# Intel® Desktop Board
D815EGEW Product Guide

Universal Platform for 370-pin Processors
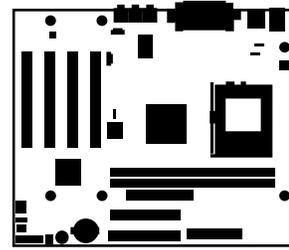
Order Number: A70495-001

Revision History

Revision	Revision History	Date
-001	First release of the Intel® Desktop Board D815EGEW Product Guide	September 2001

If an FCC declaration of conformity marking is present on the board, the following statement applies:

FCC Declaration of Conformity

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions related to the EMC performance of this product, contact:

  Intel Corporation
  5200 N.E. Elam Young Parkway
  Hillsboro, OR 97124
  1-800-628-8686

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canadian Department of Communications Compliance Statement:

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numerique német pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Réglement sur le broullage radioélectrique édicté par le ministére des Communications du Canada.

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Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

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Tables

1 Desktop Board Features

Table 1 describes the major features of the boards.

Table 1.   Feature Summary

Form Factor	microATX at 9.6 inches by 7.65 inches
Processors	• Intel® Pentium® III processor family with FC-PGA (Flip Chip Pin Grid Array) and FC-PGAII package supporting 100 MHz and 133 MHz system bus frequency • Intel® Celeron™ processor family with FC-PGA and FC-PGAII package supporting 66 MHz and 100 MHz system bus frequency
Chipsets	• Intel 82815EG Graphics Memory Controller Hub (GMCH) • Intel® 82801BA I/O Controller Hub (ICH2) • 4 Mbit Firmware Hub (FWH)
Memory	Two 168-pin Dual Inline Memory Module (DIMM) sockets supporting: • 100 MHz PC100 SDRAM (all system bus frequencies) • 133 MHz PC133 SDRAM (only with 133 MHz system bus frequency processors)
I/O Control	National PC87360 super I/O controller
Audio	An audio subsystem that includes the: • Intel 82801BA ICH2 digital controller (AC link output) • Analog Devices Inc. AD1885 audio codec
Video	• Intel 82815EG integrated graphics support • Rear panel VGA connector
Peripheral Interfaces	• One serial port • Two USB ports • One parallel port • Two IDE interfaces with Ultra DMA (33 MB/sec) and ATA-66/100 support • One diskette drive interface • PS/2† keyboard and mouse ports
Expansion Capabilities	Four PCI add-in card connectors (SMBus routed to PCI bus connector 2, S5 wake from PCI bus connector 2)
BIOS	• Intel/AMI BIOS • 4 Mbit Firmware Hub (FWH)

Table 1.   Feature Summary (continued)

Form Factor	microATX at 9.6 inches by 7.65 inches
Instantly Available PC	Support for: • ACPI S3 Suspend to RAM (STR) sleep state • *PCI Local Bus Specification* Revision 2.2 • Wake on PS/2 keyboard/mouse and USB ports (see page 35 for information on how to set the jumper blocks)
Power Management	Support for: • Advanced Power Management (APM 1.2) • Advanced Configuration and Power Interface (ACPI 1.0b)
SCSI LED Connector	Allows add-in SCSI host bus adapters to use the same LED as the onboard I/O controller
Chassis Intrusion Connector	Detects chassis intrusion
Wake on LAN[†] (WOL) Technology Connector	Support for system wake up using an add-in network interface card with remote wake up capability.
LAN Subsystem (optional)	• Intel® 82562ET 10/100 Mbit/sec Platform LAN Connect (PLC) device • RJ-45 connector

✏ **NOTE**

For information about Intel® desktop boards, including technical product specifications, BIOS upgrades, and device drivers, go to the Intel customer support World Wide Web site at:

http://support.intel.com/support/motherboards/desktop

Components

Figure 1 shows the major components on the D815EGEW board.
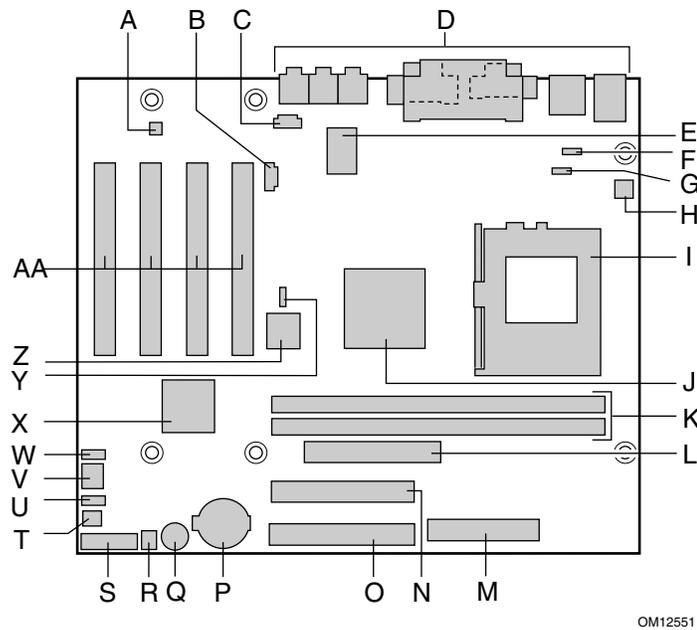
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Item	Description	Item	Description
A	Analog Devices Inc. AD1885 audio codec	O	Primary IDE connector
B	ATAPI-style auxiliary line in connector	P	Battery
C	ATAPI-style CD-ROM connector	Q	Speaker
D	Back panel connectors	R	SCSI hard drive activity LED connector
E	National PC87360 I/O controller	S	Front panel connector
F	PS/2 port wake configuration jumper block	T	Chassis intrusion connector
G	USB port wake configuration jumper block	U	Alternate power sleep/LED connector
H	Processor fan connector (fan 1)	V	Chassis fan connector (fan 2)
I	370-pin processor socket	W	WOL technology connector
J	Intel 82815EG Graphics and Memory Controller Hub (GMCH)	X	82801BA I/O Controller Hub (ICH2)
K	DIMM sockets	Y	BIOS configuration jumper block
L	Diskette drive connector	Z	4 Mbit Firmware Hub (FWH)
M	Main power connector	AA	PCI bus add-in card connectors
N	Secondary IDE connector		

Figure 1. Desktop Board Components

✏ **NOTE**

Components labeled optional do not come on all the boards.

Processors

⚠ CAUTION

Use only the processors listed below. Use of unsupported processors can damage the board, the processor, and the power supply. See the Intel® Desktop D815EGEW Specification Update for the latest list of supported processors for the D815EGEW board.

The board supports a single Intel Pentium lll processor or Intel Celeron processor. Processors are not included with the desktop board and must be purchased separately.

The processor connects to the desktop board through a PGA370 socket. The board supports the processors listed in Table 2.

Table 2.   Supported Processors

Processor Type	Designation (GHz)	Designation (MHz)	System Bus Frequency (MHz)	L2 Cache Size (KB)
Intel Pentium III processors (FC-PGA2 socket)	1.2 and 1.13	N/A	133	256
Intel Pentium III processors (FC-PGA socket)	1.0	933, 866, 800EB, 733, 667, 600EB, and 533EB	133	256
	N/A	850, 800, 750, 700, 650, 600E, 550E, and 500E	100	256
Intel Celeron processors (FC-PGA2 socket)	1.2	N/A	100	256
Intel Celeron processors (FC-PGA socket)	1.1 and 1.0	950, 900, 850, and 800	100	128
	N/A	766, 733, 700, 667, 633, 600, 566, and 533A	66	128

For the latest information on supported Intel® processors for the board, refer to the Intel customer support World Wide Web site at:

http://support.intel.com/support/motherboards/desktop/

For instructions on installing or upgrading the processor, see Chapter 2.

Main Memory

✏ **NOTE**

To be fully compliant with all applicable Intel® SDRAM memory specifications, the board should be populated with DIMMs that support the Serial Presence Detect (SPD) data structure. If your memory modules do not support SPD, you will see a notification to this effect on the screen at power up. The BIOS will attempt to configure the memory controller for normal operation at 100 MHz.

✏ **NOTE**

Because the main system memory is also used as video memory, the board requires a 100 MHz SDRAM DIMM even though the host bus frequency is 66 MHz. It is highly recommended that an SPD DIMM be used, since this allows the BIOS to read the SPD data and program the chipset to accurately configure memory settings for optimum performance. If non-SPD memory is installed, the BIOS will attempt to correctly configure the memory settings, but performance and reliability may be impacted.

The board supports memory as defined below:

- Two 3.3 V, 168-pin SDRAM Dual Inline Memory Modules (DIMMs) with gold-plated contacts
- Unbuffered single or double-sided DIMM configurations
- 100 MHz PC100 SDRAM (all FSB frequencies)
- 133 MHz PC133 SDRAM (only supported with 133 MHz system bus frequency)
- Minimum system memory: 64 MB
- Maximum system memory: 512 MB

✏ **NOTE**

The BIOS cannot determine DIMM size or type when not initialized. If more than 512 MB system memory is installed, the BIOS displays a message at boot indicating memory above 512 MB has not been initialized. The message indicates that additional information is available in Setup. The first time the BIOS detects this condition, a pause follows the message with the option to enter Setup or to press <ESC> and continue to boot. The message continues to be displayed at boot time as long as the condition exists, however, the BIOS will not pause on subsequent detection. Setup displays the installed memory configuration and shows memory above 512 MB as "not initialized."

- Basic non-SPD at 100 MHz
- Suspend to RAM support
- Mixed speed DIMM configuration will default to the slowest speed DIMM installed.

The board supports the processor and memory module combinations shown in Table 3.

Table 3.   Processor and Memory Module Combinations

Processor Type (System Bus Frequency)	PC100 Memory Modules…	PC133 Memory Modules…
Intel Celeron processor (66 MHz)	…will operate at 100 MHz	…will operate at 100 MHz
Intel Celeron processor (100 MHz)	…will operate at 100 MHz	…will operate at 100 MHz
Intel Pentium III processor (100 MHz)	…will operate at 100 MHz	…will operate at 100 MHz
Intel Pentium III processor (133 MHz)	…will operate at 100 MHz	…will operate at 133 MHz (see note below)

✏ **NOTE**

100 MHz system bus frequency processors will support 133 MHz memory; however, the memory will operate at 100 MHz.

Chipset

The D815EGEW board includes the following chipset:

- Intel 82815EG Graphics Memory Controller Hub (GMCH) with Accelerated Hub Architecture (AHA) bus
- Intel 82801BA I/O Controller Hub (ICH2) with AHA bus
- 4 Mbit Firmware Hub (FWH)

Intel® 82815EG Graphics Memory Controller Hub (GMCH)

The GMCH provides the following:

- An integrated Synchronous DRAM memory controller with autodetection of SDRAM
- Support for ACPI Rev 2.0 and APM Rev 1.2 compliant power management

Intel® 82801BA I/O Controller Hub (ICH2)

The Intel 82801BA ICH2 has these features:

- Four 33 MHz Peripheral Component Interface (PCI) Local Bus slots supporting PCI specification, rev 2.2
- Support for the Low Pin Count (LPC) interface
- Integrated IDE controller (supports Ultra DMA (33 MB/sec) mode and ATA-66/100 mode)
- Integrated LAN media access controller
- Support for USB
- Power management logic (ACPI Rev 2.0 compliant)
- Support for the System Management Bus routed to:
  — PCI bus connector 2
  — S5 wake from PCI bus connector 2

- Real-Time Clock (with 256-byte battery backed CMOS RAM)
- AC '97 digital link for:
  — AC '97 2.1 compliant
  — Logic for audio in, audio out, and mic input
  — PCI functions for audio
- Supports two Master/DMA devices

Firmware Hub (FWH)

The 4 Mbit Firmware Hub has these features:

- System BIOS
- System security and management logic

Input/Output (I/O) Controller

The board supports the National PC87360 I/O controller.

The I/O controller provides the following features:

- 3.3 V operation
- One serial port
- One parallel port with Extended Capabilities Port (ECP) and Enhanced Parallel Port (EPP) support
- Serial IRQ interface compatible with serialized IRQ support for PCI systems
- PS/2-style mouse and keyboard interfaces
- Interface for one 1.2 MB, 1.44 MB, or 2.88 MB diskette drive
- Intelligent power management, including a programmable wake up event interface
- PCI power management support

Real-Time Clock

The desktop boards have a time-of-day clock and 100-year calendar. A battery on the desktop board keeps the clock current when the computer is turned off.

USB Support

The desktop board has two back panels USB ports. You can connect two USB peripheral devices directly to the computer without an external hub. To attach more than two devices, connect an external hub to either of the built-in ports.

The desktop board supports the Universal Host Controller Interface (UHCI) and takes advantage of standard software drivers written to be compatible with UHCI.

✎ **NOTE**

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 a full-speed USB device.

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 IDE devices (such as hard drives)
* ATAPI devices (such as CD-ROM drives)
* PIO Mode 3 and PIO Mode 4 devices
* Ultra DMA (33 MB/sec) and ATA-66/100 protocols
* Support for laser servo (LS-120) drives

Add-in Card Connectors

The D815EGEW board has four PCI add-in card connectors.

Audio Subsystem

The board has an AC '97 compliant audio subsystem. The audio subsystem includes these features:

* Split digital/analog architecture for improved S/N (signal-to-noise) ratio: > 90 dB
* Power management support for APM 1.2 and ACPI 2.0 (driver dependent)
* 3-D stereo enhancement

The audio subsystem consists of the following:

* Intel 82801BA I/O Controller Hub (ICH2)
* Analog Devices Inc. AD1885 analog codec

✎ **NOTES**

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

Audio drivers and utilities are available from the Intel customer support World Wide Web site at:

http://support.intel.com/support/motherboards/desktop

BIOS

The BIOS provides the Power-On Self-Test (POST), the BIOS Setup program, the PCI and IDE auto-configuration utilities, and the video BIOS. The BIOS is stored in the Firmware Hub.

