

PCI TROUBLESHOOTING GUIDE

NexGen™

**Nx586® PCI/ISA System Board
with on board Bus Master PCI IDE and Super I/O**

January 22, 1996

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Introduction

This troubleshooting guide is provided to assist OEMs, dealers, and resellers with the support of the NexGen PCI motherboard. It will explain and provide a resolution to most common incidents and configuration questions your customers may encounter during the installation and usage of their motherboard or system.

Please consult this guide prior to contacting NexGen Technical Support. This will allow you to become more responsive to your customers.

About This Manual

The guide is organized into two main sections:

- A section that provides a list of those games that will require the assistance of various tools to install and/or execute.
- A section that provides a list of frequently-asked questions and answers relative to a wide variety of topics concerning the PCI motherboard.

Designed-In Compatibility

At the inception of the development process, NexGen ensured x86 binary-code compatibility with two years of research on Intel processors. During Nx586 processor design, the knowledge gained in the exhaustive research process formed the foundation of formal tests for every aspect of design and development of the Nx586 processor. In simulation, tens of millions of operations were applied to demonstrate that the Nx586 processor design provided full x86 binary-code compatibility. On the final Nx586 processor, NexGen and the XXCAL independent testing lab have run hundreds of diverse applications and an extensive range of peripherals transparently, covering trillions of processor cycles.

Through this process, the Nx586 processor has been shown to provide full binary-code compatibility with x86 processors, allowing users of Nx586 processor-based PCs to utilize the full spectrum of more than 50,000 applications

Technical Support for Games

Background

This chapter is provided to assist you with installing and running various games on the Nx586 PCI motherboard.

You may find that certain games will misidentify the Nx586 as an 80386 processor, and as a result, will not allow you to install it. In other cases, the game may install without incident, but may not be executable because of the misidentification of the Nx586. For such cases, NexGen has developed the ***DOS CPU Identifier*** and the ***Windows CPU Identifier*** that will allow you to smoothly run all such games without incident (note: the *Windows CPU Identifier* supports Windows 3.1x and Windows 95, hereafter referred to as *Windows*).

In addition, there is a small percentage of games that require the presence of a floating-point processor to run. NexGen has successfully tested these games with ***Q87*** -- a floating-point emulator developed by *QuickWare*

This chapter should help you assist your customers with the questions they may have regarding these particular games.

Games Requiring the CPU Identifier

How to Use the CPU Identifiers

The *DOS CPU Identifier* and the *Windows CPU Identifier* are currently provided as part of the **PCI Toolkit** and the **PCI Update Kit** (the *PCI Toolkit* is currently shipped with every PCI board; the *PCI Update Kit* contains all of the tools in the *PCI Toolkit*, along with new and updated versions of these tools). Within these kits is a **readme.txt** file that clearly describes how to use the CPU Identifiers.

How to Obtain the PCI Update Kit

The *PCI Update Kit* can be downloaded from the NexGen Web Server (www.nexgen.com), the NexGen FTP Server ([ftp.nexgen.com](ftp://ftp.nexgen.com)), or the NexGen BBS (408.955.1839, 14.4 Kb/s). The *PCI Update Kit* is contained within a self-extracting file that will create all the files you need to use the CPU Identifiers. One of the files is *readme.txt* that will fully explain how to install and use the CPU Identifiers.

Games That Require the DOS CPU Identifier to Install

Each of the following DOS games requires the assistance of the *DOS CPU Identifier* to be installed. Once the game is installed, you will not need the Identifier to run the game:

- *Oregon Trail II v1.0*
- *Star Trek, The Next Adventure, Final Unity*

¹*Oregon Trail II v1.0* does not require the *DOS CPU Identifier* to install

²*Star Trek* requires *Alternate Instructions* set to ON in Advanced Setup in order to run

Games That Require the *DOS CPU Identifier* to Run

Each of the following DOS games will install without incident, but will require the assistance of the *DOS CPU Identifier* to run.

- *Cadillacs and Dinosaurs*
- *Loadstar*
- *Need for Speed*
- *Primal Rage*
- *Wingnuts*

Games That Require the *DOS CPU Identifier* to Install and Run

Each of the following DOS games requires the assistance of the *DOS CPU Identifier* to be installed and to run.

