Intel® Server Board S815EBM1 Product Guide

A Guide for Technically Qualified Assemblers of Intel® Identified Subassemblies/Products

Order Number: A67054-002

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1   Description

Server Board Features

Table 1.   Server Board Features

Feature	Description
Processors	Support for either an Intel® Pentium® III processor in a Flip Chip Pin Grid Array (FC-PGA and FC-PGA2) package or an Intel® Celeron™ processor in a FC-PGA package.
Memory	• Three 168-pin Dual Inline Memory Module (DIMM) sockets • Support for up to 512 MB system memory • Support for single row or double row DIMMs
Chipset	The S815EBM1 board includes the Intel® 815E Chipset, consisting of: • Intel® 82815 Graphics and Memory Controller Hub (GMCH) • Intel® 82801BA I/O Controller Hub (ICH2) • 4 Mbit Firmware Hub (FWH) (STM M50FW040 or equivalent)
I/O Control	SMSC LPC47M132 LPC bus I/O controller.
Peripheral Interfaces	• One back panel serial port • USB ports: four back panel • One parallel port • Two IDE interfaces with Ultra ATA/66 and ATA/100 support • One floppy drive interface • PS/2† keyboard and mouse ports
SCSI LED Connector	Allows add-in SCSI controllers to use the same LED as the onboard I/O controller.
Expansion Capabilities	Three PCI bus expansion slots (SMBus routed to PCI slot 2, S5 wake from all PCI slots).
BIOS	Intel/AMI BIOS 4 Mbit Firmware Hub (FWH) Support for: • Advanced Power Management (APM) • Advanced Configuration and Power Interface (ACPI) • Plug and Play • SMBIOS
Power Management	Support for both ACPI Rev. 2.0 and APM Rev. 1.2
Wake on LAN† Technology	Support for system wake up using an add-in network interface card with remote wake up capability.
Form Factor	MicroATX (9.6 inches by 8.2 inches)

Back Panel Connectors

The back panel connectors are color-coded in compliance with PC 99 recommendations. The figure legend below lists the colors used.
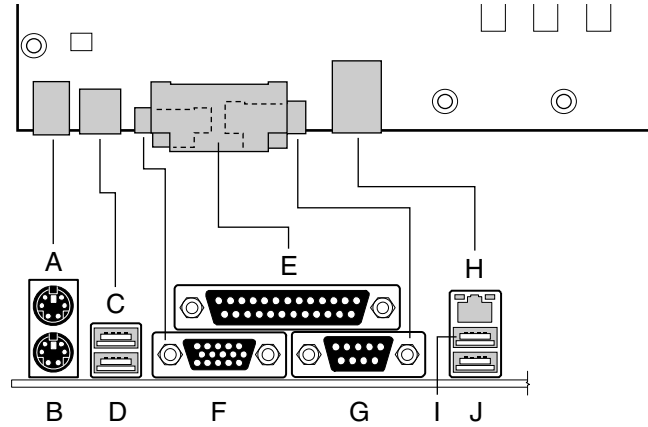
OM12208

A. PS/2 mouse, green
B. PS/2 keyboard, purple
C. USB port 1
D. USB port 3
E. Parallel port, burgundy
F. VGA port, blue
G. Serial port A, teal
H. RJ-45 LAN connector with LED display
I. USB port 0
J. USB port 2

Figure 1. Back Panel Connectors

Front Panel Connectors

Figure 2 shows the location of the front panel connectors.
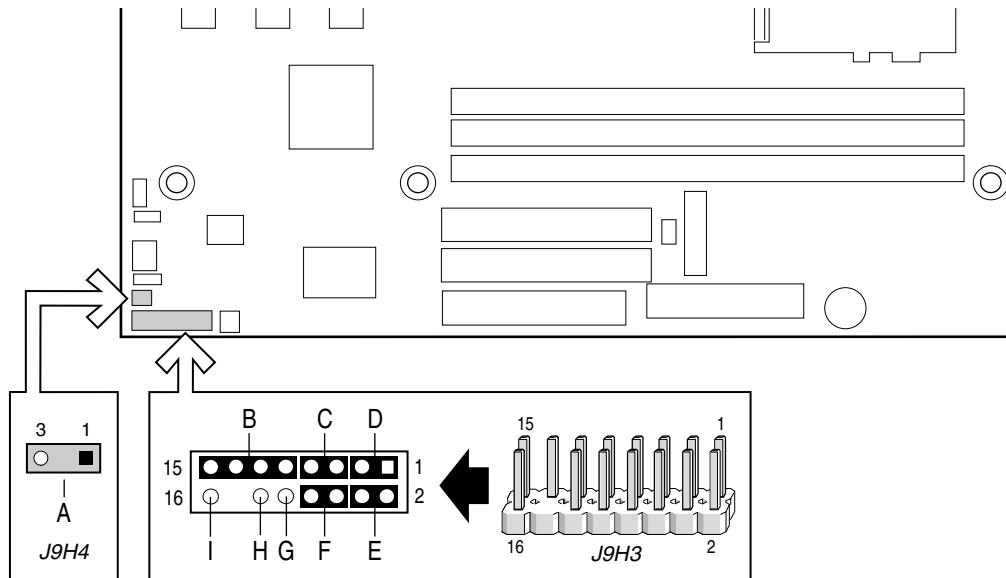
OM12281

A. Chassis intrusion 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 2. Front Panel Connectors

Server Board Connector and Component Locations
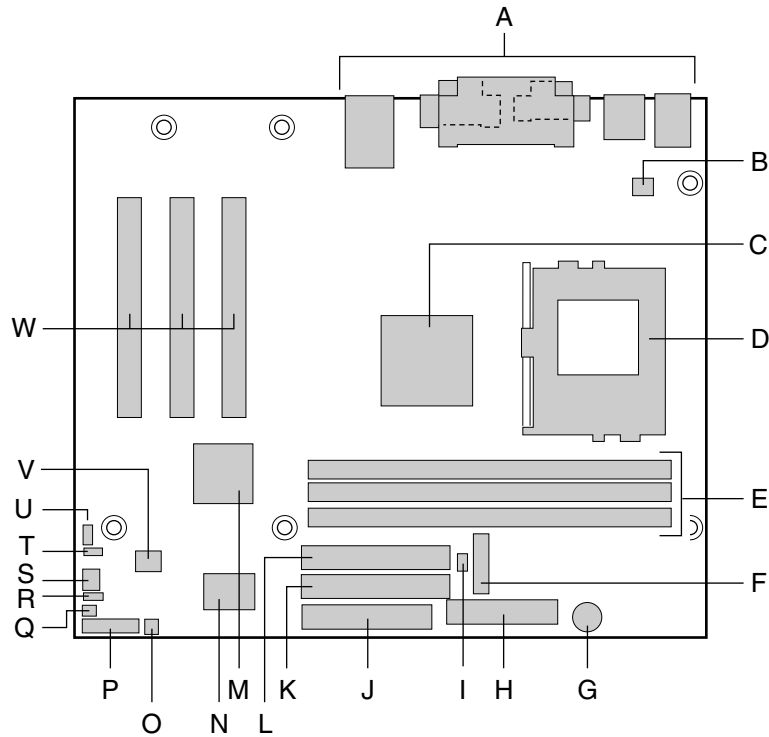
OM12201

A.	Back panel connectors	M.	Intel 82801BA I/O Controller Hub (ICH2)
B.	Processor fan connector (fan 1)	N.	SMSC LPC47M132 Super I/O controller
C.	Intel® 82815E GMCH	O.	SCSI hard drive activity LED connector
D.	370-pin processor socket	P.	Front panel switch/LED connector
E.	DIMM sockets	Q.	Chassis intrusion connector
F.	Battery	R.	Alternate front panel power LED connector
G.	Speaker	S.	System fan (fan 2)
H.	Main power connector	T.	BIOS configuration jumper block
I.	Chassis fan (fan 3)	U.	Wake on LAN technology connector
J.	Floppy drive connector	V.	4 Mbit Firmware Hub (FWH)
K.	Primary IDE connector	W.	PCI expansion slots
L.	Secondary IDE connector		

Figure 3. Server Board Components

Processors

The board supports a single Intel Pentium lll processor or Intel Celeron processor above 533 MHz. Processors are not included with the server board and must be purchased separately.

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

Table 2.   Supported Processors

Type	Designation	System Bus Frequency	L2 Cache Size
Intel Pentium III processor in an FC-PGA2 package	1.0 GHz*, 1.2 GHz	133 MHz	512 KB
	1.13 GHz, 1.26 GHz	133 MHz	256 KB
Intel Pentium III processor in an FC-PGA package	533EB, 600EB, 667, 733, 800B, 866, and 933 MHz 1.0 GHz*	133 MHz	256 KB
	500E, 550E, 600E, 650, 700, 750, 800, and 850 MHz	100 MHz	256 KB
Celeron processor in an FC-PGA package	800 and 850 MHz	100 MHz	128 KB
	533A, 566, 600, 633, 667, 700, 733, and 766 MHz	66 MHz	128 KB

* Support of the 1 GHz Pentium III is dependent upon package type. S815EBM1 Fan Heatsink (FHS) only supports FCPGA2 packaging type – customers can determine S815EBM1 support at this speed by product s-spec. For the latest information on processor support for the boards, refer to the Intel server board web site at:

http://support.intel.com/support/motherboards/server/S815EBM1/

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

Memory

The board supports 168-pin SDRAM DIMMs as defined below:

- 168-pin SDRAM Dual Inline Memory Modules (DIMMs) with gold-plated contacts
- Three DIMM slots are provided for flexible memory configurations
- 133 MHz SDRAM up to two double row DIMMs, or one double row DIMM and two single row DIMMs
- 100 MHz SDRAM up to three double row DIMMs
- Minimum system memory: 32 MB
- Maximum system memory: 512 MB
- Unbuffered single or double row DIMMs
- Serial Presence Detect (SPD) memory
- Non-ECC and ECC DIMMs (ECC DIMMs will operate in non-ECC mode only)
- 3.3 V memory (only)
- Basic Non-SPD support
- Mixed speed DIMM configuration will default to the slowest speed DIMM installed

✏ **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 <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."