The BIOS can be upgraded by following the instructions in Chapter 3.

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. You can override the auto-configuration options by specifying manual configuration in the BIOS Setup program.

To use ATA-66/100 features, the following items are required:
• An ATA-66/100 peripheral device
• An ATA-66/100 compatible cable
• ATA-66/100 operating system device drivers

LAN Subsystem (Optional)

The optional Intel 82562ET (with the Intel 82801BA ICH2) provides a Fast PCI LAN subsystem providing both 10Base-T and 100Base-TX connectivity. The Intel 82562ET provides the following functions:
• Basic 10/100 Ethernet LAN connectivity
• Supports RJ-45 connector with status indicator LEDs
• Programmable transit threshold
• Configurable EEPROM that contains the MAC address

LAN Subsystem Software

For LAN software and drivers, refer to the D815EGEW link on Intel's World Wide Web site at:

http://support.intel.com/support/motherboards/desktop

RJ-45 LAN Connector LEDs

Two LEDs are built into the RJ-45 LAN connector. Table 4 describes the LED states when the board is powered up and the LAN subsystem is operating.

Table 4.   RJ-45 LAN Connector LEDs

LED Color	LED State	Indicates
Green	Off	10 Mbit/sec data rate is selected.
	On	100 Mbit/sec data rate 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.

Security Passwords

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

- The supervisor password gives unrestricted access to view and change all Setup options. If only the supervisor password is set, pressing <Enter> at the password prompt of Setup gives the user restricted access to Setup.
- If both the supervisor and user passwords are set, you must enter either the supervisor password or the user password to access Setup. Setup options are then available for viewing and changing depending on whether the supervisor or user password was entered.
- Setting a user password restricts who can boot the computer. The password prompt is displayed before the computer is booted. If only the supervisor password is set, the computer boots without asking for a password. If both passwords are set, you can enter either password to boot the computer.

Speaker

A 47 Ω inductive speaker is mounted on the desktop boards. The speaker provides audible error code (beep code) information during the Power-On Self-Test (POST).

Battery

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

Power Management Features

Power management is implemented at several levels, including:

- Software support:
  - — Advanced Power Management (APM)
  - — Advanced Configuration and Power Interface (ACPI)
- Hardware support:
  - — Power connector
  - — Fan connectors
  - — Instantly Available technology ACPI S3 state (must be enabled in BIOS under the Power menu)
  - — S5 wake on PCI bus connector 2 only
  - — Wake from USB (see page 35 for information on how to set the jumper blocks)
  - — Wake from keyboard/mouse (see page 35 for information on how to set the jumper blocks)
  - — Wake on PME
  - — Resume on Ring

If the board is used with an ACPI-aware operating system, the BIOS can provide ACPI support. Otherwise, it defaults to APM support.

Instantly Available Technology

⚠ **CAUTION**

For Instantly Available technology, the 5 V standby line for the power supply must be capable of providing adequate +5 V standby current. Failure to provide adequate standby current when using this feature can damage the power supply and/or affect ACPI S3 sleep state functionality.

⚠ **CAUTION**

If the standby current necessary to support multiple wake events from the PCI and/or USB buses exceeds power supply capacity, the desktop board may lose register settings stored in memory.

Instantly Available technology enables the board to enter the ACPI S3 (Suspend-to-RAM) sleep state. While in the S3 sleep state, the computer will appear to be off. When signaled by a wake-up device or event, the system quickly returns to its last known awake state.

The board's standby power indicator, shown in Figure 2, is lit when there is standby power to the system. This includes the memory modules and PCI bus connectors even when the computer appears to be off.

If the system has a dual-colored power LED on the front panel, the sleep state is indicated by the LED turning amber.
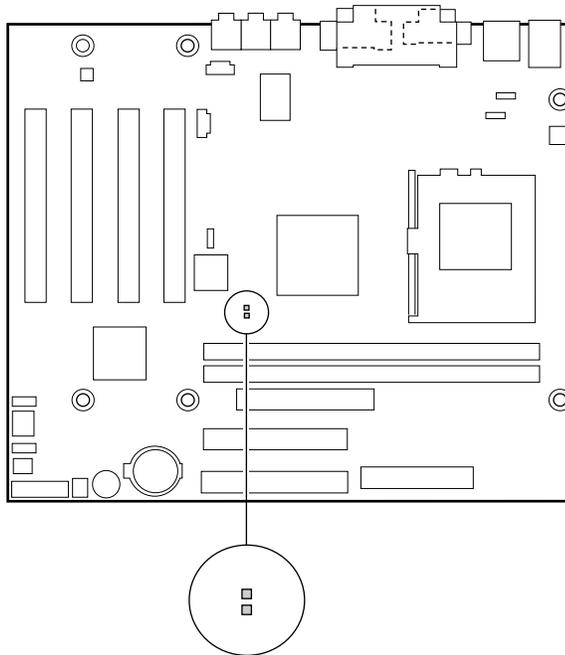
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Figure 2. Location of the Standby Power Indicator

Power supplies used with this board must be able to provide enough standby current to support the standard Instantly Available (ACPI S3 sleep state) configuration as outlined in Table 5. Values are determined by specifications such as PCI 2.2. Actual measurements may vary.

To estimate the total amount of standby current required for a particular system configuration, standby current requirements of all installed components must be added. Refer to the descriptions in Table 5 and follow the steps outlined below:

1. Note the total D815EGEW board standby current requirement.
2. Add to that the total PS/2 port standby current requirement if a wake-enabled device is connected.
3. Add, from the PCI 2.2 slots (wake-enabled) row, the total of the number of wake-enabled devices installed (PCI) multiplied by the standby current requirement.
4. Add, from the PCI 2.2 slots (nonwake-enabled) row, the total of the number of wake-enabled devices installed (PCI) multiplied by the standby current requirement.
5. Add all additional wake-enabled devices' and nonwake-enabled devices' standby current requirements as applicable.
6. Add all the required current totals from steps 1 through 5 to determine the total estimated standby current power supply requirement.

Table 5.   Standby Current Requirements

Instantly Available Current Support	Description	Standby Current Requirements (mA)
Estimate for integrated board components	Total for the D815EGEW board	770*
Estimate for add-on components (Add to integrated board components shown above)	PS/2 ports**	345
	PCI 2.2 slots (wake-enabled)	375
	PCI 2.2 slots (nonwake-enabled)	100
	USB ports**	700

* Refer to the Intel Desktop Board D815EGEW Technical Product Specification for the exact standby current requirements

** Dependent upon system configuration

✏ **NOTE**

PCI requirements are calculated by totaling the following:

- *One wake-enabled device @ 375 mA*
- *Five non wake-enabled devices @ 20 mA each*

PS/2 Ports requirements per the IBM PS/2 Port Specification (Sept 1991):

- *Keyboard @ 275 mA*
- *Mouse @ 70 mA*

USB requirements are calculated by totaling the following:

- *One wake-enabled device @ 500 mA*
- *USB hub @ 100 mA*
- *Three USB non-wake-enabled devices @ 2.5 mA each*
- *The USB ports are limited to a combined total of 700 mA*

Resume on Ring

The operation of Resume on Ring can be summarized as follows:

- Resumes operation from either the APM sleep mode or the ACPI S1 state
- Requires only one call to access the computer
- Detects incoming call similarly for external and internal modems
- Requires modem interrupt be unmasked for correct operation

2 Installing and Replacing Desktop Board Components

This chapter tells you how to:

- Install and remove memory
- Install the I/O shield
- Install the desktop board
- Install and remove the processor
- Connect the IDE cable
- Set the BIOS configuration jumper
- Set the PS/2 and USB wake configuration jumpers
- Replace the battery
- Clear passwords

Before You Begin

> ✎ **NOTE**
>
> *Before you install the desktop board in a chassis, see Appendix B for regulatory requirements and precautions.*

- *Always follow the steps in each procedure in the correct order.*
- *Set up a log to record information about your computer, such as model, serial number, installed options, and configuration information.*
- *Electrostatic discharge (ESD) can damage components. Perform the procedures described in this chapter only at an ESD workstation using an anti-static wrist strap and a conductive foam pad. If such a station is not available, you can provide some ESD protection by wearing an anti-static wrist strap and attaching it to a metal part of the computer chassis.*

⚠ **CAUTION**

The procedures in this chapter assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.

Disconnect the computer from its power source and from any telecommunications links, networks, or modems before performing any of the procedures described in this chapter. Failure to disconnect power, telecommunications links, networks, or modems before you open the computer or perform any procedures can result in personal injury or equipment damage. Some circuitry on the desktop board can continue to operate even though the front panel power button is off.

Installing and Removing Memory

⚠ **CAUTION**

To be fully compliant with all applicable Intel SDRAM memory specifications, the board requires DIMMs that support the Serial Presence Detect (SPD) data structure.

You can access the PC Serial Presence Detect Specification at:

http://www.intel.com/technology/memory/pcsdram/spec/

⚠ **CAUTION**

Devices in PCI slot 1 may interfere with the memory retention mechanism. Remove the device from PCI slot 1 before adding or removing memory.

The board has two 168-pin DIMM sockets arranged as banks 0 and 1 as shown in Figure 3. The memory module requirements are listed in the Main Memory section on page 11.

DIMM Installation Guidelines

All memory components and DIMMs used with the board must comply with the PC SDRAM specifications. These include the following:

- PC SDRAM Specification (memory component specific)
- PC100 and PC133 SDRAM Component Testing Summary
- PC Unbuffered DIMM Specification
- PC Registered DIMM Specification

You can access these documents at the Intel World Wide Web site:

http://www.intel.com/technology/memory/pcsdram/spec/

Installing DIMMs

To install DIMMs, follow these steps:
1. Observe the precautions in "Before You Begin" (see page 21).
2. Turn off all peripheral devices connected to the computer. Turn off the computer and disconnect the ac power cord.
3. Remove the computer's cover and locate the DIMM sockets (see Figure 3).

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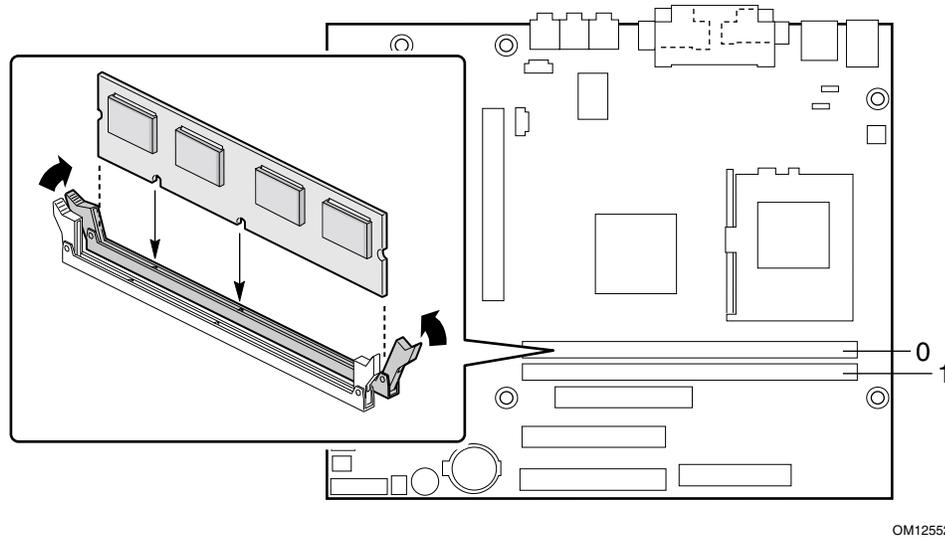
Figure 3. DIMM Socket Locations

4. Make sure the clips at either end of the DIMM socket(s) are pushed outward to the open position.
5. Holding the DIMM by the edges, remove it from its anti-static package.
6. Position the DIMM above the socket. Align the two small notches in the bottom edge of the DIMM with the keys in the socket (see inset in Figure 3).
7. Insert the bottom edge of the DIMM into the socket.
8. When the DIMM is inserted, push down on the top edge of the DIMM until the retaining clips snap into place. Make sure the clips are firmly in place.
9. Replace the computer's cover and reconnect the ac power cord.

Removing DIMMs

To remove a DIMM, follow these steps:

1. Observe the precautions in "Before You Begin" (see page 21).
2. Turn off all peripheral devices connected to the computer. Turn off the computer.
3. Remove the ac power cord from the computer.
4. Remove the computer's cover.
5. Gently open the retaining clips at each end of the DIMM socket. The DIMM pops out of the socket.
6. Hold the DIMM by the edges, lift it away from the socket, and store it in an anti-static package.
7. Reinstall and reconnect any parts you removed or disconnected to reach the DIMM sockets.
8. Replace the computer's cover and reconnect the ac power cord.

Installing the I/O Shield

✏ **NOTE**

Systems based on this desktop board require that the I/O shield be properly installed to comply with Class B emissions requirements.

The boxed desktop board comes with an I/O shield. When installed in the chassis, the shield blocks radio frequency transmissions, protects internal components from dust and foreign objects, and promotes correct airflow within the chassis.

