

Multimedia PC Specification 1.0

Introduction

The Multimedia PC Marketing Council, Inc. has developed a multimedia computer specification to encourage the adoption of a standard multimedia computing platform as an extension of the desktop PC already used by millions. The appearance of the distinctive Multimedia PC logo on computer systems or upgrade kits guarantees that the hardware meets the Multimedia PC specification. End-users can be assured that software bearing the Multimedia PC mark has been designed to work on Multimedia PC licensed hardware. By establishing a standard platform, and by providing interoperability between software and hardware for the consumer, the Council wishes to encourage widespread use of multimedia applications and hardware.

Hardware Specifications

CPU - Minimum requirement: 386SX (or compatible) microprocessor.

RAM - Minimum requirement: 2 megabytes of RAM.

Magnetic Storage - Requirement: 3.5" high density (1.44 MB) floppy disk drive.

Minimum requirement: 30 MB hard drive.

Optical Storage - Requirement: CD-ROM drive with sustained 150kB/sec transfer rate; average seek time of 1 second or less; 10,000 hours MTBF; mode 1 capability (mode 2 and form 1 & 2 optional); MSCDEX 2.2 driver that implements the extended audio APIs; subchannel Q (subchannels P and R-W optional-- if R-W subchannel support is provided, additional APIs must be implemented in MSCDEX driver; specifications for these additional APIs are available from Microsoft).

The drive must be capable of maintaining a sustained transfer rate of 150 kB/sec, without consuming more than 40% of the CPU bandwidth in the process. It is recommended that this capability be achieved for read block sizes no less than 16K and lead time of no more than is required to load the CD-ROM buffer with 1 read block of data. We recommend that the drive have on-board buffers of 64KB and implement read-ahead buffering (read ahead buffering is described in a specification available from Microsoft).

Audio - Requirement: CD-ROM drive with CD-DA (Red Book) outputs and a front panel volume control. As an option, CD-ROM XA audio may be provided.

Requirement: 8-bit (16-bit recommended) Digital-to-Analog Converter (DAC) with: Linear PCM sampling; DMA or FIFO buffered transfer capability with interrupt on buffer empty; 22.05 and 11.025 kHz sample rate mandatory; 44.1 kHz sampling rate desirable; Optional stereo channels; No more than 10% of the CPU bandwidth required to output 11.025 or 22.05 kHz; no more than 15% for 44.1 kHz.

Requirement: 8-bit (16-bit recommended) Analog-to-Digital Converter (ADC) with: Linear PCM sampling; 11.025 kHz mandatory, (22.01 kHz, or 44.1 kHz sampling rate optional); DMA or FIFO buffered transfer capability with interrupt on buffer full; Microphone input.

Requirement: Internal synthesizer hardware with multi-voice, multi-timbral capabilities, 6 simultaneous melody notes plus 2 simultaneous percussive notes.

Requirement: Internal mixing capabilities to combine input from three (recommended four) sources and present the output as a stereo, line-level audio signal at the back panel. The four sources are: CD Red Book, synthesizer, DAC (waveform), and (recommended but not required) an auxiliary input source. Each input must have at least a 3-bit volume control (8 steps) with a logarithmic taper. (4-bit or greater volume control is strongly recommended.) If all sources are sourced with -10dB (consumer line level: 1 milliwatt into 600 ohms=0dB) without attenuation, the mixer will not clip and will output between 0 dB and +3 dB. Individual audio source and master digital volume control registers and extra line-level audio sources are highly recommended.

(Guidelines for synthesizer implementation available on request.)

Video - Requirement: VGA compatible display adapter, and a color VGA compatible monitor.

A basic Multimedia PC uses mode 12h (640x480, 16 colors). An enhanced configuration referred to as VGA+ is recommended with 640x480, 256 colors. The recommended performance goal for VGA+ adapters is to be able to blit 1, 4, and 8 bit-per-pixel DIBs (device independent bitmaps) at 350K pixels/second given 100% of the CPU, and at 140K pixels/second given 40% of the CPU. This recommendation applies to run-length encoded images and non-encoded images. The recommended performance is needed to fully support high-performance applications such as synchronized audio-visual presentations.

User Input - Requirement: Standard 101 key IBM-style keyboard with standard DIN connector, or keyboard which delivers identical functionality utilizing key-combinations.

Requirement: Two-button mouse with bus or serial connector, with at least one additional communication port remaining free.

I/O - Requirement: Standard 9-pin or 25-pin asynchronous serial port, programmable up to 9600 baud, switchable interrupt channel.

Requirement: Standard 25-pin bi-directional parallel port with interrupt capability.

Requirement: 1 MIDI port with In, Out, and Thru, must have interrupt support for input and FIFO transfer.

Requirement: IBM style analog or digital joystick port.

System Software

The Multimedia PC system software shall conform to the APIs, function and

performance described in the *Microsoft Windows Software Development Kit Programmer's Reference, Volumes I and II* (Version 3.0) and the *Microsoft Multimedia Development Kit Programmer's Reference* (Beta version, published November 15, 1991 and due to be updated at the final release of the Multimedia Development Kit).

Minimum Full System Configuration

A full Multimedia PC system requires the following elements and components, all of which must meet the full functional specifications outlined above. Please note this is a minimum system requirement and not a recommendation for a particular system configuration:

CPU	386SX or compatible microprocessor
RAM	2 megabytes of RAM
Magnetic Storage	floppy drive, hard drive
Optical Storage	CD-ROM with CD-DA outputs
Audio analog	DAC, ADC, music synthesizer, on-board audio mixing
Video	VGA graphics adapter
Input equivalent), two	101 key Keyboard (or functional button mouse
I/O joystick	Serial port, parallel port, MIDI I/O port, port

Minimum Upgrade Kit Configuration

A Multimedia PC Upgrade Kit requires the following elements and components, all of which must meet the full functional specifications outlined above:

Optical Storage	CD-ROM with CD-DA outputs
Audio analog	DAC, ADC, music synthesizer, on-board audio mixing
I/O joystick	Serial port, parallel port, MIDI I/O port, port

(Providing system software with Upgrade Kits is optional.)