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

✏ **NOTES**

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

If more than four rows of 133 MHz SDRAM are populated, the BIOS will display a message indicating that it will initialize installed memory up to 512 MB at 100 MHz.

Intel® 82815E 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:

- 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 ATA-66/100 mode and Ultra DMA 33 mode).
- Integrated LAN media access controller.
- Universal Serial Bus Interface with two USB controllers providing four back panel ports in a Universal Host Controller Interface (UHCI) implementation.
- Power management logic (ACPI Rev 2.0 compliant).
- Support for the System Management Bus routed to:
  - PCI Slot 2
  - S5 wake from all PCI slots
- Real-Time Clock (with 256-byte battery backed CMOS RAM).
- Supports two Master/DMA devices.

Firmware Hub (FWH)

The 4 Mbit Firmware Hub has this feature:

- System BIOS

Input/Output (I/O) Controller

The boards support the SMSC LPC47M132 I/O controller.

The SMSC LPC47M132 I/O controller features the following:

- One parallel port with Extended Capabilities Port (ECP) and Enhanced Parallel Port (EPP) support
- Mouse and keyboard controller
- Diskette drive controller
- Fan control (chassis fan only)
- Fan tachometer

Real-Time Clock

The server board has a time-of-day clock and 100-year calendar. A battery on the board keeps the clock current when the server is turned off.

USB Support

The server board has four rear panel USB ports. You can connect four USB peripheral devices directly to the server without an external hub. To attach more than four devices, connect an external hub to either of the built-in ports. The server board supports the UHCI specification and takes advantage of standard software drivers written to be compatible with UHCI.

> ✏ **NOTE**
>
> *Server 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, and Iomega Zip† drives inside the server. The interface supports:

- Up to four IDE devices (such as hard drives)
- PIO Mode 3 and PIO Mode 4 devices
- Ultra UDMA/33, Ultra ATA/66, and Ultra ATA/100 protocols
- Support for laser servo (LS-120) drives

Expansion Slots

The S815EBM1 board has three add-in board connectors.

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 server, 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 server, the IDE auto-configuration utility in the BIOS automatically detects and configures the device for your server. You do not need to run the BIOS Setup program after installing an IDE device.

Security Passwords

The BIOS includes security features that restrict whether the BIOS Setup program can be accessed and who can boot the server. A supervisor password and a user password can be set for the Setup menu and for booting the server, 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 server. The password prompt is displayed before the server is booted. If only the supervisor password is set, the server boots without asking for a password. If both passwords are set, you can enter either password to boot the server.

Speaker

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

LAN Subsystem

The Intel® 82562ET (in conjunction with the Intel 82801BA ICH2) provides a Fast Ethernet Wired for Management (WfM) PCI LAN subsystem providing both 10Base-T and 100Base-TX connectivity. Features include:

- 32-bit, 33-MHz direct bus mastering on the PCI bus
- Shared memory structure in the host memory that copies data directly to/from host memory
- 10Base-T and 100Base-TX capability using a single RJ-45 connector with connection and activity status LEDs
- IEEE 802.3u Auto-Negotiation for the fastest available connection
- Jumperless configuration; the LAN subsystem is completely software configurable

Intel® 82562ET Platform LAN Connect Device

The Intel 82562ET LAN component provides an interface to the back panel RJ-45 connector with integrated LEDs.

The Intel 82562ET provides the following functions:

- Basic 10/100 Ethernet LAN connectivity
- Supports RJ-45 connector with status indicator LEDs
- Full driver compatibility
- Advanced Power Management (APM) support
- Programmable transit threshold

LAN Subsystem Software

For Intel 82562ET Fast Ethernet WfM PCI LAN software and drivers, refer to the S815EBM1, link on Intel's support web site at:

http://support.intel.com/support/motherboards/server/S815EBM1/

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 speed is selected.
	On	100 Mbit/sec speed is selected.
Yellow	Off	LAN link is not established.
	On (steady state)	LAN link is established.
	On (brighter and pulsing)	The server is communicating with another server on the LAN.

Battery

A battery on the server board keeps the values in CMOS RAM and the clock current when the server 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:
  — Wake on LAN technology
  — S5 wake on all PCI slots
  — Wake on Ring
  — 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.

Wake on LAN Technology

The Wake on LAN technology connector can be used with PCI bus network adapters that have a remote wake-up connector. Network adapters that are PCI 2.2 compliant assert the wake-up signal using the PCI bus signal PME# (pin A19 on the PCI bus connectors). See Figure 21 on page 68 for the location of the Wake on LAN technology connector on the server board.

⚠ CAUTION

For Wake on LAN 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 implementing Wake on LAN technology can damage the power supply.

⚠ CAUTION

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

Wake on Ring

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

- Powers up the server from the APM soft-off mode.
- Modem must support PME.
- Requires two calls to access the server:
  - The first call powers up the server.
  - The second call enables access (when the appropriate software is loaded).
- For external modems, hardware on the server board monitors the ring indicate (RI) input of the serial port.

Resume on Ring

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

- Resumes operation from the APM sleep mode.
- Requires only one call to access the server.
- Detects incoming call similarly for external and internal modems; does not use the Wake on Ring connector.
- Requires modem interrupt be unmasked for correct operation.

Intel Server Board S815EBM1 Product Guide

2 Upgrading

Tools and Supplies Needed

- Phillips† (cross head) screwdriver (#1 bit and #2 bit)
- Jumper removal tool or needle nosed pliers
- Pen or pencil
- Antistatic wrist strap and conductive foam pad (recommended)

Warnings and Cautions

These warnings and cautions apply throughout this chapter. Only a technically qualified person should configure the server board.

⚠ WARNING

Hazardous conditions, devices & cables: *Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.*

⚠ CAUTIONS

System power on/off: *The power button DOES NOT turn off the system AC power. To remove power from system, you must unplug the AC power cord from the wall outlet. Make sure the AC power cord is unplugged before you open the chassis, add, or remove any components.*

Electrostatic discharge (ESD) & ESD protection: *ESD can damage disk drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground—any unpainted metal surface—on your server when handling parts.*

ESD and handling boards: *Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.*

Installing or removing jumpers: *A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that you can grip with your fingertips or with a pair of fine needle nosed pliers. If your jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to*

grip with, but not squeeze, the pliers or other tool you use to remove a jumper, or you may bend or break the stake pins on the board.

Memory

⚠ CAUTION

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

You can access the PC Serial Presence Detect Specification at:

http://www.intel.com/design/chipsets/memory/

The boards have three 168-pin DIMM sockets arranged as banks 0, 1, and 2 as shown in Figure 4. 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 boards 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 through the Internet at:

http://www.intel.com/design/chipsets/memory/

Installing DIMMs

To install DIMMs, follow these steps:

1. Observe the safety and ESD precautions at the beginning of this chapter.
2. Turn off all peripheral devices connected to the server. Turn off the server and disconnect the AC power cord.

3. Remove the server's cover and locate the DIMM sockets (see Figure 4).
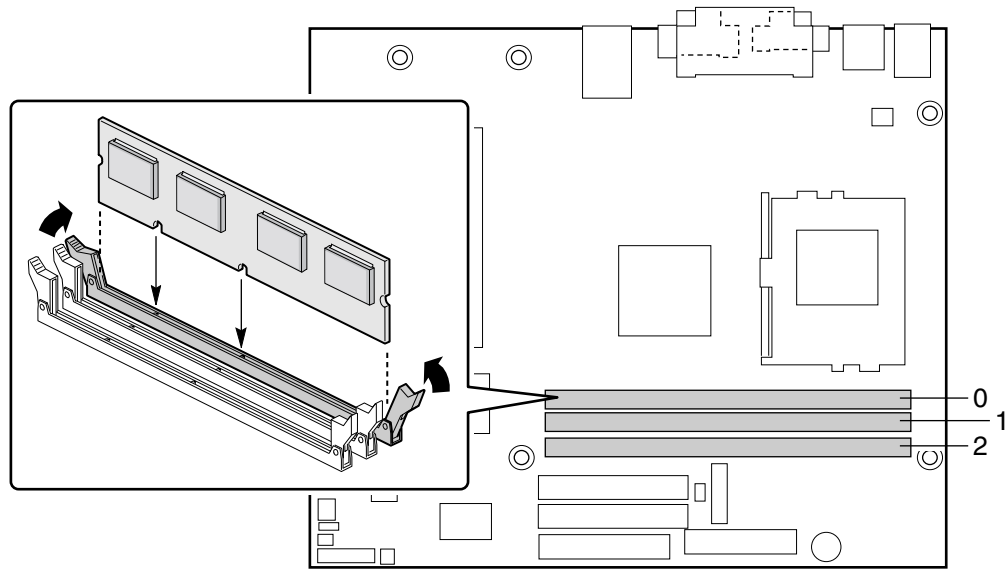
OM12202

Figure 4. 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 4).
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 server's cover and reconnect the AC power cord.

Removing DIMMs

To remove a DIMM, follow these steps:
1. Observe the safety and ESD precautions at the beginning of this chapter.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Remove the AC power cord from the server.
4. Remove the server's cover.
5. Gently spread the retaining clips at each end of the 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 server's cover and reconnect the AC power cord.

Installing the I/O Shield

⚠ CAUTION

Systems based on these boards need the I/O shield properly installed to pass emissions (EMI) certification testing and to meet Class B emissions compliance levels. Without the I/O shield, or with an improperly installed I/O shield, the PC system will not meet Class B regulatory compliance requirements.

