

USB TROUBLESHOOTING

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Since the earliest PCs, system designers, builders, and users have been searching for ways to ease the time and trouble normally associated with installing or upgrading new PC devices. The adoption of plug-and-play technology was the first major step forward, but it still required you to power-down the PC, then add drivers and applets manually—even for devices used “outside the box,” such as keyboards, mice, speakers, digital cameras, and so on.

By the early 1990s, designers envisioned the “next generation” of intelligent serial interface. This was dubbed the *Universal Serial Bus* (or simply USB). USB was originally developed by the seven key players in the PC industry: Compaq, DEC, IBM, Intel, Microsoft, NEC, and Northern Telecom, and is now receiving broad acceptance in the PC industry. This chapter looks at the general concepts surrounding USB, and offers a suite of troubleshooting procedures designed to ease problems with implementation and performance on Windows 95 OSR2 and Windows 98/SE platforms.

The Promise of USB

Traditional device installation continues to present serious problems for system integrators and end users alike. PC resources (such as IRQs) are scarce, and the time required to install and configure an

ever-greater array of devices—then troubleshoot the resulting resource conflicts—can quickly become significant (and expensive).

The USB interface promises to ease the integration problems of many “external” peripheral devices. With USB, there’s no need to install cards into dedicated computer slots and reconfigure the system. USB will allow computer peripherals to be automatically configured as soon as they are physically attached, without the need to reboot a system or run the CMOS setup. USB will also allow up to 127 USB devices to run simultaneously on a computer.

USB DEVICES

According to the USB SIG (<http://www.usb.org/>), the potential for USB devices is every bit as diverse as the personal computer itself. Telephones, modems, keyboards, mice, CD-ROM drives, joysticks, tape and floppy drives, scanners, digital cameras, and printers are just a few of the devices that have already been developed for USB.

USB’s 12Mbit/s data rate also accommodates a whole new generation of peripherals, including MPEG-2 video-based products, data gloves, and digitizers. Since computer-telephony integration is expected to be a big growth area for PCs, USB can also provide an interface for Integrated Services Digital Network (ISDN) and digital PBXs.



Intel has identified a series of current USB offerings, which you can find at <http://developer.intel.com/design/usb/frstwave.htm>.

USB ARCHITECTURE NOTES

USB has two data rates: a 12Mbit/s rate for devices requiring increased bandwidth and a 1.5Mbit/s rate for lower-speed devices like joysticks and game pads. USB uses a *tiered star topology*, which means that some USB devices—called USB hubs—can serve as connection ports for other USB peripherals. Only *one* device needs to be plugged into the port at the PC (though the PC itself may support several hubs). Other devices can then be plugged into the hub. USB hubs may be embedded in such key devices as monitors, printers, and keyboards. Stand-alone hubs can also be made available. Hubs feature an “upstream” connection (pointed toward the PC) as well as multiple “downstream” ports to allow the connection of additional peripheral devices. Up to 127 USB devices can be connected together in this way.

USB host controllers (which are available as part of most current PCI- and AGP-compliant chipsets) manage and control the driver software and data flow required by each peripheral connected to the bus. Users don’t need to take any specific configuration action because all the configuration steps happen automatically—the USB host controller even allocates electrical power to the USB devices. USB hubs and host controllers can detect attachments and detachments of peripherals occurring downstream and supply appropriate levels of power to downstream devices as needed. Figure 44-1 illustrates a typical USB connector arrangement. The USB connection uses four pins:

- Pin 1: Power
- Pin 2: Signal (-)
- Pin 3: Signal (+)
- Pin 4: Ground

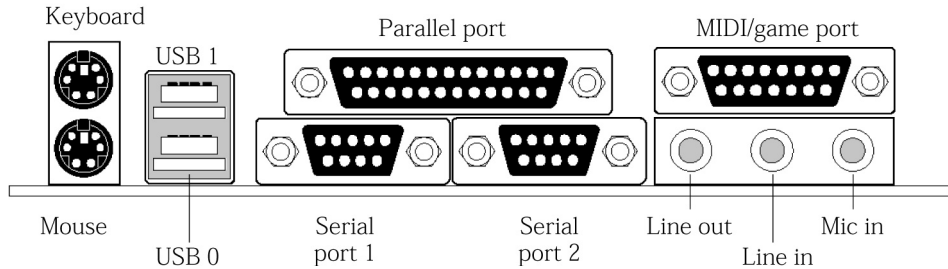


FIGURE 44-1 A dual USB port arrangement

IMPLEMENTING USB

Virtually all new motherboards and systems are equipped with one or two USB ports (usually located in the back panel I/O area containing COM and LPT ports). In this case, it is simply a matter of attaching a USB hub (such as a USB keyboard), and then attaching USB devices to the hub. For systems without USB, you'll need a motherboard upgrade that contains a USB-complaint chipset (such as Intel's single-chip 8x931HX USB Hub Controller and 8x931AX USB hubless controller) and port(s). Most current ATX and NLX motherboards will sport at least one USB port. Once the new motherboard is in place, USB devices can be attached.



If you'd rather not upgrade a motherboard to support USB, you may be able to install a PCI-based USB expansion card.

