ASUS® AP2400R-E1

Dual Intel® Xeon™ 4 2U Rackmount Server
533/400MHz Front Side Bus

User Guide

E1649

Revised edition V2
July 2004

Copyright © 2004 ASUSTeK COMPUTER INC. All Rights Reserved.

No part of this manual, including the products and software described in it, may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form or by any means, except documentation kept by the purchaser for backup purposes, without the express written permission of ASUSTeK COMPUTER INC. ("ASUS").

ASUS provides this manual "as is" without warranty of any kind, either express or implied, including but not limited to the implied warranties or conditions of merchantability or fitness for a particular purpose. In no event shall ASUS, its directors, officers, employees, or agents be liable for any indirect, special, incidental, or consequential damages (including damages for loss of profits, loss of business, loss of use or data, interruption of business and the like), even if ASUS has been advised of the possibility of such damages arising from any defect or error in this manual or product.

Specifications and information contained in this manual ae furnished for informational use only, and are subject to change at any time without notice, and should not be construed as a commitment by ASUS. ASUS assumes no responsibility or liability for any errors or inaccuracies that may appear in this manual, including the products and software described in it.

Product warranty or service will not be extended if: (1) the product is repaired, modified or altered, unless such repair, modification of alteration is authorized in writing by ASUS; or (2) the serial number of the product is defaced or missing.

Products and corporate names appearing in this manual may or may not be registered trademarks or copyrights of their respective companies, and are used only for identification or explanation and to the owners' benefit, without intent to infringe.

Contents

iii

Contents

Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

• This device may not cause harmful interference, and

• This device must accept any interference received including interference that may cause undesired operation.

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

• Reorient or relocate the receiving antenna.

• Increase the separation between the equipment and receiver.

• Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced radio/TV technician for help.

> **WARNING!** The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

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

This class B digital apparatus complies with Canadian ICES-003.

Safety information

Electrical Safety

- Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

- When adding or removing any additional devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your dealer.

Operation Safety

- Any mechanical operation on this server must be conducted by certified or experienced engineers.

- Before operating the server, carefully read all the manuals included with the server package.

- Before using the server, make sure all cables are correctly connected and the power cables are not damaged. If any damage is detected, contact your dealer as soon as possible.

- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.

- Avoid dust, humidity, and temperature extremes. Place the server on a stable surface.

> This product is equipped with a three-wire power cable and plug for the user's safety. Use the power cable with a properly grounded electrical outlet to avoid electrical shock.

Lithium-Ion Battery Warning

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

CD-ROM Drive Safety Warning

CLASS 1 LASER PRODUCT

About this guide

Audience

This user guide is intended for system integrators, and experienced users with at least basic knowledge of configuring a server.

Contents

This guide contains the following parts:

1. **Chapter 1: Product Introduction**

   This chapter describes the general features of the AP2400R-E1 barebone server. It includes sections on front panel and rear panel specifications.

2. **Chapter 2: Hardware setup**

   This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

3. **Chapter 3: Configuration options**

   This chapter describes how to install optional components and devices into the barebone server.

4. **Chapter 4: Motherboard information**

   This chapter includes the motherboard layout, and brief descriptions of the jumpers and internal connectors.

5. **Chapter 5: BIOS setup**

   This chapter tells how to change the system settings through the BIOS Setup menus.

6. **Appendix: References**

   This appendix includes additional information that you may refer to when configuring your barebone server.

Conventions

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Information that you MUST follow to complete a task.

NOTE: Tips and information to aid in completing a task.

Chapter 1

This chapter describes the general features of the barebone server. It includes sections on front panel and rear panel specifications.

Product introduction

ASUS AP2400R-E1 2U barebone server

1.1 System package contents

Check your ASUS AP2400R-E1 package for the following items.

> Contact your dealer immediately if any of the items is damaged or missing.

Package items

✓ ASUS AR21 2U rackmount chassis with:
  • ASUS PR-DLS533/Rack motherboard
  • 500W redundant power supply, 115V~230V
  • slim optical drive
  • slim floppy disk drive
  • chassis fan
  • HDD fan
  • hot-swap SCSI HDD trays
  • SCSI backplanes
  • front bezel

✓ CPU heatsink (2 pcs.)
✓ AC power cable
✓ System screws and cables
✓ Rackmount rail kit

✓ Accessory box
  • AP2400R-E1 user guide
  • AP2400R-E1 support CD (includes ASWM)
  • TrendMicro® ServerProtect® CD
  • AR22 chassis ears (left, right)
  • Bag of screws

1.2 System specifications

The ASUS AP2400R-E1 is a 2U barebone server system featuring the ASUS PR-DLS533/Rack motherboard. The server supports dual Intel® Xeon™ processors, and includes the latest technologies through the chipsets embedded on the motherboard.

Chassis	Rackmount 2U (AR21)
Motherboard	ASUS PR-DLS533/Rack
Chipset	North Bridge: ServerWorks® Grand Champion LE (GCLE) South Bridge: ServerWorks® South Bridge 5.0 (CSB5) I/O Bridge: ServerWorks® CIOB-X2
Processor	Supports dual Intel® Xeon™ 3.2GHz processors with L2 512K and L3 1MB caches via two 604-pin sockets
Memory	6 x 184-pin DDR sockets for up to 12GB system memory Supports PC2100/PC1600 registered ECC DDR DIMMs
LAN	Intel® 82544GC 64-bit Gigabit LAN controller Intel® 82540EM 32-bit Gigabit LAN controller
VGA	ATI RAGE-XL PCI-based VGA controller Supports 8MB display memory
SCSI	LSI® 53C1030 64-bit/133MHz Ultra320 SCSI controller
Expansion slots	3 x full-length 64-bit/133MHz 3V PCI-X slots 1 x low-profile 64-bit/133MHz 3V PCI slot
Storage	8 x 3.5-inch hot-swappable HDD bays 1 x slim Teac CD-ROM drive 1 x slim 1.44MB floppy drive
Front I/O	2 x USB 1.1 ports Power switch Reset switch Location switch System LEDs: Power, HDD access, location, message, LAN HDD LEDs: Status, activity
Rear panel I/O	1 x PS/2 keyboard port 1 x PS/2 mouse port 1 x Serial port 1 x VGA port 2 x USB 1.1 ports 2 x RJ-45 ports (with LEDs) 1 x external SCSI port
Management	ASUS Server Web-based Management (ASWM)
Hardware monitors	Voltage, temperature, and fan speed monitoring Automatic System Restart (ASR) feature
Power supply	500W redundant power supply, 115V~230V, 50Hz~60Hz
Dimensions	732.5mm (l) x 448mm (w) x 87.7mm (h))

1.3 Front panel features

The barebone server displays a simple yet stylish front panel with easily accessible features. The power and reset buttons, LED indicators, location switch, slim CD-ROM and floppy drives, and two USB ports are located on the front panel.

Reset button

Location switch

Power button

Slim floppy drive　　**Slim optical drive**

Front panel LEDs

USB 1.1 ports

Hot-swappable HDD bays
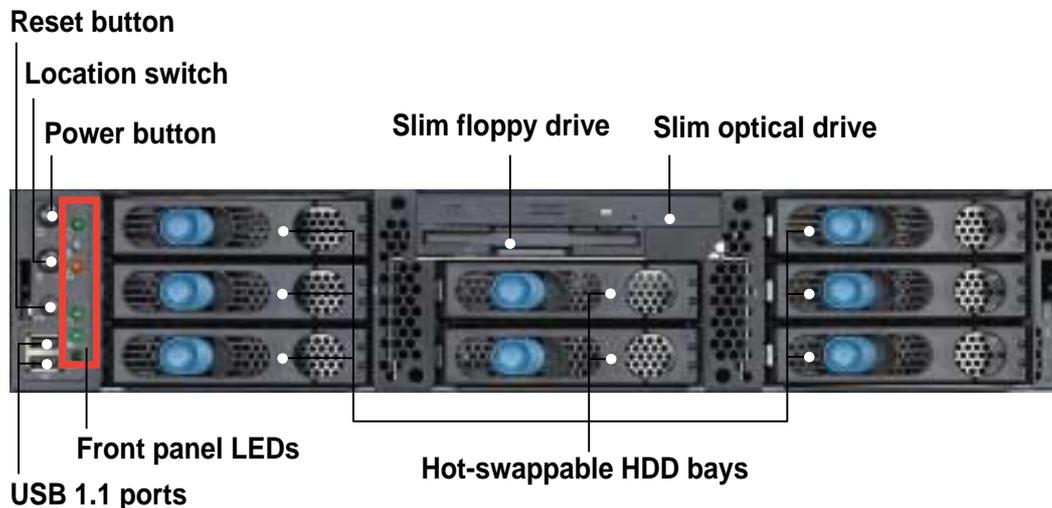
1.4 Rear panel features

The rear panel includes the expansion slots, LAN, VGA, and I/O ports, fans, and the system power sockets.

Redundant power supply modules　　**Rear fans**　　**Expansion slots**

Power supply LEDs

AC power sockets

PS/2 keyboard port
PS/2 mouse port

USB 1.1 ports

Serial port

VGA port

Gigabit LAN ports

External SCSI port

Location switch

Location LED
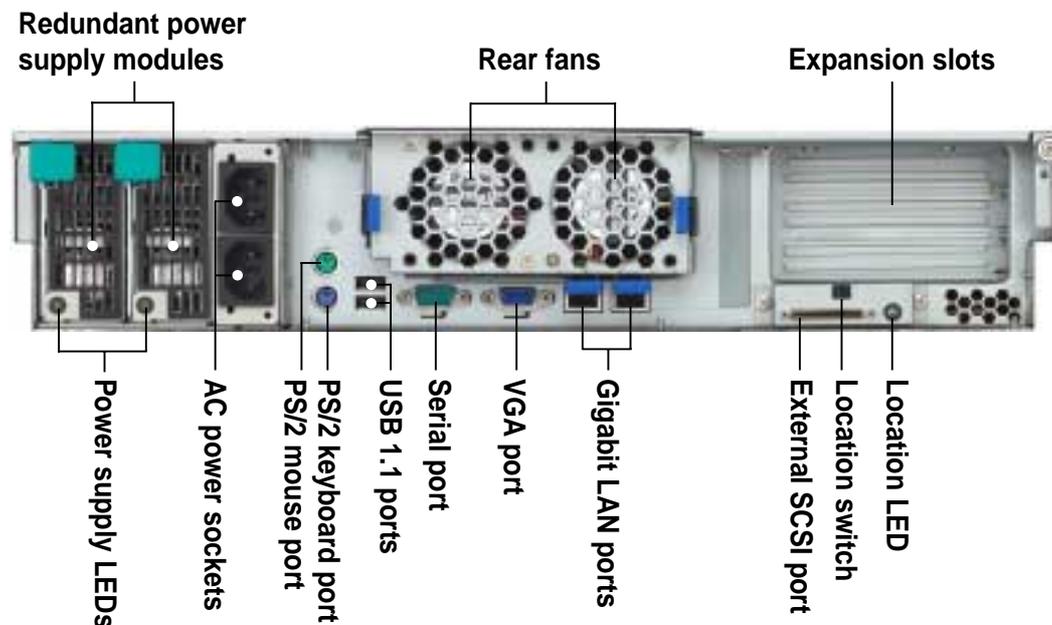
When disconnecting LAN cables, you need to remove the rear fan cage. Refer to section "2.7 Removable components" for instructions on removing the fan cage.

1.5 Internal features

The barebone system includes the basic components as shown.
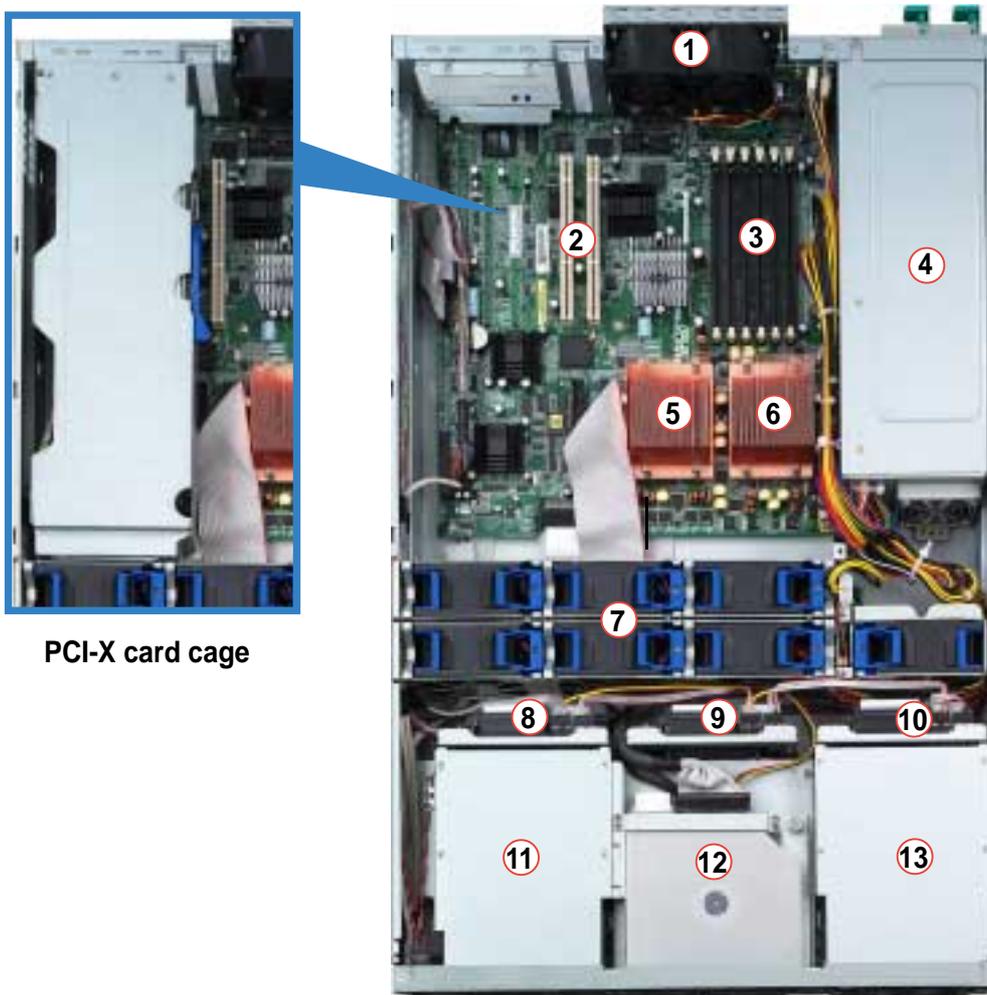
PCI-X card cage

1. 2 x rear fans
2. 64-bit PCI-X slots
    (underneath the PCI-X card cage)
3. DDR DIMM sockets
4. Power supply cage
5. CPU2 socket with heatsink
6. CPU1 socket with heatsink
7. 7 x system fans

8. SCSI backplane 1
9. SCSI backplane 2
10. SCSI backplane 3
11. 3 x HDD bays
12. Top: Slim optical drive
    Mid: Slim floppy drive
    Bottom: 2 x HDD bays
13. 3 x HDD bays

> The air duct lies on top of the motherboard components. Remove the air duct to access the components. Refer to section "2.1.4 Removing and installing the air duct" for instructions.

ASUS AP2400R-E1 2U barebone server 1-5

1.6   LED information

Front panel LEDs
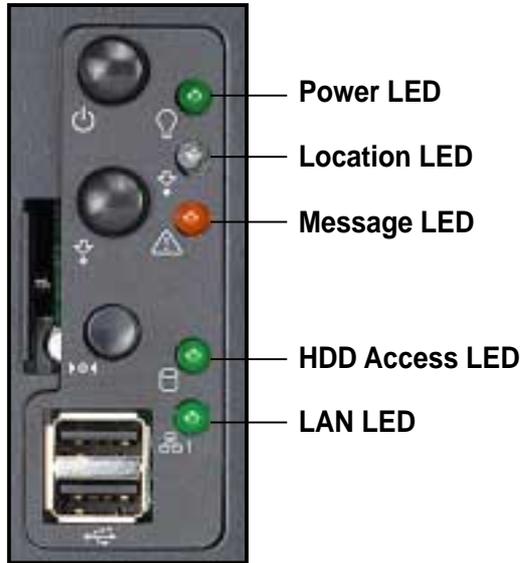
LED	Icon	Display status	Description
Power LED		ON	System power ON
HDD Access LED		OFF Blinking	No activity Read/write data into the HDD
Message LED		OFF Blinking	System is normal; no incoming event ASWM indicates a HW monitor event
Location LED		OFF ON	Normal status Location switch is pressed (Press the location switch again to turn off)
LAN1 LED		OFF Blinking ON	No 64-bit Gbit LAN connection LAN is transmitting or receiving data LAN connection is present

> The location switch and LED are for service purposes. When the system fails or is shut down, the server administrator can press either the front or the rear location switch to identify the location of the specific 2U system in a rack cabinet.

Chapter 2

This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

Hardware setup

ASUS AP2400R-E1 2U barebone server

2.1   Chassis cover

The chassis features a "screwless design" that allows convenient assembly and disassembly.

- Remove the front bezel to access the hot-swap HDDs, optical drive, and floppy drive.
- Remove the chassis cover to access the internal components or if you wish to install system devices.

2.1.1   Removing the front bezel

To remove the front bezel:

1. Hold the sides of the front bezel, then slightly press the middle part to disengage it from the front panel.

Press here to release

2. Pull the bezel from the front panel.

2.1.2 Opening the top cover (front half)

To open the top cover:

1. Push the two sliding locks on the top cover to release the front half of the top cover.

2. With both hands, flip up the front corners of the top cover then lift the front half.

   The front corners of the cover have dents that match those on the chassis. These dents provide a holding mechanism and keeps the cover in place even when the sliding locks are released.

Matching dents
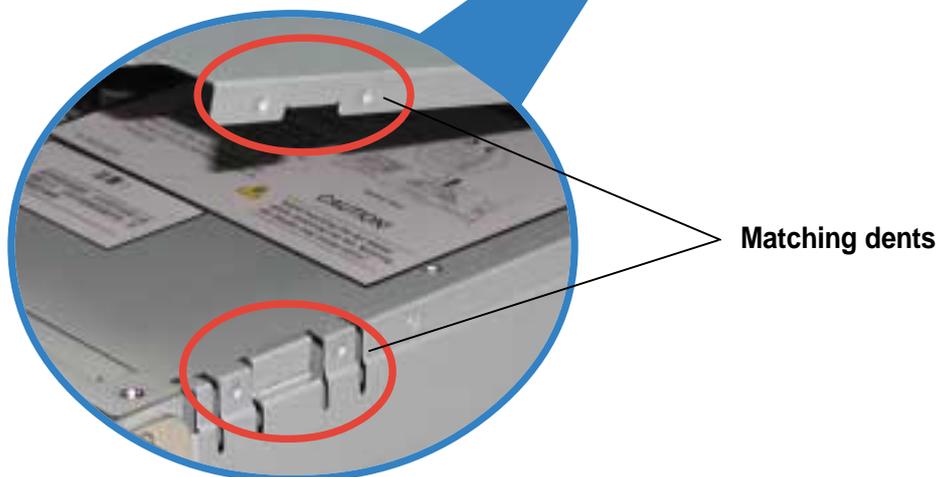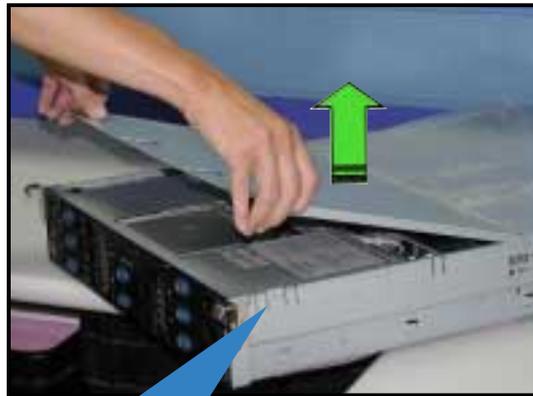
If you wish to access the hot-swappable system fans, backplanes, optical drive, and floppy drive, you only need to open the front half of the top cover.

ASUS AP2400R-E1 2U barebone server
2-3

2.1.3 Removing the top cover

You need to open the front half of the top cover before you can remove the entire top cover. Refer to section "2.1.1 Opening the top cover (front half)" for instructions.

To remove the top cover:

1. Loosen the thumbscrew that secures the top cover on the rear part of the chassis.

Thumbscrew
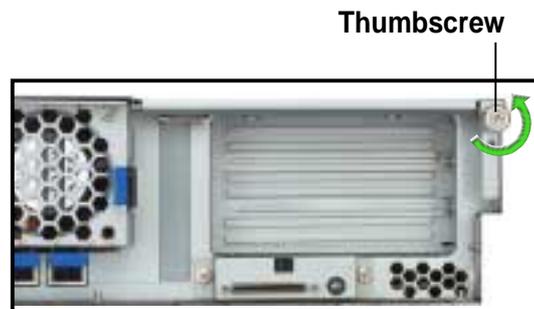
2. With the front half of the top cover open, slide the cover toward the rear panel until the mid-hooks on the top cover are disengaged.
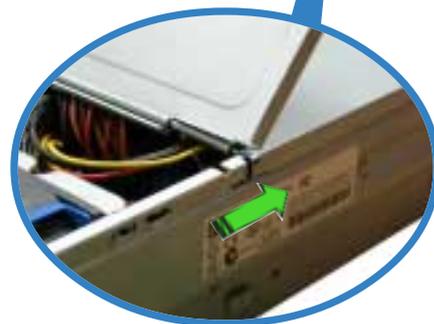
3. Firmly hold the cover on the front and rear ends, then remove it from the chassis.

2.1.4 Installing the top cover

To install the top cover:

1. Place the top cover over the chassis as shown, and align the mid-hooks with the notches on the sides.
2. Slide the cover toward the front panel until the mid-hooks are locked into the notches.
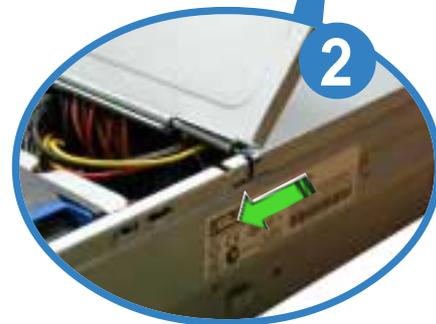
3. Flip down the front part of the top cover.
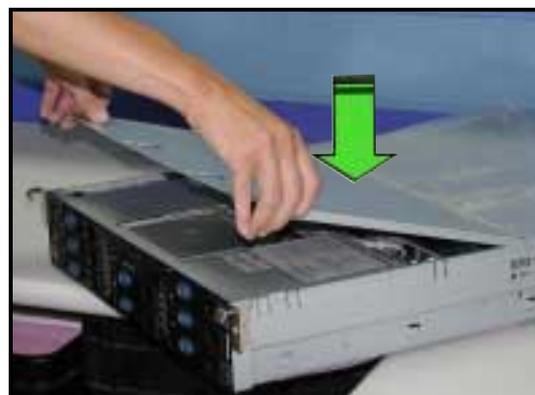
4. Push the sliding locks toward the front edge to secure the top cover in place.

ASUS AP2400R-E1 2U barebone server   **2-5**
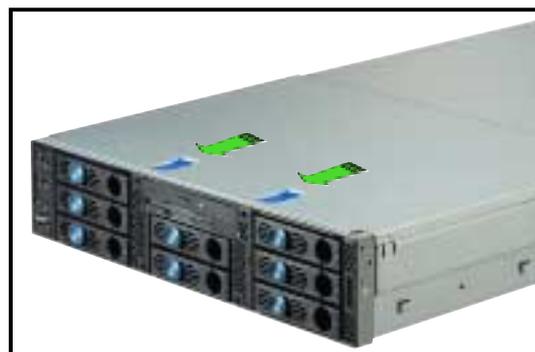
5. Tighten the thumbscrew on the rear corner of the cover to completely secure the top cover.

Thumbscrew

2.1.5 Removing the air duct

To remove the air duct:

1. Carefully route the cables that may interfere when removing the air duct.

2. Hold the rear part of the air duct and press it for about a fraction of an inch, just enough to tilt the front end.

3. When tilted, carefully pull the air duct upward to release it from the chassis.

Be careful not to pull off or break any cables while removing the air duct.

2.1.6   Installing the air duct

To install the air duct:

1. Take note of the parts of the air duct that should match specific locations inside the chassis.

Metal strips to fit the plastic clips on the air duct

Flat rubber pads should match the top of the two heatsinks

CPU heatsinks

Plastic clips to grip the metal strips on the fan cage

Vertical rubber pads should fit the spaces between the two heatsinks
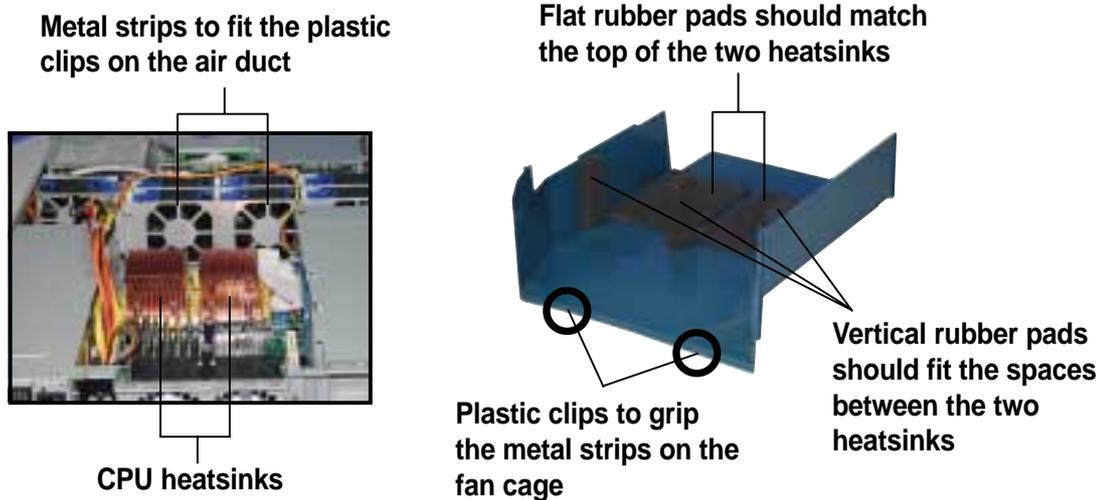
2. Position the air duct inside the chassis with the plastic clips matching the two vertical metal strips on the fan cage.