The boxed server board comes with an I/O shield for a general purpose chassis. If installing this board in an 1U chassis, obtain an I/O shield from the chassis vendor. 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 server board in the chassis. Place the shield inside the chassis and press the shield into place so that it fits tightly and securely. If the shield doesn't fit, obtain a proper-sized shield from the chassis supplier.
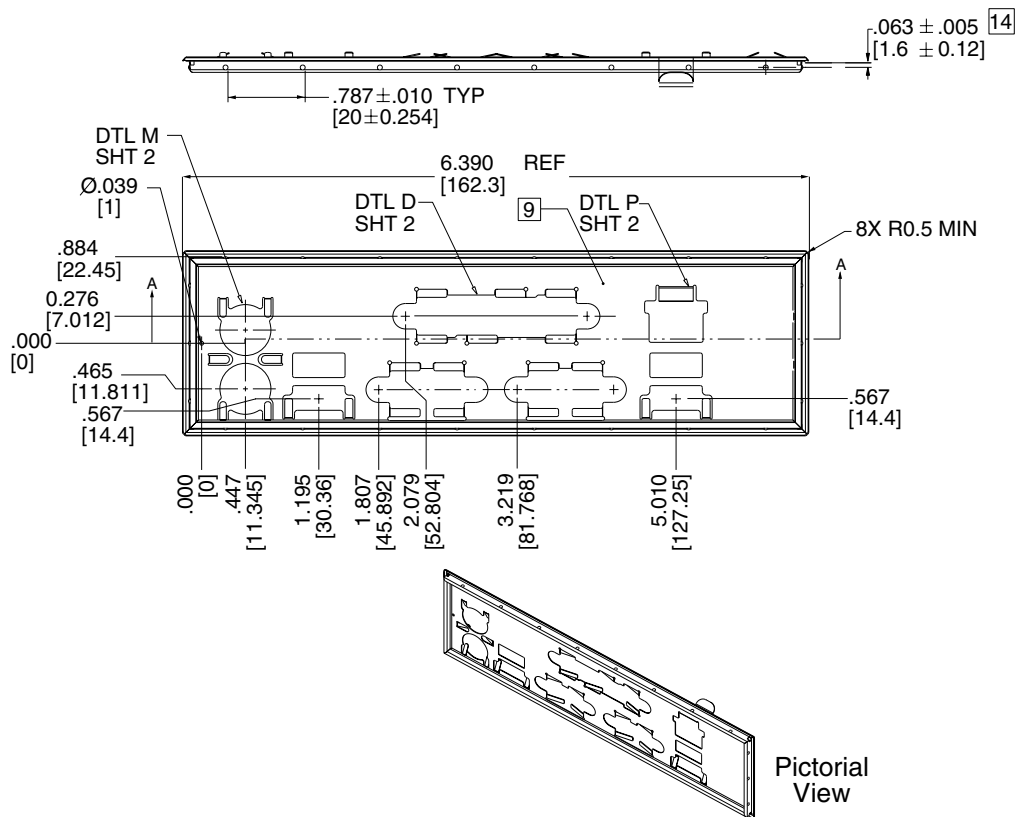
Figure 5. I/O Shield Dimensions

Installing the Server Board

Refer to your chassis manual for instructions on installing the server board. Six screws secure the server board to the chassis. Figure 6 shows the locations of the mounting screw holes.

✏ **NOTES**

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

Refer to Page 73 for regulatory requirements and installation instructions and precautions.

⚠ **WARNING**

Only qualified technical personnel should attempt this procedure. Disconnect the server from its power source before performing the procedures described here. Failure to disconnect the power before you open the server can result in personal injury or equipment damage.
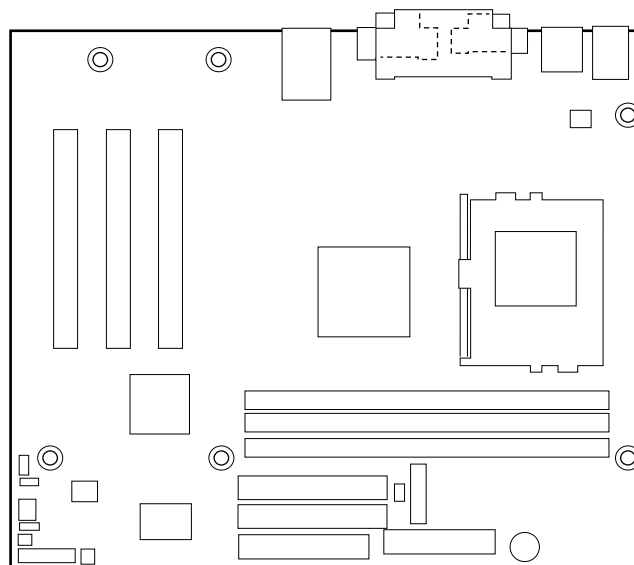
OM12203

Figure 6. Location of the Mounting Screw Holes

Installing a Processor

✏ **NOTE**

For instructions on how to install a 1 GHz processor heatsink, see page 27.

To install a processor, follow these instructions:

1. Observe the safety and ESD precautions at the beginning of this chapter.
2. Locate the processor socket and raise the socket handle completely (see Figure 7, B).
3. Aligning the pins of the processor with the socket, insert the processor into the socket (see Figure 7, A and C).
4. Close the handle completely (see Figure 7, D).
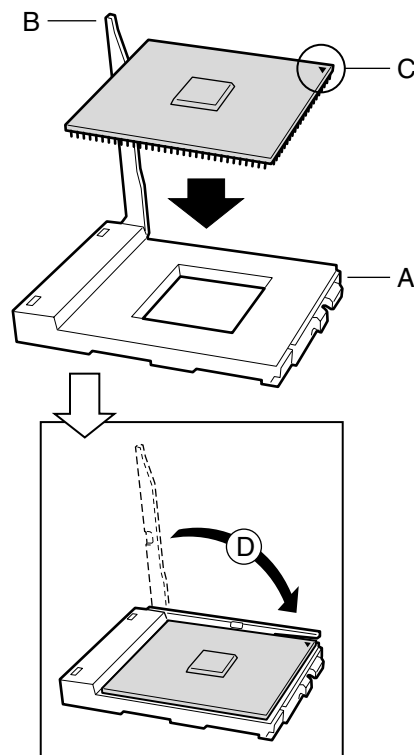
OM11065

Figure 7. Installing the Processor in the Processor Socket

5. Place the fan heatsink on top of the processor (see Figure 8).
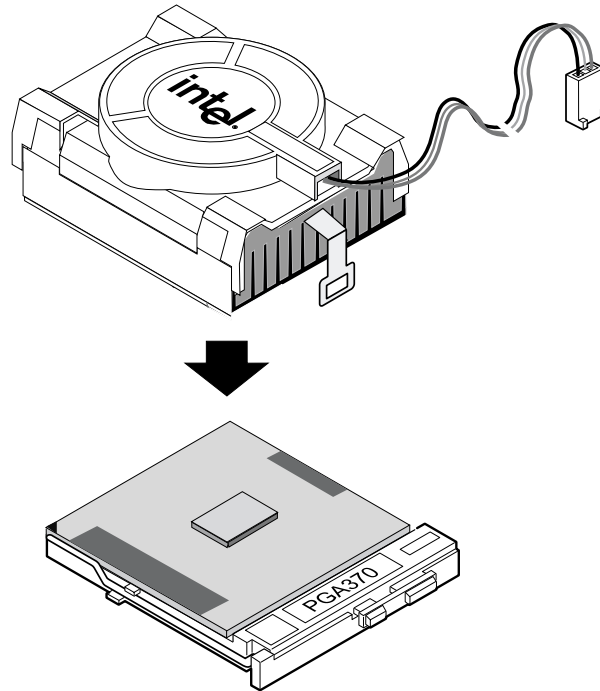
OM09415

Figure 8. Attaching the Heatsink to the Processor

6. Attach the fan heatsink clips to the processor socket (see Figure 9).
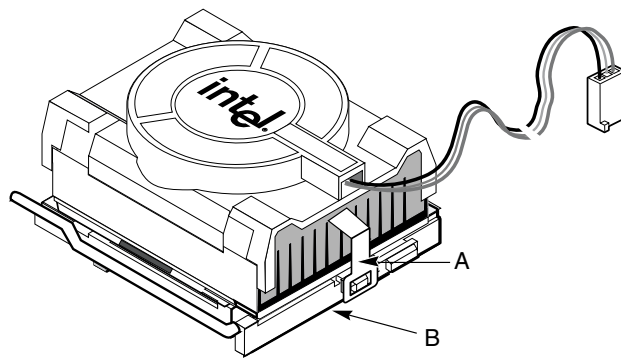
OM09416