ENABLING USB

USB ports on the motherboard are controlled through the BIOS and are enabled through the system's CMOS setup utility. Once you've entered the CMOS setup, locate the USB configuration settings section. These are typically found under the "Input/Output Ports" configuration menu, or the "Peripheral Setup" menu. If the USB ports are not already enabled by default, you must enable the port(s) before you can use USB. In some cases, you must also assign an IRQ for the USB controller once it's enabled.

USB AND WINDOWS 95

One of the main limiting factors with USB is the operating system itself. The initial release of Windows 95 does not support USB (even though the motherboard and BIOS may support USB perfectly). As a minimum, you'll need to be running Windows 95 OSR 2.1 (preferably OSR 2.5) with the "USB Supplement" in order to implement USB. Many of the bugs and glitches that remain with USB under OSR 2.x are supposed to be corrected with the introduction of Windows 98. Table 44-1 lists the files included with the USB Supplement in OSR 2.1 and OSR 2.5.

USB HOST CONTROLLER TYPES

There are two types of USB host controllers: the UHCI (Universal Host Controller Interface) and the OHCI (Open Host Controller Interface). The choice of host controller can have an impact on USB device compatibility. USB devices often work fine with UHCI, but not all USB devices will function properly with OHCI (see Symptom 44-8). This is because many OHCI implementations do not fully comply with

TABLE 44-1 USB-RELATED FILES IN OSR 2.1/2.5**README.TXT file**

Text file with installation/uninstallation instructions

REM.PSS file

Text file used to uninstall the USB Supplement

USBSUPP.EXE file

DETROIT.EXE	21,504	04-10-97	12:14p
WDMUSB.EXE	896,864	04-10-97	7:21p

WDMUSB.EXE File

AUTOEXEC.BAT	259	04-10-97	12:14p
CONAGENT.EXE	14,596	04-10-97	12:14p
DETROIT.INF	8,926	04-10-97	12:14p
DEVLIB.EXE	35,417	04-10-97	12:14p
IMAGE.INF	3,922	04-10-97	12:14p
IMAGECLS.SYS	9,936	04-10-97	12:14p
KERNEL32.DLL	409,600	04-10-97	12:14p
KRNL386.EXE	124,480	04-10-97	12:14p
LICENSE.TXT	10,127	04-10-97	12:14p
NODRIVER.INF	4,603	04-10-97	12:14p
NTKERN.VXD	111,662	04-10-97	12:14p
OPENHCI.SYS	30,720	04-10-97	12:14p
REDIRECT.MOD	4,313	04-10-97	12:14p
RPLCLDR.EXE	8,307	04-10-97	12:14p
SPOOLSS.DLL	86,528	04-10-97	12:14p
UHCD.SYS	38,496	04-10-97	12:14p
USB.INF	4,517	04-10-97	12:14p
USBCAMD.SYS	20,560	04-10-97	12:14p
USBD.SYS	18,240	04-10-97	12:14p
USBHUB.SYS	28,256	04-10-97	12:14p
VCOND.VXD	53,435	04-10-97	12:14p
VFWWDM.DRV	17,072	04-10-97	12:14p
VFWWDM32.DLL	49,152	04-10-97	12:14p
VMCPD.VXD	18,578	04-10-97	12:14p
VMM.VXD	427,528	04-10-97	12:14p
VPICD.VXD	47,252	04-10-97	12:14p
VTD.VXD	12,811	04-10-97	12:14p
VWIN32.VXD	52,457	04-10-97	12:14p
VXDldr.VXD	39,237	04-10-97	12:14p
WINOA386.MOD	61,680	04-10-97	12:14p

industry specifications. Devices used on OHCI platforms may work erratically or may not even be detected. Use the following steps to determine the type of USB host controller in your system:

- 1 Click Start, choose Settings, and then choose Control Panel.
- 2 Double-click the System icon, and then select the Device Manager tab.
- 3 Expand the Universal Serial Bus Controller entry by clicking the + in front of it.
- 4 You will see the controller information dialog. Look for “Universal” (for UHCI) or “Open” (for OHCI).

If you cannot get your USB peripheral to work properly (if at all), and you find that you do have an OHCI controller, you should contact the motherboard or system manufacturer for updated USB drivers. When you cannot resolve OHCI controller problems, your only solution to the problem is to exchange the USB version of the peripheral for a PCI bus controller version.

USB 2.0

The major developers of the original USB specification (Compaq, Hewlett-Packard, Intel, Lucent, Microsoft, NEC, Philips, and more) are hard at work creating the next generation of USB. This continuing development will basically make USB a much faster interface. Today, the USB standard (dubbed USB 1.1) will support low-to-midspeed devices at data rates from 1.5Mb/s and 12Mb/s. The development of USB 2.0 promises to improve this performance by 30 to 40 times—yielding data transfer speeds up to 360Mb/s. (Don’t be surprised if this reaches 480Mb/s before USB 2.0 is released.)

By supporting faster data rates, USB 2.0 can handle more sophisticated high-bandwidth devices like video cameras. However, since USB 2.0 is intended to be fully backward compatible with the existing USB 1.1 standard, you’ll use the same cables and devices that you have now. Your current USB devices will not be obsolete. The only thing you may need to do is upgrade your USB hubs (if you have lots of USB devices attached) in order to support USB 2.0.

USB 2.0 is still a little ways off, but if you’re interested in learning more about it, or you want to stay on top of the developments surrounding USB 2.0, check in with the USB Web site at <http://www.usb.org/developers/usb20/index.html>.

