



MSX Systems (1983 – 1990) for Personal Computers Specifications

	MSX	MSX2	MSX2+	MSX TurboR
Release	Worldwide (1983)	Worldwide (1985)	Only officially in Japan (1988) (available in Europe and Brazil via upgrades)	Only Japan (1990)
Processor	Zilog Z80A running at 3.58 MHz	Zilog Z80A running at 3.58 MHz (the HC-90 and HC-95 models from JVC have a 6.144MHz HD64180 CPU, but this is not part of the standard)	Zilog Z80-compatible running at 3.58 MHz (the MSX2+ models from Panasonic can be set to run on 5.37 MHz by software, but this is not part of the standard)	<ul style="list-style-type: none"> R800 running at 7.16 MHz (instructions use about 4× less clock ticks than the Z80, so often quoted as 28.6 MHz when comparing with the Z80) Zilog Z80A-compatible (embedded in the T9769C MSX-Engine) running at 3.58 MHz for backward compatibility
ROM	32 KB <ul style="list-style-type: none"> BIOS (16 KB) MSX BASIC V1.0 (16 KB) 	48 KB <ul style="list-style-type: none"> BIOS + Extended BIOS (32 KB) MSX BASIC V2.0 or V2.1 (16 KB) DiskROM (16 KB) (optional, common) MSX-Audio BIOS (32 KB) (optional, no machines are known with this BIOS built in) 	64 KB <ul style="list-style-type: none"> BIOS + extended BIOS (32 KB) MSX BASIC V3.0 (16 KB) DiskROM (16 KB) (optional, very common) Kun-BASIC (16 KB) (optional) Kanji ROM (optional) 	96 KB <ul style="list-style-type: none"> BIOS + Extended BIOS (48 KB) MSX BASIC V4.0 (16 KB) DiskROM (16 KB) Kun-BASIC (16 KB) Kanji ROM (256 KB) Firmware (4 MB)
RAM	8 KB minimum, most machines provided either 32 or 64 KB; machines with 128 KB exist	64 KB minimum, commonly 128 KB in Europe, 64 KB on Japanese computers, machines with up to 512 KB were made. Normally memory mapped (4 MB per slot maximum, 48 MB max total)		256 KB (FS-A1ST) or 512 KB (FS-A1GT) <ul style="list-style-type: none"> Memory-mapped (4 MB/slot max, 44 MB max total) Additionally 16 KB (FS-A1ST) or 32 KB (FS-A1GT) of SRAM (battery-powered)





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Video display processor	<p>Texas Instruments TMS9918 family</p> <ul style="list-style-type: none"> Video RAM: 16 KB Text modes: 40×24 and 32×24 Resolution: 256×192 or 64×48 (16 colours). In reality, there are just 15 colour tints available, because, just like Sinclair Spectrum there are two codes for black. Unlike the Spectrum, however, one of the blacks is actually "transparent", so the MSX video picture could be overlaid on another video signal, for example one from a video disk. Sprites: 32 sprites with 8×8 or 16×16 resolution, 1 colour, max 4 per horizontal line 	<p>Yamaha V9938 (a.k.a. MSX-Video) Supports all MSX video modes</p> <ul style="list-style-type: none"> Increased video RAM: 128 KB (sometimes 64 KB) New text mode: 80×24 or 80×26.5 New bitmapped video modes without the attribute clash of MSX1, with modes for 4, 16 or 256 simultaneous colors New resolutions: 256×212p, 512×212p, 256×424i and 512×424i Increased number of, and more advanced sprites: 32 sprites with 8×8 or 16×16 resolution, max 8 per horizontal line. Each sprite line can have 1 or 3 different colors. Hardware acceleration for copy, line, fill, etc. Interlacing to double vertical resolution A full-screen vertical scroll register Vertical and horizontal display offset register 	<p>Yamaha V9958</p> <ul style="list-style-type: none"> The minimal video RAM is now 128 KB. Up to 192 KB is supported. a new 256×212p or 256×424i YJK video mode with 19268 simultaneous colors a new 256×212p or 256×424i mixed-YJK/RGB video mode with 12499 simultaneous colors. horizontal scroll register with either full-screen or dual-page support 	<p>Yamaha V9958 (aka MSX-Video), so the same capabilities as MSX2+</p>
Sound chip	<p>General Instrument AY-3-8910 (PSG)</p>	<ul style="list-style-type: none"> Yamaha YM2149 (PSG) Optional: Yamaha Y8950 (OPL1) (MSX-Audio) 	<ul style="list-style-type: none"> Yamaha YM2149 (PSG) Optional: Yamaha Y8950 (OPL1) (MSX-Audio) Optional: Yamaha YM2413 (OPLL) (MSX-Music) 	<ul style="list-style-type: none"> Yamaha YM2149 (PSG) Yamaha YM2413 (OPLL) (MSX-Music) Optional: Yamaha Y8950 (OPL1) (MSX-Audio) PCM <ul style="list-style-type: none"> 8-bit single channel (no DMA), 16 kHz max using BIOS routines Microphone built-in (FS-A1GT only): MIDI in/out
Clock chip	(Not installed.)	Ricoh RP5C01 (or compatible)		





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Interfaces	<ul style="list-style-type: none">• 1 cartridge slot (usually 2, up to 16)• 1 or 2 General Purpose ports (aka joystick ports)• Optional: Parallel Printer port	<ul style="list-style-type: none">• 1 cartridge slot (usually 2, up to 16)• 2 General Purpose ports (aka joystick ports)• Parallel Printer port• Optional: Light pen interface• Optional: Video superimposer• Optional: Video Digitizer		
Media	<ul style="list-style-type: none">• Standard<ul style="list-style-type: none">○ Cartridge○ Cassette tape (1200bps or 2400bps)○ Floppy disk (diskless models require a floppy controller cartridge)○ Mass storage (originally hard disk, later extended to flash drives, requires a controller cartridge)• Proprietary<ul style="list-style-type: none">○ Bee Card (requires an adapter cartridge)○ Quick Disk (requires a controller cartridge)○ Laserdisc (requires a controller cartridge and superimposer)			