- *Bloodwings*
- *NHL Hockey '96*
- *PGA Tour '96*

Games That Require the *Windows CPU Identifier* to Install

Each of the following Windows games requires the assistance of the *Windows CPU Identifier* to be installed. Once the game is installed, you will not need the Identifier to run the game:

- *Spectre Enhanced CD*

Games That Require the *Windows CPU Identifier* to Run

Each of the following Windows games will install without incident, but will require the assistance of the *Windows CPU Identifier* to run.

- *Daedulus Encounter*
- *Hover*
- *Pitfall v1.0*

Games That Require the *Windows CPU Identifier* to Install and Run

Each of the following Windows games requires the assistance of the *Windows CPU Identifier* to be installed and to run.

- *Spectre VR*

Games Requiring a Floating-point Presence

Games That Require a Floating-point Presence

- *Dark Forces*
- *Fade to Black*
- *Falcon 3.0*
- *Falcon Gold*
- *FX Fighter*
- *Heretic*³
- *Magic Carpet II*
- *PGA Tour '96*
- *Rugby World Cup '95*
- *Spectre Enhanced CD*
- *Spectre VR*
- *US Navy Fighters*⁴

³*Heretic* does not require a floating-point processor if invoked as follows:

c:\>heretic -debug

⁴The *US Navy Fighters* upgrades, *US Navy Fighter Gold* and *US Marine Fighters* do not require a floating-point processor

If your NexGen motherboard does not contain a floating-point processor, you may use a floating-point emulator such as *Q87* to assist with the execution of those games that require a floating-point presence. The NexGen compatibility lab has successfully tested *Q87* version 4.03 with all of the games listed above.

How to Use *Q87*

The *Q87* package contains a *readme.txt* file and a *Q87.txt* file that explain how to use *Q87*.

How to Obtain *Q87*

A shareware version of *Q87* can be downloaded from the NexGen Web Server (www.nexgen.com), the NexGen FTP Server ([ftp.nexgen.com](ftp://ftp.nexgen.com)), or the NexGen BBS (408.955.1839, 14.4 Kb/s). *Q87* is contained within a self-extracting file that will create all the files you need to use the floating-point emulator, along with instructions for registering the software with *QuickWare*

Frequently Asked Questions

Background

This chapter is provided to assist you in answering the most commonly asked questions related to installing and operating the NexGen PCI motherboard.

Questions and Answers

Motherboard Jumpers

Q1: *How do I reset my CMOS settings?*

A1: With the system powered down, install a jumper on JP20 for about ten seconds. Then remove the jumper since the normal setting is for the jumper to be open.

Q2: *How do I connect the Reset switch in my system case to the motherboard?*

A2: The 2-pin connector labeled RESET can be attached to the case Reset switch connector in either orientation.

Q3: *How do I connect the speaker in my system case to the motherboard?*

A3: The 4-pin connector labeled SPEAKER can be attached to the case speaker connector in either orientation.

Q4: *How do I connect the power LED in my system case to the motherboard?*

A4: Pins 1, 2, and 3 of the 5-pin connector labeled KEYLOCK/PWR are for the power LED. Pins 1 and 3 should be connected to the case Power LED. Pin 1 is connected to +5 volts and pin 3 is connected to ground.

Q5: *How do I connect the keylock switch in my system case to the motherboard?*

A5: Pins 4 and 5 of the 5-pin connector labeled KEYLOCK/PWR are for the keylock switch. The keylock connector can be attached to the case keylock connector in either orientation.

Q6: How do I connect the Turbo switch and Turbo LED in my system case to the motherboard?

A6: The PCI motherboard always runs in Turbo mode and cannot be switched to non-Turbo mode. Therefore, there is no Turbo switch connector on the motherboard. The Turbo LED from the case can be connected to the 2-pin connector labeled TURBO LED. Since the PCI motherboard only runs in Turbo mode, the Turbo LED should be illuminated when the connectors are mated. If it is not illuminated, then the connector is installed backwards and must be turned around.

Q7: How do I connect the Hard Drive LED in my system case to the motherboard?

A7: The 2-pin connector labeled HD LED can be attached to the case Hard Drive LED connector to support the on-board IDE controller. If the LED does not illuminate during hard drive activity, then the connector is installed backwards and must be turned around.

Motherboard Specifications

Q8: What is the speed of the PCI Bus on my motherboard?

A8: The PCI bus runs asynchronously at 33MHz.

Q9: What is the speed of the ISA bus on my motherboard?

A9: The speed of the ISA bus is equal to the speed of the PCI bus divided by 3 or 4, where the divisor is selected in the **Chipset** option of the BIOS Setup. The default setting of **PCIClk/4** is recommended for a standard ISA bus speed of 8MHz.