USB Troubleshooting

In spite of its great promise, the pathway toward USB has been *anything* but straightforward. Chipset issues, BIOS versions, and operating system bugs (along with a surprisingly slow initial release of USB peripherals by the PC industry) continue to present serious problems for USB users. This part of the chapter examines many of the more common USB symptoms that you may encounter.

KNOWN USB ISSUES

Before you jump right into the symptoms involved with USB, there are a series of known device-specific issues under Windows 98/SE that you should be familiar with:

- **Belkin USB hubs** There are two issues with this device: the power adapter does not supply enough power for the hub to support four full bus-powered devices, and the hub always reports itself as a self-powered device, even when being used as a bus-powered device. If you always use the power

adapter, you'll avoid having the hub always report itself as a self-powered device. You should note that if you have four devices plugged into the hub, you may run into intermittent problems.

- **CATC USB bus-powered hubs** This hub sometimes fails to work with low-speed devices such as keyboards, mice, and joysticks. The solution is to use only self-powered devices with this hub.
- **CMD OHCI USB controller REV_04** If you upgrade your machine and have a PCI-based USB host controller from CMD, you may see the following string in the Device Manager: "Rev 04 CMD USB controller not supported by Microsoft." This device is not supported by Microsoft. You can contact CMD about getting a filter driver that should allow your machine to work.
- **Hitachi Visionbook Plus 4000 Series laptop** USB is disabled on these machines due to problems with power on the laptop. The laptop does not properly support high-powered bus-powered devices.
- **NEC flat-screen monitor with USB hub** This device has problems with low-speed devices (such as keyboards, mouse devices, and joysticks) when plugging and unplugging. You may have to disconnect and reconnect the device several times to get it to work correctly.
- **NEC NX Series machines** These machines come equipped with a legacy-mode USB BIOS that allows the USB keyboard to work in real mode. When you suspend and resume your computer, wake up the machine by using the NEC USB keyboard/mouse, or the device will not work after the computer is resumed. You need to disconnect and reconnect the device.
- **NEC USB OHCI host controllers** Some older systems ship with a USB OHCI host controller from NEC that has known problems with bulk devices. You may experience problems with this host controller when using bulk USB devices such as scanners, printers, and modems.
- **"Original" Intel USB camera** The original USB camera (the square-shaped camera rather than the oval-shaped camera) has problems working on OHCI host controllers. This device should be used on UHCI host controllers.
- **Samsung USB keyboard with hub** The hub on a Samsung USB keyboard does not always identify itself correctly. When it identifies itself as a self-powered device, it confuses the operating system and causes odd behavior with the hub portion of the keyboard. There is no work-around. Use low-powered USB devices (such as a mouse and gaming device) or self-powered devices with this keyboard.
- **Thrustmaster GrandPrix steering wheel** This device has problems working on OHCI host controllers, so this device should be used only on UHCI host controllers.
- **Thrustmaster Top Gun USB joystick** This device has problems working on OHCI host controllers, so this device should be used only on UHCI host controllers.
- **Unistar USB hubs** This hub always reports itself as a self-powered device, even when being used as a bus-powered device. In order for the hub to work correctly, you must always use the power adapter.

SYMPTOMS

SYMPTOM 44-1 **Pressing CTRL+ALT+DEL on the USB keyboard has no effect** This problem has been reported when connecting the Microsoft Natural Keyboard Elite (version 1.0) to the USB port on a computer running Windows 98. According to Microsoft, this is a problem with Windows 98 itself, and should be corrected in the final release (or Windows 98/SE). To correct the problem in the meantime, revert to a version of OSR 2.x, or exchange the keyboard for another model (or use a conventional keyboard).

SYMPTOM 44-2 You cannot log on to Windows 98 through the USB keyboard

This problem has been reported with the Microsoft Natural Keyboard Elite (version 1.0) under Windows 98. The keyboard does not respond the first time you try to log on. This occurs because you must log on to Windows 98 *before* Windows can detect the keyboard and install the drivers needed to use it. Use the following steps to work around the problem:

- 1 Shut down and turn off your computer.
- 2 Connect the keyboard to the USB port on the computer.
- 3 Connect a PS/2 keyboard to a PS/2 port on the computer.
- 4 Use the PS/2 keyboard to log on to Windows 98. Windows 98 then detects the keyboard and installs the proper drivers.
- 5 Shut down and turn off the computer again.
- 6 Disconnect the PS/2 keyboard.
- 7 Restart the computer and use the USB keyboard to log on to Windows 98 normally.

SYMPTOM 44-3 Windows 95 OSR 2.1 hangs while a USB device is “hot inserted”

Under some conditions, plugging a USB device into the PC can cause an over-current condition. The problem is that Windows 95 OSR 2.1 does not clear the over-current status of the USB hardware, and this causes Windows 95 to service the same over-current error multiple times—hanging up the system. This is a problem with Windows 95 OSR 2.1. OSR 2.5 should fix this problem by updating Windows 95 with the following files:

OPENHCI.SYS	2/17/98	31,280	(version 4.03.1217)
USBHUB.SYS	2/17/98	28,448	(version 4.03.1217)

SYMPTOM 44-4 The computer hangs after attempting to resume from a power-saving mode This is a known problem that occurs frequently under Windows 95 OSR 2.1, and can manifest itself in two general scenarios:

- First, the system may hang if you use the PC’s “sleep” button to manually place the PC into a power-saving mode, then use the “sleep” button again to resume normal operation.
- Second, the system may hang if it automatically switches to a “sleep” mode (or other power-saving mode) after some period of inactivity, and then you use the “sleep” button to resume normal operation.