Install the I/O shield before installing the desktop board in the chassis. Place the shield inside the chassis as shown in Figure 4. Press the shield into place so that it fits tightly and securely. If the shield doesn't fit, obtain a properly sized shield from the chassis supplier.
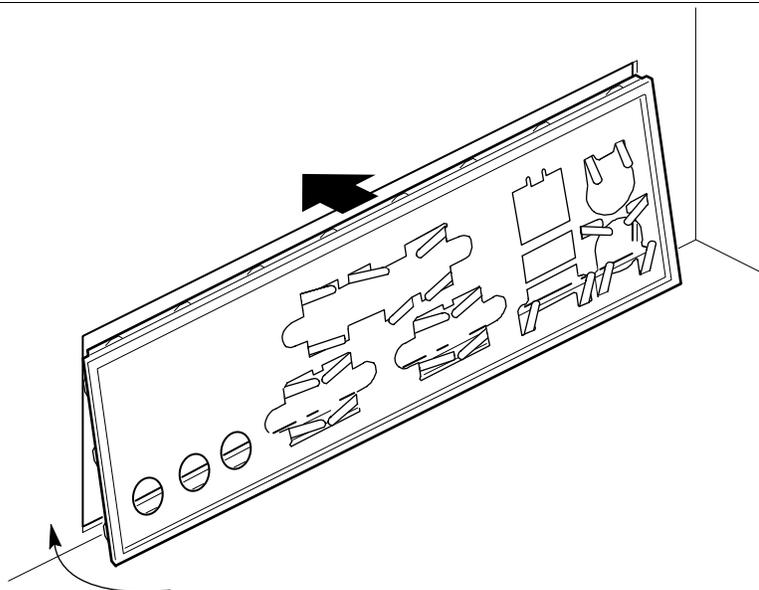
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Figure 4. Installing the I/O Shield

Installing the Desktop Board

Refer to your chassis manual for instructions on installing the desktop board. Six screws secure the desktop board to the chassis. Figure 5 shows the locations of the mounting screw holes.

✎ **NOTES**

You will need a Phillips† (#2 bit) screwdriver.

Refer to Appendix B for regulatory requirements and installation instructions and precautions.

⚠ **CAUTION**

Only qualified technical personnel should attempt this procedure. Disconnect the computer from its power source before performing the procedures described here. Failure to disconnect the power before you open the computer can result in personal injury or equipment damage.
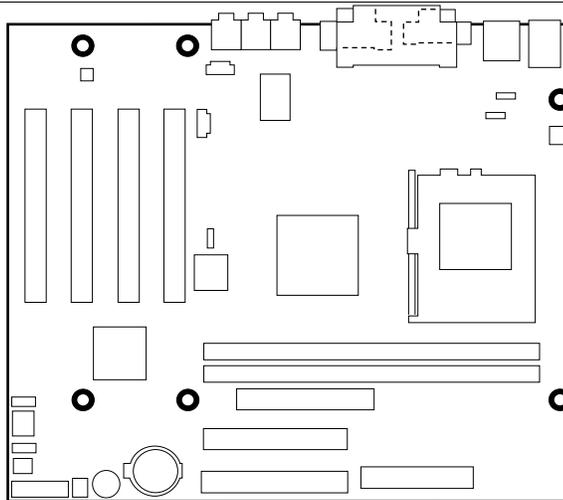
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Figure 5. Location of the Mounting Screw Holes

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Installing a Processor

To install a processor, follow these instructions:

1. Observe the precautions in "Before You Begin" (see page 21).
2. Locate the processor socket and raise the socket handle completely (see Figure 6, B).
3. Aligning the pins of the processor with the socket, insert the processor into the socket (see Figure 6, A and C).
4. Close the handle completely (see Figure 6, D).
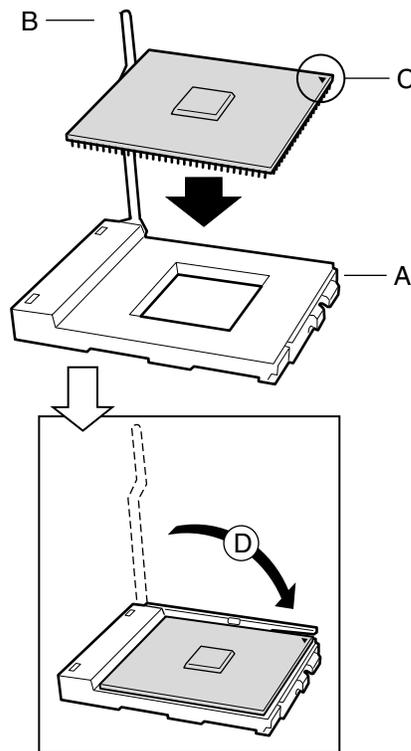
OM11639

Figure 6. Installing the Processor in the Processor Socket

✏ **NOTE**

For instructions on how to install a fan heatsink for a processor 1 GHz or greater, see page 29.

5. Place the fan heatsink on top of the processor (see Figure 7).
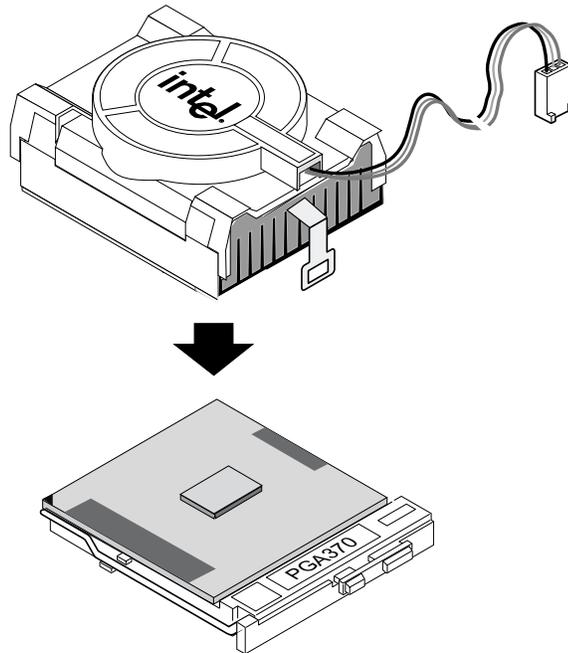
OM11619

Figure 7. Attaching the Heatsink to the Processor

6. Attach the fan heatsink clips to the processor socket (see Figure 8).
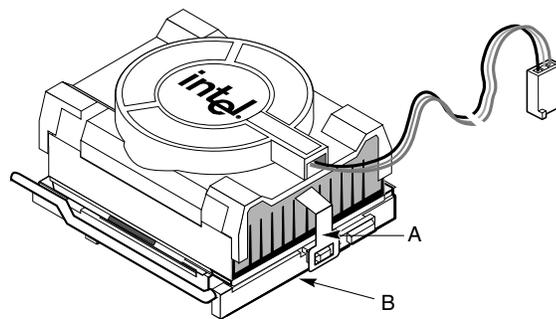
OM11620

A   Fan heatsink clip
B   Processor socket

Figure 8. Attaching the Fan Heatsink Clips to the Processor Socket

7. Connect the processor fan cable to the processor fan connector (see Figure 9).
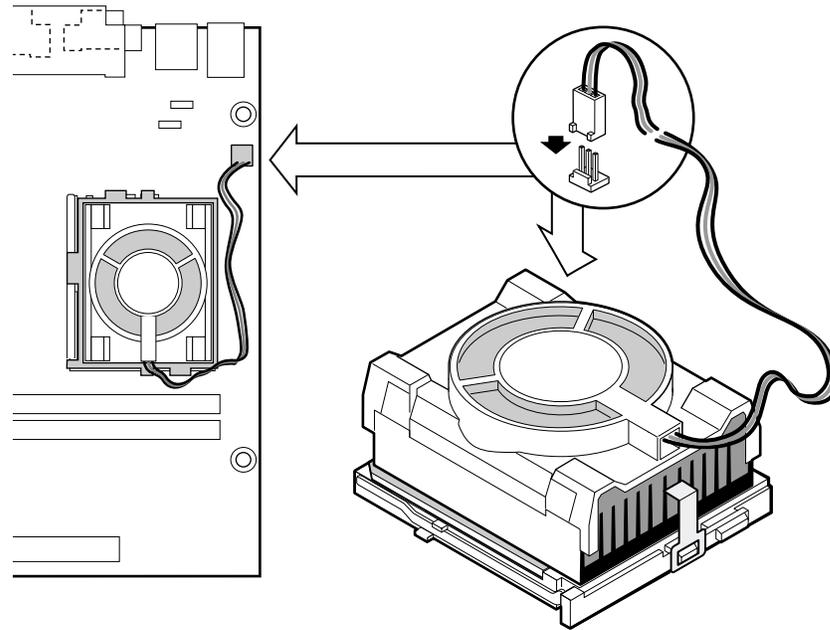
OM12556

Figure 9. Connecting the Processor Fan Cable to the Processor Fan Connector

Removing the Processor

To remove the processor, follow these instructions:

1. Observe the precautions in "Before You Begin" (see page 21).
2. Disconnect the processor fan cable.
3. Detach the fan heatsink clips.
4. Remove the heatsink.
5. Raise the socket handle completely.
6. Remove the processor.

Installing a 1 GHz or Greater Processor Fan Heatsink

To install a processor, follow the instructions given on page 26, Figure 6. Follow the instructions below to install the fan heatsink on a processor 1 GHz or greater.

1. Attach the fan heatsink to the processor making sure the notch at the bottom of the heatsink is aligned on the processor socket label side (see Figure 10, A).
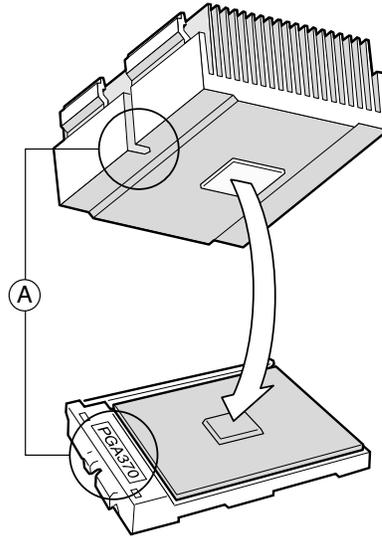
OM11063

Figure 10. Attaching the Fan Heatsink Over the Processor

2. Making sure the handle is in the up position, place the plastic clip (see Figure 11, B) on the fan heatsink (see Figure 11, C). The inset in Figure 11 (A) shows the heatsink notch location.
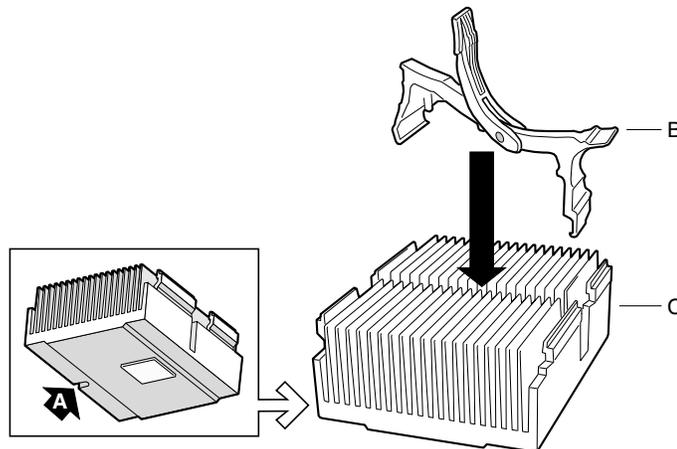
OM11064

Figure 11. Placing the Plastic Clip on the Fan Heatsink

3. When properly aligned, each edge of the plastic clip should click into place. Hold the clip handle (see Figure 12, A) and very slowly lower the handle until the clip secures the fan heatsink to the processor socket.
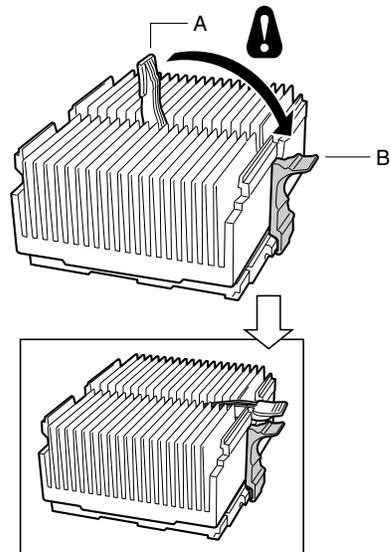
OM11062

Figure 12. Lowering the Plastic Clip Handle

4. Clip the fan (A) over the fan heatsink (B) as illustrated in Figure 13.
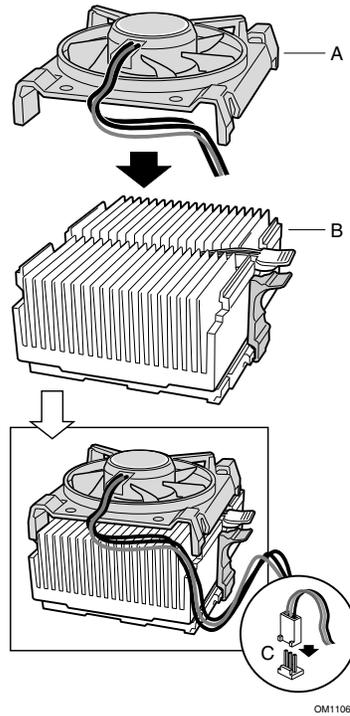
Figure 13. Attaching the Fan to the Fan Heatsink

5. Connect the processor fan cable to the processor fan connector (see Figure 14).
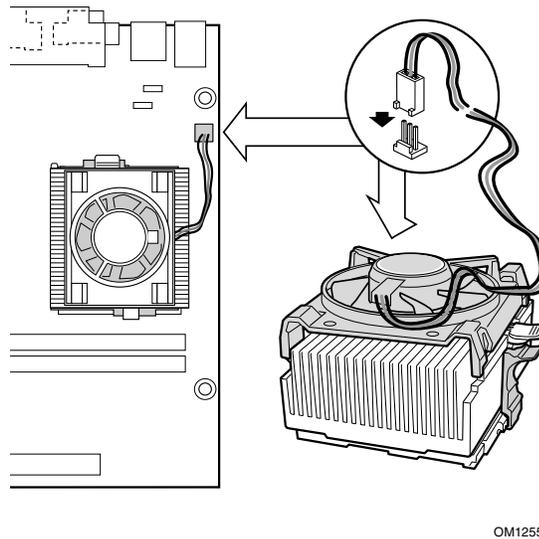
Figure 14. Connecting the Processor Fan Cable to the Processor Fan Connector

Removing the 1 GHz or Greater Processor Fan Heatsink

To remove the fan heatsink for the 1 GHz or greater processor, follow these instructions:

1. Observe the precautions in "Before You Begin" (see page 21).
2. Disconnect the processor fan cable.
3. Remove the fan from the fan heatsink.
4. Slowly pull up the handle of the plastic clip (reversing the action shown in Figure 12, A).
5. Disengage the fan heatsink clip by pushing your index finger against the back of the clip as you pull up on the clip extension with your thumb (see Figure 15).
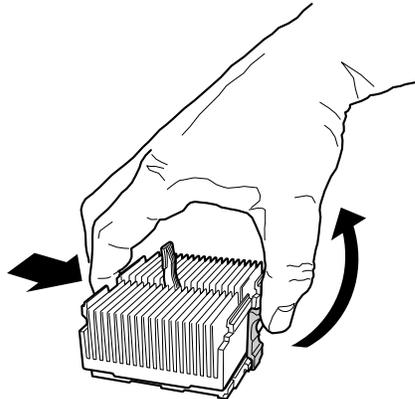
OM11069

Figure 15. Removing the Fan Heatsink

6. Remove the fan heatsink.
7. Raise the processor socket handle completely and remove the processor.

Connecting the IDE Cable

The Intel® boxed desktop board package includes one IDE cable. The cable is capable of connecting two drives to the desktop board, and supports the Ultra DMA-33 and ATA-66/100 transfer protocols.