3. Check the rubber pads underneath the air duct and ensure that they are in place; otherwise, the air duct will not fit properly.

4. Fit the other end of the air duct making sure that no power cable is strayed under it.

> ⚠ Be careful not to pull off or break any cables while installing the air duct.

ASUS AP2400R-E1 2U barebone server   **2-7**

5. When the air duct is in place, arrange the power cable cluster to fit the space beside the air duct.

6. Flatten the power cable that runs across the air duct. When properly installed, the air duct should appear as shown.

2.2 Central Processing Unit (CPU)

The motherboard comes with two surface mount 604-pin Zero Insertion Force (ZIF) socket and designed for the Intel® Xeon™ processors.

Prestonia

Gold Arrow →

PR-DLS533 Socket 604
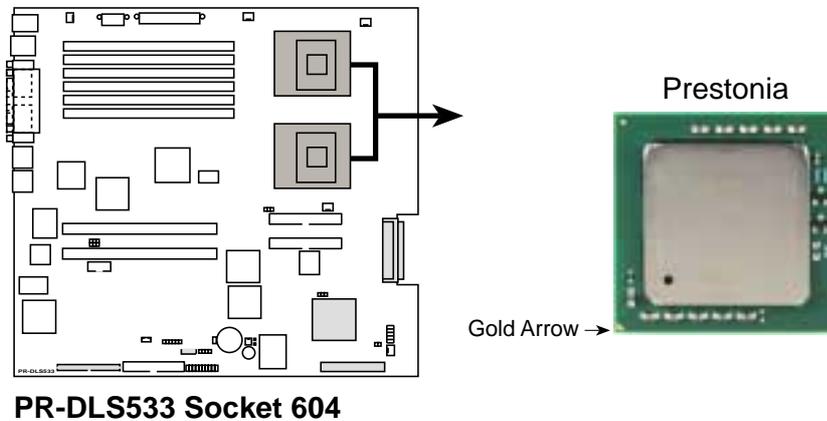
> ✎ You need to remove the pre-installed CPU heatsink before installing a CPU.

2.2.1 Removing the CPU heatsink

If you have previously installed CPUs and heatsinks, follow these steps to remove the heatsinks before proceeding to the next section.

To remove the CPU heatsink:

1. Disconnect the fan cable from the connector on the motherboard.
2. Use a Phillips (cross) screwdriver to loosen the four screws that secure the heatsink until it is released.
3. Carefully lift the heatsink from the motherboard.
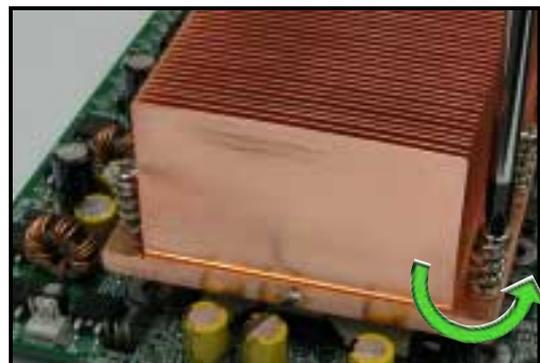
> ✎ You don't need to detach the screws from the heatsink.

2.2.2 Installing a CPU

Note in the illustration that the CPU has a gold triangular mark on one corner. This mark indicates the processor Pin 1 that should match a specific corner of the CPU socket.

> ⚠ Incorrect installation of the CPU into the socket may bend the pins and severely damage the CPU!
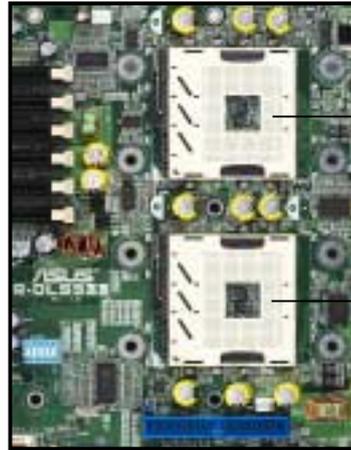
CPU Socket 1
(outer socket)

CPU Socket 2
(inner socket)

> 1. The motherboard supports either one or two CPUs. If you are installing only one CPU, you MUST install it in CPU socket 1.
>
> 2. If you are installing two CPUs, install in the CPU socket 2 first.

CPU onboard LED

This warning LED (LED1) lights up if you installed two CPUs of different type/voltage. You must install **identical** CPUs on this motherboard.
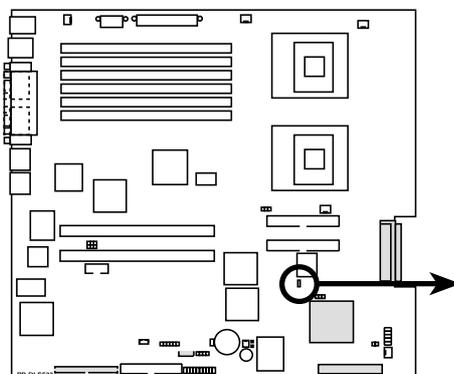
LED1

ON
CPU Type/Voltage
not identical

OFF
CPU Type/Voltage
identical

PR-DLS533 Onboard LED

⚠ Incorrect installation of the CPU into the socket may bend the pins and severely damage the CPU!

To install the CPUs:

1. Locate the CPU1 socket on the motherboard. Flip up the socket lever and push it all the way to the other side.

👉 Make sure that the socket lever is pushed back all the way. Otherwise the CPU does not fit in completely.

Marked Corner

2. Position the CPU above the socket as shown.

3. Carefully insert the CPU into the socket until it fits in place.

⚠ The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!
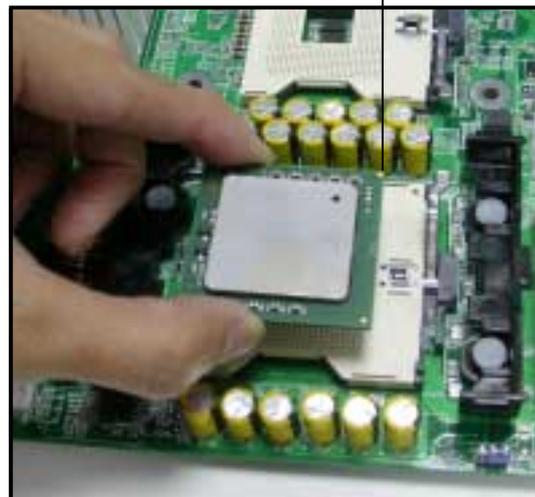
4. Carefully push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.

5. Apply the thermal interface material (thermal grease) to the top of the CPU. This thermal grease should come with the CPU package.

6. Repeat steps 2 to 5 if you wish to install a second CPU.

2.2.3 Installing the CPU heatsink

To install the CPU heatsink:

1. Carefully place the heatsink on top of the installed CPU (CPU1), with the thermistor cable near the connector labeled CPUFAN1.

Thermistor cable

2. Hold down the heatsink lightly and twist each of the four screws with a Philips (cross) screwdriver just enough to attach the heatsink to the motherboard. When the four screws are attached, tighten them one by one to completely secure the heatsink.

3. Connect the thermistor cable to the 2-pin cable from the mid-fan board.

4. Follow steps 1 and 2 to install the second CPU heatsink.
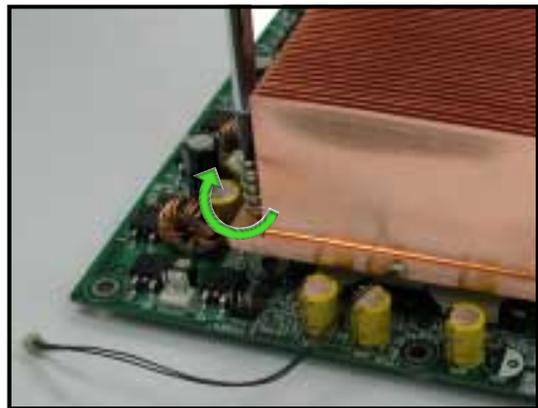
The second CPU heatsink does not have a thermistor cable.
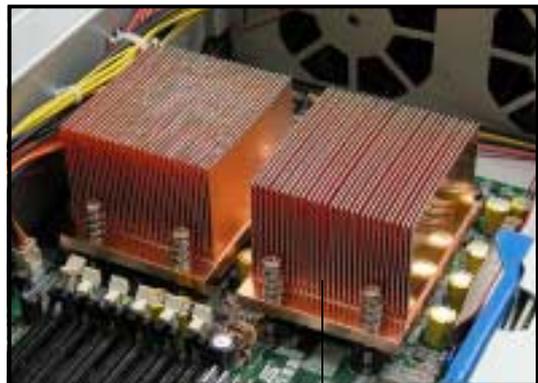
Heatsink for CPU2

2.3   System memory

The motherboard comes with six Double Data Rate (DDR) Dual Inline Memory Module (DIMM) sockets. These sockets support up to 12GB system memory using 2.5V 184-pin registered ECC PC2100/PC1600 DDR DIMMs.

104 Pins   80 Pins

DDRA1
DDRA2
DDRB1
DDRB2
DDRC1
DDRC2
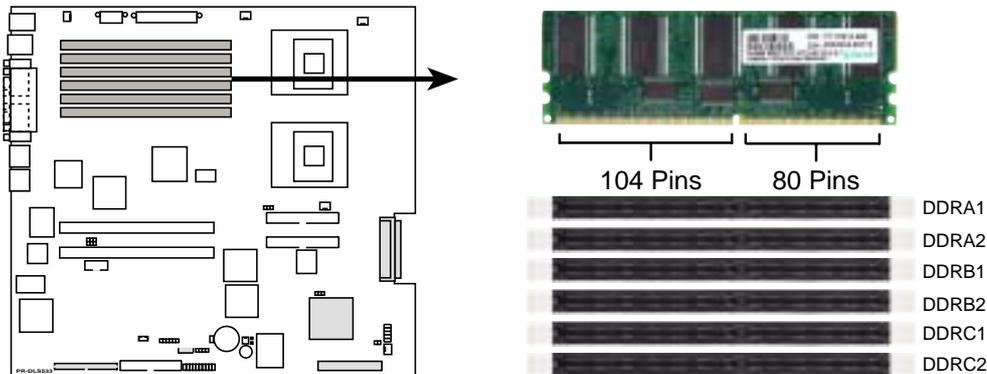
PR-DLS533 184-Pin DDR DIMM Sockets

2.3.1   Memory configurations

As a rule, you need to install identical DDR DIMMs (exactly the same type and size) in pairs. For example, if you installed a 512MB module into DDRA1, you must install the same type of 512MB module into DDRA2. The same rule applies to pairs DDRB1/DDRB2 and DDRC1/DDRC2.

An exception to this rule allows you to install one DIMM into the DDRA1 socket (the socket closest to the ATX power connector). Installing a single DIMM into any other socket would not work.

The following table lists the DIMM socket pairs and the memory modules that you can install.

DIMM sockets	DDRA1	DDRA2	DDRB1	DDRB2	DDRC1	DRC2
Configuration 1	Populated	—	—	—	—	—
Configuration 2	Populated	Populated	—	—	—	—
Configuration 3	—	—	Populated	Populated	—	—
Configuration 4	—	—	—	—	Populated	Populated

The system chipset only supports PC2100/PC1600 registered ECC DIMMs. Make sure th use only the specified DIMM types for stable system operation.

ASUS AP2400-E1 2U barebone server   **2-13**

2.3.2 Installing a DIMM

⚠ Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

Follow these steps to install a DIMM.

1. Unlock a DIMM socket by pressing the retaining clips outward.

2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.
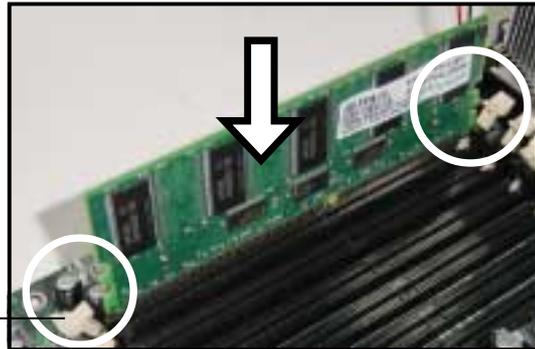
Unlocked retaining clip ————

3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.
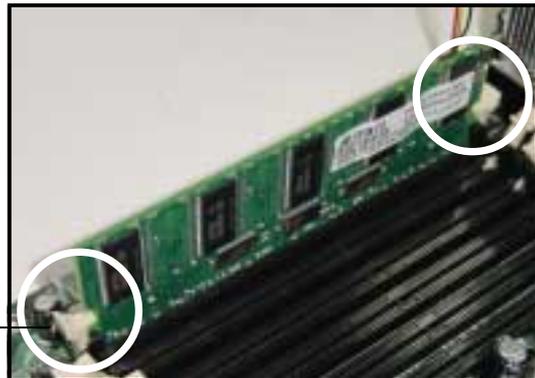
Locked retaining clip ————

2.3.3 Removing a DIMM

Follow these steps to remove a DIMM.

1. Simultaneously press the retaining clips outward to unlock the DIMM.

2. Remove the DIMM from the socket.

⚠ Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.
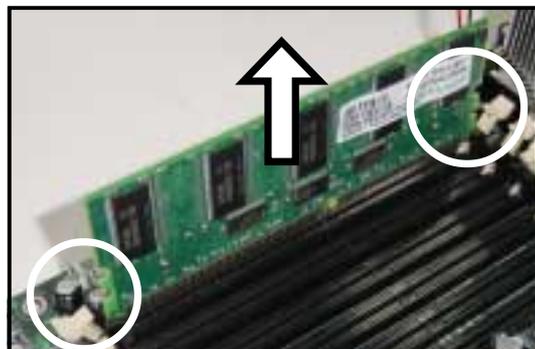
2.4 Hard disk drives

To install a hard disk drive:

1. Open the front bezel to access the hot-swap drive trays.

2. Release a drive tray by pushing the spring lock to the right, then pulling the tray lever outward. The drive tray ejects slightly after you pull out the lever.

3. Firmly hold the tray lever and pull the drive tray out of the bay.

Metal bracket

4. An empty drive tray includes a metal bracket for support. Use a Phillips (cross) screwdriver to remove the bracket if you wish to install a hard disk in the drive tray.

ASUS AP2400-E1 2U barebone server   **2-15**
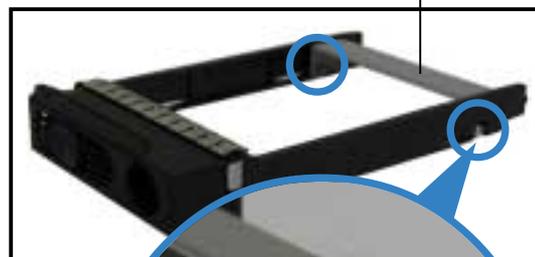
5. Place a hard disk drive into the drive tray, and secure it with four screws (two on each side).

6. Carefully insert drive tray and push it all the way to the depth of the bay until just a small fraction of the tray edge protrudes.

7. Push the tray lever until it clicks, and secures the drive tray in place. The drive tray is correctly placed when its front edge aligns with the bay edge.

2.5 Expansion cards

The system motherboard comes with two PCI-X expansion slots, one slot installed with the PCI cage to support three full-length expansion cards.

PCI-X1

PCI-X2

PCI-X slots inside the PCI cage
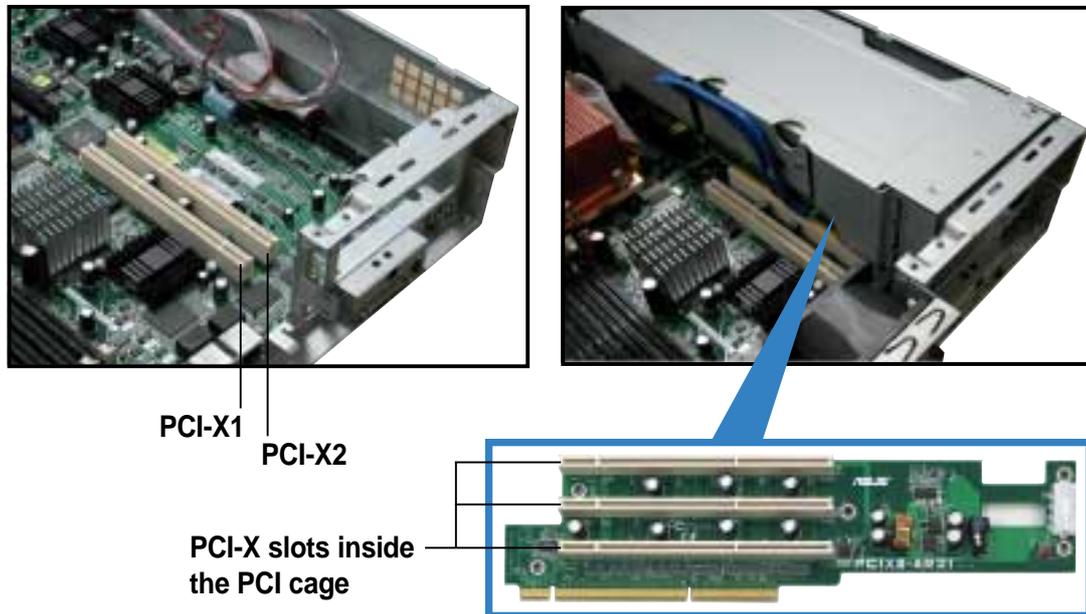
2.5.1 Installing a low-profile expansion card

To install a low-profile expansion card:

1. Firmly hold the card by the edges and align the card connector to the PCI-X slot.
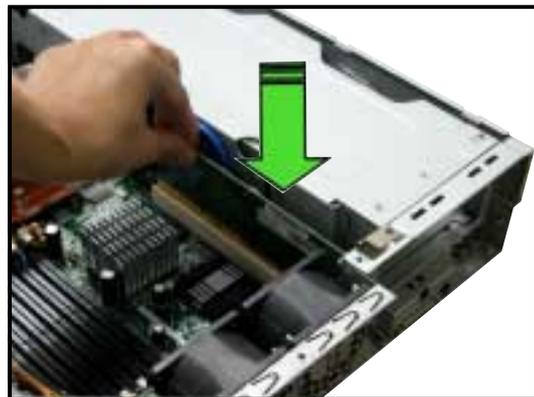
2. Push the card connector into the slot until it fits in place.

3. Secure the card bracket with a screw.
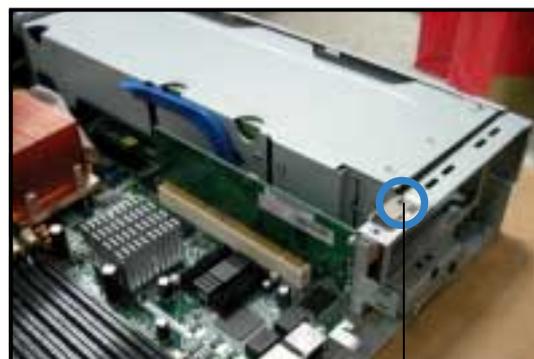
Card screw

2.5.2 Installing a full-length expansion card

The full-length expansion cards are inside the PCI cage. If you wish to install full-length expansion cards, you need to remove the PCI cage from the chassis.

To install a full-length expansion card:

1. Disengage the PCI cage from the chassis by lifting the cage handle to about 45° angle.
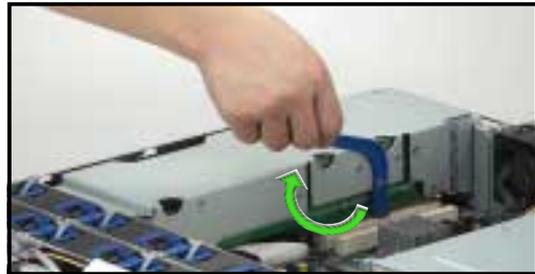
2. Firmly hold and lift the cage as shown to completely detach it from the chassis, then turn it over to access the power connector.
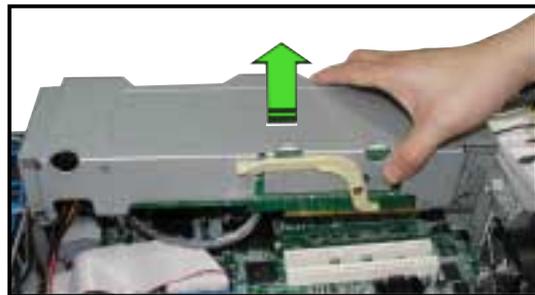
DO NOT lift the PCI cage too high to avoid pulling and breaking the power cable!

3. Disconnect the 4-pin power plug from the connector inside the cage.
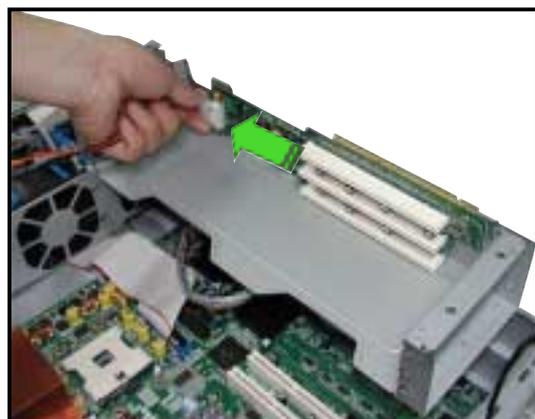
4. Place the cage on a flat stable surface with the slot facing up, and prepare the card that you wish to install.

Internal view of PCI cage
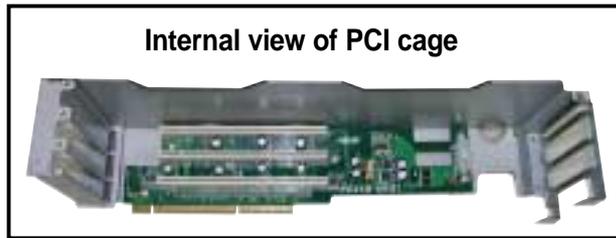
Install PCI-X cards in the following order:

*   first PCI-X card ➡ top slot (furthest from motherboard)
*   second PCI-X card ➡ middle slot
*   third PCI-X card ➡ bottom slot (nearest the motherboard)

Exceptions

1. Install a <u>RAID card to the top slot</u> to facilitate connection of SCSI cables.

2. Install a <u>LAN card to the bottom slot</u> for easy connection of LAN (RJ-45) cables from the chassis rear panel.

5. Remove the metal cover opposite the PCI-X slot that you wish to use, then install a PCI-X card as shown. The card golden connectors should match the notches on the slot.
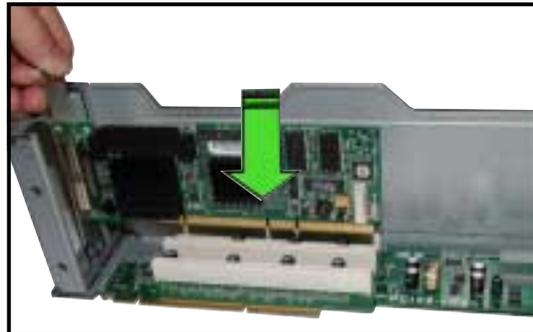
6. Firmly push down the card until it is completely seated on the slot.

7. Secure the card bracket with a screw.

8. Connect cable(s) to the card, if applicable.
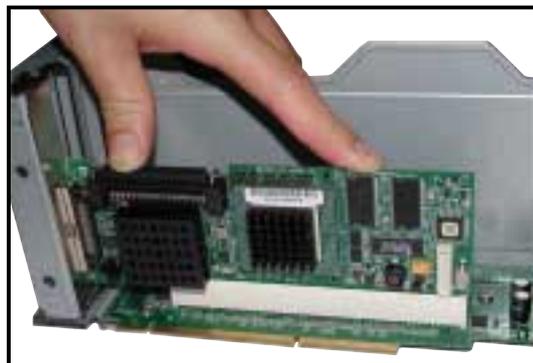
Repeat steps 5 to 8 if you wish to install other PCI-X cards.

