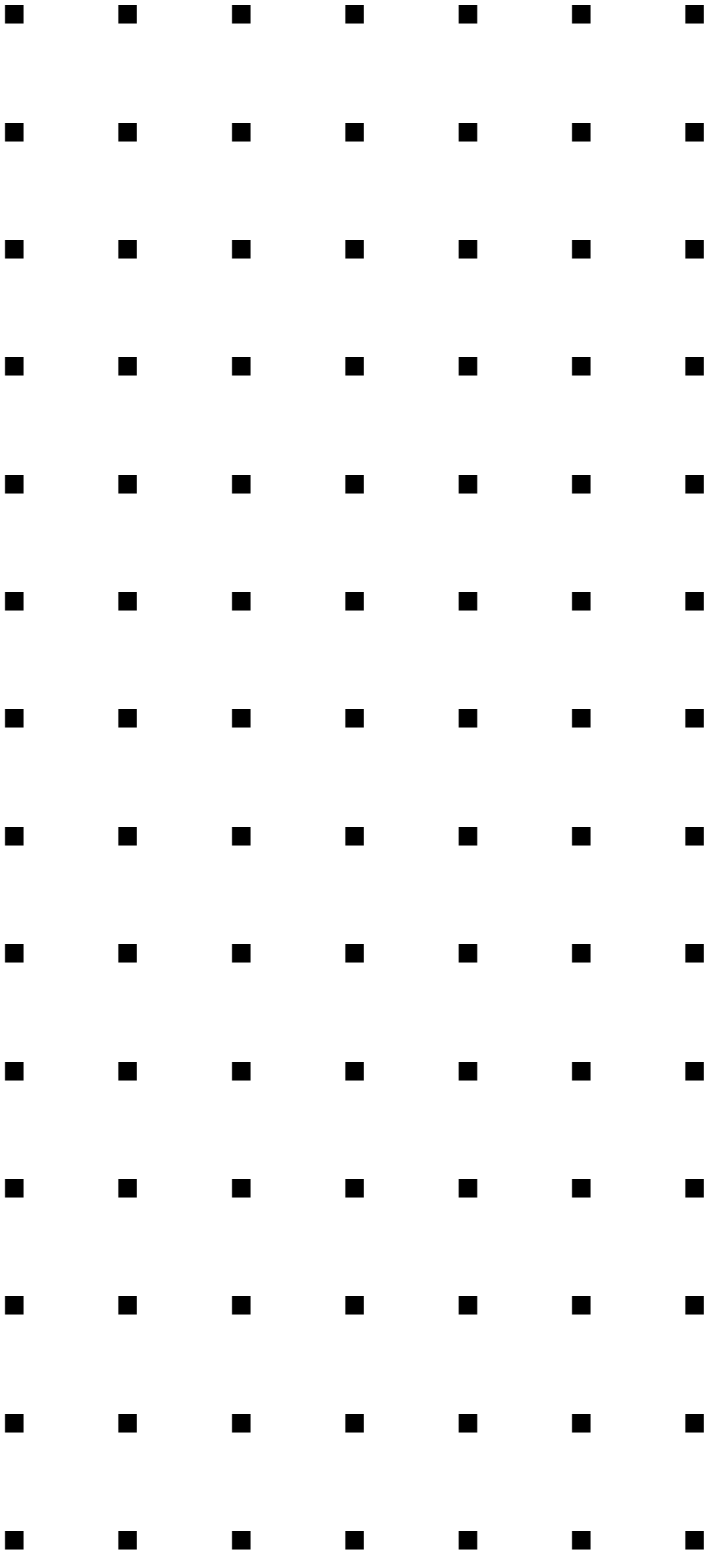


## Express5800 120Rf-1



# User Guide

This page is intentionally left blank.

## **Proprietary Notice and Liability Disclaimer**

The information disclosed in this document, including all designs and related materials, is the valuable property of NEC Computers International and/or its licensors. NEC Computers International and/or its licensors, as appropriate, reserve all patent, copyright and other proprietary rights to this document, including all design, manufacturing, reproduction, use, and sales rights thereto, except to the extent said rights are expressly granted to others.

The NEC Computers International product(s) discussed in this document are warranted in accordance with the terms of the Warranty Statement accompanying each product. However, actual performance of each product is dependent upon factors such as system configuration, customer data, and operator control. Since implementation by customers of each product may vary, the suitability of specific product configurations and applications must be determined by the customer and is not warranted by NEC Computers International.

To allow for design and specification improvements, the information in this document is subject to change at any time, without notice. Reproduction of this document or portions thereof without prior written approval of NEC Computers International is prohibited.

### **Trademarks**

Adobe, and Adobe Acrobat are registered trademarks of Adobe Systems, Incorporated.

Microsoft, Microsoft Windows, Windows NT, Windows 95, Windows 98, Windows 2000 and Windows Storage Server 2003 are all registered trademarks of Microsoft Corporation.

MS-DOS is a registered trademark of Microsoft Corporation.

Intel and Pentium are registered trademarks of Intel Corporation.

All other product, brand, or trade names used in this publication are the trademarks or registered trademarks of their respective trademark owners.

**rev0.0 June 2005**

Copyright 2005  
NEC Computers International B.V.  
Nieuweweg 279  
6603 BN Wijchen  
The Netherlands  
All Rights Reserved

This page is intentionally left blank.

# Table of Contents

Table of Contents	iii
Using This Guide	xiii
<b>Text Conventions</b>	<b>x</b>
<b>Related Documents</b>	<b>xi</b>
<b>Safety Notices</b>	<b>xii</b>
Safety Notices for Users Outside of the U.S.A. and Canada	xiii
<b>Regulatory Information</b>	<b>xiv</b>
European Notice	xiv
Notice for USA and Canada	xiv
Modifications to the Product	xv
CE and FCC Marking	xv
Connections and Remote Earths	xv
PELV (Protected Extra Low Voltage)	xv
SELV (Safety Extra Low Voltage)	xv
Remote Earths	xv
Building Supply	xv
Power Supply and Cables	xv
Power Supply	xv
Cables	xvi
Batteries	xvi
Chassis Cover Removal and Replacement	xvi
Laser Compliance Statement	xvi
Warning - Hazardous Voltage!	xvii
Warning - Avoid Electrostatic Discharge!	xvii
Product Disposal	xvii
<b>Care and Handling</b>	<b>xviii</b>
 Server General Description	 1-1
<b>Server Overview</b>	<b>1-2</b>
<b>Server Chassis</b>	<b>1-3</b>
External View	1-3
Front View with Front Bezel Closed	1-4
Front View with Front Bezel Removed	1-5
Rear View	1-7
RJ45 Leds	1-9
Internal View	1-10
<b>System board Features</b>	<b>1-11</b>
Motherboard	1-11
Processor	1-12
Memory	1-12
PCI Riser Slots	1-12
Video	1-12

SCSI Controller	1-13
Network Controller	1-13
Keyboard and Mouse	1-13
ACPI	1-13
Remote Management Card (RMC) - optional	1-14
Degradation Feature	1-15
Remote Power-On Feature (Wake On LAN)	1-15
AC-Link Feature	1-15
ESMPRO	1-16
Off-line Maintenance Utility	1-16
System Diagnostic Utility	1-16
Dianascope	1-16
<b>Standard Features</b>	<b>1-17</b>
Peripheral Bays	1-19
System Cooling	1-19
Server Security	1-20
Security with Mechanical Locks and Monitoring	1-20
Software Locks via the BIOS Setup Utility	1-20
<b>SAF-TE LOGIC</b>	<b>1-24</b>
<b>EXPRESSBUILDER CD-ROM</b>	<b>1-25</b>
With the EXPRESSBUILDER CD you can:	1-25
Software End-User License Agreement	1-25
 Setting Up Your Server	 2-1
<b>Overview</b>	<b>2-2</b>
<b>Selecting a Site</b>	<b>2-3</b>
<b>Unpacking the Server</b>	<b>2-4</b>
<b>Installing the Server into a Rack</b>	<b>2-5</b>
Before Installation	2-5
Restricted Access Location	2-5
Static Precautions	2-5
Checking Components	2-5
Required Tools	2-5
Installing the Server	2-6
Preparing before Installation	2-6
Removing the Rail Assemblies	2-6
Installing the Core Nuts on the Rack	2-7
Installing the Rail Assemblies	2-8
Installing the Server into the Rack	2-10
Securing the Server in the Rack	2-12
<b>Installing the Optional Cable Arm</b>	<b>2-13</b>
To install the optional cable arm:	2-14
<b>Removing the Server from the Rack Assembly</b>	<b>2-17</b>
<b>Making Connections</b>	<b>2-19</b>
<b>Connecting the Power Cord</b>	<b>2-22</b>
<b>Using the Server</b>	<b>2-23</b>
Removing and Installing the Front Bezel	2-24
Removing the Front Bezel	2-24
Installing the Front Bezel	2-25

---

Powering On Your Server	2-26
To power on your server:	2-26
Powering Off Your Server	2-27
To power off your server:	2-27
Forcing a Power Shutdown	2-27
 Configuring Your Server	 3-1
<b>Overview</b>	<b>3-2</b>
<b>BIOS Setup Utility</b>	<b>3-3</b>
Running the BIOS Setup Utility	3-3
BIOS Setup Configuration Settings	3-4
Main Menu and Submenus	3-4
Advanced Menu and Submenus	3-6
Security Menu	3-10
Server Menu and Submenus	3-11
Boot Menu	3-14
Exit Menu	3-15
<b>SCSISelect Utility</b>	<b>3-16</b>
Using SCSISelect Utility	3-16
Configuring SCSI Controller on Motherboard	3-16
Running the Utility	3-16
Exiting the Utility	3-17
Configure/View SCSI Controller Settings	3-17
SCSI Disk Utilities	3-20
Configuring SCSI Controller on Optional Board	3-21
<b>RAID Configuration Utility</b>	<b>3-22</b>
RAID BIOS	3-22
<b>RAID Configuration of SCSI Hard Disk Drives</b>	<b>3-23</b>
Installing the Hard Disk Drives	3-24
Enabling RAID Feature by SCSISelect Utility	3-24
Main Menu	3-26
Exiting the Utility	3-28
<b>RAID Configuration by SCSISelect Utility</b>	<b>3-29</b>
Creating Arrays	3-29
Requirements	3-29
Creating RAID0 Array	3-30
Creating RAID1 Array	3-32
To create a RAID1 array:	3-32
Deleting Arrays	3-35
To delete an array:	3-35
Creating Spare Disks	3-36
To assign a spare disk:	3-36
<b>RAID Configuration of SATA Hard Disk Drives</b>	<b>3-39</b>
Enabling the SATA RAID feature in the BIOS Setup	3-40
Configuring RAID Using the Array Configuration Utility (ACU)	3-40
Running the Array Configuration Utility (ACU)	3-41
Configuring RAID	3-41
Managing Arrays	3-46
Viewing Array Properties	3-46

---

---

Deleting Arrays	3-47
Initializing Hard Disk Drive	3-48
To initialize hard disk drives:	3-48
Using the Disk Utilities	3-49
Setting the Bootable Hard Disk Drive	3-51
<b>Configuring Motherboard Jumpers</b>	<b>4-52</b>
To clear passwords or the CMOS data:	4-52
 Upgrading Your Server	 4-1
<b>General Safety Information</b>	<b>4-2</b>
<b>Static Precautions</b>	<b>4-2</b>
<b>Equipment Log</b>	<b>4-3</b>
<b>Tools Recommended</b>	
<b>for Upgrading Your Server</b>	<b>4-3</b>
<b>Preparing Your Server for Upgrade</b>	<b>4-4</b>
To prepare your server for installation or removal of server components:	4-4
<b>Installing and Removing a Hard Disk Drive</b>	<b>4-5</b>
Installing a Hard Disk Drive (SCSI hot-swap HDD model)	4-7
Installing a Hard Disk Drive (SATA fixed HDD model)	4-9
Removing a Hard Disk Drive (SCSI hot-swap HDD model)	4-11
Removing a Hard Disk Drive (SATA fixed HDD model)	4-12
<b>Installing and Replacing a Power Supply Unit</b>	
<b>(Servers with SCSI HDDs only)</b>	<b>4-13</b>
Installing a Power Supply Unit	4-13
Replacing a Failing Power Supply Unit	4-16
<b>Removing and Replacing the Top Cover</b>	<b>4-18</b>
Removing and Installing the Drive Cover	4-19
Removing the Drive Cover	4-19
Installing the Drive Cover	4-19
Removing and Installing the Logic Cover	4-21
Removing the Logic Cover	4-21
Installing the Logic Cover	4-21
<b>Installing or Removing Random Access Memory</b>	<b>4-22</b>
DIMMs Installation Order	4-23
Installing DIMMs	4-24
To install a DIMM module:	4-24
Removing DIMMs	4-25
To remove a DIMM module:	4-25
<b>Installing and Removing a Microprocessor</b>	<b>4-27</b>
Installing a Microprocessor	4-29
Removing a Microprocessor	4-34
To remove a microprocessor:	4-34
If a CPU is removed or replaced:	4-35
<b>Installing and Removing a PCI Board</b>	<b>4-36</b>
Installing a PCI Board	4-39
To install a PCI board on the riser card:	4-39
Removing a PCI Board	4-42
<b>Installing and Removing a Raid Controller Board</b>	<b>4-43</b>
Installing a SCSI RAID Controller Board	4-44

---

---

Removing a SCSI RAID Controller Board	4-44
Use of internal hard disk drives in a RAID configuration	4-44
Connecting the SCSI cable to an optional RAID controller in the low-profile PCI slot	4-45
Connecting the SCSI cable to an optional RAID controller in the full-height PCI slot	4-46
SCSI cable connection	4-47
LED relay cable connection	4-47
Disk array configuration of internal hard disk drives	4-48
Use of a disk expansion unit in a disk array configuration	4-49
<b>Installing and Removing a Redundant Hot-Swap Fan</b>	<b>4-50</b>
Installing a Hot-Swap Fan	4-50
Removing/Replacing a Hot-Swap Fan	4-53
<b>Installing a Board Management Controller</b>	<b>4-54</b>
Installing a Remote Management Card	4-55
Removing a Remote Management Card	4-58
Replacing the optional RMC by an optional ARMC	4-58
<b>Replacing the Battery</b>	<b>4-60</b>
To replace the battery on the motherboard:	4-60
<b>Error Messages</b>	<b>4-61</b>
Error Messages	4-61
Error Messages after Power-on	4-61
POST Error Messages	4-62
<b>How to Identify BIOS Revision Level</b>	<b>5-65</b>
 Solving Problems	 5-1
Problems Solving	5-2
Static Precautions	5-2
Resetting the Server	5-3
Troubleshooting Guide	5-4
System Viewers	5-4
Problems at initial System Start-up	5-5
Problems After the System Has Been Running Correctly	5-6
Problems Running New Application Software	5-7
Beep Codes	5-8
Problems and Suggestions	5-9
Problems with NEC Express Server	5-10
The server is not found on the network:	5-14
Wake on LAN does not start from standby state.	5-14
Problems with the Windows Operating Systems	5-15
Problems with Disk Array Configuration	5-20
Problems with Master Control Menu	5-21
Problems with Configuration Diskette Creator	5-21
Collecting Event Log	5-22
Collecting Configuration Information	5-23
Collecting Dr. Watson Diagnostic Information	5-24
Memory Dump	5-25
Preparing for Memory Dumping	5-25

---

To change the setting to enable the forced shutdown and restart of the server: _____	5-25
<b>Backup IPMI Information</b> _____	<b>5-26</b>
<b>Off-Line Maintenance Utility</b> _____	<b>5-27</b>
Starting the Off-line Maintenance Utility _____	5-27
Features of Off-line Maintenance Utility _____	5-28
<b>If You Need Assistance</b> _____	<b>5-30</b>
<b>Status Indicators</b> _____	<b>5-31</b>
POWER Lamp _____	5-31
Status Lamp _____	5-32
Disk Access Lamp _____	5-33
ACT Lamp _____	5-33
UID Lamp (UID) _____	5-33
Disk Access Lamp _____	5-33
Hard Disk Lamp (SCSI hot-plug HDD model only) _____	5-34
LAN Connector Lamps _____	5-36
 Appendix A: Specifications _____	 A-1
<b>SCSI Hot-Swap HDD Model Specifications</b> _____	<b>A-1</b>
<b>SATA Fixed HDD Model Specifications</b> _____	<b>A-3</b>
 Appendix B: Interrupt Requests _____	 B-1
 Appendix C: Maintenance _____	 C-1
<b>Making Backup Copies</b> _____	<b>C-1</b>
<b>Cleaning</b> _____	<b>C-1</b>
Cleaning the External Surfaces of the Server _____	C-2
Cleaning the Interior of the Server _____	C-2
To clean the interior of the server: _____	C-3
Cleaning the Keyboard _____	C-3
Cleaning the Mouse _____	C-4
To clean the mouse: _____	C-4
Cleaning an Optical Drive and CD-Rom/CD-RW/DVD-Rom _____	C-4
To Clean an Optical Drive: _____	C-4
To Clean a CD-Rom or CD-RW or DVD-Rom: _____	C-5
<b>System Diagnostics</b> _____	<b>C-6</b>
Test Items _____	C-6
Starting and Ending the System Diagnostics _____	C-7
 Appendix D: Installing Windows Server 2003 _____	 D-1
<b>Before Installing Windows Server 2003</b> _____	<b>D-2</b>
Installing Service Pack _____	D-2
Updating System _____	D-2
Re-installing to the Hard Disk which has been upgraded to Dynamic Disk _____	D-2
Manual Installation when the Disk Array Controllers are Connected _____	D-2

Magneto-Optical device _____	D-2
Partition Size _____	D-3
<b>Installing Microsoft Windows Server 2003 _____</b>	<b>D-4</b>
Creating "Windows 2003 OEM-DISK for EXPRESSBUILDER" _____	D-4
Creating from the menu which appears	
when running EXPRESS5800 Server with EXPRESSBUILDER _____	D-4
Creating Windows 2003 OEM-DISK from [Master Control Menu] _____	D-5
Windows Server 2003 Clean Installation _____	D-6
Upgrade installation _____	D-7
Reinstallation to Multiple Logical drives _____	D-9
Before Re-installing the Operation System _____	D-9
Re-installing the Operation System _____	D-9
Modifying the Drive Letter _____	D-9
Updating the System _____	D-10
<b>Driver Installation and Device Settings _____</b>	<b>D-11</b>
PROSet _____	D-11
To install PROSet: _____	D-11
Network Driver _____	D-11
[When PROSet is not installed] _____	D-11
[When PROSet is installed] _____	D-12
Re-install the Network Driver _____	D-12
Graphics Accelerator Driver _____	D-12
Installing SCSI Controller Driver _____	D-13
Installing RAID Controller Driver _____	D-13
Available Switch Options for Windows Server 2003 Boot.ini File _____	D-14
<b>Setting for Collecting Memory Dump (Debug Information) _____</b>	<b>D-15</b>
 Appendix E :Installing Windows 2000 _____	 E-1
<b>Before Installing Windows 2000 _____</b>	<b>E-2</b>
Installing Service Pack _____	E-2
Updating System _____	E-2
Re-installing to the Hard Disk which has been upgraded to Dynamic Disk _____	E-2
Partition Size _____	E-2
<b>Installing Windows 2000 _____</b>	<b>E-3</b>
Creating "Windows 2000 OEM-DISK for EXPRESSBUILDER" _____	E-3
Windows 2000 Clean Installation _____	E-4
Updating the System -Installing Service Pack - _____	E-5
Driver Installation and Advanced Settings _____	E-6
PROSetII _____	E-6
Network Driver _____	E-7
Display Driver _____	E-8
USB 2.0 Driver _____	E-8
 Appendix F: Installing and Using Utilities _____	 F-1
<b>EXPRESSBUILDER _____</b>	<b>F-2</b>
EXPRESSBUILDER for DOS-Based with Local Console _____	F-3
Starting EXPRESSBUILDER _____	F-3
EXPRESSBUILDER for DOS-based with Remote Console _____	F-8

Starting	F-9
EXPRESSBUILDER for Windows-Based (Master Control Menu)	F-10
<b>Configuration Diskette Creator</b>	<b>F-12</b>
Creating Configuration Diskette	F-12
Installing Optional Mass Storage Driver	F-13
<b>ESMPRO</b>	<b>F-14</b>
Functions and Features	F-14
<b>Adaptec Storage Manager<sup>®</sup> - Browser Edition</b>	<b>F-15</b>
Features	F-15
<b>Power Console Plus</b>	<b>F-16</b>
Major Functions	F-16
Components	F-16
Server Setup	F-17
Operating Environment	F-17
Management PC Setup	F-18
Operating Environment	F-18
<b>DianaScope</b>	<b>F-19</b>
 Appendix G: Installing the Operating System with Express Setup	 G-1
About Express Setup	G-1
<b>Microsoft Windows Server 2003</b>	<b>G-4</b>
Installation Notice	G-4
Supported Operating System on this Model	G-4
BIOS Settings	G-4
ESMPRO Agent	G-4
Windows Server 2003	G-4
Setup Flow	G-7
Installing Microsoft Windows Server 2003	G-8
Installing and Setting Device Drivers	G-12
PROSet	G-12
Network Driver	G-13
Optional Network Board Driver	G-14
Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)	G-15
Installing SCSI Controller Driver	G-16
Installing RAID Controller Driver	G-16
Graphics Accelerator Driver	G-16
Available switch options for Windows Server 2003 Boot.ini file.	G-17
Setting for Solving Problems	G-18
Memory Dump (Debug Information)	G-18
Windows Dr. Watson	G-19
Network Monitor	G-20
Installing Maintenance Utilities	G-21
Updating the System	G-21
Making Backup Copies of System Information	G-21
Exceptional Setup	G-22
Installation of mass storage device not supported by ExpressSetup	G-22
<b>Microsoft Windows 2000</b>	<b>G-23</b>
Installation Notice	G-23
Supported Operating System on this Model	G-23

BIOS Specification	G-23
ESMPRO Agent	G-23
Windows 2000	G-23
Installing on the Mirrored Volume	G-24
Connecting Hard Disk Drive	G-24
Creating Partition Size	G-24
Re-installing to the hard disk which has been upgraded to Dynamic Disk	G-25
Setup Flow	G-26
Installing Windows 2000	G-27
Installing and Setting Device Drivers	G-30
PROSet	G-31
Network Driver	G-31
Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)	G-32
Graphics Accelerator Driver	G-33
USB 2.0 Driver	G-33
Setting for Solving Problems	G-34
Memory Dump (Debug Information)	G-34
Windows 2000 Dr. Watson	G-36
Network Monitor	G-36
Updating the System - Installing Service Pack	G-37
Making Backup Copies of System Information	G-37
Exceptional Setup	G-37
Installation of Mass storage device not to be supported by ExpressSetup	G-38
<b>HostRAID</b>	<b>G-39</b>
Overview of HostRAID	G-39
Overview of the specifications	G-40
Features	G-40
Notes	G-40
HostRAID Setup Flow	G-41
 Appendix H: Restrictions	 H-1
 Equipment Log	 I-1
<b>Hardware</b>	<b>I-2</b>
<b>Software</b>	<b>I-4</b>
 Index	 I-1
 List of Figures	 II-1
 List of Tables	 III-1

# Using This Guide

This user guide provides a reference to information about the Express5800 120Rf-1 server. Its goal is to familiarize you with your server and the tasks necessary for server configuring and upgrading.

- Chapter 1 contains information about the front, back and internal features of your server and about the motherboard. It lists the features of your server and provides details about the EXPRESSBUILDER CD-ROM.
- Chapter 2 helps you installing the server in a rack assembly and in an appropriate place, making connections and starting using your server.
- Chapter 3 shows you how to configure your server and helps you set up the options.
- Chapter 4 provides the information to remove components from your server and install new ones. You will find in this chapter how to install hard disk drives, upgrade memory, install optical devices... etc.
- Chapter 5 gives you information about how to solve the issues you may encounter with your server. This chapter contains information about the status indicators of your server.
- 'Glossary' lists the main vocabulary used in this guide.

## Text Conventions

This guide uses the following text conventions.

Warnings, cautions, and notes have the following meanings:

---

### **Warning**

Warnings alert you to situations that could result in serious personal injury or loss of life.

---


---

### **Caution**

Cautions indicate situations that can damage the server hardware or software.

---

---

 **Note:** *Notes give important information about the material being described.*

---

- Names of keystrokes are printed as boldface type. For example: **Ctrl**, **Enter**, **S**.
- Text that you type is printed as boldface type. For example: type **abc123**.
- File names are printed in uppercase letters. For example: AUTOEXEC.BAT.

## ***Related Documents***

In addition to this User Guide, several other documents are included with your system either as electronic files (on the EXPRESSBUILDER CD-ROM) or as paper copy shipped with your server.

We recommend you read these additional documents as it becomes necessary when setting up, using or upgrading your server system.

## Safety Notices



- **Caution:** To reduce the risk of electric shock which could cause personal injury, follow all safety notices. The symbols shown are used in your documentation and on your equipment to indicate safety hazards.
- **Warning:** Lithium batteries can be dangerous. Improper handling of lithium batteries may result in an explosion. Dispose of lithium batteries as required by local ordinance or as normal waste if no local ordinance exists.
- **Warning:** The detachable power supply cord is intended to serve as the disconnect device.
- **Warning:** This equipment has a 3-wire, grounded power cord. To prevent electrical hazards, do not remove or defeat the ground prong on the power cord. Replace the power cord if it gets damaged. Contact your dealer for an exact replacement.
- **Warning:** The DC push-button on/off switch on the front panel does not turn off the system AC power. Also, +5vdc is present on the system board whenever the AC power cord is connected between the system and an AC outlet. Before doing the procedures in this manual, make sure that your system is powered off and unplug the AC power cord from the back of the chassis. Failure to disconnect power before opening your system can result in personal injury and equipment damage.

In the U.S.A. and Canada, the power cord must be a UL-listed detachable power cord (in Canada, CSA-certified), type ST or SJT, 16 AWG, 3-conductor, provided with a molded-on NEMA type 5-15 P plug cap at one end and a molded-on cord connector body at the other end. The cord length must not exceed 9 feet (2.7 meters).