CMOS Setup / BIOS

Q10: Is the PCI system BIOS Plug-and-Play (PnP) compatible?

A10: Yes.

Q11: What are the IRQx options in the Advanced Setup used for?

A11: If you are using non-Plug-and-Play compatible (Legacy) ISA adapters in conjunction with PCI adapters, then the interrupts used by the non-PnP ISA adapters should be set to **ISA** in order to reserve these particular interrupts for these ISA adapters. Otherwise, if set to **Auto**, the PnP system BIOS may erroneously assign the same interrupt to a non-PnP ISA adapter and a PCI adapter. If all adapters are PnP compatible, then the **IRQx** settings may be left to **Auto**.

For example, if your sound card is programmed to use interrupt 5, then **IRQ5** should be set to **ISA**.

Q12: When should I enable Boot with PnP OS in the Advanced Setup?

A12: Enable this option only if your operating system is Plug-and-Play compatible, such as Windows 95. Leave this option disabled if you are using DOS, Windows 3.1x, or OS/2 (all versions released, including OS/2 Warp).

Q13: There are several Setup options in the BIOS that I do not understand. Can I change any of these parameters to increase my performance?

A13: Unless instructed otherwise by a NexGen Technical Support Representative, it is highly advised that the **Optimal** setup values be used without any changes. This will ensure that your system will run optimally, as well as reliably.

Q14: How do I know if I am using the latest BIOS?

A14: The *PCI Update Kit* contains the latest BIOS release and flash utility for your motherboard. It is always prudent to operate your motherboard using the latest BIOS since NexGen and AML are continuously improving the BIOS with new features and functions. Also, the latest BIOS may resolve some of the problems you are encountering.

See *How to Obtain the PCI Update Kit* above for instructions on obtaining this kit.

System Errors / Lockups

Q15: My application will not run, is producing errors, or hangs the system. What can I do to resolve this?

A15: First contact the vendors that developed your operating system, application, or hardware adapters to determine if a known problem exists that can be corrected. It is not uncommon for back-level device drivers for video and drive controllers to cause problems within a system. It may also help to check and correct your hard disk for corruption, followed by a re-installation of your software.

Q16: Why don't I see any video when I power up my system?

A16: The NexGen motherboard requires at least one memory SIMM-pair to be installed before the video will be seen. Also, some PCI adapters only partially support **Frame Write Merging** as defined in the PCI specification. Therefore, if enabled, try disabling this option in the **Chipset** option of the **BIOS Setup**. Finally, you might try pressing the INSERT key on the Numeric Keypad during a cold boot. Make sure you continue to press the key until you are prompted to press F1. This will by-pass the saved NVRAM and CMOS settings, thereby allowing you to avoid any conflicts that may have occurred due to the Plug-and-Play BIOS.

Q17: Why does my motherboard produce a series of long beeps when I power up my system?

A17: The Power On Self Test (POST) code in the BIOS has detected an error. Table 1 contains a description and resolution for each of the **WINBIOS Beep Codes**

Q18: When I first boot my system, I see a message indicating that a conflict exists, such as "Resource Device Conflict." What can I do to resolve this?

A18: You may be able to resolve this as follows: while your system is powered down, press and hold the INSERT key on the Numeric Keypad. While still pressing the INSERT key, power up the system until you are prompted with "Press F1 to RESUME." Press F1 and you will enter Setup. Load the "Optimal" values, along with your custom settings, and exit Setup.

You may have a conflict between the on-board devices and add-on devices such as:

- Floppy Controllers
- IDE Controllers
- Serial Ports

In this case, you must resolve or disable one of the resources to avoid the conflict. For instance, if you are using a PCI SCSI adapter that also contains a floppy controller, you must either disable the floppy controller on the SCSI adapter, or disable the on-board floppy controller in the Peripheral option of Setup.

Video

Q19: I am using the Diamond Stealth 64 VRAM video adapter with the S3 968 chip. When I make a change to my system, such as adding more memory, I lose my video. What can I do to resolve this?

A19: This problem is resolved in BIOS version P06W034N and later. To get your video back, wait 20 seconds after powering up, then press F1. Wait about ten seconds and press ESC, then ENTER. The system should boot with video. At this point, flash your BIOS to the latest level using the **PCI Update Kit**

See *How to Obtain the PCI Update Kit* above for instructions on obtaining this kit.

