SYSTEM BOARD D1181

TECHNICAL MANUAL

FUJITSU COMPUTERS
SIEMENS

Is there ...

... any technical problem or other
question you need clarified?

Please contact:
- one of our service partners
- your sales partner
- your sales outlet

The addresses of your service partners are contained in the guarantee booklet or in the service address booklet.

The latest information on our products, tips, updates, etc., can be found on the Internet under:
http://www.fujitsu-siemens.com

A26361-D1181-Z120-1-7619

SYSTEM BOARD D1181

Technical Manual

October 1999 edition

Contents

Contents

Introduction

i These system boards are available in different configuration levels. Depending on the hardware configuration of your device, it may be that you cannot find several options in the system board, even though they are described.

Important notes

Store this manual close to the device. If you pass on the device to third parties, you should also pass on this manual.

Be sure to read this page carefully and note the information before you open the device.

You cannot access the components of the system board without first opening the device. How to dismantle and reassemble the device is described in the Operating Manual accompanying the device.

Please note the information provided in the chapter "Safety" in the Operating Manual of the device.

Incorrect replacement of the lithium battery may lead to a risk of explosion. It is therefore essential to observe the instructions in the chapter "How to Replace the CR2032 Lithium Battery (HH)".
The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2032).

Do not throw lithium batteries into the trashcan. It must be disposed of in accordance with local regulations concerning special waste.

The shipped version of this board complies with the requirements of the EEC directive 89/336/EEC "Electromagnetic compatibility".

Compliance was tested in a typical PC configuration.

When installing the board, refer to the specific installation information in the Operating Manual or Technical Manual of the receiving device.

Connecting cables for peripherals must be adequately insulated to avoid interference.

Components can become very hot during operation. Make sure you do not touch components when making extensions to the system board. There is a danger of burns!

i The warranty is invalidated if the device is damaged during the installation or replacement of system expansions. Information on which system expansions you can use is available from your sales outlet or the customer service center.

Information on boards

To prevent damage to the system board or the components and conductors on it, please take great care when you insert or remove boards. Take care above all to ensure that extension boards are slotted in straight without damaging components or conductors on the system board, or any other components, for example EMI spring contacts.
Be especially careful with the locking mechanisms (catches, centering pins etc.) when you replace the system board or components on it, for example memory modules or processors.

Never use sharp objects (screwdrivers) for leverage.

Boards with electrostatic sensitive devices (ESD) are identifiable by the label shown.

When you handle boards fitted with ESDs, you must observe the following points under all circumstances:

- You must always discharge yourself (e.g. by touching a grounded object) before working.
- The equipment and tools you use must be free of static charges.
- Pull out the power plug before inserting or pulling out boards containing ESDs.
- Always hold boards with ESDs by their edges.
- Never touch pins or conductors on boards fitted with ESDs.

Installation Precautions

When you install and test the system board, observe all warnings and cautions in the installation instructions.

To avoid injury, be careful of:

- Sharp pins on connectors
- Sharp pins on printed circuit assemblies
- Rough edges and sharp corners on the chassis
- Hot components (like processors, voltage regulators, and heat sinks)
- Damage to wires that could cause a short circuit.
- Observe all warnings and cautions that instruct you to refer computer servicing to qualified technical personnel.

1 System board Features

Feature Summary

Form Factor	ATX (12.0 inches by 9.6 inches)
Processor	Support for one to two Intel® Pentium® III processors • Two- (2), 242-pin connectors • 133 MHz host bus speed (FSB) • 512 KB discrete L2 cache support on each processor or • 256 KB advanced transfer L2 cache support on each processor
Chipset	Intel® 82840, consisting of: • Intel 82840 Memory Controller Hub (MCH) • Intel 82801AA I/O Controller Hub (ICH) • Intel 82802AC 8 Mbit Firmware Hub (FWH)
Memory	Support for up to 1 GB[1] • Four- (4), 168-pin RDRAM* Interface Memory Module (RIMM*) sockets
I/O Control	SMSC* LPC47B272 SIO low pin count (LPC) interface I/O controller
AGP Video	AGP universal connector support 1X, 2X, 4X and AGP Pro50*
Peripheral Interfaces	• One- (1), serial port (RS232) • Two- (2), Universal Serial Bus (USB) ports • One- (1), parallel port (IEEE 1284) • Two- (2), IDE interfaces with Ultra ATA-66 support • One- (1), diskette drive interface • SCSI HD Activity LED connector (optional)
Expansion capabilities	Six- (6), add-in card expansion slots • Five- (5), full-length, PCI 32/33 bus add-in card connectors • One- (1), AGP universal connector
BIOS	• Intel proprietary BIOS for workstations • Intel® 8 Mbit symmetrical blocked (per EPS) flash memory • Compliant with Advanced Configuration and Power Interface (ACPI) and SMBIOS
Management Level 5	• Intel® 82559 Local Area Network (LAN) Controller • Alert on LAN™2
Hardware Monitor Subsystem	• Six- (6), fan sense inputs used to monitor fan activity • Two- (2), headers for chassis intrusion detection security feature • Multiple processor temperature sensors • Voltage sense to detect out-of-range values • DMI Event logging
Other features	Hardware monitor (optional) Audio subsystem, AD1881

---

1 2GB may be supported with the availability of 512MB RIMM

Components

Figure 1 shows the major components found on the system board.
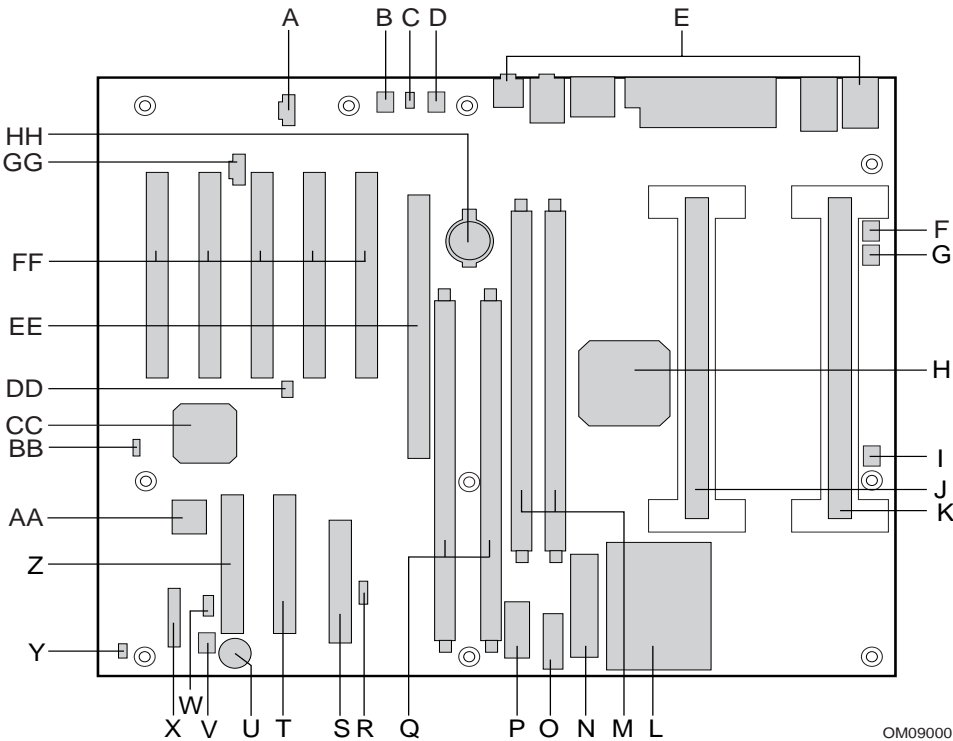
Figure 1. System board Components

A	CD-ROM audio connector	R	SCSI LED
B	System Fan A	S	Diskette drive connector
C	Rear chassis intrusion detection	T	Secondary IDE connector
D	System Fan B	U	Internal speaker
E	Rear panel connectors	V	System Fan C
F	Processor Fan B	W	Auxiliary LED connector
G	Processor Fan A	X	Front panel connector
H	Intel® 82840 Memory Controller Hub (MCH)	Y	Front chassis intrusion connector
I	Processor Fan C	Z	Primary IDE connector
J	Processor connector P1	AA	Intel® 82802AC Firmware Hub (FWH)
K	Processor connector P0	BB	Configuration jumper
L	DC-to-DC converter	CC	Intel® 82801AA I/O Controller Hub (ICH)
M	RIMM connectors 3 and 4 (Channel B)	DD	Internal MIDI connector
N	ATX power connector	EE	AGP Pro50 connector
O	Supplementary AGP Pro50 power connector	FF	PCI slots
P	Auxiliary power connector	GG	Telephony connector
Q	RIMM connectors 1 and 2 (Channel A)	HH	Battery

Microprocessor

The D1181 system board supports one or two Pentium* III processors as listed in Table 1. Each processor is packaged in a single-edge, contact cartridge 2 (S.E.C.C.2). The S.E.C.C.2 includes the processor core, second-level (L2) cache, thermal plate, and back cover.

Table 1. Processors Supported by the System board

Processor Type	Processor Core Frequency	Host Bus Speed	Cache Size
Pentium III processor	533B MHz	133 MHz	512 KB
	600B MHz	133 MHz	512 KB
	600EB MHz	133 MHz	256 KB
	667 MHz	133 MHz	256 KB
	733 MHz	133 MHz	256 KB

The letter designators for the table are:

E	Designates Pentium III processors with advanced transfer L2 cache
B	Designates Pentium III processors with 133 MHz host bus speed

For instructions on installing or upgrading processors, see Chapter 2.

Main Memory

The system board has four- (4) sockets used for installing RIMMs. Minimum memory size is 128 MB; maximum memory size is 1 GB^2. See Chapter 2 for types of memory supported and installation instructions. All supported on-board memory is cacheable.

Intel® 840 Chipset

Chipset on the D1181 system board consists of the following devices:

- 82840 Memory Controller Hub (MCH)
- 82801AA I/O Controller Hub (ICH)
- 82802AC Firmware Hub (FWH).

Advanced Graphics Port

The system board supports AGP 1X, 2X, 4X and AGP Pro50* add-in graphics cards.

---

2 2GB may be supported with the availability of 512MB RIMM

AGP

AGP is a high-performance, interconnect for graphic-intensive applications, such as 3D applications. AGP is independent of the PCI bus and is intended for exclusive use with graphical display devices. AGP provides these performance features:

- Pipelined-memory read and write operations that hide memory access latency
- Demultiplexing of address and data on the bus for near-100 percent bus efficiency
- AC timing for 133 MHz data transfer rates (AGP 2X), allowing data throughput of 533 MB/sec
- AC timing for 266 MHz data transfer rates (AGP 4X), allowing data throughput of 1064 MB/sec

An AGP Pro50 universal add-in card connector is provided on the system board. It accommodates both AGP and AGP Pro50 cards with a maximum power requirement of 50 Watts.

AGP Pro50

AGP Pro50* is an extension to the AGP interface specification and is designed to meet the needs of advanced workstation graphics. The new specification is primarily designed to deliver additional electrical power to the graphics add-in cards.

The AGP Pro Universal Connector on the D1181 system board is designed to deliver up to 50 Watts of electrical power.

i	The system board has been designed to support AGP Pro50 add-in cards. If you install an APG Pro add-in card with a power consumption > 50W, the BIOS utility prevents the board from booting. In addition, it is recommended that the Supplementary AGP Pro50 power connector is utilized when running an AGP Pro50 card.

!	Installing an AGP add-in card, which does not meet the requirements of the Accelerated Graphics Interface Specification Revision 2.0, may result in damage to the system board or the card.

Audio Subsystem

The Audio Subsystem includes the AD1881 Analog Devices* Audio Codec, and various connectors.

Analog Devices* AD1881 Audio Codec

The board contains a single *AC '97 V 2.0*-compliant audio feature, an Analog Devices* AD1881 Audio Codec, which also meets *AC '97 V 2.1 Extensions*. The AD1881 offers multiple features, including:

- Multi-bit Sigma-Delta Converter Architecture* for improved signal-to-noise ratio: ≥90 dB
- 16-bit stereo full-duplex Codec
- Audio inputs
- Audio outputs
- Power management support
- Digital audio mixer mode
- DSP 16-bit serial port format, slot 16 mode
- Full variable 7 kHz to 48 kHz sampling rate with 1 Hz resolution
- Split power supplies (3.3V Digital/5V Analog)
- Phat* Stereo 3D Stereo Enhancement

Audio Connectors

The audio connectors include the following:
- ATAPI-style CD-ROM
- ATAPI-style Telephony
- MIDI connector
- Back panel audio connectors
  - Line out
  - Line in
  - Mic in

LAN Subsystem

The Intel 82559 10/100Mbps Fast Ethernet Wired for Management (WfM), LAN subsystem provides both 10Base-T and 100Base-TX connectivity. Features include:

- Dual mode 10Base-T and 100Base-TX capability using a single RJ45 connector
- 32-bit, 33 MHz direct bus mastering on the PCI bus
- Shared memory structure in the host memory that copies data directly to/from host memory
- 10Base-T and 100Base-TX capability using a single RJ45 connector with connection and activity status LEDs
- IEEE 802.3µ Auto-Negotiation for the fastest available connection
- Jumperless configuration; the LAN subsystem is completely software-configurable.

Intel® 82559 LAN Controller

The Intel 82559 PCI LAN controller's features include:

- CSMA/CD Protocol Engine
- Glueless 32-bit PCI Bus interface
- DMA engine for movement of commands, status, and network data across the PCI bus
- Integrated physical layer interface, including:
    - Complete functionality necessary for the 10Base-T and 100Base-TX network interfaces; when in 10 Mbit/sec mode, the interface drives the cable directly
    - A complete set of Media Independent Interface (MII) management registers for control and status reporting
    - 802.3µ Auto-Negotiation for automatically establishing the best operating mode when connected to other 10Base-T or 100Base-TX devices, whether half- or full-duplex capable
- Jumperless configuration; the LAN subsystem is completely software-configurable
- Integrated power management features, including:
    - System Management Bus support
    - Support for Wake on LAN* and Alert on LAN* 2 technology
    - Support for ACPI technology

RJ45 LAN Connector LEDs

Two- (2) LEDs are built into the RJ45 LAN connector. Table 2 describes the LED states when the board is powered up and the LAN subsystem is operating.

Table 2. RJ45 LAN Connector LEDs

LED Color	LED State	Indicates
Green	Off	10 Mbit/sec speed is selected.
	On	100 Mbit/sec speed is selected.
Yellow	Off	LAN link is not established.
	On (steady state)	LAN link is established.
	On (brighter and pulsing)	The computer is communicating with another computer on the LAN.

PCI Enhanced IDE Interface

The PCI enhanced IDE interface handles the exchange of information between the processor and peripheral devices like hard disks, CD-ROM drives, and Iomega Zip[*] drives inside the computer. The interface supports:

- Up to four- (4) IDE devices (such as hard drives).
- ATAPI devices (such as CD-ROM drives).
- ATA devices using the single-word DMA 0, 1, and 2 and multi-word DMA 1 and 2, PIO 0-4.
- Ultra ATA/33 and Ultra ATA/66.
- Logical block addressing (LBA) of hard drives larger than 528 MB and extended cylinder head sector (ECHS) translation modes.
- Support for laser servo (LS-120) drives. However, an LS-120 drive can not be configured as a boot drive.

Input / Output (I/O) Controller

The SMSC* LPC47B272 super I/O controller handles the exchange of information between the processor and external devices, such as a mouse, keyboard, or printer that are connected to the computer. The controller features the following:

- Low pin count (LPC) interface
- One- (1) serial port
- One- (1) parallel port with Extended Capabilities Port (ECP) and Enhanced Parallel Port (EPP) support
- Serial IRQ interface compatible with serialized IRQ support for PCI systems (16C550 compatible)
- PS/2-style mouse and keyboard interfaces
- Fan Tachometer Inputs
- Interface for only one- (1), 1.44 MB 3.5-inch floppy diskette drive
- Intelligent power management, including a programmable wake up event interface
- Infrared port (IrDA 1.1 compliant)
- Supports multiple GPIOs

Note: The BIOS Configuration Manager program provides configuration options for the I/O controller.

Real-Time Clock

The system board has a time-of-day clock and a multi-century calendar with alarm features and century rollover. A battery on the system board keeps the clock current when the computer is turned off.