This is a problem with Windows 95 OSR 2.1. OSR 2.5 should fix this problem by updating Windows 95 with the following file:

USBHUB.SYS	8/29/97	28,448	(version 4.03.1215)
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SYMPTOM 44-5 You experience docking and power management trouble with mobile USB-equipped PCs There are three general problem modes that can occur when using the USB driver in Windows 95 OSR 2.1 with a USB-equipped mobile PC:

- The PC’s “hot docking” feature of the mobile PC may function only intermittently (if at all).
- The automatic power-saving modes (for example, “sleep” or “suspend”) may not work properly on some mobile PC models.

- When entering a power-saving mode, the CPU clock is not properly slowed or stopped by the power management software.

This is a problem with Windows 95 OSR 2.1. OSR 2.5 should fix this problem by updating Windows 95 with the following file:

UHCD.SYS 8/13/97 39,872 (version 4.03.1215)

SYMPTOM 44-6 **You find that the PC hangs when working with USB** This is a known problem under Windows 95 OSR 2.1. The USB-equipped computer may hang in any of several known situations:

- If a mobile PC's PC Card controller is in CardBus mode and the PC is docked to a port replicator, the PC may hang when undocking. This is a known problem with USB-equipped Toshiba portables.
- When suspending and resuming a PC's operation with a USB mouse (such as a Logitech USB mouse), the PC may not complete its resume process successfully.
- When disabling a USB Root Hub device in the Device Manager while PC Card sockets are enabled, the system may hang, or a "Fatal Exception Error 0E" may appear.
- When rapidly installing and removing a USB game pad (such as an ALPS USB game pad), the PC may hang, or a "Fatal Exception Error 0E" may appear.

This is a problem with Windows 95 OSR 2.1. OSR 2.5 should fix this problem by updating Windows 95 with the following file:

OPENHCI.SYS 7/17/97 31,248 (version 4.03.1214)

Some Toshiba portable computers also require the following updated file for Windows 95 OSR 2.1:

CBSS.VXD 6/13/97 16,249 (version 4.00.1117)

SYMPTOM 44-7 **During the setup of OSR 2.1, you find that the VMM32.VXD file is missing or damaged** This problem occurs when rebooting the PC after installing OSR 2.1, and it may prevent you from restarting Windows 95.

This error can occur if the VMM32.VXD file was not rebuilt properly (or was damaged), resulting in an error message suggesting that "VMM32.VXD is missing or corrupt." The rebuilding of the VMM32.VXD file was unsuccessful, preventing Windows 95 from booting properly and processing the RunOnce section of the registry.

This error can also occur when the addition of USB support causes a conflict with the system, and Windows 95 is unable to boot normally. To correct the problem, you'll need to use either of the procedures described next.

If the VMM32.VXD file is missing or damaged, you must uninstall OSR2.1 using the OSR 2.1 real-mode uninstall tool (REM.PSS) on the installation disk:

- 1 Restart the computer and press F8 when you see "Starting Windows 95."
- 2 From the Startup menu, choose Safe Mode Command Prompt Only.

- 3 Copy the REM.PSS file to the root folder of the boot drive as “REMUSB.BAT.” (Do not copy it to REM.BAT because “Rem” is a reserved command, and it will not function.)
- 4 Type **REMUSB** to restore the original files that were renamed with an .o20 extension.
- 5 To complete the uninstall process, restart your computer and use the Add/Remove Programs tool in Control Panel to remove the program “WDM/USB Supplement.”
- 6 Delete the REMSUB.BAT file from the root folder of the boot drive.
- 7 Restart the computer normally, and then try reinstalling OSR 2.1 from a known-good source disk.

If there is a conflict between Windows 95 and USB support, follow these steps:

- 1 Restart the computer and press F8 when you see “Starting Windows 95.”
- 2 From the Startup menu, choose Safe Mode.
- 3 Rename the DETROIT.BAT file to AUTOEXEC.BAT. The DETROIT.BAT file is actually your original AUTOEXEC.BAT file that was renamed by the OSR 2.1 setup process.
- 4 Troubleshoot the conflict while in the Safe Mode, or delete OSR 2.1 as described above.

SYMPTOM 44-8 You find that a USB peripheral may not function properly in any USB port For example, this is a known problem with the Compaq USB camera. When you attempt to use a Compaq USB camera with an Open HCI (OHCI) USB host controller, the camera may not be detected and probably will not work properly.

This means your particular USB peripheral was probably designed and developed for use on the Intel Universal HCI (UHCI) USB host controller and is not supported on an OHCI controller. OHCI host controllers employ optimization that allows multiple transactions to be submitted within a single frame. By comparison, the UHCI host controller sends only a single transaction per frame. This means the peripheral (such as the Compaq USB camera) cannot respond to a second transaction within a single frame. Such a PC-specific peripheral cannot be used on other PCs. For more information, you’ll need to contact the peripheral maker for any patches or work-arounds.