A. Fan Heatsink Clip
B. Processor Socket

Figure 9. Attaching the Fan Heatsink Clips to the Processor Socket

7. Connect the processor fan cable to the processor fan connector (see Figure 10).
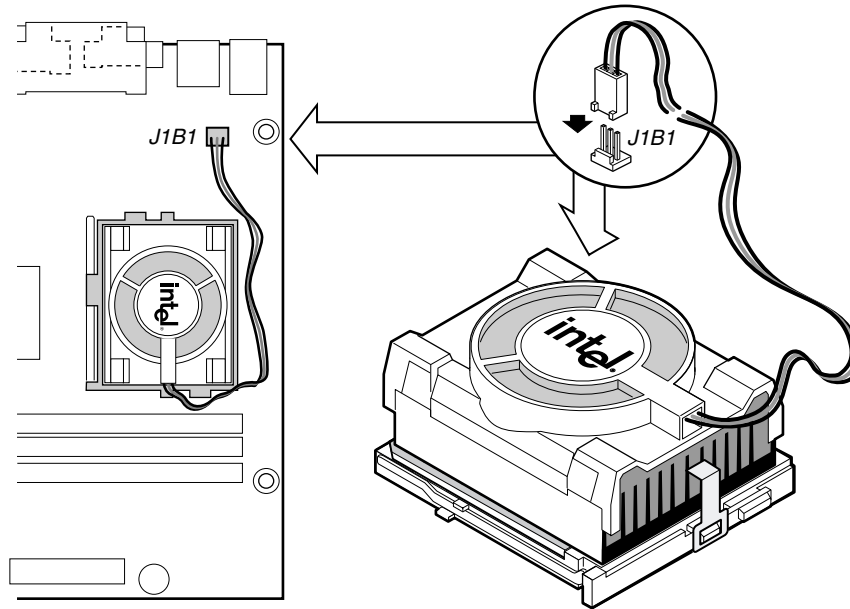
OM11156

Figure 10. Connecting the Processor Fan Cable to the Processor Fan Connector

Removing the Processor

To remove the processor, follow these instructions:

1. Observe the safety and ESD precautions at the beginning of this chapter.
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 Processor Heatsink

✏ **NOTES**

These instructions do <u>NOT</u> apply to the processors in the FCPGA-2 type of packaging. Processors in the FCPGA-2 type of packaging include an Integrated Heat Spreader (IHS) on the processor package and require a different fan heatsink. Integration of the fan heatsink shown below with processors in the FCPGA-2 packaging will result in using the thermal solution provided with the board in a configuration that is out of specification and will void this server board warranty. For more details on processors specifically supported with this board and the included thermal solution please refer to:

http://support.intel.com/support/motherboards/server/S815EBM1/

To install a 1 GHz processor, follow the instructions given on page 24, Figure 7. Follow the instructions below to install the fan heatsink to the processor:

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 11, A).
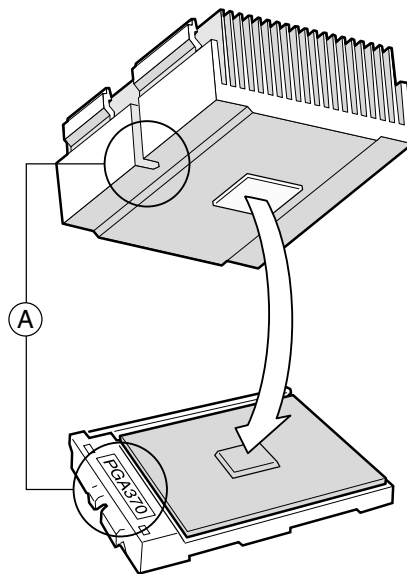
OM11063

Figure 11. Attaching the Fan Heatsink Over the Processor

2. Making sure the handle is in up position, place the plastic clip (see Figure 12, B) on the fan heatsink (see Figure 12, C). The inset in Figure 12 (A) shows the heatsink notch location.
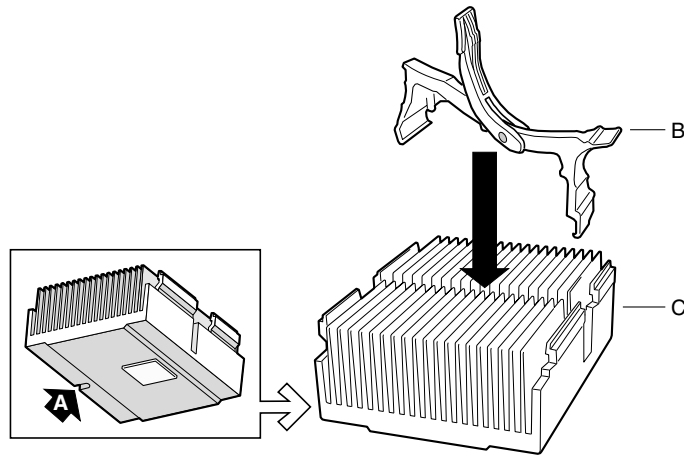
OM11064

Figure 12. Placing the Plastic Clip Over the Fan Heatsink

3. When properly aligned, each edge of the plastic clip should click into place. Hold the clip handle (see Figure 13, A) and **very slowly** lower the handle until the clip secures the fan heatsink to the processor socket.
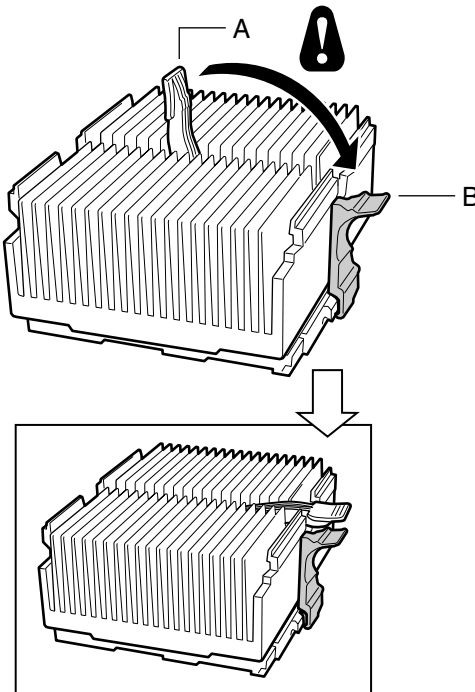
OM11062

Figure 13. Lowering the Plastic Clip Handle

4. Clip the fan (A) over the fan heatsink (B) as illustrated in Figure 14.
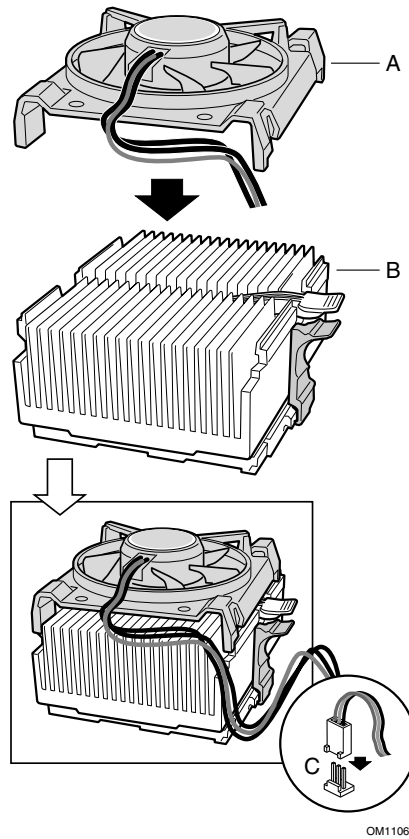
OM11061

Figure 14. Attaching the Fan to the Fan Heatsink

5. Connect the processor fan cable to the processor fan connector (see Figure 15).
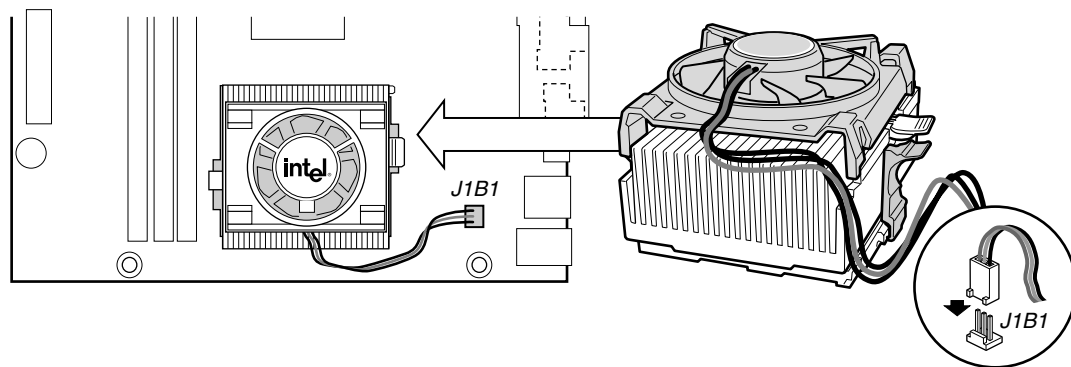
OM11175

Figure 15. Connecting the Processor Fan Cable to the Processor Fan Connector

Removing the 1 GHz Processor

To remove the 1 GHz processor, follow these instructions:

1. Observe the safety and ESD precautions at the beginning of this chapter.
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 13, 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 16).
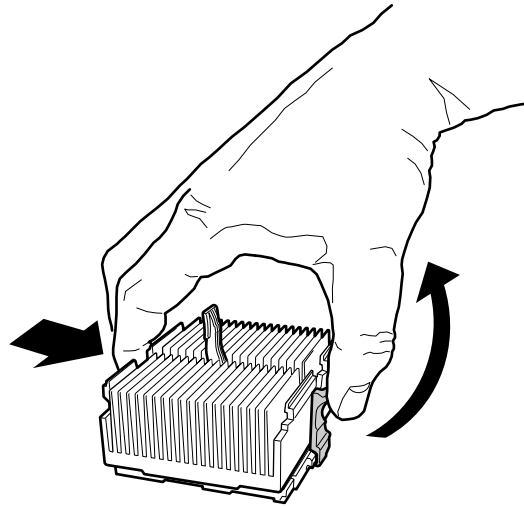
OM11069

Figure 16. Removing the Fan Heatsink

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

Replacing the Battery

When your server is turned off, a lithium battery maintains the time-of-day clock and the keeps the values in CMOS RAM. The location of the server board battery is shown in Figure 17 on page 33.

The battery should last about seven years whereupon it begins to lose voltage. 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**

Refer to technically qualified persons only for replacement of battery.

⚠ **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.