> **i** The recommended method of accessing the date in systems with the system board is indirectly from the Real-Time Clock (RTC) via the BIOS. The BIOS contains a century checking and maintenance feature. This feature checks the two least significant digits of the year stored in the RTC during each BIOS request (INT 1Ah) to read the date and, if less than 80 (i.e., 1980 is the first year supported by the PC), updates the century byte to 20. This feature enables operating systems and applications using the BIOS date/time services to reliably manipulate the year as a four-digit value.

USB Support

The system board has two- (2) USB ports, only one- (1) USB peripheral can be connected per port. To attach more than two- (2) devices, connect an external hub to either of the built-in ports. The system board fully supports the standard, Universal Host Controller interface (UHCI) and takes advantage of standard software drivers written to be compatible with UHCI.

> **i** Computer systems that have an unshielded cable attached to a USB port might not meet FCC Class B requirements, even if no device or a low-speed USB device is attached to the cable. Use a shielded cable that meets the requirements for full-speed USB devices.

BIOS

The BIOS provides the "Power-on Self-test" (POST), the BIOS Configuration Manager (Setup) program, ACPI, PCI and IDE auto-configuration utilities. The BIOS can be upgraded by following the instructions in Section 3.

Intel$^®$ 82802AC Firmware Hub (FWH)

The BIOS is stored in the Intel 82802AC Firmware Hub. The firmware hub contains a nonvolatile memory core based on Intel$^®$ Flash technology. In addition to storing the system BIOS, the firmware hub incorporates logic features such as the hardware Random Number Generator (RNG). These logic features enable protection for storing and updating platform information relating to security and manageability.

PCI Auto Configuration

If you install a PCI add-in board in your computer, the PCI auto-configuration utility in the BIOS automatically detects and configures the resources (IRQs, DMA channels, and I/O space) for that add-in board. You do not need to run the BIOS Setup program after you install a PCI add-in board.

IDE Auto Configuration

If you install an IDE device (such as a hard drive) in your computer, the IDE auto-configuration utility in the BIOS automatically detects and configures the device for your computer. You do not need to run the BIOS Setup program after installing an IDE device.

Security Passwords

The BIOS includes security features that restrict whether the BIOS Setup program can be accessed and who can boot the computer. An administrator password and a user password can be set for Setup and for booting the computer, with the following restrictions:

- The administrator password gives unrestricted access to view and change all Setup options. This is administrator mode.
- Setting a user password restricts who can boot the computer. The password prompt is displayed before the computer is booted. If the administrator password is the only setting, the computer boots without asking for a password. If both passwords are set, you can enter either password to boot the computer.

Expansion Slots

The system board has five- (5), PCI expansion slots and one- (1) AGP slot.

Power Management Features

Power management is implemented at several levels, including:

- Software support:
    - Advanced Configuration and Power Interface (ACPI)
- Hardware support:
    - Alert-on -LAN* 2 Technology
    - Wake-on-LAN* Technology
    - Wake-on-Ring Technology
    - Wake on USB Keyboard/mouse (S1 is presently supported). Note: S3 wake support for the USB Keyboard/mouse is planned for the near future.
    - Wake on Real-time clock

Note: Advanced Power Management is not supported.

Wake on LAN* Technology

Wake on LAN Technology enables remote wakeup of the computer through a network. The system board supports Wake on LAN through the PCI bus PME# signal and the Intel® 82559 LAN controller. This signal can wake up the computer only when the power cord is still plugged into the socket and the computer is in a supported sleep state. Wake on LAN can be enabled or disabled through the BIOS Configuration Manager program. A "Wake on LAN" connector is not required.

Alert on LAN* 2 Technology

The system board supports Alert on LAN Technology. Alert on LAN Technology enables PCs to send immediate alerts over the network when there are hardware or operating system failures or evidence of tampering. Alert on LAN* 2 improves on this technology by providing a way to remotely reboot hung systems. If the system still hangs, it can be booted to a "known good state" in order to run diagnostics.

The 82559 LAN device supports Alert on LAN 2 technology in combination with the Alert on LAN device through a dedicated 8-bit interface and through the Intel® 82801AA ICH.

Battery

A battery on the system board keeps the clock and the values in CMOS RAM current when your computer is turned off. See Chapter 2 for instructions on how to replace the battery.

2 Installing and Replacing System board Components

This chapter explains how to remove and install the D1181 system board and its various component parts. The chapter covers the following topics:

Topic or Procedure

Safety Considerations Before You Begin

Installing the Processor(s)

Removing the Processor(s)

How to Upgrade a Processor

How to Install the Termination Card

Procedure to Install the Termination Card

How to Install Memory

Memory Installation and Removal

Procedure to Install RIMMs

Procedure to Remove RIMMs

How to Replace the CR2032 Lithium Battery (HH)

Procedure to Replace the Battery

How to Set BIOS configuration Jumpers

Safety Considerations Before You Begin

⚠️ For all steps described in this chapter exit the suspend mode before switching off the device and then pull the power plug out of the power outlet!
Even when you have run down the device, parts of the device (e. g. memory modules, AGP and PCI extension boards) are still energized.
The voltage indicator LED shows whether the main-memory slots are energized.

Installing the Processor(s)

| i |

If you are installing a single processor, you must:

- Install the processor in the slot marked 'P0'

- Install a termination card in the slot marked 'P1'

If you are installing two processors, the following values must be identical for both processors:

- Host bus speed

- Processor core frequency

- Cache size

- Cache type (either discrete or advanced transfer)

- Operating voltages
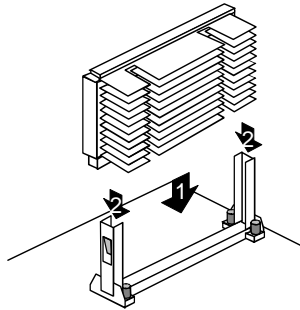
► Remove the old processor if necessary.

► Slide the processor into the bracket (1).

► Push the processor down in the bracket and press it into the slot until the clamps (2) to the left and right snap into place.

► If the processor has a temperature sensor or a fan, attach the associated cable to the connector for the temperature sensor or the fan on the system board.

Removing the processor

► If the processor has a temperature sensor or a fan, pull out the associated cable.

► Press the clamps (2) on either side of the processor slightly outwards and pull the processor up and out. Use a screwdriver if necessary.

How to Upgrade a Processor

i	If your system board contains one (1) microprocessor, then you can upgrade the computer by replacing this processor with one faster or by installing an application processor.

If your system board has two (2) microprocessors, then you can upgrade by replacing these processors with two faster processors.

If you install only one processor on a system board, then it must go in the boot (P0) processor connector. In a single processor configuration, you must install a Termination Card in the empty, application processor connector (P1), to ensure proper operation of the computer.

How to Install the Termination Card

Procedure to Install the Termination Card

The following is the procedure for installing a Termination card:

► Turn OFF the computer.

► Disconnect the computer's power cord and all external peripheral equipment.

► Remove any peripherals that block access to the processor connector.

► Slide the Termination Card into the GRM.

► Ensure that the alignment notches in the Termination Card fits over the key in the Processor connector.

How to Install Memory

i	You can install from 128 MB to 1 GB of 300 MHz or 400 MHz RDRAM into the four, system board RIMM sockets.

2GB may be supported with the availability of 512MB RIMM.

Memory Installation and Removal

Figure 2 illustrates the correct method for installing RIMMs*. The system board has two- (2) RDRAM* channels, in which a total of four- (4) RIMMs may be installed.

When using only two- (2) RIMMs, you must install a Continuity Rambus Inline Memory Module (CRIMM) in those slots that do not contain RIMMs.

Note: In order to optimize memory performance, you must first populate RIMM-1 and RIMM-3.
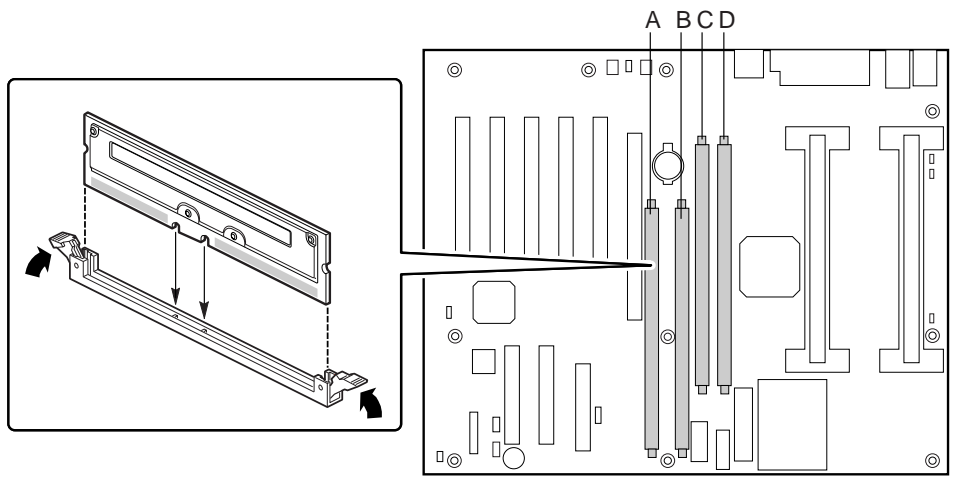
OM09018A

Figure 2. Installing RIMMs

A	RIMM-2 (Channel A)	C	RIMM-4 (Channel B)
B	RIMM-1 (Channel A)	D	RIMM-3 (Channel B)

Table 3 shows the optimum combinations for installing RIMMs and CRIMMS.

Table 3. Optimum RIMM Installation Combinations.

	RIMM 1	RIMM 2	RIMM 3	RIMM 4
Combination 1	RDRAM	CRIMM	RDRAM	CRIMM
Combination 2	RDRAM	RDRAM	RDRAM	RDRAM

i	CRIMMs must be installed in unpopulated RIMM connectors for the system board to boot. RIMMs must be installed as described previously in Table 3, or the system board will not boot.

The memory in RIMM-1 and RIMM-3 must be the same size, density, type, and speed. The memory in RIMM-2 and RIMM-4 must be the same size, density, type and speed. Using the encoded part numbers on the RIMMs is the best way to determine if the parts are the same.

Procedure to Install RIMMs

The following are the steps required used to install RIMMs:

► Disconnect the computer's power cord and all external peripheral equipment.

► Remove the computer cover and locate the RIMM sockets.

► Holding the RIMM by its edges, remove it from its anti-static package.

► Ensure that the clips at either end of the socket are pushed away from the socket.

► Position the RIMM above the socket and align the two- (2) small notches in the bottom edge of the RIMM with the keys in the socket.

Procedure to Remove RIMMs

The following are the steps required used to remove RIMMs:

► Turn OFF the computer.

► Disconnect the computer's power cord and all external peripheral equipment.

► Remove the computers' cover, and locate the RIMM sockets (See Figure 1/ Callout I).

► Gently spread the retaining clips at each end of the socket.

► The RIMM pops out of the socket.

► Holding the RIMM by its edges, lift it away from the socket and store it in an anti-static package.

How to Replace the CR2032 Lithium Battery (HH)

When turned off, a computer's lithium battery maintains the current time-of-day clock and the current values in CMOS RAM.

The battery should last about three- (3) years. When the battery begins to fail, it loses voltage; when the voltage drops below a certain level, the Setup program settings stored in CMOS RAM (for example, the date and time) might not be accurate. Always replace the battery with an equivalent one in size and value.

WARNING

Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du méme type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

⚠ ADVARSEL

Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

⚠ VARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

⚠ VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käjtetty paristo valmistajan ohjeiden mukaisesti.

Procedure to Replace the Battery

The following is the procedure for replacing the battery:

► Record CMOS settings.

► Turn OFF the computer.

► Disconnect the computer's power cord and all external peripheral equipment.

► Remove the computer cover.

► Locate the battery on the system board (See Figure 1/ Callout M).

► Gently pry the battery free from its socket using a small flat bladed screwdriver. Note the orientation of the "+" on the battery.

► Install the new battery in the socket, orienting the "+" as shown in the illustration.

► Replace the computer cover.

► Update CMOS records with any changes.
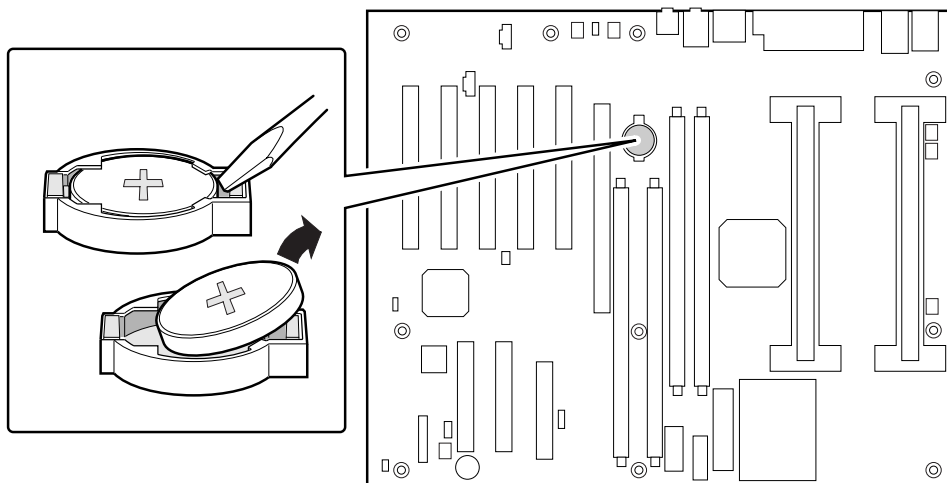
OM09020

Figure 3. Installing/Changing the Battery

How to Set BIOS configuration Jumpers

⚠ Do not move any jumper with the power on. Always turn off the power and unplug the power cord from the computer before changing a jumper setting. Otherwise, damage to the system board could occur.

The system board has one- (1) jumper block. Figure 4 shows the location of the system board's jumper block.

This 3-pin jumper block determines the BIOS Configuration Manager's mode. Figure 4 describes the jumper settings for the three modes: normal, configure, and recovery.
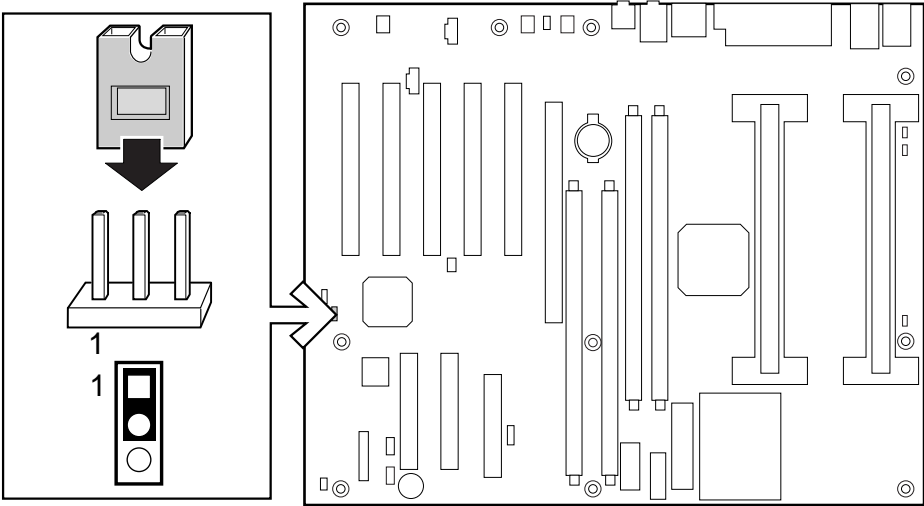
OM09013

Figure 4. Location of Configuration Mode Jumper

Table 4. BIOS Configuration Jumper (J1G2)

Function/Mode	Jumper Setting	Description
Normal	1-2	The BIOS uses current configuration information and passwords for booting.
Configure	2-3	Displays the Configuration Manager program, and clears the CMOS on the next power-up as well.
Recovery	None	The BIOS attempts to recover the BIOS configuration. A BIOS update diskette is required.

⚠ Always turn off the power and unplug the power cord from the computer before changing the jumper. Moving the jumper with the power on may result in unreliable computer operation.