✎ **NOTE**

ATA-66/100 compatible cables are backward compatible with drives using slower IDE transfer protocols. If an ATA-66/100 disk drive and a disk drive using any other IDE transfer protocol are attached to the same cable, the maximum transfer rate between the drives can be reduced to that of the slowest drive.

✎ **NOTE**

Do not connect an ATA device as a slave on the same IDE cable as an ATAPI master device. For example, do not connect an ATA hard drive as a slave to an ATAPI CD-ROM drive.

For the cable to function correctly:

• Attach the cable end with the single connector (A), which is blue and labeled P1, to the desktop board as shown in Figure 16.
• Attach the cable end with the two closely spaced connectors (B), which are gray and black and are labeled P2 and P3, to the drives.
• If connecting only one IDE drive, be sure to connect the drive to the black connector (P3).
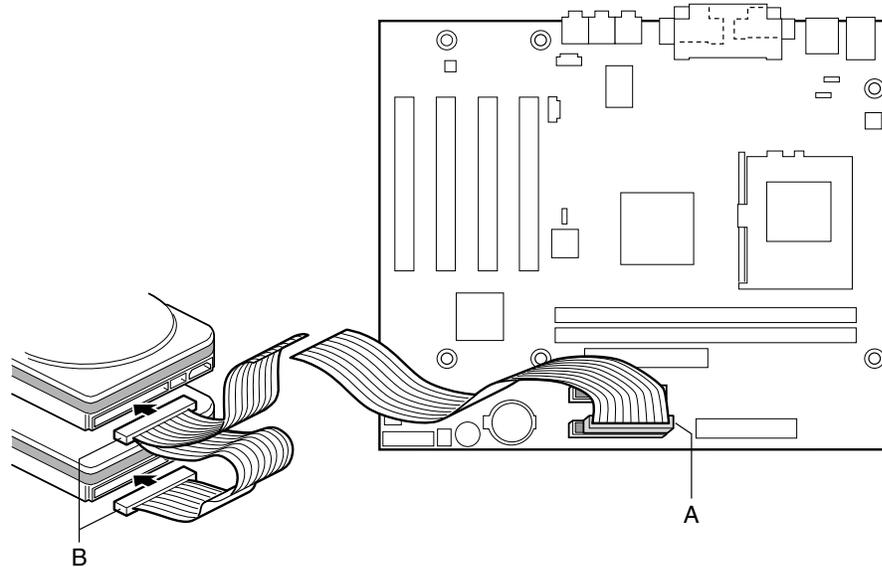
OM12559

Figure 16. Connecting the IDE Cable

Setting the BIOS Configuration Jumper Block

⚠ CAUTION

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.

The location of the board's BIOS configuration jumper block, labeled C6D6, is shown in Figure 17.
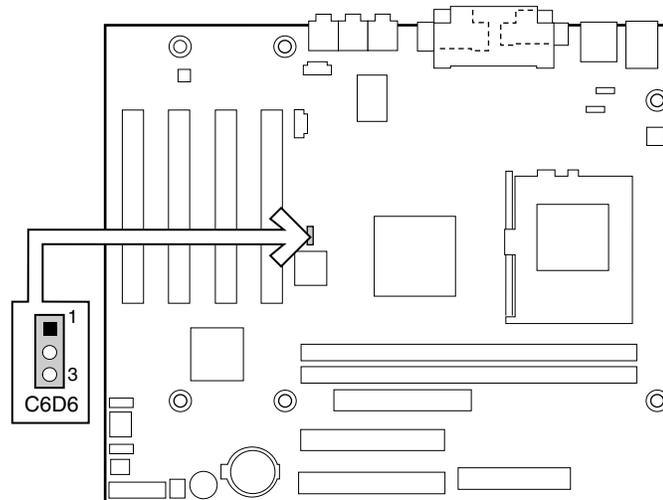
OM12560

Figure 17. BIOS Configuration Jumper Block Location

This three-pin jumper block, shown in Figure 17, enables all desktop board configurations to be done in BIOS Setup. Table 6 shows the jumper settings for the Setup program modes.

Table 6.   Jumper Settings for the BIOS Setup Program Modes

Function/Mode	Jumper Setting	Configuration
Normal	1-2	The BIOS uses current configuration information and passwords for booting.
Configure	2-3	After the POST runs, Setup runs automatically. The maintenance menu is displayed.
Recovery	None	The BIOS attempts to recover the BIOS configuration. A recovery diskette is required.

Setting the PS/2 and USB Wake Configuration Jumper Blocks

The 3-pin PS/2 jumper block, labeled J2B1, enables configuration of the two PS/2 ports. The 3-pin USB port jumper block, labeled J2B2, enables configuration of the two USB ports. Figure 18 shows the location of these jumpers on the board.
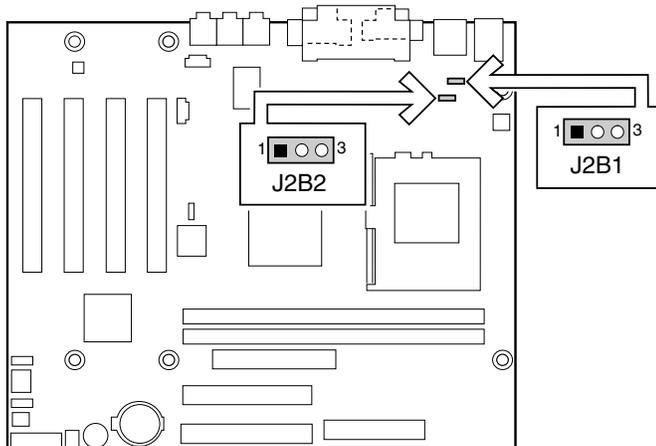
OM12687

Figure 18. PS/2 Port and USB Port Wake Configuration Jumper Block Locations

Table 7 describes the jumper settings for configuring the PS/2 mouse and keyboard ports.

Table 7.   Jumper Settings for the PS/2 Ports

Jumper Setting		Configuration
1-2		Allows wake from ACPI state S1
2-3		Allows wake from keyboard/mouse in all ACPI states (must also set ACPI BIOS option to S3)
None		PS/2 ports will not function

Table 8 describes the jumper settings for configuring USB port 0 and USB port 1.

Table 8.   Jumper Settings for the USB Ports

Jumper Setting		Configuration
1-2		Allows wake from ACPI state S1
2-3		Allows wake from USB ports in all ACPI states (must also set ACPI BIOS option to S3)
None		USB ports will not function

Clearing the Passwords

This procedure assumes that the desktop board is installed in the computer and the configuration jumper block is set to normal mode.

1. Observe the precautions in "Before You Begin" (see page 21).
2. Turn off all peripheral devices connected to the computer. Turn off the computer. Disconnect the computer's power cord from the ac power source (wall outlet or power adapter).
3. Remove the computer cover.
4. Find the configuration jumper block (see Figure 17).
5. Place the jumper on pins 2-3 as shown below.

6. Replace the cover, plug in the computer, turn on the computer, and allow it to boot.
7. The computer starts the Setup program. Setup displays the maintenance menu.
8. Press <Enter> and Setup displays a pop-up screen requesting that you confirm clearing the password. Select Yes and press <Enter>. Setup displays the maintenance menu again.
9. Press <F10> to save the current values and exit Setup.
10. Turn off the computer. Disconnect the computer's power cord from the ac power source.
11. Remove the computer cover.
12. To restore normal operation, place the jumper on pins 1-2 as shown below.

13. Replace the cover, plug in the computer, and turn on the computer.

Replacing the Battery

A coin-cell battery (CR2032) powers the real-time clock and CMOS memory. When the computer is not plugged into a wall socket, the battery has an estimated life of three years. When the computer is plugged in, the standby current from the power supply extends the life of the battery. The clock is accurate to $\pm$ 13 minutes/year at 25 ºC with 3.3 VSB applied. Figure 19 on page 39 shows the location of the battery for this board.

When the voltage drops below a certain level, the BIOS Setup program settings stored in CMOS RAM (for example, the date and time) might not be accurate. Replace the battery with an equivalent one.

⚠ **CAUTION**

Risk of explosion if the battery is replaced with an incorrect type. Batteries should be recycled where possible. Disposal of used batteries must be in accordance with local environmental regulations.

⚠ **PRÉCAUTION**

Risque d'explosion si la pile usagée est remplacée par une pile de type incorrect. Les piles usagées doivent être recyclées dans la mesure du possible. La mise au rebut des piles usagées doit respecter les réglementations locales en vigueur en matière de protection de l'environnement. (French)

⚠ **FORHOLDSREGEL**

Eksplosionsfare, hvis batteriet erstattes med et batteri af en forkert type. Batterier bør om muligt genbruges. Bortskaffelse af brugte batterier bør foregå i overensstemmelse med gældende miljølovgivning.
(Danish)

⚠ **OBS!**

Det kan oppstå eksplosjonsfare hvis batteriet skiftes ut med feil type. Batterier bør sendes til gjenvinning hvis det er mulig. Brukte batterier bør kastes i henhold til gjeldende miljølovgivning. (Norwegian)

⚠ **VIKTIGT!**

Risk för explosion om batteriet ersätts med felaktig batterityp. Batterier bör om möjligt återvinnas. Batterier ska kasseras enligt de lokala miljövårdsbestämmelserna. (Swedish)

⚠ **VARO**

Räjähdysvaara, jos pariston tyyppi on väärä. Paristot on kierrätettävä, jos se on mahdollista. Käytetyt paristot on hävitettävä paikallisten ympäristömääräysten mukaisesti.
(Finnish)

⚠ **VORSICHT**

Bei falschem Einsetzen einer neuen Batterie besteht Explosionsgefahr. Die Batterie darf nur durch denselben oder einen entsprechenden, vom Hersteller empfohlenen Batterietyp ersetzt werden. Entsorgen Sie verbrauchte Batterien den Anweisungen des Herstellers entsprechend.
(German)

⚠ **AVVERTIMENTO**

Esiste il pericolo di un esplosione se la pila non viene sostituita in modo corretto. Utilizzare solo pile uguali o di tipo equivalente a quelle consigliate dal produttore. Per disfarsi delle pile usate, seguire le istruzioni del produttore.
(Italian)

⚠ **PRECAUCIÓN**

Existe peligro de explosión si la pila no se cambia de forma adecuada. Utilice solamente pilas iguales o del mismo tipo que las recomendadas por el fabricante del equipo. Para deshacerse de las pilas usadas, siga igualmente las instrucciones del fabricante.
(Spanish)

⚠ **WAARSCHUWING**

Er bestaat ontploffingsgevaar als de batterij wordt vervangen door een onjuist type batterij. Batterijen moeten zoveel mogelijk worden gerecycled. Houd u bij het weggooien van gebruikte batterijen aan de plaatselijke milieuwetgeving.
(Dutch)

⚠ **ATENÇÃO**
Haverá risco de explosão se a bateria for substituída por um tipo de bateria incorreto. As baterias devem ser recicladas nos locais apropriados. A eliminação de baterias usadas deve ser feita de acordo com as regulamentações ambientais da região.
(Brazilian Portuguese)

To replace the battery, follow these steps:

1. Observe the precautions in "Before You Begin" (see page 21).
2. Turn off all peripheral devices connected to the computer. Always turn off the power and unplug the power cord from the computer before replacing the battery.
3. Remove the computer cover.
4. Locate the battery on the desktop board (see Figure 19).
5. With your fingernail or a medium flat-bladed screwdriver, gently pry the battery hold-down latch back enough to free the battery from its socket.
6. Install the new battery in the socket, orienting the "+" as shown in Figure 19.
7. Replace the computer cover before reconnecting the computer.
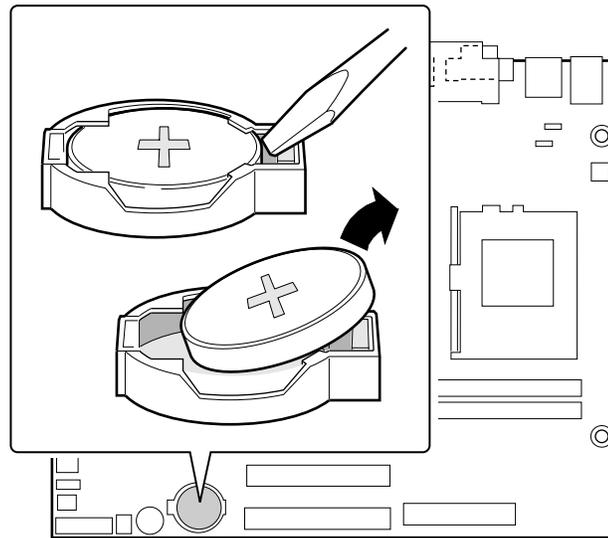
OM12558

Figure 19. Removing the Battery from the Board

✑ **NOTE**

If your local ordinances permit, you may dispose of individual batteries as normal trash. Do not expose batteries to excessive heat or fire. Keep all batteries away from children.