Outside the U.S.A. and Canada, the plug must be rated for 250 VAC, 10 amp minimum, and must display an international agency approval marking. The cord must be suitable for use in the end-user country. Consult your dealer or the local electrical authorities if you are unsure of the type of power cord to use in your country. The voltage change occurs via a switch in the power supply.

- **Warning:** Under no circumstances should the user attempt to disassemble the power supply. The power supply has no user-replaceable parts. Inside the power supply are hazardous voltages that can cause serious personal injury. A defective power supply must be returned to your dealer.

## ***Safety Notices for Users Outside of the U.S.A. and Canada***

- **PELV (Protected Extra-Low Voltage) Integrity:** To ensure the extra-low voltage integrity of the equipment, connect only equipment with mains-protected electrically-compatible circuits to the external ports.
- **Remote Earths:** To prevent electrical shock, connect all local (individual office) computers and computer support equipment to the same electrical circuit of the building wiring. If you are unsure, check the building wiring to avoid remote earth conditions.
- **Earth Bonding:** For safe operation, only connect the equipment to a building supply that is in accordance with current wiring regulations in your country. In the U.K., those regulations are the IEE.

## ***Regulatory Information***

### ***European Notice***

Products with the CE marking comply with both the Electromagnetic Compatibility Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) - modified by the Directive 93/68/ECC - issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Standards:

- EN55022: Radio Frequency Interference
- EN55024 (1998+A1:2001): Immunity characteristics
- EN6100-3-2: Limits for harmonic current emissions
- EN6100-3-3: Limitation of voltage fluctuation and flicker in low-voltage supply system
- EN60950-1 (2001): Product Safety

If your system includes a telecommunication network board, the input/output socket is classified as Telecommunication Network Voltage (TNV-3)

### ***Notice for USA and Canada***

Products with UL marking comply with the following UL standards:

- UL 1950 (3rd edition 1998)

Products with FCC marking comply with the following FCC standards

- FCC part 15

The model type/ref. used for UL and FCC certification can be found on the regulatory labels stuck on your system.

The equipment has been tested and found to comply with the limits for a Class A or B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

## ***Modifications to the Product***

### ***CE and FCC Marking***

NEC Computers International cannot be held responsible for modifications made by the User and the consequences thereof, which may alter the conformity of the product with the CE or FCC Marking.

## ***Connections and Remote Earths***

### ***PELV (Protected Extra Low Voltage)***

To ensure the extra-low voltage integrity of the equipment, only connect equipment with mains-protected electrically-compatible circuits to the external ports.

### ***SELV (Safety Extra Low Voltage)***

Every input and output of this product is classified as Safety Extra Low Voltage.

### ***Remote Earths***

To prevent electrical shock, connect all local (individual office) systems and system support equipment to the same electrical circuit of the building wiring. If you are unsure, check the building wiring to avoid remote earth conditions.

### ***Building Supply***

Only connect the equipment to a building supply that is in accordance with current wiring regulations in your country. In the U.K., those are the IEE regulations.

## ***Power Supply and Cables***

### ***Power Supply***

- The DC push-button on/off switch on the front panel does not turn off the system AC power. Also, +5vdc is present on the system board whenever the AC power cords are connected between the system and an AC outlet. Before doing the procedures in this manual, make sure that your system is powered off and unplug the AC power cords from the back of the chassis. Failure to disconnect power before opening your system can result in personal injury and equipment damage.
- Under no circumstances should the user attempt to disassemble the power supply. The power supply has no user-replaceable parts. Inside the power supply are hazardous voltages that can cause serious personal injury. A defective power supply must be returned to your dealer.

## **Cables**

- In the U.S.A. and Canada, the power cord must be a UL-listed detachable power cord (in Canada, CSA-certified), type ST or SJT, 16 AWG, 3-conductor, provided with a moulded-on NEMA type 5-15 P plug cap at one end and a moulded-on cord connector body at the other end. The cord length must not exceed 9 feet (2.7 meters).
- Outside the U.S.A. and Canada, the plug must be rated for 250 VAC, 10 amp minimum, and must display an international agency approval marking. The cord must be suitable for use in the end-user country. Consult your dealer or the local electrical authorities if you are unsure of the type of power cord to use in your country. The voltage change occurs via a switch in the power supply.
- The detachable power supply cords are intended to serve as the disconnect devices.
- For PLUGGABLE EQUIPMENT, the socket-outlet shall be installed near the equipment and shall be easily accessible.
- This equipment has a 3-wire, grounded power cords. To prevent electrical hazards, do not remove or defeat the ground prong on the power cords. Replace a power cord if it gets damaged. Contact your dealer for an exact replacement.

## **Batteries**

Lithium batteries can be dangerous. Improper handling of lithium batteries may result in an explosion. Dispose of lithium batteries as required by local ordinance or as normal waste if no local ordinance exists.

## **Chassis Cover Removal and Replacement**

When working inside your system, you must replace the chassis cover and secure it with the screws before plugging in the power cable and turning it on.

## **Laser Compliance Statement**

The optical devices are tested and certified to be compliant with International Electrotechnical Commission IEC60825-1 and European EN60825-1 standards for Class 1 laser products.

Class 1 laser products are not considered hazardous. The optical devices are designed such that there is never human access to laser radiation above a Class 1 level during normal operation or prescribed maintenance conditions.

The optical devices installed in your system is designed for use solely as a component of such electronic product and therefore does not comply with the appropriate requirements of Code of Federal Regulation Sec. 1040.10 and Sec. 1040.11 for **COMPLETE** laser products

## ***Warning - Hazardous Voltage!***

Hazardous voltage is present inside your system when it is connected to an AC supply even when the system's power switch is off. Exposure to Hazardous Voltage could cause personal injury. To reduce the risk of electric shock which could cause personal injury, follow all safety notices. The symbols shown are used in your documentation and on your equipment to indicate safety hazards.

## ***Warning -Avoid Electrostatic Discharge!***

Circuit cards and integrated circuits can be easily damaged by static electricity. To reduce risk of damage, store them in protective packaging whenever they are not installed in your system.

Before you install or remove memory modules, video memory, disk drives, circuit cards or other devices, protect them from static electricity. To do so, make sure your system's power switch is **OFF**. Then, unplug the system's AC power cord(s). Before picking up the device you want to install, you will need to wear an antistatic wrist strap (available at electronic supply stores). Be sure to connect the wrist strap to an unpainted metal portion of the system chassis.

As an alternative, you can dissipate electrostatic buildup by touching an unpainted metal portion of the system chassis with one hand. Then touch the device you are installing with the other hand, and maintain continuous contact with it until it is installed in the system.

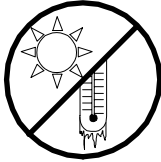
## ***Product Disposal***



The Waste Electrical and Electronic Equipment (WEEE) Electrical and Electronic Equipment (WEEE) Directive requires that used electrical and electronic products must be disposed of separately from normal household waste in order to promote reuse, recycling and other forms of recovery and to reduce the quantity of waste to be eliminated with a view to reduce land-fill. WEEE includes accessories such as keyboard, mouse, remote control, speakers, etc... When you dispose of such products, please follow the agreement made between you and NEC and/or your distributor.

## Care and Handling

Use the following guidelines to properly handle and care for your server.



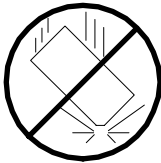
Protect the server from extremely low or high temperatures. Let the server warm (or cool) to room temperature before using it.



Keep the server away from magnetic forces.



Keep the server dry. Do not wash the system with a wet cloth or pour fluid into it.



Protect the server from being bumped or dropped.



Check the server for condensation. If condensation exists, allow it to evaporate before powering on the server.



Keep the server away from dust, sand, and dirt.

This page is intentionally left blank.

# 1

## **Server General Description**

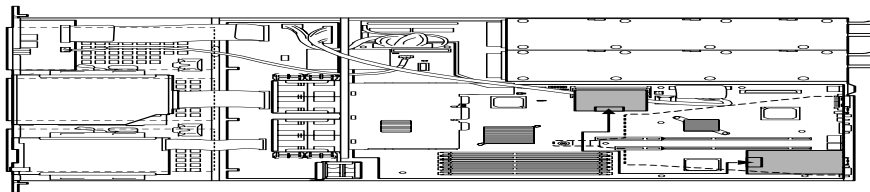
## Server Overview

The Express5800 120Rf-1 server is a modular, multiprocessing server based on the Intel® Xeon™ microprocessor. It is a solid performer and offers the latest technology. The combination of compute performance, memory capacity, and integrated I/O provides a high performance environment for many server market applications. These range from large corporations supporting remote offices to small companies looking to obtain basic connectivity capability such as file and print services, e-mail, web access, web site server, etc.

The Express5800 120Rf-1 server is housed and available as a rack-mount system. Your server conveniently installs into a standard EIA 19-inch rack assembly.

Your server includes a 3.5-inch floppy disk drive, an optical device (DVD-ROM or DVD/CD-RW) drive and three SCSI or two S-ATA hard disk drive bays. The hot-swap SCSI hard disk drive bays support up to three 1.0-inch SCSI hard disk drives that can be swapped in or out of the server without powering it down, if RAID functionality is configured in the server.

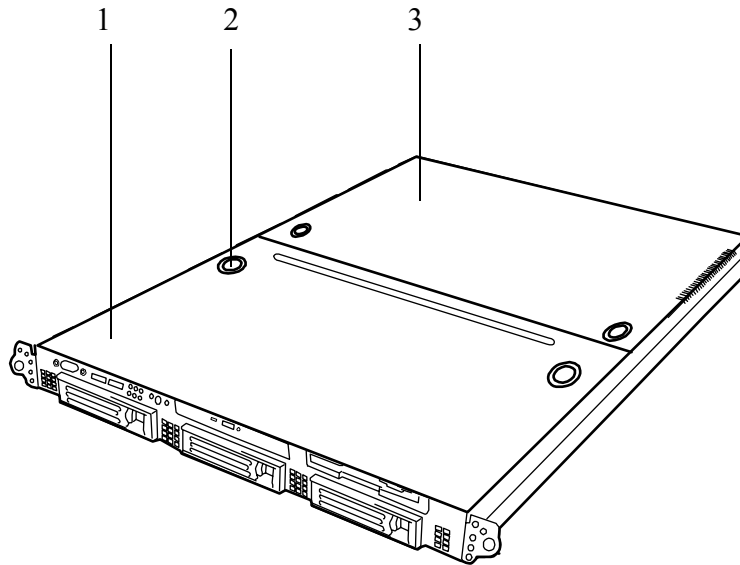
As application requirements increase, you can expand your server with an additional processor, additional memory, add-in boards and peripheral devices: tape devices, optical devices, and hard disk drives.



**Figure 1 - 1 : 120Rf-1**

# Server Chassis

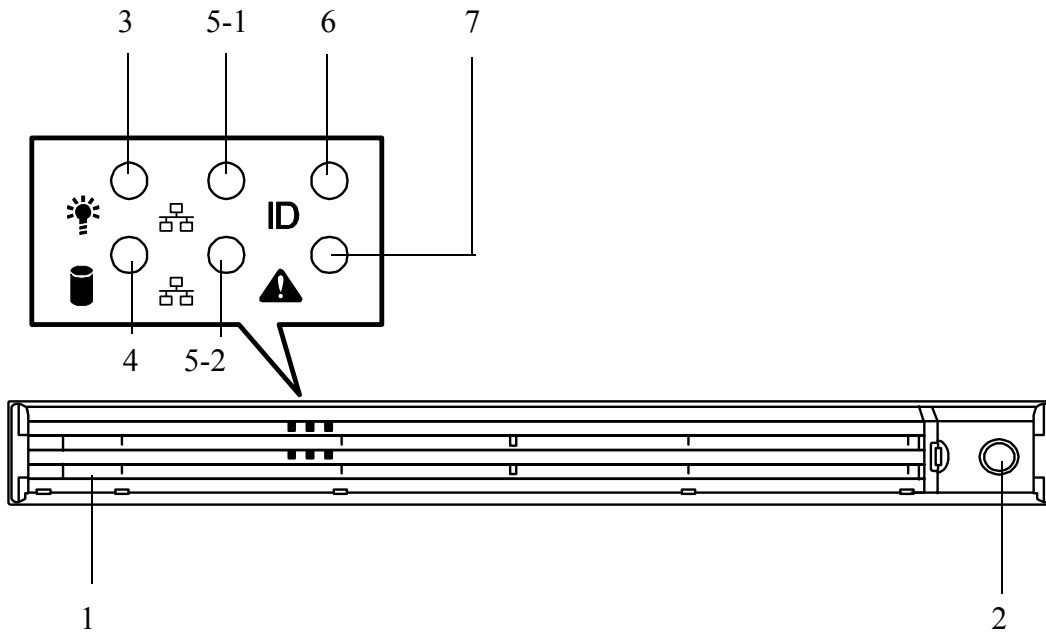
## External View



**Figure 1 - 2 : 120Rf-1 External View**

- 1 Drive cover
- 2 Release button
- 3 Logic cover

## Front View with Front Bezel Closed



**Figure 1 - 3 : 120Rf-1 Front View with Front Bezel Closed**

**1 Front bezel**

The front bezel is a cover protecting the front devices during daily operation. A security key is provided to lock the cover.

**2 Key slot**

Insert the security key into this slot when unlocking the front bezel.

**3 Power lamp (green)**

This lamp turns green when the power is turned on.

**4 Disk access lamp (green/amber)**

This lamp is green during access to the internal hard disks.  
The lamp turns amber when even one of the internal hard disks fails.

**5 ACT lamp (green)**

This lamp lights while the server is connected to the network.  
5-1 is for LAN port 1 and 5-2 is for LAN port 2.

**6 UID lamp (blue)**

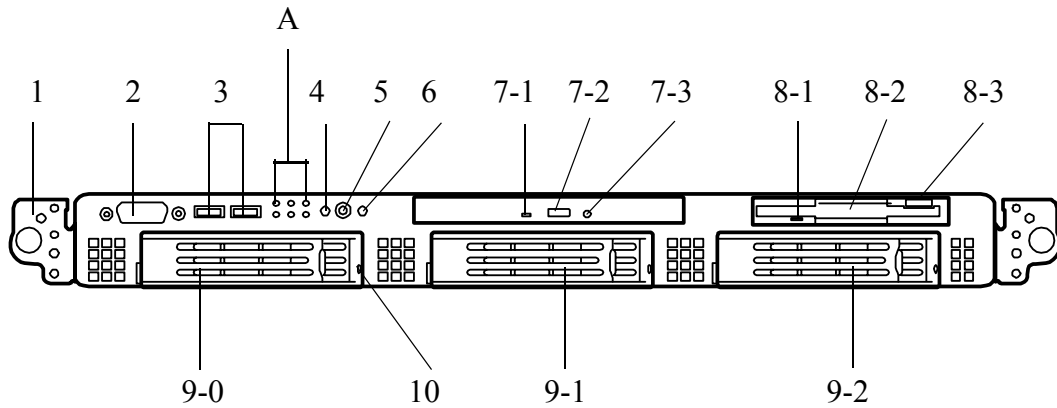
This lamp goes on when the UID switch is pressed.  
The lamp also goes on or flashes when software issues a command.

**7 Status lamp (green/amber)**

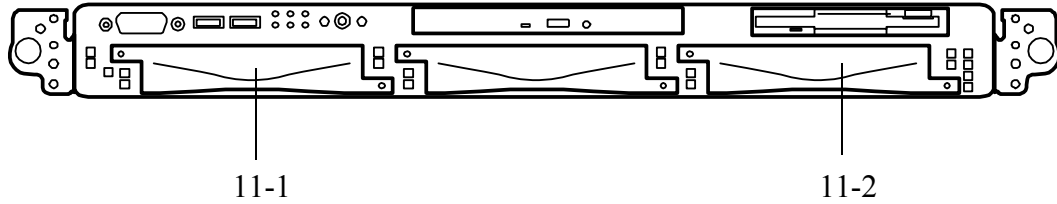
This lamp indicates the server status.  
The lamp is green during normal operation.  
The lamp turns amber or flashes when the server enters the abnormal state.

## **Front View with Front Bezel Removed**

Hot-swap SCSI hard disk drive model



S-ATA fixed hard disk drive model



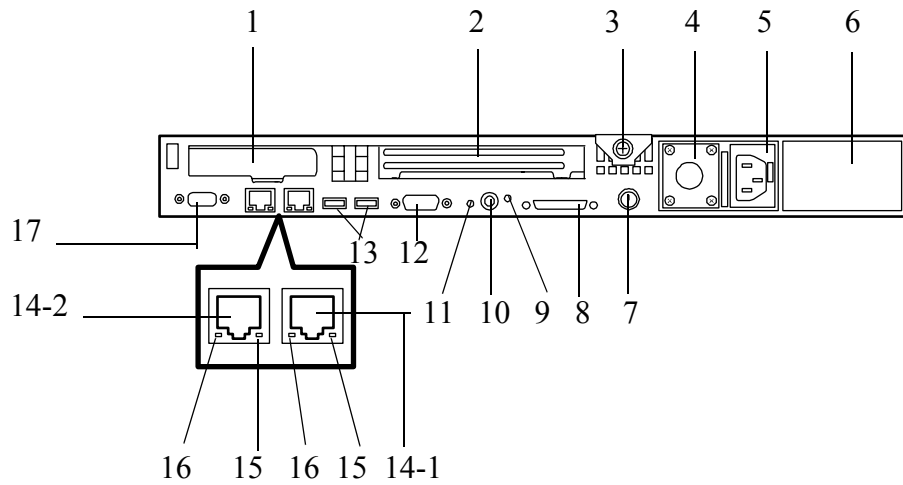
A - Status indicators 3 to 7 on Figure 1-3

**Figure 1 - 4 : 120Rf-1 Front View with Front Bezel Removed**

- 1 Handle (1 at the right and left each)**  
Hold the handles when dismounting/mounting the server from/in the rack.
- 2 Serial port B (COM B) connector**  
Connect device having a serial interface to this connector (such as remote console PC).
- 3 USB connectors (2 ports)**  
Connect device compliant with the USB interface to the connectors.
- 4 Dump (NMI) switch**  
Press this switch to dump server memory.
- 5 Power switch**  
Press this switch to turn on/off the power.  
Pressing the switch once turns on the power: the power lamp goes on.  
Pressing it again turns off the power.  
Keep pressing the switch for 4 seconds or more forcibly turns off the power.
- 6 UID (Unit ID) switch**  
Press this switch to turn on/off the UID lamps on the front and rear panels of the server.  
Pressing the switch once turns on the lamps.  
Pressing it again turns them off.
- 7 Optical device drive**  
7-1 Disk access lamp      7-2 Tray eject button      7-3 Emergency hole
- 8 3.5-inch floppy disk drive**  
This drive reads/writes data from/to the 3.5-inch floppy disk.  
8-1 Disk access lamp      8-2 Disk slot      8-3 Eject button
- 9 Hard disk bays**  
Mount SCSI hard disks in the bays.  
Each number following 9 indicates the SCSI ID.  
Dummy sponge blocks are mounted in the bays except 9-1 in the standard configuration.
- 10 Hard disk lamp (green/amber)**  
Each hard disk lamp is green during access to the hard disk.  
The lamp turns amber when the hard disk fails.  
The lamp flashes switching back and forth between green and amber during build processing (in only disk array configuration).
- 11 S-ATA hard disk drive bays**  
Mount S-ATA hard disks in the bay.  
The left side bay 11-1 is connected to channel 1 of the S-ATA connector on the motherboard.  
The right side bay 11-2 is connected to channel 2 of the S-ATA connector on the motherboard.

## Rear View

SCSI hot-swap hard disk drive model



S-ATA fixed hard disk drive model

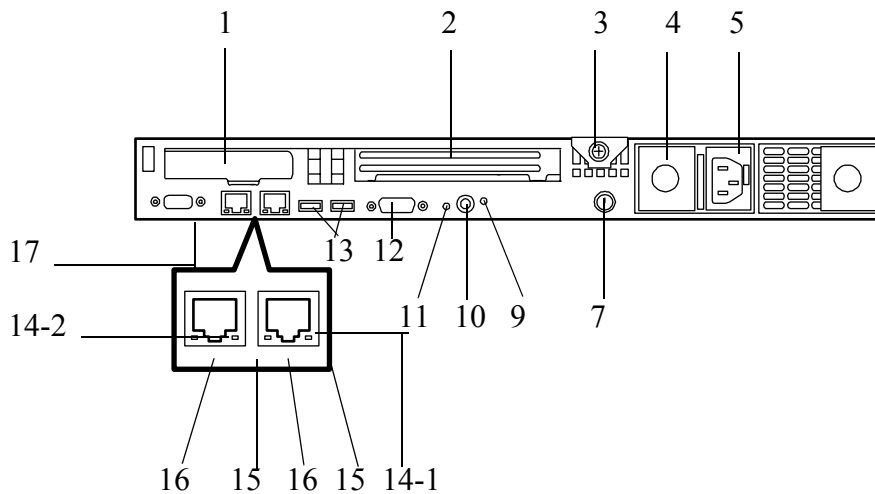


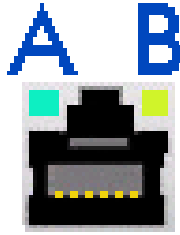
Figure 1 - 5 : 120Rf-1 Rear View

- 1 Low-profile PCI board extension slot**  
Mount PCI board of the low-profile type into this slot.  
The slot number is 1C.
- 2 Full-height PCI board extension slots**  
Mount PCI board of the full-height type in the slot.  
The slot number is 1B.
- 3 Captive thumbscrew**  
Secures the logic cover to the chassis.
- 4 Power supply**  
Supplies DC power to the server.
- 5 AC inlet**  
Connect the power cord to this socket.
- 6 Redundant power supply slot**  
An optional slot for 1+1 redundant power configuration.
- 7 Mouse/keyboard connectors**  
Connect the mouse and keyboard to the connectors through the provided relay cables.
- 8 SCSI connector**  
Connect external SCSI device to this connector.
- 9 UID lamp (blue)**  
This lamp goes on when the UID switch is pressed or when software issues a command.
- 10 UID switch**  
Press this switch to turn on/off the UID lamps on the front and rear panels of the server.  
Pressing the switch once turns on the lamps.  
Pressing it again turns them off.
- 11 DUMP (NMI) switch**  
Press this switch to dump system memory.
- 12 Serial port A (COM A) connector**  
Connect device having a serial interface to this connector.  
A leased line cannot be connected to this connector.
- 13 USB connector**  
Connect device compliant with the USB interface to this connector.
- 14 LAN connectors**  
Connect network systems on the LAN to the connectors. The number "1" following the bold-faced number indicates LAN port 1, and the number "2" indicates LAN port 2.
- 15 Speed lamp (amber)**  
This lamp indicates the transmission speed of the LAN.
- 16 LINK/ACT lamp (green)**  
This lamp indicates the access status of the LAN.
- 17 Monitor connector**  
Connect the display unit to this connector.

