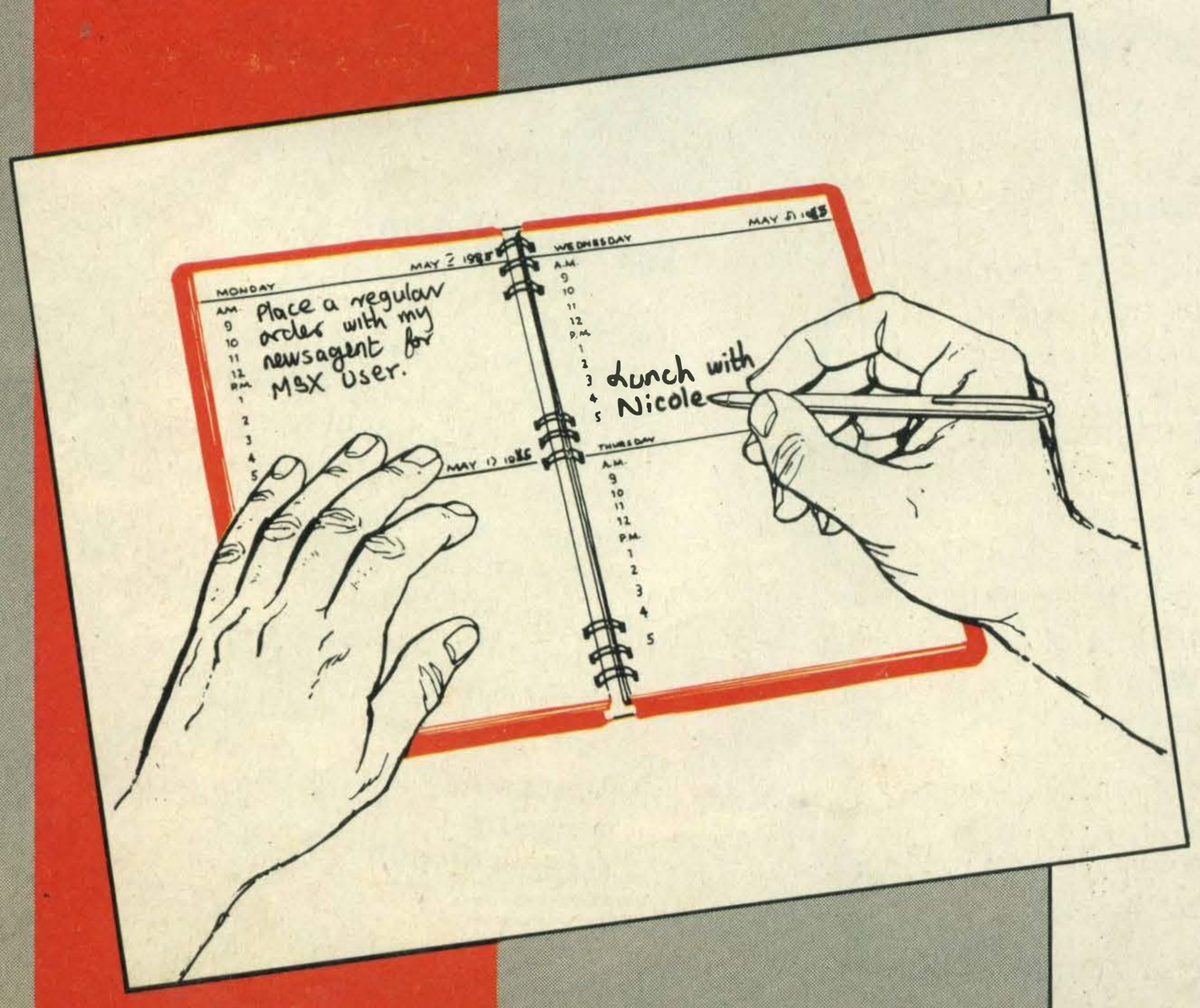
Diary

Here is a short utility which enables you to keep a diary on your computer. You can make entries, SAVE and LOAD them, or look at the current entry.

When the program is RUN a menu is displayed. If option 1 is chosen, the screen clears and the cursor is displayed. Text can then be typed in and mistakes corrected using backspace. When the entry is finished, press ESC to return to the menu. Press 4 to view the current entry, and again press ESC to return to the menu.

The save an entry to tape, press 3. The screen will clear and a six-figure filename should be input, eg 161085 for 16th October 1985. When loading an entry, follow the same procedure — enter a six-figure name, or press RETURN to load the next file.

Andrew Hay of Denny, Stirlingshire, who wrote this program, chose WIDTH 39 because it gives the maximum number of characters on his TV in SCREEN 0. This may need to be altered to suit your TV.