SYMPTOM 44-9 Your USB keyboard does not operate in DOS Chances are that this is a fault of the BIOS. Without a USB-aware operating system (such as Windows 98 or Windows NT 5.0), USB keyboards rely on the system BIOS for support. If the BIOS does not directly support USB keyboards, your keyboard won’t work under DOS. You’ll receive a “Keyboard Error” or “Keyboard Not Present” error message when you start the computer. Check with the motherboard or system maker for available BIOS upgrades. There are generally two ways to work around this issue.

First, you can replace the USB keyboard with a PS/2 model outright. Shut down Windows 95 and turn off the computer. Disconnect the USB keyboard and remove the USB adapter. Connect a PS/2 keyboard to a PS/2 port on the computer, and then restart the computer.

Second, you can use a “dual keyboard” strategy. If you have a PS/2 keyboard available, shut down Windows 95 and turn off the computer. Plug the PS/2 keyboard into a PS/2 port on the computer (leaving the USB keyboard attached), and then restart the computer. You can then use the PS/2 keyboard in DOS and the USB keyboard in Windows.

SYMPTOM 44-10 You notice that the General tab is missing under your mouse Properties dialog under Windows 98 The General tab in Windows 95 is intended to provide a location from which you can upgrade the mouse driver. However, the General tab can accommodate only

one mouse. With the addition of USB support in Windows 98, more than one pointing device may be installed on the computer. You'll need an alternate strategy to upgrade the mouse driver in Windows 98:

- 1 Click Start, highlight Settings, and then click Control Panel.
- 2 Double-click the System icon.
- 3 Click the Device Manager tab, and then double-click the Mouse branch to expand it.
- 4 Click the desired mouse, and then click Properties.
- 5 Click the Driver tab, and then click Update Driver.
- 6 Follow the instructions on the screen.

SYMPTOM 44-11 You notice that USB devices do not seem to work in the Safe Mode under Windows 95/98 After you attempt to start your computer in the Safe Mode, your computer may not respond to any keyboard commands, or you may receive the following error message:

```
Windows did not detect a mouse attached to a computer. You can safely attach a serial mouse now. To attach a mouse to a PS/2 mouse port, you must first turn the computer off.
```

The fault can occur if you're using a USB keyboard or mouse, *and* your system BIOS does not support USB devices natively. Windows 98 and Windows 95 do not support the use of a USB keyboard or mouse in Safe Mode (or in real mode) unless the computer's BIOS supports these devices. To circumvent this problem, use a standard keyboard or mouse instead of a USB keyboard or mouse.

SYMPTOM 44-12 ESD seems to disable USB devices plugged into a hub When you employ USB devices connected to an "external" USB hub, one or more devices plugged into that hub may suddenly stop working. This problem is more likely to occur under Windows 98/SE with external USB hubs that are self-powered rather than with USB hubs that are bus powered. This problem does not seem to occur with devices that are plugged directly into the "root" hub of the computer itself. This problem is usually caused when the USB hub receives an electrostatic discharge (ESD, or a "static electric shock"). When ESD occurs, Windows may be unable to properly restart an external USB hub to recover from the error. There is a fix that you can download for Windows 98/SE:

```
USBHUB.SYS 08/13/99 36,672 (4.10.2223)
```

To work around this problem in the meantime, simply unplug the external USB hub from the computer (or upstream hub), wait a moment, and then reconnect the external USB hub. The hub should be redetected, and all connected devices should be restored.

SYMPTOM 44-13 USB device performance is diminished under Windows 98/SE because the USB driver is using the largest report size USB devices that support multiple packet sizes send packets using the *largest* supported data field size rather than the *smallest* required data field. Each supported function of the USB device should send packets using the smallest required data field size. The overall performance of the USB device suffers because more data is sent over the USB device. This problem occurs because the HID-class driver in Windows 98 SE always uses the largest data field the USB device supports to transmit packets. This behavior causes the USB device to transmit

unnneeded data during an IN or OUT transaction. You can download a fix from Microsoft that should correct the problem:

HIDCLASS.SYS 1/10/2000 23,584 (4.10.2223)



This fix is generally recommended when you're using multifunction USB devices and will not affect single-purpose (dedicated) USB devices.

SYMPTOM 44-14 You may hear a high-pitched noise when you enable OHCI USB support under Windows 98/SE If you use a USB video capture device, the image may freeze, and Windows may also stop responding to the signal. There is a patch available from Microsoft that should fix this problem:

OPENHCI.SYS 01/01/99 24,576 (4.10.2224)

To circumvent this problem in the meantime, disable USB support in the Device Manager. Disabling USB causes the noise to stop.

SYMPTOM 44-15 The laptop battery offers less running time when USB devices are attached Battery-powered computers that use Windows 95/98/SE Advanced Power Management (APM) or the Advanced Configuration and Power Interface (ACPI) may experience additional power consumption (resulting in a faster drain of battery power) when a USB device is attached. The bus activity needed to support communications with the USB device prevents the CPU from switching to the "C3" (Clock-Stopped) power state. When a USB device is not connected, the CPU can spend a significant amount of time in the C3 state, which reduces power consumption and extends battery life. Unfortunately, the option to turn off USB devices after a computer is idle is not supported under Windows 95/98/SE.

You may need to use other tricks to conserve battery power. One work-around is to disconnect all USB devices if you're not using them. You may also try adjusting the timeout periods for your display and hard drive so that the system will use those standby states sooner.

