

## CHAPTER 5

# Entertainment PC 99

This chapter provides a summary of the key requirements for Entertainment PC systems.

Unless a specific requirement or exception is defined in this chapter, all requirements apply for Entertainment PCs as defined in Chapter 3, “PC 99 Basic Requirements” and in Parts 3 and 4 of this guide. If there is a conflict with requirements or recommendations made elsewhere in this guide, the items in this chapter have precedence for Entertainment PCs.

**Important:** The system requirements defined in this guide provide guidelines for designing PC systems that will result in the optimal user experience with typical Windows-based applications running under either the Microsoft Windows 98 or Windows 2000 Professional operating systems. These design requirements are not the basic system requirements for running any Windows operating systems.

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## Entertainment PC System Requirements

This section summarizes the requirements for the basic components of Entertainment PC systems.

### 5.1. System performance meets Entertainment PC 99 minimum requirements

#### *Required*

For Entertainment PC systems based on Intel Architecture processors, minimum performance requirements include the following:

- 300 MHz processor with 128 L2 cache.

This processor requirement does not specify a particular processor form factor or package type.

- 64 MB minimum system memory.

The basic limitations for memory available to the operating system apply for Entertainment PCs, as defined in requirement 3.1, “System performance meets PC 99 minimum requirements.”

### **5.2. Entertainment PC includes three IEEE 1394 ports, with at least one easily accessible connector**

*Recommended*

The Entertainment PC system should include three IEEE 1394 ports, with at least one IEEE 1394 connector in an easily accessible location (not on the rear panel) to support camcorders and other digital consumer-electronics devices.

The recommended location for an easily accessible connector is to place a port on the front of the PC. The additional connectors for static connections to continuously used devices can be placed on the rear of the PC.

If implemented, the IEEE 1394 ports must meet the requirements defined in Chapter 8, “IEEE 1394.”

### **5.3. All Entertainment PC input devices meet USB HID specifications**

*Recommended*

All keyboards, pointing devices, game pads, and their connections should comply with the *USB Device Class Definition for Human Interface Devices, Version 1.0* or later, and *USB HID Usages Table*. This is recommended whether the devices are implemented as wired or wireless.

The game device should support at least four devices simultaneously.

**Note:** For Entertainment PC systems, wireless connections are recommended for the keyboard, pointing device, and game pad. This can be implemented for a pointing device by using a remote-control pointing device or a wireless keyboard with a connector that enables a standard mouse to be attached. The ability to attach a standard two-button mouse is strongly encouraged, although the device itself does not need to be included with the PC.

For more information about requirements for input devices, see Chapter 13, “I/O Ports and Devices.”

### **5.4. Entertainment PC includes a remote-control pointing device**

*Recommended*

There is no requirement for implementing an infrared (IR) or radio frequency (RF) remote-control pointing device.

If a remote-control pointing device is implemented on an Entertainment PC system, all buttons and any additional controls implemented must comply with the current USB HID specifications, including HID usage-code specifications and command structures defined in the *USB HID Usages Table*.

Also, the remote-control device must have the controls defined in the following table.

#### Required Controls for Remote-Control Devices

Label	Icon	Function
Power	—	Toggle switch between On and Standby power state
Start	Windows flag <sup>1</sup>	Display Start menu (same action as the keyboard Windows logo key)
—	—	Mouse pointer control, including left and right mouse buttons

<sup>1</sup> Windows flag is implemented under a Microsoft licensing agreement.

In addition, the following buttons are recommended for remote-control devices.

#### Recommended Controls for Remote-Control Devices

Label	Icon	Function
Cancel	—	Same as the keyboard ESCAPE key
Enter	—	Same as the keyboard ENTER key
Menu	—	Display application menus or toolbar (same as the keyboard F10 key)
Switch	—	Switch between applications (same as the keyboard ALT+TAB combination)
Close	—	Close active window (same as the keyboard ALT+F4 combination)

## Entertainment PC Audio Requirements

High-quality audio is a key differentiating feature for Entertainment PC systems. Audio fidelity and functions must be significantly better than for traditional PCs, and on par with consumer-electronics stereos.

Using IEEE 1394 for positional 3-D audio and connections to home-theater systems will enable more realistic game and video experiences. Implementation is using the audio subsystem as an external digital-to-analog converter (DAC) attached to a secondary IEEE 1394 port on the rear of the PC. This isolates the analog audio stream from the RF noise of internal PC components while enabling easy connection to either legacy analog or new Plug and Play-compatible digital stereo components.

### **5.5. Entertainment PC audio subsystem meets PC 99 audio requirements**

*Required*

Recommended: Audio hardware accelerator is ready for digital audio.

Audio on an Entertainment PC system must meet PC 99 audio requirements, which include requirements for audio hardware capabilities, performance metrics, and external connections. For more information, see Chapter 17, “Audio Components.”

## Entertainment PC Graphics Components

This section summarizes the Entertainment PC system requirements for graphics adapters and monitors. For complete information about requirements for the graphics subsystem, see Chapter 17, “Graphics Adapters.”

### **5.6. Graphics subsystem meets Entertainment PC 99 requirements for 3-D acceleration**

*Required*

Acceleration features for 3-D graphics using Microsoft Direct 3D must be implemented as defined in “Hardware Acceleration for 3-D Graphics” in Chapter 14, “Graphics Adapters.”