3 Using the Configuration Manager

This chapter provides an overview of the Configuration Manager. This program enables you to change the BIOS settings of your computer. This chapter covers the following topics:

Topic or Procedure

Configuration Manager Tabs

Using the Mouse and Keyboard in Configuration Manager

Help Tab

System Processors Tab

System Memory Tab

Boot Options Tab

System Event Log Tab

Integrated IDE Tab

Integrated Floppy Tab

System BIOS Tab

Peripheral Ports Tab

Power Events Tab

Time/Date Tab

General Tab

Security Tab

Save/Exit Tab

How to enter the Configuration Manager please refer to chapter "Entering and Exiting the Configuration Manager".

Configuration Manager Tabs

The Configuration Manager is organized into a set of tabbed panels. Table 5 summarizes the uses for each Tab.

Table 5. Summary of Configuration Manager Screens

Tab Legend	Uses
Help	Help on using the Configuration Manager
System Processors	Displays processor information and Front Side Bus (FSB) speed
System Memory	Displays the amount of memory
	Enables Error Correcting Code (ECC)
Boot Options	Select the order for the boot devices
System Event Log	Configure System Event Log Mark System Event Log entries as read View System Event Log
Integrated IDE	Configure the Primary and Secondary IDE channels
Integrated Floppy	Configure the floppy
System BIOS	Displays the BIOS version
Peripheral Ports	Configure the serial ports, parallel port, and USB
Power Events	Enable or disable the S5 wake-up events
Time/Date	Set the time or date
General	Set the amount of time the introductory screen remains visible
	Disable the on-board Network Interface Card (NIC)
	Disable the on-board audio device
	Set resume after AC power failure or remain off
	Enable Num Lock at power-up
	Enable the processor serial number
	Set the temperature threshold for high-speed fan operation
Security	Set or clear the User and Administrator passwords
Save/Exit	Save, discard, or reset the changes
	Exit Configuration manager

Using the Mouse and Keyboard in Configuration Manager

You can use your keyboard and mouse together to navigate within the Configuration Manager, however the mouse is the preferred method.

Table 6. Mouse and Keyboard Usage in Configuration Manager

Mouse	Use the left mouse button to select tabs or buttons. If you have swapped the left and right mouse buttons in your Operating System, that setting is not in effect while you are using the Configuration Manager.
Backspace	Use the backspace key when entering text to erase the previous character.
Tab key	Use the Tab key to move to the next control.
Shift+Tab key	Use the Shift+Tab key to move back one control.
ESC key	Jump to the Save/Exit Tab.
F1 key	Displays help text for the selected tab.
Right Arrow	Move to the next Tab panel to the right. If you are currently on the last Tab panel, the Right Arrow will move to the first Tab panel.
Left Arrow	Move to the next Tab panel to the left. If you are currently on the first Tab panel, the Left Arrow will move to the last Tab panel.
Space Bar	If the focus is on a checkbox, use the Space Bar to toggle the check box on or off.
Enter	If the focus is on a button, use the Enter key to activate the button.
Up/Down Arrows	If the focus is on a combo box (a text box with a drop down list), the Up and Down Arrows will move the highlight in the drop down list up or down.
	If the focus is on a spin box, the Up and Down Arrows will select the previous or next value.

Note: Figure 5, which follows shows the General Tab in the Configuration Manager.

F ———
A ———
E ———
D ———
B ———
C ———

BIOS Configuration Manager

| System BIOS | Peripheral Ports | Time/Date | General | Security | Save ◄ ► |

Configure Splash Screen Delay Time

Splash Screen Delay: `10` ⇕

Configure General Platform Options

Integrated NIC Enabled: ☑
Integrated Audio Enabled: ☑
Keypad Num Lock: `On` ▾
High Speed Fan Threshold (C): `90` ▾

Intel(R) Processor Serial Number

Processor Serial Number Enabled: ☐
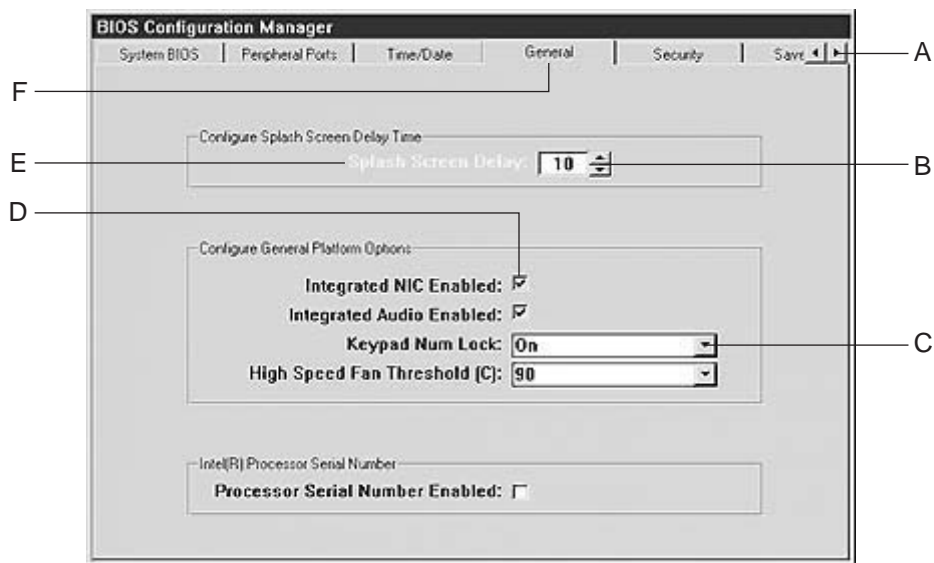
Figure 5. Configuration Manager Controls

A	Previous or next tab	D	Checkbox
B	Spin button	E	Label turns white to indicate focus
C	Drop-down list	F	Active tab

Help Tab

Figure 6. Help Tab

The Help Tab lists the keyboard navigation shortcuts used by Configuration Manager. For help on any Tab, press F1, or click the right mouse button.

System Processors Tab
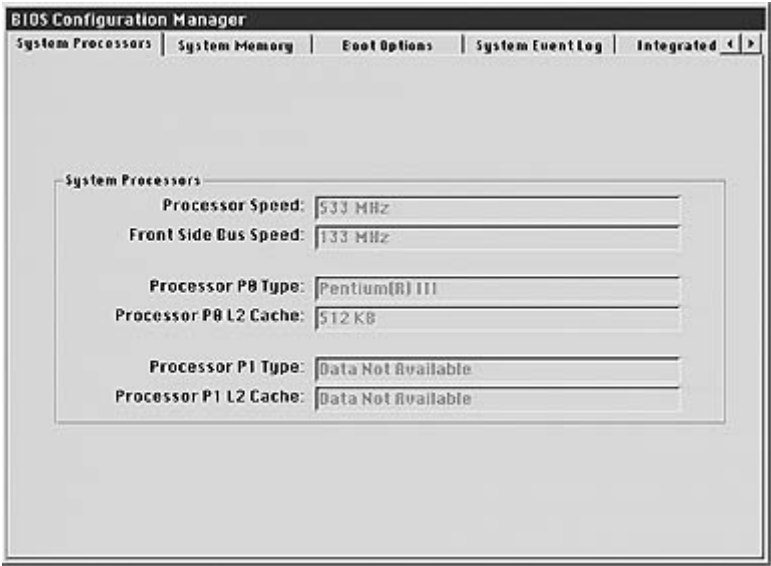
Figure 7. System Processors Tab

Table 7. Description of the System Processors Tab

Feature	Options	Description
Processor Speed	No options	Displays the processor speed detected by the BIOS. If two processors are installed, both processors have the same processor speed.
Front Side Bus Speed	No options	Displays the front side bus speed detected automatically by the BIOS. Only Pentium® III processors with 133 MHz front side bus speeds are supported.
Processor P0 Type	No options	Displays the processor type. P0 is the "boot processor".
Processor P0 L2 Cache	No options	Displays the amount of L2 cache RAM for the processor. The L2 cache is located on the processor cartridge.
Processor P1 Type	No options	Displays the processor type. P1 is the "application processor."
Processor P1 L2 Cache	No options	Displays the amount of L2 cache RAM for the processor. The L2 cache is located on the processor cartridge.

System Memory Tab
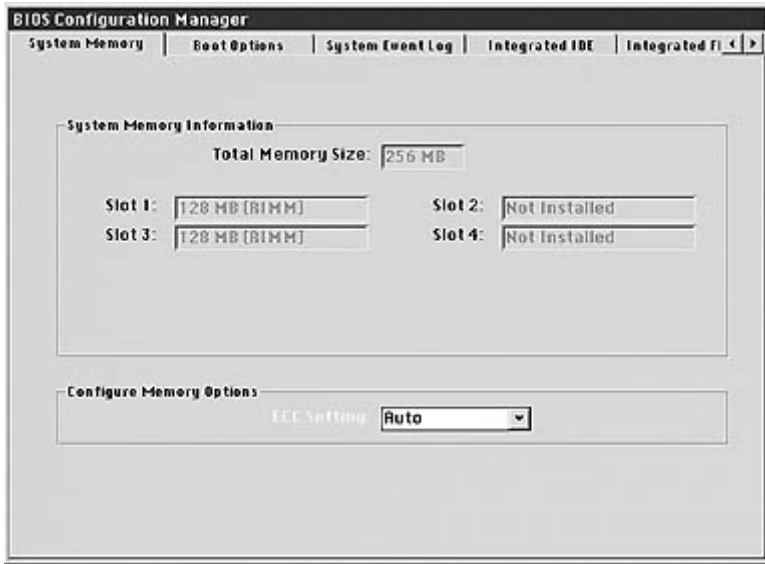
Figure 8. System Memory Tab

Feature	Options	Description
Total Memory Size	No options	Displays the total amount of RAM on the system board.
Memory Slot 1	No options	Displays the size and type of memory installed in this slot.
Memory Slot 2**	No options	Displays the size and type of memory installed in this slot.
Memory Slot 3	No options	Displays the size and type of memory installed in this slot.
Memory Slot 4**	No options	Displays the size and type of memory installed in this slot.
ECC Setting	**Auto** (default) Disabled	Enables or disables error correcting code (ECC) processing. Choose Auto to automatically enable ECC processing when ECC memory is detected.

** For best performance, avoid the following memory configurations: a.) Memory installed in slot 2, but not in slot 1; b.) Memory installed in slot 4, but not in slot 3; c.) Memory installed in slots 2 and 4, but not installed in slots 1 and 3.

Boot Options Tab
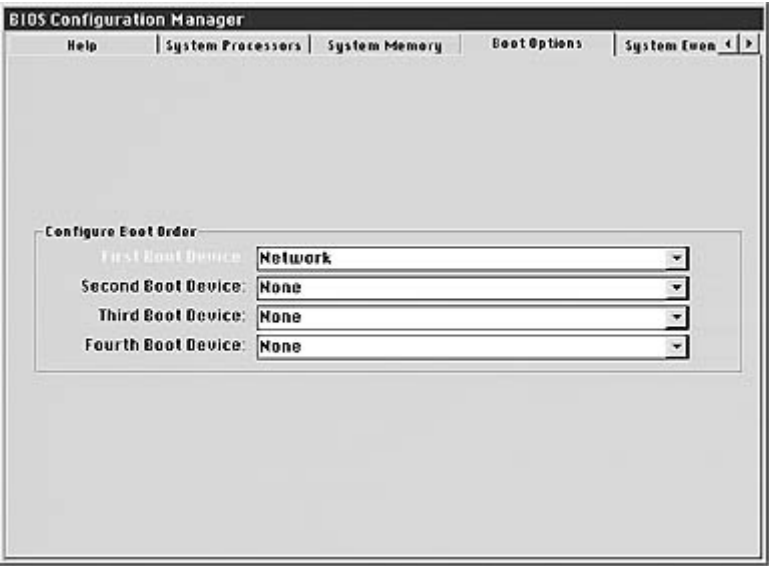
Figure 9. Boot Options Tab

Table 8. Description of the Boot Options tab

Feature	Options	Description
First Boot Device	**Auto** (default) None Available boot devices	Specifies the boot sequence from the available devices. The Auto setting selects the 3.5-inch floppy disk drive, if available. The Network boot is only available as the first boot device.
Second Boot Device	**Auto** (default) None Available boot devices	Specifies the boot sequence from the available devices. The Auto setting selects the IDE hard disk drive, if available.
Third Boot Device	**None** (default) Available boot devices	Specifies the boot sequence from the available devices.
Fourth Boot Device	**None** (default) Available boot devices	Specifies the boot sequence from the available devices.

System Event Log Tab
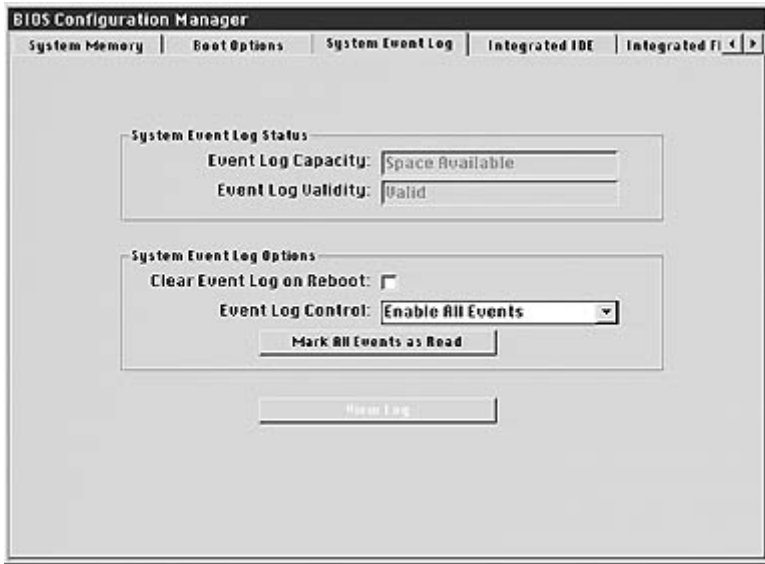
Figure 10. System Event Log Tab

Table 9. Description of the System Event Log Tab

Feature	Options	Description
Event Log Capacity	Display only	Shows whether or not space is available for the event log.
Event Log Validity	Display only	Shows whether or not the information in the event log is marked as valid or invalid.
Clear Event Log on Reboot	Enabled **Disabled** (default)	Enable this option to clear the event log each time the system is rebooted.
Event Log Control	**Enable All Events** (default) Disable All Events Disable ECC Events	Enable or disable event logging. Disable ECC Events will enable logging all events except for ECC events.
Mark All Events as Read	Button	Mark all events in the log as read.
View Log	Button	Displays the System Event Log (*see* Figure 11) and marks the events as read.
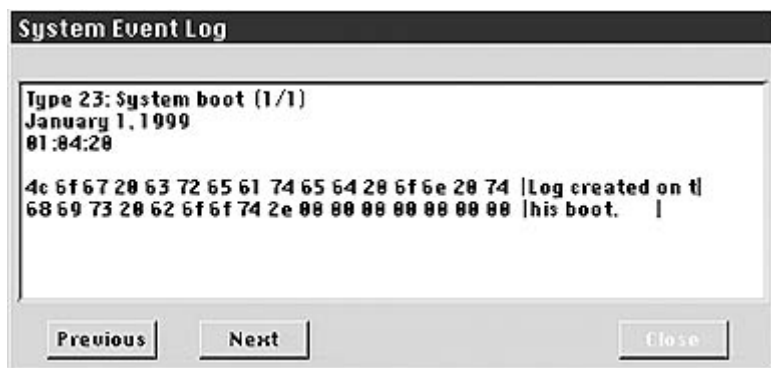
Figure 11. Sample View of System Event Log

Integrated IDE Tab
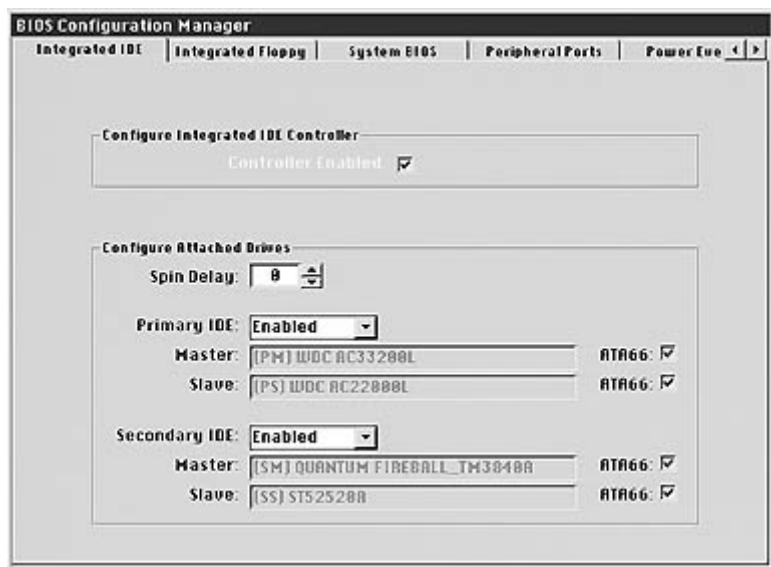
Figure 12. Integrated IDE Tab

Feature	Options	Description
Controller Enabled	**Enabled** (default) Disabled	*Disabled* will disable the dual-channel IDE controller. This option will prevent the IDE controller from using system resources. *Enabled* will enable the dual-channel IDE controller.
Spin Delay	0–60 seconds (**0** sec. is default)	Selects the hard disk drive pre-delay. Causes the BIOS to insert a delay before attempting to detect IDE drives in the system.
Primary IDE	**Enabled** (default) Disabled	*Enabled* automatically sets the values for the LBA mode, transfer mode, and Ultra DMA settings. *Disable* will disable the primary channel.
(Primary IDE) Master	No options	Reports the type of connected IDE device.
(Primary IDE) Slave	No options	Reports the type of connected IDE device.
Secondary IDE	**Enabled** (default) Disabled	*Enabled* automatically sets the values for the LBA mode, transfer mode, and Ultra DMA settings. *Disable* will disable the secondary channel.
(Secondary IDE) Master	No options	Reports the type of connected IDE device.
(Secondary IDE) Slave	No options	Reports the type of connected IDE device.
ATA66 (Primary Master, Primary Slave, Secondary Master, Secondary Slave)	**Enabled** (default) Disabled	Enables high-speed ATA-66 modes if an ATA-66 drive is used with the special 80-conductor IDE cable. If the drive doesn't support ATA-66 mode, or if the cable is not detected by the BIOS, the IDE device will operate in ATA-33 mode. Choosing Disabled forces the IDE device to operate in one of the ATA-33 modes.