ASUS AP2400-E1 2U barebone server   **2-19**

9. Re-connect the 4-pin power plug to the connector inside the cage.

⚠ When re-connecting the power plug, place the PCI cage close enough to avoid pulling the power cable.
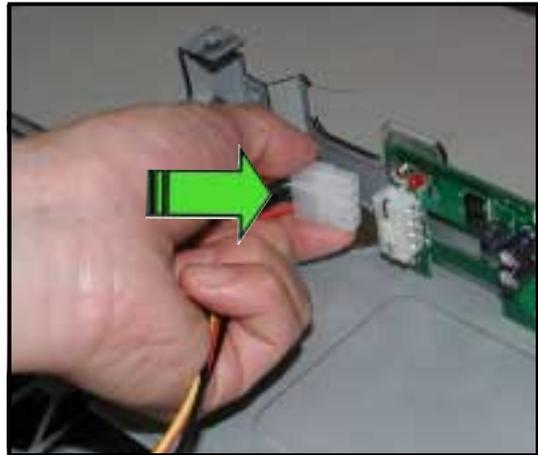
10. Before re-installing the PCI cage into the chassis, check that all cables on the PCI cage bay are properly connected and routed.

Cables on the PCI cage bay
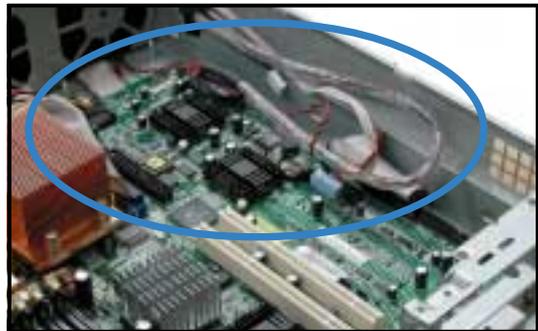
11. Take note of the two pegs on the PCI cage bay. These pegs should match the holes on the cage to make sure it fits in place.
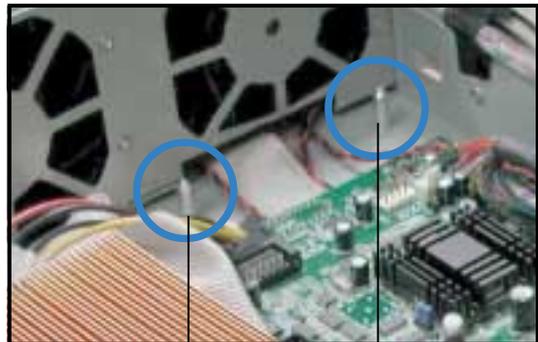
PCI cage pegs

12. Position the PCI cage into the bay making sure that the pegs go into the holes on the front of the cage, and the dents on the rear part match those on the chassis.
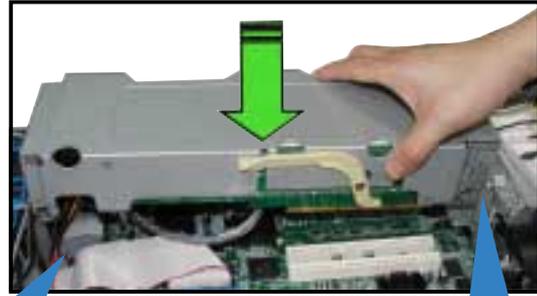
13. Match and push the cage card connector into the PCI-X slot (PCI-X2) until the PCI cage fits in place.
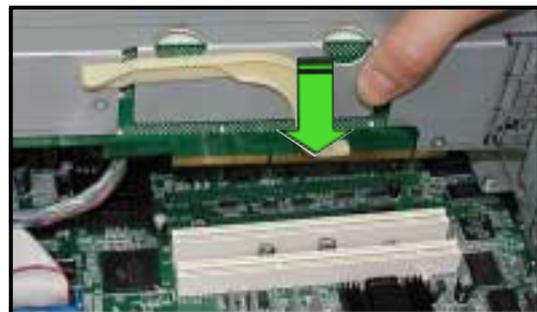
14. Ensure that the PCI cage card golden connectors completely fit the slot.
If properly installed, the top of the PCI cage aligns with the top edge of the rear panel.

2.5.3   Configuring an expansion card

After installing the expansion card, configure the it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 5 for information on BIOS setup.
2. Assign an IRQ to the card. Refer to the following tables.
3. Install the software drivers for the expansion card.

Standard interrupt assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	N/A	Programmable Interrupt
3*	11	Communications Port (COM2)
4*	12	Communications Port (COM1)
5*	13	Sound Card (sometimes LPT2)
6	14	Floppy Disk Controller
7*	15	Printer Port (LPT1)
8	3	System CMOS/Real Time Clock
9*	4	ACPI Mode when used
10*	5	IRQ Holder for PCI Steering
11*	6	IRQ Holder for PCI Steering
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

*   These IRQs are usually available for ISA or PCI devices.

IRQ assignments for this motherboard

	INTA#	INTB#	INTC#	INTD#
PCIX slot 1	1	12	13	14
PCIX slot 2	4	15	16	17
PCIX slot 3	16	17	4	15
PCIX slot 4	17	4	15	16
Onboard LAN1 controller (Intel 82544GC)	2	—	—	—
Onboard LAN2 controller (Intel 82540EM)	3	—	—	—
Onboard SCSI controller (LSI 53C1030)	6	7	—	—
Onboard VGA controller (ATI RAGE-XL)	30	—	—	—

When using PCI cards on shared slots, ensure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

2.6 Cable connections

The bundled system cables are pre-connected before shipment. You do not need to disconnect these cables unless you will remove pre-installed components to install additional devices.

Refer to this section when reconnecting cables to ensure correct cable connections.
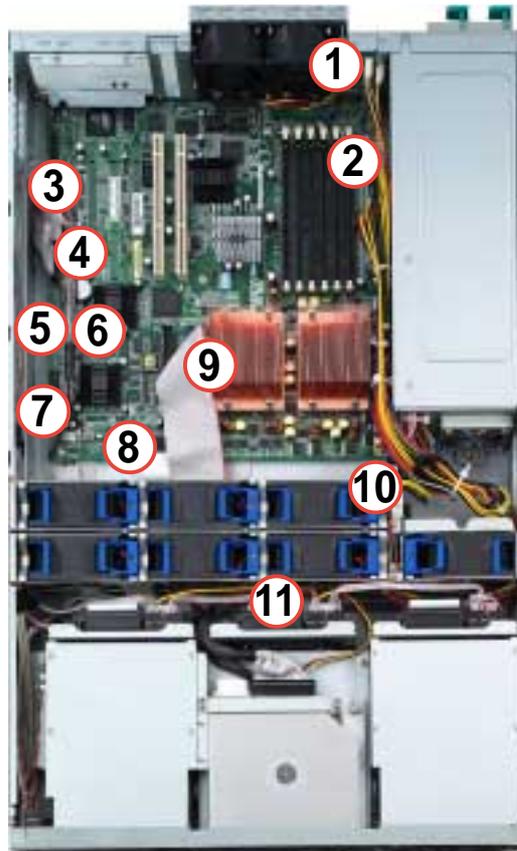
Pre-connected system cables

1. Rear fan connectors (from MB to rear fan board)
2. 24-pin/8-pin power connectors (from power supply to MB)
3. Floppy drive connector (from MB to floppy drive)
4. SMBus connector (from MB to SCSI board)
5. PANEL connectors (from MB to front panel)
6. Chassis intrusion connector (from MB to front panel)
7. SCSI-B connector (from MB to SCSI board or to external SCSI port)
8. SCSI-A connector (from MB to SCSI board)
9. Secondary IDE (from MB to optical drive)
10. Mid-fan power connector (from power supply to mid-fan board)
11. SCSI board connectors (from 3 SCSI boards to MB and power supply)

2.6.1 Motherboard

8-pin power cable

Rear fan cable

24-pin power cable

Mid-fan board cable

PS/2
T: Mouse
B: Keyboard

SYSFAN3   CON12V   ATX_POWER   CPUFAN1   SYSFAN2

CPU 1

mPGA 604

USB1
USB2

DDR DIMMA1 (64/72 bit, 184-pin module)
DDR DIMMA2 (64/72 bit, 184-pin module)
DDR DIMMB1 (64/72 bit, 184-pin module)

COM1

DDR DIMMB2 (64/72 bit, 184-pin module)
DDR DIMMC1 (64/72 bit, 184-pin module)
DDR DIMMC2 (64/72 bit, 184-pin module)

VGA

CPU 2

mPGA 604

/ISUS
PR-DLS533

RJ-45
(LAN-2)

ServerWorks®
CMIC-LE
North Bridge

RJ-45
(LAN-1)

Intel
82544GC
Gigabit
Ethernet

CLKSW

ServerWorks®
CIOB-X2
I/O Bridge

CLKSEL   CPUFAN2

Super
I/O

PCI-X1 (64-bit, 133MHz 3V)

Primary IDE

Intel
32bit
PCI
LAN
Controller

IGLAN_EN
LAN_SW

PCI-X2 (64-bit, 133MHz 3V)

Secondary IDE

SCSI-A

COM2

ServerWorks®
RCC CSB5
South Bridge

4Mbit
Flash
BIOS

VGA RAM

LED1

SCSI_EN

ATI
RAGE XL
VGA
Controller

ServerWorks®
CIOB-X2
I/O Bridge

LSI® 53C1030
SCSI
Controller

USB2

WOR
R452

SMB

CONFIG_SW

CR2032 3V
Lithium Cell
CMOS Power

IDELED

WOL_CON

IPMI

CHASSIS

BUZZER

ASUS
ASIC
with Hardware
Monitor

SYSFAN1

FLOPPY

SCSI-B

PANEL

Floppy drive cable

IDE cable to
optical drive

SCSI cable to
SCSI BP-3

SMBus cable
to SCSI BP-1

2-pin chassis
intrusion cable

20-pin PANEL cable
to front panel

SCSI cable to
SCSI BP-1

Rear panel

2.6.2   SCSI backplanes

View from front panel

**Hot-swap SCSI
HDD connectors**
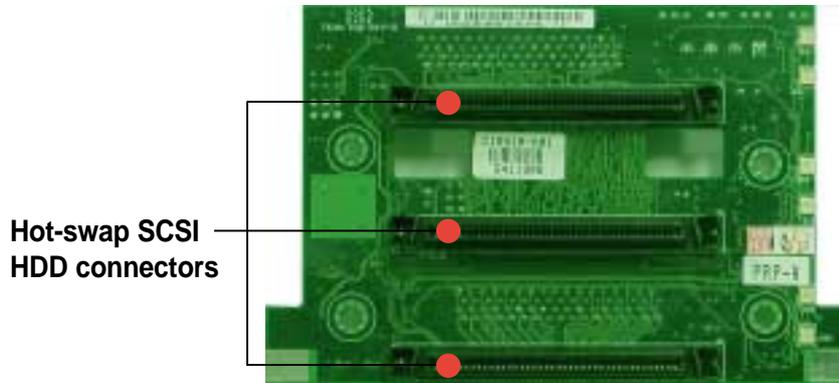
View from rear panel

**(J4)
SCSI BP-1: SMBus cable to SCSI BP-2
SCSI BP-2: SMBus cable to SCSI BP-3 (J5)
SCSI BP-3: SMBus cable to mid-fan board (J4)**

**(J5)
SCSI BP-1: SMBus cable from motherboard
SCSI BP-2: SMBus cable from SCSI BP-1 (J4)
SCSI BP-3: SMBus cable from SCSI BP-2 (J5)**

**4-pin power cable
from power supply**

J6 jumper

J3 jumper

J1 jumper

**SCSI Terminator
or
SCSI cable from motherboard
or
SCSI cable to SCSI BP-2**

**SCSI cable from motherboard
or
SCSI cable from SCSI BP-1**
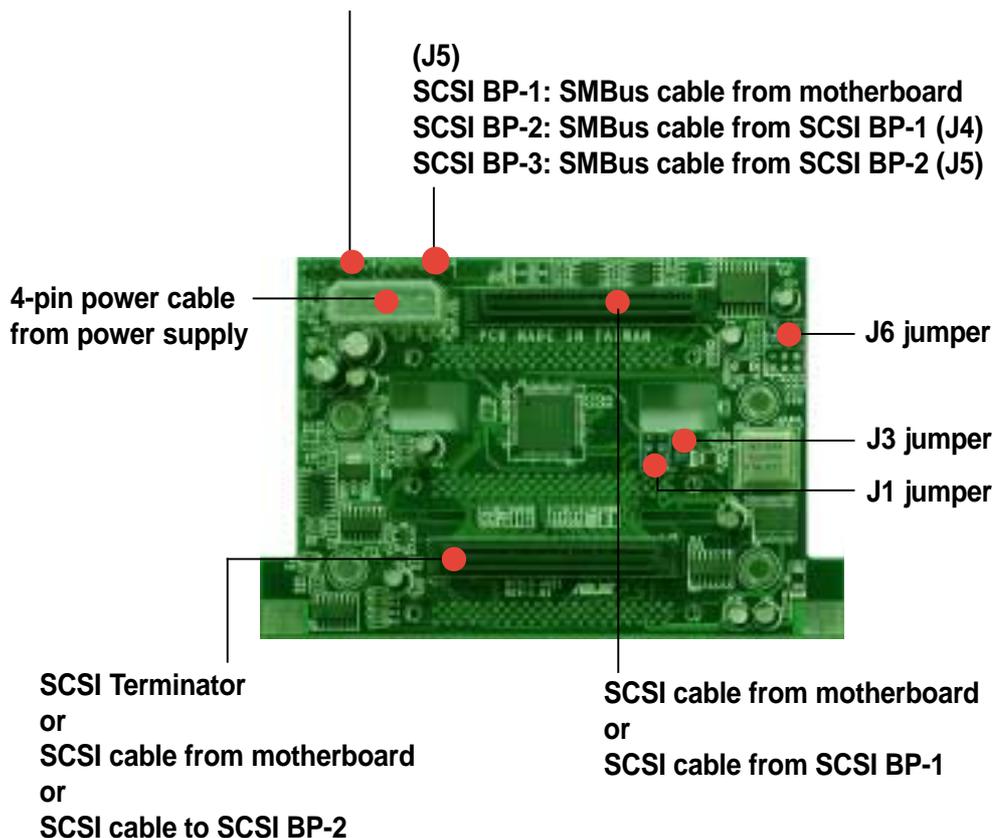
2.6.3 SCSI HDD configurations

SCSI HDD Configuration 1

SCSI-A and SCSI-B connectors used by SCSI backplane boards
No RAID card

SCSI BP-3
SCSI BP-2
SCSI BP-1

SCSI-A connector
SCSI-B connector

SCSI BP-3

SCSI cable from
MB SCSI-B connector

Terminator

SCSI BP-2

SCSI cable from SCSI BP-1

Terminator

SCSI BP-1

SCSI cable from
MB SCSI-A connector

SCSI cable to SCSI BP-2

Rear panel
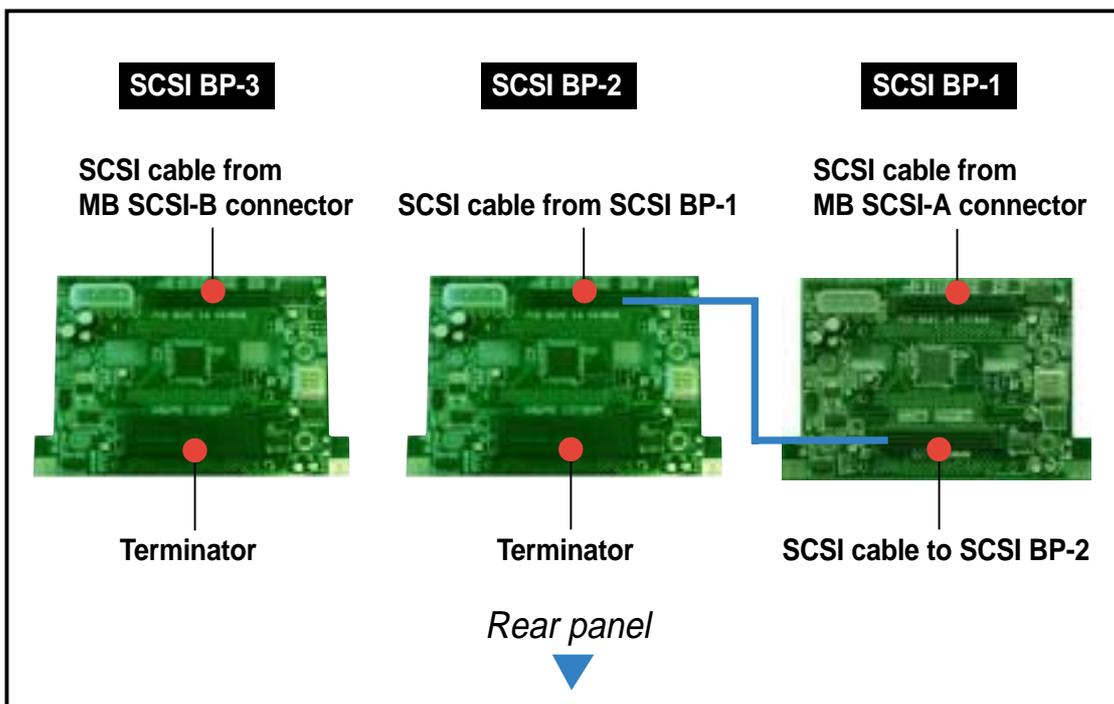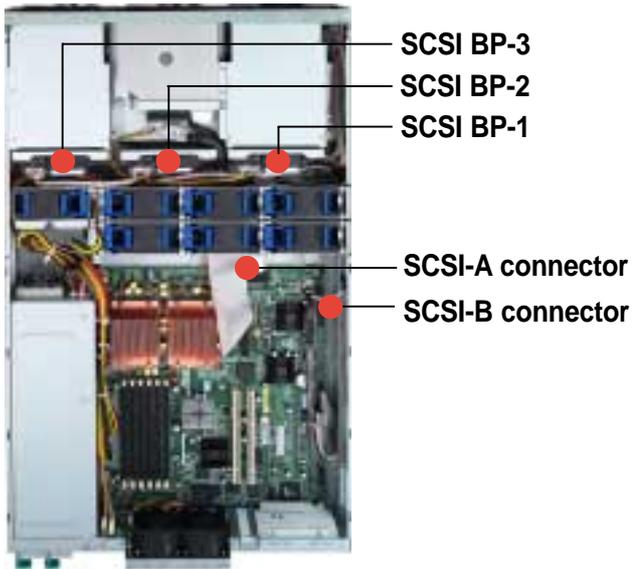
SCSI HDD Configuration 2

Single-channel RAID card installed, connects to SCSI BP-1

SCSI-A connector used by SCSI BP-3

SCSI-B connector free for use by external SCSI device

SCSI BP-3

SCSI BP-2

SCSI BP-1

SCSI-A connector *(connects to SCSI BP-3)*

SCSI-B connector
  (connects to external SCSI port on the rear panel)

External SCSI connector *(on the rear panel)*

**RAID card installed on
PCI-X riser card** *(inside PCI cage)*

SCSI BP-3

SCSI BP-2

SCSI BP-1

**SCSI cable from
MB SCSI-A connector**

SCSI cable from SCSI BP-1

**SCSI cable from
RAID card connector**

Terminator

Terminator

SCSI cable to SCSI BP-2

Rear panel

ASUS AP2400-E1 2U barebone server   **2-27**

SCSI HDD Configuration 3

Dual-channel RAID card installed

SCSI-A connector has no connected device

SCSI-B connector used by external SCSI connector (from rear panel)

- SCSI BP-3
- SCSI BP-2
- SCSI BP-1
- **SCSI-A connector** *(no connection)*
- **SCSI-B connector** *(connects to external SCSI port on the rear panel)*
- **External SCSI connector** *(on the rear panel)*
- **RAID card installed on PCI-X riser card** *(inside PCI cage)*

SCSI BP-3

SCSI cable from RAID card channel-2

Terminator

SCSI BP-2

SCSI cable from SCSI BP-1

Terminator

SCSI BP-1

SCSI cable from RAID card channel-1

SCSI cable to SCSI BP-2

Rear panel

Chapter 2: Hardware setup

2.6.4 SCSI ID assignments

	SCSI BP-1	SCSI BP-2	SCSI BP-3
SCSI slot 1	0	4	8
SCSI slot 2	2	6	10
SCSI slot 3	1	5	9
SAF-TE	15	12	13
SCSI card (if present)	7		

2.6.5 SCSI jumper settings
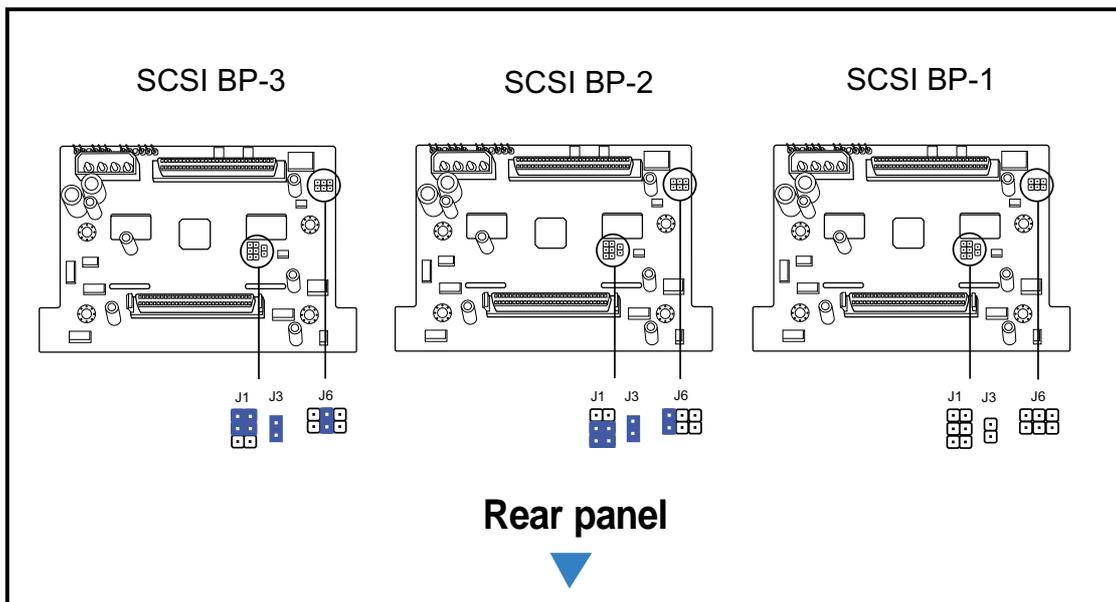
2.6.6 SMBus and backplane power cabling

SCSI BP-1
SCSI BP-2
SCSI BP-3

Mid-fan board
(FANBPC-AR21)

SMBus (J4)

SCSI BP-3

SCSI BP-2

SCSI BP-1

SMBus cable to mid-fan board
SMBus connector (J4)

SMBus cable from
MB SMBus connector

J4 J5

J4 J5

J4 J5

P9 plug from
power supply

P7 plug from
power supply

P6 plug from
power supply

Rear panel
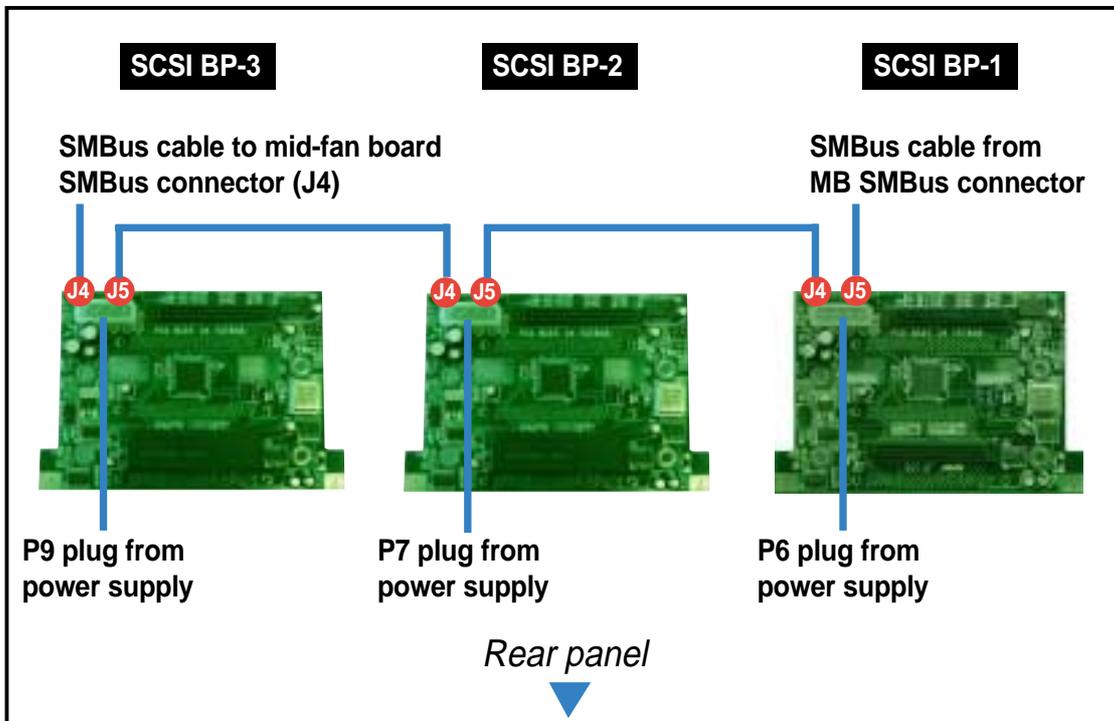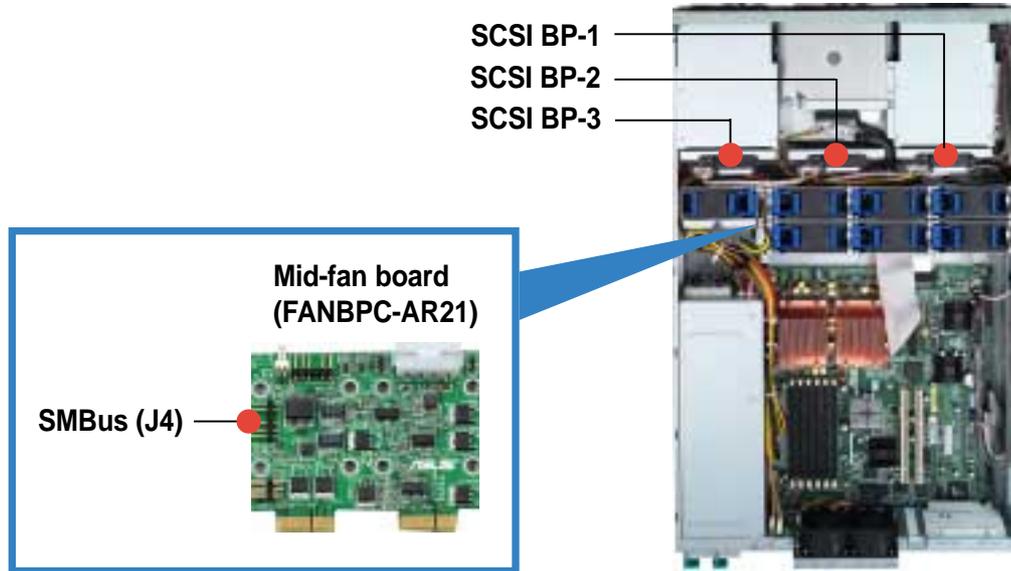
2.6.7 Fan boards