SYMPTOM 44-16 You cannot view a USB camera that's in Device Manager under Windows 98 After you connect your USB digital camera to a USB port, you may not be able to view this device in the Device Manager. This problem can occur if the camera was disabled in Device Manager before you removed it. When you reconnect the camera, Device Manager does not refresh the information it's displaying. To avoid this problem, click Refresh in Device Manager.

SYMPTOM 44-17 Your digital video camera is disabled under Windows 98/SE

This is a problem with cameras like the Kodak DVC300 or Kodak DVC343. When you view your system devices in Device Manager, you may see a red X through the device icon for your USB digital video camera. This issue can occur because Windows 98/SE doesn't include device drivers for the Kodak DVC300 USB or the Kodak DVC323 USB digital video cameras. To correct this issue, download and install the most current driver for the device. If your camera worked before you upgraded your computer, simply reenble the device drivers:

- 1 Click Start, highlight Settings, click Control Panel, double-click the System icon, and then click the Device Manager tab.

- 2 Click Kodak Camera DVC323 or Kodak Camera DVC300, click Properties, click to select the “Exists in all hardware profiles” check box, click OK, and then click OK again.



The red X may still be displayed on the camera in your Device Manager, but the camera may be working.

SYMPTOM 44-18 Moving your USB mouse causes a USB printer job to stop under Windows 98 When a USB printer and a USB mouse are connected to a computer without a hub, print jobs in progress may terminate prematurely if the mouse is moved. The USB printer may stop printing in the middle of the job and advance the page instead. This is a known issue with Windows 98/SE, and a patch is available from Microsoft that will fix computers using OHCI controllers:

Openhci.Sys 5/12/1999 22,816 (4.10.2019)



Although you may see this issue with printers and mice, any combination of low-speed and high-speed USB devices may cause this same behavior.

SYMPTOM 44-19 Scanning stops when using an NEC OHCI controller and HP USB scanner under Windows 98/SE When using an HP ScanJet 6200C USB scanner connected to a computer with an NEC OHCI USB controller, you may suddenly be unable to perform a scan after having run a scanning operation (such as a “Preview” scan). The scanning software may also be listed as “Not responding” in the Close Program dialog box. This problem occurs when the NEC controller does not correctly acknowledge a USB packet that is smaller than the full packet size, and the HP ScanJet 6200C does not properly resend a packet that has not been acknowledged. A patch for this problem is available from Microsoft:

Openhci.sys 11/08/99 24,416 (4.10.0.2226) for WIN98SE
 Openhci.sys 11/22/99 22,944 (4.10.0.2021) for WIN98

SYMPTOM 44-20 Your USB keyboard does not work correctly under Windows 98 When you try to install a new USB keyboard, this keyboard may not work after you start your computer. This fault can occur if you install a new USB keyboard while your computer is off, and your computer prompts you to log on when you start it. USB keyboards are not enumerated until after you log on to your computer. To resolve this issue, click Cancel when you’re prompted to log on, click Start, click Log Off <user name>, click Yes, and then log on to your computer.

SYMPTOM 44-21 The PS/2 mouse doesn’t work after resuming a docked laptop under Windows 98/SE This is a known issue with laptops like the IBM 560Z. If you dock your laptop while the power is on, and you have a USB device connected to it, you may not be able to use your PS/2 mouse when you resume using your computer. This is a driver issue, so contact the laptop manufacturer for updated mouse drivers.

SYMPTOM 44-22 You cannot use the “standby” mode with a USB printer This is a known issue with the Epson Stylus 740 USB printer under Windows 98/SE. When you try to place your computer in “standby” mode, you may receive the following error message:

Your computer cannot go on standby because a device driver or program won’t allow it. Close all open programs, and then try again.

If you click OK, close all running programs, and try to use the “standby” mode again, you may still receive the same error message.

There is a conflict with the third-party Epson printer drivers. To fix this issue, unplug the printer from the USB port before placing your computer in “standby” mode. When you need to print, simply plug the printer back in. You may also check with the printer manufacturer to see if there are updated drivers available.

SYMPTOM 44-23 Your laptop doesn't resume from “standby” mode when docked

This is a known problem with the Tecra 530CDT laptop under Windows 98/SE. When you attach your Toshiba Tecra 530CDT computer to a DeskStation 5+ docking station, your computer may not resume from the “standby” mode. This fault can occur if both the docking station's SCSI controller and the laptop's USB controller are enabled. This configuration can cause a USB and SCSI IRQ sharing conflict across the PCI bridge. The docking station's SCSI controller may be allocated the same IRQ as the laptop's USB controller when the computer is docked. This can cause a unique type of resource conflict, resulting in the USB host controller's inability to resume from “standby” mode.

To work around this issue, either disable the USB controller in Device Manager (if you're not using USB devices), or disable the SCSI controller in Device Manager (if you're not using SCSI devices). If you require the use of both devices simultaneously, configure the System Standby setting in the Power Management icon to Never when docked, and do not manually start the “standby” mode from the Shut Down Windows dialog box. To disable a device in the Device Manager:

- 1 Click Start, highlight Settings, click Control Panel, and then click the System icon.
- 2 Click the Device Manger tab, double-click the branch containing the device you need disabled, and then double-click the exact device to open the Properties dialog.
- 3 On the General tab, select the “Disable in this hardware profile” check box, click OK, and then click Close.
- 4 Restart your computer.