Integrated Floppy Tab

Figure 13. Integrated Floppy Tab

Feature	Options	Description
Floppy Controller Enabled	**Enabled** (default) Disabled	Disables or enables the integrated diskette controller.
Floppy A	**1.44 MB, 3½"** (default) 2.88 MB, 3½"	Specifies the capacity and physical size of diskette drive A.
Write Protect A Enabled	**Disable** (default) Enable	Disables or enables the "write protect" feature for the diskette drive.

System BIOS Tab

Figure 14. System BIOS Tab

Table 10. Description of the System BIOS Tab

Feature	Options	Description
BIOS Version	No options	Displays the BIOS version.
SMBIOS Version	No options	Displays the System Management BIOS (SMBIOS) version.

Peripheral Ports Tab
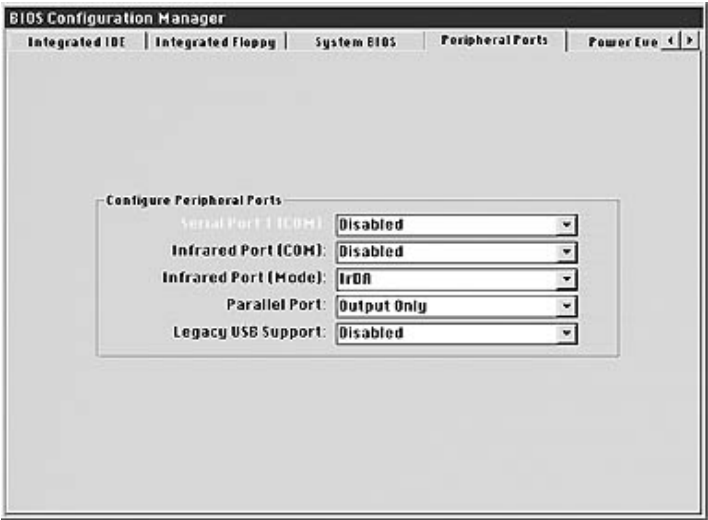
Figure 15. Peripheral Ports Tab

Table 11. Description of the Peripheral Ports Tab

Feature	Options	Description
Serial Port 1 (COM)	**COM1** (default) COM2 Disabled	Configures the serial port. *COM1* assigns COM1, address 3F8h, and interrupt IRQ4. *COM2* assigns COM2, address 2F8h, and interrupt IRQ3. *Disabled* disables Serial Port 1.
Infrared Port (COM)	Available COM ports **Disabled** (default)	Configures the infrared port. *COM1* assigns COM1, address 3F8h, and interrupt IRQ4. *COM2* assigns COM2, address 2F8h, and interrupt IRQ3. *Disabled* disables Serial Port 1.
Infrared Port (Mode)	IrDA (default)	Specifies the mode for serial port 2 for infrared applications.
Parallel Port	ECP **EPP** (default) Bi-directional Output only Disabled	Configures the parallel port. *Output Only* operates in AT-compatible mode. *Bi-directional* operates in bi-directional PS/2-compatible mode. *EPP* is Extended Parallel Port mode, a high-speed bi-directional mode. *ECP* is Enhanced Capabilities Port mode, a high-speed bi-directional mode.
Legacy USB Support	**Disabled** (default) Enabled	Enables or disables USB legacy support. Enable this option to use a USB keyboard or mouse with non-USB aware operating systems.

Power Events Tab
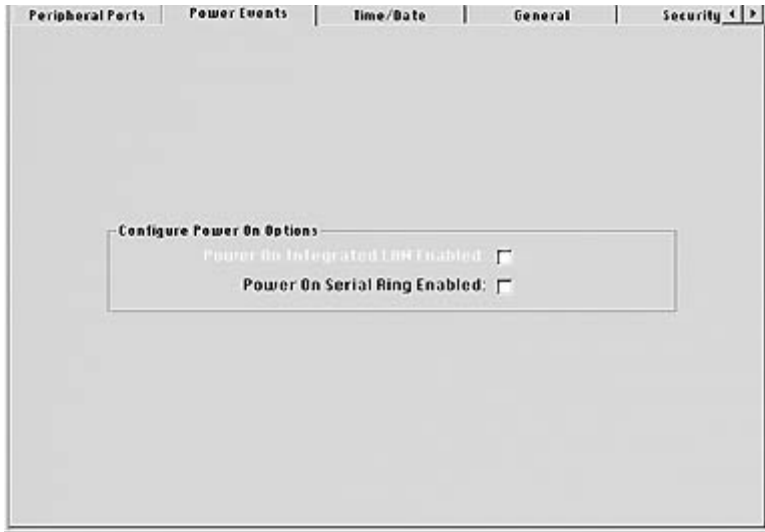
Figure 16. Power Events Tab

Table 12. Description of the Power Events Tab

Feature	Options	Description
Power On Integrated LAN Enabled	Enabled **Disabled** (default)	Choose this option to enable Wake on LAN from ACPI sleep state 5, or from the normal off state in non-ACPI operating systems. The default is disabled (the system will remain off). This option has no effect on the wake events in ACPI sleep states 1 and 4.
Power On Serial Ring Enabled	Enabled **Disabled** (default)	Choose this option to enable wake on ring for external modems connected to the serial port from ACPI sleep state 5, or from the normal off state in non-ACPI operating systems. The default is disabled (the system will remain off). This option has no effect on the wake events in ACPI sleep states 1 and 4.
Power On Add-In PCI (PME) Enabled	Enabled **Disabled** (default)	Choose this option to enable wake on PCI PME (Power Management Event) for PCI modems or other PCI devices from ACPI sleep state 5, or from the normal off state in non-ACPI operating systems. The default is disabled (the system will remain off). This option has no effect on the wake events in ACPI sleep states 1 and 4.

Time/Date Tab
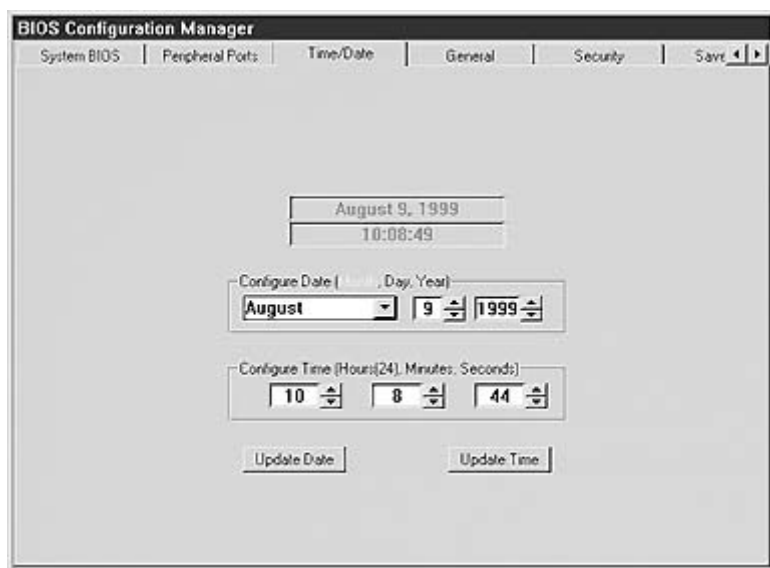
Figure 17. Time/Date Tab

Table 13. Description of the Time/Date Tab

Feature	Options	Description
Date	No options	Displays the current date.
Time	No options	Displays the current time.
Month, Day, Year	0-12, 1-31, 1980-2999	Specifies the current date.
Hours, Minutes, Seconds	0-23, 0-59, 0-59	Specifies the current time.
Update Date/Update Time	Buttons	Sets the date or time.

General Tab
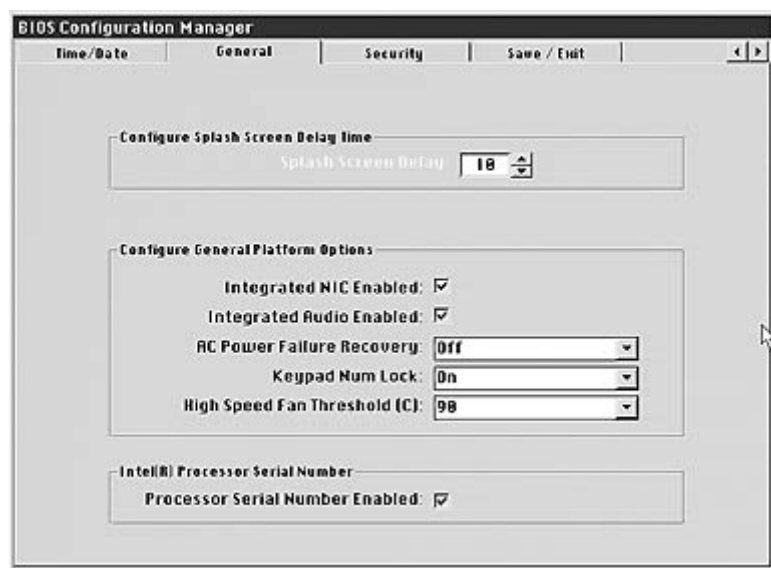
Figure 18. General Tab

Table 14. Description of the General Tab

Feature	Options	Description
Splash Screen Delay	2–30 seconds (**10** sec. is default)	Specifies the number of seconds to display the start-up screen before automatically booting the operating system.
Integrated NIC Enabled	**Enabled** (default) Disabled	Enables or disables the on-board LAN Network Interface Card (NIC).
Integrated Audio Enabled	**Enabled** (default) Disabled	Enables or disables the on-board audio.
AC Power Failure Recovery	**Off** (default) On	Specifies the response after an AC power failure. Choose Off to keep the system off after AC power is restored. Choose On to power-on the system after AC power is restored.
Keypad Num Lock	**On** (default) Off	Specifies the power-on state of the Num Lock feature on the numeric keypad of the keyboard.
Processor Serial Number Enabled	**Disabled** (default) Enabled	Enables or disables the Intel processor serial number in the Intel Pentium® III processors. This option applies to all processors in the system.
High Speed Fan Threshold (C) **	**0** (default) 70 75 80 85 90** 95** 100** 105** 110**	Select the processor junction temperature threshold (degrees Celsius) for high-speed operation of the system cooling fans. For maximum cooling, choose zero degrees to continuously run the fans in high-speed mode. For quieter operation, choose a temperature greater than zero.

** Junction temperatures higher than 85°C may result in system damages. Therefore it is not recommended to change the default settings.

Security Tab

Figure 19. Security Tab

Table 15. Description of the Security Tab

Feature	Options	Description
User Password Set	No options	Reports if a user password is set.
Administrator Password Set	No options	Reports if an Administrator password is set.
Clear User Password	Button	Clears the user password.
Set User Password	Button	Specifies the user password. The User Password can be up to 15 characters long.
Clear Administrator Password	Button	Clears the Administrator password.
Set Administrator Password	Button	Specifies the Administrator password. The Administrator Password can be up to 15 characters long.

Save/Exit Tab

Figure 20. Save/Exit Tab

Table 16. Description of the Save/Exit Tab

Feature	Options	Description
Save New Settings	Button	Saves the changes in Flash memory.
Discard Changes	Button	Discards any changes made in Configuration Manager.
Load Factory Settings	Button	Loads the factory default values for all the Configuration Manager options.
Exit	Button	Exits Configuration Manager.

4 Using the BIOS Features

The D1181 system board uses an Intel proprietary BIOS, which is stored in flash memory and can be upgraded using a disk-based program.

The flash memory also contains the BIOS Configuration Manager (described in Chapter 3), Power-On Self- Test (POST), the PCI auto-configuration utility, and Windows 98-ready Plug and Play code. This system board supports system BIOS shadowing. This chapter covers the following topics:

Topic or Procedure

Entering and Exiting the Configuration Manager

Booting the Operating System

Creating a Bootable Floppy Disk

Procedure To Create A Bootable Floppy Disk

Getting Online Help

Using the Memory Error Correcting Code

Setting the Time and Date

Keyboard Num Lock

High Speed Fan Threshold (C)

Enabling/Disabling On-board LAN NIC (Optional)

Enabling/Disabling On-board Audio (Optional)

Power Management ACPI Sleep States

IDE Configuration

Floppy Drive Configuration

Selecting Boot Options

How to Display the Network Bootstrap Selection Menu

Canceling a Network Boot

Identifying the BIOS

Setting the Splash Screen Delay

Using the BIOS Security Features

Clearing BIOS Passwords

Using USB

Serial Port Configuration

Parallel Port Configuration

Processor Speed Detection

Loading the Factory Default Settings

Entering and Exiting the Configuration Manager

The BIOS displays the introductory screen shortly after the start of the boot sequence.

● Choose *Enter Setup* to view the Configuration Manager

● Choose *Boot OS* to dismiss the introductory screen and continue booting the operating system

To move the current selection between the *Boot OS* and *Enter Setup* buttons, select the desired button with the left mouse button, or use the Tab key.

The text box between the two buttons shows the number of seconds remaining before the BIOS automatically continues and boots the OS.

Boot OS	Boot operating system
Enter Setup	Enter Configuration Manager

To exit Configuration Manager, do the following:

► Go to the Save/Exit Tab.

► Choose *Save New Settings* or *Discard Changes* if you have made changes in the Configuration Manager Settings.

► Choose *Exit*.

Booting the Operating System

To boot the operating system, do the following:

▶ Turn the power on or restart the system.

▶ Choose Boot OS from the introductory screen, or simply wait without making a choice (the BIOS will boot the operating system if you do not choose Enter Setup).

▶ If only the User Password is set, you must enter the User Password. If both the User and Administrator passwords are set, you can enter either password.

▶ The BIOS will search for a valid boot image on the boot devices selected in the Boot Options Tab in Configuration Manager.

If the system does not boot, check the following possible causes:

▶ The boot devices listed on the Boot Options Tab of the Configuration Manager do not have boot images.

▶ The system has a 110W AGP Pro graphics adapter.

▶ The boot image is on an unsupported device (USB mass storage device, Iomega ZIP* drive, LS-120 device).