⚠ **PRECAUTION**

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 safety and ESD precautions at the beginning of this chapter.
2. Turn off all peripheral devices connected to the server. Disconnect the server's power cord from the AC power source (wall outlet or power adapter).
3. Remove the server cover.
4. Locate the battery on the board (see Figure 17).
5. With your fingertip, gently pull back the tab away from the battery.
   Pull out the battery. Note the orientation of the "+" and "-" on the battery.
6. Install the new battery in the connector, orienting the "-" as shown in Figure 17.
7. Replace the server cover.
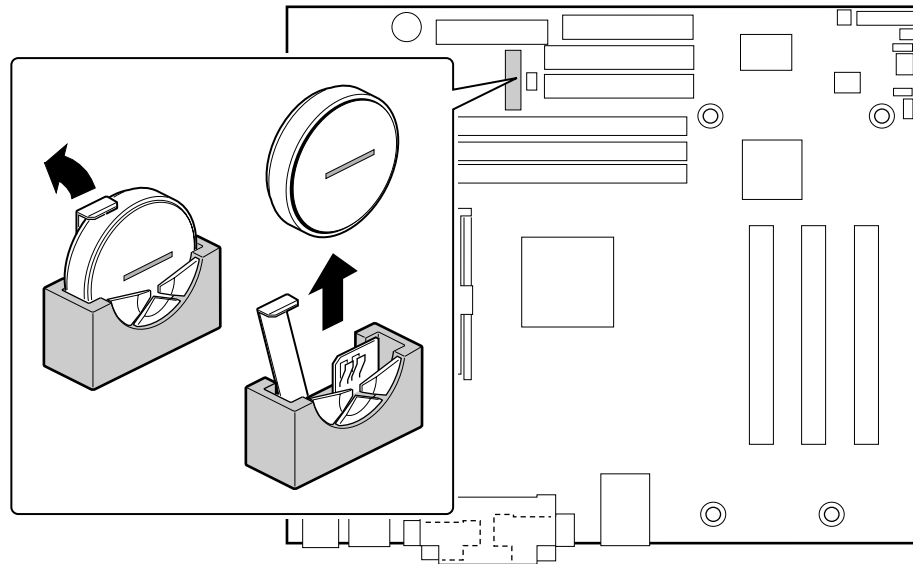
OM12204

Figure 17. Removing the Battery

Connecting the IDE Cable

The Intel® boxed server board package includes a 40-contact, 80-conductor IDE cable. It is capable of connecting two drives to the server board. The cable supports Ultra ATA/66 and Ultra ATA/100 transfer protocols and is backward compatible with drives using slower IDE transfer protocols.

For the cable to function correctly:

- Attach the cable end with the single connector (A), which is black and labeled PRI IDE, to the server board as shown in Figure 18.
- 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 gray connector (P3).
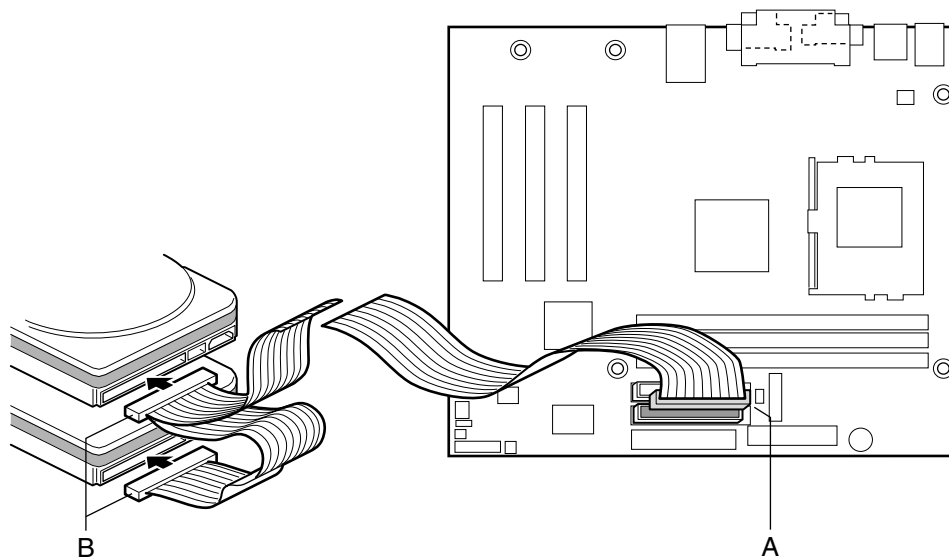
OM12205

Figure 18. Connecting the IDE Cable

Setting the BIOS Configuration Jumper

⚠ CAUTION

Always turn off the power and unplug the power cord from the server before changing the jumper. Moving the jumper with the power on may result in unreliable server operation.
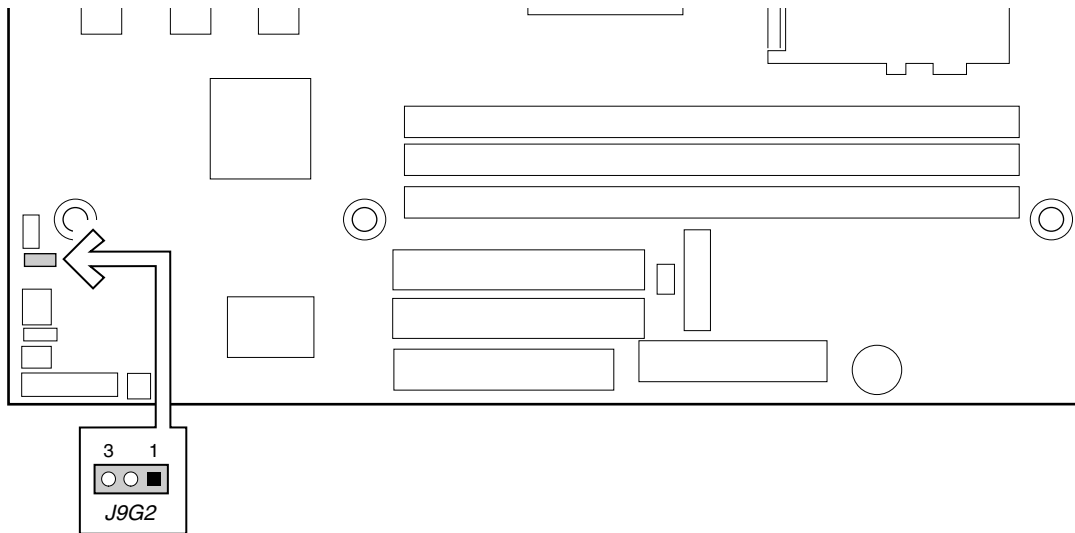
OM12206

Figure 19. BIOS Configuration Jumper Block Location

This three-pin jumper block, shown in Figure 19, enables all server board configurations to be done in BIOS Setup. Table 5 shows the jumper settings for the Setup program modes.

Table 5.   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.

Clearing the Passwords

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

1. Observe the safety and ESD precautions at the beginning of this chapter.
2. Turn off all peripheral devices connected to the server. Turn off the server. Disconnect the server's power cord from the AC power source (wall outlet or power adapter).
3. Remove the server cover.
4. Find the configuration jumper block (see Figure 19).
5. Place the jumper on pins 2-3 as shown below.

   3 ▣ ● ● ▢ 1

6. Replace the cover, plug in the server, turn on the server, and allow it to boot.
7. The server 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 server. Disconnect the server's power cord from the AC power source.
11. Remove the server cover.
12. To restore normal operation, place the jumper on pins 1-2 as shown below.

    3 ○ ● ■ 1

3 Configuration Software and Utilities

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 support web site:
   http://support.intel.com/support/motherboards/server
2. Navigate to the S815EBM1 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 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

Follow the steps described below to update the BIOS using the Intel Flash Memory Update Utility:

* Prepare for the update
* Update the BIOS
* Recover the BIOS if an update fails

Preparing for the Update

Before you update the BIOS, prepare by:

* Obtaining the BIOS update file
* Recording the current BIOS settings
* Creating the BIOS upgrade diskette

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 server supplier or from the Intel World Wide Web site:

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

✏ **NOTE**

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

Recording the Current BIOS Settings

1. Boot the server and press `<F2>` when you see the message:

```
Press <F2> Key if you want to run SETUP
```

✏ **NOTE**

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

2. Write down the current settings in the BIOS Setup program.

Creating Bootable Media

You can create bootable media with a:

- CD writer
- Normal diskette drive or an LS-120 diskette drive

Creating a Bootable CD

Follow the instructions provided with your CD writer to make a bootable CD using floppy emulation and bootable files.

Creating a Bootable Diskette

✏ **NOTE**

If your drive A is an LS-120 diskette drive, you must use a 1.44-MB diskette as the bootable BIOS update diskette. The server is unable to recover a BIOS from an LS-120 diskette.

To create a bootable diskette using a DOS system:

- Place an unformatted diskette in the diskette drive and format the diskette using the /s option. *Example:* `format a: /s`
- Alternatively, place a formatted diskette in the diskette drive and use the sys command. *Example:* `sys a:`

To create a bootable diskette using a non-DOS system:

1. Obtain the BIOS update file through your server supplier or from the Intel World Wide Web site:

   http://support.intel.com/support/motherboards/server/
2. Copy the BIOS update file to a temporary directory on your hard disk.
3. Change to the temporary directory.
4. To extract the files, double click on the BIOS update file, for example, EABIOSxx.EXE.
5. One of the extracted files is MK_BOOTZ.EXE. Double click on this file to extract the README.TXT file.
6. Follow the directions in the README.TXT file.