*RJ45 Leds*

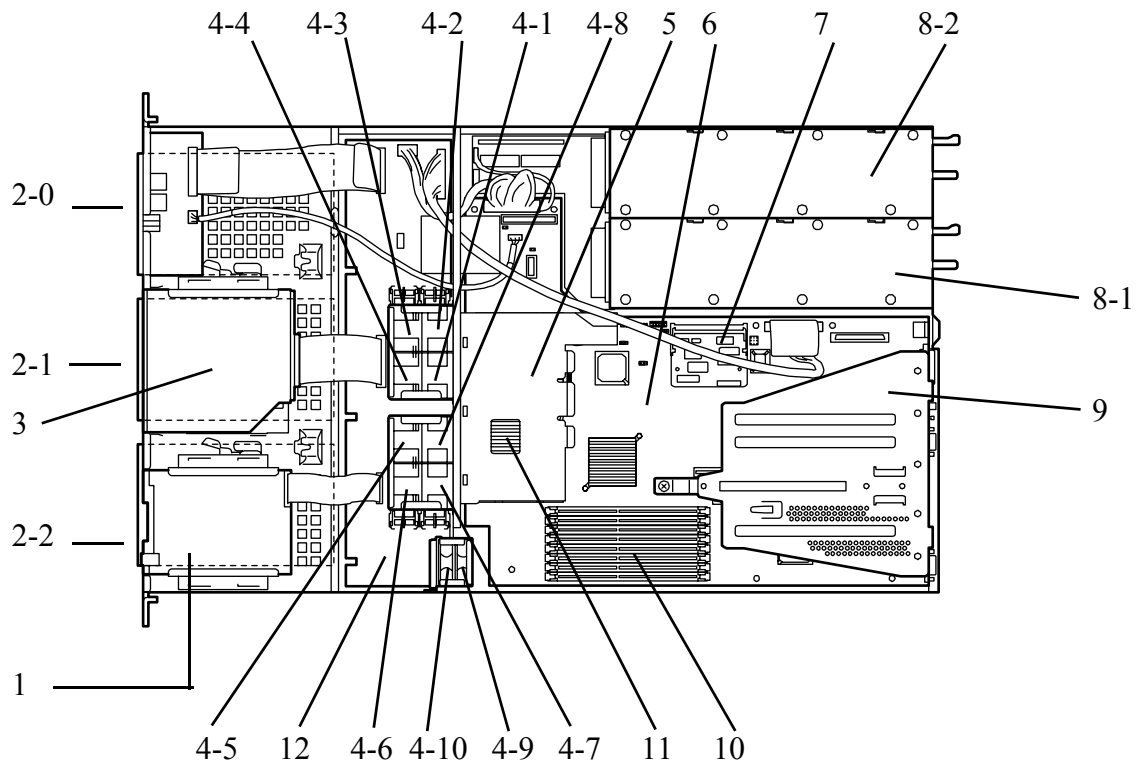
**Table 1 - 1: RJ45 Leds Activity**

Speed	Led A Activity	Led B Activity
10	Lights ON (green) when active	OFF
100		ON (green)
1000		ON (orange)



**Figure 1 - 6 : RJ45 Leds**

## Internal View

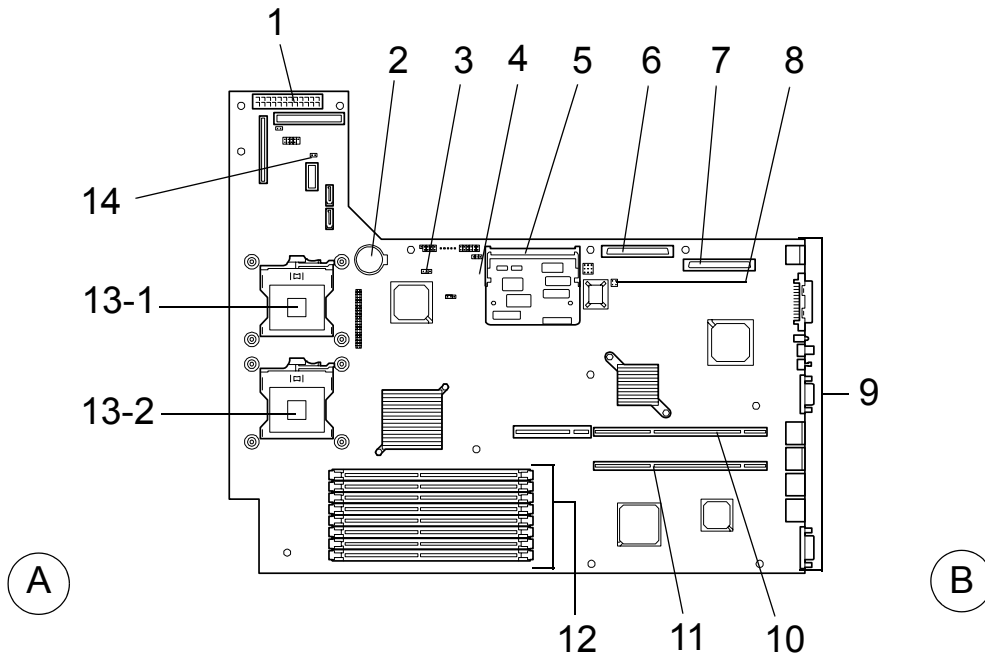


**Figure 1 - 7 : 120Rf-1 Internal View**

- 1 Floppy disk drive**
- 2 Disk bays**  
The second number is the channel number.  
Item 2-1 is used only for SCSI hot-swap hard disk drive model.
- 3 Optical device drive**
- 4 Cooling fans**  
The second number is the fan number.  
Fans #3, #4, #5, #6, and #9 are redundant options for the SCSI hot-swap hard drive model.
- 5 Fan duct**
- 6 Motherboard**
- 7 Remote Management Card**
- 8 Power supply (SATA fixed HDD model)**  
8-1 Standard (SCSI hot-swap HDD model).  
8-2 Option (SCSI hot-swap HDD model).
- 9 Riser card assembly**
- 10 DIMM**
- 11 Processor (mounted under the CPU and heat sink)**
- 12 Backplane**

# System board Features

## Motherboard



**Figure 1 - 8: Motherboard**

- A** Front side
- B** Rear side
- 1** Main power connector
- 2** Lithium battery
- 3** CMOS clear jumper switch
- 4** Hard disk drive access lamp pin header  
Connect here the LED relay cable of an additional SCSI/RAID controller.
- 5** Remote management card socket
- 6** SCSI 1 connector  
For SCSI hard disk drives
- 7** SCSI 2 connector  
For backup file device
- 8** Password clear jumper switch
- 9** Connectors for external devices
- 10** PCI riser card slot  
For full-height boards. 100 MHz/64-bit, 3.3V, PCI-X
- 11** PCI riser slot  
For only low-profile boards. 66MHz/64-bit, 3.3V, PCI-X
- 12** DIMM sockets (for the interleave type)  
The sockets are called #1, #2, #3, #4, #5, #6, #7 and #8 sequentially from top.
- 13** Processor sockets  
13-1 Processor #1 (CPU #1) - 13-2 Processor #2 (CPU #2)
- 14** Redundant fan jumper switch

## Processor

The system board accommodates one or two Intel Xeon processors with 1MB or 2MB cache in the PPGA-604 socket package. This processor uses the 90 nm technology and offers advanced performance. The processor external interface operates at a maximum of 800 MHz.

## Memory

The system board contains eight 240-pin DIMM slots each supporting 72-bit ECC (64-bit main memory plus ECC) registered SDRAM DIMMs (DDR2 400 compatible). Memory is two-way interleaved and partitioned in four banks. You may install a minimum of 512 GB (256 MB × 2) and as much as 16 GB.

The controller automatically detects, sizes, and initializes the memory array, depending on the type, size, and speed of the installed DIMMs, and reports memory size and allocation to the server via configuration registers.



**Note:** Use DIMMs that have been tested for compatibility with the server board.  
Contact your sales representative or dealer for a current list of approved memory modules.

---

## PCI Riser Slots

The mother board has two PCI riser slots. Riser slot B provides the following features:

- Bus speed up to 133 MHz
- 184 pin, 5 volt keyed, 64-bit expansion slot connector
- Support for a 3-slot PCI riser card
- Support for both full length and low profile PCI cards

Riser C provides the following features:

- Bus speed up to 66 MHz
- 184 pin, 5 volt keyed, 64-bit expansion slot connector
- Support for a 3-slot PCI riser card
- Support for only low profile PCI cards

## Video

The mother board uses an ATI RADEON 7000 PCI graphics accelerator with 16 MB of VRAM. The embedded SVGA video subsystem supports:

- Resolutions up to 1600 x 1200 under 2D and 1024 x 768 under 3D
- CRT and LCD monitors up to 100 Hz vertical refresh rate

The mother board supports disabling of the onboard video through the BIOS setup menu or when a plug in video card is installed in any of the PCI slots.


## SCSI Controller

The SCSI version of the server board includes an embedded Adaptec AIC-7902 controller providing dual Ultra320 Low Voltage Differential (LVD) SCSI channels.

The SCSI bus is terminated on the server board with active terminators that cannot be disabled. The onboard device must always be at one end of the bus. The device at the other end of the cable must also be terminated. LVD devices generally do not have termination built-in and need to have a termination source provided. Non-LVDs devices generally are terminated through a jumper or resistor pack on the device itself.

## Network Controller

---

 **Note:** To ensure EMC product regulation compliance, the system must be used with a shielded LAN cable.

---

The mother board uses a dual-channel Ethernet Controller and supports 10Base-T/100Base-TX/1000Base-T network subsystems.

The network controller supports the following features:

- 64-bit, 100 MHz PCI-X interface
- Integrated IEEE 802.3 10Base-T, 100Base-TX, and 1000Base-T compatible PHY
- IEEE 802.3u auto-negotiation support
- Chained memory structure similar to the 82559, 82558, 82557 and 82596
- Full duplex support at both 10 Mbps, 100 Mbps, and 1000 Mbps operation
- Low power +3.3 V device

On the system board, NIC 1 can be used as both a network interface and server management interface.

## Keyboard and Mouse

The keyboard/mouse controller is PS/2-compatible. A Y-cable can be used if both a PS/2 mouse and keyboard are required at the same time.

## ACPI

The mother board supports the Advanced Configuration and Power Interface (ACPI) as defined by the ACPI 2.0 specifications. An ACPI aware operating system can put the system into a state where the hard drives spin down, the system fans stop, and all processing is halted. However, the power supply will still be on and the processors will still be dissipating some power, so the power supply fans will still run.

The system board supports sleep states s0, s1, s4, and s5:

- s0: Normal running state.
- s1: Processor sleep state. No context will be lost in this state and the processor caches will maintain coherency.
- s4: Hibernate or Save to Disk: The memory and machine state are saved to disk. Pressing the power button or other wakeup event will restore the system state from the disk and resume normal operation. This assumes that no hardware changes have been made to the system while it was off.
- s5: Soft off: Only the RTC section of the CSB and the BMC are running in this state. No context is saved by the OS or hardware.



### Caution

The system is off only when the AC power cord is disconnected.

---

## **Remote Management Card (RMC) - optional**

Server management is concentrated in the Remote Management Card (RMC). The RMC and associated circuitry are powered from a 5Vdc standby voltage, which remains active when system power is switched off, but the ac power source is still on and connected.

The RMC supports Dianascope, which allows remote server management through the network. Events monitored by the manager system include over-temperature and over-voltage conditions, fan failure, or chassis intrusion.

Information on Dianascope may be found in the EXPRESSBUILDER CD-ROM.

One major function of the RMC is to autonomously monitor system management events, and log their occurrence in the nonvolatile System Event Log (SEL). The events being monitored include overtemperature and overvoltage conditions, fan failure, or chassis intrusion. To enable accurate monitoring, the RMC maintains the nonvolatile Sensor Data Records (SDRs), from which sensor information can be retrieved. The RMC provides an ISA host interface to SCR sensor information, so that software running on the server can poll and retrieve the server's current status.

The RMC performs the following:

- Monitors server board temperature and voltage\*
- Monitors processor presence and controls Fault Resilient Boot (FRB)
- Detects and indicates baseboard fan failure\*
- Manages the SEL interface
- Manages the SDR Repository interface
- Monitors the SDR/SEL timestamp clock
- Monitors the system management watchdog timer

- Monitors the periodic SMI timer
- Monitors the event receiver
- Controls secure mode, including video blanking, diskette write-protect monitoring, and front panel lock/unlock initiation
- Controls Wake On LAN via Magic Packet support.

\*ESMPRO also supports these features.

## **Degradation Feature**

The degradation feature automatically isolates a failed DIMM or processor to assure continuous operation of the server when the POST (Power On Self-Test, self-diagnosis program after power on) detects such a DIMM or processor.



**Note:** The degradation feature is only available when at least two DIMMs or processors are installed.

---

Failed DIMMs and processors may be identified on the screen that the POST displays, or with the BIOS setup utility of the server, "SETUP." They may also be identified on the system that has the ESMPRO installed.

## **Remote Power-On Feature (Wake On LAN)**

The remote power-on function turns on the server through a network. It sends a special packet from the management computer to a remote server to turn it on if the server is off-powered.

To enable this feature, use the BIOS setup utility, "SETUP." (See ["BIOS Setup Utility" on page 3-3.](#))

The remote power-on feature is not available in the following cases. Press the POWER switch once to start the OS, and turn off the server in an appropriate procedure.

- Abnormal previous system shut-down
- No power supply to the server (due to turned-off breaker, disconnected power cord, power blackout, etc.)

## **AC-Link Feature**

When the power cord of the server is connected to an uninterruptible power supply (UPS) unit, the server supports the power linkage feature that enables control over the power supply from the UPS to the server. The AC-Link feature can be enabled or disabled with the Server menu of the BIOS setup utility, "SETUP." (See ["BIOS Setup Utility" on page 3-3.](#))

## **ESMPRO**

The ESMPRO is a server management software that runs on the OS. The ESMPRO includes the ESMPRO Manager for the server monitoring terminal and the ESMPRO Agent for the server.

## **Off-line Maintenance Utility**

The Off-line Maintenance Utility is used for proactive maintenance and fault analysis of the server.

## **System Diagnostic Utility**

The system diagnostic utility contained in the EXPRESSBUILDER is useful to prevent the hardware failures. See ["EXPRESSBUILDER CD-ROM" on page 1-25.](#)

## **Dianascope**

The Dianascope is a software for the remote management of the Express5800 series. The Dianascope can control the managed server even if OS is not running on the managed server. To use the Dianascope, you need to purchase the separately priced server license.

See the online documentation located on the EXPRESSBUILDER CD-ROM.

## Standard Features

### High performance

- Intel® Xeon™ Processor
- High-speed network interface (1000Mbps/100Mbps/10Mbps supported)
- High-speed disk access (Ultra320 SCSI or S-ATA)
- High-speed memory access (DDR2-400)

### High reliability

- Memory monitoring feature (error correction/error detection)
- CPU/memory degradation feature (logical isolation of a failed device)
- Memory chip kill
- Bus parity error detection
- Temperature detection
- Error notification
- Internal fan monitoring feature
- Internal voltage monitoring feature
- Auto-rebuild feature (optional, hot-swappable)
- BIOS password feature
- Mechanical security lock
- Onboard RAID controller
- Redundant fans (optional)
- Redundant power supply (option in 1\*)
- Remote Management Card (optional)

### Management utilities

- ESMPRO
- DianaScope

### Maintenance Features

- Off-line Maintenance Utility
- Memory dump feature using the DUMP switch

### Expandability

- One 64-bit/133 MHz PCI-X and one 64-bit/66 MHz PCI-X
- Large memory of up to 16 GB
- Three hot-swap SCSI hard disk drive bays\*<sup>1</sup>
- Up to two multi-processors are available for upgrade.
- USB interface (A USB-support driver is required.)
- Two network ports

### Many available features

- Graphic accelerator "RADEON 7000" support
- El Torito Bootable CD-ROM (no emulation mode) format support
- POWER switch mask
- Software power-off
- Remote power-on feature
- AC-Link feature
- Consoleless feature

### Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis (T&D)

\*<sup>1</sup> SCSI hot-swap hard disk drive model

\*<sup>2</sup> S-ATA fixed hard disk drive model

## Easy and Fine Setup

- EXPRESSBUILDER  
(system setup utility)
- Configuration Parameter Diskette  
Creator
- SETUP (BIOS setup utility)
- SCSISelect (SCSI device RAID  
configuration<sup>\*1</sup> utility)
- Array configuration<sup>\*2</sup>

<sup>\*1</sup> SCSI hot-swap hard disk drive model


<sup>\*2</sup> S-ATA fixed hard disk drive model

## Power Supply

The SCSI hot-swap hard disk drive model contains one auto-sensing 465-watt power supply at an operating frequency of 50/60 Hz.

A second optional power supply may be added as part of a fault-tolerant hot-swap design. With two power supplies installed, in the unlikely event of a power supply failure, the load is transferred to the remaining power supply without interruption to normal operation. In this case the faulty power supply can be replaced without powering down the server.

---

 **Note:** The power supplies are not hot-swappable unless there are two power supplies installed.

---

The power supply for S-ATA fixed hard disk drive model is rated for 425 watts of power at an operating frequency of 50/60 Hz.


The power subsystem supports implementation of remote management features including remote enable that permits power to be activated from different sources.

## Peripheral Bays

Your server supports a variety of standard PC AT-compatible peripheral devices. The chassis includes these peripheral bays:

- A 3.5-inch front panel bay for mounting the standard 3.5-inch diskette drive (supports 720 KB and 1.44 MB diskette media)
- A standard optical device drive bay
- Three hot-swap SCSI hard disk drive bays or two S-ATA hard disk drive bays for mounting hard disk drives installed in easily removable drive carriers.

---

 **Note:** The hot-swap SCSI hard disk drive bays contain a hot-swap back plane that require an 80-pin single connector attachment (SCA) connector on the drives that you install.

---

## System Cooling

The 120Rf-1 SATA fixed HDD server includes a fan module with five fans for cooling the processor(s), hard drives, and PCI cards.

The 120Rf-1 SCSI hot-swap HDD server includes a fan module with five fans and can include five optional redundant fans (option).

The fan system is located in the middle of the SATA and SCSI chassis to pull cooling air through the chassis. The power supply contains two built-in fans for cooling.

## Server Security

To help prevent unauthorized entry or use of the server, the server includes a full lockable front bezel and Server Management software that monitors the front bezel intrusion switch.

### *Security with Mechanical Locks and Monitoring*

To unlock the bezel, insert the key in the lock and turn the lock counterclockwise until it stops (about a quarter turn).

The bezel is unlocked and can be opened again.

To lock the bezel, insert the key in the lock. Turn the lock clockwise until it stops (about a quarter turn).

The bezel is locked and cannot be opened.

### *Software Locks via the BIOS Setup Utility*

The BIOS Setup Utility provides security features to prevent unauthorized or accidental access to the system. Once the security measures are enabled, you can access the system only after you enter the correct password(s). For example:

- Enable the keyboard lockout timer so that the server requires a password to reactivate the keyboard and mouse after a specified time out period - 1 to 120 minutes.
- Set and enable a supervisor password.
- Set and enable a user password.
- Set secure mode to prevent keyboard or mouse input and to prevent use of the front panel reset and power switches.
- Activate a hot key combination to enter secure mode quickly.
- Disable writing to the diskette drive when secure mode is set.
- Disable access to the boot sector of the operating system hard disk drive.

### **Using Passwords**

You can set either the user password, the supervisor password, or both passwords. If only the user password is set, you:

- Must enter the user password to enter BIOS Setup.
- Must enter the user password to boot the server if Password on Boot is enabled in the BIOS Setup.
- Must enter the user password to exit secure mode.

If only the supervisor password is set, you:

- Must enter the supervisor password to enter BIOS Setup.
- Must enter the supervisor password to boot the server if Password on Boot is enabled in the BIOS Setup.
- Must enter the supervisor password to exit secure mode.

If both passwords are set, you:

- May enter the user password to enter BIOS Setup. However, you will not be able to change many of the options.
- Must enter the supervisor password if you want to enter BIOS Setup and have access to all of the options.
- May enter either password to boot the server if Password on Boot is enabled in either the BIOS Setup.
- May enter either password to exit secure mode.

### **Secure Mode**

Configure and enable the secure boot mode by using the BIOS Setup (See “BIOS Setup Utility” on page 3-3).

When secure mode is in effect:

- You can boot the server and the operating system will run, but you must enter the user password to use the keyboard or mouse.
- You cannot turn off the server power or reset the server from the front panel switches.

Secure mode has no effect on functions enabled via remote server management or power control via the watchdog timer.

Taking the server out of secure mode does not change the state of system power. That is, if you press and release the power switch while secure mode is in effect, the system will not be powered off when secure mode is later removed. However, if the front panel power switch remains depressed when secure mode is removed, the server will be powered off.

## Software Security Features

The table below lists the software security features and describes what protection each offers. In general, to enable or set the features listed here, run the BIOS Setup and go to the Security Menu (See “Security Menu” on page 3-10).

The table also refers to the Setup utility (See “BIOS Setup Utility” on page 3-3).

**Table 1 - 1: Software Security Features**


Feature	Description
Secure mode	<p>How to enter secure mode:</p> <ul style="list-style-type: none"> <li>- Setting and enabling passwords automatically places the server in secure mode.</li> <li>- If you set a hot-key combination (through Setup), you can secure the system simply by pressing the key combination. This means you do not have to wait for the inactivity time-out period.</li> </ul> <p>When the server is in secure mode:</p> <p>The server can boot and run the operating system, but mouse and keyboard input is not accepted until the user password is entered.</p> <p>At boot time, if a CD is detected in the optical device drive or a diskette in drive A, the system prompts for a password. When the password is entered, the server boots from CD or diskette and disables the secure mode.</p> <p>If there is no CD in the optical device drive or diskette in drive A, the server boots from drive C and automatically goes into secure mode. All enabled secure mode features go into effect at boot time.</p> <p>To leave secure mode: Enter the correct password(s).</p>
Disable writing to diskette	<p>In secure mode, the server will not boot from or write to a diskette unless a password is entered.</p> <p>To write protect access to diskette whether the server is in secure mode or not, use the Setup main menu, Floppy Options, and specify Floppy Access as read only.</p>
Set a time out period so that keyboard and mouse input are not accepted.  Also, screen can be blanked, and writes to diskette can be inhibited	<p>Specify and enable an inactivity time out period of from 1 to 120 minutes.</p> <p>If no keyboard or mouse action occurs for the specified period, attempted keyboard and mouse input will not be accepted.</p> <p>The monitor display will go blank, and the diskette drive will be write protected (if these security features are enabled through Setup).</p> <p>To resume activity: Enter the correct password(s).</p>

Table 1 - 1: Software Security Features

Feature	Description
Control access to using the BIOS Setup: set supervisor password	<p>To control access to setting or changing the system configuration, set a supervisor password and enable it through Setup.</p> <p>If both the supervisor and user passwords are enabled, either can be used to boot the server or enable the keyboard and/or mouse, but only the supervisor password will allow Setup to be changed.</p> <p>To disable a password, change it to a blank entry in the Change Password menu of the Supervisor Password Option menu found in the Security Subsystem Group.</p> <p>To clear the password if you cannot access Setup, change the Clear Password jumper (see "Security Menu" on page 3-10).</p>
Control access to the system other than BIOS Setup: set user password	<p>To control access to using the system, set a user password and enable it through Setup.</p> <p>To disable a password, change it to a blank entry in the Change Password menu of the User Password Option menu found in the Security Subsystem Group.</p> <p>To clear the password if you cannot access Setup, change the Clear Password jumper (see "Security Menu" on page 3-10).</p>
Boot without keyboard	The server can boot with or without a keyboard. During POST, before the system completes the boot sequence, the BIOS automatically detects and tests the keyboard if it is present and displays a message.
Specify the boot sequence	The sequence that you specify in setup will determine the boot order. If secure mode is enabled (a user password is set), then you will be prompted for a password before the server fully boots. If secure mode is enabled and the "Secure Boot Mode" option is also enabled, the server will fully boot but will require a password before accepting any keyboard or mouse input.

## SAF-TE LOGIC

---

 **Note:** SAF-TE Logic is in servers that include the hot-swap SCSI disk drive bay. SAF-TE Logic is not available in servers that include the standard SCSI disk drive bay.

---

The SCSI backplane includes SAF-TE (SCSI Accessed Fault Tolerant Enclosure) logic that provides an interface to the disk subsystem that supports status signals, hot swapping drives, and enclosure monitoring.

The transport mechanism for the standardized alert detection and status reporting is the SCSI bus. Disk drives, power supplies, cooling fans, and temperature are continually monitored and the conditions then reported over the SCSI bus to the system. When used with RAID management software the user can be alerted of impending or imminent disk conditions requiring attention. This allows the user to react to conditions that could normally go unnoticed until data loss.


## **EXPRESSBUILDER CD-ROM**

Please setup the server using the EXPRESSBUILDER CD-ROM both when setting it up for the first time, and when you make changes to its configuration.

### **With the EXPRESSBUILDER CD you can:**

- Install the Operating System, using the Express Setup.
- Diagnose the system, using the System Diagnostics tool.
- Create a support disk; this disk will be used to manually install a Microsoft operating system.
- Update the BIOS or the server firmware.
- Update a Microsoft operating system, using the “Update Express5800 System” feature of the Master Control menu (available from the windows-based Express-builder).
- Install utilities, such as management software for Windows (ESMPRO, Diana-scope, etc.), and DOS-based maintenance utilities (System Diagnostics, Off-line Maintenance Utility, etc.). Windows-based applications are installed via the Master Control menu, whereas DOS-based utilities are installed via the Tools menu. Refer to the appendices for more information.
- Read the on-line documentation (Windows systems only).

---

 **Note:** Some of the above features can be performed remotely using a cross cable (COM) or LAN.

---

### **Software End-User License Agreement**

Carefully read the terms and conditions of the Software End User License Agreement printed on the EXPRESSBUILDER CD-ROM sleeve.

This page is intentionally left blank.

# 2

## Setting Up Your Server

## Overview

This chapter describes how to:

- select a site,
- unpack the server,
- install the server into a standard EIA 19-inch rack cabinet,
- make cable connections,
- power on/off the server.


## Selecting a Site

To use the server, install it on a standard EIA 19-inch rack assembly ([See “Installing the Server into a Rack” on page 2-5](#)).

The rack has to be installed in a site that is:

- Near grounded, three-pronged power outlets.

---

 **Note:** For the United States and Canada, this means a NEMA 6-15R outlet for 200-240 VAC. The server cannot be used on a NEMA 5-15R outlet for 100-120 VAC. For other international sites, this means three-pronged power outlets applicable for the electrical code of the region.

---

---

### Warning

Be sure the power service connection is through a properly grounded outlet.

---

- Clean, dust-free, and well ventilated. Every side ventilating openings kept free of obstructions. Away from sources of heat, vibration or physical shock.
- Isolated from strong electromagnetic fields and electrical noise produced by electrical devices (such as air conditioners, large fans, large electric motors, radio and TV transmitters, and high-frequency security devices)
- Spacious enough around the server to allow proper cooling, airflow, and cable clearance.

---

### Caution

Leave enough space behind the server. Not doing so may result in overheating and damaging the server.

---

- Easily accessible for server maintenance and installation of server upgrades.

## ***Unpacking the Server***

When you receive your server, inspect the shipping containers prior to unpacking. If the shipping boxes are damaged, note the damage, and if possible, photograph it for reference. After removing the contents of the containers, keep the cartons and the packing materials. If the contents appear damaged when you unpack the boxes, file a damage claim with the carrier immediately.

## ***Installing the Server into a Rack***

This section provides the instructions to install the 120Rf-1 server into a standard EIA 19-inch rack cabinet.

### ***Before Installation***

---

#### **Warning**

- Do not use any rack which does not conform to the relevant standard.
  - Disconnect the power cord(s) before installing or removing the server.
  - Do not install the server on the rack leaving the cover removed.
  - Do not pinch your finger with mechanical components.
- 

### ***Restricted Access Location***

The server is intended for installation in a Restricted Access Location, mounted above a non-combustible material.

### ***Static Precautions***

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground when handling server components.

Electronic devices can be easily damaged by static electricity. To prevent damage, keep them in their protective packaging when they are not installed in your server.

### ***Checking Components***

Check that you have the components to install the server on the rack (screws, core nuts, sliding rails).

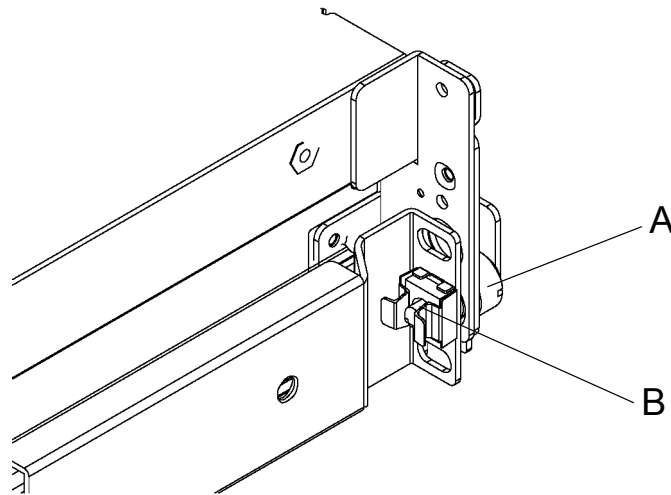
### ***Required Tools***

Prepare a Phillips screwdriver to install the server in the rack.