Main mid-fan boards (FANBP-AR21)
(located underneath the 7 hot-swap fans)
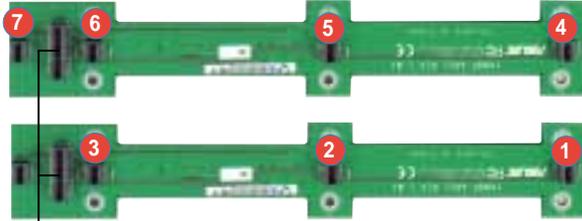
Connect the mid-fan board
(FANBPC-AR21)

Mid-fan board (FANBPC-AR21)

P3 plug from power supply

2-pin thermistor cable
from CPU heatsink 1

SMBus cable
from SCSI BP-3

6-1 pin cable
from FAN60M
J1 connector

To main fan board
(FANBP-AR21)

ASUS AP2400-E1 2U barebone server   **2-31**
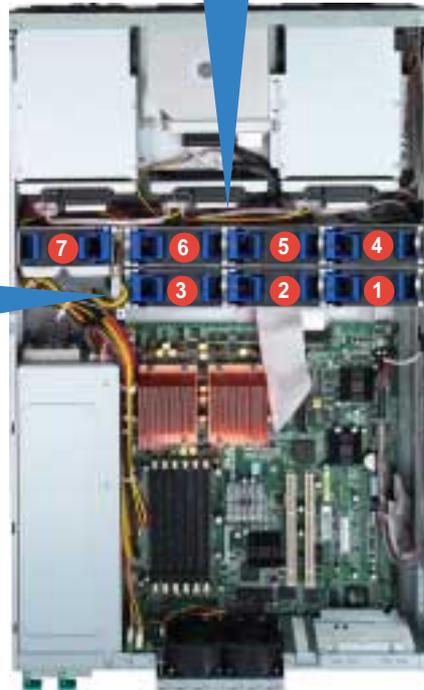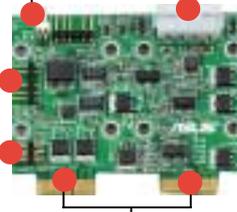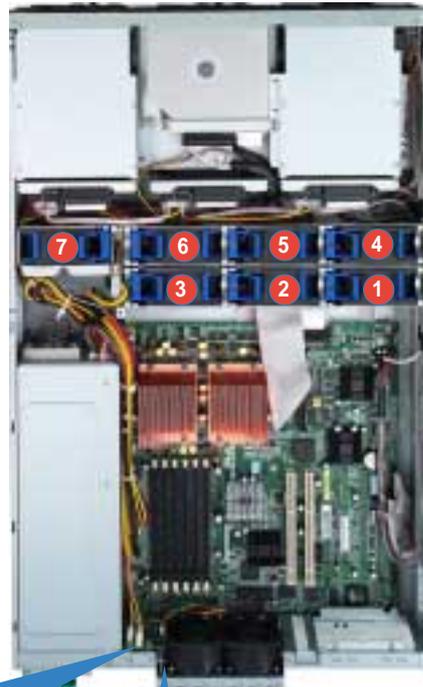
Fan interface board (FAN60M)

Side facing rear panel
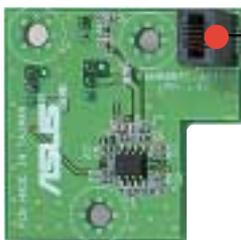
— Connects the FAN60BPC board

Side facing front panel
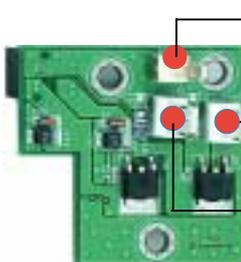
Connects to J2 on FANBPC-AR21

Connects to CPU_FAN1 on MB

Connects to SYS_FAN3 on MB

Rear fan board (FAN60BPC)

Rear fan cables
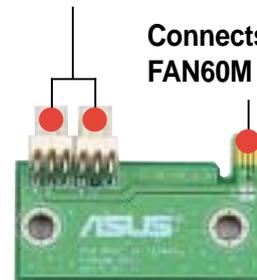
Connects to FAN60M board

Chapter 2: Hardware setup

2.7   Removable components

You may need to remove previously installed system components when installing or removing system devices, or when you need to replace defective components. This section tells how to remove the following components:

1. Hot-swap mid-fans
2. Rear fans
3. Power supply modules

4. Optical drive/floppy drive
5. Front panel LED/switch board
6. SCSI backplanes

2.7.1   Hot-swap mid-fans (80mm)

The fan LED lights up green in normal operation. If the LED color turns orange, the fan is faulty and should be replaced.

To remove an 80mm hot-swap fan:

1. Stand in front of the system and open the top cover.

2. Use the thumb and index finger of your right hand to flip up the right handle, and the thumb and index finger of your left hand to flip up the left handle of the fan that you wish to remove.

3. Firmly hold the handles and pull up the fan until it is disengaged from its connector.

Front panel
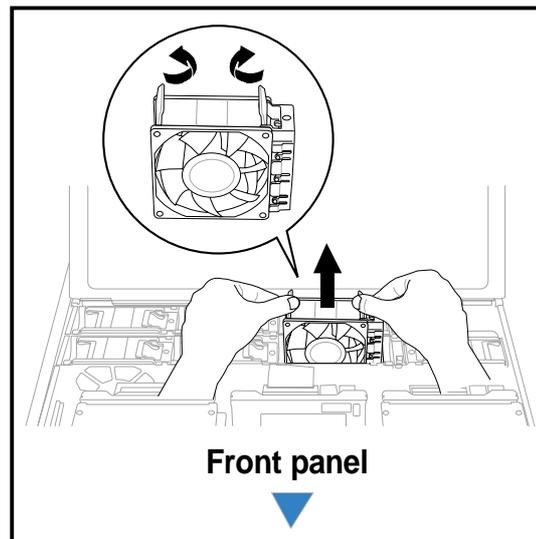
⚠️ Avoid touching the fan blades while removing the fan. Spinning fan blades may cause injury!

2.7.2   Rear fans (60mm)

To uninstall the rear fans:

1. Press the rear fan cage levers, two on each side and two on the bottom.

2. Pull the fan cage from the chassis.

2.7.3 Power supply modules

The barebone system ships with one power supply module. You may purchase a second power supply module for redundancy.

To uninstall a power supply module:

1. Locate the power supply modules on the rear panel, and select the module that you wish to remove.

2. Hold the module lever and press the latch on the inner side to release the module.

3. Firmly pull the lever to slide the power supply module out of the chassis.

The module lever bends down about half an inch as the power supply slides out.

4. Repeat steps 2 to 3 to remove the other module.

2.7.4 Slim optical and floppy drives

To uninstall the optical floppy drives:

1. Disconnect the power and signal cables connected to the rear of the drives.

2. Loosen the thumbscrew that secures the drive bracket to the chassis. The optical drive is attached to the top of the bracket, and the floppy drive to bottom.

3. Slide the drive bracket toward the SCSI backplanes to release it from the chassis, then carefully pull it out of the drive bay.

ASUS AP2400-E1 2U barebone server   **2-35**

2.7.5 Front panel LED and switch board

To uninstall the front panel and swtich board:

1. Disconnect all cables connected to the rear of the board.
2. Remove the three screws the secure the board to the chassis.
3. Carefully remove the board out of the chassis.

Rear side

When removed, the LED and switch board appears as shown. The LEDs and switches on the board correspond to the LEDs and buttons on the system front panel.

Front side

Front panel LEDs and buttons

2.7.6 SCSI backplanes

To uninstall a SCSI backplane:

1. Disconnect all cables connected to the rear of the SCSI backplane.

2. Carefully push the backplane upward to remove it from the chassis.

3. Repeat steps 1 to 2 to remove the other backplanes.
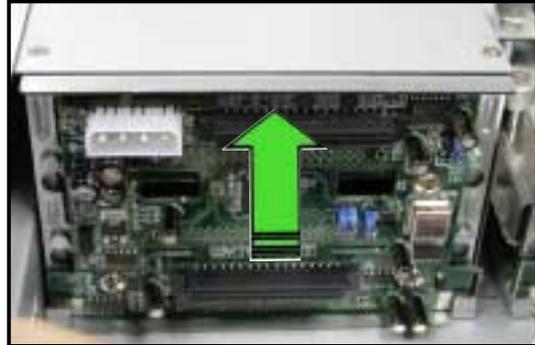
This chapter describes how to install
optional components and devices into the
barebone server.

installation options

ASUS AP2400R-E1 2U barebone server

3.1   Rackmount rail kit items

Your rackmount rail kit package contains:

* one pair of rack rails (for the rack)
* two pairs of server rails (for the server)
    * to accommodate different sizes of rack
* 12 pairs of nut-and-bolt type screws
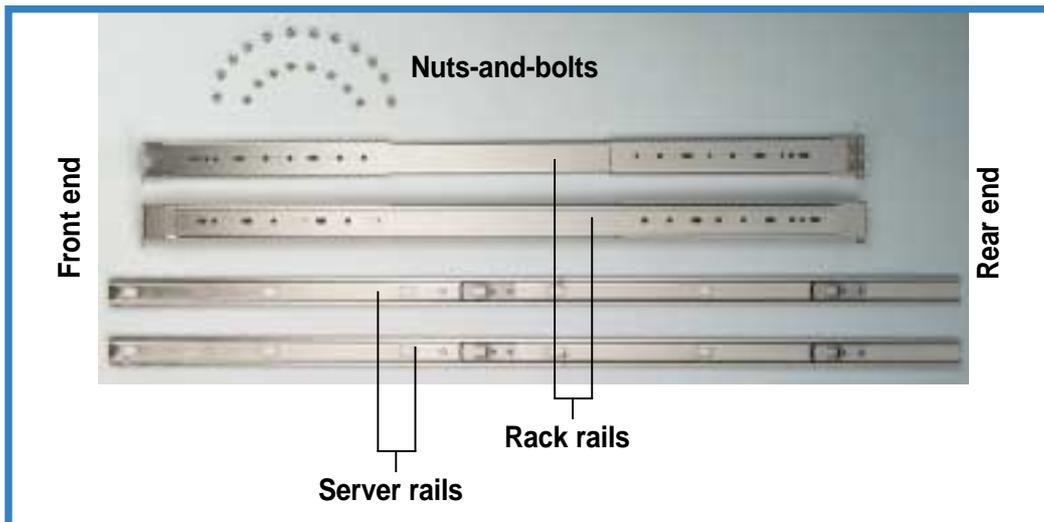
3.2 Attaching the rails to the server

To attach the server rails:

1. Locate the hooks on the side of the chassis.
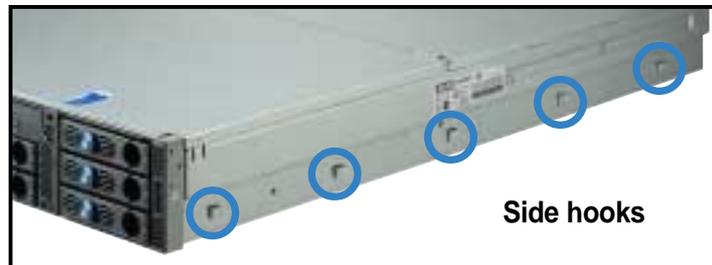
Side hooks

2. Position a server rail parallel to the side of the chassis, and match each of the five hooks to the holes on the rail.
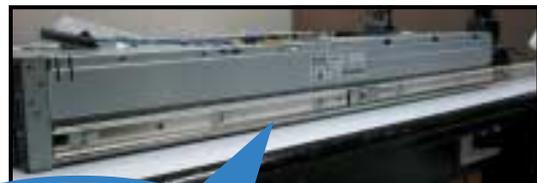
Side hook locked to rail hole

3. Secure the server rail to the with a screw.

4. Repeat steps 1 to 3 to attach the second server rail to the other side of the chassis.

ASUS AP2400R-E1 2U barebone server 3-3

3.3   Attaching the rack rails

To attach the rack rails:

1. Select two units of space (2U) on the rack where you wish to install the barebone server.

2. Remove the screws from the 2U space on the rack front.

3. Remove the screws from the corresponding 2U space on the rack rear.

4. Measure the depth of the rack to determine the length of the rack rails.

5. Take three pieces of rack rail, consisting of the middle piece, one front end (with stopper tab), and one rear end (without stopper tab). Assemble the rack rail to a length depending on the rack depth.

Front end

Rear end   **Stopper tabs**
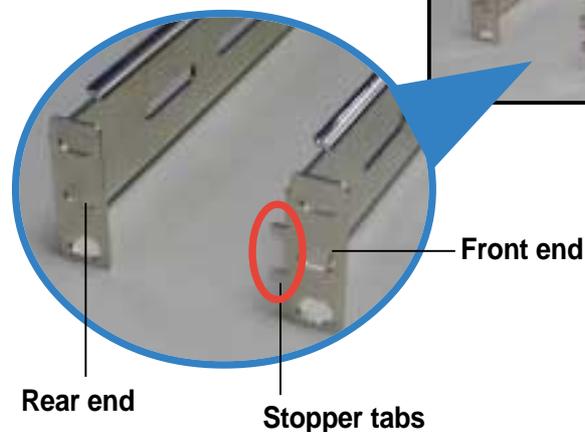
6. Secure the pieces together with two pairs of nut-and-bolt screws.

7. Measure the rack rail when assembled to make sure that it fits the rack.

8. Position the rack rail to the 2U space on the rack.

9. Secure the front end of the rail with two rack screws.

10. Secure the rear end of the rail with two rack screws.

Rear end
(without stopper)
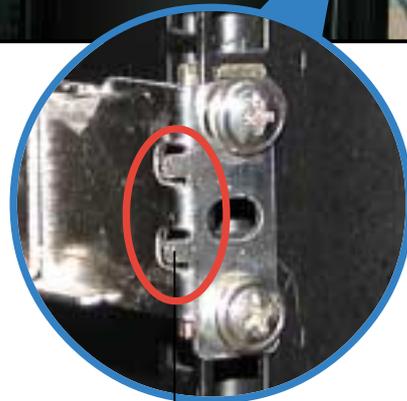
Front end
(with stopper)

11. Repeat steps 5 to 9 to assemble and attach the second rack rail.

ASUS AP2400R-E1 2U barebone server **3-5**

3.4 Rackmounting the server

To mount the server to the rack, align the server rails with the rack rails and push the server to the depth of the rack as shown.

This chapter includes the motherboard
layout, and brief descriptions of the jumpers
and internal connectors.

Motherboard info

ASUS AP2400R-E1 2U barebone server

4.1 Motherboard layout

33cm (13in)

30.5cm (12in)

PS/2
T: Mouse
B: Keyboard

SYSFAN3 CON12V ATX_POWER CPUFAN1 CPU 1 SYSFAN2

USB1
USB2

mPGA 604

COM1

DDR DIMMA1 (64/72 bit, 184-pin module)
DDR DIMMA2 (64/72 bit, 184-pin module)
DDR DIMMB1 (64/72 bit, 184-pin module)
DDR DIMMB2 (64/72 bit, 184-pin module)
DDR DIMMC1 (64/72 bit, 184-pin module)
DDR DIMMC2 (64/72 bit, 184-pin module)

VGA

ASUS
PR-DLS533

CPU 2

mPGA 604

RJ-45
(LAN-2)

RJ-45
(LAN-1)

Intel
82544GC
Gigabit
Ethernet

ServerWorks®
CMIC-LE
North Bridge

CLKSW

Super
I/O

ServerWorks®
CIOB-X2
I/O Bridge

CLKSEL CPUFAN2

PCI-X1 (64-bit, 133MHz 3V)

Primary IDE

Intel
32bit
PCI
LAN
Controller

IGLAN_EN
LAN_SW

PCI-X2 (64-bit, 133MHz 3V)

Secondary IDE

COM2

ServerWorks®
RCC CSB5
South Bridge

4Mbit
Flash
BIOS

VGA RAM

LED1

SCSI-A

ATI
RAGE XL
VGA
Controller

ServerWorks®
CIOB-X2
I/O Bridge

SCSI_EN

LSI® 53C1030
SCSI
Controller

USB2

WOR
R452

CR2032 3V
Lithium Cell
CMOS Power

IDELED

WOL_CON

SMB CONFIG_SW

SYSFAN1

IPMI

CHASSIS

BUZZER

ASUS
ASIC
with Hardware
Monitor

FLOPPY

PANEL

SCSI-B

Layout contents

Switches/Jumpers	
1. CPU external frequency selection (CLKSW Switches 1-5)	4-4
2. CPU clock setting (3-pin CLKSEL)	4-5
3. Gigabit LAN2 controller setting (3-pin LAN_SW)	4-5
4. Gigabit LAN1 controller setting (3-pin 1GLAN_EN)	4-6
5. SCSI setting (2-pin SCSI_EN)	4-6
6. Clear RTC RAM (R452)	4-7

Connectors	
1. Floppy disk drive connector (34-1 pin FLOPPY1)	4-8
2. Serial port 2 connector (10-1 pin COM2)	4-8
3. IDE connectors (40-1 pin PRI_IDE [blue], SEC_IDE [black])	4-9
4. Chassis intrusion connector (4-1 pin CHASSIS)	4-10
5. SMBus connector (6-1 pin SMB)	4-10
6. ATX power connectors (24/20-pin ATXPWR, 8-pin CON12V)	4-11
7. CPU, Chassis, and Power Fan Connectors (3-pin CPUFAN1, CPUFAN2, SYSFAN1, SYSFAN2, SYSFAN3)	4-12
8. USB header (10-1 pin USB2)	4-12
9. IPMI connector (4-pin IPMI)	4-13
10. Wake-On-LAN Connector (3-pin WOL_CON)	4-13
11. 68-pin Ultra320 SCSI Connectors (SCSI-A, SCSI-B)	4-14
12. Wake-On-Ring Connector (2-pin WOR)	4-15
13. Hard disk activity LED (2-pin IDELED)	4-15
14. System panel connector (20-1 pin PANEL1)	4-16

ASUS AP2400R-E1 2U barebone server **4-3**

4.2   Switches and jumpers

4.2.1   Switches

The following figure shows the location and default settings of the DIP switches on the motherboard.

> Keep the default settings for stable system operation.

CLKSW
ON
OFF
1.Frequency Selection
2.Frequency Selection
3.Frequency Selection
4.Frequency Selection
5.Reserved (On)

PR-DLS533 DIP Switches
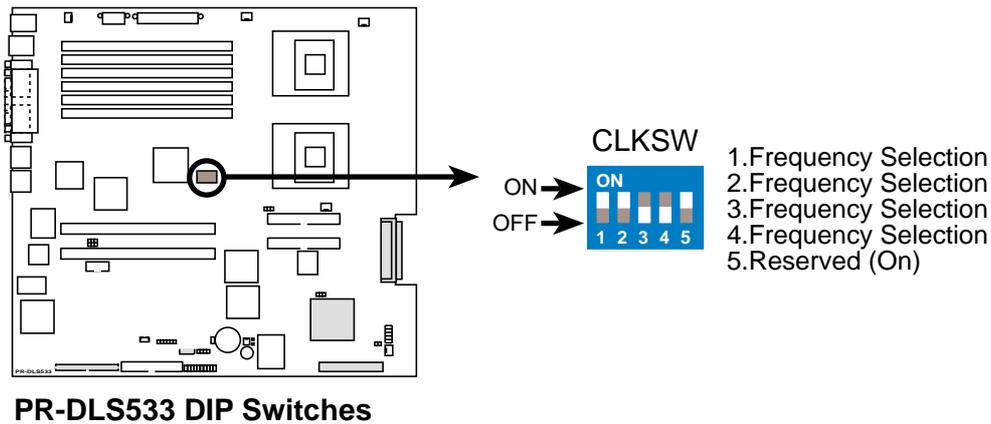
CPU external frequency selection (CLKSW Switches 1-5)

This option tells the clock generator what frequency to send the CPU. This allows the selection of the CPU's external frequency (or Bus Clock). The BUS Clock multiplied by the Frequency Multiple equals the CPU's internal frequency (the advertised CPU speed).

CLKSW

100MHz   101MHz   103MHz

105MHz   110MHz   133MHz
(Default)

**PR-DLS533 CPU
External Frequency Selection**
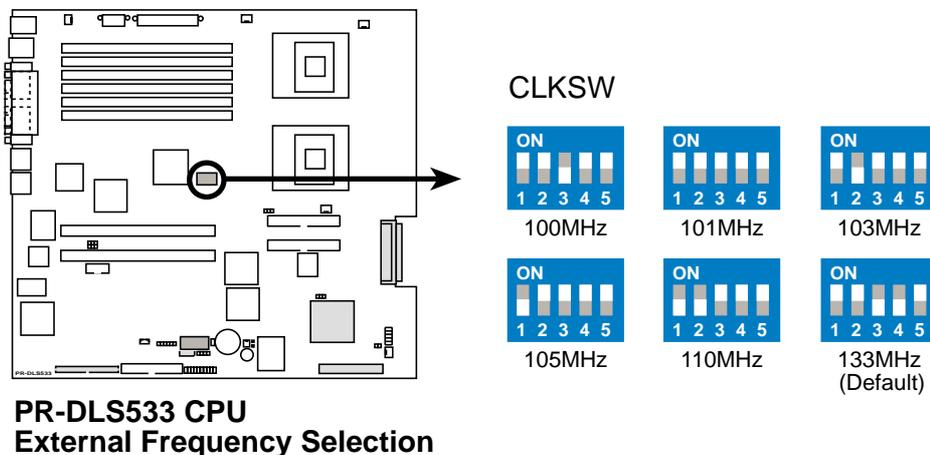
4.2.2 Jumpers

1. CPU clock setting (3-pin CLKSEL)

This jumper allows you to select the CPU frequency. Set to Auto (pins 1-2) to allow automatic frequency selection depending on the type of the installed CPU. Set to pins 2-3 if you installed a 100MHz CPU. Remove the jumper cap to manually select the CPU frequency using the DIP switches.

CLKSEL

2 1 — Auto (Default)
3 2 — Foster
3 2 1 — Select by CLKSW

PR-DLS533 CLK Setting
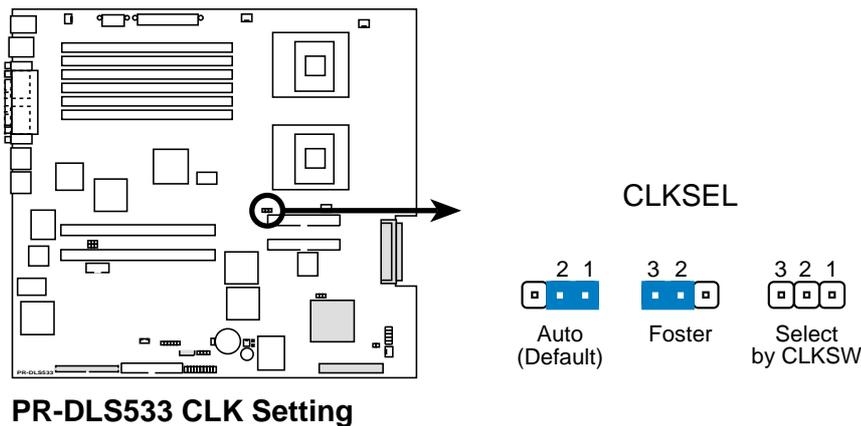
2. Gigabit LAN2 controller setting (3-pin LAN_SW)

This jumper allows you to enable or disable the 32-bit Intel® 82540EM Gigabit LAN controller. Setting this jumper to pins 2-3 disables the Gigabit LAN port (RJ-45) on the rear panel that corresponds to this controller.