Creating a BIOS Update Media

1. Obtain the BIOS update file through your server supplier or from the Intel World Wide Web site:

   http://support.intel.com/support/motherboards/server/
2. Copy the BIOS update file to a temporary directory on your hard disk.
3. From the C:\ prompt, change to the temporary directory.
4. To extract the file, type the name of the BIOS upgrade file, for example, EABIOSxx.
5. Press <Enter>. The extracted file contains the following files:

   LICENSE.TXT
   BIOINSTR.TXT
   BIOS.EXE
   MK_BOOTZ.EXE
6. Read the LICENSE.TXT file, which contains the software license agreement, and the BIOINSTR.TXT file, which contains the instructions for the BIOS update.
7. Insert the bootable diskette into drive A.
8. To extract the BIOS.EXE file to the diskette, change to the temporary directory that holds the BIOS.EXE file and type:

   `BIOS A:`
9. Press <Enter>.
10. The diskette now holds the new BIOS files, the Intel Flash Update Utility, and the recovery files.

Updating the BIOS

⚠ CAUTION

The AUTOEXEC.BAT file provided with the update files updates the BIOS in two parts: first updating the boot block and displaying the `Operation completed successfully` *message and second, updating the BIOS core. You will be asked to reboot the system when the update process is complete. Do not interrupt the process or the system may not be capable of rebooting.*

1. Boot the server with the BIOS upgrade diskette in drive A. During system boot, the AUTOEXEC.BAT file provided with the update files will automatically run the BIOS update process.
2. The AUTOEXEC.BAT file updates the BIOS in two parts: first updating the boot block and displaying the `Operation completed successfully` message and then updating the BIOS core.
3. When the update process is complete, the monitor will display a message telling you to remove the diskette and to reboot the system.
4. As the server boots, check the BIOS identifier (version number) to make sure the upgrade was successful. If a logo appears, press <Esc> to view the POST messages.
5. To enter the BIOS Setup program, press <F2> when you see the message:

        Press <F2> to Run SETUP

6. For proper operation, load the BIOS Setup program defaults. To load the defaults, press <F9>.
7. To accept the defaults, press <Enter>.
8. In Setup, enter the settings you wrote down before beginning the BIOS upgrade.
9. To save the settings, press <F10>.
10. To accept the settings, press <Enter>.
11. Turn off the server and reboot.

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 35 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 server, disconnect the server's power cord, and disconnect all external peripherals.
2. Remove the server cover and locate the configuration jumper block (J9G2) (see Figure 19).
3. Remove the jumper from all pins as shown below to set recovery mode for Setup.

    3 ▢◯◯□ 1

4. Insert the bootable BIOS update diskette into diskette drive A.
5. Replace the server cover, connect the power cord, turn on the server, and allow it to boot. (The recovery process will take a few minutes. Listen to the speaker and watch for drive A activity.)
    *   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 that successful BIOS recovery has taken place.
    *   A series of continuous beeps indicates that BIOS recovery has failed.
6. If recovery fails, return to step 1 and repeat the recovery process.
7. If recovery is successful, turn off the server, and disconnect its power cord.
8. Remove the server cover and continue with the following steps.
9. On the jumper block (J9G2), reinstall the jumper back on pins 1-2 as shown below to set normal mode for Setup.

    3 ◯▮▮□ 1

10. Leave the update diskette in drive A, replace the server cover, and connect the server's power cord.
11. Turn on the server and continue with the BIOS update (see page 40).

Using the Setup Program

You can use the BIOS Setup program to change the configuration information and boot sequence for the server. 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 BIOS Setup Program Operating mode is controlled by the setting of the configuration jumper block. The jumper is set to normal mode at the factory.

✎ **NOTE**

The Setup menus described in this section apply to the server boards with BIOS identifier EA815.20A.86B Server 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 server. 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 6. 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 and power supply controls	Saves or discards changes to Setup program options

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

Table 7 shows the function keys available for menu screens.

Table 7.   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

This 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 35 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 8.   Maintenance Menu

Feature	Options	Description
Clear All Passwords	No options	Clears the user and administrative passwords.
Clear BIS Credentials	No options	Clears the Wired for Management Boot Integrity Service (BIS) credentials.
Extended Configuration	• **Default** • User-Defined	Invokes the Extended Configuration submenu.
CPU Information	No options	Displays CPU Information.
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 represented by Table 9 is for setting video memory cache mode. This submenu becomes available when User Defined is selected under Extended Configuration.

Table 9.   Extended Configuration Submenu

Feature	Options	Description
Extended Configuration	• **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**	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** • User Defined	Sets extended memory configuration options to auto or user defined.
CAS# Latency	• 3 • 2 • **Auto**	Selects the number of clock cycles required to address a column in memory.
SDRAM RAS# to CAS# Delay	• 3 • 2 • **Auto**	Selects the number of clock cycles between addressing a row and addressing a column.
SDRAM RAS# Precharge	• 3 • 2 • **Auto**	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 10 describes the Main Menu. This menu reports processor and memory information and is for configuring the system date and system time.

Table 10. 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.
Internal Cache	Disabled Write Thru **Write Back** Reserved	Displays CPU internal cache and, if enabled, select WriteThru or WriteBack mechanism.
External Cache	Disabled **Write Thru** Write Back Reserved	Displays CPU external cache and, if enabled, select WriteThru or WriteBack mechanism.
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 Memory Bank 2	No options	Displays the amount and type of RAM in the memory banks.
Language	• **English** • Deutsche	Selects the current default language used by the BIOS.
Processor Serial Number	• **Disabled** • 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.

✏ **NOTE**

Additional language support available. For more information visit Intel's support web site at: www.support.intel.com/support/motherboards/server/S815EBM1.

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

Table 11 describes the Advanced Menu. This menu is used for setting advanced features that are available through the chipset.

Table 11. 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.

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

The submenu represented by Table 12 is for configuring the IRQ priority of PCI slots individually.

Table 12.   PCI Configuration Submenu

Feature	Options	Description
PCI Slot 1 IRQ Priority	• **Auto** • 3 • 9 • 10 • 11	Allows selection of IRQ priority and S5 wake.
PCI Slot 2 IRQ Priority	• **Auto** • 3 • 9 • 10 • 11	Allows selection of IRQ priority and S5 wake.
PCI Slot 3 IRQ Priority	• **Auto** • 3 • 9 • 10 • 11	Allows selection of IRQ priority and S5 wake.

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

The submenu represented by Table 13 is for setting Plug and Play (PnP) options, resetting configuration data, and the power-on state of the Numlock key.

Table 13.   Boot Configuration Submenu

Feature	Options	Description
Plug & Play O/S	• **No** • 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** • 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**	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

The submenu represented in Table 14 is used for configuring server peripherals.

Table 14.   Peripheral Configuration Submenu

Feature	Options	Description
Serial Port A	• Disabled • Enabled • **Auto**	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** • 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**	Specifies the interrupt for serial port A, if serial port A is Enabled.
Parallel Port	• Disabled • Enabled • **Auto**	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** • 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.

Table 14. Peripheral Configuration Submenu (continued)

Feature	Options	Description
Base I/O Address (This feature is present only when Parallel Port is set to *Enabled*)	• **378** • 278	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**	Specifies the interrupt for the parallel port.
LAN Device	• Disabled • **Enabled**	Enables or disables the LAN device.
Legacy USB Support	• Disabled • **Enabled**	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

The menu represented in Table 15 is used to configure IDE device options.

Table 15. IDE Configuration Submenu

Feature	Options	Description
IDE Controller	• Disabled • Primary • Secondary • **Both**	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** • 3 Seconds • 6 Seconds • 9 Seconds • 12 Seconds • 15 Seconds • 21 Seconds • 30 Seconds	Specifies the hard disk drive pre-delay.

Table 15.   IDE Configuration Submenu (continued)