## ***Installing the Server***

### ***Preparing before Installation***

The slide rail is fixed with the screw to prevent its falling off during transportation. Remove the left and right core nuts from the front of the server before you install the server in the rack.



**Figure 2 - 1: Removing the Core Nut before Installing the Server**

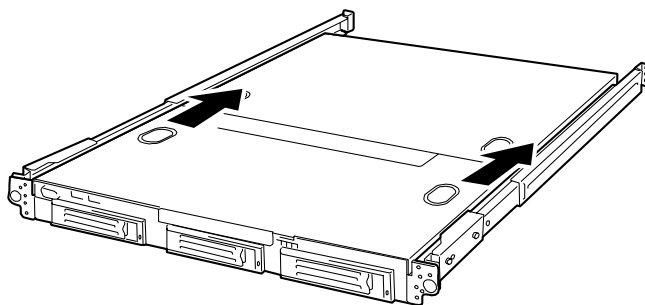
<b>A</b>	<b>Set screw</b>
<b>B</b>	<b>Core nut</b>

Hold the core nut, and rotate the set screw to remove the core nut.

Keep the removed core nuts for future use.

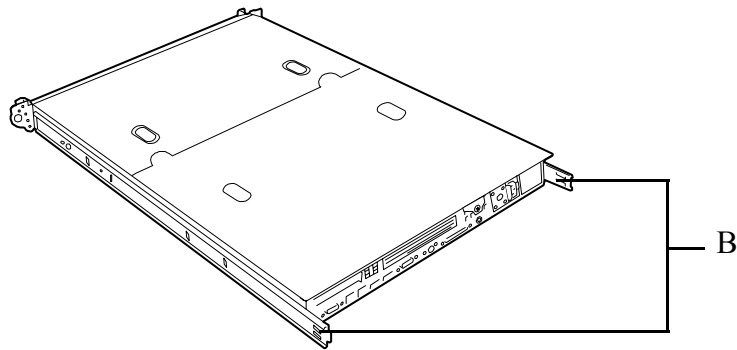
### ***Removing the Rail Assemblies***

1. Remove the sliding rails from the server.
2. Hold the rails and slowly slides them toward the rear of the server until a 'click' is heard.  
The rails are locked.
3. Push the release levers on the right and left sides of the server, and remove the rail assemblies from the server while unlocking.



**Figure 2 - 2 : Removing the Rails Assemblies from the Server**

Only the inner rails remain screwed to the server when the rail assemblies have been removed.



B - Inner Rails

**Figure 2 - 3: Inner Rails**



## Caution

The removed rail assemblies are to be installed on the inner rails later. To install each rail assembly on the correct inner rail, make a mark on the assemblies.

When installing more than one server, distinguish between the pairs of inner rails and rail assemblies of the servers by making marks.

---

### *Installing the Core Nuts on the Rack*

You have to install:

- three core nuts on the front of the rack for each of the right and left sides,
- two core nuts on the rear of the rack for each of the right and left sides.

### **Installing three core nuts on the front of the 1U rack for each of the right and left sides**

Three slots (square holes) are opened per 1U of a rack. For any NEC rack, round marks are put in the unit of 1U.

You have to install one core nut in each of the three slots of the 1U (*A in Figure 2-3 below*).

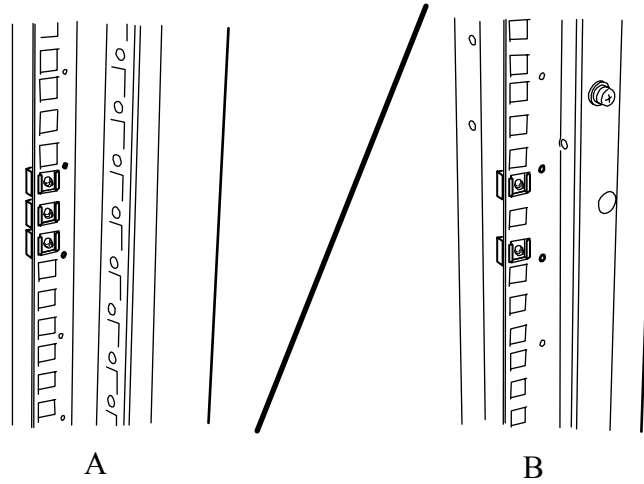
To install one core nut in a slot:

1. Hang a clip of the core nut on a slot on the rack.
  2. Insert the other clip into the slot by using a tool such as a flat tip screwdriver.
- For one core nut installed on the front of the rack:
- the lower nut fixes the front of the rail assembly,
  - the upper nut supports the set screw of the server.

### Installing two core nuts on the rear of the 1U rack for each of the right and left sides


Use the previous procedure to install one core nut in the upper slot of the 1U unit and one core nut in the lower slot.

The two core nuts installed on the rear of the rack (*B*) fix the rear of the rail assemblies.



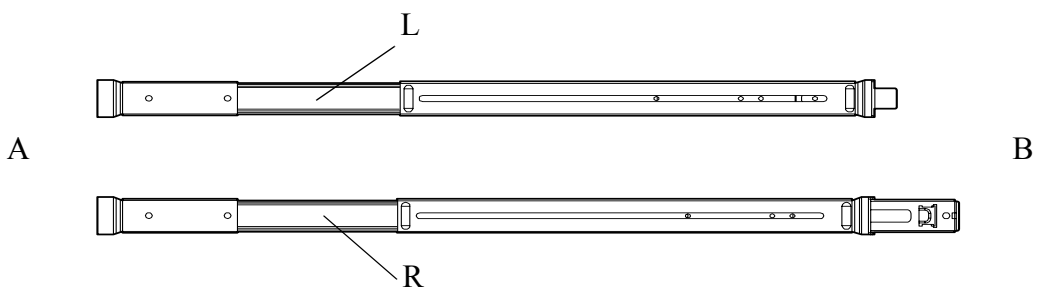
A - Front of the rack    B - Rear of the rack

**Figure 2 - 4 : Installing the Core Nuts on the 1U Rack**

 **Note:** Check that all the core nuts are installed at the same 1U level.

### Installing the Rail Assemblies

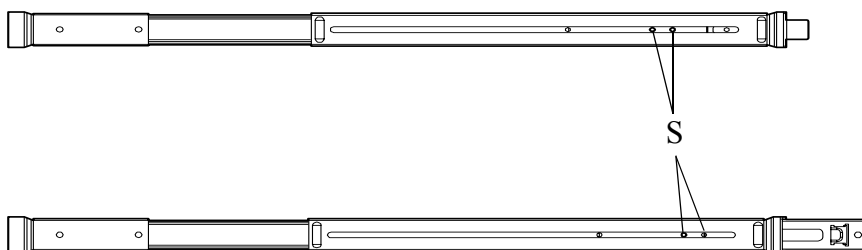
Make sure of the right side rail assembly or the left one when installing it.



A - Front  
B - Rear  
L - Left side rail assembly  
R - Right side rail assembly

**Figure 2 - 5 : Left and Right Side Rail Assemblies**


1. Remove the screws (S) securing the rail assembly.



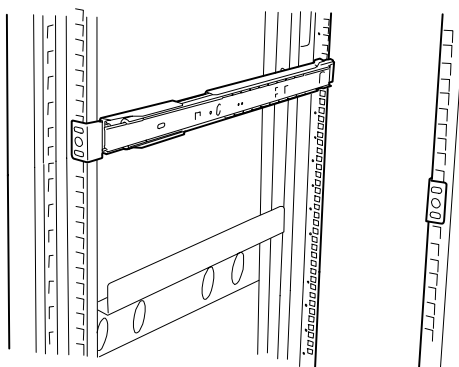
**Figure 2 - 6: Rail Assembly Screws (S)**

2. Align the front and rear frames of rail assembly to the location where the core nuts are installed.  
Locate the rail assembly so that the frame of the rack is located between core nuts and frames of rail assembly.

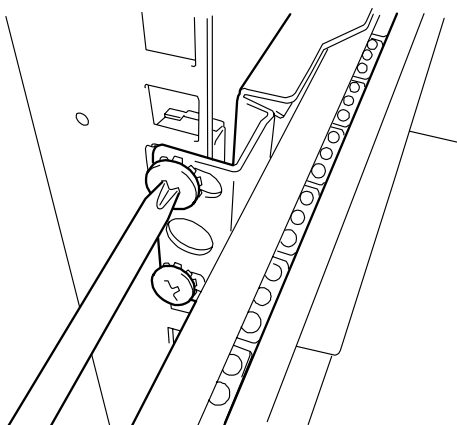
---

 **Note:** Check that the portion of the frame to fix the rail assembly is located in front of the rack frame.

---



3. Firmly secure the rail assembly.



**Figure 2 - 7 : Securing the Rail Assembly**

## Installing the Server into the Rack

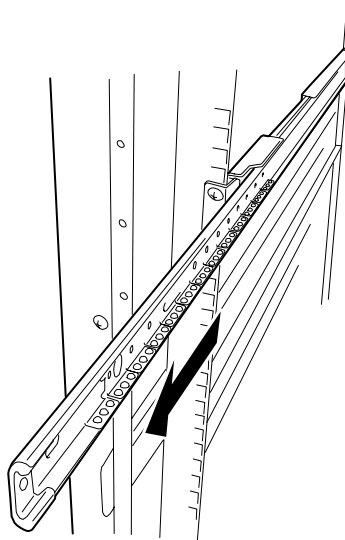


### Caution

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See “General Safety Information” on page 4-2 for details.

- At least two persons are required to install the server.
  - Do not pinch your finger with mechanical components.
- 

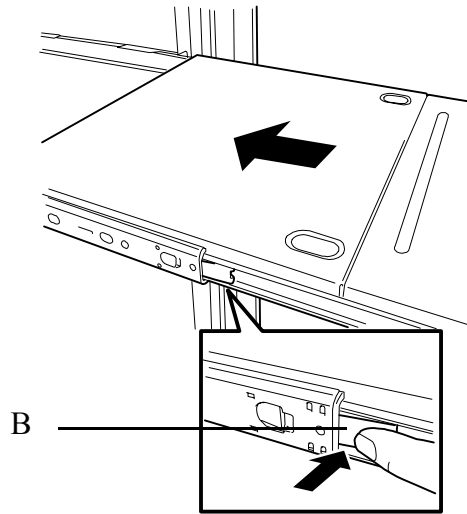
1. Pull out the sliding rails of the right and left rail assemblies until they are locked.



**Figure 2 - 8 : Locking the Sliding Rails**

2. Securely hold the server and install it in the rack.
3. Firmly fit the inner rails on the sides of the server into the rail assemblies that are installed on the rack.
4. Slowly push the server into the rack.


5. If the server is locked on its way into the rack, slowly push it in while pressing the release levers (B) on the right and left sides of the server.



**Figure 2 - 9 : Pushing the Server while Pressing the Release Levers (B)**

6. When the server is installed for the first time, the mechanical parts are rather hard to slide. You may feel strong friction when pushing in the server. In this case, strongly push it in.
7. Check that the sliding rails work normally by pulling the server out of the rack and pushing it in several times.

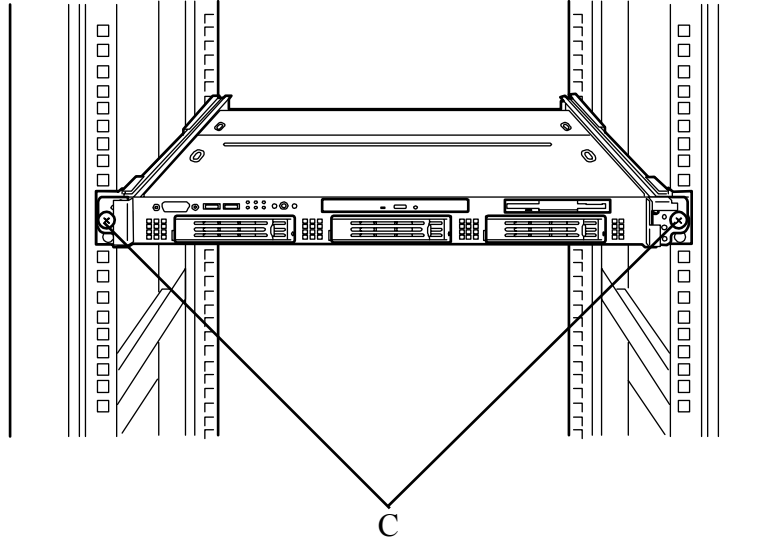
---

 **Note:** Check that the sliding rails work normally. If the sliding rails are stuck to the rack frame and do not come out, reinstall them.

---

### *Securing the Server in the Rack*

1. Push the server into the rack as far as it will go.
2. Tighten the right and left captive thumb screws (C) on the server front panel to secure the server to the rack.



**Figure 2 - 10 : Tightening the Server Captive Thumb Screws (C)**

3. Install the front bezel.
4. If you have an optional cable arm, install it by following the procedure ([see \*"Installing the Optional Cable Arm"\* on page 2 - 13](#)).

## ***Installing the Optional Cable Arm***

---

### **Warning**

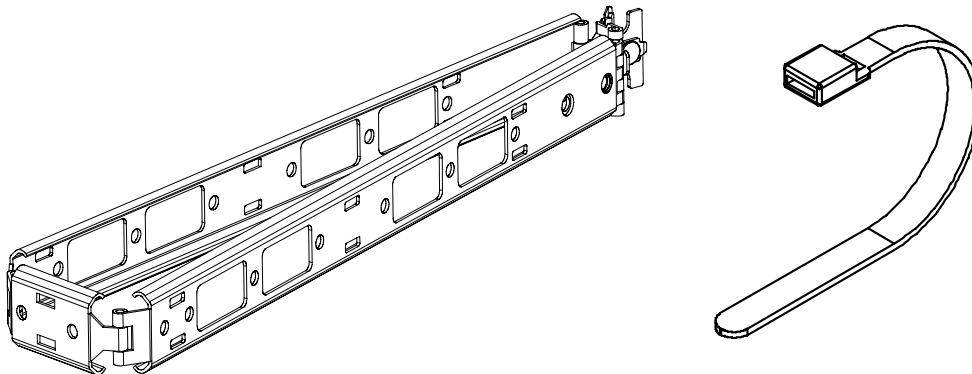
- Install the cable arm on the basic processing unit carefully, paying attention not to injure people.
  - Do not disassemble, repair, and alter the cable arm. This may cause people to be injured and/or the cable arm and surrounding devices to be damaged.
- 

---

### **Caution**

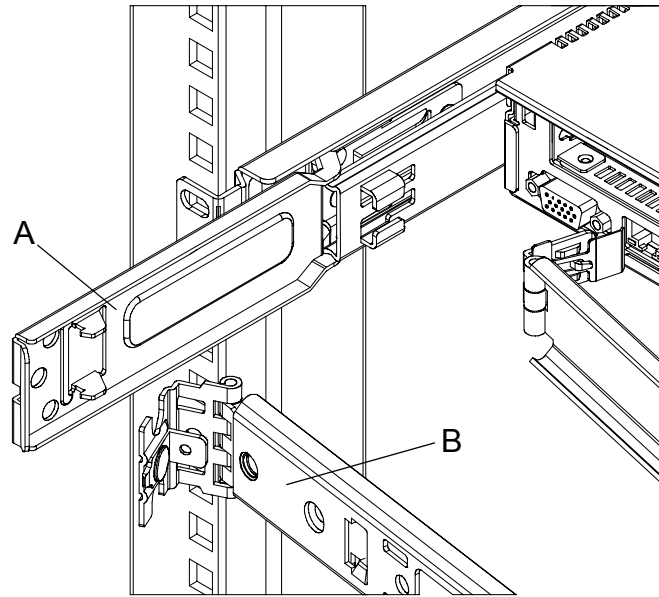
- Do not install the SCSI cable on the cable arm.
  - Always pull out the unit from the rack after removing the cables which are not installed on the cable arm.
- 

After unpacking the cable arm, check that the appropriate accessories are contained in the package. The components shown below are required to install the cable arm on the server.



To install the optional cable arm:

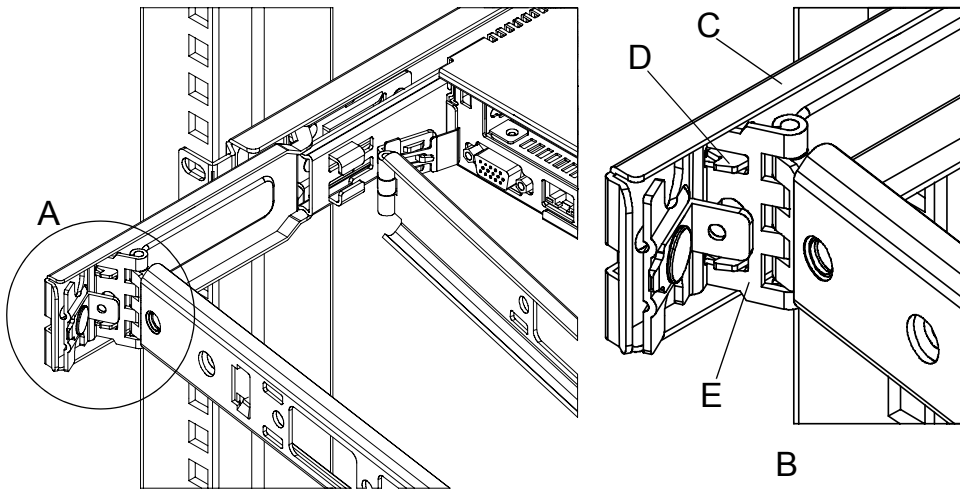
1. Install one end of the cable arm on the rail bracket



- A Rail bracket  
B Cable arm

**Figure 2 - 11: Installing the Cable Arm on the Rail Bracket**

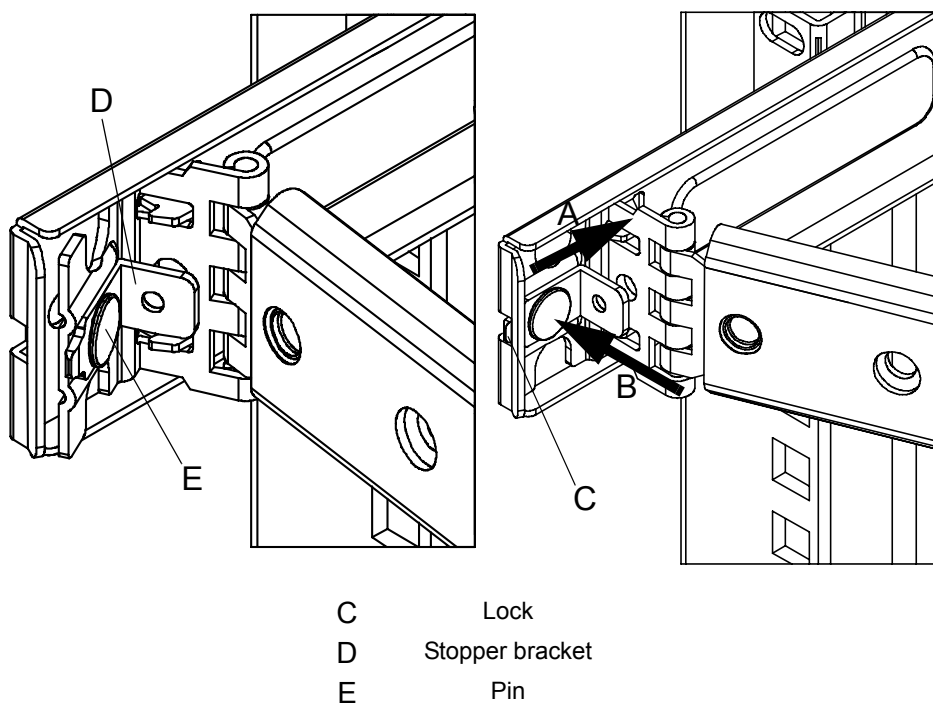
2. Hook the arm stopper A on the nail of slide rail bracket.



- B Detail A  
C Slide rail bracket  
D Nail  
E Arm stopper A

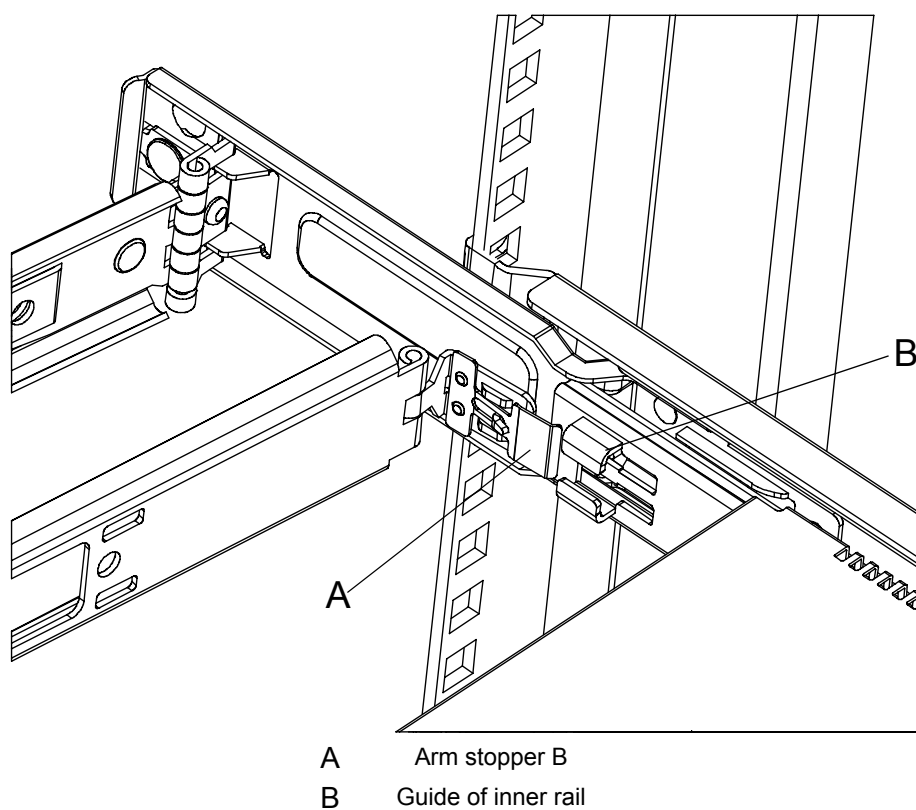
**Figure 2 - 12: Hooking the Arm Stopper A on the Slide Rail Bracket**

3. Push the Stopper bracket (*D*) in the direction *A* and then push the pin (*E*) in the direction *B* until stopper bracket locks.



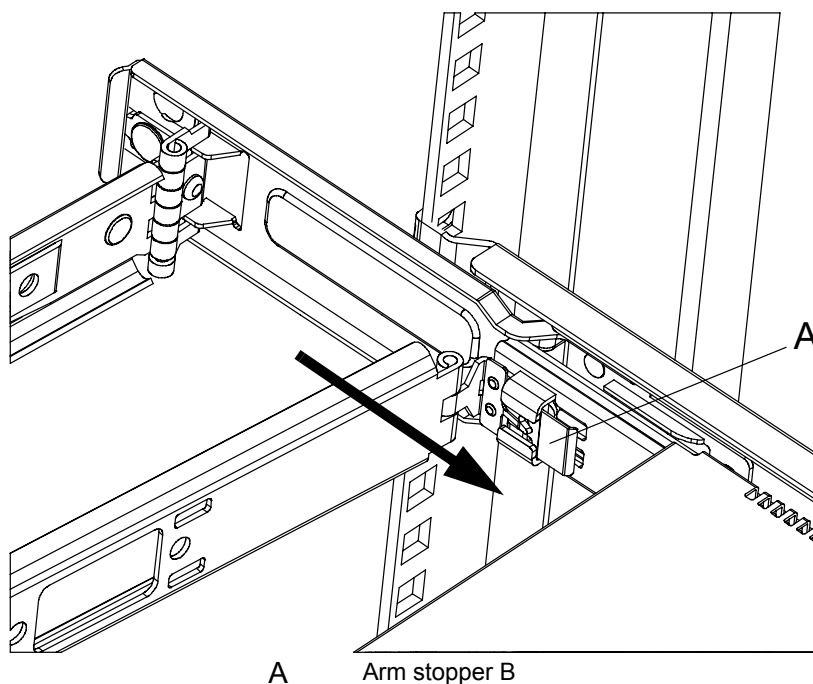
**Figure 2 - 13: Locking the Stopper Bracket**

4. Install the other end of the cable arm (arm stopper *B*) into the guide of the inner rail.



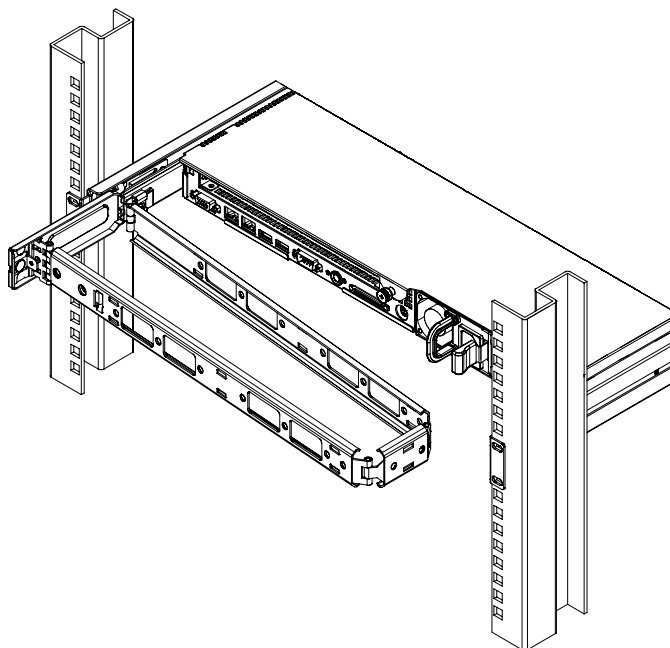
**Figure 2 - 14: Installing Arm Stopper B into Guide of Inner Rail**

5. Insert the Arm stopper B into the guide of the inner rail until it locks.



**Figure 2 - 15: Inserting Arm Stopper B into Guide of Inner Rail**

6. Remove and insert the unit for several times to check that:
  - the cable arm is moved smoothly,
  - the unit can be mounted on the rack securely.
7. Temporarily fix the cables to the arm with repeat ties.
8. Fix the cables to the arm securely with the unit pulled out from the rack.



