for the Spectrum, however, he might have to wait quite a while before a version becomes available for his machine.

If you're a computer manufacturer with a new product to launch, you know that there will be almost no software for your product until a substantial user base has been established. With little or no software to go with the computer, you will be well aware that the sales appeal of your machine will be strictly limited and this could risk all your investment in developing the product.

If you earn your living by writing commercial software, your sales will be limited to (at best) the number of people who own the model of computer the program has been written for. Suppose you have created an adventure game called The Dungeons of Rathbone, replete with a Faceless Presence, a sadistic Dungeonmaster and countless Dens of Iniquity to trap the unwary. The market research people say the sales potential for the product is immense if you can get it on the market for £5.50 and sell at least 65,000 copies. Unfortunately, the appeal of the product is such that the number of Spectrum owners alone would be unlikely to generate the required number of sales, and at least one more version would be needed. The cost of producing new versions for, say, the Oric and the BBC Micro would push the unit cost up to £6.70 and, at this price, the sales would drop below an economically viable level. This is the dilemma that frustrates many prospective software writers.

The problem of software compatibility has not been ignored by the computer industry. The individualistic West does not look kindly on standardisation, but computer developers in the Far East prefer things to be systematic, ordered and standardised, especially when this translates into profits.

ASCII/Microsoft is attempting to change the chaos into order. The company is the result of a merger involving the American Microsoft Corporation and ASCII, a successful Japanese publishing company with a string of popular magazines to its credit. As a side-line, ASCII also publishes commercial software, and when Microsoft wanted to penetrate the 'impenetrable' Japanese market, ASCII seemed a natural company to turn to for a joint venture. Microsoft had the technical expertise and ASCII had the marketing experience.

The American Microsoft Corporation had made its name on the nearest thing BASIC has to a standard, Microsoft MBASIC, which has been adopted by computer makers all over the world. But even so, no MBASIC program could be guaranteed to run on all computers using the language whenever any special features were present, simply because of the lack of hardware compatibility.

Microsoft BASIC was successfully sold to numerous Japanese computer manufacturers through the offices of ASCII/Microsoft. But still this didn't solve the problem of hardware and software compatibility. ASCII/Microsoft's solution was to create a standard, in co-operation with leading Japanese manufacturers, which they hoped would become internationally recognised. What they eventually came up with is called the MSX Standard. The specification includes basic hardware requirements (based around the Z80 microprocessor and certain other chips), together with a standardised language.

MSX SPECIFICATIONS

MSX BASIC is very similar to Microsoft's MBASIC but with a number of significant enhancements to take advantage of today's graphics and sound capabilities. Extra statements include SCREEN, to specify the screen mode, sprite sizes, key 'click', cassette baud rate and printer options; LOCATE for character positioning on the screen; COLOUR for selecting one of 16 foreground and background colours; PUT SPRITE for setting up sprite attributes; CIRCLE for drawing circles and ellipses; DRAW for drawing figures; LINE for drawing lines between specified co-ordinates; and PAINT for filling figures with a specified colour. A KEY statement is also provided for assigning strings to function keys. Further statements provide for poking values to the video RAM (VPOKE), writing values to the registers of the sound effects chip (SOUND) and cassette motor control (MOTOR).

MSX involves more than just standardised software, however. The CPU is specified as a Z80 running at 3.58MHz. There must be at least 32 Kbytes of ROM to store the MSX software. Additionally, there must be at least eight Kbytes of RAM. There is no upper limit on the allowable amount of ROM and RAM. An MSX computer must incorporate a Texas Instruments TMS9918A video controller chip (or equivalent) and an AY-3-8910 — a three-voice sound generator chip. The video output must be capable of displaying either 32 columns by 24 lines, or 40 columns by 24 lines. There is no provision in the standard for an 80 column display at present. A resolution of 256 by 192 pixels is required.

The cassette interface has been established, cassettes being the primary means of storing programs and data. It must use the FSK encoding system at 1,200/2,400 bits per second. The keyboard, reflecting MSX's Japanese pedigree, has not only a standard layout, including function keys, but also provision for Katakana (the Japanese 'angular' alphabet), Hiragana (the 'cursive' alphabet), standardised graphics characters and, optionally, Kanji (the Chinese character writing system).

Plug-in software is catered for through a standard ROM cartridge slot and there is a 50-pin standard I/O bus. There is even a standardised port for two joysticks.

Disk formats are also standardised, as is the disk operating system, MSX-DOS. It is functionally equivalent to MS-DOS and enables MS-DOS data files to be read. It is also said to be compatible with the hugely popular CP/M 2.2 disk operating