3 Updating the BIOS

This chapter tells you how to update the BIOS by either using the Intel® Express BIOS Update utility or the Intel® Flash Memory Update utility, and recovering the BIOS if an update fails.

Updating the BIOS with the Intel® Express BIOS Update Utility

With the Intel Express BIOS Update utility you can update the system BIOS while in the Windows† environment. The BIOS file is included in an automated update utility which combines the functionality of the Intel Flash Memory Update utility and the ease-of use of Windows-based installation wizards.

To update the BIOS with the Intel Express BIOS Update utility:

1. Go to the Intel customer support World Wide Web site at:
   http://support.intel.com/support/motherboards/desktop/
2. Navigate to the D815EGEW page and click the Express BIOS Update utility file for the board's BIOS.
3. Download the file to your hard drive. (You can also save this file to a diskette. This is useful if you are updating the BIOS for multiple identical systems.)
4. Close all other applications. This step is required. Your system will be rebooted at the last Express BIOS Update window.
5. Double-click the executable file from the location on your hard drive where it was saved. This runs the update program.
6. Follow the instructions provided in the dialog boxes to complete the BIOS update.

Updating the BIOS with the Intel® Flash Memory Update Utility

With the Intel Flash Memory Update utility you can update the system BIOS from a floppy disk or other bootable media. The utility available from the Web provides a simple method for creating a bootable flash memory update floppy that will automatically update your BIOS.

Obtaining the BIOS Update File

You can update to a new version of the BIOS by using the BIOS update file. The BIOS update file is a compressed self-extracting archive that contains all the files you need to update the BIOS. The BIOS update file contains:

- New BIOS files
- BIOS recovery files
- Intel Flash Memory Update Utility

You can obtain the BIOS update file through your computer supplier or by navigating to the D815EGEW page on the Intel customer support World Wide Web site at:

http://support.intel.com/support/motherboards/desktop

✏ **NOTE**

Please review the instructions distributed with the update utility before attempting a BIOS update.

The Intel Flash Memory Update Utility allows you to:

- Update the BIOS in flash memory
- Update the language section of the BIOS

Updating the BIOS

⚠ **CAUTION**

The AUTOEXEC.BAT file provided with the update files updates the BIOS. Do not interrupt the process or the system may not function.

1. Boot the computer with the BIOS update diskette in drive A. During system boot, the AUTOEXEC.BAT file provided with the update files will automatically run the BIOS update process.
2. When the update process is complete, the monitor will display a message telling you to remove the diskette and to reboot the system.
3. As the computer boots, check the BIOS identifier (version number) to make sure the update was successful. If a logo appears, press <Esc> to view the POST messages.

Recovering the BIOS

It is unlikely that anything will interrupt the BIOS update; however, if an interruption occurs, the BIOS could be damaged. The following steps explain how to recover the BIOS if an update fails. The following procedure uses recovery mode for the Setup program. See page 34 for more information on Setup modes.

✏ **NOTE**

Because of the small amount of code available in the boot block area, there is no video support. You will not see anything on the screen during this procedure. Monitor the procedure by listening to the speaker and looking at the diskette drive LED.

1. Turn off the computer, disconnect the computer's power cord, and disconnect all external peripherals.
2. Remove the computer cover and locate the BIOS configuration jumper labeled C6D6 (see Figure 17).
3. Remove the jumper from all pins as shown below to set recovery mode for Setup.
4. Insert the bootable BIOS update diskette into diskette drive A.
5. Replace the computer cover, connect the power cord, turn on the computer, and allow it to boot. The recovery process will take a few minutes.
6. Listen to the speaker:
   - Upon applying power, drive A will begin to show activity. In about a minute, two beeps are heard and drive A activity ceases (temporarily) indicating the successful recovery of the BIOS core. Drive A activity will begin again followed by two more beeps indicating the successful recovery of the boot block. This sequence of events indicates a successful BIOS recovery.
   - A series of continuous beeps indicates a failed BIOS recovery.
7. If recovery fails, return to step 1 and repeat the recovery process.
8. If recovery is successful, turn off the computer, and disconnect its power cord.
9. Remove the computer cover and continue with the following steps.
10. Reinstall the jumper back on pins 1-2 as shown below to set normal mode for Setup.

11. Leave the update diskette in drive A, replace the computer cover, and connect the computer's power cord.
12. Turn on the computer and continue with the BIOS update (see page 41).

4 Using the Setup Program

You can use the BIOS Setup program to change the configuration information and boot sequence for the computer. This chapter tells you how to access the BIOS Setup program and lists Setup features, options, and default settings.

✎ **NOTE**

For reference purposes, you should write down the current Setup settings. When you make changes to the settings, update this record.

BIOS Setup Program Modes

The BIOS Setup program has three modes of operation:

- Normal mode for normal operations
- Configure mode for clearing passwords (see Chapter 2 for instructions)
- Recovery mode for BIOS recovery

The setting of the BIOS configuration jumper block controls the BIOS Setup Program Operating mode. The jumper is set to normal mode at the factory.

✎ **NOTE**

The Setup menus described in this section apply to the desktop boards with BIOS identifier EW81510A.86A. Desktop boards with other BIOS identifiers might have differences in some of the Setup menu screens.

The BIOS Setup program can be used to view and change the BIOS settings for the computer. The BIOS Setup program is accessed by pressing the <F2> key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins. The menu bar is shown below.

Maintenance	Main	Advanced	Security	Power	Boot	Exit

Table 9.   BIOS Setup Program Menu Bar

Maintenance	Main	Advanced	Security	Power	Boot	Exit
Clears passwords and Boot Integrity Service (BIS)* credentials, and configures extended configuration memory settings	Allocates resources for hardware components	Configures advanced features available through the chipset	Sets passwords and security features	Configures power management features	Selects boot options	Saves or discards changes to Setup program options

* For information about the BIS, refer to the Intel World Wide Web site at:
   http://developer.intel.com/design/security/index1.htm

Table 10 shows the function keys available for menu screens.

Table 10.   BIOS Setup Program Function Keys

BIOS Setup Program Function Key	Description
<←> or <→>	Selects a different menu screen
<↑> or <↓>	Moves cursor up or down
<Tab>	Moves cursor to the next field
<Enter>	Executes command or selects the submenu
<F9>	Load the default configuration values for the current menu
<F10>	Save the current values and exits the BIOS Setup program
<Esc>	Exits the menu

Maintenance Menu

The Maintenance menu is used to clear passwords, to access the extended configuration submenu, and to access processor information. Setup only displays this menu in the configure mode. See page 34 for information about setting the configure mode. To access this menu, select Maintenance on the menu bar at the top of the screen.

Maintenance	Main	Advanced	Security	Power	Boot	Exit
Extended Configuration						

Table 11.   Maintenance Menu

Feature	Options	Description
Clear All Passwords	• **Yes (default)** • No	Clears the user and administrative passwords.
Clear BIS Credentials	• **Yes (default)** • No	Clears the Wired for Management Boot Integrity Service (BIS) credentials.
Extended Configuration	No options	Invokes the Extended Configuration submenu.
CPU Microcode Update Revision	No options	Displays CPU's Microcode Update Revision.
CPU Stepping Signature	No options	Displays CPU's Stepping Signature.

Extended Configuration Submenu

To access this submenu, select Maintenance on the menu bar, then Extended Configuration.

Maintenance	Main	Advanced	Security	Power	Boot	Exit
Extended Configuration						

The submenu features shown in Table 12 are for setting video memory cache mode. This submenu becomes available when User Defined is selected under Extended Configuration.

Table 12.   Extended Configuration Submenu

Feature	Options	Description
Extended Configuration	• **Default (default)** • User-Defined	*User Defined* allows setting memory control and video memory cache mode. If selected here, will also display in the Advanced Menu as: "Extended Menu: *Used*."
Video Memory Cache Mode	• USWC	Selects Uncacheable Speculative Write-Combining (USWC) video memory cache mode. Full 32 byte contents of the Write Combining buffer are written to memory as required. Cache lookups are not performed. Both the video driver and the application must support Write Combining.
	• **UC (default)**	Selects UnCacheable (UC) video memory cache mode. This setting identifies the video memory range as uncacheable by the processor. Memory writes are performed in program order. Cache lookups are not performed. Well suited for applications not supporting Write Combining.
SDRAM Auto-Configuration	• **Auto (default)** • User Defined	Sets extended memory configuration options to *Auto* or *User Defined*.
CAS# Latency	• 3 • 2 • **Auto (default)**	Selects the number of clock cycles required to address a column in memory.
SDRAM RAS# to CAS# Delay	• 3 • 2 • **Auto (default)**	Selects the number of clock cycles between addressing a row and addressing a column.
SDRAM RAS# Precharge	• 3 • 2 • **Auto (default)**	Selects the length of time required before accessing a new row.

Main Menu

To access this menu, select Main on the menu bar at the top of the screen.

Maintenance	**Main**	Advanced	Security	Power	Boot	Exit

Table 13 shows the features in the Main menu. This menu reports processor and memory information and is for configuring the system date and system time.

Table 13.   Main Menu

Feature	Options	Description
BIOS Version	No options	Displays the version of the BIOS.
Processor Type	No options	Displays processor type.
Processor Speed	No options	Displays processor speed.
System Bus Frequency	No options	Displays the system bus frequency.
Cache RAM	No options	Displays the size of second-level cache and whether it is ECC-capable.
Total Memory	No options	Displays the total amount of RAM.
Memory Bank 0 Memory Bank 1	No options	Displays the amount and type of RAM in the memory banks.
Language	• **English (default)** • Espanol	Selects the current default language used by the BIOS.
Processor Serial Number	• **Disabled (default)** • Enabled	Enables and disables the processor serial number. (Present only when a Pentium III processor is installed.)
System Time	Hour, minute, and second	Specifies the current time.
System Date	Day of week Month/day/year	Specifies the current date.

Advanced Menu

To access this menu, select Advanced on the menu bar at the top of the screen.

Maintenance	Main	**Advanced**	Security	Power	Boot	Exit

PCI Configuration
Boot Configuration
Peripheral Configuration
IDE Configuration
Diskette Configuration
Event Log Configuration
Video Configuration

Table 14 shows the features in the Advance menu. This menu is used for setting advanced features that are available through the chipset.

Table 14.   Advanced Menu

Feature	Options	Description
Extended Configuration	No options	If *Used* is displayed, *User-Defined* has been selected in Extended Configuration under the Maintenance Menu.
PCI Configuration	No options	Configures individual PCI slot's IRQ priority. When selected, displays the PCI Configuration submenu.
Boot Configuration	No options	Configures Plug and Play and the Numlock key, and resets configuration data. When selected, displays the Boot Configuration submenu.
Peripheral Configuration	No options	Configures peripheral ports and devices. When selected, displays the Peripheral Configuration submenu.
IDE Configuration	No options	Specifies type of connected IDE device.
Diskette Configuration	No options	When selected, displays the Diskette Configuration submenu.
Event Log Configuration	No options	Configures Event Logging. When selected, displays the Event Log Configuration submenu.
Video Configuration	No options	Configures video features. When selected, displays the Video Configuration submenu.

PCI Configuration Submenu

To access this submenu, select Advanced on the menu bar, then PCI Configuration.

Maintenance	Main	**Advanced**	Security	Power	Boot	Exit

PCI Configuration
Boot Configuration
Peripheral Configuration
IDE Configuration
Diskette Configuration
Event Log Configuration
Video Configuration

The submenu features shown in Table 15 are for configuring the IRQ priority of PCI slots individually.

Table 15.   PCI Configuration Submenu

Feature	Options	Description
PCI Slot 1 IRQ Priority	• **Auto (default)** • 9 • 10 • 11	Allows selection of IRQ priority. IRQ Priority selections for PCI slots 1 and 5 are linked. Selections made to PCI Slot 1 IRQ Priority are repeated in PCI Slot 5 IRQ Priority.
PCI Slot 2 IRQ Priority	• **Auto (default)** • 9 • 10 • 11	Allows selection of IRQ priority and S5 wake.
PCI Slot 3 IRQ Priority	• **Auto (default)** • 9 • 10 • 11	Allows selection of IRQ priority.
PCI Slot 4 IRQ Priority	• **Auto (default)** • 9 • 10 • 11	Allows selection of IRQ priority.

Boot Configuration Submenu

To access this submenu, select Advanced on the menu bar, then Boot Configuration.

Maintenance	Main	**Advanced**	Security	Power	Boot	Exit

PCI Configuration
Boot Configuration
Peripheral Configuration
IDE Configuration
Diskette Configuration
Event Log Configuration
Video Configuration

The features shown in Table 16 are for setting Plug and Play (PnP) options, resetting configuration data, and the power-on state of the Numlock key.