**Figure 2 - 16 : The Optional Cable Arm Installed on**

## Removing the Server from the Rack Assembly

The server should be removed from the rack by at least two persons.

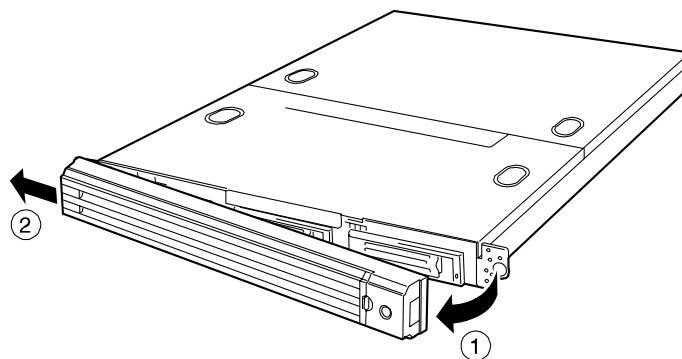
---

### Warning

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See [“General Safety Information” on page 4-2](#) for details.

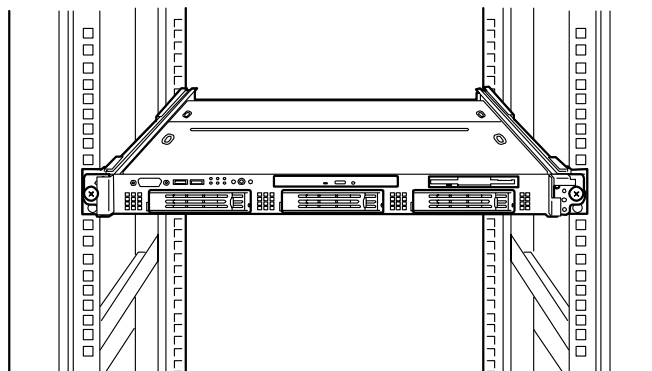
- Do not lift the server only by a single person.
  - Do not pinch your finger with mechanical components.
  - Note high temperature.
  - Do not pull out a device from the rack if the rack is unstable.
  - Do not leave more than one device being pulled out from the rack.
- 

1. Release the security lock to remove the front bezel.



2. Confirm that the power of the server is OFF, and disconnect the power cable and all the interface cables connected to the server.
3. <This step is required only when the optional cable arm is mounted.>  
Remove the two screws securing the cable arm, and dismount the cable arm from the server.

4. Loosen the two captive thumb screws.
5. Hold the handle and pull out the server from the rack slowly and carefully.  
The server clicks to be latched.



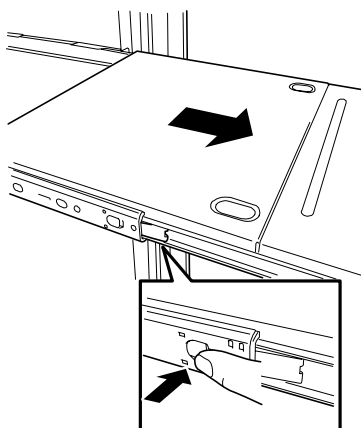
6. Pull out the server from the rack with the right and left release lever pressed to release the latch.



### Caution

- Pull out the server slowly holding the bottom of the server by at least two persons.
  - Do not apply any load on the server pulled out from the rack.  
Doing so may cause personal injury if the server drops.
- 

To remove some mechanical parts of the rack, see the installation procedure.



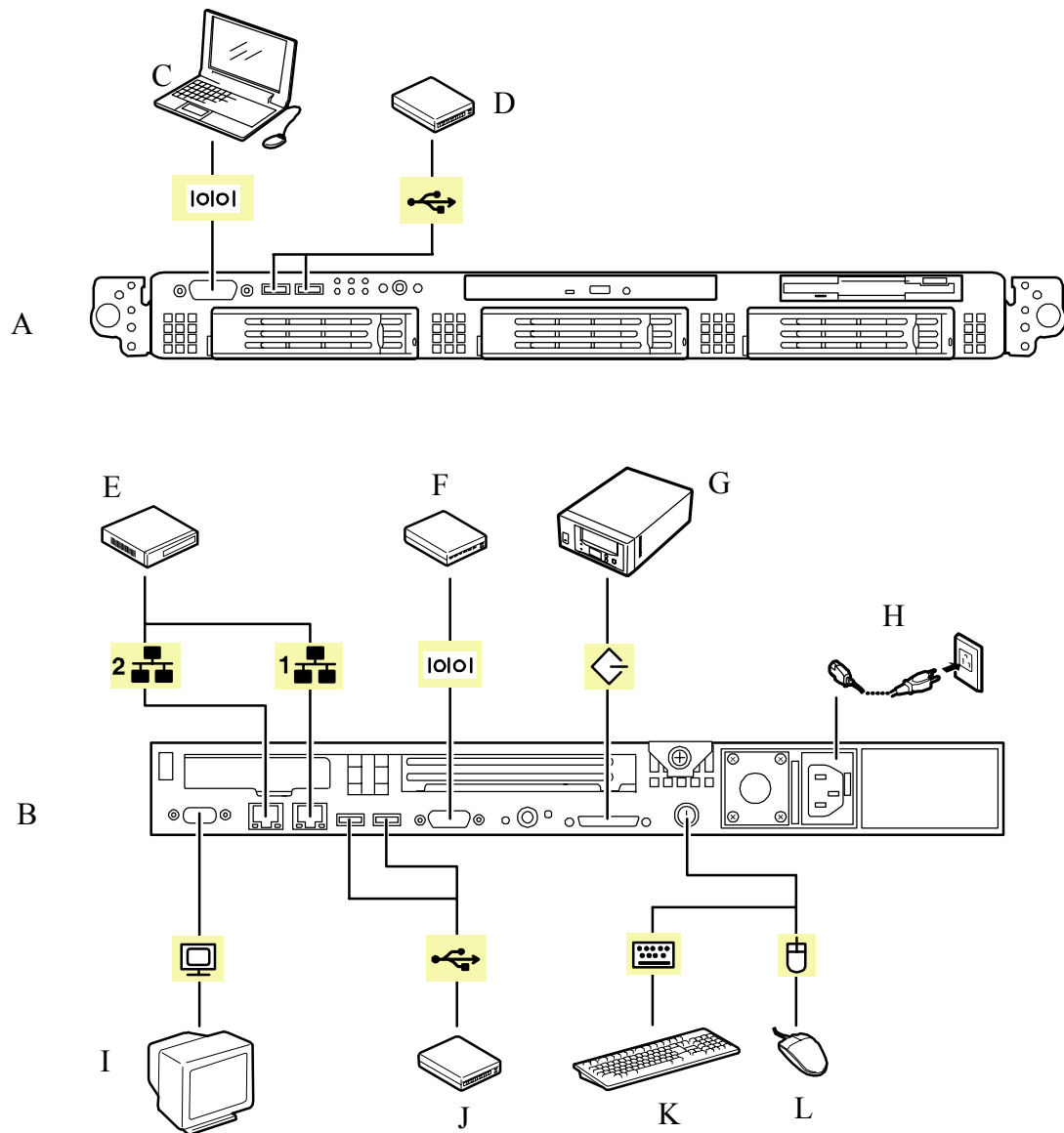
## Making Connections

Connect your keyboard, monitor, and mouse. Also connect any external peripheral devices by following the instructions included with these devices.



### Caution

- Power off the server and a peripheral device before connection. Connecting a powered peripheral device to the powered server will cause malfunctions and failures.
  - Inserting a telephone line connector into a LAN RJ-45 port may result in personal injury and equipment damage
  - To connect a third-party peripheral device or interface cable to the server, consult with your sales agent for availability of such a device or cable. Some third-party devices may not be used for the server.
  - The length of a cable (including the connection cable in SCSI device) is limited by the SCSI standard. Ask your sales representative for details.
  - A leased line cannot be connected directly to the serial port connectors.
  - Secure the power cord(s) and interface cables with a tie wrap.
  - Form the cables in such a way that they will not come into contact with the door or the guide rails on the sides of the server.
-



**Figure 2 - 17 : Connecting Peripheral Devices**

- A Front
- B Rear
- C Device with the serial interface (e.g., Management PC)  
A leased line cannot be connected directly to this connector. The console of a management PC can be connected to only serial port 2. (BIOS setup required.)
- D USB device
- E Hub (multiport repeater)
- F Device with the serial interface
- G Device with the SCSI interface

- H      Connect the provided power cord to the receptacle.  
         Connect the power cord to a circuit breaker of 15 A or less.  
         If connecting the server to UPS, see the explanation below.
- I      Display unit
- J      USB device
- K      Keyboard
- L      Mouse
- 1      100BASE-T/1000BASE-TX/10BASE-T
- 2      100BASE-T/1000BASE-TX/10BASE-T

## Connecting the Power Cord

1. Plug the female end of the AC power cord into the input receptacle on the rear of the power supply cage.
2. Plug the male end of the power cord into NEMA 5-15R outlet for 100-120 VAC, or CEE7, or UK outlet for 200-240 VAC.

If the power cord(s) supplied with the server is not compatible with the AC wall outlet in your region, obtain a suitable power cord that meets the following criteria.:

- The power cord must be rated for the available AC voltage and have a current rating that is at least 125 % of the current rating of the system.
- The power cord connector that plugs into the wall outlet must be terminated in a grounding-type male plug designed for use in your region. It must have certification marks showing certification by an agency acceptable in your region.
- The power cord connector that plugs into the system must be an IEC- type CEE-22 female connector.

---

### **Warning**

Your server shipped with a power cord for the power supply.

Do not attempt to modify or use the supplied AC power cord if it is not the exact type required.

---

## ***Using the Server***

The following sections describe how to use this server properly and safely, including an explanation of the server power on/off sequences, what the POST program checks in the server, and how to perform a forced power shutdown.

When using the server the following precautions should be observed:

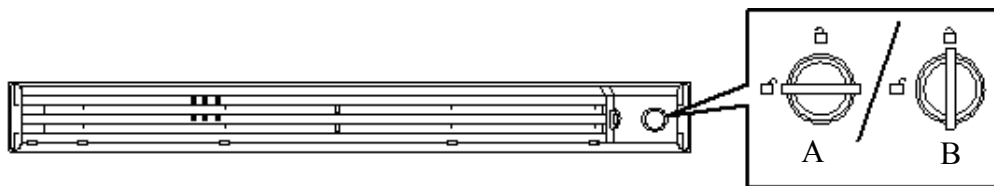
- Make sure you power off the server before connecting or disconnecting cables between the server and peripheral devices. Connecting or disconnecting the cables while the server is powered on may cause malfunction or failures within the server.
- Verify that the access lamp on the diskette drive is unlit before turning off the server or ejecting the floppy disk. Turning off the server or ejecting the floppy disk while the access lamp is lit may damage data being stored on the floppy disk.
- After turning off the server, wait at least 10 seconds before turning it on again. Cycling the power immediately may cause malfunction or failures of the server.
- Before relocating the server, turn off the power and unplug the power cord from the outlet. Moving the server when it is powered may cause malfunction or failures of the server.
- Clean the server regularly. Regular cleaning prevents failures of the server and its components.
- Lightning may cause a momentary voltage drop. To prevent this problem, an uninterruptible power supply unit is recommended.
- Only use options qualified for the server. A non-qualified option may be mounted or connected to the server, but it may fail to operate normally or even cause failures. These types of failures are not covered under warranty.

## Removing and Installing the Front Bezel

Remove the front bezel to power on/off the server, to access the floppy disk drive and the optical device drive, and to install/remove hard disks to/from the 3.5-inch disk bays.

### Removing the Front Bezel

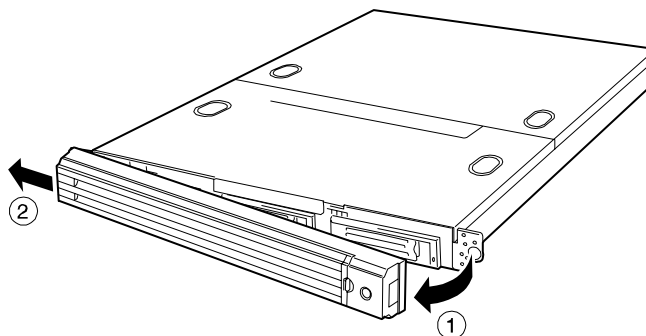
1. Insert the attached security key into the key slot and turn the key to the front bezel side pressing it lightly.  
The front bezel is unlocked.



A - Unlocked      B - Locked

**Figure 2 - 18 : Unlocking the Front Bezel**

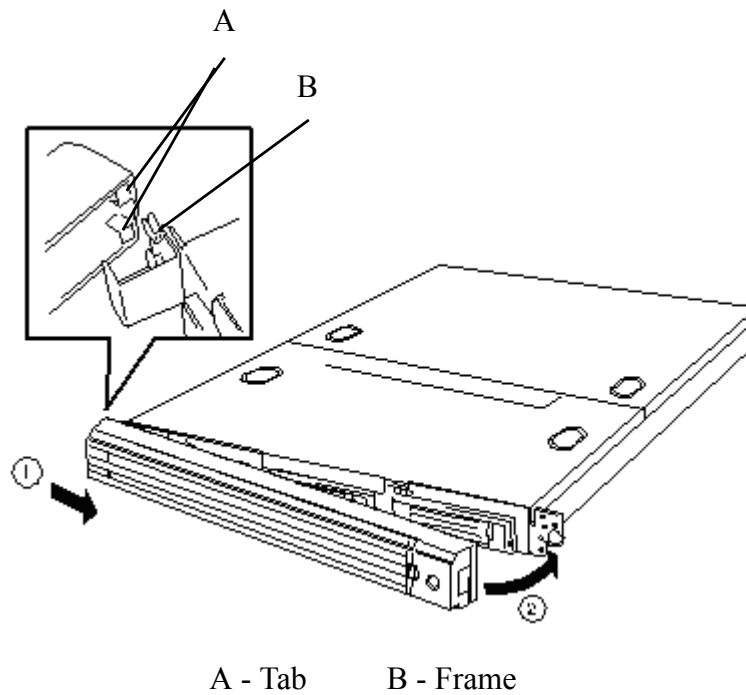
2. Hold the right end of the front bezel lightly and pull it toward you ((1) on the figure below).
3. To remove the tab from the frame, slide the front bezel to the left then remove the front bezel from the server (2).



**Figure 2 - 19 : Removing the Front Bezel**

### *Installing the Front Bezel*

1. Latch the tab at the left side of the front bezel on the server frame (1) then pull the right end of the front bezel toward the server (2).



**Figure 2 - 20 : Installing the Front Bezel**

2. Lock the front bezel by using the key for security.

## Powering On Your Server



### Caution

If the power cord is connected to the server, an initial diagnosis of the hardware starts. The POWER switch does not work while in diagnosis.

Wait for about 10 seconds, then press the POWER switch.

---

*To power on your server:*

1. Make sure all external devices, such as a video display, keyboard, and mouse (optional) have been connected, and the power cords are connected.
2. Power on the video display and any other external device.



**Note:** If the server power cord(s) is connected to a power control unit such as an UPS (Uninterruptible Power Supply), make sure that the power control device is powered.

---


3. Remove the front bezel (see “Removing the Front Bezel” on page 2 - 24).
4. Press the POWER switch on the front of the server chassis.  
The POWER lamp lights green.
5. If the POWER lamp is not lit, ensure the ac power cord is connected to a functional ac power source.

After a few seconds your server begins the internal Power-On Self Tests (POST). POST checks the motherboard, CPU(s), memory, keyboard, mouse, and most installed peripheral devices. POST also displays the start messages of the BIOS setup utility during execution.

The POST check results should be checked in the following cases:

- When the server is being used for the first time.
- When the server appears to fail.
- When the server beeps many times between power-on and OS start-up.
- When an error message appears on the screen.

---

 **Note:** For error messages that appear on the display unit, see “Error Messages” on page 4 - 61.

---

---

 **Caution**

Always allow POST to complete before powering down your server.

---

If you have problems powering on your server, see “Solving Problems” on page 5 - 1.

After you have powered on your server, insert the EXPRESSBUILDER CD-ROM into the optical device drive and follow the screen prompts to run EXPRESSBUILDER.


## **Powering Off Your Server**

When the server power is on, to turn the server off press the power on/off switch on the front panel.

*To power off your server:*

1. Shutdown the operating system (OS).
2. If necessary, remove the front bezel then press the POWER switch on the front of the server to power off the server.  
The POWER lamp lights off.
3. Power off the peripheral devices.

---

 **Note:** If the server power cord is connected to a power control unit such as an UPS (Uninterruptible Power Supply), refer to the UPS user's guide for proper power-off procedures.

---

## **Forcing a Power Shutdown**

A forced power shutdown can be used when the power on/off switch does not power off the server or the reset functions do not work.

To perform a forced power shutdown, press in on the POWER on/off switch located on the front panel of the server for at least 4 seconds.

To power on after a forced shutdown, wait 10 seconds and then power on again.

This page is intentionally left blank.

# 3

## **Configuring Your Server**

## Overview

Configuration and setup utilities are used to change your server configuration. You can configure your server, as well as option boards you may add to your server, using the BIOS Setup Utility. Several unique system parameters are configured using the BIOS Setup, which is stored in the system FLASH memory.

The Adaptec Configuration Utility detects the SCSI host adapters on the system board. Use this utility if you need to configure the two SCSI controllers in your system, to configure the hard disk drives connected to a SCSI controller as a RAID drive, or to perform a SCSI disk format or verify disk operation on the SCSI disk drives. The Adaptec Configuration Utility is also used to configure any SCSI removable media devices installed in your server.

If your server has been factory configured, the BIOS Setup Utility does not need to be run unless you want to change the password or security features, add certain types of option boards or devices, or upgrade your system board.

This chapter also provides information on several system configuration parameters that are set by jumpers on the system board. However, these parameters do not usually require change.

## BIOS Setup Utility

The BIOS Setup Utility is used to change server configuration parameters. The utility is resident in the system FLASH memory and does not require a diskette or an operating system present to run.

### Running the BIOS Setup Utility

1. Power-on or reboot the server.  
'Press <F2> to enter SETUP' displays.
2. Press **F2**.  
The BIOS Setup Utility starts and the Main Menu is displayed.  
The menu bar at the top of the Main Menu lists the following selections:

**Table 3 - 1: Main Menu**


Menu	Use
Main	Use this menu for basic system configuration.
Advanced	Use this menu for setting the Advanced Features available on your system.
Security	Use this menu for setting passwords.
Server	Use this menu to configure server specific options, the redirection console and to display server information.
Boot	Use this menu to configure Boot Device priority.
Exit	Exits the current menu.

Use the arrow keys to select a menu or an item on a displayed menu. Press the value keys (listed in the table below) to cycle through the allowable values for the selected field. Use the Exit menu's "Save Values" selection to save the current values on all the menus.

To display a submenu, position the cursor on a selection that has a submenu and press **ENTER**. An arrow precedes selections with submenus.

Refer to the following table for information on the keys that you use with BIOS Setup. These keys are also listed at the bottom of the Setup menu.

**Table 3 - 2: BIOS Setup Keys**

Key	Function in Setup Menu
F1 or Alt-H	Get Help about an item.
ESC	Exit the current menu and return to the previous menu.
Left or right arrow keys	Move between menus.
Up or down arrow keys	Move cursor up and down. The cursor moves only to the settings that you can change.
F9	Load default configuration values for this menu.
F10	Save configuration values and exit.
ENTER	Execute command or Select  submenu.

## BIOS Setup Configuration Settings

The BIOS Setup Configuration tables show the default settings for the BIOS Setup Utility and allow you to record any changes you make to these settings.

Recommended values are bold in the following tables.

### Main Menu and Submenus

**Table 3 - 3: Main Menu**

Feature	Choices or Display Only	Description	Your Setting
System Time	HH:MM:SS	Set the System Time.	
System Date	MM/DD/YYYY	Set the System Date.	
Legacy Diskette A	Disabled 360 KB 5¼" 1.2 MB 5¼" 720 KB 3½" <b>1.44/1.25 Mb 3½"</b> 2.88 MB 3½"	Select floppy disk drive type	
Hard Disk Pre-Delay	<b>Disabled</b> 3, 6, 9, 12, 15, 21, 30 Seconds	Allows to add a delay before the first access of a hard disk drive by the BIOS.	
Primary IDE Master	CD-Rom	Select sub-menu	
Primary IDE Slave	None	Select sub-menu	
Secondary IDE Master	None	Select sub-menu	
Secondary IDE Slave	None	Select sub-menu	
Serial ATA Channel 0 Master	None	Select sub-menu	
Serial ATA Channel 1 Master	None	Select sub-menu	
Processor Settings		Select sub-menu	
Language	<b>English (US)</b> Italiano Español Français Deutsch	Select the display language for the BIOS.	

**Table 3 - 4: Primary IDE Master Submenu**

Feature	Choices or Display Only	Description	Your Setting
Type	Auto		
LBA Mode Control	Disabled		
Transfer Mode	FPIO 4 / DMA 2		
Ultra DMA Mode	Mode 2		

Table 3 - 5: Primary IDE Slave Submenu

Feature	Choices or Display Only	Description	Your Setting
Multi-Sector Transfers	Disabled		
LBA Mode Control	Disabled		
Transfer Mode	Standard		
Ultra DMA Mode	Disabled		

Table 3 - 6: Secondary Master and Slave IDE and Serial ATA Channels Submenus

Feature	Choices or Display Only	Description	Your Setting
Multi-Sector Transfers	Disabled		
LBA Mode Control	Disabled		
Transfer Mode	Standard		
Ultra DMA Mode	Disabled		

Table 3 - 7: Processor Settings Submenu

Feature	Choices or Display Only	Description	Your Setting
Processor Retest	No Yes	If Yes is selected, the BIOS will clear historical processor status and retest the processor on next boot.	
Processor Speed	Display only	Displays the processor speed detected by the BIOS e.g. 3.00 GHz	
Processor 1 CPUID	Display only	Displays the processor 1 CPU ID detected by the BIOS e.g. 0F34	
Processor 1 L2 Cache	Display only	Displays the processor 1 level 2 cache detected by the BIOS e.g. 1024 KB	
Processor 2 CPUID	Display only	Displays the processor 2 CPU ID detected by the BIOS e.g. 0F34	
Processor 2 L2 Cache	Display only	Displays the processor 2 level 2 cache detected by the BIOS e.g. 1024 KB	
Hyper-Threading Technology	Disabled <b>Enabled</b>	Enables or disables the Hyper-Threading technology. See note below.	
Execute Disable Bit	<b>Disabled</b> Enabled	Displays the CPU which supports Execute Disable Bit.	

## Advanced Menu and Submenus

Table 3 - 8: Advanced Menu

Feature	Choices or Display Only	Description	Your Setting
Memory Configuration	Select submenu		
PCI Configuration	Select submenu		
Peripheral Configuration	Select submenu		
Advanced Chipset Control	Select submenu		
Boot-time Diagnostic Screen	<b>Disabled</b> Enabled	Enables or disables the display of the diagnostic screen during boot.	
Reset Configuration Data	<b>No</b> Yes	Select Yes if you want to clear the Extended System Configuration Data (ESCD) area.	
NumLock	<b>Auto</b> On Off	Selects power on state for NumLock.	
Memory/Processor Error	<b>Boot</b> Halt	If <i>Boot</i> is selected, the system will attempt to boot after a memory or processor error.	
SATA RAID Enable	<b>Disabled</b> Enabled	Enables or disables the SATA RAID function.	

Table 3 - 9: Memory Configuration Submenu

Feature	Choices or Display Only	Description	Your Setting
System Memory	Display only	e.g. 624 KB	
Extended Memory	Display only	e.g. 1047040 KB	
DIMM Group #1 Status	Display only	Indicates the current memory status. "Normal" indicates the normal status, "Disabled" indicates a memory error, and "Not installed" indicates no DIMM installed (display only).  Group #1 indicates DIMMs in DIMM sockets #1 and #2. Group #2 indicates DIMMs in DIMM sockets #3 and #4. Group #3 indicates DIMMs in DIMM sockets #5 and #6. Group #4 indicates DIMMs in DIMM sockets #7 and #8. (Memory is interleaved and DIMMs are used per pair.)	
DIMM Group #2 Status	Display only		
DIMM Group #3 Status	Display only		
DIMM Group #4 Status	Display only		
Memory Retest	Yes <b>No</b>	Clears the memory error status	

Table 3 - 9: Memory Configuration Submenu (Continued)

Feature	Choices or Display Only	Description	Your Setting
Extended RAM Step	1MB 1KB Every location <b>Disabled</b>	Test the extended memory once per MB or per KB or per location.	
Online Spare Memory	<b>Disabled</b> Enabled	Enables / disables Online Spare Memory.	

Table 3 - 10: PCI Configuration Submenu

Feature	Choices or Display Only	Description	Your Setting
Embedded SCSI submenu	Select submenu	Additional setup menus to configure the embedded SCSI controller	
Embedded NIC (Dual Gbit)	Select submenu	Additional setup menus to configure the embedded LAN controller	
Embedded Video Controller	Select submenu	Additional setup menus to configure the embedded VGA controller	
PCI Slot 1B Option ROM	<b>Enabled</b> Disabled	Initialises device expansion ROM; Set it to disable if the board is not implied in the boot process.	
PCI Slot 1C Option ROM	<b>Enabled</b> Disabled		

Table 3 - 11: Embedded SCSI Submenu

Feature	Choices or Display Only	Description	Your Setting
SCSI Controller	<b>Enabled</b> Disabled	Disables / enables the onboard SCSI controller	
Option ROM Scan	<b>Enabled</b> Disabled	Initialises device expansion ROM.	