LAN_SW

Enable (Default)   Disable

PR-DLS533 LAN_SW Setting

ASUS AP2400R-E1 2U barebone server 4-5
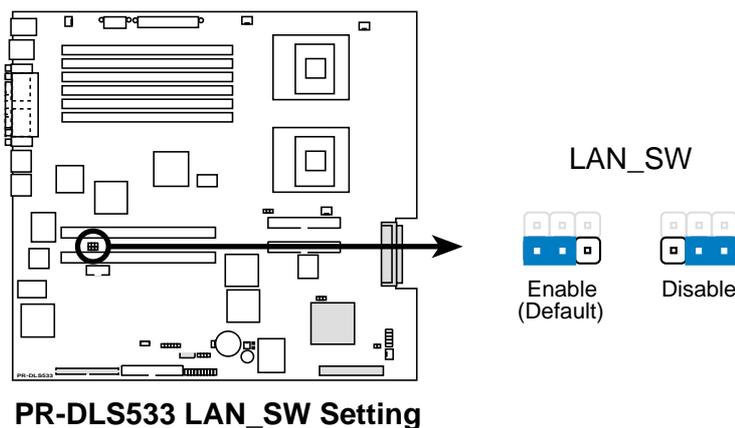
3. Gigabit LAN1 controller setting (3-pin 1GLAN_EN)

This jumper allows you to enable or disable the 64-bit Intel® 82544GC Gigabit LAN controller. Setting this jumper to pins 2-3 disables the Gigabit LAN port (RJ-45) on the rear panel that corresponds to this controller.

1G LAN_EN

Enable (Default)   Disable
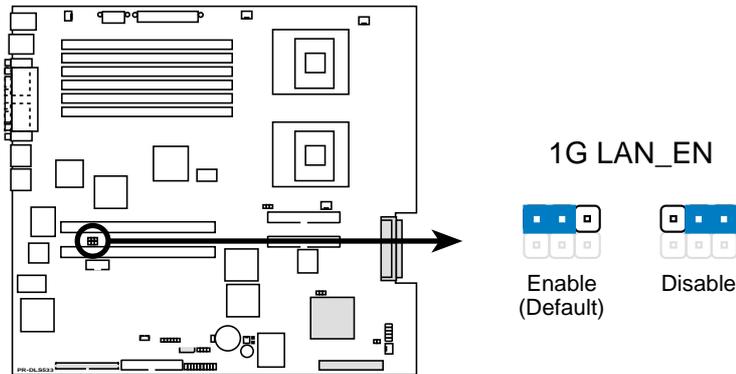
PR-DLS533 1G LAN Setting

4. SCSI setting (2-pin SCSI_EN)

This jumper allows you to enable or disable the onboard SCSI feature. Keep the jumper open if you wish to install SCSI devices. Place a cap on the jumper to disable the onboard SCSI controller.

SCSI_EN

Enable (Default)   Disable
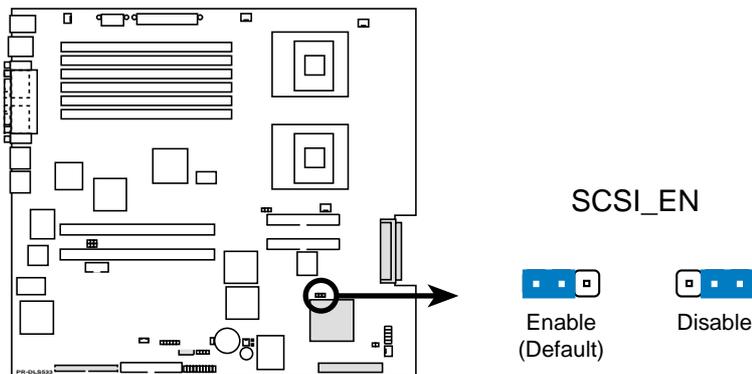
PR-DLS533 SCSI Setting

5. Clear RTC RAM (R452)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The RAM data in CMOS, that include system setup information such as system passwords, is powered by the onboard button cell battery.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Short the solder pads for about 5 seconds.
4. Re-install the onboard battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

PR-DLS533 Clear RTC RAM

ASUS AP2400R-E1 2U barebone server   **4-7**
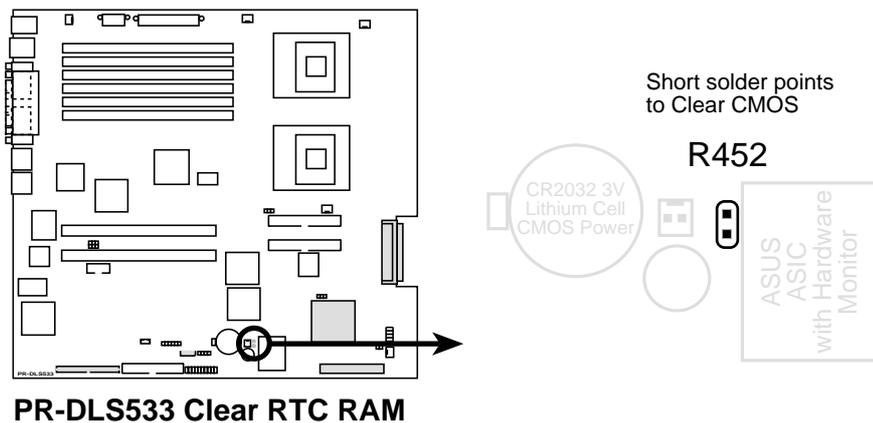
4.3   Connectors

This section describes the internal connectors on the motherboard. Refer to section "1.4 Rear panel features" for information on the external (rear panel) connectors.

1. Floppy disk drive connector (34-1 pin FLOPPY1)

This connector supports the provided floppy drive ribbon cable. After connecting one end to the motherboard, connect the other end to the floppy drive. (Pin 5 is removed to prevent incorrect insertion when using ribbon cables with pin 5 plug).

FLOPPY

PIN 1

NOTE: Orient the red markings on the floppy ribbon cable to PIN 1.

PR-DLS533 Floppy Disk Drive Connector
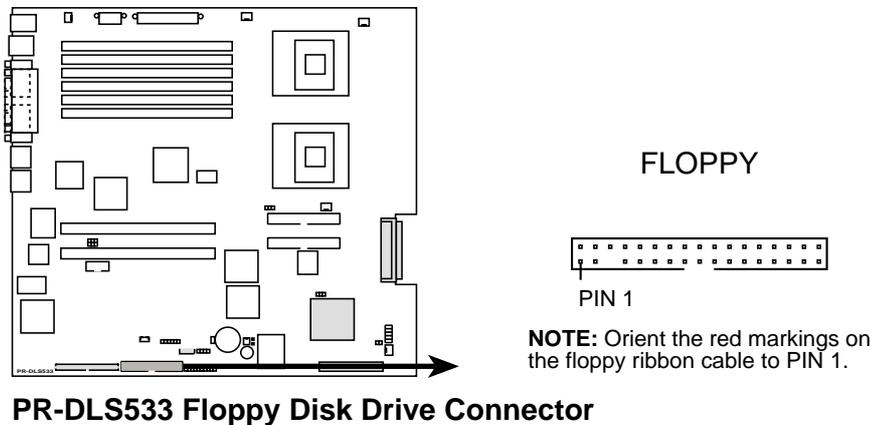
2. Serial port 2 connector (10-1 pin COM2)

This connector accommodates a second serial port using an optional serial port bracket. Connect the bracket cable to this connector then install the bracket into a slot opening at the back of the system chassis.

PIN 1

PR-DLS533 Serial COM2 Connector
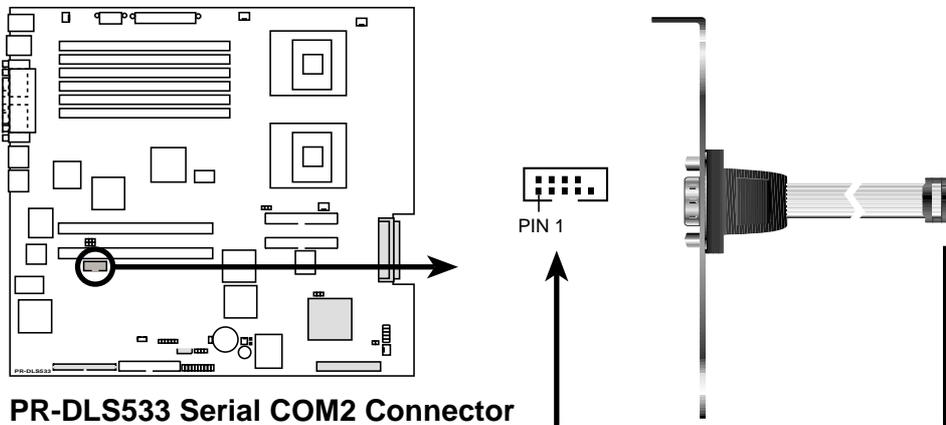
3. IDE connectors (40-1 pin PRI_IDE [blue], SEC_IDE [black])

This connector supports the provided UltraDMA/100/66 IDE hard disk ribbon cable. Connect the cable's blue connector to the primary (recommended) or secondary IDE connector, then connect the gray connector to the UltraDMA/100/66 slave device (hard disk drive) and the black connector to the UltraDMA/100/66 master device. It is recommended that you connect non-UltraDMA/100/66 devices to the secondary IDE connector. If you install two hard disks, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings. BIOS supports specific device bootup. You may configure two hard disks to be both master devices with two ribbon cables – one for the primary IDE connector and another for the secondary IDE connector.

1. Pin 20 on each IDE connector is removed to match the covered hole on the UltraDMA cable connector. This prevents incorrect orientation when you connect the cables.

2. The hole near the blue connector on the UltraDMA/100/66 cable is intentional.

3. For UltraDMA/100/66 IDE devices, use the 80-conductor IDE cable.
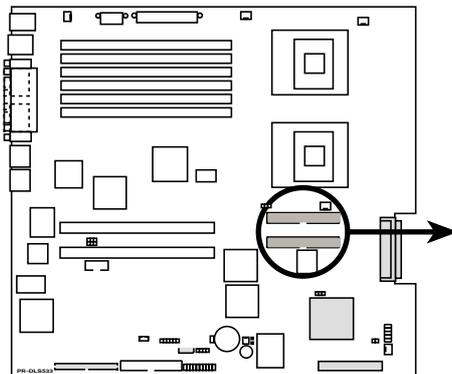
PR-DLS533 IDE Connectors

Primary IDE Connector

PIN 1

Secondary IDE Connector
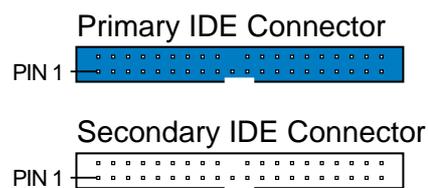
PIN 1

NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN 1.

ASUS AP2400R-E1 2U barebone server   **4-9**

4. Chassis intrusion connector (4-1 pin CHASSIS)

This lead is for a chassis designed with intrusion detection feature. This requires an external detection mechanism such as a chassis intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high-level signal to this lead to record a chassis intrusion event.

By default, the pins labeled "Chassis Signal" and "Ground" are connected to the front panel microswitch. If you wish to disable the chassis intrusion detection feature, unplug the cable from the microswitch and place a jumper cap to these pins.

CHASSIS

+5Volt
(Power Supply Stand By)

Chassis Signal

Ground

PR-DLS533 Chassis Intrusion Connector
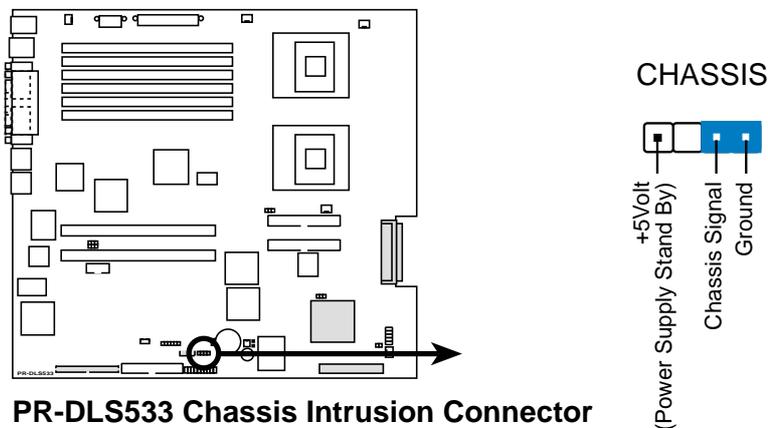
5. SMBus connector (6-1 pin SMB)

This connector allows you to connect SMBus (System Management Bus) devices. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface. SMBus is a specific implementation of an I^2C bus, a multi-device bus that allows multiple chips to connect to the same bus and enable each one to act as a master by initiating data transfer.

SMB

+3V

SMBDATA

Ground

SMBCLK

FLOATING

1

PR-DLS533 SMBus Connectors
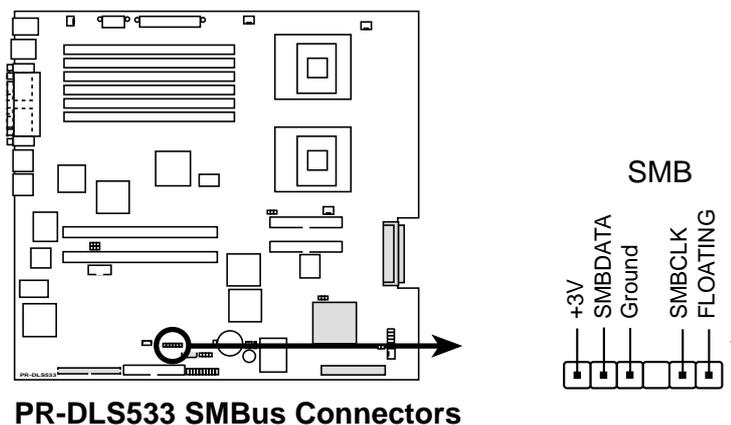
6. ATX power connectors (24/20-pin ATXPWR, 8-pin CON12V)

These connectors connect to an ATX 12V power supply. The plugs from the power supply are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

In addition to the 24/20-pin power connector, this motherboard requires that you connect the 8-pin +12V power plug to provide sufficient power to the CPU.

Make sure that your ATX 12V power supply can provide 8A on the +12V lead and at least 2A on the +5-volt standby lead (+5VSB). The minimum recommended wattage is 230W, or 300W for a fully configured system. The system may become unstable and may experience difficulty powering up if the power supply is inadequate.

PR-DLS533 ATX Power Connectors

24-pin Power Connector

ATXPWR

Ground
+5 Volts
+5 Volts
+5 Volts
-5 Volts
Ground
Ground
Ground
PSON#
Ground
-12 Volts
+3 Volts

1

+3 Volts
+12 Volts
+12 Volts
+5V Standby
Power OK
Ground
+5 Volts
Ground
+5 Volts
Ground
+3 Volts
+3 Volts

For Power Supply
with 20-pin
Power Connector

CON12V

4-pin
12V 12V 12V 12V

8-pin

GND GND GND GND
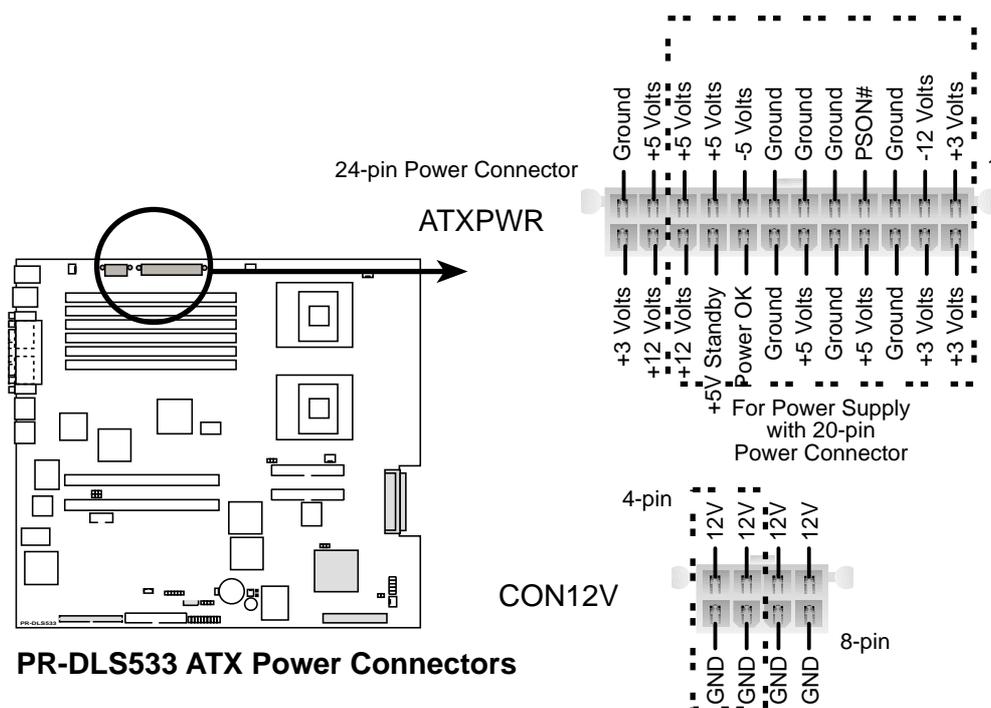
7. CPU, Chassis, and Power Fan Connectors (3-pin CPUFAN1, CPUFAN2, SYSFAN1, SYSFAN2, SYSFAN3)

The fan connectors support cooling fans of 350mA~740mA (8.88W max.) or a total of 1A~2.22A (26.64W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.

> ⚠️ Do not forget to connect the fan cables to the fan connectors. Lack of sufficient air flow within the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!

PR-DLS533 12-Volt Cooling Fan Power
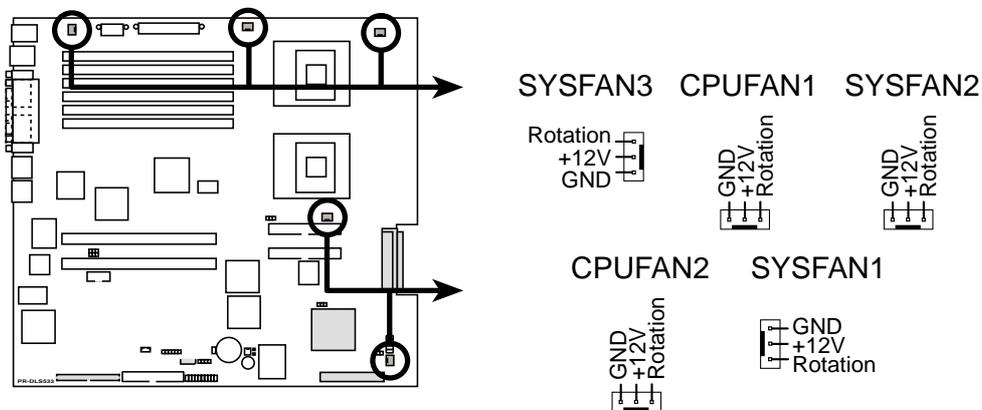
8. USB header (10-1 pin USB2)

If the USB ports on the rear panel are inadequate, a USB header is available for additional USB ports. The USB header complies with USB 1.1 specification that supports up to 12 Mbps connection speed.

PR-DLS533 USB Header
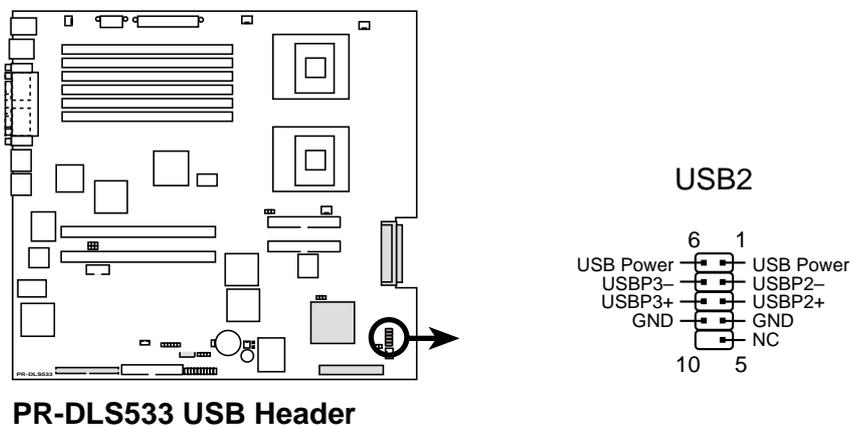
9. IPMI connector (4-pin IPMI)

The Intelligent Platform Management Interface (IPMI) connector is for the ASMC card. Connect the 4-pin ASMC interface cable to this connector.

PR-DLS533 IPMI Connector

IPMI
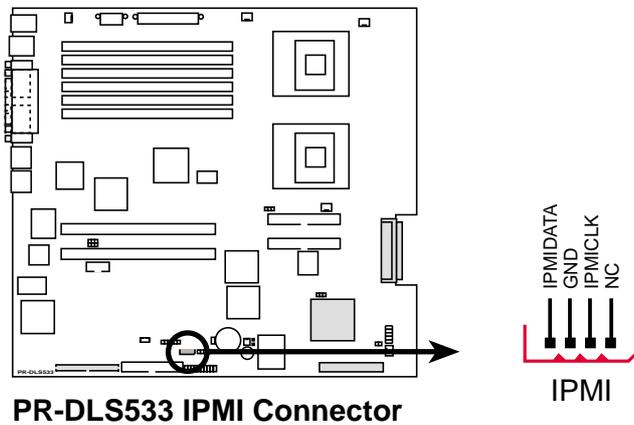
10. Wake-On-LAN Connector (3-pin WOL_CON)

This connector supports a LAN card with a Wake-On-LAN output. The connector powers up the system when a wakeup packet or signal is received through the LAN card.

PR-DLS533 Wake-On-LAN Connector

IMPORTANT: Requires an ATX power supply with at least 720mA +5 volt standby power

WOL_CON

Ground

PME   +5 Volt Standby

ASUS AP2400R-E1 2U barebone server   **4-13**
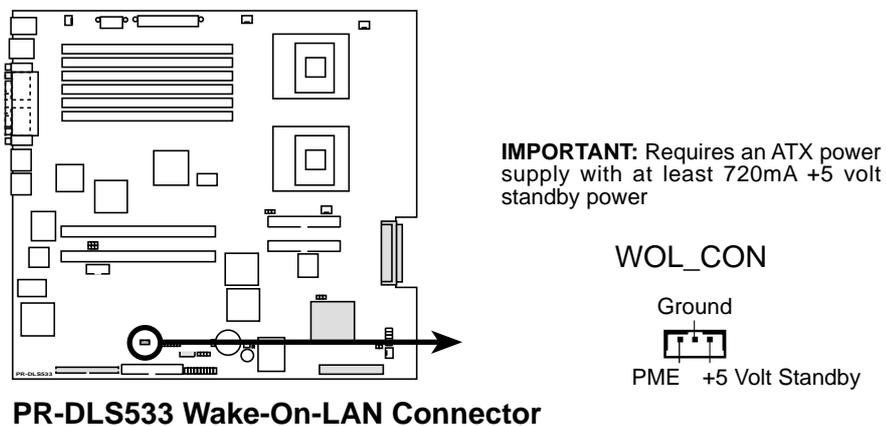
11. Two 68-pin Ultra320 SCSI Connectors (SCSI-A, SCSI-B)

This motherboard has two 68-Pin Ultra320 SCSI connectors; one for each of the two channels. Each channel can support a maximum of 15 devices as specified by Ultra320 standards.

SCSI-A
68-Pin Ultra160/
Ultra2-Wide SCSI Connector

SCSI-B
68-Pin Ultra160/
Ultra2-Wide SCSI Connector

PR-DLS533 Onboard SCSI Connectors
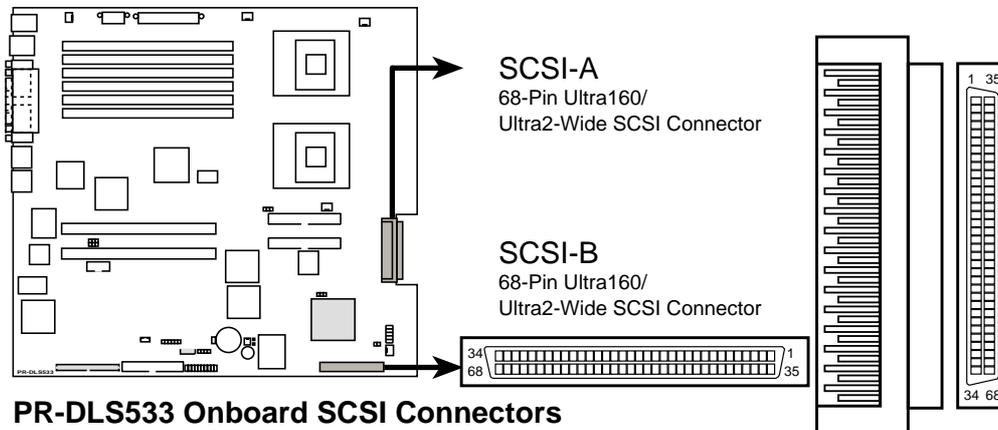
SCSI Connection Notes

This motherboard has two 68-Pin Ultra320 SCSI connectors; one for each of the two channels.

The onboard SCSI chipset incorporates an advanced multimode I/O cell that supports both single-ended (SE), Ultra2, Ultra160, and Ultra320 devices. With Ultra320 devices, the SCSI bus platform performs at full Ultra320 speeds (up to 320MB/s) and extended cabling 12m (or 25m in a point-to-point configuration). When an SE device is attached, the bus defaults to an SE speed and 1.5m cable length.

Connect SCSI devices as shown. Each channel should have only one type of SCSI standard (e.g. Ultra320, Ultra160, Ultra2, Ultra-Wide). Mixing SCSI devices on the same channel decreases performance of the slower device.