Getting Online Help

To get online help, do the following:

► Go to the Tab where you need help.

► Press the F1 key, or click the right mouse button anywhere in the Tab Window.
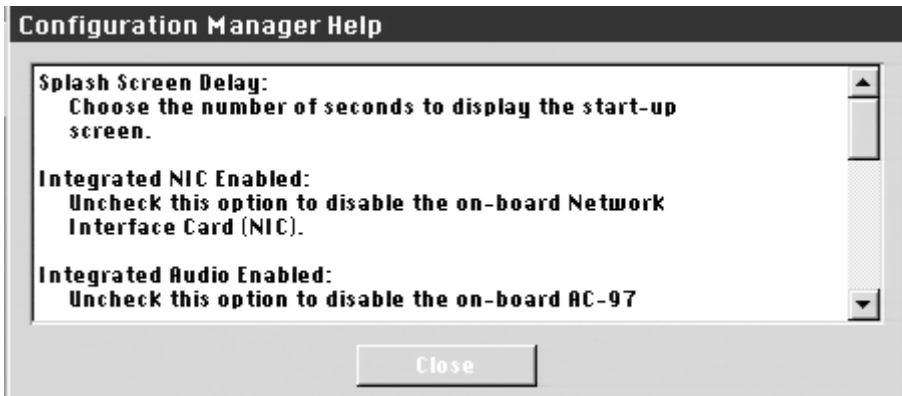
A pop-up window will appear with the on-line help for the Tab you selected.

Figure 21. Example of Configuration Manager Help (General Tab)

Using the Memory Error Correcting Code

● ECC Setting (System Memory Tab)

Use the ECC Setting option to enable or disable Error Correcting Code (ECC) support for main memory. The Auto option enables ECC if your system has ECC memory modules. If enabled, single-bit memory errors are detected and automatically corrected by the hardware. To log the ECC errors, go to the System Event Log Tab.

Setting the Time and Date

● Configure Date (Time/Date Tab)

● Configure Time (Time/Date Tab)

You can set the time and date in the operating system or in the Configuration Manager. To set the time or date, enter the new time or date, then press the Update Time or Update Date button.

Keyboard Num Lock

● Keypad Num Lock (General Tab)

Use the Keypad Num Lock setting to control the on/off state of the Num Lock key on the keyboard when the system is powered-on.

High Speed Fan Threshold (°C)

● High-Speed Fan Threshold (°C) (General Tab)

Use this option to select the processor junction temperature threshold (degrees Celsius) for high-speed operation of the system cooling fans (this does not affect the processor cooling fans). For maximum cooling, choose zero degrees to continuously run the fans in high-speed mode. For quieter operation, choose a temperature greater than zero. Junction temperatures higher than 85°C may result in system damages. Therefore it is not recommended to change the default settings.

Enabling/Disabling On-board LAN NIC (Optional)

● Integrated NIC Enabled (General Tab)

Use the Integrated Audio Enabled setting to enable or disable on on-board audio controller. This setting will not enable or disable the MIDI controller and dual game controller.

Power Management ACPI Sleep States

The BIOS supports ACPI-aware operating systems. Table 17 shows the wake events supported by the BIOS.

Table 17. Wake Events Supported for Each Sleep State

S0 Normal Operation	S1 Processor Sleep	S2	S3 Suspend to RAM	S4 Suspend to Disk	S5 Normal Off
Not applicable	LAN Modem ring** RTC alarm PCI PME USB (keyboard or mouse) PS/2 keyboard or mouse Power switch	Not supported	Not supported	LAN Modem ring** RTC alarm PCI PME Power switch	LAN Modem ring** PCI PME Power switch

** Serial or PCI modems only. No wake on modem ring support is provided for USB modems.

The S5 wake-up events can be enabled or disabled on the Power Events Tab. Momentary closure of the power switch will wake-up the system from all sleep states.

IDE Configuration

- Spin Delay (Integrated IDE Tab)
- Primary IDE (Integrated IDE Tab)
- Secondary IDE (Integrated IDE Tab)

If the IDE hard drive is not ready when the BIOS searches for a boot drive, the BIOS will proceed to the next boot device. To delay the BIOS search for boot devices until the IDE drive is ready, use the Spin Delay option to insert a delay.

Use the Primary IDE/Secondary IDE settings to enable the Primary/Secondary IDE channels.

Floppy Drive Configuration

- Floppy Controller Enabled (Integrated Floppy Tab)
- Floppy A: type (Integrated Floppy Tab)
- Write Protect A Enabled (Integrated Floppy Tab)

i	► Use the Floppy Controller Enabled setting to enable or disable the floppy drive.
	► Use the Floppy A: setting to select the floppy drive density.
	► Use the "Write Protect An Enabled" setting to enable or disable the write capability of the floppy disk drive.

Selecting Boot Options

- Select Boot Device (Boot Options Tab)
- Splash Screen Delay (General Tab)
- Hard Disk Spin-up Delay (Integrated IDE Tab)

In the Configuration Manager, the user can choose to boot from a diskette drive, hard drive, CD-ROM, or the network. The default setting is for the diskette drive to be the primary boot device and the hard drive to the secondary boot device. By default the third and fourth devices are disabled.

Booting from CD-ROM is supported in compliance to the *El Torito* bootable CD-ROM format specification. You can boot a CD-ROM from either a CD-ROM drive or a DVD drive. If you have multiple CD-ROM drives in your system, only the first CD-ROM drive found in the system can be used as a boot device.

A PXE-compliant network server may be selected as a boot device by choosing "Network" on the Boot Options Tab. The on-board network adapter does not require the user to install a remote boot ROM. Booting from an add-in network adapter may require the user to install a remote boot ROM. To access the PXE bootstrap selection menu, press both left and right shift keys immediately after the video BIOS sign-on message.

The Hard Disk Spin-up Delay setting is used to add a time delay to allow IDE hard disk drives to spin-up before the BIOS checks for a bootable image.

How to Display the Network Bootstrap Selection Menu

The D1181 system board includes a PXE boot ROM (included in the firmware hub) for the built-in network interface that is compatible with the *Preboot Execution Environment (PXE) Specification*. The Bootstrap Selection Menu is a feature required by the specification.

To display the Bootstrap Selection Menu, do the following:

▶   Power-on the system and enter Configuration Manger.

▶   Go to the Boot Options Tab. Change the First Boot Device to "Network."

▶   Reboot the system.

▶   Simultaneously press the two Shift keys immediately following the video BIOS sign-on messages. The Bootstrap Selection Menu (Figure 22) will be displayed.

```
Bootstrap Selection Menu
1 - Disable network boot
2 - Network boot using interrupt 18h
3 - Network boot using interrupt 19h
4 - Network boot using PnP/BEV (BBS)
Press 1, 2, 3 or 4: 4

Show initialization messages (y/n)?
```

Figure 22. Bootstrap Selection Menu Example

The default menu choice is to boot using PnP/BEV (BBS). The default setting will automatically be selected if the user doesn't enter a value. For most applications, choose the default value. For special situations, developers may want to choose either option 2 or 3.

After choosing an option from the bootstrap menu, you can turn the initialization messages on or off. The default is set to "n" (initialization messages will not be displayed).

Canceling a Network Boot

To cancel a PXE network boot, press the Escape key or <Ctrl> + <C>.

Identifying the BIOS

●   BIOS version (System BIOS Tab)

●   SMBIOS Version (System BIOS Tab)

The System BIOS Tab displays the BIOS identifier string and the version number for SMBIOS.

Setting the Splash Screen Delay

●   Splash Screen Delay (General Tab)

The Splash Screen Delay setting controls how long the OEM introductory screen remains visible.

Using the BIOS Security Features

- User password (Security Tab)
- Administrator password (Security Tab)

The BIOS has support for two password levels: Administrator and User. The User password is used to prevent unauthorized users from booting the Operating System. The Administrator password is used to prevent unauthorized users from entering the Configuration Manager.

Table 18. Administrative and User Passwords in Configuration Manager

Configuration Mode Jumper:	pins 1-2				pins 2-3
Condition➔ Action⬇	Neither Password Set	User Password Set	Administrator Password Set	Both Passwords Set	Jumper Set to Configure
Boot OS	No password required	User Password Required	No password required	Password Required (User or Administrator)	Not allowed
Remote Boot across Network using LAN-based Management Software	No password required	User Password must be entered on local machine	No passwords required	User Password must be entered on local machine	Not allowed
Enter Configuration Manager	No password required	No password required	Administrator Password Required	Administrator Password Required	No password required (Limited to setting the password)
Set or Reset User Password	No password required	User password required	Administrator Password Required**	Both Passwords Required**	No password required
Set or Reset Administrator Password	No password required	No password required	Administrator Password Required	Administrative Password Required	No password required

** Administrative password required allowing entry into the Configuration Manager.

Passwords are limited to 15 characters and are stored in flash memory. Valid characters have character codes in the range from 20h to 7Eh (32 to 126 in decimal notation). Updating the system BIOS clears both passwords.

Using USB

- Legacy USB Support (General Tab)

The D1181 system board includes an on-board USB hub that supports two device ports. USB-aware Operating Systems support the USB interface. For non USB-aware Operating Systems (Windows* NT 4.0), the BIOS will provide support for USB "legacy" keyboard and mouse.

To enable an USB keyboard/mouse in a non USB-aware Operating Systems, check "Legacy USB Support" on the General Tab.

Tips:

- You should not have more than two USB hubs between your device and the USB ports on your computer.
- Do not use two keyboards or two mice (one- (1) on the PS/2 or serial port and the other on the USB port).
- Do not connect or disconnect the keyboard or mouse during power-on.
- The BIOS does not support booting from USB storage devices.
- The BIOS does not support wake on ring from USB modems.

Serial Port Configuration

- Serial Port 1 (Peripheral Ports Tab)
- Infrared Port (Peripheral Ports Tab)

The D1181 system board has one RS-232 serial port connector, and one connector header for an IrDA v1.0 compatible infrared transceiver.

The infrared interface (not available in some systems) provides two-way wireless communications to infrared devices. The infrared transceiver must be connected to the infrared header on the system board.

The BIOS does not support booting with an infrared keyboard or mouse. Also, the BIOS utility does not support wake on infrared keyboard or mouse.

Parallel Port Configuration

* Parallel Port mode (Peripheral Ports Tab)

The parallel port mode can be set to ECP, EPP, Bi-directional, or Output only mode.

Table 19. Parallel Port Modes

Mode	Description
ECP	IEEE-1284 compatible Enhanced Capabilities Port mode. A bi-directional parallel port mode with hardware support for RLE compression. This mode is software and hardware compatible with all other parallel port modes and therefore can be used as the default mode.
EPP	IEEE-1284 compatible Enhanced Parallel Port (ECP 1.9) mode. A bi-directional parallel port mode.
Bi-directional	PS/2 type bi-directional parallel port (SPP) mode.
Output only	Output only mode used to support basic printers.

Processor Speed Detection

* Front Side Bus Speed (System Processor Tab)
* Processor Speed (System Processor Tab)

The processor speed and front side bus (FSB) settings are displayed on the System Processor Tab. Only Pentium® III processors with 133 MHz front side bus speeds are supported.

The D1181 system board only supports Intel® Pentium® III processors with a front-side bus speed of 133 MHz. Pentium III processors with a front-side bus speed of 100 MHz have not been validated on this system board. Installing Pentium II or Celeron™ processors may result in damage to the system board and processors.

If two processors are installed, both processors must have the same processor speed, cache size, and cache type (either discrete cache or advanced transfer cache).

The Intel nomenclature for Pentium III processors with speeds between 500 and 600 MHz includes two letter designators that customers can use to determine the front-side bus speed and cache type of the processor. The letter designators are:

E	Designates Pentium III processors with advanced transfer cache
B	Designates Pentium III processors with 133 MHz Front Side Bus speed

Note: All Pentium III processors above 600 MHz will have 133 MHz FSB and advanced transfer cache.

Examples:

Pentium III processor *xxx* MHz	Designates a *xxx* MHz Pentium III processor with a 100 MHz FSB and discrete cache
Pentium III processor *xxx*B MHz	Designates a *xxx* MHz Pentium III processor with a 133 MHz FSB and discrete cache
Pentium III processor *xxx*E MHz	Designates a *xxx* MHz Pentium III processor with a 100 MHz FSB and advanced transfer cache
Pentium III processor *xxx*EB MHz	Designates a *xxx* MHz Pentium III processor with both a 133 MHz FSB and advanced transfer cache

xxx=core processor speed, *e.g.*, 600

Loading the Factory Default Settings

- Load Factory Settings (Save/Exit Tab)

The Load Factory Settings button restores the factory defaults.

5 Upgrading the System BIOS

This chapter describes how to upgrade the System BIOS. This chapter covers the following topics:

Topic or Procedure

Preparing for the Upgrade

Obtaining the BIOS upgrade File

Recording the Current BIOS settings

Creating the BIOS Upgrade Diskette

Upgrading the System BIOS

Recovering the BIOS

Changing the BIOS Language

Preparing for the Upgrade

Before you upgrade the BIOS, prepare by:

- Obtaining the BIOS upgrade file
- Recording the current BIOS settings
- Creating the BIOS upgrade diskette

Obtaining the BIOS Upgrade File

You can upgrade to a new version of the BIOS by using the BIOS upgrade file. The BIOS upgrade file is a compressed self-extracting archive that contains all the files you need to upgrade the BIOS. The BIOS upgrade file also functions as the BIOS recovery file.

i	Please review the instructions distributed with the BIOS files for last minute notes before attempting a BIOS upgrade.

Recording the Current BIOS Settings

i	Do not skip step 2. You will need these settings to configure your computer at the end of the upgrade procedure.

- ► Boot the computer and choose the Enter Setup button.
- ► Use the form in Appendix C to record the current settings in the Configuration Manager.

Creating the BIOS Upgrade Diskette

To create a BIOS upgrade or recovery diskette, do the following:

► Obtain the BIOS upgrade file through your computer supplier

► Follow the instructions provided with the upgrade files to create the upgrade diskette:

Upgrading the System BIOS

i	For BIOS upgrades you must use a bootable 1.44 MB floppy. LS-120 drives cannot be used to upgrade or recover the BIOS. You must use a floppy diskette drive.

Use the following procedure to upgrade the BIOS:

► Create a BIOS upgrade diskette.

► Follow the instructions provided with the upgrade files.

Recovering the BIOS

⚠	Before opening the chassis, always turn the power off, unplug the power cord from the wall outlet, disconnect any telephone lines or LAN connections, and unplug all peripheral devices. The inside of the chassis presents potential for multiple risks of personal injury, including risk of electrical shock, burns due to hot components, and lacerations due to sharp edges! Refer to your system user's guide for important safety information. It is unlikely that anything will interrupt the BIOS upgrade, however, if an interruption occurs, the BIOS could be damaged. To recover the BIOS, use the following:

► Turn the computer off and unplug the power cord from the wall outlet, disconnect any telephone lines or LAN connections, and unplug all peripheral devices.

► Remove the chassis cover to gain access to the jumper.

► Remove the Configuration Mode jumper. Save the jumper.
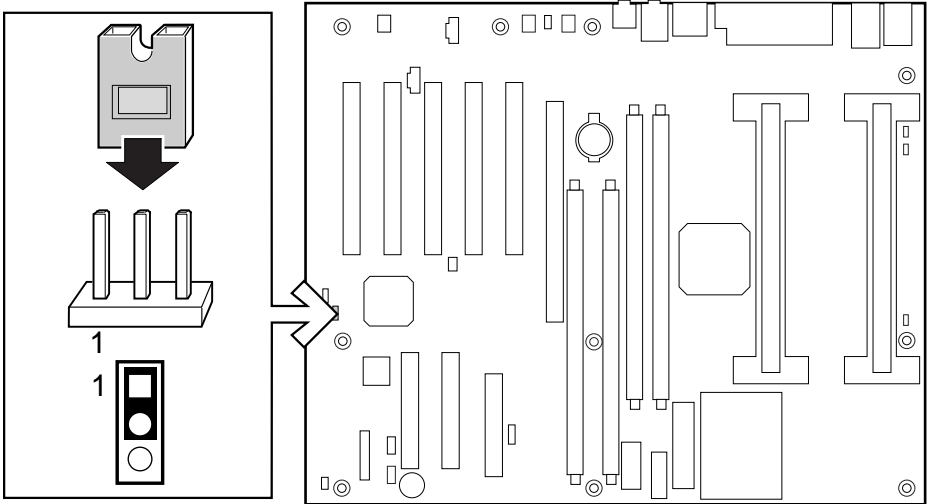
OM09013

Figure 23. Location of Configuration Mode Jumper

► Reassemble your system and turn the power on.