Table 3 - 12: Embedded NIC (Dual Gbit) Submenu

Feature	Choices or Display Only	Description	Your Setting
LAN Controller	Disabled <b>Enabled</b>	Disables / enables the onboard LAN controller	
Option ROM Scan	<b>Enabled</b> Disabled	Initialises device expansion ROM.	

Table 3 - 13: Embedded Video Controller Submenu

Feature	Choices or Display Only	Description	Your Setting
Onboard VGA Control	Disabled <b>Enabled</b>	Enables or disables the onboard VGA controller.	

Table 3 - 14: Peripheral Configuration Submenu

Feature	Choices or Display Only	Description	Your Setting
Serial port A	Disabled <b>Enabled</b> Auto	Enables or disables the serial port A	
Base I/O address	<b>3F8</b> 2F8 3E8 2E8	Set the base I/O address for serial port A	
Interrupt	IRQ3 <b>IRQ4</b>	Set the interrupt for serial port A	
Serial port B	Disabled <b>Enabled</b> Auto	Enables or disables the serial port B.	
Base I/O address	3F8 <b>2F8</b> 3E8 2E8	Set the base I/O address for the serial port B.	
Interrupt	<b>IRQ 3</b> IRQ 4	Set the interrupt for the serial port B.	
USB Device 29, Function 0&1&2&3	Disabled <b>Enabled</b>	Enables / disables all USB Functions by setting item to the desired value.	
USB Device 29, Function 1&2&3	Disabled <b>Enabled</b>		
PS/2 Mouse	Disabled Enabled <b>Auto Detect</b>	Enables or disables the PS/2 mouse.	
USB Host Controller	Disabled <b>Enabled</b>	Enables or disables the USB controller	
Legacy USB Support	Disabled <b>Enabled</b>	Enables or disables support for legacy USB.	
Parallel ATA	Disabled Channel 0 Channel 1 <b>Both</b>	Enables or disables the Parallel ATA.	

Table 3 - 15: Advanced Chipset Control Submenu

Feature	Choices or Display Only	Description	Your Setting
Enable Multimediac Timer	<b>No</b> Yes		
Wake On LAN/PME	Disabled <b>Enabled</b>	Enables or disables system wake-up when a LAN or PME wake-up event occurs.	

**Table 3 - 15: Advanced Chipset Control Submenu (Continued)**

Feature	Choices or Display Only	Description	Your Setting
Wake On Ring	Disabled Enabled	Enables or disables system wake-up when the modem is ringing.	
Wake On RTC Alarm	Disabled Enabled	Enables or disables system wake-up when a RTC Alarm wake-up event occurs.	

## Security Menu



**Note:** Enabling the Supervisor Password field requires a password for entering Setup. The passwords are not case sensitive.

**Table 3 - 16: Security Menu**

Feature	Choices or Display Only	Description	Your Setting
User Password is	Set Clear	Indicates whether the user password is set (view only).	
Supervisor Password is	Set Clear	Indicates whether the supervisor password is set (display only).	
Set User Password	Up to 7 alphanumeric characters	Press <b>Enter</b> to display the user password entry screen. With a user password, only certain menus are accessible. This option is available only if the Supervisor Password is set.	
Set Supervisor Password	Up to 7 alphanumeric characters	Press <b>Enter</b> to display the supervisor password entry screen. With the supervisor password, all SETUP menus are available for access. This option is available only when you log into the SETUP utility with the supervisor password.	
Password On Boot	<b>Disabled</b> Enabled	Specify whether to request a password entry at boot-up. Administrator password setup is required. Only available if supervisor password is set.	
Fixed Disk Boot Sector	<b>Normal</b> Write Protect	Allows to write protect hard disk boot sector to protect against viruses.	
Hot Key (CTRL + ALT + )	<b>L</b> <b>Z</b>	Selects a key to be the Secure Mode Hot Key.	
Secure Mode Boot	<b>Disabled</b> Enabled	The system will boot in Secure Mode. Requires a password to unlock the system.	

## Server Menu and Submenus

Table 3 - 17: Server Menu

Feature	Choices or Display Only	Description	Your Setting
System Management	Select Submenu		
Console Redirection	Select Submenu		
Event Log Configuration	Select Submenu		
Assert NMI on PERR	Disabled <b>Enabled</b>	Sets support of PCI bus parity error (PERR).	Assert NMI on PERR
Assert NMI on SERR	Disabled <b>Enabled</b>	Sets support of PCI bus system error (SERR).	Assert NMI on SERR
FRB-2 Policy	Disable FRB-2 Timer  <b>Retry 3 Times</b>	Sets the FRB level 2 timer.	FRB-2 Policy
Boot Monitoring	<b>Disabled</b> 5 Minutes 10 Minutes 15 Minutes 20 Minutes 25 Minutes 30 Minutes 35 Minutes 40 Minutes 45 Minutes 45 Minutes 50 Minutes 55 Minutes 60 Minutes	Sets whether the boot monitoring function is disabled, or, if it is enabled, sets the time limit for time out.  It is mandatory to install the ESMPRO Agent in order to use this function.	Boot Monitoring
Boot Monitoring Policy	<b>Retry 3 Times</b> Retry Service Boot Always Reset	Specifies what happens when a time out is detected during boot monitoring.  When <b>Retry 3 Times</b> is selected, the system is reset after a time out occurrence, and tries 3 times to boot the OS.  When <b>Retry Service Boot</b> is selected, the system is reset after a time out occurrence, and tries 3 times to boot the OS. The system then tries to boot from the service partition (3 times).  When <b>Always Reset</b> is selected, the system is reset after the time out occurrence, and tries repeatedly to boot the OS.	

Table 3 - 17: Server Menu (Continued)

Feature	Choices or Display Only	Description	Your Setting
Thermal Sensor	Disabled <b>Enabled</b>	Specifies whether the thermal sensor monitoring function is enabled or not.  If a thermal error is detected while this parameter is enabled, the system stops at the end of the POST.	
POST Error Pause	Disabled <b>Enabled</b>	Specifies whether the system waits for user intervention on critical POST errors.  If no keyboard is connected to the system, this option is ignored and the system always continues to bootup.	
AC-LINK	Stays Off <b>Last State</b> Power On	Sets the AC-LINK feature.  Determines the mode of operation if a power loss occurs.	
Power On Delay Time (Sec)	0 - 255	Sets the power-on delay time within a 0 to 255 seconds range.  This parameter is valid when "Power On " or "Last State" is specified for AC Link.	
Platform Event Filtering	Disabled <b>Enabled</b>	This item is meaningless when the notification feature of the Remote Management Card is enabled.	

Table 3 - 18: System Management Submenu

Feature	Choices or Display Only	Description	Your Setting
BIOS Version	Display only	e.g. 2N42	
IPMI Specification Version	Display only	e.g. 1.5	
BMC Device ID	Display only	e.g. 21	
BMC Device Version	Display only	e.g. 01	
BMC Firmware Version	Display only	e.g. 00.38	
PIA Version	Display only	e.g. 00.14	
SDR Revision	Display only	e. g. 00.14	

**Table 3 - 19: Console Redirection Submenu**

Feature	Choices or Display Only	Description	Your Setting
BIOS Redirection Port	<b>Disabled</b> Serial Port A Serial Port B	Specify the serial port to which a hardware console is connected.	
ACPI Redirection Port	<b>Disabled</b> Serial Port A Serial Port B	Specify the serial port to use for ACPI Headless Console Redirection.	
Baud Rate	9600 <b>19.2K</b> 38.4K 57.6K 115.2K	Selects a baud rate for communications with the connected HW console.	
Flow Control	None XON/XOFF <b>CTS/RTS</b> CTS/RTS + CD	Select a flow control method.	
Console Type	<b>PC ANSI</b> VT100+ VT-UTF8	Specify the console type.	

**Table 3 - 20: Event Log Configuration Submenu**

Feature	Choices or Display Only	Description	Your Setting
Clear all event logs		Press <b>Enter</b> and select <b>Yes</b> to clear the system event log.	

*Boot Menu***Table 3 - 21: Boot Menu**

Feature	Description
CD-ROM Drive	Keys used to view or configure devices:  <Enter> expand or collapses devices with a + or - in front <Ctrl+Enter> expands all <Shift+1> enables or disables a device <+> and <-> moves the device up or down <n> may move removable device between hard disks or removable disks <d> removes a device that is not installed
+Removable Devices	
+ Hard Drive	
IBA GE Slot 0200 v1216	
IBA GE Slot 0219 v1216	

### Exit Menu

You can make the following selections on the Exit Menu. Select an option using the up or down arrow keys, then press **Enter** to execute the option. Pressing **Esc** does not exit this menu. Select one of the items from the menu or menu bar to exit.

**Table 3 - 22: Exit Menu**

Choices	Description
Exit Saving Changes	Exit after writing all modified Setup item values to CMOS. <b>F10</b> key can be used for this operation.
Exit Discarding Changes	Exit leaving CMOS unmodified. User is prompted if any of the setup fields were modified. <b>Esc</b> key can be used for this operation.
Load Setup Defaults	Load default values for all SETUP items. <b>F9</b> key can be used for this operation.
Discard Changes	Read previous values of all Setup items from CMOS.
Save Changes	Save changes to CMOS without exiting the Setup.

---

### Warning

The [Load Setup Defaults] option sets [SATA RAID Enabled] in the [Advanced] menu to [Disable].

If the SATA hard disk drives are installed in your server and the onboard SATA RAID feature is used, change the parameter of the [SATA RAID Enable] from [Disable] to [Enable] before exiting BIOS Setup.

---

## SCSISelect Utility

The SCSISelect Utility configures the SCSI controller located on the motherboard or the SCSI controller on an optional board. This utility may be started with a simple key operation while POST is in progress and requires no specific start-up disk.


### Using SCSISelect Utility

Use the SCSISelect utility:

- to set the transfer speed of connected SCSI devices,
- to configure the internal hard disk drives connected to the onboard SCSI controller as a RAID drive (HostRAID).

The SCSI devices include those installed in the backup file bay, such as an external DAT, but not hard disks.

---

 **Note:** SCSI configuration must be made on a per-SCSI controller basis with a utility. The server contains one SCSI controller. When you added optional SCSI controllers, you need to make configuration for each SCSI controller in addition to the standard internal SCSI controller. Some additional SCSI controllers may require a different utility to make changes to the configuration.

---

## Configuring SCSI Controller on Motherboard

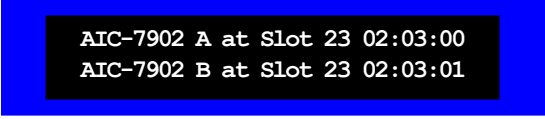
### Running the Utility

1. Power on the server.  
The following message appears for each additional SCSI controller while POST is in progress:

Adaptec SCSI BIOS Vxxx xxxxx  
(c) 2000 Adaptec, Inc. All Rights Reserved


◀ ◀ ◀ Press <Ctrl> <A> for SCSISelect(TM) Utility! ▶ ▶ ▶

2. Press and hold **Ctrl** and **A**.  
The *SCSISelect* utility starts and its Main menu appears.
3. Select the channel and press **Enter**.



```
AIC-7902 A at Slot 23 02:03:00
AIC-7902 B at Slot 23 02:03:01
```

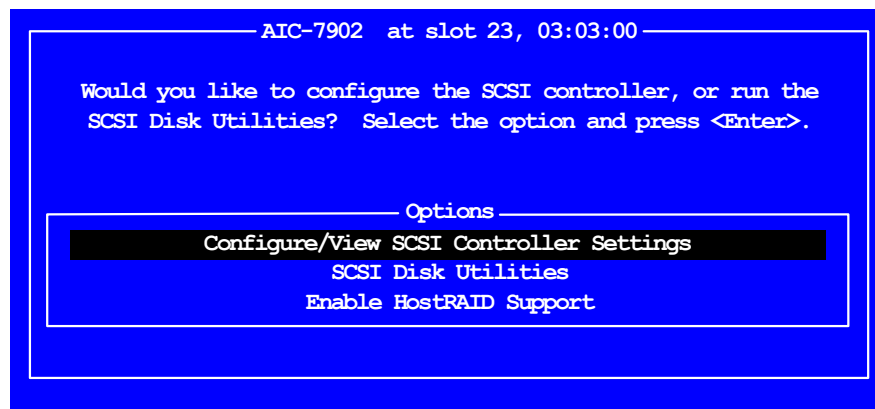
---

 **Note:** "AIC-7902A" is for backup file devices.  
"AIC-7902B" is for internal SCSI hard disk drives.

---

The Options menu appears.

4. Select option in the Options box and press **Enter**.



5. If you want to configure the adapter or a device, select "Configure/View SCSI Controller Settings".
6. If you want to format a disk, verify disk media, or display a list of devices and their SCSI IDs, select "SCSI Disk Utilities".

### *Exiting the Utility*

To exit the utility, press **Esc** until a message prompts you to exit. If you changed any setting, you are prompted to save the changes before you exit.

### *Configure/View SCSI Controller Settings*

The Configure/View Host Adapter Settings has the following menu items and parameters. Read descriptions to select a correct parameter for each menu item.

### **SCSI Bus Interface Definitions**

To set three menu items under "SCSI Bus Interface Definitions", select a menu item with the cursor keys (↓ or ↑) and press **Enter** to fix the item. Use the cursor keys (↓ or ↑) for parameter selection.

The following table lists menu items, available parameters, and descriptions.

**Table 3 - 23: SCSISelect - SCSI Bus Interface Definitions**

Menu item	Parameter	Description
SCSI Controller ID	0 - [7] - 15	Select "7".
SCSI Controller Parity	[Enabled] Disabled	Select "Enabled".
SCSI Controller Termination	[Enabled] Disabled	Enables or disables the SCSI termination. Select "Enabled".
[xxxx]: Factory default		

### Additional Options

To set three menu items under "Additional Options", select a menu item with the cursor keys (↓ or ↑) and press **Enter** to display its submenu. Then, select a submenu item with the cursor keys (↓ or ↑) and press **Enter** to fix the item. Use the cursor keys (↓ or ↑) for parameter selection.

#### ■ Boot Device Configuration

Move the cursor onto "Boot Device Configuration" and press **Enter** to display the submenu. The Boot Device Configuration submenu allows you to select the device connected to the channel A or B as a boot device. Always select "AIC-7902 A".

#### ■ SCSI Device Configuration

Move the cursor onto "SCSI Device Configuration" and press **Enter** to display the submenu.

The following table lists submenu items, available parameters, and descriptions.

#### Notes:

- Select a parameter for each submenu item on a per-SCSI ID basis. Verify the SCSI ID of a desired device before configuration.
- To find out the SCSI ID for the optional device connected, select "SCSI Disk Utilities" on the Options menu and press **Enter**. See "SCSI Disk Utilities" on page 3 - 20.

Table 3 - 24: SCSISelect - SCSI Device Configuration

Submenu item	Parameter	Description
Sync Transfer Rate (MB/Sec)	<b>[320]</b> 33.3 160 20.0 80.0 10.4 66.6 ASYN 40.0	Select "320". You may need to change the value depending on your optional device. Refer to the manual that comes with your optional device for details.
Packetized	<b>[Yes]</b> No	Optimizes bus use and minimizes command overhead to bolster performance by transferring commands, data, and status using Deal Transition (DT) data phases.
QAS	<b>[Yes]</b> No	Quick Arbitration and Selection (QAS) reduces the overhead of control release on the SCSI bus from one device to another to help decrease command overhead and increase bus use.
Initiate Wide Negotiation	<b>[Yes]</b> No	Select "Yes" if your SCSI device supports the Wide SCSI interface. Select "No" if not.
Enable Disconnection	<b>[Yes]</b> No	Select "Yes".
Send Start Unit Command	<b>[Yes]</b> No	Select "Yes" to send the command to the hard disk. Otherwise select "No".
BIOS Multiple LUN Support	Yes <b>[No]</b>	Select "No".
Include in BIOS Scan	<b>[Yes]</b> No	Select "Yes".
<b>[xxxx]:</b> Factory default		

#### ■ Advanced Configuration

Move the cursor onto "Advanced Configuration" and press **Enter** to display the submenu.

The following table lists submenu items, available parameter, and descriptions.

Table 3 - 25: SCSISelect - Advanced Configuration

Submenu item	Parameter	Description
Reset SCSI Bus at IC Initialization	<b>[Enabled]</b> Disabled	Select "Enabled".
Display <Ctrl><A> Message During BIOS Initialization	<b>[Enabled]</b> Disabled	Select "Enabled".
Extended Int 13 Translation for DOS Drives > 1 GByte	<b>[Enabled]</b> Disabled	Select "Enabled".
POST Display Mode	<b>[Verbose]</b> Silent Diagnostic	Select "Verbose".
SCSI Controller Int 13 Support	<b>[Enabled]</b> Disabled: NOT Scan Disabled: scan bus	Enable or disable SCSI BIOS. Select "Enabled" for most cases other than the following: - To boot the OS from a hard disk connected to any other controller than SCSI controller. (If the controller has no hard disks connected, there is no problem.) - BIOS of the SCSI controller may be disabled to reserve an area in the expansion ROM space if the controller has no hard disks connected.
Domain Validation	<b>[Enabled]</b> Disabled	Select "Enabled".

**Table 3 - 25: SCSISelect - Advanced Configuration (Continued)**


Submenu item	Parameter	Description
Support Removable Disks Under Int 13 as Fixed Disks	Boot Only All Disks [Disabled]	AIC-79xx BIOS automatically controls the removable disks.
BIOS Support for Bootable CD-ROM	[Enabled] Disabled	Select "Enabled".
[xxxx]: Factory default		

### ■ HostRAID

Move the cursor onto "HostRAID" and press **Enter** to choose the HostRAID option.

**Table 3 - 26: SCSISelect - HostRAID**

Submenu item	Parameter	Description
HostRAID	Enabled [Disabled]	Select "Disabled" if the onboard HostRAID controller is not used.
[xxxx]: Factory default		

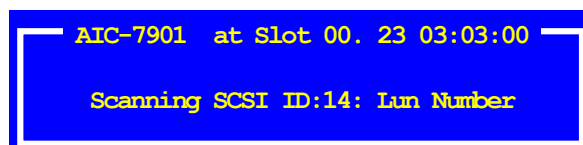
 **Note:** For detailed explanations on the HostRAID feature, see *SCSISelect Utility User's Manual and Adaptec Storage Manager™ - Browser Edition User's Guide*. You may view or print the *SCSISelect Utility User's Manual and Adaptec Storage Manager™ - Browser Edition User's Guide* from the EXPRESSBUILDER CD-ROM.

## SCSI Disk Utilities

This utility scans the SCSI bus for SCSI devices, reports a description of each device. Run these utilities before configuring SCSI devices.

To enter the utility, select "SCSI Disk Utilities" on the Options menu.

The SCSI ID scan begins displaying the message as shown below.



When the SCSI ID scan completes, the screen listing SCSI IDs and associated devices appears.

Find out the SCSI ID for the installed optional on this screen. You can also view the device information by selecting a device and pressing **Enter**.

The following sub menu appears.

SCSI ID#4: xxxxxxxx  
Firmware: xxxx xxx  
Capacity: xxGB  

Format

Verify Disk Media

The following table lists submenu items and descriptions.

**Table 3 - 27: SCSISelect - SCSI Disk Utilities**

Submenu item	Description
Format	Formats the selected device in the raw level.
Verify Disk Media	Checks all the sectors in the selected device. If one or more bad sectors are found, reassigns the sectors.

### ***Configuring SCSI Controller on Optional Board***

To configure SCSI devices connected to an optional SCSI controller board, use the SCSI BIOS utility provided with the optional SCSI controller board.

Refer to the manual that comes with the optional SCSI controller board for details.

When the server has multiple SCSI controller boards installed, the server first displays the start-up message of the *SCSISelect* utility for the SCSI controller on the motherboard. It then displays the utility start-up message for additional SCSI controllers one by one.

The message displayed may vary depending on the optional SCSI controller board. Refer to the manual that comes with the optional SCSI controller board for details.

## ***RAID Configuration Utility***

### ***RAID BIOS***

The RAID (Redundant Array of Inexpensive Devices) option available for your system is a RAID controller board (depending on your configuration) which gives your system the added security of fault tolerance.

- If you want to change the RAID level or add additional hard disk drives to the array, use the RAID configuration utility. The RAID configuration utility is included with a RAID controller.
- If you are adding the RAID controller to an existing system, the RAID configuration utility allows you to configure your disk array before reinstalling your network operating system. The RAID controllers support various versions of RAID technology (referred to as RAID levels). To use any RAID level, you must configure the RAID controller using the RAID configuration utility prior to installing your Network Operating System.

For an explanation of this utility, refer to the documentation that comes with the RAID controller. It describes RAID technology and provides tips on making your array perform well in your specific application. It also covers array hardware preparation, configuration, and initialization. After completing the steps in the manual, you can install your Network Operating System.

- If you want to remotely configure the array (from a PC client), increase array capacity online, or monitor statistics on disk and controller activity, you must install the array manager provided with your RAID subsystem. Increasing array capacity is covered in the documentation shipped with the option.

## ***RAID Configuration of SCSI Hard Disk Drives***

You can configure a disk array (RAID0 or RAID1) by using the onboard RAID controller of the server.

You need at least two SCSI hard disk drives for configuration.

For a RAID5 configuration, refer to the documentation of your optional RAID controller board.

### ■ RAID0 (striping)

Stores data on two hard disk drives by dividing it (striping). Both hard disk drives can be accessed at the same time. This improves disk access performance compared to using a single hard disk.

---

#### **Warning**

- RAID0 does not have data redundancy. When a hard disk drive failure occurs, data cannot be restored.
  - Logical capacity of the array becomes a multiple of the connected hard disk drive.
- 

### ■ RAID1 (mirroring)

Stores the data being saved to one hard disk drive to another hard disk drive. This method is called "mirroring." When storing data onto one hard disk drive, the same data is simultaneously stored onto another hard disk drive. When a hard disk drive becomes faulty, the one with the same data can be used. This allows continuous operation even when a hard disk drive fails.

---

#### **Warning**

- RAID1 reads or writes data to/from the several hard disk drives at the same time. The disk access performance is lower than the single disk.
  - Logical capacity of the array is equal to one hard disk drive connected.
-

## Installing the Hard Disk Drives

Install the two or more SCSI hard disk drives to your server.

---

### Warning

Use two hard disk drives of the same revolution. In addition, use two hard disk drives of the same capacity if you are going to configure RAID1.


---

## Enabling RAID Feature by SCSISelect Utility

The two or more hard disk drives installed can be used either as a single disk or a RAID drive.

To configure a disk drives as RAID drive, you must specify the hard disk drive being connected to the onboard SCSI connector as a RAID drive by using the SCSISelect Utility.

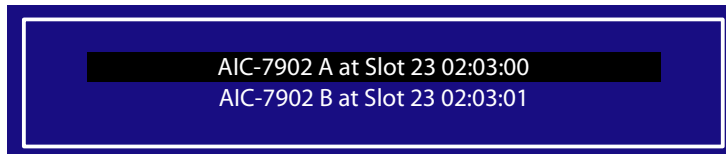
---

 **Note:** *The factory-set value is to use the hard disk drive as a single disk drive.*

---

To change settings by SCSISelect Utility:

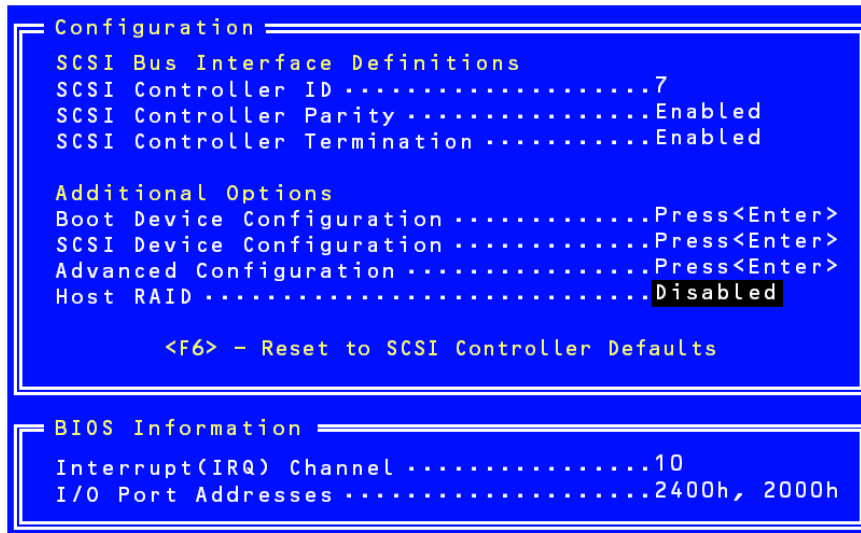
1. Power on the server and press Ctrl and A to start the SCSISelect Utility.



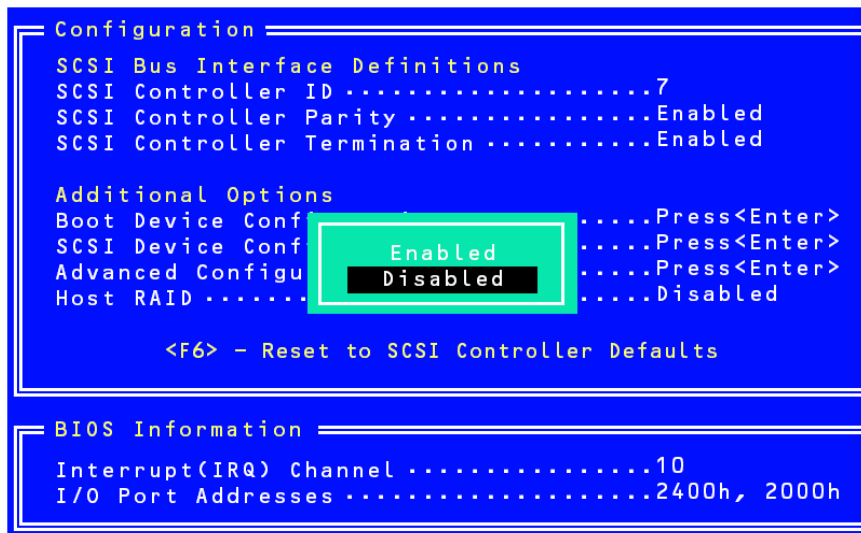
2. Select the channel to set HostRAID to open the Options window.
3. Select [Configure/View SCSI Controller Settings] and press **Enter**.