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
```

There are four IDE submenus: primary master, primary slave, secondary master, and secondary slave. Table 16 shows the format of the IDE submenus. For brevity, only one example is shown.

Table 16.   Primary/Secondary IDE Master/Slave Submenus

Feature	Options	Description
Drive Installed	None	Displays the type of drive installed.
Type	• None • User • **Auto** • 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.

continued

Table 16. Primary/Secondary IDE Master/Slave Submenus (continued)

Feature	Options	Description
LBA Mode Control (This feature is present only when Type is not set to *Auto*.)	• Disabled • **Enabled**	Enables or disables LBA mode control.
Multi-Sector Transfers (This feature is present only when Type is not set to *Auto*.)	• Disabled • 2 Sectors • 4 Sectors • 8 Sectors • **16 Sectors**	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) (This feature is present only when Type is not set to *Auto*.)	• **Auto** • 0 • 1 • 2 • 3 • 4	Specifies the PIO mode.
Ultra DMA (This feature is present only when Type is not set to *Auto*.)	• **Disabled** • Mode 0 • Mode 1 • Mode 2 • Mode 3 • Mode 4	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

The submenu represented by Table 17 is used for configuring the diskette drive.

Table 17. Diskette Configuration Submenu

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

The submenu represented by Table 18 is used to configure the event logging features.

Table 18.   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** • Yes	Clears the event log after rebooting.
Event Logging	• Disabled • **Enabled**	Enables logging of events.
Mark Events As Read	[Enter]	Marks all events as read.

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

The menu represented by Table 19 is for setting passwords and security features.

Table 19. 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** • No	Clears the user password.
User Access Level (Note 2)	• Limited • No Access • View Only • **Full**	Sets BIOS Setup Utility access rights for user level.
Unattended Start (Note 1)	• Enabled • **Disabled**	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		

The menu represented in Table 20 is for setting the power management features.

Table 20. 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** • Power On	Specifies the mode of operation if an AC power loss occurs. *Power On* restores power to the server. *Stay Off* keeps the power off until the power button is pressed. *Last State* restores the previous power state before power loss occurred.
On LAN	• **Stay Off** • Power-On	In APM mode only, determines how the system responds to a LAN wake up event.
On PME	• **Stay Off** • Power-On	In APM mode only, determines how the system responds to a PCI power management event.
On Modem Ring	• **Stay Off** • Power-On	In APM mode only, specifies how the server responds to an incoming call on an installed modem when the power is off.

APM Submenu

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

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

The submenu represented in Table 21 is for setting the APM features.

Table 21.   APM Submenu

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

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 22 is for setting the ACPI features.

Table 22.   ACPI Submenu

Feature	Options	Description
Wake on LAN from S5	• **Stay Off** • Power On	Specifies how the server responds to an incoming call from a Wake on LAN event when the power is off.

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
					IDE Drive Configuration	

The menu represented in Table 23 is used to set the boot features and the boot sequence.

Table 23.   Boot Menu

Feature	Options	Description
Quiet Boot	• **Disabled** • Enabled	*Disabled* displays normal POST messages. *Enabled* displays OEM graphic instead of POST messages.
Intel Rapid BIOS Boot	• Disabled • **Enabled**	Enables the computer to boot without running certain POST tests.
Scan User Flash Area	• **Disabled** • 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 on the menu bar, then Boot Devices Priority.

Maintenance	Main	Advanced	Security	Power	**Boot**	Exit
					Boot Device Priority	
					Hard Disk Drives	
					Removeable Devices	
					ATAPI CDROM Drives	

The submenu represented in Table 24 is for setting boot devices priority.

Table 24.   Boot Device Priority Submenu

Feature	Options	Description
1st Boot Device 2nd Boot Device 3rd Boot Device 4th Boot Device (Note 1)	• Removable Dev. • 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 $<\uparrow>$ or $<\downarrow>$. 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 Dev. (maximum of four) • Hard Drive (maximum of twelve) • 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 listed individually 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 on the menu bar, then Hard Disk Drives.

Maintenance	Main	Advanced	Security	Power	**Boot**	Exit
					Boot Device Priority	
					Hard Disk Drives	
					Removeable Devices	
					ATAPI CDROM Drives	

The submenu represented in Table 25 is for setting hard disk drive priority.

Table 25. 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 on the menu bar, then Removable Devices.

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

The submenu represented in Table 26 is for setting removable device priority.

Table 26. 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 CDROM Drives Submenu

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

Maintenance	Main	Advanced	Security	Power	**Boot**	Exit
					Boot Device Priority	
					Hard Disk Drives	
					Removeable Devices	
					ATAPI CDROM Drives	

The submenu represented in Table 27 is for setting ATAPI CDROM drive priority.

Table 27.   ATAPI CDROM Drives Submenu

Feature	Options	Description
1st ATAPI CDROM Drive (Note)	Dependent on installed ATAPI CDROM drives	Specifies the boot sequence from the available ATAPI CDROM 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 CDROM drives, the maximum number of ATAPI CDROM 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**

The menu represented in Table 28 is for exiting the BIOS Setup program, saving changes, and loading and saving defaults.

Table 28.   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 server was turned on are used.

4 Solving BIOS Problems

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 29. The BIOS also issues a beep code (one long tone followed by two short tones) during POST if the video configuration fails, or if an external ROM module does not properly checksum to zero.

Table 29. 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 30).

Table 30. 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

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Table 30.   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.

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5 Technical Reference

Server Board Connectors

⚠ **CAUTION**

Many of the baseboard and front panel connectors provide operating voltage (+5 V DC and +12 V DC, for example) to devices inside the server chassis, such as fans and internal peripherals. These connectors are not overcurrent protected. Do not use these connectors for powering devices external to the server chassis. A fault in the load presented by the external devices could cause damage to the server, the interconnecting cable, and the external devices themselves.

The server board connectors can be divided into three groups, as shown in Figure 20.

A   Back panel connectors (see page 8)

B   Baseboard connectors (see page 68)

C   Front panel connectors (see page 9)
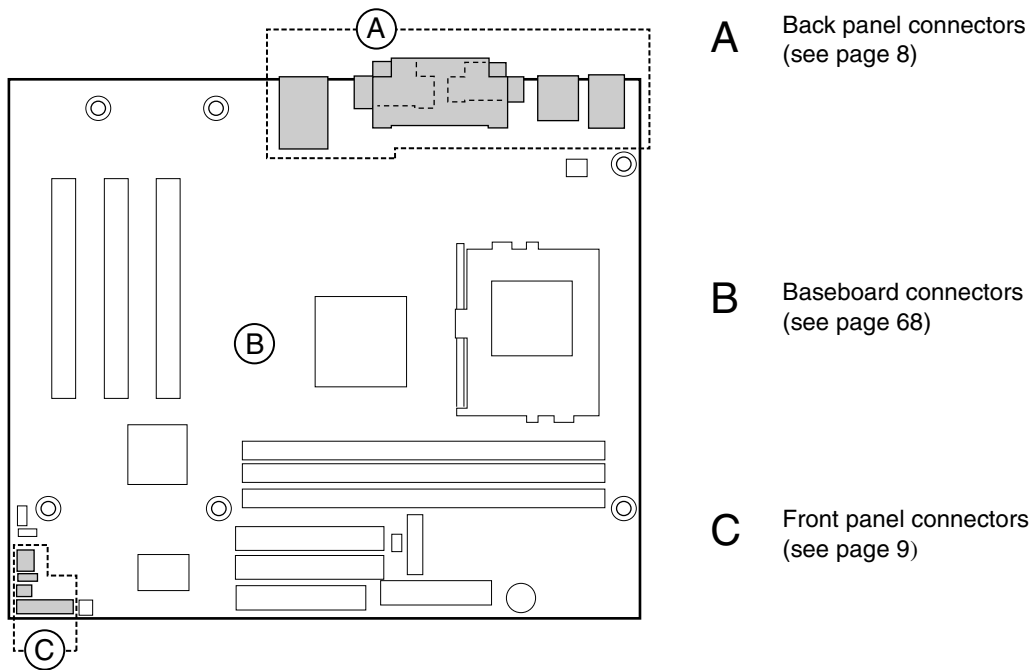
OM12207

Figure 20. Connector Groups

Baseboard Connectors

Power and Hardware Control Connectors

Figure 21 shows the power and hardware connectors.
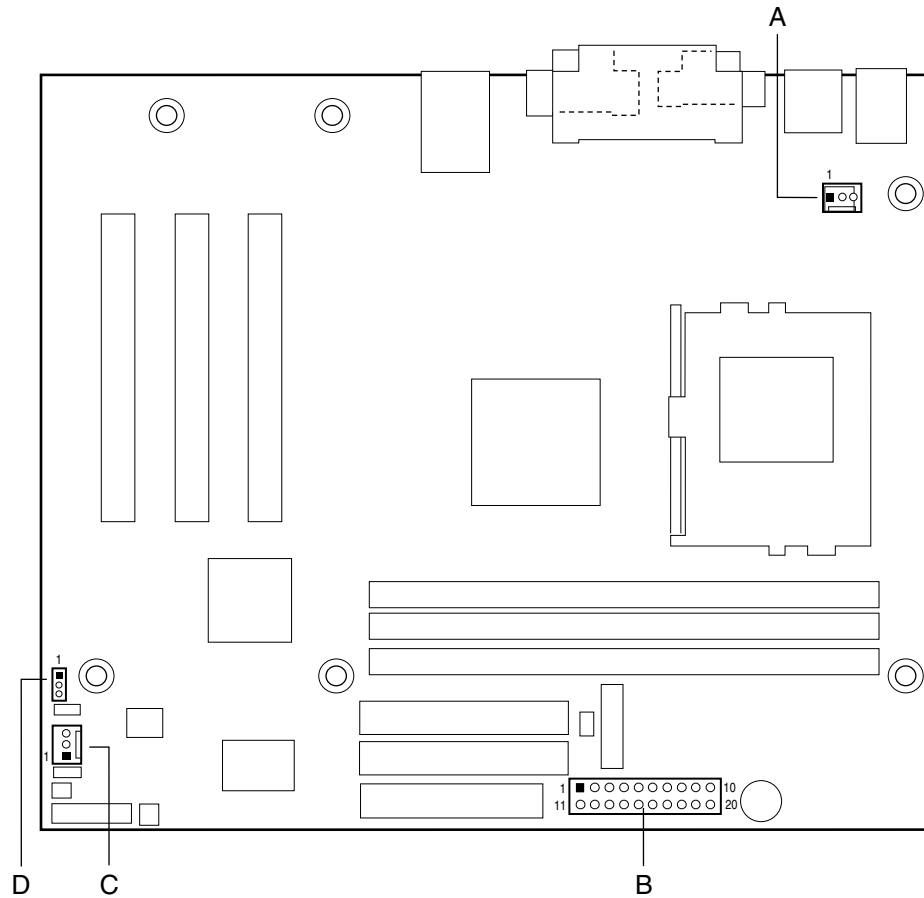
OM12209

A. Processor fan (fan 1)
B. Power
C. Chassis fan (fan 2)
D. Wake on LAN technology

Figure 21. Power and Hardware Control Connectors

Add-In Board and Peripheral Interface Connectors

Figure 22 shows the add-in board and peripheral interface connectors.
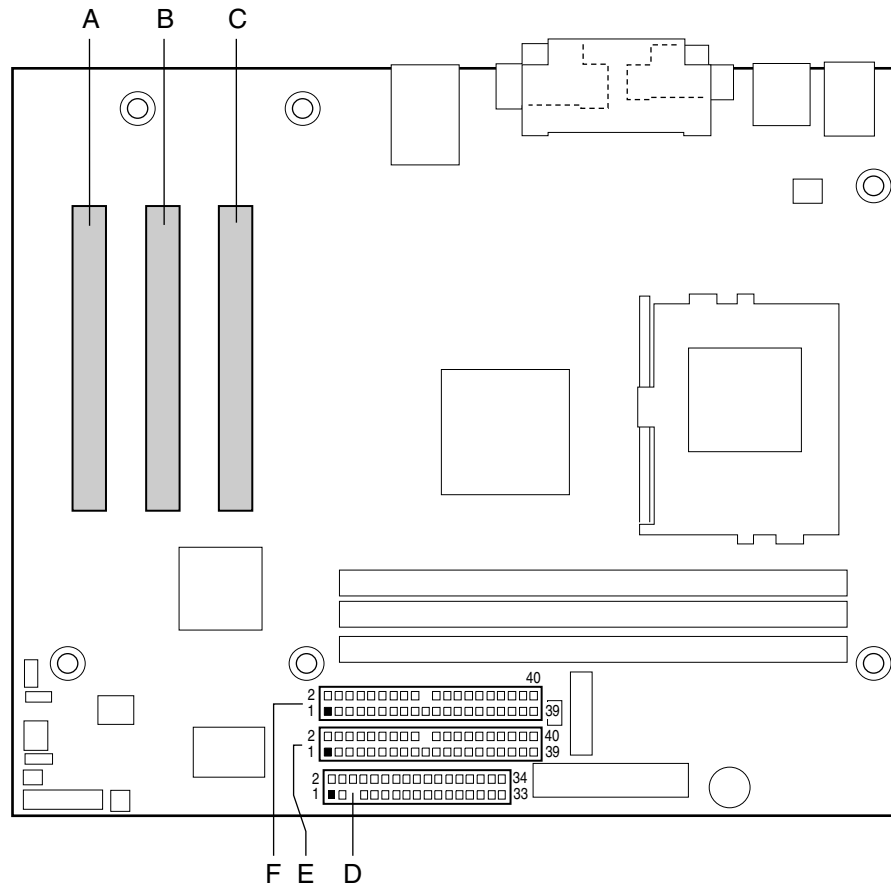
OM12210

A. PCI slot 3
B. PCI slot 2
C. PCI slot 1
D. Diskette drive
E. Primary IDE
F. Secondary IDE

Figure 22. Add-in Board and Peripheral Interface Connectors

Server Board Resources

Memory Map

Table 31. System Memory Map

Address Range (decimal)	Address Range (hex)	Size	Description
1024 K - 524288 K	100000 - 1FFFFFFF	511 MB	Extended memory
960 K - 1024 K	F0000 - FFFFF	64 KB	Runtime BIOS
896 K - 960 K	E0000 - EFFFF	64 KB	Reserved
800 K - 896 K	C8000 - DFFFF	96 KB	Available high DOS memory (open to the PCI bus)
640 K - 800 K	A0000 - C7FFF	160 KB	Video memory and BIOS
639 K - 640 K	9FC00 - 9FFFF	1 KB	Extended BIOS data (movable by memory manager software)
512 K - 639 K	80000 - 9FBFF	127 KB	Extended conventional memory
0 K - 512 K	00000 - 7FFFF	512 KB	Conventional memory

DMA Channels

Table 32. DMA Channels

DMA Channel Number	Data Width	System Resource
0	8 or 16 bits	Open
1	8 or 16 bits	Parallel port
2	8 or 16 bits	Diskette drive
3	8 or 16 bits	Parallel port (for ECP or EPP)
4	8 or 16 bits	DMA controller
5	16 bits	Open
6	16 bits	Open
7	16 bits	Open

I/O Map

Table 33. I/O Map

Address (hex)	Size	Description
0000 - 000F	16 bytes	DMA controller
0020 - 0021	2 bytes	Programmable Interrupt Control (PIC)
0040 - 0043	4 bytes	System timer
0060	1 byte	Keyboard controller byte—reset IRQ
0061	1 byte	System speaker
0064	1 byte	Keyboard controller, CMD / STAT byte
0070 - 0071	2 bytes	System CMOS / Real Time Clock
0072 - 0073	2 bytes	System CMOS
0080 - 008F	16 bytes	DMA controller
0092	1 byte	Fast A20 and PIC
00A0 - 00^A1	2 bytes	PIC
00B2 - 00B3	2 bytes	APM control
00C0 - 00DF	32 bytes	DMA
00F0	1 byte	Numeric data processor
0170 - 0177	8 bytes	Secondary IDE channel
01F0 - 01F7	8 bytes	Primary IDE channel
0228 - 022F*	8 bytes	LPT3
0278 - 027F*	8 bytes	LPT2
02E8 - 02EF*	8 bytes	COM4 / video (8514A)
02F8 - 02FF*	8 bytes	COM2
0376	1 byte	Secondary IDE channel command port
0377, bits 6:0	7 bits	Secondary IDE channel status port
0378 - 037F	8 bytes	LPT1
03B0 - 03BB	12 bytes	Intel 82815E GMCH / AGP
03C0 - 03DF	32 bytes	Intel 82815E GMCH / AGP
03E8 - 03EF	8 bytes	COM3
03F0 - 03F5	6 bytes	Diskette channel 1
03F6	1 byte	Primary IDE channel command port
03F8 - 03FF	8 bytes	COM1
04D0 - 04D1	2 bytes	Edge/level triggered PIC
LPTn + 400	8 bytes	ECP port, LPTn base address + 400h
0CF8 - 0CFB**	4 bytes	PCI configuration address register
0CF9***	1 byte	Reset control register
0CFC - 0CFF	4 bytes	PCI configuration data register
FFA0 - FFA7	8 bytes	Primary bus master IDE registers
FFA8 - FFAF	8 bytes	Secondary bus master IDE registers

Table 33.   I/O Map (continued)

Address (hex)	Size	Description
96 contiguous bytes starting on a 128-byte divisible boundary		ICH (ACPI + TCO)
64 contiguous bytes starting on a 64-byte divisible boundary		S815EBM1 board resource
64 contiguous bytes starting on a 64-byte divisible boundary		ICH2 LAN controller
32 contiguous bytes starting on a 32-byte divisible boundary		ICH2 USB controller #1
32 contiguous bytes starting on a 32-byte divisible boundary		ICH2 USB controller #2
16 contiguous bytes starting on a 16-byte divisible boundary		ICH2 (SMBus)
4096 contiguous bytes starting on a 4096-byte divisible boundary		Intel 82801BA PCI bridge

*   Default, but can be changed to another address range.
**   Dword access only.
***   Byte access only.

Interrupts

Table 34.   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	User available
4	COM1*
5	LPT2 (Plug and Play option) 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.

6 Regulatory and Integration Information

Product Regulatory Compliance

Product Safety Compliance

The S815EBM1 complies with the following safety requirements:

- 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 Community)
- 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)

Product EMC Compliance

The S815EBM1 has been has been tested and verified to comply with the following electromagnetic compatibility (EMC) regulations when installed a compatible Intel host system. For information on compatible host system(s) refer to Intel's Server Builder website or contact your local Intel representative.

- FCC Class B   Title 47 of the Code of Federal Regulations, Parts 2 and 15, Subpart B, Radio frequency Devices. (USA)
- ICES-003 (Class B)   Interference-Causing Equipment Standard, Digital Apparatus. (Canada)
- EN55022: 1994 (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/NZ 3548 (Class B)   Australian Communications Authority, Standard for Electromagnetic Compatibility. (Australia and New Zealand)
- CISPR 22, 2nd 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

The S815EBM1 board has the following 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 server boards: E210882 (component side).
- FCC Declaration of Conformity logo mark for Class B equipment; to include 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). The CE mark should also be on the shipping container.
- 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. The C-tick mark should also be on the shipping container.
- Printed wiring board manufacturer's recognition mark: consists of a unique UL recognized manufacturer's logo, along with a flammability rating (94V-0) (solder side).
- PB part number: Intel bare circuit board part number (solder side) A44507-xxx. 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.
- Mic mark