SYMPTOM 44-24 The “automatic repeat” feature for your USB keyboard doesn't work after resuming from the “suspend” mode This problem has been addressed by a Windows 98/SE patch that's available from Microsoft:

KBDHID.VXD 10/04/99 16,666 (4.10.2223)

SYMPTOM 44-25 You encounter performance problems when using a USB camera

When you use a USB camera with certain PCI video cards in Windows 95 OSR2.1, performance may be reduced, or your computer may seem to hang up. Video playback may also be affected. This happens because certain PCI video cards may not work well with “isochronous transactions” (which USB cameras require). The video card may require several attempts to complete an operation. Try reducing your hardware acceleration level:

- 1 In Control Panel, double-click Display.
- 2 On the Settings tab, click Advanced Properties.
- 3 On the Performance tab, move the Hardware Acceleration slider to None.
- 4 Click OK or Close until you return to Control Panel. Restart the computer when you're prompted to do so.

SYMPTOM 44-26 You encounter a GPF in the URM.EXE module under Windows 98 After you install Windows 98 on a Toshiba Infinia computer that uses a USB “In Touch” module, you may receive the following error message:

```
(file) caused a General Protection Fault in module URM.EXE at 015F:00000055
```

This problem may occur if your version of the In Touch module is not compatible with the revision of the Toshiba Infinia. There are several revisions of the Toshiba Infinia and the USB In Touch module. If you use an In Touch module on a Toshiba Infinia model other than that for which it is designed, this error message can occur. (This can occur when you repair or upgrade the In Touch module.) To work around this problem temporarily, disconnect the In Touch module. You may also contact Toshiba to inquire about possible driver updates.

SYMPTOM 44-27 Your computer doesn’t recognize a USB device when resuming from standby under Windows 98 If you connect a USB device to a Windows 98 computer while the computer is in “standby” mode, the computer does not resume from “standby” mode to process the USB device connection and immediately recognize the new USB device. The computer remains in “standby” mode and may not recognize the USB device once resumed. If you disconnect and reconnect the USB device after the computer has resumed, the USB device will be correctly recognized. A fix that patches three offending files is available from Microsoft (though this was fixed in Windows 98/SE):

```
OPENHCI.SYS      07/06/98   21,904 (4.10.2018)
USBDD.SYS        07/06/98   17,568 (4.10.2018)
USBHUB.SYS       07/06/98   27,136 (4.10.2018)
```

SYMPTOM 44-28 Your video capture WDM driver doesn’t work under Windows 98 Programs that use the Microsoft Video for Windows 1.1 (VFW) interface cannot directly communicate with analog video capture devices that use the Windows Driver Model (WDM) video capture interfaces in Windows 98. Such analog capture devices may include PCI adapters with video decoder chips that use WDM drivers. The VFW/WDM mapping files included with Windows 98 do not allow WDM-based analog capture devices to be used with the VFW 1.1 interface. Microsoft has a fix that corrects this problem:

```
VFWWDM.DRV       08/10/98   15,344 (4.10.2043)
VFWWDM.DLL       08/10/98   56,832 (4.10.2043)
KSWDMCAP.AX      08/10/98   51,712 (4.10.2043)
```

SYMPTOM 44-29 The system locks up after you click the Close button in the Close Program dialog box under Windows 98 This problem can occur if you’re using a USB mouse. The Close Program dialog box is displayed as a fault thread, and the WDM driver message sent by the USB mouse driver cannot be delivered to the window. Microsoft has a patch that should correct this problem (though the problem was corrected under Windows 98/SE):

```
KERNEL32.DLL     02/22/99   452,096 (4.10.2000)
```

To work around this issue, press ESC to close the Close Program dialog box instead of clicking the Close button.

SYMPTOM 44-30 You receive an error when you press CTRL+ALT+DEL to shut down using a USB keyboard under Windows 98 If you press CTRL+ALT+DEL twice on a USB keyboard in Windows 98, you may receive the following “blue screen” error message:

```
A fatal exception 06 has occurred at xxxx:xxxxxxxx. The current application
will be terminated.
```

Restarting Windows by pressing CTRL+ALT+DEL twice is not recommended. This method causes Windows to suspend most processes and should be used only when the normal shutdown process is not possible. Use the Shut Down command on the Start menu to restart your computer. If you cannot use the Start menu to perform a shutdown, press CTRL+ALT+DEL, and then click Shut Down in the Close Program dialog box.

SYMPTOM 44-31 The Creative Labs VideoBlaster WebCam II drivers are not loading properly under Windows 98/SE After you upgrade to Windows 98/SE, your VideoBlaster WebCam II may not respond, and a yellow exclamation point may appear for that hardware in Device Manager. To correct this issue, unplug and then reconnect the camera to the USB port. The drivers for the camera should then be detected and loaded correctly. The VVLUSB.SYS driver used by the VideoBlaster WebCam II may not be enumerated correctly during the upgrade process. You may also see a “Code 10” status for the device in your Device Manager.

SYMPTOM 44-32 You encounter a “file not found” error when installing a 3Com USB modem under Windows 98 When you install a 3Com USB ISDN modem, you’re prompted to insert the Windows 98 CD, but you then receive a “File not found” error when Windows attempts to copy the following files:

- Cport.sys
- Usbser.sys
- Wdmmdmld.vxd

These files are not located on the Windows 98 CD or the Windows 98 Service Pack 1 (SP1) CD. To resolve the issue, upgrade to Windows 98/SE. The 3Com Web site incorrectly states that the files are available on the Windows 98 SP1 CD. However, the files are only located on the Windows 98 SE CD.