68-pin Internal SCSI Cable (Twisted-Pair Ribbon)

Channel B

68-pin Female Terminator

Internal SCSI Devices (up to 15 devices)

68-pin Internal SCSI Cable (Twisted-Pair Ribbon)

Channel A

68-pin Female Terminator

Internal SCSI Devices (up to 15 devices)
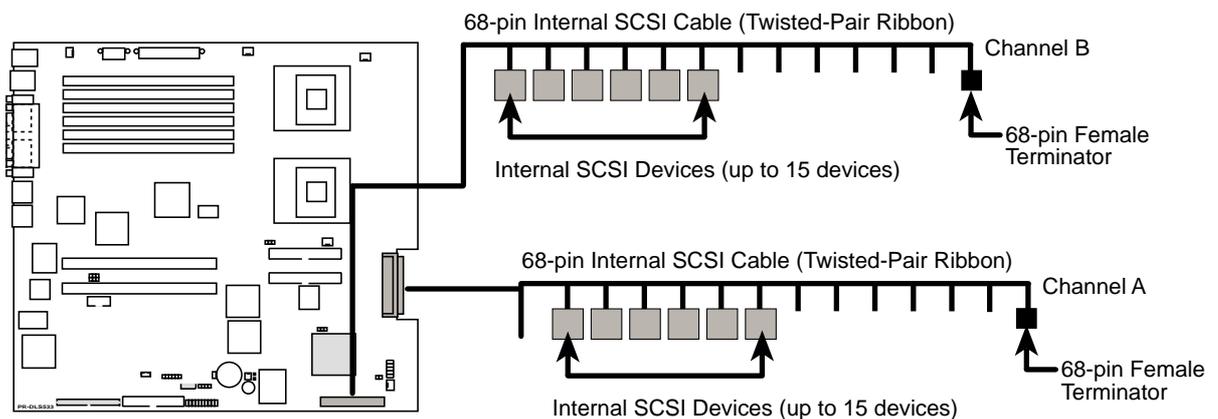
PR-DLS533 SCSI Connection Example

4-14   **Chapter 4: Motherboard information**

12. Wake-On-Ring Connector (2-pin WOR)

This connector connects to internal modem cards with a Wake-On-Ring output. The connector powers up the system when a ringup packet or signal is received through the internal modem card.

> For external modems, Wake-On-Ring is detected through the COM port.

WOR

1 ☐ 2

Ground Ring#
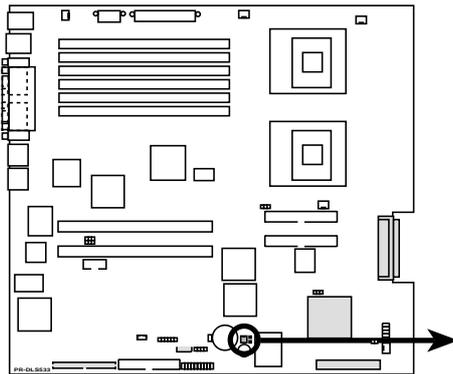
PR-DLS533 Wake-On-Ring Connector
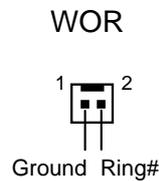
13. Hard disk activity LED (2-pin IDELED)

This connector supplies power to the hard disk activity LED. The read or write activities of any device connected to the primary or secondary IDE connector cause this LED to light up.

IDELED

- +
☐ ☐
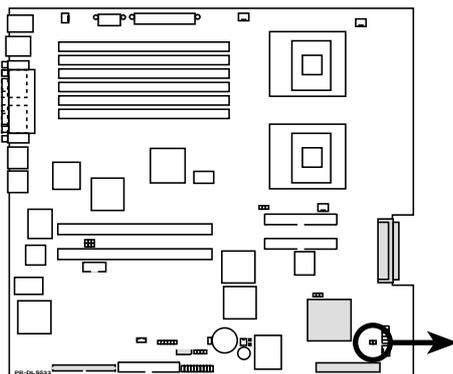
PR-DLS533 IDE Activity LED
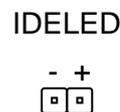
TIP: If the case-mounted LED does not light, try reversing the 2-pin plug.

ASUS AP2400R-E1 2U barebone server   **4-15**

14. System panel connector (20-1 pin PANEL1)

This connector accommodates several system front panel functions.

PR-DLS533 System Panel Connectors
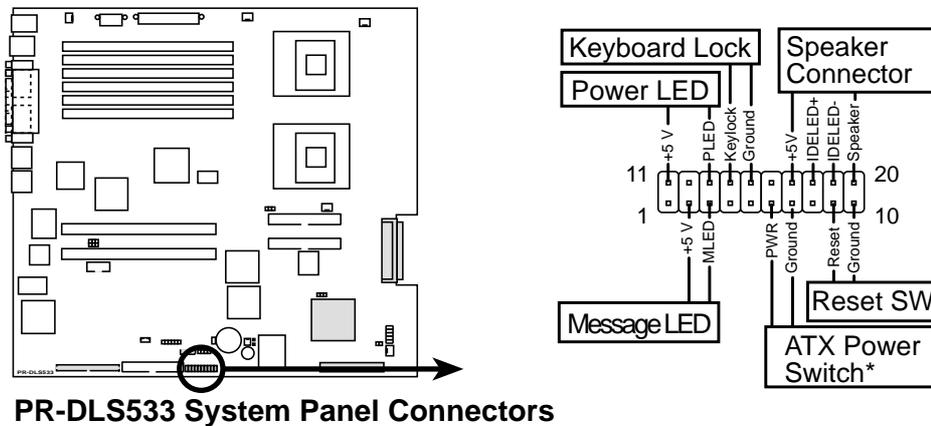
- **System power LED (2-pin PLED)**

  These leads connect to the system power LED on the front panel using a cable. The LED lights up when you turn on the system power.

- **Message LED (2-pin MLED)**

  These leads connect to the message LED on the front panel. The LED indicates receipt of messages from a fax/modem. The normal status of this LED is OFF when there is no incoming data signal. The LED blinks when data is received. The system message LED feature requires an ACPI operating system and driver.

- **System speaker LED (4-pin SPEAKER)**

  These leads connect to the chassis-mounted speaker.

- **ATX power button/ Soft-off switch (2-pin PWRBTN)**

  These leads connect a switch that controls the system power. Pressing the power switch turns the system between ON and SLEEP, or ON and SOFT OFF, depending on the BIOS or OS settings. Pressing the power switch while in the ON mode for more than 4 seconds turns the system OFF.

- **Reset switch (2-pin RESET)**

  These leads connect to the reset switch on the front panel using a cable for rebooting the system without turning off the system power.

- **Keyloack (2-pin KEYLOCK)**

  These leads connect to the chassis-mounted switch to allow use of the keyboard lock feature.

This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

BIOS setup

ASUS AP2400R-E1 2U barebone server

5.1 Managing and updating your BIOS

5.1.1 Creating a bootable disk

AFLASH.EXE is a Flash Memory Writer utility that updates the BIOS by uploading a new BIOS file to the programmable flash ROM on the motherboard. This file works only in DOS mode. To determine the BIOS version of your motherboard, check the last four numbers of the code displayed on the upper left-hand corner of your screen during bootup. Larger numbers represent a newer BIOS file.

1. Type FORMAT A:/S at the DOS prompt to create a bootable system disk. DO NOT copy AUTOEXEC.BAT and CONFIG.SYS to the disk.

2. Type COPY D:\AFLASH\AFLASH.EXE A:\ (assuming D is your CD-ROM drive) to copy AFLASH.EXE to the boot disk you created.

> AFLASH works only in DOS mode. It does not work in the DOS prompt within Windows, and does not work with certain memory drivers that may be loaded when you boot from the hard drive. It is recommended that you reboot using a floppy disk.

3. Reboot the computer from the floppy disk.

> BIOS setup must specify "Floppy" as the first item in the boot sequence.

4. In DOS mode, type A:\AFLASH <Enter> to run AFLASH.

> If the word "unknown" appears after Flash Memory:, the memory chip is either not programmable or is not supported by the ACPI BIOS and therefore, cannot be programmed by the Flash Memory Writer utility.

5. Select 1. Save Current BIOS to File from the Main menu and press <Enter>. The Save Current BIOS To File screen appears.
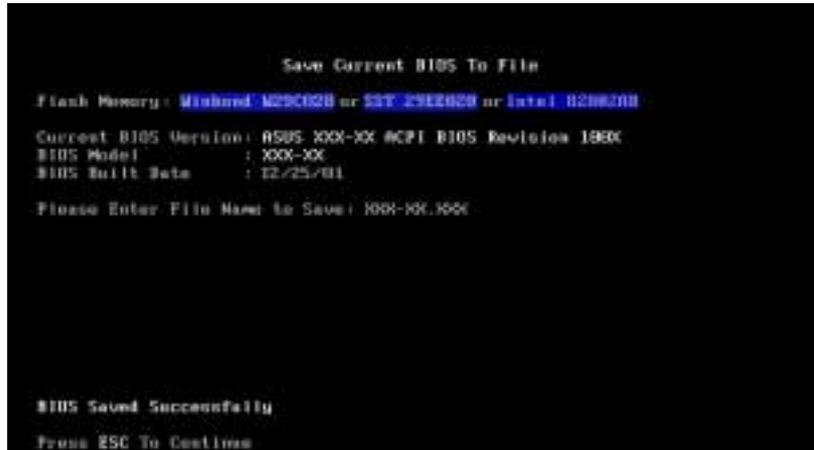
6. Type a filename and the path, for example, A:\XXX-XX.XXX, then press <Enter>.

5.1.2 Updating the BIOS

Update the BIOS only if you have problems with the motherboard and you are sure that the new BIOS revision will solve your problems. Careless updating may result to more problems with the motherboard!

1. Download the latest ASUS BIOS file from the ASUS website, and save to the boot floppy disk you created earlier.

2. Boot from the floppy disk.

3. At the "A:\" prompt, type AFLASH and then press <Enter>.

4. In the Main Menu, type 2 then press <Enter>. The Update BIOS Including Boot Block and ESCD screen appears.

5. Type the filename of your new BIOS and the path, for example, A:\XXX-XX.XXX, then press <Enter>.

To cancel this operation, press <Enter>.

6. When prompted to confirm the BIOS update, press **Y** to start the update.

7. The utility starts to program the new BIOS information into the Flash ROM. The boot block is updated automatically only when necessary. This minimizes the possibility of boot problems in case of update failures. When the programming is done, the message *"Flashed Successfully"* appears.

8. Follow the onscreen instructions to continue.

> If you encounter problems while updating the new BIOS, DO NOT turn off the system because this may cause boot problems. Just repeat the process, and if the problem persists, load the original BIOS file you saved to the boot disk. If the Flash Memory Writer utility is not able to successfully update a complete BIOS file, the system may not boot. If this happens, call the ASUS service center for support.

ASUS AP2400R-E1 2U barebone server 5-5

5.2 BIOS Setup program

This motherboard supports a programmable Flash ROM that you can update using the provided utility described in section "5.1 Managing and updating your BIOS."

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup". This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you may want to change the configuration of your computer in the future. For example, you may want to enable the security password feature or make changes to the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the Flash ROM.

The Flash ROM on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Delete> during the Power-On Self Test (POST) to enter the Setup utility, otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. It is a menu-driven program, which means you can scroll through the various sub-menus and make your selections among the predetermined choices.

> Because the BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purposes only, and may not exactly match what you see on your screen.

5.2.1   BIOS menu bar

The top of the screen has a menu bar with the following selections:

MAIN　　　　Use this menu to make changes to the basic system configuration.

ADVANCED　Use this menu to enable and make changes to the advanced features.

POWER　　　Use this menu to configure power management features.

BOOT　　　　Use this menu to configure the default system device used to locate and load the Operating System.

SERVER　　　Use this menu to set server-related items

EXIT　　　　　Use this menu to exit the current menu or to exit the Setup program.

To access the menu bar items, press the right or left arrow key on the keyboard until the desired item is highlighted.

5.2.2   Legend bar

At the bottom of the Setup screen is a legend bar. The keys in the legend bar allow you to navigate through the various setup menus. The following table lists the keys found in the legend bar with their corresponding functions.

Navigation Key(s)	Function Description
<F1> or <Alt + H>	Displays the General Help screen from any-where in the BIOS Setup
<Esc>	Jumps to the Exit menu or returns to the main menu from a sub-menu
Left or Right arrow	Selects the menu item to the left or right
Up or Down arrow	Moves the highlight up or down between fields
- (minus key)	Scrolls backward through the values for the highlighted field
+ (plus key) or spacebar	Scrolls forward through the values for the high-lighted field
<Enter>	Brings up a selection menu for the highlighted field
<Home> or <PgUp>	Moves the cursor to the first field
<End> or <PgDn>	Moves the cursor to the last field
<F5>	Resets the current screen to its Setup Defaults
<F10>	Saves changes and exits Setup

General help

In addition to the Item Specific Help window, the BIOS setup program also provides a General Help screen. You may launch this screen from any menu by simply pressing <F1> or the <Alt> + <H> combination. The General Help screen lists the legend keys and their corresponding functions.

Saving changes and exiting the Setup program

See "5.8 Exit Menu" for detailed information on saving changes and exiting the setup program.

Scroll bar

When a scroll bar appears to the right of a help window, it indicates that there is more information to be displayed that will not fit in the window. Use <PgUp> and <PgDn> or the up and down arrow keys to scroll through the entire help document. Press <Home> to display the first page, press <End> to go to the last page. To exit the help window, press <Enter> or <Esc>.

Sub-menu
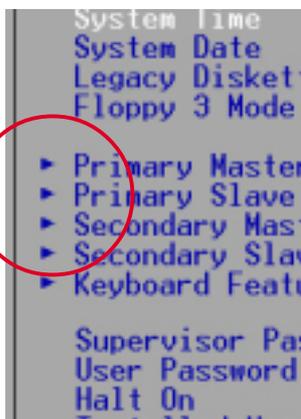
Note that a right pointer symbol (as shown on the left) appears to the left of certain fields. This pointer indicates that you can display a sub-menu from this field. A sub-menu contains additional options for a field parameter. To display a sub-menu, move the highlight to the field and press <Enter>. The sub-menu appears. Use the legend keys to enter values and move from field to field within a sub-menu as you would within a menu. Use the <Esc> key to return to the main menu.

Take some time to familiarize yourself with the legend keys and their corresponding functions. Practice navigating through the various menus and sub-menus. If you accidentally make unwanted changes to any of the fields, use the set default hot key <F5> to load the Setup default values. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right of each menu. This window displays the help text for the currently highlighted field.

5.3   Main Menu

When you enter the Setup program, the following screen appears.

```
                          AwardBIOS Setup Utility
   Main    Advanced    Power     Boot     Server     Exit
 ┌──────────────────────────────────────────┬────────────────────────┐
 │                                           │   Item Specific Help   │
 │  System Time            [18:16:29]        │                        │
 │  System Date            [12/26/2000]      │                        │
 │  Legacy Diskette A      [1.44M, 3.5 in.]  │  <Enter> to select field;│
 │  Floppy 3 Mode Support  [Disabled]        │  <+>,<-> to change value.│
 │                                           │                        │
 │ ► Primary Master        [Auto]            │                        │
 │ ► Primary Slave         [Auto]            │                        │
 │ ► Secondary Master      [Auto]            │                        │
 │ ► Secondary Slave       [Auto]            │                        │
 │ ► Keyboard Features                       │                        │
 │                                           │                        │
 │  Supervisor Password    [Disabled]        │                        │
 │  User Password          [Disabled]        │                        │
 │  Halt On                [No Error]        │                        │
 │  Installed Memory       256MB             │                        │
 │                                           │                        │
 └──────────────────────────────────────────┴────────────────────────┘
  F1   Help   ↑↓  Select Item   -/+  Change Values    F5  Setup Defaults
  ESC  Exit   ←→  Select Menu   Enter Select ► Sub-Menu  F10 Save and Exit
```

System Time [XX:XX:XX]

Sets the system to the time that you specify (usually the current time). The format is hour, minute, second. Valid values for hour, minute and second are Hour: (00 to 23), Minute: (00 to 59), Second: (00 to 59). Use the <Tab> or <Shift> + <Tab> keys to move between the hour, minute, and second fields.

System Date [XX/XX/XXXX]

Sets the system to the date that you specify (usually the current date). The format is month, day, year. Valid values for month, day, and year are Month: (1 to 12), Day: (1 to 31), Year: (up to 2099). Use the <Tab> or <Shift> + <Tab> keys to move between the month, day, and year fields.

Legacy Diskette A [1.44M, 3.5 in.]

Sets the type of floppy drive installed. Configuration options: [None] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

Floppy 3 Mode Support [Disabled]

This is required to support older Japanese floppy drives. The Floppy 3 Mode feature allows reading and writing of 1.2MB (as opposed to 1.44MB) on a 3.5-inch diskette. Configuration options: [Disabled] [Enabled]

ASUS AP2400R-E1 2U barebone server   **5-9**

Supervisor Password [Disabled] / User Password [Disabled]

These fields allow you to set passwords. To set a password, highlight the appropriate field and press <Enter>. Type in a password then press <Enter>. You can type up to eight alphanumeric characters. Symbols and other characters are ignored. To confirm the password, type the password again and press <Enter>. The password is now set to [Enabled]. This password allows full access to the BIOS Setup menus. To clear the password, highlight this field and press <Enter>. The same dialog box as above appears. Press <Enter>. The password is set to [Disabled].

A note about passwords

The BIOS Setup program allows you to specify passwords in the Main menu. The passwords control access to the BIOS during system startup. Passwords are not case sensitive, meaning, passwords typed in either uppercase or lowercase letters are accepted. The BIOS Setup program allows you to specify two different passwords: a Supervisor password and a User password. If you did not set a Supervisor password, anyone can access the BIOS Setup program. If you did, the Supervisor password is required to enter the BIOS Setup program and to gain full access to the configuration fields.

Forgot the password?

If you forget your password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. The RAM data containing the password information is powered by the onboard button cell battery. See section "2.7 Switches and jumpers" for information on how to erase the RTC RAM.

Halt On [All Errors]

This field specifies the types of errors that will cause the system to halt. Configuration options: [All Errors] [No Error] [All but Keyboard] [All but Disk] [All but Disk/Keyboard]

Installed Memory [XXX MB]

This field automatically displays the amount of conventional memory detected by the system during the boot process.

5.3.1 Primary and Secondary Master/Slave

```
                    AwardBIOS Setup Utility
 Main

         Primary Master   [Auto]              Item Specific Help

  Type                       [Auto]        <Enter> to select the
                                           type of the IDE drive.
  Cylinders                  [ 1024]       [User Type HDD] allows
  Head                       [255]         you to set each entry on
  Sector                     [63]          your own.
  CHS Capacity               8422MB
  Maximum LBA Capacity       25590MB       WARNING: Ultra DMA mode
                                           3/4/5 can be enabled
  Multi-Sector Transfers     [Maximum]     only when BIOS detects
  SMART Monitoring           [Disabled]    shielded 80-pin cable.
  PIO Mode                   [4]
  ULTRA DMA Mode             [Disabled]



 F1   Help    ↑↓  Select Item   -/+     Change Values    F5   Setup Defaults
 ESC  Exit    ↔   Select Menu   Enter   Select ► Sub-Menu F10  Save and Exit
```

Type [Auto]

Select [Auto] to automatically detect an IDE hard disk drive. If automatic detection is successful, Setup automatically fills in the correct values for the remaining fields on this sub-menu. If automatic detection fails, this may be because the hard disk drive is too old or too new. If the hard disk was already formatted on an older system, Setup may detect incorrect parameters. In these cases, select [User Type HDD] to manually enter the IDE hard disk drive parameters. Refer to the next section for details.

> ⚠ Before attempting to configure a hard disk drive, make sure you have the correct configuration information supplied by the drive manufacturer. Incorrect settings may cause the system to fail to recognize the installed hard disk.

ASUS AP2400R-E1 2U barebone server　　　　　　　　**5-11**

[User Type HDD]

```
                    AwardBIOS Setup Utility
  Main

  Primary Master  [User Type HDD]          Item Specific Help

 Type                  [User Type HDD]     <Enter> to select the
 Translation Method    [LBA]               type of the IDE drive.
                                           [User Type HDD] allows
 Cylinders             [ 1024]             you to set each entry on
 Head                  [255]               your own.
 Sector                [63]
 CHS Capacity          8422MB              WARNING: Ultra DMA mode
 Maximum LBA Capacity  25590MB             3/4/5 can be enabled
                                           only when BIOS detects
 Multi-Sector Transfers [Maximum]          shielded 80-pin cable.
 SMART Monitoring       [Disabled]
 PIO Mode               [4]
 ULTRA DMA Mode         [Disabled]



 F1   Help    ↑↓  Select Item   -/+    Change Values      F5   Setup Defaults
 ESC  Exit    ←→  Select Menu    Enter  Select ► Sub-Menu  F10  Save and Exit
```

Manually enter the number of cylinders, heads and sectors per track for the drive. Refer to the drive documentation or on the drive label for this information.

> After entering the IDE hard disk drive information into BIOS, use a disk utility, such as FDISK, to partition and format new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to active.

If no drive is installed or if you are removing a drive and not replacing it, select [None].

Other options for the Type field are:

[CD-ROM] - for IDE CD-ROM drives

[LS-120] - for LS-120 compatible floppy disk drives

[ZIP] - for ZIP-compatible disk drives

[MO] - for IDE magneto optical disk drives

[Other ATAPI Device] - for IDE devices not listed here

After making your selections on this sub-menu, press the <Esc> key to return to the Main menu. When the Main menu appears, the hard disk drive field displays the size for the hard disk drive that you configured.

Translation Method [LBA]

Select the hard disk drive type in this field. When Logical Block Addressing (LBA) is enabled, the 28-bit addressing of the hard drive is used without regard for cylinders, heads, or sectors. Note that LBA Mode is necessary for drives with more than 504MB storage capacity. Configuration options: [LBA] [LARGE] [Normal] [Match Partition Table] [Manual]

Cylinders

This field configures the number of cylinders. Refer to the drive documentation to determine the correct value. To make changes to this field, set the Type field to [User Type HDD] and the Translation Method field to [Manual].

Head

This field configures the number of read/write heads. Refer to the drive documentation to determine the correct value. To make changes to this field, set the Type field to [User Type HDD] and the Translation Method field to [Manual].

Sector

This field configures the number of sectors per track. Refer to the drive documentation to determine the correct value. To make changes to this field, set the Type field to [User Type HDD] and the Translation Method field to [Manual].

CHS Capacity

This field shows the drive's maximum CHS capacity as calculated by the BIOS based on the drive information you entered.

Maximum LBA Capacity

This field shows the drive's maximum LBA capacity as calculated by the BIOS based on the drive information you entered.