Table 16.   Boot Configuration Submenu

Feature	Options	Description
Plug & Play O/S	• **No (default)** • Yes	Specifies if manual configuration is desired. *No* lets the BIOS configure all devices. This setting is appropriate when using a Plug and Play operating system. *Yes* lets the operating system configure Plug and Play devices not required to boot the system. This option is available for use during lab testing.
Reset Config Data	• **No (default)** • Yes	*No* does not clear the PCI/PnP configuration data stored in flash memory on the next boot. *Yes* clears the PCI/PnP configuration data stored in flash memory on the next boot.
Numlock	• Off • **On (default)**	Specifies the power-on state of the Numlock feature on the numeric keypad of the keyboard.

Peripheral Configuration Submenu

To access this submenu, select Advanced on the menu bar, then Peripheral Configuration.

Maintenance	Main	**Advanced**	Security	Power	Boot	Exit
		PCI Configuration				
		Boot Configuration				
		Peripheral Configuration				
		IDE Configuration				
		Diskette Configuration				
		Event Log Configuration				
		Video Configuration				

The submenu features shown in Table 17 are used for configuring computer peripherals.

Table 17.   Peripheral Configuration Submenu

Feature	Options	Description
Serial Port A	• Disabled • Enabled • **Auto (default)**	Configures serial port A. *Auto* assigns the first free COM port, normally COM1, the address 3F8h, and the interrupt IRQ4. An * (asterisk) displayed next to an address indicates a conflict with another device.
Base I/O Address (This feature is present only when Serial Port A is set to *Enabled*)	• **3F8 (default)** • 2F8 • 3E8 • 2E8	Specifies the base I/O address for serial port A, if serial port A is Enabled.
Interrupt (This feature is present only when Serial Port A is set to *Enabled*)	• IRQ 3 • **IRQ 4 (default)**	Specifies the interrupt for serial port A, if serial port A is Enabled.
Parallel Port	• Disabled • Enabled • **Auto (default)**	Configures the parallel port. *Auto* assigns LPT1 the address 378h and the interrupt IRQ7. An * (asterisk) displayed next to an address indicates a conflict with another device.
Mode	• Output Only • **Bi-directional (default)** • EPP • ECP	Selects the mode for the parallel port. Not available if the parallel port is disabled. *Output Only* operates in AT[†]-compatible mode. *Bi-directional* operates in 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.

continued

Table 17.   Peripheral Configuration Submenu (continued)

Feature	Options	Description
Base I/O Address (This feature is present only when Parallel Port is set to *Enabled*)	• **378 (default)** • 278 • 228	Specifies the base I/O address for the parallel port.
Interrupt (This feature is present only when Parallel Port is set to *Enabled*)	• IRQ 5 • **IRQ 7 (default)**	Specifies the interrupt for the parallel port.
DMA Channel (This feature is present only when Parallel Port Mode is set to *ECP*)	• 1 • **3 (default)**	Specifies the DMA channel.
Audio Device	• Disabled • **Enabled (default)**	Enables or disables the onboard audio subsystem.
LAN Device (This feature is present only when there is onboard LAN)	• Disabled • **Enabled (default)**	Enables or disables the LAN device.
Legacy USB Support	• Disabled • **Enabled (default)**	Enables or disables USB legacy support. (See USB Support on page 13 for more information.)

IDE Configuration Submenu

To access this submenu, select Advanced on the menu bar, then IDE Configuration.

Maintenance	Main	**Advanced**	Security	Power	Boot	Exit
		PCI Configuration				
		Boot Configuration				
		Peripheral Configuration				
		IDE Configuration				
		Diskette Configuration				
		Event Log Configuration				
		Video Configuration				

Table 18 shows the features used to configure IDE device options.

Table 18.   IDE Configuration Submenu

Feature	Options	Description
IDE Controller	• Disabled • Primary • Secondary • **Both (default)**	Specifies the integrated IDE controller. *Primary* enables only the primary IDE controller. *Secondary* enables only the secondary IDE controller. *Both* enables both IDE controllers.
Hard Disk Pre-Delay	• **Disabled (default)** • 3 Seconds • 6 Seconds • 9 Seconds • 12 Seconds • 15 Seconds • 21 Seconds • 30 Seconds	Specifies the hard disk drive pre-delay.
Primary IDE Master	No options	Reports type of connected IDE device. When selected, displays the Primary IDE Master submenu.
Primary IDE Slave	No options	Reports type of connected IDE device. When selected, displays the Primary IDE Slave submenu.
Secondary IDE Master	No options	Reports type of connected IDE device. When selected, displays the Secondary IDE Master submenu.
Secondary IDE Slave	No options	Reports type of connected IDE device. When selected, displays the Secondary IDE Slave submenu.

Primary/Secondary IDE Master/Slave Submenus

To access these submenus, select Advanced on the menu bar, then IDE Configuration, and then the master or slave to be configured.

Maintenance	Main	**Advanced**	Security	Power	Boot	Exit

PCI Configuration
Boot Configuration
Peripheral Configuration

IDE Configuration
   Primary IDE Master
   Primary IDE Slave
   Secondary IDE Master
   Secondary IDE Slave

Diskette Configuration
Event Log Configuration
Video Configuration

There are four IDE submenus: primary master, primary slave, secondary master, and secondary slave. Table 19 shows the format of the IDE submenus. For brevity, only one example is shown.

Table 19.   Primary/Secondary IDE Master/Slave Submenus

Feature	Options	Description
Drive Installed	None	Displays the type of drive installed.
Type	• None • User • **Auto (default)** • CD-ROM • ATAPI Removable • Other ATAPI • IDE Removable	Specifies the IDE configuration mode for IDE devices. *User* allows capabilities to be changed. *Auto* fills-in capabilities from ATA/ATAPI device.
Maximum Capacity	None	Displays the capacity of the drive.
LBA Mode Control	• Disabled • **Enabled (default)**	Enables or disables LBA mode control.
Multi-Sector Transfers	• Disabled • 2 Sectors • 4 Sectors • 8 Sectors • **16 Sectors (default)**	Specifies number of sectors per block for transfers from the hard disk drive to memory. Check the hard disk drive's specifications for optimum setting.
PIO Mode (Note)	• **Auto (default)** • 0 • 1 • 2 • 3 • 4	Specifies the PIO mode.

Note: These configuration options appear only if an IDE device is installed.

Table 18.   Primary/Secondary IDE Master/Slave Submenus (continued)

Feature	Options	Description
Ultra DMA	• **Disabled (default)** • Mode 0 • Mode 1 • Mode 2 • Mode 3 • Mode 4 • Mode 5	Specifies the Ultra DMA mode for the drive.
Cable Detected (Note)	None	Displays the type of cable connected to the IDE interface: 40-conductor or 80-conductor (for ATA-66/100 devices).

Note: These configuration options appear only if an IDE device is installed.

Diskette Configuration Submenu

To access this menu, select Advanced on the menu bar, then Diskette Configuration.

Maintenance	Main	**Advanced**	Security	Power	Boot	Exit
		PCI Configuration				
		Boot Configuration				
		Peripheral Configuration				
		IDE Configuration				
		Diskette Configuration				
		Event Log Configuration				
		Video Configuration				

Table 20 shows the features used for configuring the diskette drive.

Table 20.   Diskette Configuration Submenu

Feature	Options	Description
Diskette Controller	• Disabled • **Enabled (default)**	Disables or enables the integrated diskette controller.
Floppy A	• Not Installed • 360 KB 5¼" • 1.2 MB 5¼" • 720 KB 3½" • **1.44/1.25 MB 3½" (default)** • 2.88 MB 3½"	Specifies the capacity and physical size of diskette drive A.
Diskette Write-Protect	• **Disabled (default)** • Enabled	Disables or enables write-protect for the diskette drive.

Event Log Configuration Submenu

To access this menu, select Advanced on the menu bar, then Event Log Configuration.

Maintenance	Main	**Advanced**	Security	Power	Boot	Exit

PCI Configuration
Boot Configuration
Peripheral Configuration
IDE Configuration
Diskette Configuration
Event Log Configuration
Video Configuration

Table 21 shows the features used to configure the event logging features.

Table 21.   Event Log Configuration Submenu

Feature	Options	Description
Event Log	No options	Indicates if there is space available in the event log.
Event Log Validity	No options	Indicates if the contents of the event log are valid.
View Event Log	[Enter]	Displays the event log.
Clear All Event Logs	• **No (default)** • Yes	Clears the event log after rebooting.
Event Logging	• Disabled • **Enabled (default)**	Enables logging of events.
Mark Events As Read	• **Yes (default)** • No	Marks all events as read.

Video Configuration Submenu

To access this menu, select Advanced on the menu bar, then Video Configuration.

Maintenance	Main	**Advanced**	Security	Power	Boot	Exit
		PCI Configuration				
		Boot Configuration				
		Peripheral Configuration				
		IDE Configuration				
		Diskette Configuration				
		Event Log Configuration				
		Video Configuration				

Table 22 shows the options available for configuring the video features.

Table 22.   Video Configuration Submenu

Feature	Options	Description
Primary Video Adapter	• **AGP (default)** • PCI	Selects primary video adapter to be used during boot.
AGP Hardware Detected	No Options	*Integrated* indicates that the onboard graphics subsystem is enabled on the board.

Security Menu

To access this menu, select Security from the menu bar at the top of the screen.

| Maintenance | Main | Advanced | **Security** | Power | Boot | Exit |

Table 23 shows the options for setting passwords and security features.

Table 23.   Security Menu

If no password entered previously:

Feature	Options	Description
Supervisor Password Is	No options	Reports if there is a supervisor password set.
User Password Is	No options	Reports if there is a user password set.
Set Supervisor Password	Password can be up to seven alphanumeric characters.	Specifies the supervisor password.
Set User Password	Password can be up to seven alphanumeric characters.	Specifies the user password.
Clear User Password (Note 1)	• **Yes (default)** • No	Clears the user password.
User Access Level (Note 2)	• Limited • No Access • View Only • **Full (default)**	Sets BIOS Setup Utility access rights for user level.
Unattended Start (Notes 1, 3, and 4)	• Enabled • **Disabled (default)**	*Enabled* allows system to complete the boot process without a password. The keyboard remains locked until a password is entered. A password is required to boot from a diskette.

Notes:

1.   This feature appears only if a user password has been set.

2.   This feature appears only if both a user password and a supervisor password have been set.

3.   If both Legacy USB Support (in the Peripheral Configuration submenu) and Unattended Start (in the Security menu) are enabled, USB aware operating systems can unlock a PS/2 style keyboard and mouse without requiring the user to enter a password.

4.   When Unattended Start is enabled, a USB aware operating system may override user password protection if used in conjunction with a USB keyboard and mouse without requiring the user to enter a password.

Power Menu

To access this menu, select Power from the menu bar at the top of the screen.

Maintenance	Main	Advanced	Security	**Power**	Boot	Exit
				APM		
				ACPI		

Table 24 options available for setting the power management features.

Table 24.   Power Menu

Feature	Options	Description
APM	No Options	When selected, displays the APM submenu.
ACPI	No Options	When selected, displays the ACPI submenu.
After Power Failure	• Stays Off • **Last State (default)** • Power On	Specifies the mode of operation if an ac power loss occurs. *Stays Off* keeps the power off until the power button is pressed. *Last State* restores the previous power state before power loss occurred. *Power On* restores power to the computer.
Wake on LAN (This feature is present only when there is no onboard LAN subsystem)	• **Stay Off (default)** • Power-On	In APM soft-off mode only, determines how the system responds to a LAN wake up event.
Wake on PME	• **Stay Off (default)** • Power-On	In APM soft-off mode only, determines how the system responds to a PCI-PME wake up event.
Wake on Modem Ring	• **Stay Off (default)** • Power-On	In APM soft-off mode only, specifies how the computer responds to a Modem Ring wake up event on an installed modem.

APM Submenu

To access this menu, select Power on the menu bar, then APM.

Maintenance	Main	Advanced	Security	**Power**	Boot	Exit
				APM		
				ACPI		

Table 25 shows the options available for setting the APM features.

Table 25.   APM Submenu

Feature	Options	Description
Power Management	• Disabled • **Enabled (default)**	Enables or disables the APM feature.
Inactivity Timer	• Off • 1 Minute • 5 Minutes • 10 Minutes • **20 Minutes (default)** • 30 Minutes • 60 Minutes • 120 Minutes	Specifies the amount of time before the computer enters APM standby mode.
Hard Drive	• Disabled • **Enabled (default)**	Enables power management for hard disks during APM standby mode.

ACPI Submenu

To access this menu, select Power on the menu bar, then ACPI.

Maintenance	Main	Advanced	Security	**Power**	Boot	Exit
				APM		
				ACPI		

The submenu represented in Table 26 is for setting the ACPI features.

Table 26.   ACPI Submenu

Feature	Options	Description
ACPI Suspend State	• **S1 State (default)** • S3 State	Specifies the ACPI sleep state. The wake jumper must be set to wake from PS/2 device or USB device under S3 state.
Video Repost (This feature is present only when ACPI Suspend State is set to S3)	• **Disabled (default)** • Enabled	Allows the video BIOS to be initialized coming out of the S3 state. Some video controllers require this option to be enabled. This feature is present only if the ACPI suspend state is set to S3 state. See page 35 for more information on how to set the jumper blocks.
Wake on LAN from S5	• **Stay Off (default)** • Power On	In ACPI soft-off mode only, determines how the system responds to a LAN wake up event when the system is in the ACPI soft-off mode.

Boot Menu

To access this menu, select Boot from the menu bar at the top of the screen.

Maintenance	Main	Advanced	Security	Power	**Boot**	Exit

Table 27 shows the options used to set the boot features and the boot sequence.

Table 27.   Boot Menu

Feature	Options	Description
Quiet Boot	• Disabled • **Enabled (default)**	*Disabled* displays normal POST messages. *Enabled* displays OEM graphic instead of POST messages.
Intel® Rapid BIOS Boot	• Disabled • **Enabled (default)**	Enables the computer to boot without running certain POST tests.
Scan User Flash Area	• **Disabled (default)** • Enabled	Enables the BIOS to scan the flash memory for user binary files that are executed at boot time.
Boot Device Priority	No options	Specifies the boot sequence from the available types of boot devices.
Hard Disk Drives	No options	Specifies the boot sequence from the available hard disk drives.
Removable Devices	No options	Specifies the boot sequence from the available removable devices.
ATAPI CDROM Drives	No options	Specifies the boot sequence from the available ATAPI CD-ROM drives.