4. Select [Disabled] of Host RAID on Configuration menu and press **Enter**.

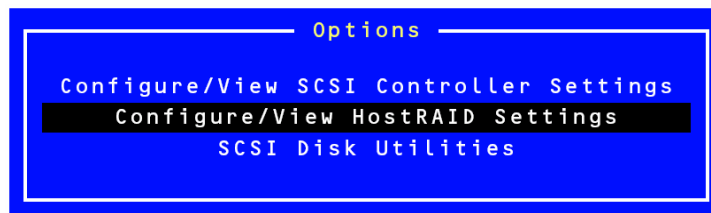


5. Change it to [Enabled].



6. Press **Esc**. The confirmation message [Save Changes Mode?] appears. Select [Yes].
7. Press **Esc** to return to the Options menu.

8. Select [Configure/View HostRAID] and press **Enter**.



### Main Menu

When you select [Configure/View HostRAID Settings], the Main Menu as shown below appears upon completion of device scan.

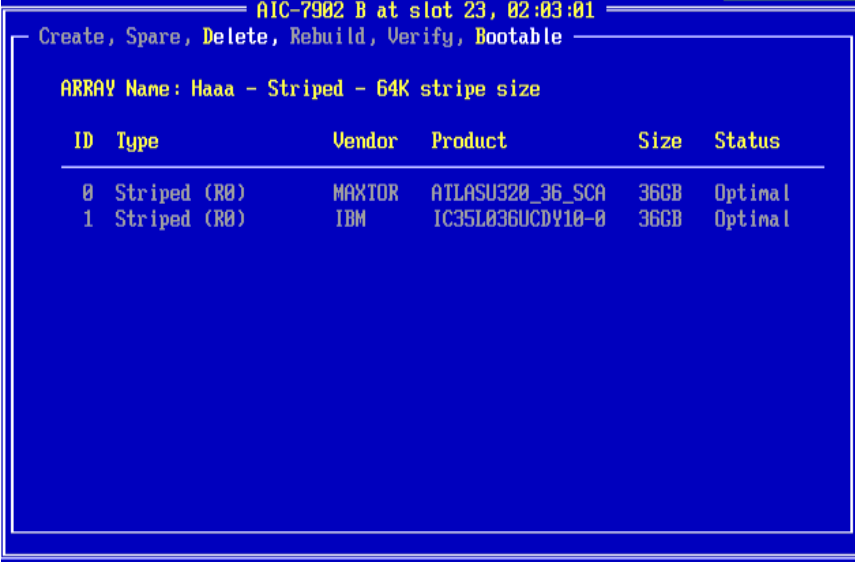
A screenshot of a blue terminal window titled "AIC-7902 B at slot 23, 02:03:01". Below the title is a subtitle "Create, Spare, Delete, Rebuild, Verify, Bootable". The main content is a table with the following data:

ID	Type	Vendor	Product	Size	Status
0	Hard Drive	MAXTOR	ATLASU320_36_SCA	36GB	Free
1	Hard Drive	IBM	IC35L036UCDV10-0	36GB	Free
2	Hard Drive	IBM	IC35L036UCDV10-0	36GB	Free
3	Hard Drive	SEAGATE	ST336753LC	36GB	Free

**Main Menu Display**

ID	Indicates SCSI ID of hard disk drive or ID of array.
Type	Indicates RAID level for the array, and available disk drive that is not in the array. <ul style="list-style-type: none"> <li>- Hard Drive: Available hard disk drive that is not in the array.</li> <li>- Striped (R0): Array configured in RAID0.</li> <li>- Mirrored (R1): Array configured in RAID1.</li> <li>- Stripe/Mirror (R10): Array configured in RAID 10 (spanning of RAID1).</li> <li>- Spare: Hard disk drive assigned as a spare disk.</li> </ul>
Vendor	Indicates the manufacturer of hard disk drive or HostRAID (Adaptec).
Product	Indicates the model name of hard disk drive or array name.
Size	Indicates the capacity of hard disk drive or that of array.
Status	Indicates the status of hard disk drive or array. <ul style="list-style-type: none"> <li>- Free: Available hard disk drive that is not in the array</li> <li>- Optimal: Array is in normal state</li> <li>- Degraded: One of the RAID1 or RAID10 hard disk drives is failed</li> <li>- Dead: One or more RAID0 hard disk drives is failed. Two or more RAID1 or RAID10 hard disk drives are failed.</li> <li>- Building: The array is in build process</li> <li>- Verify: The array is in verify process</li> <li>- Rebuild: the array is in rebuild process</li> </ul>

When you select the array on Main Menu, the detailed information of the hard disk drives in array is displayed.



```

AIC-7982 B at slot 23, 02:03:01
Create, Spare, Delete, Rebuild, Verify, Bootable

ARRAY Name: Haaa - Striped - 64K stripe size

  ID  Type          Vendor  Product          Size  Status
  --  -
  0   Striped (R0)   MAXTOR  ATLASU320_36_SCA 36GB   Optimal
  1   Striped (R0)   IBM     IC35L036UCDV10-0 36GB   Optimal

```

**Detailed indications**

ID	Indicates SCSI ID of hard disk drive that configures the array
Type	Indicates RAID level for the array. <ul style="list-style-type: none"><li>- Striped (R0): Array configured in RAID0</li><li>- Mirrored (R1): Array configured in RAID1</li><li>- Stripe/Mirror (R10): Array configured in RAID 10 (spanning of RAID1)</li></ul>
Vendor	Indicates the manufacturer of hard disk drive or HostRAID (Adaptec).
Product	Indicates the model name of hard disk drive or array name.
Size	Indicates the capacity of hard disk drive or that of array.
Status	Indicates the status of hard disk drive or array. <ul style="list-style-type: none"><li>- Optimal: the hard disk drive is operating normally</li><li>- Degraded: the hard disk drive is degraded</li><li>- Failed: the hard disk drive is failed</li><li>- Building: the hard disk drive is being built</li><li>- Verify: the hard disk drive is being verified</li><li>- Replaced: the hard disk drive is being rebuilt</li><li>- Missing: the hard disk drive is hidden from the controller</li></ul>

***Exiting the Utility***

To exit the utility, press **Esc** until the following message prompts you to exit. Select [Yes] to exit and press any key to restart the computer. The change you have made becomes valid after the system restarts.

# RAID Configuration by SCSISelect Utility

## Creating Arrays

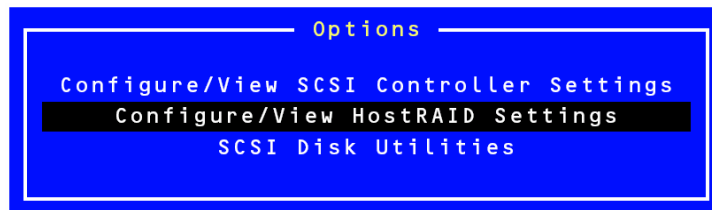
Take the following procedures to create an array.

## Requirements

Before creating arrays, make sure the disks for the array are connected and installed in your system.

1. Start the SCSISelectUtility.

Select [Configure/View HostRAIDSettings] from Options menu of the channel to create an array.



2. Press **C** on the main menu to create an array.

Some characters may not be displayed correctly when console redirection is used. It is no problem on operation. Ignore it and press **C**.




## Warning

- At least two hard disk drives are required to create an array.
- If the hard disk drives of different capacities are used, the array capacity is determined according to the smaller one.
- Use only the hard disk drives supported by the server.
- The hard disk drive which has been configured as an array disk drive cannot be selected.

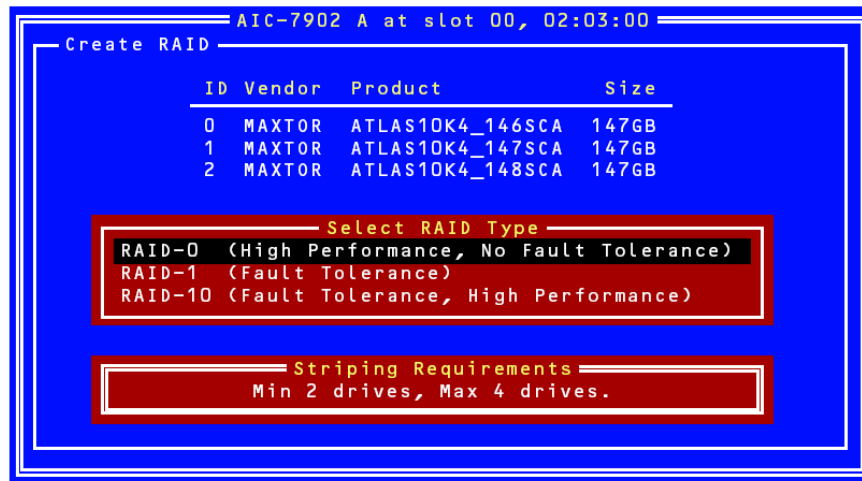
3. Select an RAID type in [Select RAID Type] window and press **Enter**.

Put a cursor to the selected item, another window opens indicating the minimum and maximum number of disks to create an array and a message for assigning a spare disk.

 **Note:** For setting of RAID, see "Creating RAID0 Array" or "Creating RAID1 Array" described later.

## Warning

After creating an array, set the boot priority for the created array according to "Boot Priority".



## Creating RAID0 Array

To create a RAID0 array:

1. Select [RAID-0] on [Select RAID Type] window.



2. Use the cursor key to move the focus to the desired hard disk drive and determine it by **Space**, and then press **Enter**.



An [X] mark is placed next to the selected hard disk drive.

3. Select the desired stripe size and press **Enter**. Available stripe sizes are 16, 32, and 64 KB.
4. Enter the desired RAID Name in [Assign RAID Name] window.

---


### **Warning**

RAID Name must be unique and up to 15 characters are acceptable.

- If a valid partition information or a boot block is detected in the selected hard disk drive, a warning message will be displayed. Select [Yes] to continue creating an array, [No] to terminate.
- Take sufficient care not to select the proper hard disk drive. If not, the data will not be restored.

5. The message "Do you want to make this array as bootable?" to prompt you to specify the boot priority of the new array appears. Select [YES] to specify, or [NO] to ignore, and then press **Enter**.

---


 **Note:** The boot priority can be changed after the arrays have been created. To change priority, see "Boot Priority" described earlier.

---

6. Select [Yes] for the message [Create Array?] and press **Enter**.  
Selecting [No] terminates creating an array and returns to the main menu.
7. Select [Yes] for the message [Are you sure?] and press **Enter**.  
Selecting [No] terminates creating an array and returns to the main menu.

8. Press **Esc** when the message [Build Completed] is displayed to return to the main menu.

---

 **Note:** On the main menu, make sure that "Optimal" is indicated for the status of the created array.

---

---

### **Warning**

After creating an array, set the boot priority for the created array according to "Boot Priority".

---

## **Creating RAID1 Array**

To create a RAID1 array, perform either of the followings:

- Create a new RAID1 array.
- Migrate to RAID1 array using the data stored in an existing single disk. (Migration)

Creating RAID1 array using the existing single hard disk drive is called "migration". In migration, the source hard disk drive must have been used as the boot disk in the standard SCSI connection.

Refer to "HostRAID Setup Card" for details of migration.

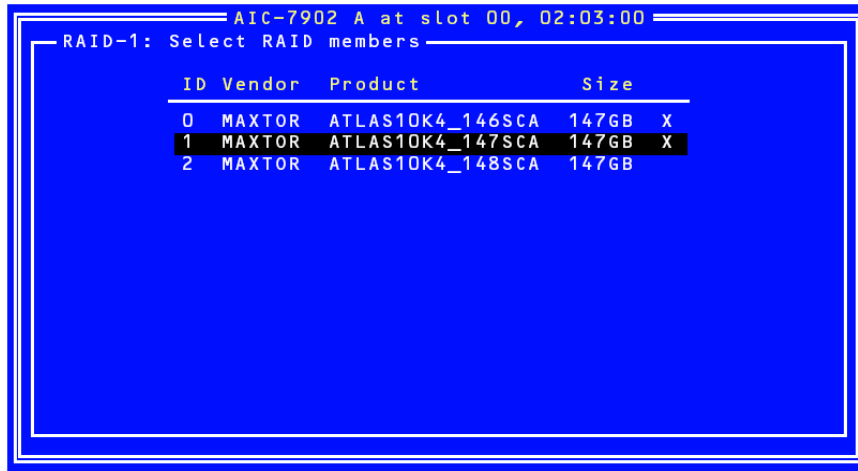
*To create a RAID1 array:*

1. Select [RAID-1] on the [Slect RAID Type] window.



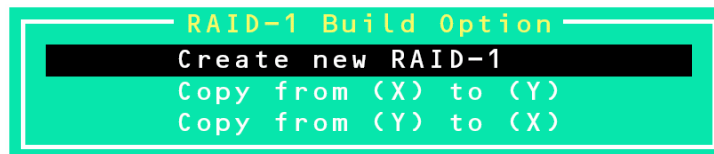
- Use the cursor key to move the focus to the desired hard disk drive and determine it by **Space**, and then press **Enter**.

A [X] mark is placed next to the selected hard disk drive.



Select one of the options in [RAID-1 Build Option] window and press **Enter**.

Available options are as follows:



- Create new RAID-1:Default
- Copy from (X) to (Y):Copy data from the disk of ID X to that of ID Y.
- Copy from (Y) to (X):Copy data from the disk of ID Y to that of ID X.

### **Warning**

- To migrate the boot disk that contains an OS, refer to the "Migration in Express5800 Windows".
- Make sure the copy source and copy destination. If they are incorrect, the data will no longer be restored.


- Enter the desired RAID Name in [Assign RAID Name] window.

### **Warning**

- RAID Name must be unique and up to 15 characters are acceptable.
- If a valid partition information or a boot block is detected in the selected hard disk drive or copy target disk drive, a warning message will be displayed. Select [Yes] to continue creating an array, [No] to terminate.

- Take sufficient care not to select the proper hard disk drive or copy destination drive. If not, the data will not be restored.
- 

4. The message "Do you want to make this array as bootable?" to prompt you to specify the boot priority of the new array appears. Select [YES] to specify, or [NO] to ignore, and then press **Enter**.
- 

 **Note:** The boot priority can be changed after the arrays have been created. To change priority, see "Boot Priority" described earlier.

---

5. Select [Yes] for the message [Create Array?] and press **Enter**.  
Selecting [No] terminates creating an array and returns to the main menu.
6. Select [Yes] for the message [Are you sure?] and press **Enter**.  
Selecting [No] terminates creating an array and returns to the main menu.  
When an array has been created, build operation starts.


---

### **Warning**

Be sure to complete the Build process. Do not stop the process by pressing **Esc**. OS detects only an array of which build process has been completed and its status is "Optimal". In addition, no OS can be installed in that array.

---

7. Press **Esc** when the message [Build Completed] is displayed to return to the main menu.
- 

 **Note:** On the main menu, make sure that "Optimal" is indicated for the status of the created array.

---

---

### **Warning**

After creating an array, set the boot priority for the created array according to "Boot Priority".

---

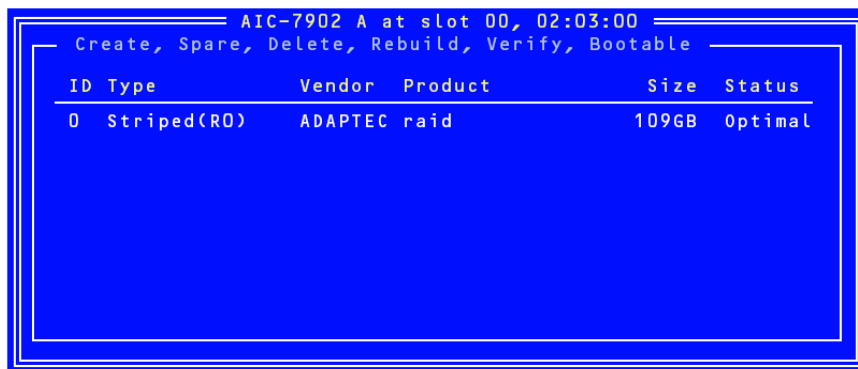
## Deleting Arrays

To delete an array:

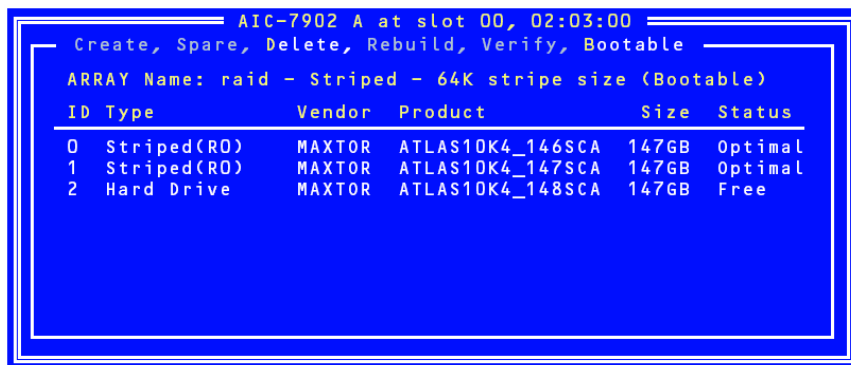
### Warning

Back up the data in the hard disk drive of an array before you delete it. Otherwise, all data on the array is lost. Deleted arrays cannot be restored.

1. On the main menu, move cursor to select the array you wish to delete and press **Enter**.



2. Press **D** on the screen shown below.  
Some characters may not be displayed correctly when console redirection is used. It is no problem on operation. Ignore it and press **D**.



3. Select [Yes] for the message [Delete Array?] and press **Enter**.  
Selecting [No] returns to the main menu without deleting any array.
4. <RAID1>  
[Deleting information] window appears. Select the hard disk drive you wish to delete its partition or boot block, or select [None], then press **Enter**.  
<Example>  
Drive ID 0:Data in drive 0 is entirely erased. Data in drive 1 is reserved.  
Drive ID 1:Data in drive 1 is entirely erased. Data in drive 0 is reserved.

Drive ID 0 & 1: All the data in both drives is erased.

None: Array is deleted, but the data is reserved in both drives.

<Other than RAID1>

The [Deleting information] window is not displayed, proceed to the next step.

---

### **Warning**

The partition or boot block of the hard disk drive selected [Deleting information] is deleted.

---


5. Select [Yes] for the message [Are you sure?] and press **Enter**.  
Selecting [No] returns to the main menu without deleting any array.

## **Creating Spare Disks**

Up to two spare disks can be assigned for one channel.

Spare disk is available for RAID1 and RAID10 (spanning of RAID1) only.

---

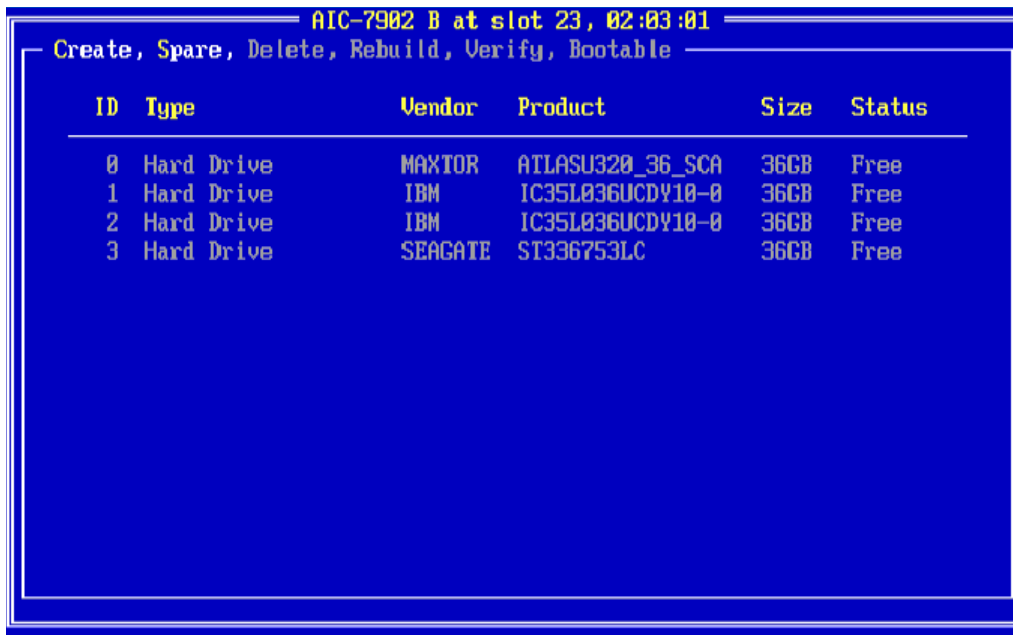
 **Note:** *Spare disk must have larger capacity than the hard disk drives configuring the array.  
If the hard disk drives in the array have 73GB or larger and the spare disk is 36GB, a 36-GB disk cannot be used as a spare disk.*

---

*To assign a spare disk:*

1. Press **S** on Main Menu.

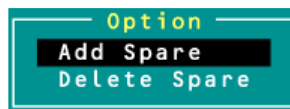
Some characters may not be displayed correctly when console redirection is used. It is no problem on operation. Ignore it and press S.



The screenshot shows a terminal window with a blue background. At the top, it says "AIC-7982 B at slot 23, 02:03:01". Below that is a menu: "Create, Spare, Delete, Rebuild, Verify, Bootable". The main part of the screen displays a table of hard drives.

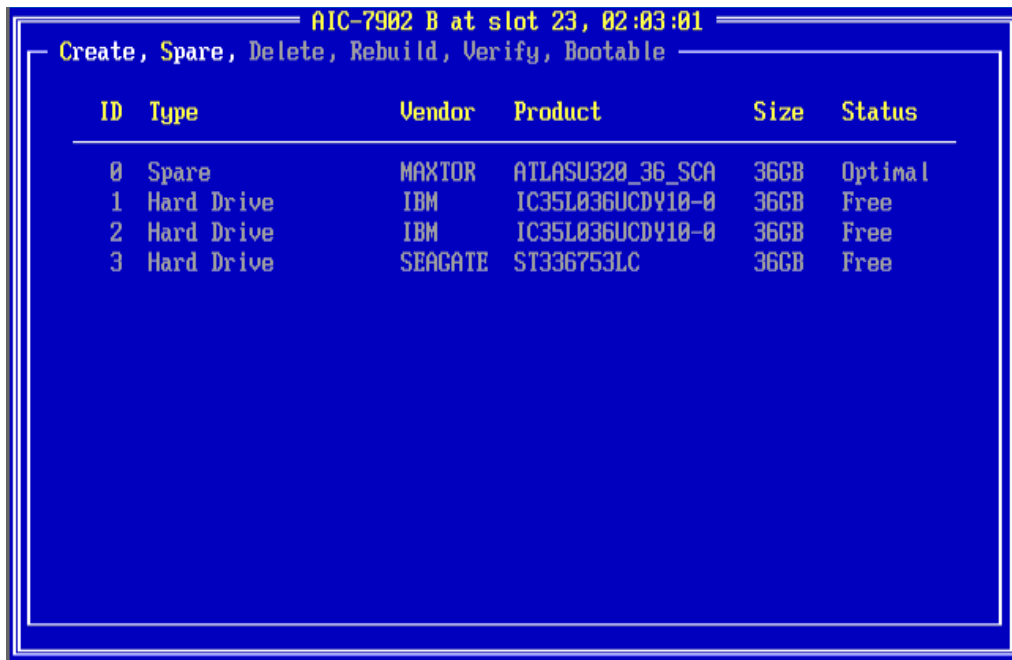
ID	Type	Vendor	Product	Size	Status
0	Hard Drive	MAXTOR	ATLASU320_36_SCA	36GB	Free
1	Hard Drive	IBM	IC35L036UCDY10-0	36GB	Free
2	Hard Drive	IBM	IC35L036UCDY10-0	36GB	Free
3	Hard Drive	SEAGATE	ST336753LC	36GB	Free

2. Select [Add Spare] on the Option window as shown below.



3. Select a hard disk drive for spare disk from the list of available disks, and press **Enter**.
4. Select [Yes] for the message [Are you sure?] and press **Enter**.  
Selecting [No] returns to the main menu without assigning any spare disk.

5. On the main menu, make sure that the type of selected hard disk drive is changed to "Spare", and its status "Optimal".

A screenshot of a server configuration interface. At the top, it says "AIC-7982 B at slot 23, 02:03:01". Below that is a menu with options: "Create, Spare, Delete, Rebuild, Verify, Bootable". The main part of the screen displays a table of disk information.

ID	Type	Vendor	Product	Size	Status
0	Spare	MAXTOR	ATLASU320_36_SCA	36GB	Optimal
1	Hard Drive	IBM	IC35L036UCDY10-0	36GB	Free
2	Hard Drive	IBM	IC35L036UCDY10-0	36GB	Free
3	Hard Drive	SEAGATE	ST336753LC	36GB	Free

To unassign a spare disk, take the same steps from 1 to 4 except for selecting "Delete Spare" instead of "Add Spare".

### Boot Priority

To specify boot priority to an array:

1. Select an array you wish to set the boot priority from the main menu and press **Enter**.
2. Press **B** on the window showing the details of array.

Some characters may not be displayed correctly when console redirection is used. It is no problem on operation. Ignore it and press **B**.

## ***RAID Configuration of SATA Hard Disk Drives***

You server includes a serial ATA RAID controller that supports RAID levels 0 and 1.

You need two SATA hard disk drives for configuration.

### ■ RAID0 (striping)

Stores data on two hard disk drives by dividing it (striping). Both hard disk drives can be accessed at the same time. This improves disk access performance compared to using a single hard disk.

---

#### **Warning**

- RAID0 does not have data redundancy. When a hard disk drive failure occurs, data cannot be restored.
  - Logical capacity of the array becomes a multiple of the connected hard disk drive.
- 

### ■ RAID1 (mirroring)

Stores the data being saved to one hard disk drive to another hard disk drive. This method is called "mirroring." When storing data onto one hard disk drive, the same data is simultaneously stored onto another hard disk drive. When a hard disk drive becomes faulty, the one with the same data can be used. This allows continuous operation even when a hard disk drive fails.