Multi-Sector Transfers [Maximum]

This option automatically sets the number of sectors per block to the highest number that the drive supports. Note that when this field is automatically configured, the set value may not always be the fastest value for the drive. You may also manually configure this field. Refer to the documentation that came with the hard drive to determine the optimum value and set it manually. To make changes to this field, set the Type field to [User Type HDD]. Configuration options: [Disabled] [2 Sectors] [4 Sectors] [8 Sectors] [16 Sectors] [32 Sectors] [Maximum]

SMART Monitoring [Disabled]

This field allows you to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) system that utilizes internal hard disk drive monitoring technology. This parameter is normally disabled because the resources used in the SMART monitoring feature may decrease system performance. Configuration options: [Disabled] [Enabled]

PIO Mode [4]

This option lets you set a PIO (Programmed Input/Output) mode for the IDE device. Modes 0 through 4 provide successive increase in performance. Configuration options: [0] [1] [2] [3] [4]

Ultra DMA Mode [Disabled]

Ultra DMA capability allows improved transfer speeds and data integrity for compatible IDE devices. Set to [Disabled] to suppress Ultra DMA capability. To make changes to this field, set the Type field to [User Type HDD]. Configuration options: [0] [1] [2] [3] [4] [5] [Disabled]

5.3.2 Keyboard Features

```
                    AwardBIOS Setup Utility
  Main

           Keyboard Features                │  Item Specific Help

 Boot Up NumLock Status      [On]           │  Select Power-on state
 Keyboard Auto-Repeat Rate   [12/Sec]       │  for Numlock
 Keyboard Auto-Repeat Delay  [1/4 Sec]      │
                                            │
 Hotkey to Lock Keyboard     [Disabled]     │
 Keyboard Idle Timer         [Disabled]     │
                                            │
                                            │
                                            │
                                            │
                                            │
                                            │
                                            │
                                            │

 F1  Help   ↑↓ Select Item  -/+   Change Values     F5  Setup Defaults
 ESC Exit   ←→ Select Menu   Enter Select ▶ Sub-Menu F10 Save and Exit
```
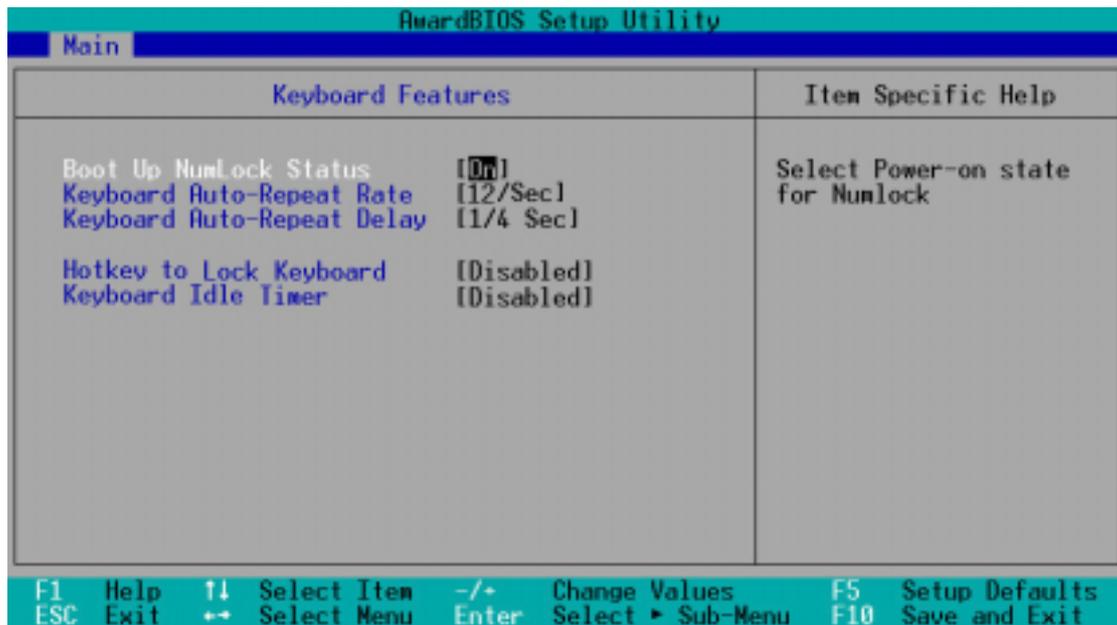
Boot Up NumLock Status [On]

This field enables users to activate the Number Lock function upon system boot. Configuration options: [Off] [On]

Keyboard Auto-Repeat Rate [6/Sec]

This controls the speed at which the system registers repeated keystrokes. Options range from 6 to 30 characters per second. Configuration options: [6/Sec] [8/Sec] [10/Sec] [12/Sec] [15/Sec] [20/Sec] [24/Sec] [30/Sec]

Keyboard Auto-Repeat Delay [1/4 Sec]

This field sets the time interval for displaying the first and second characters. Configuration options: [1/4 Sec] [1/2 Sec] [3/4 Sec] [1 Sec]

Hotkey to Lock Keyboard [Disabled]

This field allows you to activate the OS independent keyboard lock function using the selected hot keys. You must set a user password or a supervisor password before enabling the keyboard lock function. Configuration options: [Disabled] [Ctrl-Alt A] [Crtl-Alt Z] [Ctrl-Alt X] [Ctrl-Shift A] [Ctrl-Shift Z] [Ctrl- Shift X]

Keyboard Idle Timer [Disabled]

This field allows you to activate the OS independent keyboard lock function using the keyboard idle timer. You must set a user password or a supervisor password before enabling the keyboard lock function. Configuration options: [Disabled] [1 Min] [2 Mins] [5 Mins] [15 Mins] [30 Mins]

ASUS AP2400R-E1 2U barebone server 　　　　　　　　　　　**5-15**

5.4 Advanced Menu
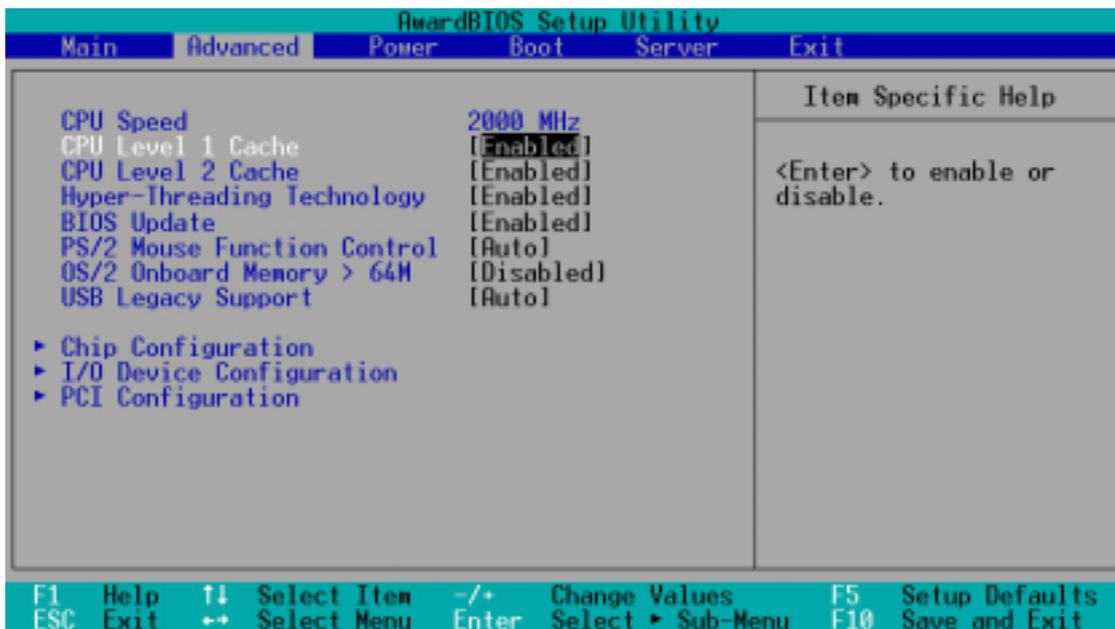
CPU Speed [Manual]

This field displays the auto-detected CPU speed.

CPU Level 1 Cache, CPU Level 2 Cache [Enabled]

These fields allow you to choose from the default [Enabled] or choose
[Disabled] to turn on or off the CPU Level 1 and Level 2 built-in cache.
Configuration options: [Disabled] [Enabled]

Hyper-Threading Technology [Enabled]

This item allows you to enable or disable support for Hyper-Threading
Technology enabled processors which contain multiple logical processors
per physical processor package. Configuration options: [Disabled]
[Enabled]

BIOS Update [Enabled]

This field functions as an update loader integrated into the BIOS to supply
the processor with the required data. When set to [Enabled], the BIOS
loads the update on all processors during system bootup. Configuration
options: [Disabled] [Enabled]

PS/2 Mouse Function Control [Auto]

The default setting [Auto] allows the system to detect a PS/2 mouse at
startup. If a mouse is detected, the BIOS assigns IRQ12 to the PS/2
mouse. Otherwise, IRQ12 can be used for expansion cards. When you set
this field to [Enabled], BIOS reserves IRQ12, whether or not a PS/2 mouse
is detected at startup. Configuration options: [Enabled] [Auto]

OS/2 Onboard Memory > 64M [Disabled]

When using OS/2 operating systems with installed DRAM of greater than 64MB, you need to set this option to [Enabled]. Otherwise, leave to the default setting [Disabled]. Configuration options: [Disabled] [Enabled]

USB Legacy Support [Auto]

This motherboard supports Universal Serial Bus (USB) devices. The default of [Auto] allows the system to detect a USB device at startup. If detected, the USB controller legacy mode is enabled. If not detected, the USB controller legacy mode is disabled.

When you set this field to [Disabled], the USB controller legacy mode is disabled whether or not you are using a USB device. Configuration options: [Disabled] [Enabled] [Auto]

5.4.1 Chip Configuration

```
                    AwardBIOS Setup Utility
        Advanced

              CHIP Configuration                      Item Specific Help

    Video Memory Cache Mode     [UC]              Select [USWC] only when
    Enhanced Memory Mapping     [Enabled]         your display card
    Unboard PCI IDE             [Both]            supports this feature.

    F1   Help     ↑↓  Select Item    -/+  Change Values        F5   Setup Defaults
    ESC  Exit     ←→  Select Menu    Enter  Select ► Sub-Menu   F10  Save and Exit
```
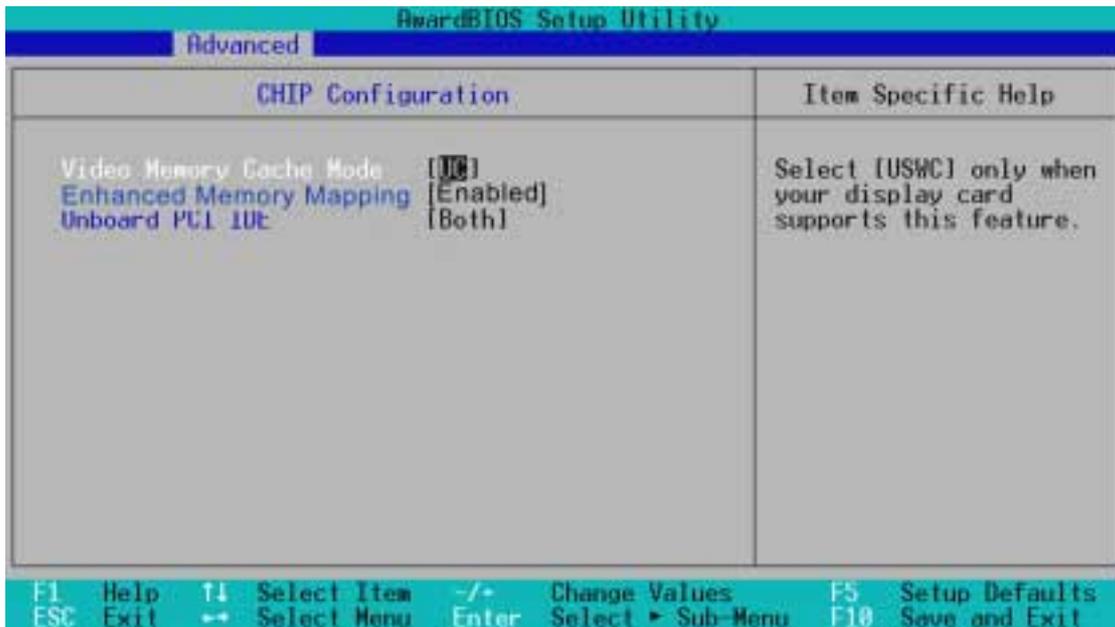
Video Memory Cache Mode [UC]

USWC (uncacheable, speculative write combining) is a new cache technology for the video memory of the processor. It can greatly improve the display speed by caching the display data. You must set this to UC (uncacheable) if your display card cannot support this feature; otherwise your system may not boot. Configuration options: [UC] [USWC]

Enhanced Memory Mapping [Enabled]

This item allows you to enable or disable the enhanced memory mapping feature. When enabled, this feature permits better memory bus utilization to increase the memory bus bandwidth and decrease the latencies. Configuration options: [Disabled] [Enabled]

The enhanced memory mapping feature can only be used under these conditions:

• DIMM rows 2 and 4 are populated

• All the DIMMs installed are identical (the same type and size)

• DIMM sockets DDRA1 and DDRA2 are populated

Onboard PCI IDE [Both]

You can select to enable the primary IDE channel, both the primary and secondary channels, or disable both channels. Configuration options: [Both] [Primary] [Disabled]

5.4.2 I/O Device Configuration

```
                      AwardBIOS Setup Utility
         Advanced

              I/O Device Configuration             │  Item Specific Help

    Floppy Disk Access Control     [R/W]            │  <Enter> to select.

    Onboard Serial Port 1          [3F8H/IRQ4]
    Onboard Serial Port 2          [2F8H/IRQ3]
    Onboard Parallel Port          [378H/IRQ7]
    Parallel Port Mode             [ECP+EPP]
    ECP DMA Select                 [3]

    F1    Help    ↑↓  Select Item   -/+   Change Values      F5   Setup Defaults
    ESC   Exit    ←→  Select Menu   Enter Select ► Sub-Menu  F10  Save and Exit
```
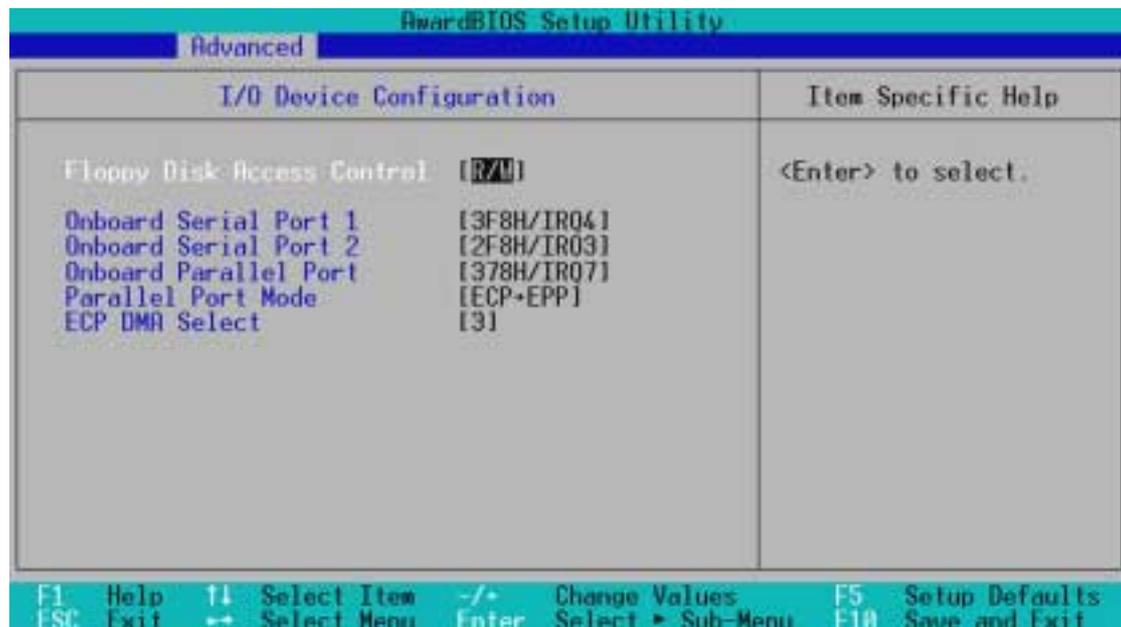
Floppy Disk Access Control [R/W]

When set to [Read Only], this parameter protects files from being copied to floppy disks by allowing reads from, but not writes to, the floppy disk drive. The default setting [R/W] allows both reads and writes. Configuration options: [R/W] [Read Only]

Onboard Serial Port 1 [3F8H/IRQ4]
Onboard Serial Port 2 [2F8H/IRQ3]

These fields allow you to set the addresses for the onboard serial connectors. Serial Port 1 and Serial Port 2 must have different addresses. Configuration options: [3F8H/IRQ4] [2F8H/IRQ3] [3E8H/IRQ4] [2E8H/IRQ10] [Disabled]

Onboard Parallel Port [378H/IRQ7]

This field allows you to set the address of the onboard parallel port connector. If you disable this field, the Parallel Port Mode and ECP DMA Select configurations are not available. Configuration options: [Disabled] [378H/IRQ7] [278H/IRQ5]

ASUS AP2400R-E1 2U barebone server   **5-19**

Parallel Port Mode [ECP+EPP]

This field allows you to set the operation mode of the parallel port. [Normal] allows normal-speed operation but in one direction only; [EPP] allows bidirectional parallel port operation; [ECP] allows the parallel port to operate in bidirectional DMA mode; [ECP+EPP] allows normal speed operation in a two-way mode. Configuration options: [Normal] [EPP] [ECP] [ECP+EPP]

ECP DMA Select [3]

This field allows you to configure the parallel port DMA channel for the selected ECP mode. This selection is available only if you select [ECP] or [ECP+EPP] in Parallel Port Mode above. Configuration options: [1] [3]

5.4.3 PCI Configuration

```
                    AwardBIOS Setup Utility
        Advanced

              PCI Configuration                    Item Specific Help

   Slot 6 IRQ                      [Auto]
   Slot 5 IRQ                      [Auto]          <Enter> to select an
   Slot 4 IRQ                      [Auto]          IRQ.
   Slot 3 IRQ                      [Auto]
   Slot 2 IRQ                      [Auto]
   Slot 1 IRQ                      [Auto]

   PCI/VGA Palette Snoop           [Disabled]
   PCI Latency Timer               [ 32]
   Sparse PCI Host Bus             [Disabled]
   Onboard SCSI BIOS               [Auto]
   ONB SCSI BIOS First             [No]
   ONB Primary SCSI Term           [Enabled]
   ONB Secondary SCSI Term         [Enabled]
   Primary VGA BIOS                [PCI VGA Card]
   USB Function                    [Enabled]
   Onboard LAN Boot ROM            [Disabled]
   Onboard 2nd LAN Boot ROM        [Disabled]

   F1   Help    ↑↓  Select Item   -/+   Change Values    F5   Setup Defaults
   ESC  Exit    ←→  Select Menu   Enter Select ▶ Sub-Menu F10  Save and Exit
```

Slot 1, Slot 2, Slot 3, Slot 4, Slot 5, Slot 6 IRQ [Auto]
These fields set how IRQ use is determined for each PCI slot. The default setting for each field is [Auto], which utilizes auto-routing to determine IRQ use. Configuration options: [Auto] [NA] [3] [4] [5] [7] [9] [10] [11] [12] [14] [15]

PCI/VGA Palette Snoop [Disabled]
Some non-standard VGA cards, like graphics accelerators or MPEG video cards, may not show colors properly. Setting this field to [Enabled] corrects this problem. If you are using standard VGA cards, leave this field to the default setting [Disabled]. Configuration options: [Disabled] [Enabled]

PCI Latency Timer [32]
Leave on default setting for best performance vs. stability.

Sparse PCI Host Bus [Disabled]

This field allows you to reserve the bus number for the PCI slots. Configuration options: [Disabled] [2 BUS] [3 BUS] [4 BUS]

ASUS AP2400R-E1 2U barebone server   **5-21**

Onboard SCSI BIOS [Auto]

[Auto] allows the motherboard BIOS to detect whether you have a Adaptec SCSI controller. If the SCSI controller is detected, the SCSI BIOS will be enabled. If no SCSI controller is detected, the onboard SCSI BIOS will be disabled.

Setting to [Disabled] deactivates the onboard SCSI BIOS so that the BIOS on an add-on SCSI card can be used. If your SCSI card does not have a BIOS, the SCSI card will not function. Configuration options: [Auto] [Disabled]

ONB SCSI BIOS First [No]

This field allows giving priority to the onboard SCSI BIOS for SCSI functions over other SCSI controllers. Configuration options: [No] [Yes]

ONB Primary SCSI Term [Enabled]
ONB Secondary SCSI Term [Enabled]

This field allows you to enable or disable the onboard termination for the primary and secondary SCSI channels. Configuration options: [Enabled] [Disabled]

Primary VGA BIOS First [PCI VGA Card]

This field allows you to select the primary graphics card. Configuration options: [PCI VGA Card] [Onboard VGA]

USB Function [Enabled]

Set this field to [Enabled] if you want to use Universal Serial Bus devices. Configuration options: [Disabled] [Enabled]

Onboard LAN Boot ROM [Disabled]
Onboard 2nd LAN Boot ROM [Disabled]

When set to [Enabled], these fields allow the system to boot from the network using the onboard LAN controller boot ROM. Configuration options: [Disabled] [Enabled]

5.5   Power Menu

The Power menu allows you to reduce power consumption. This feature turns off the video display and shuts down the hard disk after a period of inactivity.

```
                    AwardBIOS Setup Utility
  Main    Advanced    Power    Boot    Server    Exit

                                            Item Specific Help
  Power Management       [User Defined]
  Video Off Option       [Suspend -> Off]
  Video Off Method       [DPMS OFF]         <Enter> to select the
  HDD Power Down         [Disabled]         power saving mode. You
                                            can select [User
  Suspend Mode           [Disabled]         Defined] to go to the
  PWR Button < 4 Secs    [Soft Off]         suspend mode entry
                                            below.
  ▶ Power Up Control
  ▶ Hardware Monitor

  F1   Help    ↑↓  Select Item   -/+    Change Values      F5   Setup Defaults
  ESC  Exit    ←→  Select Menu   Enter  Select ▶ Sub-Menu  F10  Save and Exit
```

Power Management [User Defined]

This field allows you to activate or deactivate the automatic power saving features. When set to [Disabled], the power management features do not function regardless of the other settings on this menu. The [User Defined] option allows you to set the period of inactivity before the system enters suspend mode. Refer to "Suspend Mode" item.

When set to [Max Saving], system power is conserved to its greatest amount. This setting automatically puts the system into suspend mode after a brief period of system inactivity. [Min Saving] allows the least power saving as the system enters suspend mode only after a long period of inactivity. Configuration options: [User Defined] [Disabled] [Min Saving] [Max Saving]

> You should install the Advanced Power Management (APM) utility to keep the system time updated even when the computer enters suspend mode. In Windows 3.x and Windows 95, you need to install Windows with the APM feature. In Windows 98 or later, APM is automatically installed as indicated by a battery and power cord icon labeled "Power Management" in the Control Panel. Select the item "Advanced" in the Power Management Properties dialog box.

ASUS AP2400R-E1 2U barebone server   **5-23**

Video Off Option [Suspend -> Off]

This field determines when to activate the video off feature for monitor power management. Configuration options: [Always On] [Suspend -> Off]

Video Off Method [DPMS OFF]

This field defines the video off features. The Display Power Management System (DPMS) feature allows the BIOS to control the video display card if it supports the DPMS feature. [Blank Screen] only blanks the screen. Use this for monitors without power management or "green" features.

> Even if installed, your screen saver does not display when you select [Blank Screen] for the above field.

[V/H SYNC+Blank] blanks the screen and turns off vertical and horizontal scanning. Configuration options: [Blank Screen] [V/H SYNC+Blank] [DPMS Standby] [DPMS Suspend] [DPMS OFF] [DPMS Reduce ON]

HDD Power Down [Disabled]

Shuts down any IDE hard disk drives in the system after a period of inactivity as set in this user-configurable field. This feature does not affect SCSI hard drives. Configuration options: [Disabled] [1 Min] [2 Min] [3 Min]...[15 Min]

Suspend Mode [Disabled]

Sets the time period before the system goes into suspend mode. Configuration options: [Disabled] [1~2 Min] [2~3 Min] [4~5 min] [8~9 Min] [20 Min] [30 Min] [40 Min] [1 Hour]

PWR Button < 4 Secs [Soft Off]

When set to [Soft off], the ATX switch can be used as a normal system power-off button when pressed for less than 4 seconds. [Suspend] allows the button to have a dual function where pressing less than 4 seconds puts the system in sleep mode. Regardless of the setting, holding the ATX switch for more than 4 seconds powers off the system. Configuration options: [Soft off] [Suspend]

5.5.1 Power Up Control


```
                    AwardBIOS Setup Utility
                          Power

        Power Up Control                        Item Specific Help

  AC Power Loss Restart        [Disabled]        <Enter> to select
  Wake/Power Up On Ext. Modem  [Disabled]        whether or not to
  Onboard LAN Power Up         [Disabled]        restart the system after
  Power Up On PCI Card         [Disabled]        AC power loss.
  Power On By PS/2 Keyboard    [Disabled]
  Automatic Power Up           [Disabled]




  F1   Help    ↑↓  Select Item   -/+    Change Values    F5   Setup Defaults
  ESC  Exit    ←→  Select Menu    Enter  Select ► Sub-Menu  F10  Save and Exit
```

AC PWR Loss Restart [Disabled]

This allows you to set whether or not to reboot the system after power interruptions. [Disabled] leaves your system off while [Enabled] reboots the system. [Previous State] sets the system back to the state it was before the power interruption. Configuration options: [Disabled] [Enabled] [Previous State]

Wake/Power Up On Ext. Modem [Disabled]

This allows either settings of [Enabled] or [Disabled] for powering up the computer when the external modem receives a call while the computer is in Soft-off mode. Configuration options: [Disabled] [Enabled]

> The computer cannot receive or transmit data until the computer and applications are fully running. Thus, connection cannot be made on the first try. Turning an external modem off and then back on while the computer is off causes an initialization string that turns the system power on.

Onboard LAN Power Up [Disabled]
Power Up on PCI Card [Disabled]

These fields allow you to boot your computer from another computer by sending a wake-up frame or signal to the LAN device, or the PCI modem card if present. Configuration options: [Disabled] [Enabled]

ASUS AP2400R-E1 2U barebone server   **5-25**

Power On By PS/2 Keyboard [Disabled]

This parameter allows you to use specific keys on the keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Space Bar] [Ctrl-Esc] [Power Key]

Automatic Power Up [Disabled]

This allows an unattended or automatic system power up. You may configure your system to power up at a certain time of the day by selecting [Everyday] or at a certain time and day by selecting [By Date]. Configuration options: [Disabled] [Everyday] [By Date]

5.5.2 Hardware Monitor

```
                      AwardBIOS Setup Utility
                          Power
┌───────────────────────────────────────────┬──────────────────────┐
│          Hardware Monitor                  │  Item Specific Help  │
├───────────────────────────────────────────┼──────────────────────┤
│                                            │                      │
│  MB Temperature      30°C/86°F             │  <Enter> to switch   │
│  CPU1 Temperature    41°C/105.5°F          │  between monitoring or│
│  CPU2 Temperature    50°C/122.0°F          │  ignoring.           │
│                                            │                      │
│  CPU1  Fan Speed    7500RPM                │                      │
│  CPU2  Fan Speed    5273RPM                │                      │
│                                            │                      │
│  VCORE   Voltage     1.50V                 │                      │
│  3.3V    Voltage     3.45V                 │                      │
│  5V      Voltage     4.91V                 │                      │
│  12V     Voltage    12.09V                 │                      │
│  3VSB    Voltage     3.45V                 │                      │
│                                            │                      │
│                                            │                      │
│                                            │                      │
├───────────────────────────────────────────┴──────────────────────┤
│ F1  Help   ↑↓  Select Item   -/+   Change Values   F5  Setup Defaults│
│ ESC Exit   ←→  Select Menu   Enter Select ▶ Sub-Menu  F10 Save and Exit│
└───────────────────────────────────────────────────────────────────┘
```

MB Temperature [xxxC/xxxF]
CPU1 Temperature [xxxC/xxxF]
CPU2 Temperature [xxxC/xxxF]
The onboard hardware monitor is able to detect the MB (motherboard) and CPU temperatures. Set to [Ignore] only if necessary.