► Insert the BIOS upgrade diskette in drive A: then boot the computer. The BIOS will automatically update the System BIOS in flash memory. This process takes less than two minutes. The video display will be disabled during the upgrade process.

► Listen for the beeps coming from the small speaker on the system board (not the external audio port) that indicates the BIOS update is complete. Remove the BIOS upgrade diskette when you hear the following beep code: three beeps—pause—three beeps—pause—three beeps.

► Shut down the system and unplug the system.

► Reset the Configuration Mode jumper to the normal operation setting (connect jumper to pins 1–2).

► Reassemble the system and reboot.

► Choose Enter Setup.

► Change the Configuration Manager settings to match your previous settings.

► Save the changes and exit Configuration Manager.

Changing the BIOS Language

You can use the BIOS upgrade procedure to change the language the BIOS uses for the Configuration Manager. Use the BIOS upgrade procedure with the BIOS files for the desired language (see "Upgrading the System BIOS").

6 Technical References

System board Connectors

This chapter contains the following topics:

Topic or Procedure

Back Panel Connectors

Midboard Connectors

Audio Connectors

Fan Connectors

Power Connectors

Peripheral Connectors

Security Connectors

Add-in Board Connectors

Front Panel Connectors

System board Resources

Memory Map

System Management Bus Map

I/O Map

Fixed I/O Address Ranges

Variable I/O Decode Ranges

⚠ Only the back panel connectors of this system board have over-current protection. The powered-interval system board connectors are not over-current protected, and should connect only to devices inside the computer chassis, such as fans and internal peripherals. Do not use these connectors for powering devices external to the computer chassis. A fault in the load presented by the external devices could cause damage to the computer, the interconnecting cable, and the external devices themselves.

This section describes the system board's connectors. The connectors can be divided into three- (3) groups as shown in Figure 24.
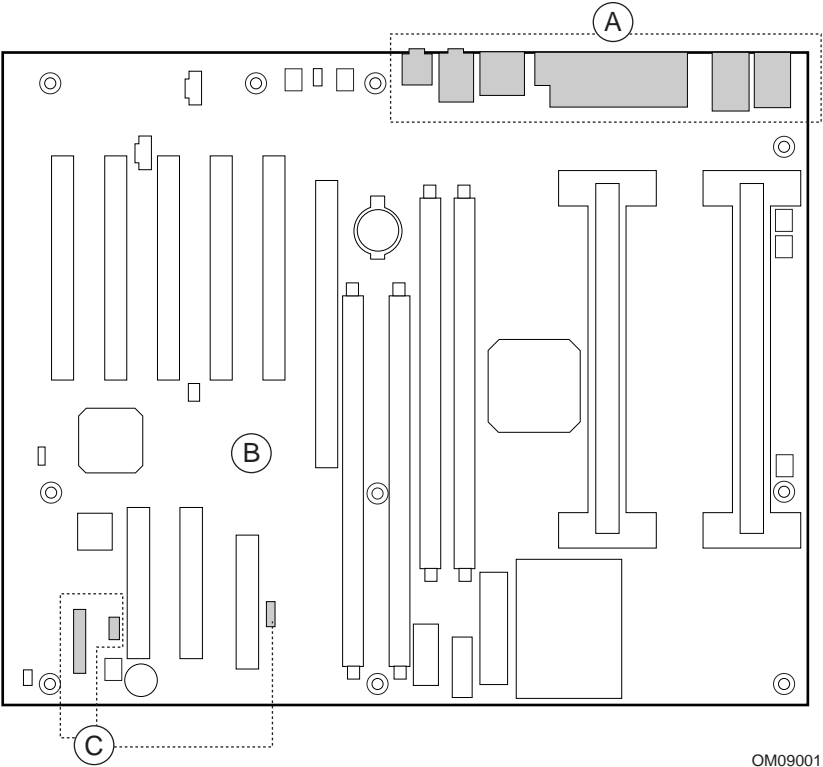
OM09001

Figure 24. Connector Groups

Group A	Back panel connectors
Group B	Midboard connectors
Group C	Front panel connectors

Back Panel Connectors

The following Figure 25 shows the location of the back panel connectors.

OM09003
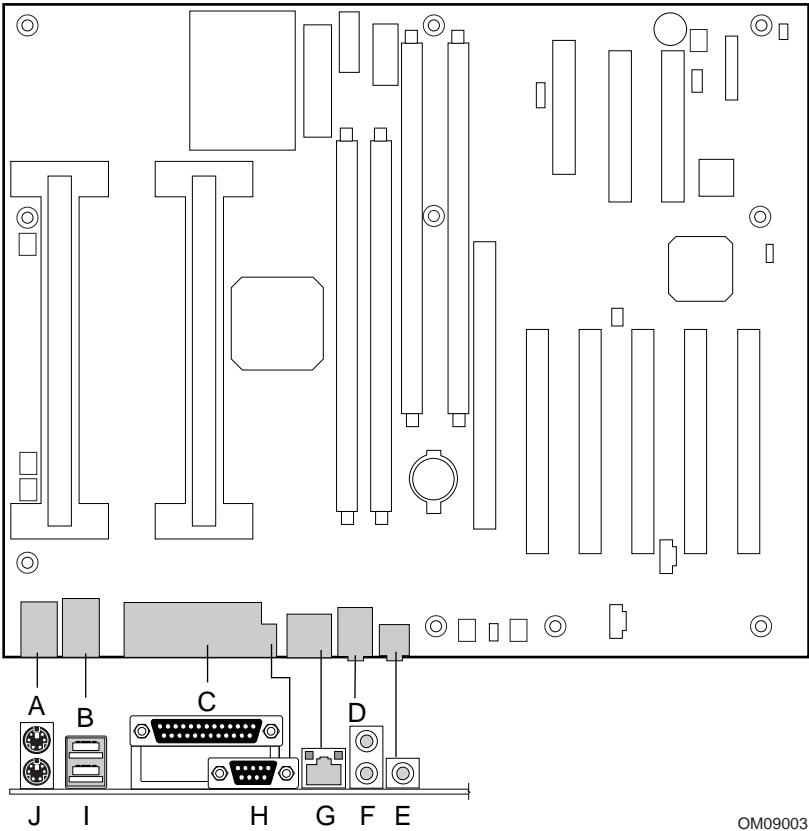
Figure 25. Back Panel Connectors

A	PS/2 Keyboard or Mouse	F	Line Out
B	USB Port 1	G	LAN
C	Parallel Port	H	Serial Port A
D	Line In	I	USB Port 0
E	Mic In	J	PS/2 Keyboard or Mouse

> **i** The back panel audio line out connector is only designed to power headphones or amplified speakers. Poor audio quality may occur if passive (non-amplified) speakers are connected to this output.

Midboard Connectors

The midboard connectors are divided into the following functional groups:

- Add-in board connectors
    - PCI
    - AGP

Audio Connectors
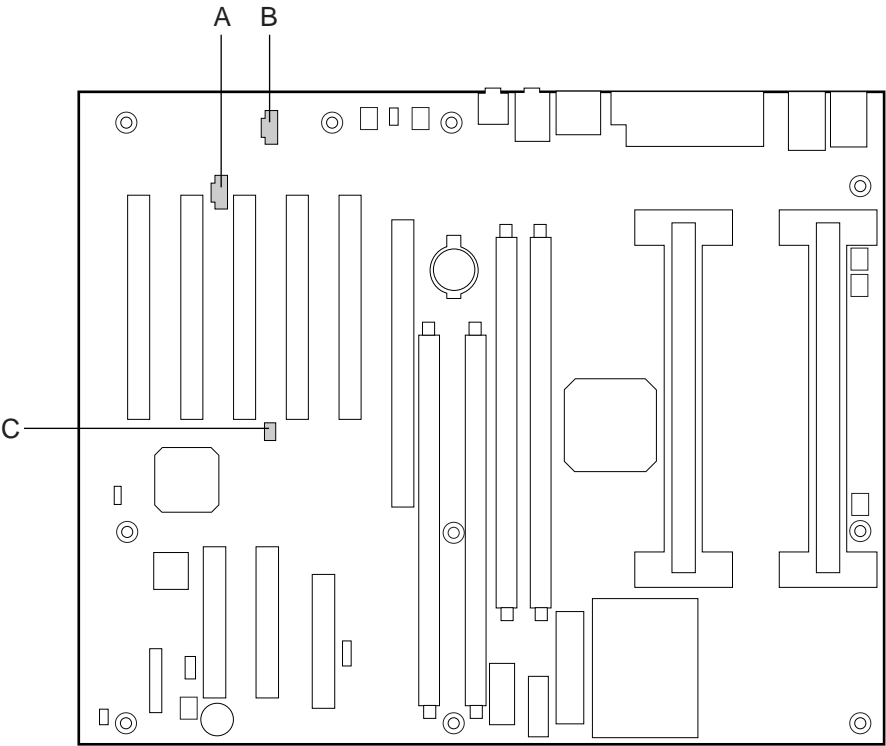
OM09009

Figure 26. Audio Connectors

A	ATAPI-style telephony	1x4-pin
B	ATAPI-style CD-ROM	1x4-pin
C	MIDI	2x3-pin

Fan Connectors
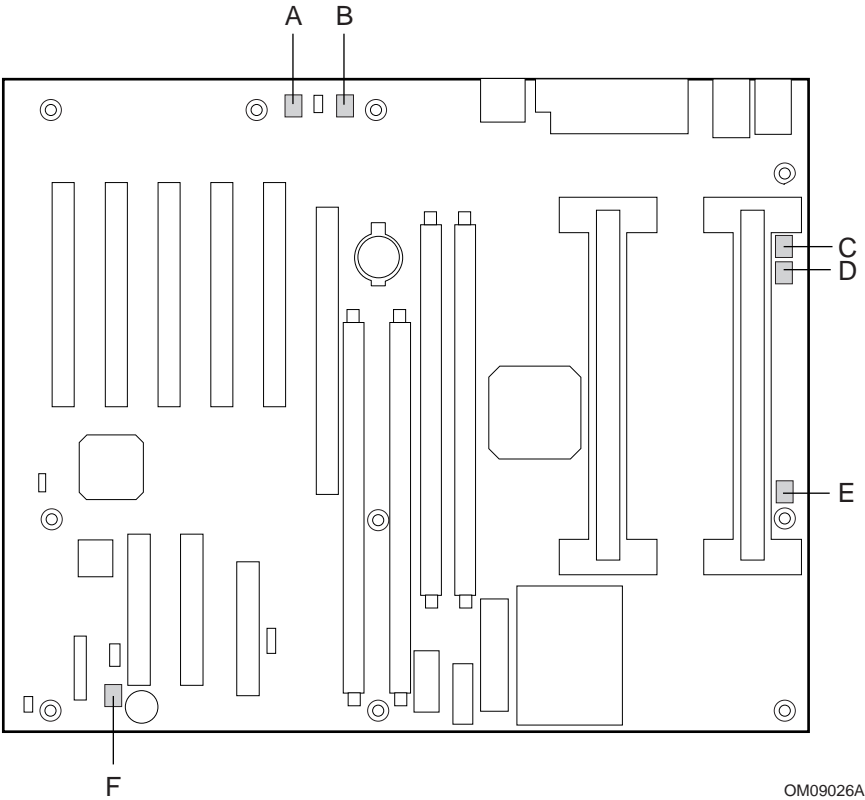
OM09026A

Figure 27. Fan Connectors

A	System Fan A
B	System Fan B
C	Processor Fan B
D	Processor Fan A
E	Processor Fan C
F	System Fan C

Power Connectors

⚠️ It is important to utilize the Supplementary AGP Pro50 power connector when the system board is configured with an AGP-Pro50 graphics card. This connector accepts a standard hard drive connector from the power supply cable harness. Failure to do this can result in damage to the system board and the 20-pin ATX connector through execessive12V current.
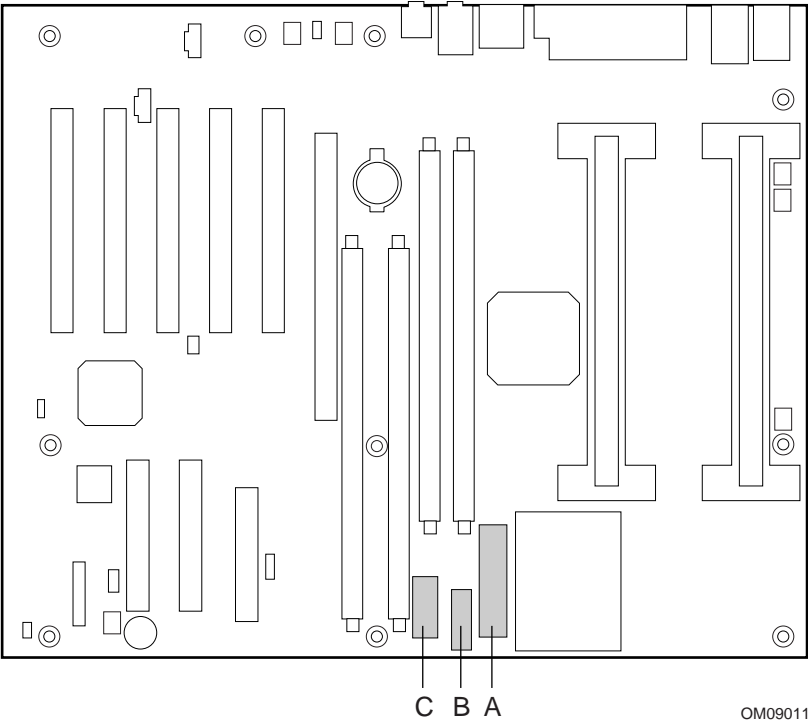
OM09011

Figure 28. Power Connectors

A	ATX power connector
B	Supplementary AGP Pro50 power connector
C	Auxiliary power connector

Peripheral Connectors
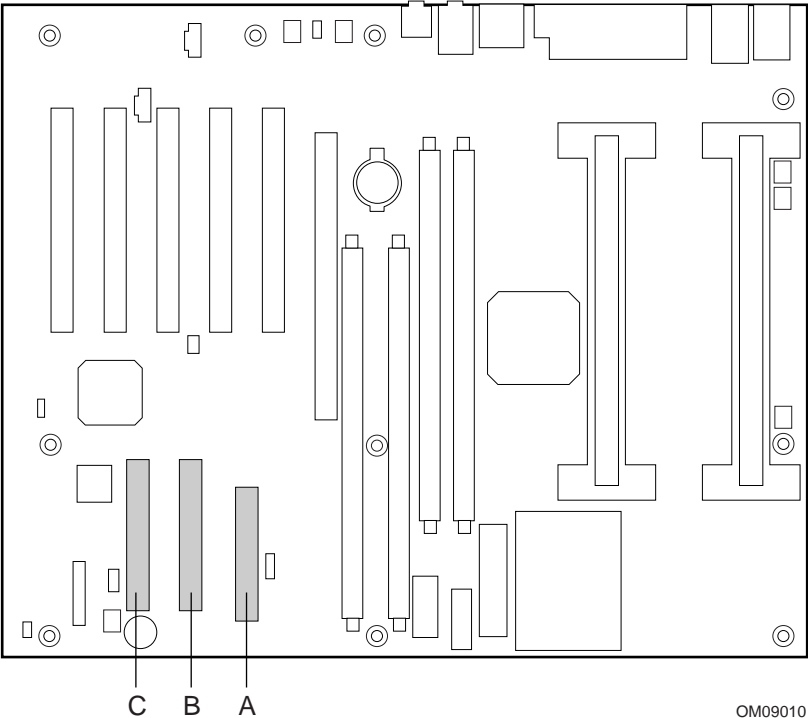
OM09010

Figure 29. Peripheral Connectors

A	Diskette drive
B	Secondary IDE
C	Primary IDE

Security Connectors
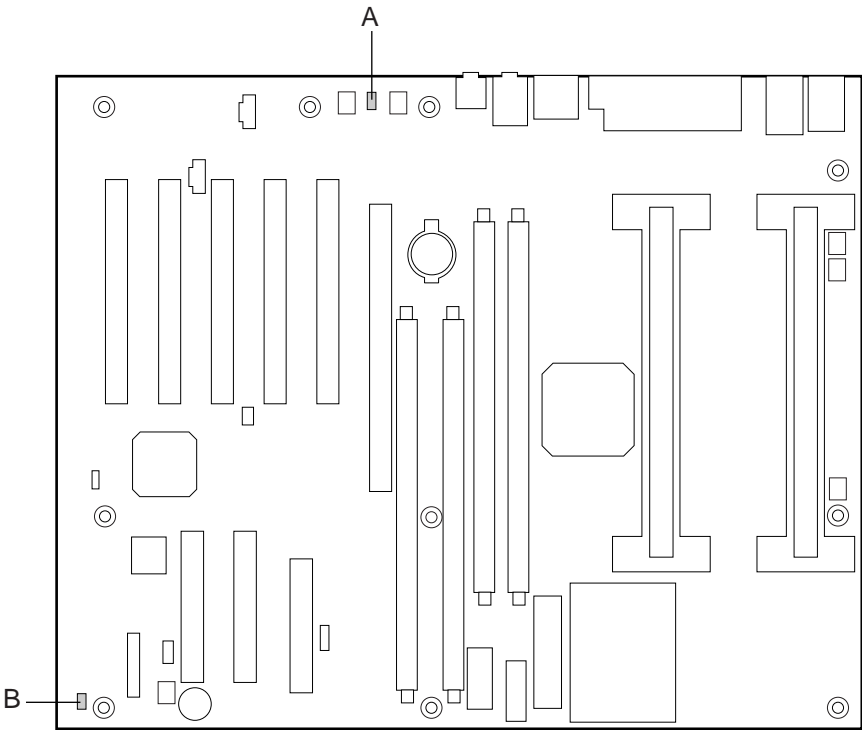
Figure 30. Security Connectors