Boot Device Priority Submenu

To access this menu, select Boot from the menu bar, then Boot Devices Priority.

Maintenance	Main	Advanced	Security	Power	**Boot**	Exit
					Boot Device Priority	
					Hard Disk Drives	
					Removable Devices	
					ATAPI CD-ROM Drives	

Table 28 shows the options available for setting boot devices priority.

Table 28.   Boot Device Priority Submenu

Feature	Options	Description
1st Boot Device 2nd Boot Device 3rd Boot Device 4th Boot Device (Note 1)	• Removable Device • Hard Drive • ATAPI CD-ROM • Intel® UNDI, PXE • Disabled	Specifies the boot sequence from the available types of boot devices. To specify boot sequence: 1. Select the boot device with <↑> or <↓>. 2. Press <Enter> to set the selection as the intended boot device. The operating system assigns a drive letter to each boot device in the order listed. Changing the order of the devices changes the drive lettering. The default settings for the first through final boot devices are, respectively listed below. The BIOS supports up to sixteen total boot devices in any combination of the boot device types below, with respect to these maximums per type. • Removable Device (maximum of four) • Hard Drive (maximum of 12) • ATAPI CD-ROM (maximum of four) • Intel UNDI, PXE (maximum of five) (Note 2) The boot devices appear in order by type. For example, assume that the default boot order is preserved and that seven boot devices of the following types are installed on the system: two removable devices, two hard drives, two ATAPI CD-ROMs, and an Intel UNDI (Universal Network Device Interface), PXE device. Both removable devices would appear as the first and second boot devices, the two hard drives would appear as the third and fourth, the two ATAPI CD-ROM drives would appear as the fifth and sixth, and the Intel UNDI, PXE device would appear as the seventh boot device.

Notes:

1.   After the predefined boot device types (removable devices, hard drives, and ATAPI CD-ROM drives), the entries in this list will reflect as many boot entry vector (BEV) boot devices (for example, Intel UNDI, PXE devices) and SCSI CD-ROM drives as are installed, up to the five BEV boot devices supported by the BIOS.

2.   While the predefined boot device types are individually listed in submenus by type, the BEV devices and SCSI CD-ROM drives are all listed at this level.

Hard Disk Drives Submenu

To access this menu, select Boot from the menu bar, then Hard Disk Drives.

Maintenance	Main	Advanced	Security	Power	**Boot**	Exit
					Boot Device Priority	
					Hard Disk Drives	
					Removable Devices	
					ATAPI CD-ROM Drives	

Table 29 shows the options available for setting hard disk drives.

Table 29.   Hard Disk Drives Submenu

Feature	Options	Description
1st Hard Disk Drive (Note)	Dependent on installed hard drives	Specifies the boot sequence from the available hard disk drives. To specify boot sequence: 1. Select the boot device with <↑> or <↓>. 2. Press <Enter> to set the selection as the intended boot device.

Note: This boot device submenu appears only if at least one boot device of this type is installed. This list will display up to twelve hard disk drives, the maximum number of hard disk drives supported by the BIOS.

Removable Devices Submenu

To access this menu, select Boot from the menu bar, then Removable Devices.

Maintenance	Main	Advanced	Security	Power	**Boot**	Exit
					Boot Device Priority	
					Hard Disk Drives	
					Removable Devices	
					ATAPI CD-ROM Drives	

The submenu represented in Table 30 is for setting removable devices.

Table 30.   Removable Devices Submenu

Feature	Options	Description
1st Removable Device (Note)	Dependent on installed removable devices	Specifies the boot sequence from the available removable devices. To specify boot sequence: 1. Select the boot device with <↑> or <↓>. 2. Press <Enter> to set the selection as the intended boot device.

Note: This boot device submenu appears only if at least one boot device of this type is installed. This list will display up to four removable devices, the maximum number of removable devices supported by the BIOS.

ATAPI CD-ROM Drives

To access this menu, select Boot from the menu bar, then ATAPI CDROM Drives.

Maintenance	Main	Advanced	Security	Power	**Boot**	Exit
					Boot Device Priority	
					Hard Disk Drives	
					Removable Devices	
					ATAPI CD-ROM Drives	

Table 31 shows the options available for setting ATAPI CD-ROM drives.

Table 31.   ATAPI CD-ROM Drives Submenu

Feature	Options	Description
1st ATAPI CD-ROM Drive (Note)	Dependent on installed ATAPI CD-ROM drives	Specifies the boot sequence from the available ATAPI CD-ROM drives. To specify boot sequence: 1. Select the boot device with <↑> or <↓>. 2. Press <Enter> to set the selection as the intended boot device.

Note: This boot device submenu appears only if at least one boot device of this type is installed. This list will display up to four ATAPI CD-ROM drives, the maximum number of ATAPI CD-ROM drives supported by the BIOS.

Exit Menu

To access this menu, select Exit from the menu bar at the top of the screen.

Maintenance	Main	Advanced	Security	Power	Boot	**Exit**

Table 32 shows the features for exiting the BIOS Setup program, saving changes, and loading and saving defaults.

Table 32.   Exit Menu

Feature	Description
Exit Saving Changes	Exits and saves the changes in CMOS SRAM.
Exit Discarding Changes	Exits without saving any changes made in the BIOS Setup program.
Load Setup Defaults	Loads the factory default values for all the Setup options.
Load Custom Defaults	Loads the custom defaults for Setup options.
Save Custom Defaults	Saves the current values as custom defaults. Normally, the BIOS reads the Setup values from flash memory. If this memory is corrupted, the BIOS reads the custom defaults. If no custom defaults are set, the BIOS reads the factory defaults.
Discard Changes	Discards changes without exiting Setup. The option values present when the computer was turned on are used.

5 Technical Reference

Board Connectors

The board connectors can be divided into three groups:

- Back panel connectors
- Midboard connectors
    - — Audio connectors
    - — Power and hardware connectors
    - — Add-in board and peripheral interface connectors
- Front panel connectors

⚠ CAUTION

Many of the midboard and front panel connectors provide operating voltage (+5 V dc and +12 V dc, for example) to devices inside the computer chassis, such as fans and internal peripherals. These connectors are not overcurrent protected. 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.

Back Panel Connectors

Figure 20 shows the back panel connectors on the desktop board. The back panel connectors are color-coded in compliance with PC 99 recommendations. The figure legend below lists the colors used.
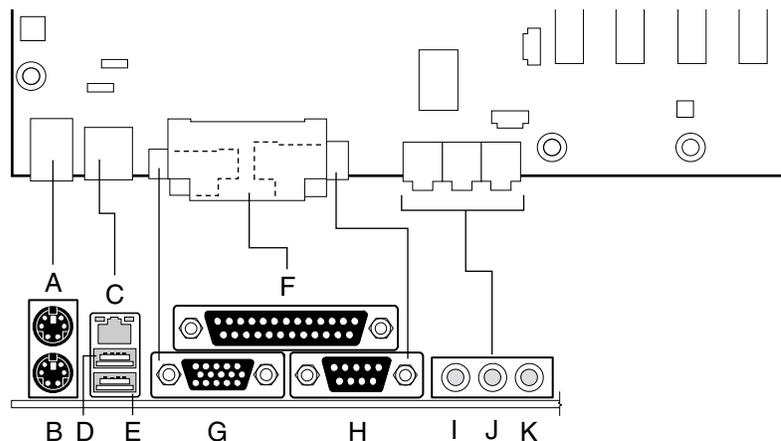
OM12561

Item	Description	Color
A	PS/2 mouse	Green
B	PS/2 keyboard	Purple
C	RJ-45 connector (optional)	N/A
D	USB port 0	N/A
E	USB port 1	N/A
F	Parallel port	Burgundy
G	VGA port	Blue
H	Serial port A	Teal
I	Audio line out	Lime green
J	Audio line in	Light blue
K	Mic in	Pink

Figure 20. Back Panel Connectors

✏ **NOTE**

The line out connector, located on the back panel, is designed to power either headphones or amplified speakers only. Poor audio quality may occur if passive (non-amplified) speakers are connected to this output.

Midboard Connectors

Audio Connectors

Figure 21 shows the location of the audio connectors.
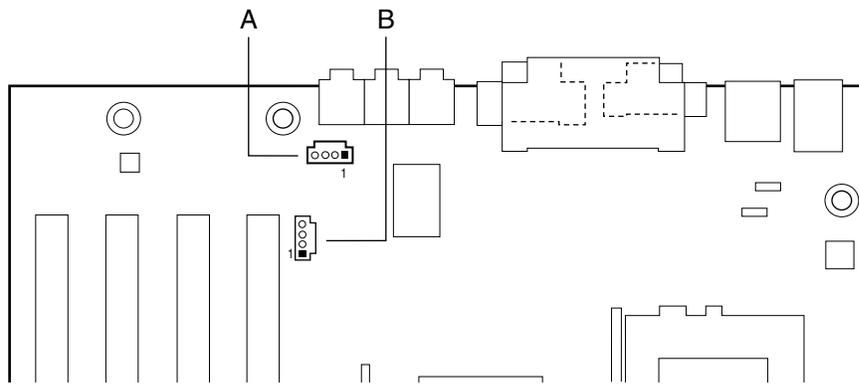
OM12562

Item	Description	Color
A	ATAPI-style CD-ROM	Black
B	ATAPI-style auxiliary line in	Gray

Figure 21. Audio Connectors

Power and Hardware Control Connectors

Figure 22 shows the power and hardware connectors.
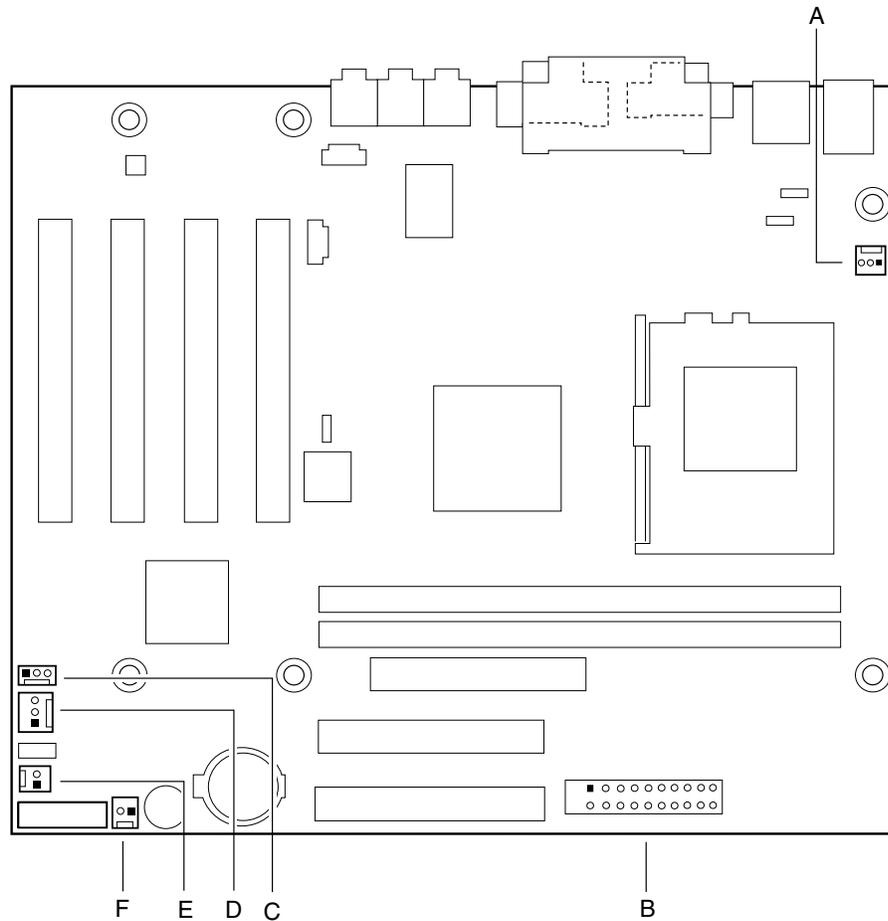
OM12563

Item	Description
A	Processor fan (fan 1)
B	Main power
C	Wake on LAN technology
D	Chassis fan (fan 2)
E	Chassis intrusion
F	SCSI hard drive activity LED