CPU1 Fan Speed [xxxxRPM]
CPU2 Fan Speed [xxxxRPM]
The onboard hardware monitor is able to detect the CPU fan speeds in rotations per minute (RPM). The presence of the fans is automatically detected.

> Make sure to connect the CPU fan cables to the appropriate connectors (CPU1 cable to CPUFAN1 connector, CPU2 cable to CPUFAN2 connector). Otherwise, the system may not boot.

VCORE Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage, 3VSB Voltage
The onboard hardware monitor is able to detect the voltage output by the onboard voltage regulators.

> If any of the monitored items is out of range, the following error message appears: "Hardware Monitor found an error. Enter Power setup menu for details". You will then be prompted to "Press F1 to continue or DEL to enter SETUP".

5.6 Boot Menu

```
                        AwardBIOS Setup Utility
    Main    Advanced    Power    Boot    Server    Exit

                                                ┌─────────────────────────┐
                                                │   Item Specific Help    │
  1. 1st Boot: (BAID)      [<0> Floppy]         ├─────────────────────────┤
  2. 2nd Boot: (BCV)       [None]               │ <Enter> to select the   │
  3. 3rd Boot: (BEV)       [<0> Intel Corporation]│ device.                │
  4. 4th Boot: (Legacy)    [Disabled]           │                         │
                                                │ To select the boot      │
  Plug & Play O/S           [No]                │ sequence, use the up or │
  Reset Configuration Data  [No]                │ down arrow. Press <+> to│
  MPS 1.4 Support           [Enabled]           │ move the device up the  │
  Quick Power On Self Test  [Enabled]           │ list, or <-> to move it │
  Boot Up Floppy Seek       [Enabled]           │ down the list.          │
                                                │                         │
  ▶ Boot Configuration                          │                         │
                                                └─────────────────────────┘

  F1   Help   ↑↓  Select Item   -/+    Change Values      F5   Setup Defaults
  ESC  Exit   ←→  Select Menu    Enter  Select ▶ Sub-Menu  F10  Save and Exit
```

The motherboard BIOS supports the BIOS Boot Specification (BBS) version 1.01. BBS is an intelligent mechanism that provides flexible ways to set boot sequence for Initial Program Load (IPL) devices such as CD-ROMs, network remote boot ROM, and SCSI or RAID controllers on PnP cards.

The IPL devices are classified into three categories:

1. BIOS Aware IPL Devices (BAID)
2. PnP devices, includes Boot Connection Vector (BCV) and Bootstrap Entry Vector (BEV) devices
3. Legacy devices

1st Boot : (BAID) [<0> Floppy]

This field allows you to select a BIOS Aware IPL Devices (BAID) to boot from. A BAID is any device that can boot on an operating system but requires a specific BIOS code for support. Bootable FDDs, ATA HDD, ATAPI CD-ROM, ATA ZIP, and ATA MO drives are classified as BAID. The drives present in the system will appear as options for this field.

2nd Boot : (BCV) [None]

This field allows you to select a Boot Connection Vector (BCV) device to boot from. BCV devices include SCSI controllers or SCSI cards, RAID cards, and other devices on add-on cards with option ROM that hooks INT 13 to BIOS.

> Some SCSI RAID cards hook INT19 to BIOS. If you use these cards, you should enable INT 19 after installing the card. Otherwise, you cannot enter the RAID card BIOS.

The BCV devices present in the system will appear as options for this field. The field shows [None] if no BCV device is installed.

3rd Boot : (BEV) [<0> Intel Corporation]

This field allows you to select a Bootstrap Entry Vector (BCV) device to boot from. BEV devices include network controllers or cards. The BEV devices present in the system will appear as options for this field. For this motherboard, the following options are present onboard:

    [<0> Intel Corporation IBA 4.0.22 Slo (LAN A)]
    [<1> Intel Corporation IBA 4.0.22 Slo (LAN B)]

4th Boot : (Legacy) [Disabled]

This field reserves the boot sequence selection only to legacy devices including FDD, HDD, CD-ROM, SCSI, and LAN. This mode does not allow booting from a boot device on an add-on card or controller. If you wish to assign a device as a 1st Boot device for a specific application, you must set that legacy device at the 1st Boot sequence.

For this motherboard, the following options are present onboard: [Disabled] [Floppy] [HDD] [CD-ROM] [LAN Option ROM] [SCSI]

Plug & Play O/S [No]

This field allows you to use a Plug-and-Play (PnP) operating system to configure the PCI bus slots instead of using the BIOS. When [Yes] is selected, interrupts may be reassigned by the OS. If you installed a non-PnP OS or if you want to prevent reassigning of interrupt settings, keep the default setting [No]. Configuration options: [No] [Yes]

Reset Configuration Data [No]
The Extended System Configuration Data (ESCD) contain information about non-PnP devices. It also holds the complete record of how the system was configured the last time it was booted. Select [Yes] if you want to clear these data during the Power-On-Self-Test (POST). Configuration options: [No] [Yes]

MPS 1.4 Support [Enabled]

This field allows you to enable or disable the MultiProcessor Specification 1.4 support. Configuration options: [Disabled] [Enabled]

Quick Power On Self Test [Enabled]

This field speeds up the Power-On-Self Test (POST) routine by skipping retesting a second, third, and fourth time. Configuration options: [Disabled] [Enabled]

Boot Up Floppy Seek [Enabled]

When enabled, the BIOS will seek the floppy disk drive to determine whether the drive has 40 or 80 tracks. Configuration options: [Disabled] [Enabled]

5.6.1 Boot Configuration
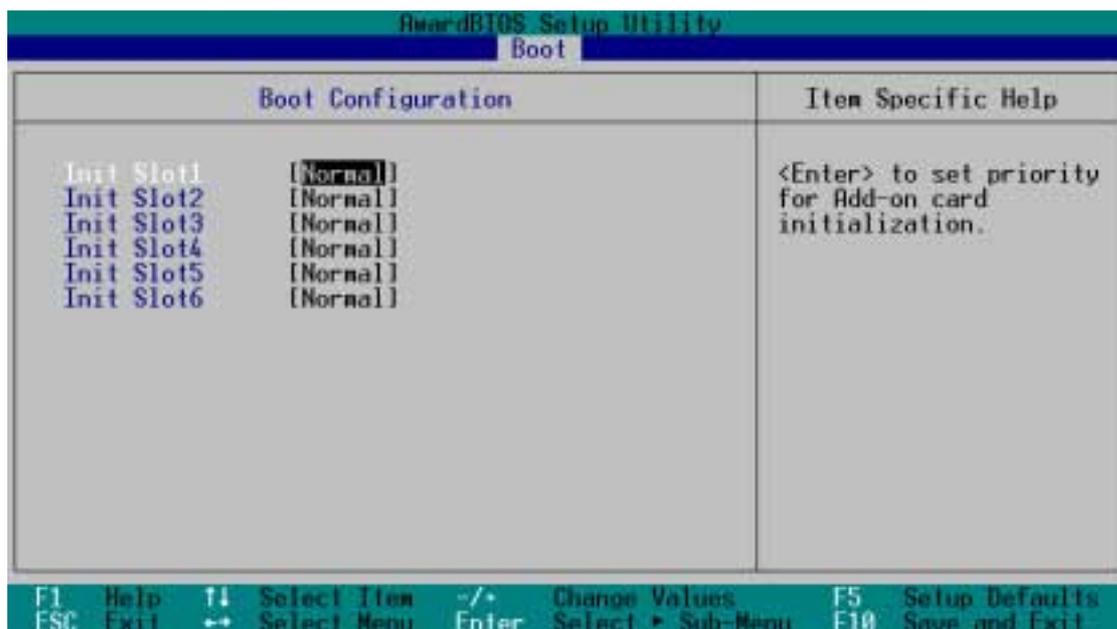
Init Slot 1, 2, 3, 4, 5, 6 IRQ [Normal]

This field allows you to set the priority level for each expansion slot in order to determine expansion card initialization order. Configuration options: [High] [Normal] [Low] [Skip]

5.7 Server Menu

```
                    AwardBIOS Setup Utility
   Main    Advanced    Power    Boot   Server    Exit

                                           Item Specific Help
   DRAM Hot Spare Memory   [Disabled]
   Remote Console          [Disabled]

  ► Event Log Viewer
   Clear Event Log         [Disabled]
   Log Memory ECC Error    [Enabled]




  F1   Help    ↑↓  Select Item   -/+     Change Values    F5   Setup Defaults
  ESC  Exit    ←→  Select Menu    Enter   Select ► Sub-Menu  F10  Save and Exit
```
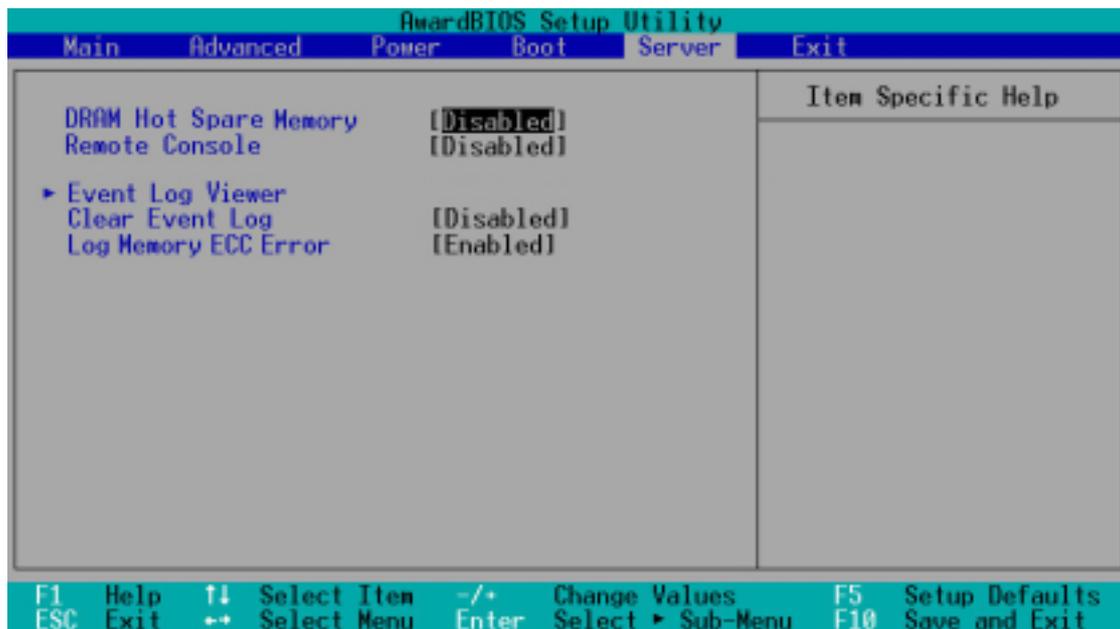
DRAM Hot Spare Memory [Disabled]
This field allows you to allocate rows of SDRAM for hot spare.
Configuration options: [Disabled] [1 row] [2 rows] [3 rows]

Remote Console [Disabled]
This field allows the text mode VGA display to be sent out to VT100
terminal through COM1. This function is effective at BIOS POST and DOS
environment. Configuration options: [Disabled] [Enabled] [POST Only]

Event Log Viewer
Pressing <Enter> on this item gives you a sub-menu. You will be shown all
events such as "no bootable media" or "fan speed out of range".

Clear Event Log [Disabled]
This field clears the event log recorded on the sub-menu. Select [Enabled]
to automatically clear the event log. Reset to [Disabled] to store up event
log data. An IPMI device must be connected to the server for this field to
function. Configuration options: [Disabled] [Enabled]

Log Memory ECC Error [Enabled]
This field allows you to set whether "Error Checking and Correcting"
memory errors are logged. Configuration options: [Disabled] [Enabled]

ASUS AP2400R-E1 2U barebone server   **5-31**

5.8   Exit Menu

When you have made all of your selections from the various menus in the
Setup program, save your changes and exit Setup. Select Exit from the
menu bar to display the following menu.

```
                    AwardBIOS Setup Utility
  Main     Advanced    Power     Boot     Server    Exit

 ┌──────────────────────────────────────┬─────────────────────────────┐
 │                                       │    Item Specific Help       │
 │ Exit Saving Changes                   │                             │
 │ Exit Discarding Changes               │  Exit setup utility and     │
 │ Load Setup Defaults                   │  save your changes to       │
 │ Discard Changes                       │  CMOS.                       │
 │ Save Changes                          │                             │
 │                                       │                             │
 │                                       │                             │
 │                                       │                             │
 │                                       │                             │
 │                                       │                             │
 │                                       │                             │
 └───────────────────────────────────────────────────────────────────┘
  F1    Help     ↑↓  Select Item    -/+     Change Values    F5   Setup Defaults
  ESC   Exit     ←→  Select Menu    Enter   Select ► Sub-Menu  F10  Save and Exit
```
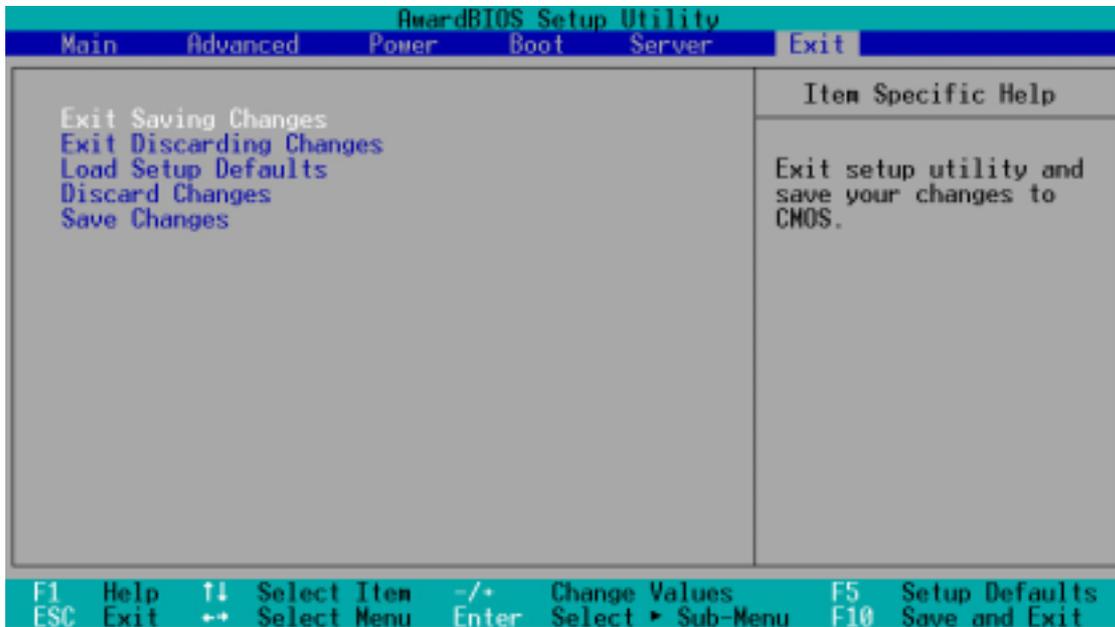
✎ Pressing <Esc> does not immediately exit this menu. Select one of the
   options from this menu or <F10> from the legend bar to exit.

Exit Saving Changes

Once you are finished making your selections, choose this option from the
Exit menu to ensure the values you selected are saved to the CMOS RAM.
The CMOS RAM is sustained by an onboard backup battery and stays on
even when the PC is turned off. When you select this option, a
confirmation window appears. Select [Yes] to save changes and exit.

✎   If you attempt to exit the Setup program without saving your changes,
    the program prompts you with a message asking if you want to save
    your changes before exiting. Pressing <Enter> saves the changes
    while exiting.

Exit Discarding Changes

Select this option only if you do not want to save the changes that you
made to the Setup program. If you made changes to fields other than
system date, system time, and password, the BIOS asks for a confirmation
before exiting.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select [Yes] to load default values. Select Exit Saving Changes or make other changes before saving the values to the non-volatile RAM.

Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.

Save Changes

This option saves your selections without exiting the Setup program. You can then return to other menus and make further changes. After you select this option, a confirmation window appears. Select [Yes] to save any changes to the non-volatile RAM.

Appendix

This appendix includes additional information that you may refer to when configuring your barebone server.

ASUS AP2400R-E1 2U barebone server

A.1 Power supply

A.1.1 General description

The barebone server comes with one SSI-type 500W redundant power supply with 115V/230V AC voltage, 50Hz/60Hz frequency.

> You may purchase and install a second power supply with the same specifications.

There are nine (9) power plugs from the power supply unit. Take note of the devices to which you should connect the plugs.

| P1 | P9 | P3 | P5 | P4 | P7 | P8 | P6 | P2 |
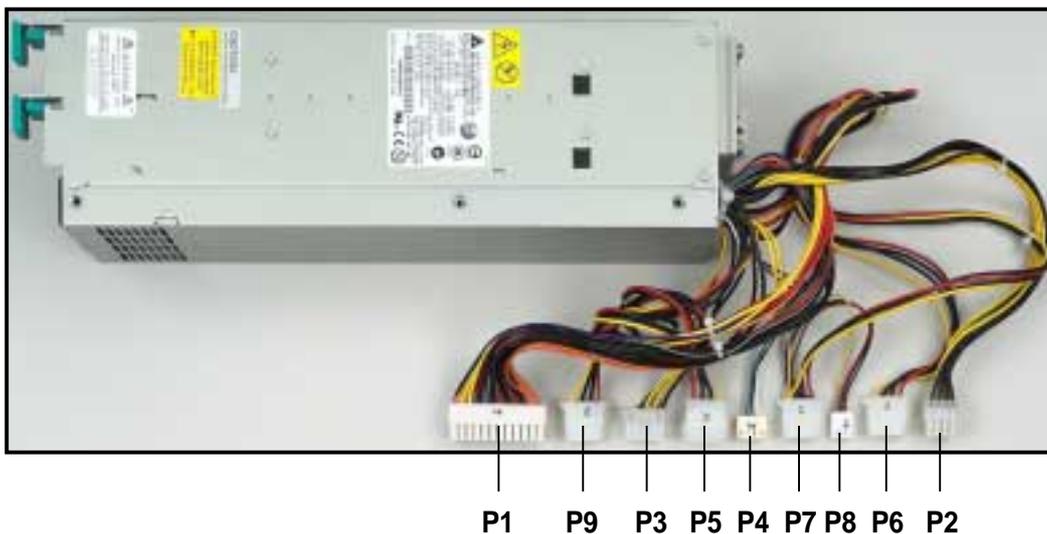
P1   Motherboard 24-pin ATX power connector
P2   Motherboard 8-pin +12V AUX power connector
P3   Mid-fan board
P4   Reserved
P5   PCI cage riser board
P6   SCSI 1 backplane board
P7   SCSI 2 backplane board
P8   Optical drive/floppy drive board
P9   SCSI 3 backplane board

A.1.2 Specifications

Output voltage regulation

Output Voltage	Min (V)	Nom (V)	Max (V)	Ripple/Noise
+3.3V	3.25	3.30	3.35	50mV$_{p-p}$
+5V	4.90	5.00	5.10	50mV$_{p-p}$
+12V	11.40	12.00	12.60	120mV$_{p-p}$
-12V	-11.40	-12.00	-13.80	120mV$_{p-p}$
+5VSB	4.85	5.00	5.20	50mV$_{p-p}$

Output current capacity

Output Voltage	Min (A)	Max (A)	Max. Output(A)
+3.3V	0.5	20.0	66.0
+5V	0.5	20.0	100.0
+12V1	1.5	18.0	216.0
+12V2	1.5	18.0	216.0
+12V3	0.0	18.0	300.0
-12V	0.0	0.5	6.0
+5VSB	0.0	2.0	10.0

Over-voltage protection

Voltage	Min (V)	Max (V)
+3.3V	3.8	4.3
+5V	5.7	6.5
+12V	13.5	15.0

Redundant power LED

LED	Display status	Description
Green	Blinking ON	Power OFF Normal operation
Orange	ON	One of two power modules is either disconnected or defective
OFF	None	The power modules are not connected to a power source

A.2   Qualified Vendors List (QVL)

CPU					
Vendor	**Model**	**L2 cache**	**L3 cache**	**Clock**	**Bus speed**
Intel	Xeon 2.8GHz	512KB	–	–	400
Intel	Xeon 2.4GHz	512KB	–	–	533
Intel	Xeon 2.66GHz	512KB	–	–	533
Intel	Xeon 2.8GHZ	512KB	–	–	533
Intel	Xeon 3.06GHz	512KB	–	–	533
Intel	Xeon 3.06GHz	512KB	1MB	–	533

Memory			
Vendor	**Type**	**Size**	**Module**
Apacer	DDR266	256MB	77.10609.112
Apacer	DDR266	512MB	77.10709.112
Apacer	DDR266	1GB	77.11243.472
ATP	DDR266	256MB	AB32L72A8S4B0S
ATP	DDR266	512MB	AB64L72R4S8B0S
ATP	DDR266	1GB	AB28L72N4SMB0S
Transcend	DDR266	256MB	TS256MAU1590VA
Transcend	DDR266	512MB	TS512MAU1395MA
Transcend	DDR266	1GB	TS128MDR72V6L5
Kingston	DR266	256MB	KVR266X72RC25/256
Kingston	DR266	512MB	KVR266X72RC25/512
Kingston	DR266	1GB	KVR266X72RC25/1G
Kingston	DDR266	2GB	KVR266X72RC25/2G

Qualified Vendors List (QVL) *continued*

SCSI HDD (10K)			
Vendor	**Type**	**Size**	**Product No.**
Seagate/8M/10K	U320/80-pin	36GB	ST336607LC
IBM/4M/10K	U320/80-pin	36GB	IC35L036UCDY10-0
FSC/8M/10K	U320/80-pin	36GB	MAP3367NC
Seagate/8M/10K	U320/80-pin	73GB	ST373307LC
IBM/4M/10K	U320/80-pin	73GB	IC35L073UCDY10-0
FSC/8M/10K	U320/80-pin	73GB	MAP3735NC
Seagate/8M/10K	U320/80-pin	146GB	ST3146807LC
FSC/8M/10K	U320/80-pin	147GB	MAP3147NC

SCSI HDD (15K)			
Vendor	**Type**	**Size**	**Product No.**
Seagate/8M/15K	U320/80-pin	36GB	ST336753LC
FSC/8M/15K	U320/80-pin	36GB	MAS3367NC
Seagate/8M/15K	U320/80-pin	73GB	ST37453LC
FSC/8M/15K	U320/80-pin	73GB	MAS3735NC

SCSI card		
Vendor	**Description**	**Product No.**
ASUS	PXL-S30 64-bit U320	
Adaptec	SCSI 39320-R 2-channel PCI-X U320	1978300;ASC-39320-PK
Adaptec	SCSI 29320-R 1-channel PCI-X U320	1978100;ASC-29320-PK
Adaptec	SCSI 39160 2-channel 64-bit PCI U160	1822300;ASC-39160-PK

SCSI RAID card		
Vendor	**Description**	**Product No.**
LSI	MegaRAID 320-1 1-channel 64-bit PCI U320	
Adaptec	ASR2120S 1-channel 64-bit PCI U320	1961800; ASR-2120S

A.3   Troubleshooting

Some problems that you may encounter are not due to defects on the system or the components. These problems only requires simple troubleshooting actions that you can perform by yourself.

Problem	Action
The power LED on the server or on the monitor do not light up	1. Check if the power cable is properly connected to the power connector in the system rear panel. 2. Make sure that the power cables are connected to a grounded power outlet. 3. Press the power button to make sure that the system is turned on.
The keyboard does not work	Check if the keyboard cable is properly connected to the PS/2 keyboard port.
The mouse does not work	Check if the mouse cable is properly connected to the mouse port.
The system does not perform power-on self tests (POST) after it was turned on	1. Check the memory modules and make sure you installed the DIMMs the system supports. 2. Make sure that the DIMMs are properly installed on the sockets.

Problem	Action
The system continuously beeps after it was turned on	1. Check the memory modules and make sure you installed supported DIMMs. 2. Make sure that the DIMMs are properly installed on the sockets.
The message "Non-system disk or disk error" appears	1. Check if a bootable HDD is active. 2. Check if the HDDs are properly installed.
Network connection not available	1. Make sure that the network cable is connected to the LAN port on the rear panel. 2. Make sure that you have installed the LAN drivers from the support CD.

Free Manuals Download Website

http://myh66.com

http://usermanuals.us

http://www.somanuals.com

http://www.4manuals.cc

http://www.manual-lib.com

http://www.404manual.com

http://www.luxmanual.com

http://aubethermostatmanual.com

Golf course search by state

http://golfingnear.com

Email search by domain

http://emailbydomain.com

Auto manuals search

http://auto.somanuals.com

TV manuals search

http://tv.somanuals.com