For the Entertainment PC graphics adapter, the following capabilities are required beyond those hardware acceleration capabilities required for Consumer PC systems:

- 14.29, “Hardware supports multi-texturing”
- 14.33, “Hardware supports Z comparison modes and Direct3D-compatible formats”
- 14.34, “Hardware meets PC 99 3-D accelerator performance requirements”

### **5.7. Entertainment PC includes support for television output if the system doesn’t have a large-screen monitor**

*Recommended*

Support for NTSC, PAL, or both types of television output is recommended unless the system is bundled with a large-screen super VGA (SVGA) monitor.

For Entertainment PC, connecting to a television is key to its ability to deliver more realistic television, movie, and game experiences, and to enable social computing activities. Television output integrated with the PC graphics adapter will deliver much higher image quality than external converters. As such, this feature optimizes the usability of an Entertainment PC system connected directly to a television in the family room and for desktop systems configured to transmit graphics and video to a television in another room.

This capability must meet the PC 99 requirements for television output for composite and S-Video connectors, parameter control, and hardware filtering and scaling capabilities as defined in “Television Output Requirements” in Chapter 14, “Graphics Adapters.”

### **5.8. Entertainment PC includes large-screen DDC2B color entertainment monitor**

#### *Recommended*

A large-screen SVGA monitor that meets the *Display Data Channel Standard, Version 3.0*, Level 2 B specification (DDC2B) is recommended for Entertainment PC systems designed for the family room. Games, movies, and other entertainment software experiences are greatly enhanced by display screens comparable to modern television sizes: 27 inches and larger in the United States.

An Entertainment PC system that includes a large-screen monitor must meet the requirements for entertainment monitors defined in Chapter 16, “Monitors.”

## Entertainment PC Video and Broadcast Components

This section summarizes the Entertainment PC system hardware requirements for video capture, television output, and DVD playback support. For complete information about the requirements summarized in this section, see Chapter 15, “Video and Broadcast Components.”

### **5.9. Entertainment PC DVD and TV playback meet PC 99 requirements**

#### *Required*

DVD-Video support is required for Entertainment PC; therefore, DVD playback capabilities must meet PC 99 requirements. If MPEG-2 hardware is included in an Entertainment PC system, it must also meet the PC 99 requirements for video playback as defined in Chapter 14, “Graphics Adapters,” and Chapter 15, “Video and Broadcast Components.”

### **5.10. Entertainment PC includes analog video input and capture capabilities**

#### *Recommended*

If implemented on an Entertainment PC system, this capability must meet the requirements defined in “Video Input and Capture Requirements” in Chapter 15, “Video and Broadcast Components.”

If implemented, the video input connector should be easily accessible on the Entertainment PC system, and therefore should not be located on the rear panel.

**5.11. Entertainment PC includes analog television tuner***Recommended*

If implemented on an Entertainment PC system, this capability must meet the requirements defined in “Analog TV Tuner/Decoder and VBI Capture Requirements” in Chapter 15, “Video and Broadcast Components.”

The NTSC or PAL decode component of the television tuner and analog video input subsystems must properly support extraction of data transmitted during the vertical blanking interval (VBI). This includes allowing certain scan lines to be placed within a separate memory buffer.

**5.12. Entertainment PC includes digital broadcast satellite subsystem***Recommended*

If implemented on an Entertainment PC system, this capability must meet the requirements defined in “Digital Broadcast TV Requirements” in Chapter 15, “Video and Broadcast Components.”

If this capability is included, the implementation must include a digital broadcast satellite network card, a smart card, and drivers that meet PC 99 requirements.

**5.13. Entertainment PC includes DTV support***Recommended*

If implemented on an Entertainment PC system, this capability must meet the requirements defined in “Digital Broadcast TV Requirements” in Chapter 15, “Video and Broadcast Components.”

Support for digital television (DTV) is recommended for Entertainment PC systems. If implemented, the hardware and software support for an Advanced Television Systems Committee (ATSC) tuner/demodulator, MPEG-2 decode capabilities, and graphics adapter must meet the PC 99 requirements.

## Entertainment PC 99 References

The following represents some of the references, services, and tools available to help build hardware that is optimized to work with Windows operating systems.

*Display Data Channel Standard, Version 3.0*

<http://www.vesa.org>

*USB Device Class Definition for Human Interface Devices, Version 1.0*

*USB HID Usages Table*

<http://www.usb.org>

## Checklist for Entertainment PC 99

If a recommended feature is implemented, it must meet the PC 99 requirements for that feature as defined in this document.

*5.1. System performance meets Entertainment PC 99 minimum requirements*  
*Required*

*5.2. Entertainment PC includes three IEEE 1394 ports, with at least one easily accessible connector*  
*Recommended*

*5.3. All Entertainment PC input devices meet USB HID specifications*  
*Recommended*

*5.4. Entertainment PC includes a remote-control pointing device*  
*Recommended*

*5.5. Entertainment PC audio subsystem meets PC 99 audio requirements*  
*Required*

*5.6. Graphics subsystem meets Entertainment PC 99 requirements for 3-D acceleration*  
*Required*

*5.7. Entertainment PC includes support for television output if the system doesn't have a large-screen monitor*  
*Recommended*

*5.8. Entertainment PC includes large-screen DDC2B color entertainment monitor*  
*Recommended*

*5.9. Entertainment PC DVD and TV playback meet PC 99 requirements*  
*Required*

*5.10. Entertainment PC includes analog video input and capture capabilities*  
*Recommended*

*5.11. Entertainment PC includes analog television tuner*  
*Recommended*

*5.12. Entertainment PC includes digital broadcast satellite subsystem*  
*Recommended*

*5.13. Entertainment PC includes DTV support*  
*Recommended*