OM09023

| A | Front chassis intrusion detection |
| B | Rear chassis intrusion detection |

Add-in Board Connectors

When the system board is installed in a chassis, a maximum of six slots is available for installing add-in boards as follows:

- Five- (5) dedicated PCI slots
- One- (1) AGP slot (supports 1X, 2X, 4X, and AGP Pro50 modes). The following Figure 31 shows the add-in board connectors.
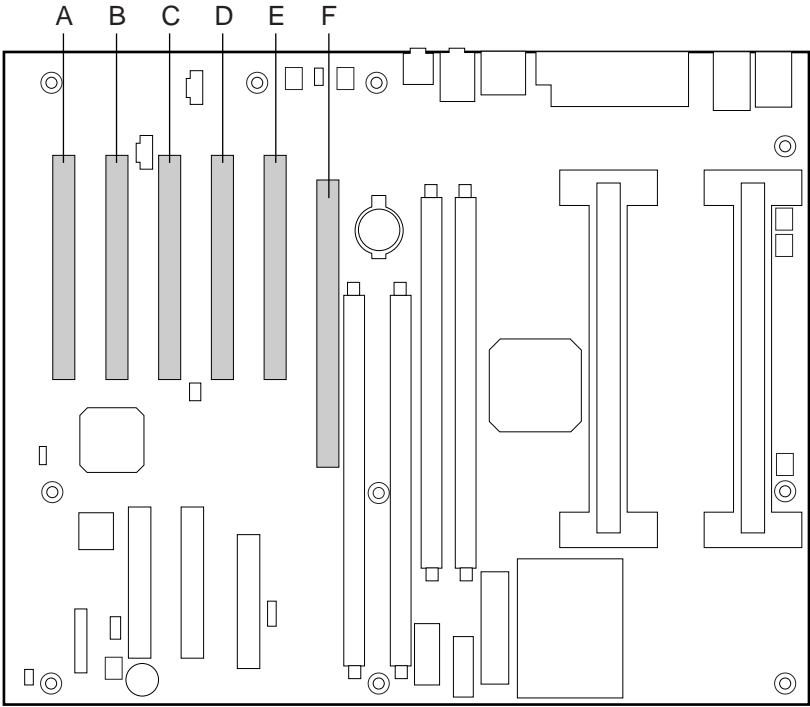
OM09012

Figure 31. Add-in Board Connectors

A	PCI Bus connector 5
B	PCI Bus connector 4
C	PCI Bus connector 3
D	PCI Bus connector 2
E	PCI Bus connector 1
F	AGP Pro universal connector

Front Panel Connectors
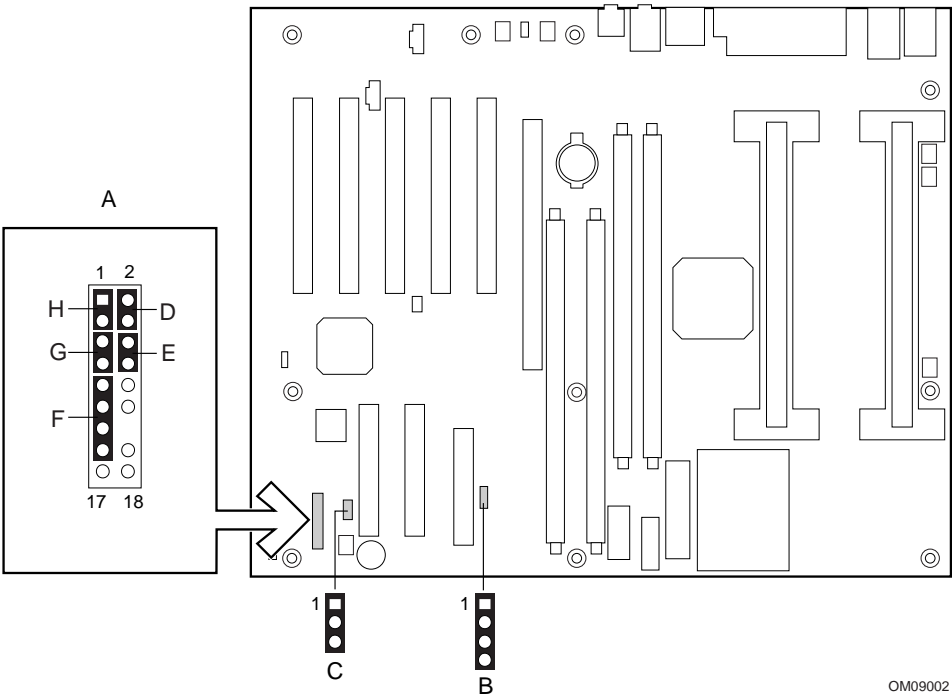
OM09002

Figure 32. Front Panel Connectors

A	Front panel connector
B	SCSI activity LED
C	Auxiliary front panel LED
D	Power/sleep LED
E	Power switch
F	Infrared port
G	Reset
H	Hard drive activity LED

System board Resources

Memory Map

Table 20. System Memory Map

Address Range (hex)	Size	Description
OFFF0000-0FFFFFFF	1 MB	Flash Memory (FWH)
	32KB	Reserved for ACPI tables (other tables as required)
00100000-(top of memory-32 KB)	varies	Extended System Memory
000E0000-000FFFFF	128 KB	Reserved for System BIOS shadow area
000C0000-000DFFFF	128 KB	Reserved for Option ROM shadow area
000A0000-000BFFFF	128 KB	Video Buffer
00000000-0009FFFF	640 KB	Conventional memory

System Management Bus Map

Table 21. System Management Bus Map

Address (hex)	Description	Partition
A0, A2, A4, A6	Baseboard IDROM	2
5A	First Heceta 4	2
5C	Second Heceta 4	2
A0	RIMM 1 SPD EEPROM	0
A4	RIMM 2 SPD EEPROM	0
A2	RIMM 3 SPD EEPROM	0
A6	RIMM 4 SPD EEPROM	0
CE	Alert on LAN 2 companion device	1

I/O Map

The I/O map is divided into Fixed and Variable address ranges. Fixed ranges cannot be moved, but in some cases can be disabled. Variable ranges can not only be moved, but also disabled.

Fixed I/O Address Ranges

Table 22. Fixed I/O Ranges Decoded by ICH

Address	Read Target	Write Target	Internal Unit
00h-08h	DMA Controller	DMA Controller	DMA
09h-0Eh	Reserved	DMA Controller	DMA
0Fh	DMA Controller	DMA Controller	DMA
10h-18h	DMA Controller	DMA Controller	DMA
19h-1Eh	Reserved	DMA Controller	DMA
1Fh	DMA Controller	DMA Controller	DMA
20h-21h	Interrupt Controller	Interrupt Controller	Interrupt
24h-25h	Interrupt Controller	Interrupt Controller	Interrupt
28h-29h	Interrupt Controller	Interrupt Controller	Interrupt
2Ch-2Dh	Interrupt Controller	Interrupt Controller	Interrupt
30h-31h	Interrupt Controller	Interrupt Controller	Interrupt
34h-35h	Interrupt Controller	Interrupt Controller	Interrupt
38h-39h	Interrupt Controller	Interrupt Controller	Interrupt
3Ch-3Dh	Interrupt Controller	Interrupt Controller	Interrupt
40h-42h	Time/Counter	Time/Counter	PIT (8254)
43h	Reserved	Time/Counter	PIT
50h-52h	Time/Counter	Time/Counter	PIT
53h	Reserved	Time/Counter	PIT
61h	NMI Controller	NMI Controller	Processor Interface
70h	Reserved	NMI and RTC Controller	RTC
71h	RTC Controller	RTC Controller	RTC
72h	RTC Controller	NMI and RTC Controller	RTC
73h	RTC Controller	RTC Controller	RTC
74h	RTC Controller	NMI and RTC Controller	RTC
75h	RTC Controller	RTC Controller	RTC
76h	RTC Controller	NMI and RTC Controller	RTC
77h	RTC Controller	RTC Controller	RTC
80h	DMA Controller	DMA Controller and LPC or PCI	DMA
81h-83h	DMA Controller	DMA Controller	DMA
84h-86h	DMA Controller	DMA Controller and LPC or PCI	DMA
87h	DMA Controller	DMA Controller	DMA
88h	DMA Controller	DMA Controller and LPC or PCI	DMA
89h-8Bh	DMA Controller	DMA Controller	DMA
8Ch-8Eh	DMA Controller	DMA Controller and LPC or PCI	DMA
08Fh	DMA Controller	DMA Controller	DMA
92h	Reset Generator	Reset Generator	Processor Interface
A0h-A1h	Interrupt Controller	Interrupt Controller	Interrupt
A4h-A5h	Interrupt Controller	Interrupt Controller	Interrupt
A8h-A9h	Interrupt Controller	Interrupt Controller	Interrupt
ACh-ADh	Interrupt Controller	Interrupt Controller	Interrupt

Table 25 (continued)

B0h-B1h	Interrupt Controller	Interrupt Controller	Interrupt
B2h-B3h	Interrupt Controller	Interrupt Controller	Interrupt
B4h-B5h	Interrupt Controller	Interrupt Controller	Interrupt
B8h-B9h	Interrupt Controller	Interrupt Controller	Interrupt
BCh-BDh	Interrupt Controller	Interrupt Controller	Interrupt
C0h-D1h	DMA Controller	DMA Controller	DMA
D2h-DDh	Reserved	DMA Controller	DMA
DEh-DFh	DMA Controller	DMA Controller	DMA
F0h	See Note 3	FERR#/IGNNE#/Interrupt	Processor Interface
170h-177h	IDE Controller[1]	IDE Controller[1]	IDE
1F0h-1F7h	IDE Controller[2]	IDE Controller[2]	IDE
376h	IDE Controller[1]	IDE Controller[1]	IDE
3F6h	IDE Controller[2]	IDE Controller[2]	IDE
4D0h-4D1h	Interrupt Controller	Interrupt Controller	IDE
CF9h	Reset Generator	Reset Generator	Processor Interface

1: Only if IDE Standard I/O space is enabled for Primary Drive. Otherwise the target is PCI.

2: Only if IDE Standard I/O space is enabled for Secondary Drive. Otherwise, the target is PCI.

3: IF POS_DEC_EN bit is enabled, reads from F0h will not be decoded by the ICH.
   If POS_DEC_EN is not enabled, reads from F0H will forward to LPC.

Variable I/O Decode Ranges

Table 23 shows the variable I/O decoded ranges for the ICH.

Table 23. Variable I/O Decode Ranges

Range Name	Mappable	Size (Bytes)	Target
ACPI	Anywhere in 64K I/O Space	64	Power Management
IDE	Anywhere in 64K I/O Space	16	IDE Unit
USB	Anywhere in 64K I/O Space	32	USB Unit
SMBus	Anywhere in 64K I/O Space	16	SMB Unit
AD'97 Audio Mixer	Anywhere in 64K I/O Space	256	AC'97 Unit
AC'97 Bus Master	Anywhere in 64K I/O Space	64	AC'97 Unit
AC'97 Modem Mixer	Anywhere in 64K I/O Space	256	AC'97 Unit
TCO	96 Bytes above ACPI Base	32	TCO Unit
GPIO	Anywhere in 64K I/O Space	64	GPIO Unit
Parallel Port	3 ranges in 64K I/O Space	8	LPC Peripheral
Serial Port 1	8 ranges in 64K I/O Space	8	LPC Peripheral
Serial Port 2	8 ranges in 64K I/O Space	8	LPC Peripheral
Floppy Disk Controller	2 ranges in 64K I/O Space	8	LPC Peripheral
MIDI	4 ranges in 64K I/O Space	2	LPC Peripheral
MSS	4 ranges in 64K I/O Space	8	LPC Peripheral
SoundBlaster	2 ranges in 64K I/O Space	32	LPC Peripheral
AdLib	2 ranges in 64K I/O Space	2	LPC Peripheral
LPC Generic 1	Anywhere in 64K I/O Space	128 bytes (with mask)	LPC Peripheral
LPC Generic 2	Anywhere in 64K I/O Space	16 bytes (with mask)	LPC Peripheral

Appendix A: Error Messages

Beep Codes and BIOS Messages

Beep Codes

The BIOS uses a series of beeps on the internal speaker to alert the user to problems during the boot process. In the following table, numbers indicate beeps; dashes indicate a pause between beeps.