Hard Disk Drives / Controllers

Q20: What is LBA mode in the Peripheral section of Setup used for?

A20: Under the IDE standard, hard drives greater than 528 MB could not be supported since the size of the drive parameters as defined in the BIOS (INT13) versus those defined by the WD 1003/IDE standard are not the same. This difference meant that the least common denominator for the cylinder, head, and sector sizes (C/H/S) had to be used -- 1023, 16, and 63, respectively.

The EIDE standard resolves this barrier by a technique known as **Logical Block Addressing (LBA)**. If the INT13 BIOS supports LBA, then the C/H/S information is translated into a 28-bit logical address which any hard drive that supports LBA can accept. This addressing scheme allows for the complete use of the INT13 drive parameters -- 1024 cylinders, 255 heads, and 63 sectors -- yielding a total drive capacity of 8.4 GB.

LBA can be found in the **Peripheral** option of **Setup** on the PCI motherboard.

If a drive was previously partitioned and formatted without LBA enabled, the drive will not operate properly with LBA enabled unless the drive is re-partitioned and re-formatted. Of course the drive data would have to be backed up first since all existing drive data would be lost following the partition and format operations.

Q21: What Hard Disk Programmed Input/Output (PIO) mode or DMA transfer rates are supported on the PCI motherboard?

A21: The system BIOS contains support for PIO Mode 0 (3.3 MB/s) through PIO Mode 4 (16.6 MB/s) and Multi-word DMA Mode 1 (13.3 MB/s) and Multi-word DMA Mode 2 (16.6 MB/s). It is very important to be certain of the transfer rate supported by the drive before selecting a mode in the **Peripheral** option of **Setup**. If uncertain about the mode supported, select the **Auto** option and the system BIOS will auto-detect the fastest PIO mode supported as defined on the drive (note: this is true of BIOS versions P06W034N and later; previous BIOS versions will select the fastest PIO or DMA mode.)

Q22: Why do I get a message that my operating system is missing?

A22: The BIOS cannot detect the presence of a device from which to boot. Ensure that the floppy drive is installed correctly as described above if attempting to boot from a floppy. Also, ensure that the bootable hard drive is installed correctly in **SETUP** including: 1) Specifying the correct cylinder/head/sector parameters for the drive; 2) Enabling or disabling LBA accordingly (see Q20 for LBA information).

Q23: I am using the Adaptec AHA3940 PCI Dual Channel SCSI adapter in conjunction with a Novell Microdyne NE5500 Ethernet adapter and I cannot get my system to boot. What can I do to resolve this?

A23: Place the NE5500 adapter in the PCI slot closest to the memory SIMM sockets. This problem may occur with other PCI adapters, such as video adapters, in which case the solution is the same. That is, place the video adapter in the PCI slot closest to the memory SIMM sockets.

Q24: Why does the "Performance" tab under "System Properties" of "My Computer" state that my "File System" and my "Virtual Memory" are running in "MS-DOS Compatibility Mode" when using the on-board IDE controller under Windows 95?

A24: The most probable cause is that Windows 95 was not installed on your NexGen motherboard. You must uninstall then reinstall Windows 95 on your NexGen motherboard in order to use the protected mode 32-bit driver capability provided by Windows 95.

Q25: Can I use the PCI on-board IDE controller driver "win4bm.386," which was installed by the EZIDE installation utility supplied by NexGen, under Windows 95?

A25: No, this driver is intended to be used with Windows 3.1x only. Use the EZIDE utility to uninstall this driver prior to upgrading to Windows 95.

Floppy / CD-ROM Drives

Q26: Why doesn't the system recognize my floppy drive?

A26: Ensure the floppy drive is cabled correctly (orientation of pin 1) and is installed correctly in the BIOS Setup based on the size and the drive letter desired.

Q27: Why isn't my IDE CD-ROM detected when attached to the on-board IDE controller?

A27: If using the on-board IDE controller, an IDE CD-ROM must be configured as a slave device if it is connected to the same IDE channel as a hard drive (where the hard drive is the master). The CD-ROM can only be configured as a master if it is the only device on the secondary IDE channel. If a CD-ROM is connected to the secondary IDE channel, then **Secondary Device 0 Installed: Secondary Device 1 Installed** under **Peripheral Setup** must be set to **Other**, depending upon whether the CD-ROM is the master or slave, respectively.

Memory

Q28: Can I use 70ns memory SIMMs in the motherboard?