SYMPTOM 44-33 The “Windows” key may not work on a USB keyboard under Windows 98/SE This problem can occur if all of the following conditions exist:

- The USB keyboard is the only keyboard attached to your computer.
- The information (INF) file used for installing the keyboard driver did not add the proper setting to the SYSTEM.INI file to correctly identify the keyboard type.
- Your computer contains no legacy devices—having only USB ports for a keyboard and mouse—and has no PS/2-based keyboard and mouse ports.

If a USB keyboard is the only keyboard attached to your computer, the keyboard may not be automatically identified as the correct type of keyboard. The “type=4” setting in the [Keyboard] section of your SYSTEM.INI file overrides this automatic detection so that Windows may correctly interpret the keyboard scan codes. Chances are that the keyboard is being detected as an IBM AT keyboard (“type 3” to the KEYBOARD.DRV file), instead of being detected as an extended keyboard (“type 4”). Because of this, the keyboard driver is not able to correctly process the extended scan.

To correct this problem, contact the manufacturer of your USB keyboard to download any available fix for this issue. To circumvent this issue, click Start, or press CTRL+ESC, or edit the SYSTEM.INI file. Verify that the following line exists in the [Keyboard] section of your SYSTEM.INI file, and if it does not exist, you can add it:

```
type=4
```

SYMPTOM 44-34 **USB devices may not work under Windows 98/SE** USB devices that are plugged into a computer running Windows 98/SE may not work if an AMD processor (running at 350 MHz or faster) and a VIA Technologies USB controller are installed on your system. This problem occurs because there is a timing-specific problem in the Universal Host Controller driver (UHCD.SYS) that may prevent USB devices from enumerating under specific timing conditions. To correct this issue, download and run the appropriate patch file for your version of Windows. For the English version of Windows, try the 240075UP.EXE file from <http://download.microsoft.com/download/win98SE/Patch/4.10.2223/W98/EN-US/240075up.exe>. This patch should have the following file attributes (or later):

```
UHCD.SYS      08/20/99  30,528  (4.10.2223)
```

SYMPTOM 44-35 **Your USB mouse or keyboard is not working with an AMD OHCI USB controller under Windows 98/SE** When you use AMD’s OHCI USB controller, you may experience intermittent instances where Windows does not recognize the USB mouse or USB keyboard. This issue can occur when querying the status of the host controller’s registers return incorrect information. As a result, the mouse and/or keyboard attached to the controller do not initialize properly. To resolve this issue, download the latest version of the OPENHCI.SYS file. The following patch is available for download from Microsoft. For the English version of Windows, try the 241134UP.EXE file from <http://download.microsoft.com/download/win98SE/amdusb/1/W98/EN-US/241134up.exe>. The patch should have the following attributes (or later):

```
OPENHCI.SYS   10/18/99  24,240  (4.10.2225)
```

SYMPTOM 44-36 **Some camera controls are not available after upgrading NetMeeting 3** This is a known issue with Kodak DVC323 digital video cameras under Windows 98/SE. After you upgrade to NetMeeting 3.0 or 3.01, the advanced camera controls in NetMeeting may be unavailable. This problem may also occur when you upgrade to Windows 98/SE because it includes NetMeeting 3.0. Click Options on the Tools menu, click the Video tab, click Source, and then click Camera Controls. All of the advanced camera settings may be unavailable. (These settings include zoom, focus, exposure, iris, tilt, pan, and roll.) Upgraded drivers for the camera cannot resolve this issue, so you may need to revert to an older version of NetMeeting 3.

SYMPTOM 44-37 The CAPS LOCK key is on at startup once the USB keyboard is installed under Windows 98/SE When you start a non-English version of Windows 98, the CAPS LOCK key is on if both of the following conditions exist:

- You have a USB keyboard attached to your computer.
- A language other than English is selected on the Language tab of the Keyboard tool in your Control Panel.

This problem occurs if you include the KEYB.COM command in your AUTOEXEC.BAT file, which is executed when you start your computer. The KEYB.COM command installs a table that defines the translation of keys to the extended character codes and then sets the CAPS LOCK state to On. Microsoft has a patch available for Windows 95/SE that should fix the problem:

Keyb.com 01/26/2000 19,927

To work around this problem, remove the KEYB.COM command from your AUTOEXEC.BAT file, and then restart your computer. Keep in mind that this work-around is not recommended if you use DOS programs that need localized keyboard support (such functionality would not be provided).

SYMPTOM 44-38 Sound may be disabled when using the PlaySound API with USB HID devices in the system On computers running Windows 98/SE, sounds may intermittently be disabled after Windows starts (for example, WAV files may not play). This problem may occur when the following conditions are true:

- The program being used to play the sound uses the PlaySound API.
- The computer has one or more USB HID devices installed (such as a USB speaker device).

After a sound fails to play, no further attempts to play sounds using the PlaySound API are successful until after you restart Windows. (Note that the Windows Startup sound may play successfully.) This problem can occur if a “reference counter” is not cleared properly by the WINMM.DLL file when the PlaySound API is processed. This prevents proper initialization during subsequent PlaySound API calls, and this causes the sound not to play.

WINMM.DLL 12/29/99 50,688 (4.03.2201)

Further Study

USB: <http://www.usb.org/>