Table 24. Beep Codes

Beep Code	Description
1-1-1	MEM_ERR_TYPE_MISMATCH—the memory types found in one or both memory banks contains an incompatible combination. See your system board documentation for information on installing memory.
1-1-2	MEM_ERR_SPD_INVALID
1-1-3	MEM_ERR_NO_DEVICES—no memory devices were found on one or both channels.
1-1-4	MEM_ERR_DEVICE_OVERFLOW—more than 32 devices were found on one or both channels.
1-1-5	MEM_ERR_SERIAL_ID_FAIL—the number of memory devices given by Serial ID does not match the number found by Serial Presence Detect.
1-1-6	MEM_ERR_TRCD_INVALID
1-2-4	MEM_ERR_INVALID_CHANNEL_FREQ—no valid channel frequency.
1-2-5	MEM_ERR_LVL_FAILS—levelization failure.
1-2-6	MEM_ERR_INVALID_CONFIG—an RDRAM has a technology not supported by the Intel® 82840 MCH.
1-2-7	MEM_ERR_RAC_INIT_FAILURE—the Intel 8240 MCH RAC initialization did not complete within 5 ms.
1-2-8	MEM_ERR_TREF_INVALID
1-3-1	MEM_ERR_BNKS_PER_REF_INVALID
1-3-2	MEM_ERR_RIMM_TCAC_INVALID
1-3-3	MEM_ERR_TCDLY_INVALID
1-3-4	MEM_ERR_RIMM_TRCD_INVALID
1-3-5	MEM_ERR_TCLS_TCAS_INVALID
1-3-6	MEM_ERR_RIMM_COLADDR_MISMATCH—row or column mismatch.
1-3-8	MEM_ERR_RIMM_BKADDR_MISMATCH
1-4-1	MEM_ERR_UNEQUAL_DEVICES_RIMMS
1-4-2	MEM_ERR_RIMMS_TREF_MISMATCH
1-4-3	MEM_ERR_RIMM_TCAS_TCLS_MISMATCH
1-4-4	MEM_ERR_RIMM_TCDLY_MISMATCH
1-4-5	MEM_ERR_RIMM_RDREFPT_MISMATCH

Table 24. **(continued)**

Beep Code	Description
1-1-1	Memory not supported (Not RDRAM)
1-1-2	Memory not supported (SPD contains invalid width – not 16 or 18)
1-1-3	No memory devices were found on one or both channels.
1-1-4	More than 32 devices on the channel.
1-1-5	Memory failure (number of devices detected does not match SPD data)
1-1-6	Memory not supported (FRAS data in SPD is invalid)
1-2-3	Memory not supported (Populated memory requires too many time domains)
1-2-4	Memory not supported (No valid channel frequency)
1-2-5	Memory failure (Levelization failure – ran out of time domains)
1-2-6	Memory not supported (unsupported memory technology)
1-2-7	Memory failure (Continuity module missing or chipset failure)
1-2-8	Memory not supported (could not find valid refresh rate)
1-3-1	Memory not supported (invalid refresh information in SPD)
1-3-2	Memory not supported (tCAC invalid)
1-3-3	Memory not supported (does not support enough time domains)
1-3-4	Memory not supported (tRCD invalid)
1-3-5	Memory not supported (invalid SPD tCLS or tCAS)
1-3-6	Memory not supported (SPD mismatch between channel A and B)
1-3-8	Memory not supported (SPD mismatch between channel A and B)
1-4-1	Memory not supported (SPD mismatch between channel A and B)
1-4-2	Memory not supported (SPD mismatch between channel A and B)
1-4-3	Memory not supported (SPD mismatch between channel A and B)
1-4-4	Memory not supported (SPD mismatch between channel A and B)
1-4-5	Memory not supported (SPD mismatch between channel A and B)
1-4-8	Memory not supported (SPD mismatch between channel A and B)
1-5-1	Memory not supported (invalid number of devices on RIMM)
1-5-3	Memory not supported (SPD mismatch between channel A and B)
1-5-5	Memory failure (Detected bad chipset configuration)
1-5-6	
1-6-1	Memory not supported (unsupported memory technology)
1-6-2	Memory not supported (unsupported memory technology)
1-6-3	Memory not supported (could not find valid CAS Latency)
1-6-5	Memory not supported (can not mix registered and non-registered memory)
1-6-6	Memory not supported (could not find valid CAS Latency)
1-6-7	Memory failure (Levelization phase 1)
1-6-8	Memory failure (Levelization phase 2)
2-1-1	APG Pro (110W) detected. Only AGP or AGP Pro50 (50W) graphics adapters are supported. The BIOS will prevent the system from booting.
2-1-2	FMM Initialization failed – Flash Corruption – BIOS Crisis Recovery required
3-1-1	BIOS Recovery – Flash Initialization Failure
3-1-2	BIOS Recovery – Flash Update Operation Failed
3-1-3	BIOS Recovery – Read file from Floppy Operation Failed
3-1-4	BIOS Recovery – Flash Erase Operation Failed
3-1-5	BIOS Recovery – Flash Write Operation Failed
3-1-6	BIOS Recovery – File Verify Operation (Checksum) Failed
3-1-7	BIOS Recovery/Flash Update – Processor Patch Installation Failed

Table 24. **(continued)**

Beep Code	Description
3-2-1	BIOS Recovery – File Verify Operation (Invalid BIOS) Failed
3-2-2	BIOS Recovery – File Verify Operation (Mismatched Platform BIOS) Failed
3-2-3	BIOS Recovery – Boot Block Incompatible with BIOS
3-3-3	BIOS update is complete.
4-8-8	A double-bit ECC error has been detected.
8-1-1	The BIOS did not detect a PS/2 or USB keyboard.
8-1-2	The BIOS did not detect a PS/2 or USB mouse.

BIOS Messages

Run-time Messages

`"Searching for Boot record from [device name]...OK"`

The BIOS is searching for, and found, a valid boot image. The device name can be floppy, IDE-0, IDE-1, CD-ROM, SCSI, or Network.

`"Searching for Boot record from [device name]...Not Found"`

The BIOS is searching for a valid boot image, but didn't find one.

`"Drive Not Ready. Insert BOOT diskette in A:"`

The floppy drive is not physically connected, or the drive does not have a diskette in the drive.

`"Invalid Boot Diskette"`

The diskette in the floppy drive contains an unformatted diskette.

`"Non-System disk or disk error. Replace and strike any key when ready."`

The diskette in the floppy drive contains a formatted diskette, but not a valid boot diskette.

Configuration Manager Messages

`"Password Entries Do NOT Match!"`

The passwords entered in the Password Verification dialog do not match. Enter the passwords again.

`"Altered settings have NOT been Saved! Selecting 'Continue' will discard changes."`

Configuration settings have been changed but not saved. Press Continue to exit without saving the changes, or Clear to return to Configuration Manager.

PXE Client Status and Error Messages

`PXE-M00: Intel UNDI, PXE-2.0 (build nnn) - Initializing: PnP/BEV`

Status message indicating the software is initializing.

`PXE-M00: Intel UNDI, PXE-2.0 (build nnn) - Initializing: Int 18h`

Status message indicating the software is initializing.

`PXE-M00: Intel UNDI, PXE-2.0 (build nnn) - Initializing: Int 19h`

Status message indicating the software is initializing.

`PXE-M00: Intel UNDI, PXE-2.0 (build nnn) - Network Boot Disabled`

Network boot has been disabled using the Bootstrap Selection menu.

`PXE-M04: Hold down both shift keys to change bootstrap selection...`

Hold down the left and right shift keys after the video BIOS identifier appears on the screen to invoke the Bootstrap Selection menu.

`PXE-M70: Network boot canceled by keystroke`

The network boot has been canceled by the user.

`PXE-M71: No services selected`

`PXE-E00: Could not find enough free base memory`

`PXE-M72: Programming UUID...`

`PXE-M73: UUID programmed`

PXE base-code and UNDI runtime modules are copied from FLASH or upper memory into the top of free base memory between 480K (78000h) and 640K (A0000h). This memory must be zero filled by the system BIOS. If this memory is not zero filled, the relocation code in the PXE ROMs will assume that this memory is being used by the system BIOS or other boot ROMs.

`PXE-E01: PCI Vendor and Device Ids do not match`

This message should never be seen in a production BIOS.

`PXE-E04: Error reading PCI configuration space`

This message is displayed if any of the PCI BIOS calls made to read the PCI configuration space return an error code. This should not happen with a production BIOS and properly operating hardware.

`PXE-E05: EEPROM checksum error`

This message is displayed if the NIC EEPROM contents have been corrupted. This can happen if the system is reset or powered down when the NIC EEPROM is being reprogrammed. If this message is displayed, the configured bootstrap type (Int 18h, 19h, PnP/BEV) has been lost and a default bootstrap type is selected. The default bootstrap type will be set to PnP/BEV if the system supports the PnP/BBS runtime functions. If the PnP/BBS runtime functions are not supported, Int 18h is the default bootstrap.

`PXE-E06: Option ROM requires DDIM support`

`This message should not be seen in a production BIOS.`

`PXE-E11: ARP timeout`

Displayed when the PXE ROM does not get an ARP reply.

`PXE-E20: BIOS extended memory copy error AH==nn`

This message is displayed if the BIOS extended memory copy service returns an error.

`PXE-E21: BIS integrity check failed`

BIS image has been corrupted.

`PXE-E22: BIS image/credential validation failed`

Downloaded image and credential do not match client key.

`PXE-E23: BIS initialization failed`

BIS could not be initialized. No more data is available.

`PXE-E24: BIS shutdown failed`

BIS could not be shutdown. No more data is available.

`PXE-E25: BIS get boot object authorization check flag failed`

Could not determine if BIS is enabled/disabled.

`PXE-E26: BIS free memory failed`

Could not release BIS allocated memory.

`PXE-E27: BIS get signature information failed`

Required BIS credential type information could not be determined.

`PXE-E28: BIS bad entry structure checksum`

BIS entry structure in the SM BIOS table is invalid.

`PXE-E32: TFTP open timeout`

TFTP open request was not acknowledged.

`PXE-E35: TFTP read timeout`

Next TFTP data packet was not received.

`PXE-E36: Error received from TFTP server`

A TFTP error packet was received from the TFTP server.

`PXE-E38: TFTP cannot open connection`

A hardware error occurred when trying to send the TFTP open packet out.

`PXE-E39: TFTP cannot read from connection`

A hardware error occurred when trying to send a TFTP acknowledge packet out.

`PXE-E3A: TFTP too many packages`

This message can mean one of two things. 1 – You are trying to download a file using TFTP that is larger than the allocated buffer. 2 – You started downloading a file, as a slave client, using MTFTP and the file increased in size when you became the master client.

`PXE-E3B: TFTP error--File not found`

The requested file was not found on the TFTP server.

`PXE-E3C: TFTP error--Access violation`

The request file was found on the TFTP server. The TFTP service does not have enough access rights to open/read the file.

`PXE-E3F: TFTP packet size is invalid`

The TFTP packet received is larger than 1456 bytes.

PXE-E51: No DHCP or BOOTP offers received

Client did not receive any valid DHCP, BOOTP or Proxy offers.

PXE-E52: No IP address received from DHCP or BOOTP

Client did not receive any valid DHCP or BOOTP offers. Client did receive at least one valid Proxy offer.

PXE-E53: No boot filename received

Client received at least one valid DHCP/BOOTP offer, but does not have a boot filename to download.

PXE-E60: Invalid UNDI API function number

An API being used by the base-code is not implemented in the UNDI ROM.

PXE-E61: Media test failed, check cable

Most likely the cable is not plugged in, or not connected. Could be a bad cable, NIC or connection.

PXE-E63: Error while initializing the NIC

An error occurred while trying to initialize the NIC hardware. Try another NIC.

PXE-E64: Error while initializing the PHY

An error occurred while trying to initialize the PHY hardware. Try another NIC.

PXE-E65: Error while reading the configuration data

An error occurred while reading the NIC configuration data. Try another NIC.

PXE-E66: Error while reading the initialization data

An error occurred while reading the NIC initialization data. Try another NIC.

PXE-E67: Invalid MAC address

The MAC address stored in this NIC is invalid. Try another NIC.

PXE-E68: Invalid EEPROM checksum

The EEPROM checksum is invalid. The contents of the EEPROM have been corrupted. Try another NIC.

PXE-E69: Error while setting interrupt

The interrupt hardware could not be configured. Try another NIC.

PXE-E74: Bad or missing PXE menu and/or prompt information

PXE tags were detected but the boot menu and/or boot prompt tags were not found/valid.

PXE-E74: No MAN_INFO or OS_INFO options found

PXE-E76: Bad or missing multicast discovery address

Multicast discovery is enabled but the multicast discovery address tag is missing.

PXE-E77: Bad or missing discovery server list

Multicast and broadcast discovery are both disabled, or use server list is enabled, and the server list tag was not found/valid.

PXE-E78: Could not locate boot server

A valid boot server reply was not received by the client.

PXE-E79: NBP is too big to fit in free memory base

The NBP is larger than the amount of free base memory.

```
PXE-E81: PXENV+ structure is invalid
PXE-E81: !PXE structure is invalid
PXE-E81: Invalid DHCP option format
PXE-E85: Not enough extended memory
PXE-EA0: Network boot canceled by keystroke
PXE-E86: ENV RAMdisk image corrupted
PXE-E87: Could not find selected boot item
PXE-E88: Could not locate boot server
```
User pressed <Esc> or <Ctrl-C> during DHCP/Discovery/TFTP.
```
PXE-EB1: Could not enable bus
PXE-EB2: Unexpected BUSD error
PXE-EC1: Base-code ROM ID structure is invalid
```
UNDI boot module could not find the base-code ROM ID structure. If there is a base-code ROM image in the system, it has probably been corrupted.
```
PXE-EC3: Base-code ROM ID structure was not found
```
The base-code ROM ID structure is invalid. The base-code ROM image has probably been corrupted.
```
PXE-EC4: UNDI ROM ID structure was not found
```
The base-code loader module could not locate the UNDI ROM ID structure.
```
PXE-EC5: UNDI ROM ID structure is invalid
```
The UNDI ROM image has probably been corrupted.
```
PXE-EC6: UNDI driver image is invalid
```
The UNDI ROM image has probably been corrupted.
```
PXE-EC8: !PXE structure was not found in UNDI driver code segment
```
The UNDI ROM image has probably been corrupted, or has not been initialized by the BIOS.
```
PXE-EC9: PXENV+ structure was not found in UNDI driver code segment
```
The UNDI ROM image has probably been corrupted, or has not been initialized by the BIOS.

Appendix B: Integration Information

Interrupts

Table 25. Interrupts

IRQ	System Resource
NMI	I/O channel check
0	Reserved, interval timer
1	Reserved, keyboard buffer full
2	Reserved, cascade interrupt from slave PIC
3	COM2[1]
4	COM1[1]
5	LPT2 audio / user available / shared
6	Diskette drive
7	LPT1[1] / shared
8	Real time clock
9	Windows Sound System[1] / shared
10	LAN / shared
11	User available / shared
12	Onboard mouse port (if present, else user available)
13	Reserved, math coprocessor
14	Primary IDE (if present, else user available)
15	Secondary IDE (if present, else user available)

1   Default, but can be changed to another IRQ.

Appendix C: Current BIOS Settings Record Form

Screen	Element	Settings	Your Settings
Help	Display Only	None	
System Processors	Front Side Bus Speed	Display only (100** or 133 MHz)	
	Processor P0 Type	Display only	
	Processor(s) Speed	Display only	
	Processor P0 L2 Cache	Display only	
	Processor P1 Type	Display only	
	Processor P1 L2 Cache	Display only	
System Memory	Total Memory	Display only	
	Memory Slot 1	Display only	
	Memory Slot 2	Display only	
	Memory Slot 3	Display only	
	Memory Slot 4	Display only	
	ECC Setting	Auto (default) Disabled	
Boot Options	First Boot Device	Auto (default) None Available boot devices	
	Second Boot Device	None (default) Available boot devices	
	Third Boot Device	None (default) Available boot devices	
System Event Log	Event Log Capacity	Display only	
	Event Log Validity	Display only	
	Clear Event Log on Reboot	Enabled Disabled (default)	
	Event Log Control	Enable All Events (default) Disable All Events Disable ECC Events	
Integrated IDE	Spin Delay	0–60 seconds	
	Primary IDE	Enabled (enabled) Disabled	
	(Primary IDE) Master	Display only	
	(Primary Master) ATA66	Enabled (enabled) Disabled	

** Only Pentium® III processors with 133 MHz front side bus speeds are supported.

Screen	Element	Settings	Your Settings
Integrated IDE (continued)	(Primary IDE) Slave	Display only	
	(Primary Slave) ATA66	Enabled (enabled) Disabled	
	Secondary IDE	Enabled (enabled) Disabled	
	(Secondary IDE) Master	Display only	
	(Secondary Master) ATA66	Enabled (enabled) Disabled	
	(Secondary IDE) Slave	Display only	
Integrated Floppy	Floppy Controller Enabled	Enabled (default) Disabled	
	Floppy A	1.44 MB 3.5 (default) 2.88 MB 3.5	
	Write Protect A Enabled	Enabled Disabled (default)	
System BIOS	BIOS Version	Display only	
	SMBIOS Version	Display only	
Peripheral Ports	Serial Port 1 (COM)	COM1 (default) COM2 Disabled	
	Infrared Port (COM)	Available COM ports Disabled (default)	
	Infrared Port (Mode)	IrDA (default)	
	Parallel Port	ECP EPP (default) Bi-directional Output only Disabled	
	Legacy USB Support	Enabled Disabled (default)	
Time/Date	Display	Time and Date	
General	Splash Screen Delay	2–30 seconds (default is 10 sec.)	
	Integrated NIC Enabled	Enabled (default) Disabled	
	Integrated Audio Enabled	Enabled (default) Disabled	
	Keypad Num Lock On	On (default) Off	
	High Speed Fan Threshold (C)	0, 70, 75, 80, 85, 90, 95, 100, 105, 110	
	Processor Serial Number Enabled	Enabled Disabled (default)	
Security	UserPassword Set	Display only (Yes, No)	
	Administrator Password Set	Display only (Yes, No)	