Figure 22. Power and Hardware Control Connectors

Figure 23 shows the add-in board and peripheral interface connectors.
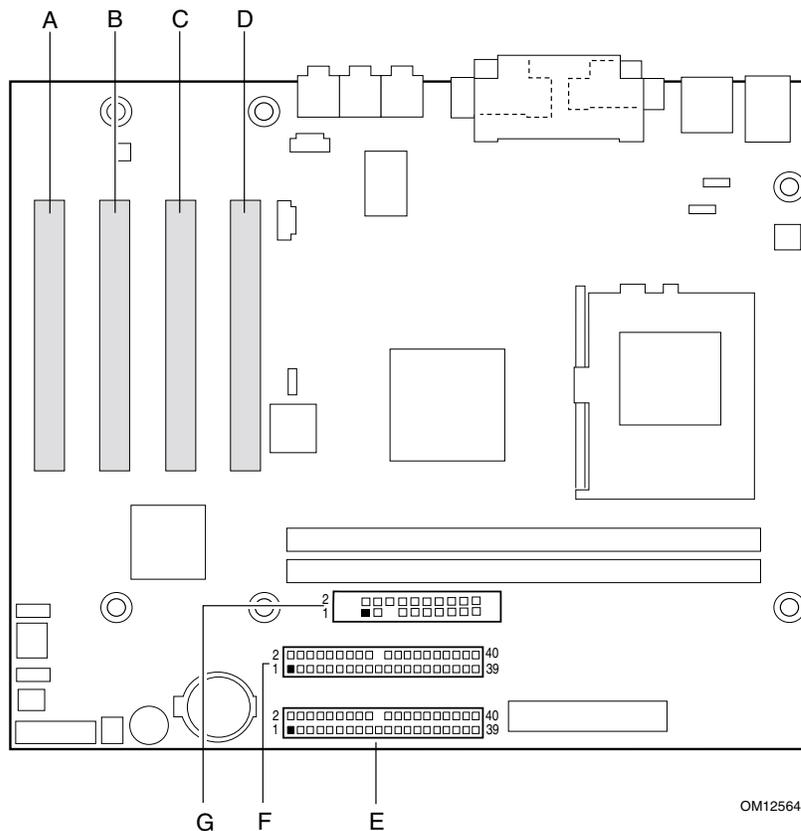
Item	Description
A	PCI slot 4
B	PCI slot 3
C	PCI slot 2
D	PCI slot 1
E	Primary IDE
F	Secondary IDE
G	Diskette drive

Figure 23. Add-in Board and Peripheral Interface Connectors

Front Panel Connectors

Figure 24 shows the location of the front panel connectors.
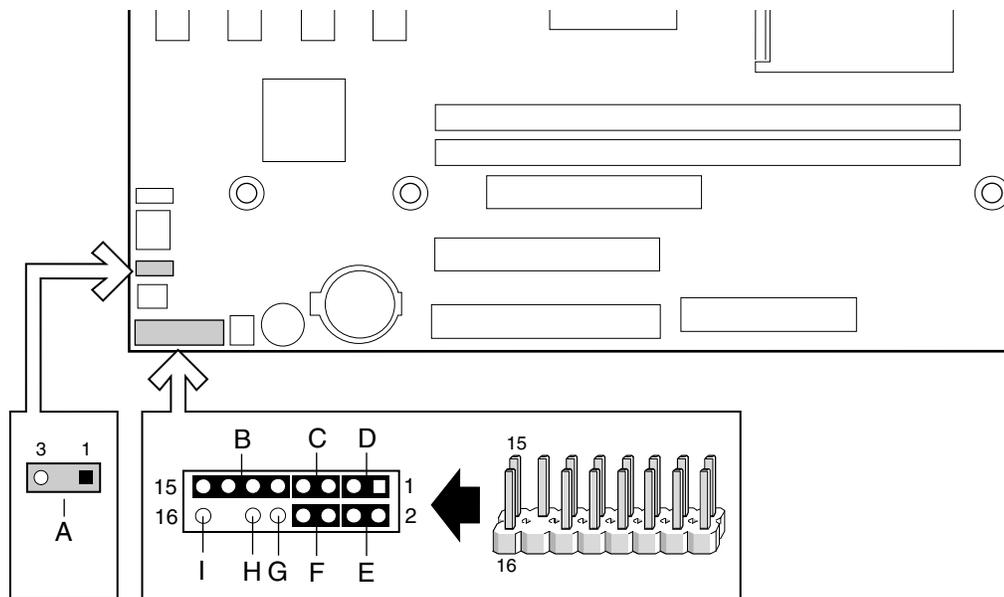
OM12565

Item	Description
A	Alternate front panel power LED connector
B	Reserved
C	Reset switch
D	Hard drive activity LED
E	Power LED
F	On/Off switch
G	No connect
H	Ground
I	+5 V

Figure 24. Front Panel Connectors

Desktop Board Resources

Interrupts

Table 33.   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* (user available if COM2 is not present)
4	COM1*
5	LPT2 (Plug and Play option)/audio/user available
6	Diskette drive controller
7	LPT1*
8	Real time clock
9	User available
10	User available
11	User available
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)

*   Default, but can be changed to another IRQ.

A Error Messages and Indicators

The board reports POST errors in two ways:

- By sounding a beep code
- By displaying an error message on the monitor

BIOS Beep Codes

The BIOS beep codes are listed in Table 34. The BIOS also issues a beep code (one long tone followed by two short tones) during POST if the video configuration fails (a faulty video card or no card installed) or if an external ROM module does not properly checksum to zero.

Table 34.   Beep Codes

Number of Beeps	Description
1	Refresh failure
2	Parity cannot be reset
3	First 64 K memory failure
4	Timer not operational
5	Processor failure (Reserved; not used)
6	8042 GateA20 cannot be toggled (memory failure or not present)
7	Exception interrupt error
8	Display memory R/W error
9	(Reserved; not used)
10	CMOS Shutdown register test error
11	Invalid BIOS (such as, POST module not found)

BIOS Error Messages

When a recoverable error occurs during the POST, the BIOS displays an error message describing the problem (see Table 35).

Table 35.   BIOS Error Messages

Error Message	Explanation
GA20 Error	An error occurred with Gate A20 when switching to protected mode during the memory test.
Pri Master HDD Error Pri Slave HDD Error Sec Master HDD Error Sec Slave HDD Error	Could not read sector from corresponding drive.
Pri Master Drive - ATAPI Incompatible Pri Slave Drive - ATAPI Incompatible Sec Master Drive - ATAPI Incompatible Sec Slave Drive - ATAPI Incompatible	Corresponding drive is not an ATAPI device. Run Setup to make sure device is selected correctly.
A: Drive Error B: Drive Error	No response from diskette drive.
CMOS Battery Low	The battery may be losing power. Replace the battery soon.
CMOS Display Type Wrong	The display type is different than what has been stored in CMOS. Check Setup to make sure type is correct.
CMOS Checksum Bad	The CMOS checksum is incorrect. CMOS memory may have been corrupted. Run Setup to reset values.
CMOS Settings Wrong	CMOS values are not the same as the last boot. These values have either been corrupted or the battery has failed.
CMOS Date/Time Not Set	The time and/or date values stored in CMOS are invalid. Run Setup to set correct values.
DMA Error	Error during read/write test of DMA controller.
FDC Failure	Error occurred trying to access diskette drive controller.
HDC Failure	Error occurred trying to access hard disk controller.
Checking NVRAM.....	NVRAM is being checked to see if it is valid.
Update OK!	NVRAM was invalid and has been updated.
Updated Failed	NVRAM was invalid but was unable to be updated.
Keyboard Error	Error in the keyboard connection. Make sure keyboard is connected properly.
KB/Interface Error	Keyboard interface test failed.

continued

Table 35.   BIOS Error Messages (continued)

Error Message	Explanation
Memory Size Decreased	Memory size has decreased since the last boot. If no memory was removed, then memory may be bad.
Memory Size Increased	Memory size has increased since the last boot. If no memory was added, there may be a problem with the system.
Memory Size Changed	Memory size has changed since the last boot. If no memory was added or removed, then memory may be bad.
No Boot Device Available	System did not find a device to boot.
Off Board Parity Error	A parity error occurred on an off-board card. This error is followed by an address.
On Board Parity Error	A parity error occurred in onboard memory. This error is followed by an address.
Parity Error	A parity error occurred in onboard memory at an unknown address.
NVRAM/CMOS/PASSWORD cleared by Jumper	NVRAM, CMOS, and passwords have been cleared. The system should be powered down and the jumper removed.
<CTRL_N> Pressed	CMOS is ignored and NVRAM is cleared. User must enter Setup.

B Regulatory Compliance

This appendix contains:

* Safety standards, electromagnetic compatibility (EMC) regulations, and product certification markings for this desktop board
* Instructions and precautions for integrators who are installing this desktop board in a chassis

Safety Regulations

This desktop board complies with the safety regulations stated in Table 36 when correctly installed in a compatible host system.

Table 36. Safety Regulations

Regulation	Title
UL 1950/CSA C22.2 No. 950, 3rd edition	Bi-National Standard for Safety of Information Technology Equipment including Electrical Business Equipment. (USA and Canada)
EN 60950, 2nd Edition, 1992 (with Amendments 1, 2, 3, and 4)	The Standard for Safety of Information Technology Equipment including Electrical Business Equipment. (European Union)
IEC 60950, 2nd edition, 1991 (with Amendments 1, 2, 3, and 4)	The Standard for Safety of Information Technology Equipment including Electrical Business Equipment. (International)
EMKO-TSE (74-SEC) 207/94	Summary of Nordic deviations to EN 60950. (Norway, Sweden, Denmark, and Finland)

EMC Regulations

The desktop board complies with the EMC regulations stated in Table 37 when correctly installed in a compatible host system.

Table 37. EMC Regulations

Regulation	Title
FCC Class B	Title 47 of the Code of Federal Regulations, Parts 2 and 15, Subpart B, Radiofrequency Devices. (USA)
ICES-003 (Class B)	Interference-Causing Equipment Standard, Digital Apparatus. (Canada)
EN55022: 1998 (Class B)	Limits and methods of measurement of Radio Interference Characteristics of Information Technology Equipment. (European Union)
EN55024: 1998	Information Technology Equipment – Immunity Characteristics Limits and methods of measurement. (European Union)
AS/NZS 3548 (Class B)	Australian Communications Authority, Standard for Electromagnetic Compatibility. (Australia and New Zealand)
CISPR 22, 3rd Edition, (Class B)	Limits and methods of measurement of Radio Disturbance Characteristics of Information Technology Equipment. (International)
CISPR 24: 1997	Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement. (International)

Product Certification Markings

- UL joint US/Canada Recognized Component mark: consists of small c followed by a stylized backward UR and followed by a small US. Includes adjacent UL file number for Intel desktop boards: E210882 (component side).
- FCC Declaration of Conformity logo mark for Class B equipment; includes Intel name and model designation (solder side).
- CE mark: declaring compliance to European Union (EU) EMC directive (89/336/EEC) and Low Voltage directive (73/23/EEC) (component side).
- Australian Communications Authority (ACA) C-Tick mark: consists of a stylized C overlaid with a check (tick) mark (component side), followed by Intel supplier code number, N-232.
- Printed wiring board manufacturer's recognition mark: consists of a unique UL recognized manufacturer's logo, along with flammability rating (94V-0) (solder side).
- PB part number: A69778-001 (Intel® bare circuit board part number, solder side).

  Also includes SKU number starting with AA followed by additional alphanumeric characters.
- Battery "+ Side Up" marking: located on the component side of the board in close proximity to the battery holder.
- Korean MIC logo mark: denotes Korean EMC certification (component side). Additional certification information is provided below:
  1. Product Name (model)
  2. Certificate ID
  3. Applicant: Intel Korea Ltd.
  4. Date of manufacture as separate marking on product
  5. Manufacturer (country of origin)

Installation Precautions

When you install and test the desktop 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.

Installation Instructions

⚠ **CAUTION**

Follow these guidelines to meet safety and regulatory requirements when installing this board assembly.

Read and adhere to all of these instructions and the instructions supplied with the chassis and associated modules. If the instructions for the chassis are inconsistent with these instructions or the instructions for associated modules, contact the supplier's technical support to find out how you can ensure that your computer meets safety and regulatory requirements. If you do not follow these instructions and the instructions provided by chassis and module suppliers, you increase safety risk and the possibility of noncompliance with regional laws and regulations.

Ensure Electromagnetic Compatibility (EMC) Compliance

Before computer integration, make sure that the power supply and other modules or peripherals, as applicable, have passed Class B EMC testing and are marked accordingly.

In the installation instructions for the host chassis, power supply, and other modules pay close attention to the following:

- Product certifications or lack of certifications
- External I/O cable shielding and filtering
- Mounting, grounding, and bonding requirements
- Keying connectors when mating the wrong connectors could be hazardous

If the power supply and other modules or peripherals, as applicable, are not Class B EMC compliant before integration, then EMC testing is required on a representative sample of the newly completed computer.

Chassis and Component Certifications

Ensure that the chassis and certain components; such as the power supply, peripheral drives, wiring, and cables; are components certified for the country or market where used. Agency certification marks on the product are proof of certification. Typical product certifications include:

In Europe

The CE marking signifies compliance with all applicable European requirements. If the chassis and other components are not properly CE marked, a supplier's Declaration of Conformity statement to the European EMC directive and Low Voltage directive (as applicable), should be obtained. Additionally, other directives, such as the Radio and Telecommunications Terminal Equipment (R&TTE) directive may also apply depending on product features.

In the United States

A certification mark by a Nationally Recognized Testing Laboratory (NRTL) such as UL, CSA, or ETL signifies compliance with safety requirements. Wiring and cables must also be UL listed or recognized and suitable for the intended use. The FCC Class B logo for home or office use signifies compliance with electromagnetic interference (EMI) requirements.

In Canada

A nationally recognized certification mark such as CSA or cUL signifies compliance with safety requirements. The Industry Canada statement at the front of this product guide demonstrates compliance with Canadian EMC regulations. Industry Canada recognizes and accepts FCC certification as denoting compliance with national electromagnetic interference (emissions) requirements.

Prevent Power Supply Overload

Do not overload the power supply output. To avoid overloading the power supply, make sure that the calculated total current loads of all the modules within the computer is less than the output current rating of each of the power supplies output circuits.

Place Battery Marking

There is insufficient space on this desktop board to provide instructions for replacing and disposing of the Lithium ion coin cell battery. For system safety certification, the following statement or equivalent statement is required to be permanently and legibly marked on the chassis near the battery.

⚠ CAUTION

Risk of explosion if battery is incorrectly replaced.

Replace with only the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Use Only for Intended Applications

All Intel desktop processor boards are evaluated as Information Technology Equipment (I.T.E.) for use in personal computers for installation in homes, offices, schools, computer rooms, and similar locations. The suitability of this product for other applications or environments, such as medical, industrial, alarm systems, test equipment, etc. may require further evaluation.