A28: Yes, with one exception: certain P100-based PCI motherboards require 60ns memory. These can be identified by examining the memory controller on the motherboard (labeled **NxMC**). If it is stamped **VL82C500PSFC** then it requires 60ns memory. Any other variation of this part number -- for instance, the presence of a trailing numeric "1" -- indicates that 70ns memory is supported.

Q29: Does the PCI motherboard support EDO memory?

A29: Yes, with one exception: certain PCI motherboards require Fast Page Mode memory. These can be identified by examining the memory controller on the motherboard (labeled **NxMC**). If it is stamped **VL82C500PSFC** then EDO memory cannot be used. Any other variation of this part number -- for instance, the presence of a trailing numeric "1" -- indicates that EDO memory is supported.

The performance benefits of EDO memory in the NexGen PCI motherboard are minimal due to the full-speed L2 cache design of the Nx586 processor and the superior buffering scheme designed into the PCI chipset. Therefore, little, if any, performance degradation will be observed when using Fast Page Mode memory.

Q30: Do I need to change any memory-related parameters in Setup based on the speed of my memory?

A30: No, the default values set by loading the **Optimal** settings will suffice for 60-, 70-, and 80-ns memory SIMMs. The performance benefits gained by attempting to use faster memory parameters on the NexGen PCI motherboard are minimal due to the full-speed L2 cache design of the Nx586 processor and the superior buffering scheme designed into the PCI chipset.

Sound Cards

Q31: Why isn't my sound card working?

A31: An interrupt or DMA conflict may exist with other peripherals in your system. Run the sound card diagnostics to help resolve these conflicts. See Q11 for interrupt related information.

Performance

Q32: *How can I maximize my system performance?*

A32: 1) Use a 64-bit graphics PCI adapter with the latest driver supplied from the manufacturer; 2) Use the on-board IDE controller with the latest driver supplied by NexGen in the *PCI Toolkit* and *PCI Update Kit* that provides 32-bit virtual disk access support; 3) Use hard drives that support higher PIO modes; 4) Use at least 8 MB of memory (16 MB is even better for performance); 5) Use 32-bit disk and 32-bit file access in Windows 3.11 or Windows for Workgroups 3.11.

Beeps	Error Message	Description	Resolution
1	Refresh Failure	The memory refresh circuitry is faulty.	Reseat the memory SIMMs. If the system still beeps, replace the memory.
2	Parity Error	Parity error in the base memory (the first 64 KB block) of memory.	Reseat the memory SIMMs. If the system still beeps, replace the memory.
3	Base 64 KB Memory Failure	Memory failure in first 64 KB.	Reseat the memory SIMMs. If the system still beeps, replace the memory.
4	Timer Not Operational	A memory failure in the first 64 KB of memory, or Timer 1 is not functioning.	The motherboard must be replaced.
5	Processor error 8042 - Gate A20 Failure	The CPU generated an error.	The motherboard must be replaced.
6	8042 - Gate A20 Failure Processor Exception Interrupt Error	Cannot switch to protected mode.	Try a different keyboard, or replace the keyboard fuse, if the keyboard has one.
7	Processor Exception Interrupt Error	The CPU on the CPU Card generated an exception interrupt.	The motherboard must be replaced.
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty. This is not a fatal error.	There is a memory error on the video adapter. Replace the video adapter, or the RAM on the video adapter.
9	ROM Checksum Error	The ROM checksum value does not match the value encoded in WINBIOS.	The BIOS ROM chip is bad. The system probably needs a new BIOS ROM chip.
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM has failed.	The motherboard must be replaced.
11	Cache memory bad - do not enable cache	The cache memory test failed. Cache memory is disabled. Do not press <Ctrl> <Alt> <Shift> <+> to enable cache memory.	The motherboard must be replaced.

Table 1. WINBIOS Beep Codes

Technical Support

If you or your customers encounter any problems during the installation or operation of your system that are not addressed by this guide, please check one of NexGen's on-line support sites. NexGen maintains a BBS (Bulletin Board System), an Internet World Wide Web site and an Internet FTP site. These sites contain the latest driver and BIOS releases, product announcements, and answers to commonly asked questions.

NexGen BBS System:

408.955.1839

14.4 Kb/s

8 bits, 1 stop, no parity

NexGen Internet Web Site:

www.nexgen.com

NexGen Internet FTP Site:

[ftp.nexgen.com](ftp://ftp.nexgen.com)

Notes

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Notes (cont.)

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