Program breakdown

10-20	initialise, set up variables
30-120	print menu, check key pressed
130-210	enter text subroutine
220-300	load entry from tape subroutine
310-400	save entry to tape subroutine
410-450	view current entry subroutine
460	end

Main variables

A%(n)	holds ASCII code for characters entered
E	counter for last character entered
X	used in loops

```
1 '********************
2 '*                  *
3 '* DIARY            *
4 '*                  *
5 '*     by           *
6 '*                  *
7 '*       Andrew Hay *
8 '*                  *
9 '********************
10 COLOR 15,1,1:KEYOFF:SCREEN0:WIDTH
39
15 DEFINTE,X
20 DIMA%(936)
30 CLS
40 LOCATE17,0,0:PRINT"DIARY":LOCATE17
,1:PRINT"CCCCC"
50 LOCATE12,5:PRINT"Press an option:"
60 LOCATE12,8:PRINT"1¦Make an entry."
70 LOCATE12,10:PRINT"2¦Load an entry.
"
80 LOCATE12,12:PRINT"3¦Save an entry.
"
90 LOCATE10,14:PRINT"4¦View current e
ntry."
100 LOCATE17,16:PRINT"5¦Quit"
110 I$=INKEY$
120 IFI$="1"THEN130ELSEIFI$="2"THEN22
0ELSEIFI$="3"THEN310ELSEIFI$="4"THEN4
10ELSEIFI$="5"THEN460ELSE110
130 CLS:LOCATE0,0,1
140 E=0
150 I$=INKEY$
160 IFI$=CHR$(27)THEN30
165 IFI$=CHR$(S)THENE=E-1:PRINTCHR$(2
9);" ";CHR$(29);:GOTO 150
170 IFI$=""THEN150
180 A%(E)=ASC(I$)
190 PRINTI$;
200 E=E+1:IFE=936THEN30ELSE150
210 GOTO30
220 CLS
230 PRINT"Enter a 6 figure date/month
/year like  this:":PRINT:PRINT"
      160385"
240 PRINT"(or just RETURN to load the
 first file)":PRINT
250 LINEINPUT D$
270 OPEN"cas:"+D$FORINPUTAS#1
280 E=0
290 INPUT#1,A%(E)
300 IFEOF(1)=-1THENCLOSE:GOTO30ELSEE=
E+1:GOTO 290
310 CLS
320 PRINT"Enter a 6 figure date/month
/year  like this:":PRINT:PRINT"
      160385"
330 LINEINPUTD$
350 OPEN"cas:"+D$FOROUTPUTAS#1
360 FORX=0TOE
370 PRINT#1,A%(X)
380 NEXT
390 CLOSE
400 GOTO30
410 CLS
420 FORX=0TOE-1
430 PRINTCHR$(A%(X));
440 NEXT
450 IFINKEY$=CHR$(27)THEN30ELSE450
460 CLS:PRINT"Bye!!":END
```

THE MSX SOFTWARE SPECIALISTS

IF YOU ARE AN MSX RETAILER PLEASE CONTACT US.

PROFIT FROM OUR EXPERIENCE AND OUR 24 HOUR DELIVERY SERVICE

WE CARRY A *FULL* RANGE OF MSX SOFTWARE

EXPORT ENQUIRIES WELCOME

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

A top quality daisywheel printer at a rock bottom price.

Take a closer look at the JUKI 2200.
In a fully portable daisywheel printer, the technology could hardly be higher.
At just £299.–, the price could scarcely be lower.
The JUKI 2200 is compatible with most leading personal computers, and ideal for use at home. Its advanced professional specification includes serial or parallel interface, print speed of 10 characters per second, 2k buffer memory and full word processing support. It uses the standard Triumph-Adler* daisywheel (available just about everywhere) and, like all JUKI products, comes with a comprehensive, easy-to-read User's Manual. Yet, complete with compact carrying hood, the JUKI 2200 weighs less than 14 lbs.
You'll be delighted with its crisp, clear printout, especially when you know that the JUKI 2200 can also be used as a high-grade electronic typewriter.

See for yourself. Ask your local JUKI dealer.

The JUKI 2200. You'll search high and low to beat it.

* Triumph-Adler is a trade-mark of TRIUMPH-ADLER AG.

JUKI

Technology true to type

JUKI (EUROPE) GMBH
Eiffestr. 74 · 2000 Hamburg 26 · F. R. Germany
Tel.: (0 40) 2 51 20 71-73 · Telex: 2 163 061 (JKI D)
Fax.: (0 40) 2 51 27 24.

Sole distributor:
Micro Peripherals ltd
Intec Unit 3, Hassocks Wood, Wade Road,
Basingstoke, Hants, RG 24 ONE.
Tel.: (0256) 47 3232 (32 lines)
Telex: 8 59669 MICRO PG
Facsimile (0256) 46 1570

JUKI 2200