```
┌─────────────────────────────────────────────────┐
│                                                   │
│                    MIC                            │
│                                                   │
│ 명    칭(모 델 명):마더보드(D815EEA2/D815EPEA2)    │
│ 인   증   번   호:E-G011-01-0607 (B)              │
│ 인증받은자의상호:(주)인텔코리아                    │
│ 제 조  년 월 일:별도표기                           │
│ 제 조 자(제 조 국):Intel Products (M) Sdn., Bhd.   │
│                   (말레이지아)                    │
└─────────────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────────────┐
│                                                   │
│                    MIC                            │
│                                                   │
│ 명    칭(모 델 명):마더보드(D815EFV/D815EPFV)     │
│ 인   증   번   호:E-G011-01-0606 (B)              │
│ 인증받은자의상호:(주)인텔코리아                    │
│ 제 조  년 월 일:별도표기                           │
│ 제 조 자(제 조 국):Intel Products (M) Sdn., Bhd.   │
│                   (말레이지아)                    │
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Installation Precautions

When you install and test the server 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 Requirements

⚠ 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 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.

Ensure Chassis and Accessory Module Certifications

Make sure that the chassis and possible subassemblies, such as a board or drive assembly, and internal and external wiring and cables, are certified for the region(s) where the end product will be used. Agent certification marks on the product are proof of certification. Typical certification marks are as follows:

In Europe
The CE marking signifies compliance with all relevant European requirements. If the chassis does not bear the CE marking, obtain a supplier's Declaration of Conformity to the appropriate standards required by the European EMC Directive and Low Voltage Directive. Other directives, such as the Radio and Telecommunications Terminal Equipment (R & TTE) directives 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. External wiring and cables must also be UL Listed and suitable for the intended use. The FCC logo (Class B 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.

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 server board to provide instructions for replacing and disposing of the battery. For system safety certification, the following statement or equivalent statement may be required to be placed permanently and legibly on the chassis near the battery.

⚠ CAUTIONS

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

This server board was evaluated as Information Technology Equipment (I.T.E.) for use in computers that will be installed in offices, homes, 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.