---

#### **Warning**

- RAID1 reads or writes data to/from the several hard disk drives at the same time. The disk access performance is lower than the single disk.
  - Logical capacity of the array is equal to one hard disk drive connected.
- 

### **Installing the Hard Disk Drives**

Install two serial ATA hard disk drives to your server.

---

#### **Caution**


Use two hard disk drives running at the same speed (rpm), and of the same capacity if you are going to configure RAID1.

---

## Enabling the SATA RAID feature in the BIOS Setup

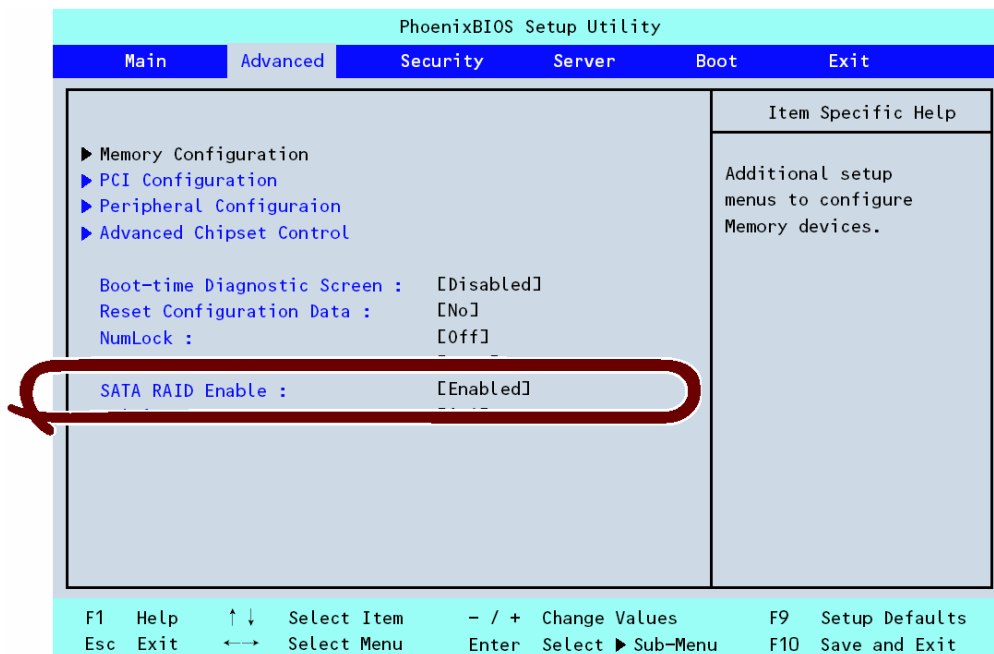
The two hard disk drives installed can be used either as a single disk or as a RAID drive.

To configure a disk drive as a RAID drive, you must specify the hard disk drive being connected to the onboard SATA connector as a RAID drive by using the BIOS SETUP Utility.

 **Note:** The factory-set value is to use the hard disk drives as a single disk drive.

To change the settings using the BIOS SETUP Utility:

1. Start the BIOS SETUP utility.
2. Select [Advanced] → [SATA RAID Enable] → [Enabled].



3. Select [Exit] → [Exit Saving Changes] to save the settings and exit the SETUP utility.

The POST will now display a message allowing you to start the [Array Configuration Utility (ACU)] every time the server boots.


*Press <Ctrl><A> for Adaptec RAID Configuration Utility*

Start the utility to configure the RAID drive as needed.

## Configuring RAID Using the Array Configuration Utility (ACU)

This section describes how to configure the RAID by using the "Array Configuration Utility (ACU)" that can be called during POST.

---

 **Note:** You can configure the RAID drive by using the EXPRESSBUILDER Express Setup.

---

### Running the Array Configuration Utility (ACU)

To start ACU:

---


 **Notes:**

- Make sure that the BIOS has been changed according to [“Enabling the SATA RAID feature in the BIOS Setup” on page 3-40](#).
  - To start the ACU from the management PC via a serial (direct) connection or via the network, refer to the Express-builder online help.
- 

1. Start the server.
2. To run ACU, press **Ctrl + A** when prompted by the following message during the system startup:

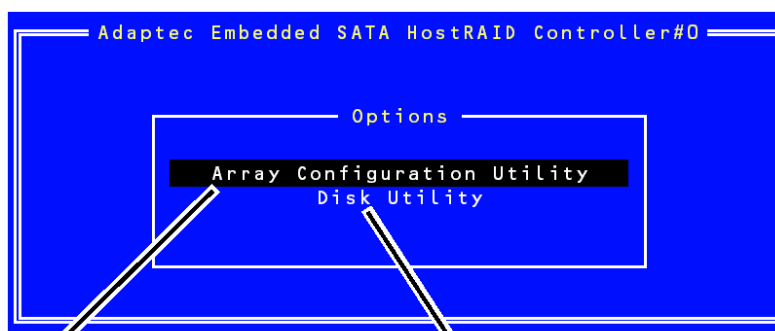
*Press <Ctrl><A> for Adaptec RAID ConfigurationUtility*

---

 **Note:** If it takes a long time until a message appears on the display unit, press **Ctrl + A** three to five seconds after power-on.

---

After a while, the ACU menu appears.



To change or delete the RAID configuration

To perform low-level formatting  
or verification of the RAID drive

### Configuring RAID

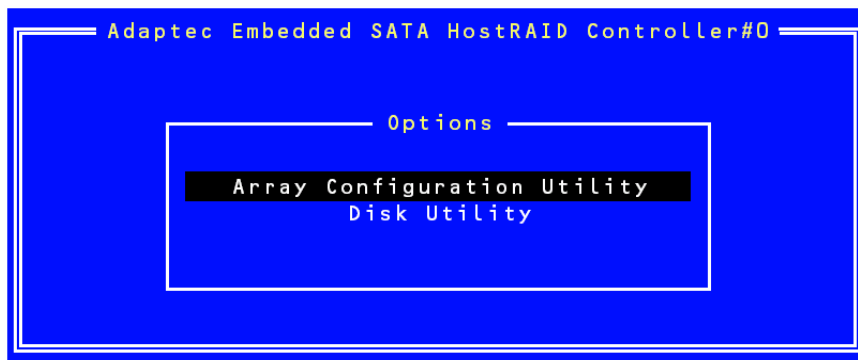
Take the following steps to configure RAID.

---

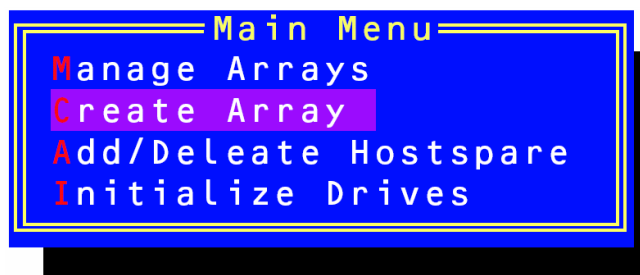
## Warning

- Once the array is created and its properties are assigned, you cannot change the array properties using the ACU. Instead, use Adaptec Storage Manager - Browser Edition.
  - Be sure to set the bootable disk according to [“Managing Arrays” on page 3-46](#) using the BIOS SETUP utility. Otherwise, the memory dump cannot be collected at system failure, or other problems will arise.
- 

1. Start the ACU.  
See "Running the Array Configuration Utility (ACU)" described earlier.
2. Use the cursor key to select [Array Configuration Utility] from the Options menu, and press **Enter**.



3. From the Main menu, select [Create Array] and press **Enter**.



4. Select two hard disk drives for RAID and press **Insert**.  
When you press **Insert**, the selected drive is added to the [Selected Drives] list box at right. If you wish to delete any drive, select the one from the list box on

the left, and press **Delete**. Then, the drive will be erased from the list box at right.



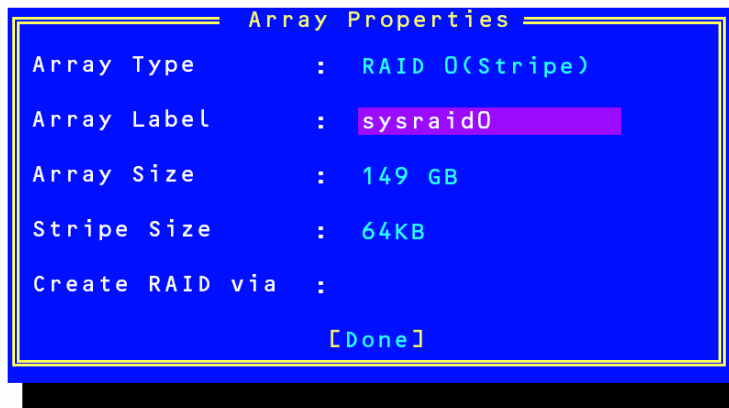
 **Notes:**

- Up to two hard disk drives can be connected to the onboard SATA connector of the server. RAID configuration requires two or more hard disk drives. Therefore, select two hard disk drives displayed in the list.
- The grayed-out hard disk drive indicates a disk that can't be used, or an uninitialized disk. Press **Esc** several times to exit this menu. See [“Initializing Hard Disk Drive” on page 3-48](#) described later.

1. Press **Enter**.
1. [Array Properties] allowing to precisely set RAID appears.
2. Select the desired RAID level using the cursor key and press **Enter**.  
Select either RAID0 (striping) or RAID1 (mirroring).




3. Enter the volume label for the RAID drive to be created, and press **Enter**.

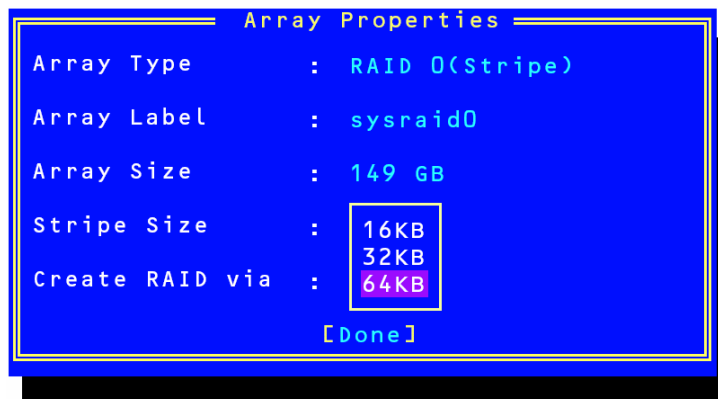


4. For RAID0, select the desired stripe size and press **Enter**. Available stripe sizes are 16, 32, and 64 KB (default).

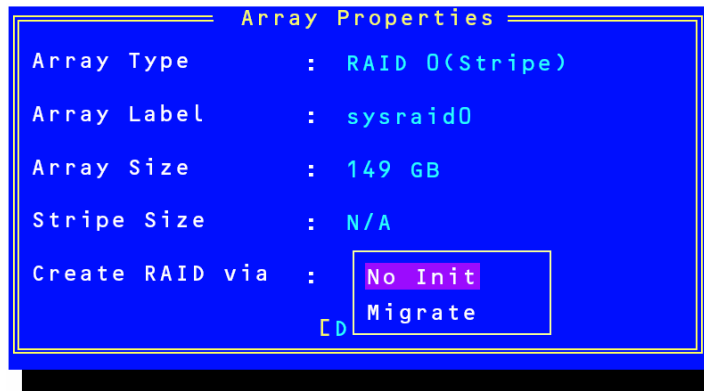
---

 **Note:** We recommends you keep the default 64KB setting for stripe size.

---



5. Select the creation method from [Create RAID via] and press **Enter**.



“Create RAID via” allows you to select between the different creation methods for RAID0 and RAID1. The following table gives examples of when each is appropriate.

RAID level	Create RAID via	Result
RAID0	No Init	Creates a RAID0 on new drives.
RAID0	Migrate	Adds a new drive to the existing drive that contains data (migration). The server does not support [Migrate] feature.
RAID1	Build*	Copies the data in the existing drive and creates RAID1 drive.
RAID	Clear	Clears all the data in the drive and creates new RAID1 drive.
RAID1	Quick Init	Fastest way to create a RAID1 drive.

\*When you start creating RAID, a window to select the copy source drive (existing drive) appears. The data in the selected drive is copied to the new drive to configure RAID. Note that the data in the destination drive is erased.

## ! Warning

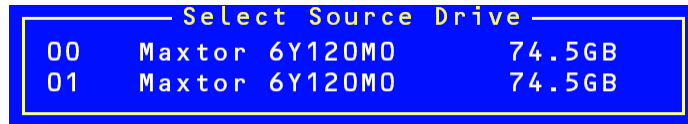
**IMPORTANT:** The server does not support Migrate option.

### Notes:

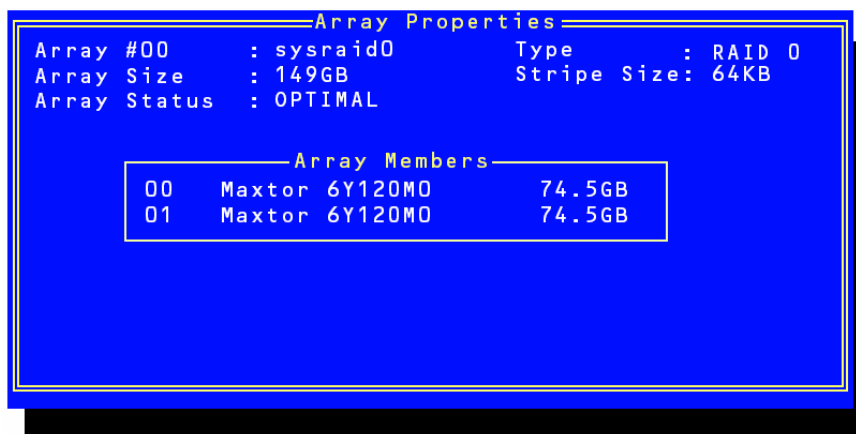
- Before adding a new drive to an existing array, back up any data contained on the new drive. Otherwise, all data will be lost.
- If you stop the Build process on a RAID1 from ACU, you can only restart it from Adaptec Storage Manager - Browser Edition.
- A RAID1 created using the Quick Init option may return some data mismatches if you later run a consistency check. This is normal and it is not a cause for concern.

- The ACU allows you to use drives of different sizes in a RAID1. During a build operation however, only the smaller drive can be selected as the copy source or first drive.
- We do not recommend building arrays on Windows dynamic disks (volumes), as it will result in data loss.

6. Select a source drive from the [Select Source Drive] list box and press **Enter**.



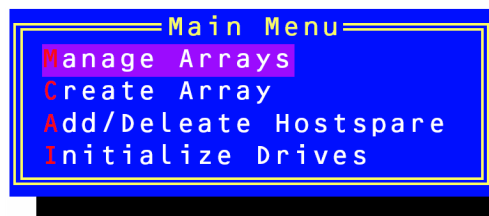
7. When you are finished, select [Done] and press **Enter**.  
The RAID Creation starts. Wait for a while.



To run the Array Configuration Utility (ACU), run the BIOS setup utility and change the "SATA RAID Enable" option in the "Advanced" menu to "Enable". Refer to "System BIOS (BIOS SETUP Utility)" described earlier in this chapter for detail.

## Managing Arrays

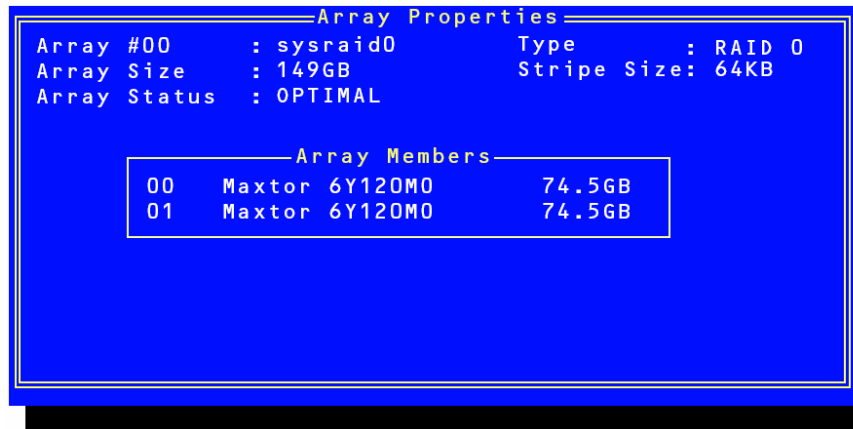
Use the [Manage Arrays] option in the main menu that appears by selecting [Option] → [Array Configuration Utility] to view array properties and delete arrays.



### Viewing Array Properties

Select [Manage Arrays] on the Main Menu and press **Enter** to display the list of RAID drives.

From the [List of Arrays] dialog box, select the RAID drive you want to view and press **Enter**. The [Array Properties] dialog box appears, showing detailed information on the array. The physical disks associated with the array are displayed here.



Press **Esc** to return to the previous menu.

### Deleting Arrays

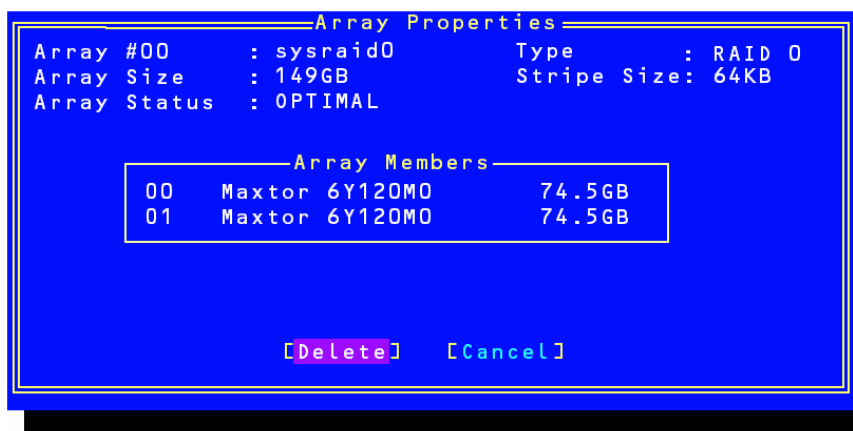
## ! Warning

**IMPORTANT:** Back up the data on an array before you delete it. Otherwise, all data on the array is lost. Deleted arrays cannot be restored.

From the main menu, select [Manage Arrays] and press **Enter**. A list of RAID drives that configure the array is displayed.


#### To delete an array:

1. Select the array you wish to delete and press **Delete**.
2. Select [Delete] on [Array Properties] dialog box and press **Enter**.



The confirmation prompt is displayed.

---

 **Note:** The number and contents depend on the RAID level.

---

3. Press **Y** to delete the array or partition or **N** to return to the previous menu.
4. Press **Esc** to return to the previous menu.

## ***Initializing Hard Disk Drive***

Hard disk drives must be initialized before they can be used as a RAID drive. (An uninitialized disk either does not appear in the disk selection list for creating a new array or appears grayed out.)

---

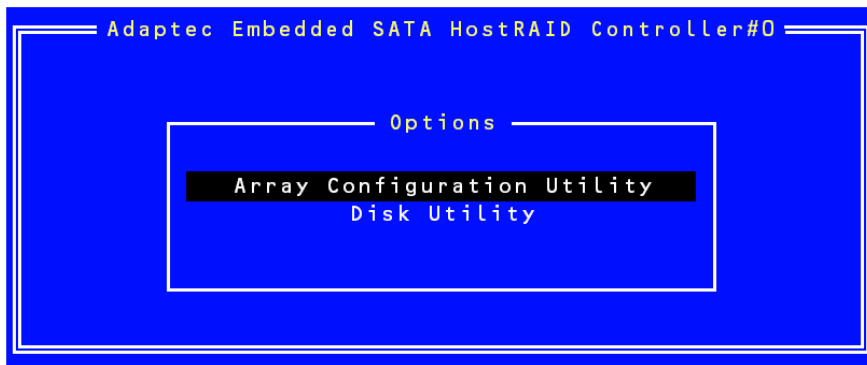
### **Warning**

- Initializing a disk overwrites the partition table on the disk and makes any data on the disk inaccessible.
  - If a drive that has been used in an array is initialized, you may not be able to return the disk to the original array again.
  - Do not initialize a disk that is part of a boot array. The system will fail to start.
- 

*To initialize hard disk drives:*

1. Start the ACU.  
See “Running the Array Configuration Utility (ACU)” on page 3-41.

2. From the Options menu, select [Array Configuration Utility] and press **Enter**.



3. Select [Initialize Drives] from the main menu and press **Enter**.



4. Use the cursor keys to select the hard disk drive you wish to initialize and press **Insert**.
5. Repeat Step 4 so that both drives that need to be initialized are selected.
6. Press **Enter**.
7. Read the warning message and ensure that you have selected the correct disk drives to initialize. Type **Y** to continue.

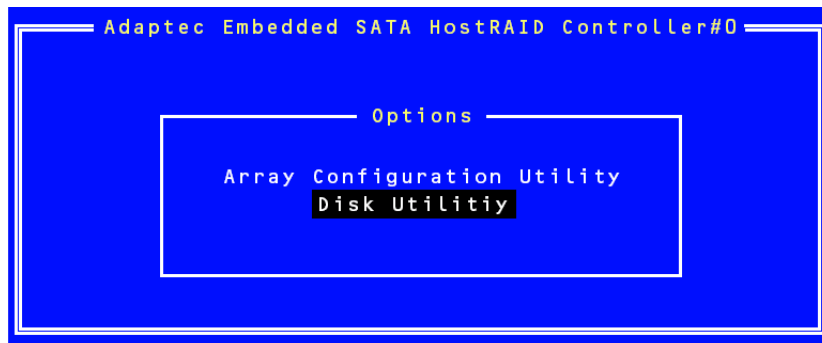
## Using the Disk Utilities

The Disk Utilities enable you to low-level format or verify the media of your Serial ATA hard disks.

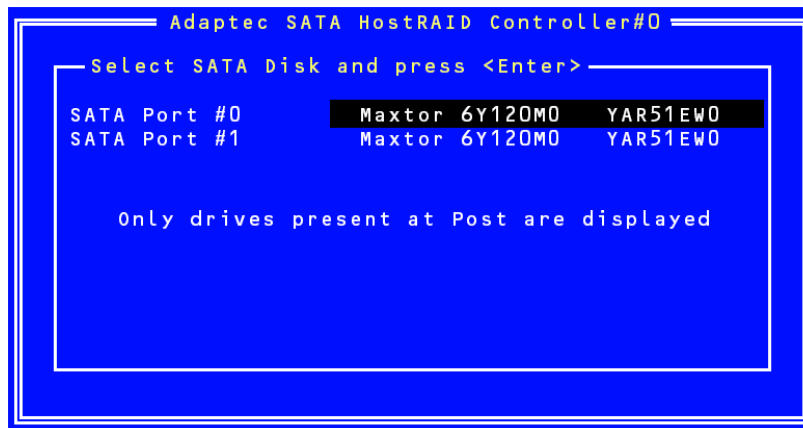
To access the disk utilities:

1. Start the ACU.  
See "Running the Array Configuration Utility (ACU)" on page 3-41.

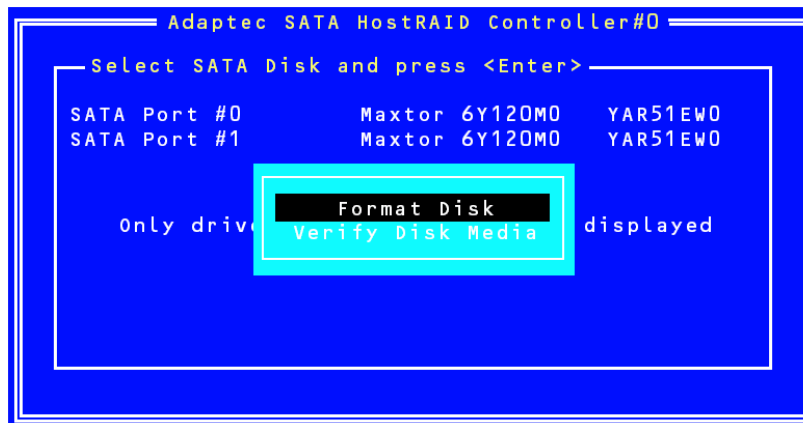
- From the Options menu, select [Disk Utilities] using the cursor key and press **Enter**.



- Select the desired hard disk drive and press **Enter**.



- Select the desired menu to execute and press **Enter**.



#### ■ Format Disk

Starts a low-level format of the hard drive by writing zeros to the entire disk. Serial ATA drives are low-level formatted at the factory and do not need to be low-level formatted again.

### Warning

Low-level formatting erases all data on the drive. Be sure to

back up your data before performing this operation.

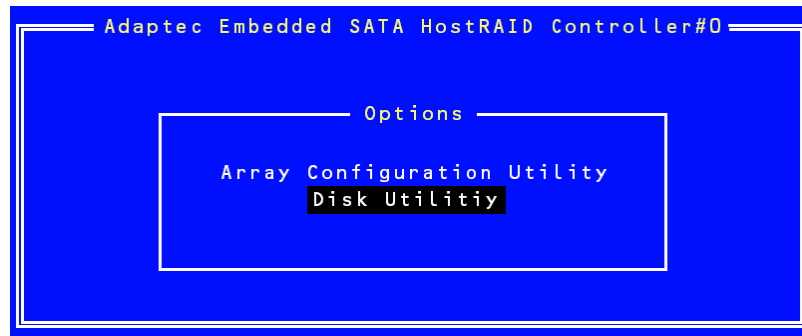
---

■ Verify Disk Media

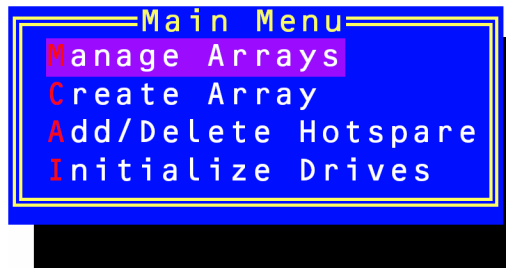
Scans the media in a disk drive for defects.

## Setting the Bootable Hard Disk Drive

1. Start the ACU.  
See “Running the Array Configuration Utility (ACU)” on page 3-41.
2. Select [Options] → [Array Configuration Utility] by using the cursor keys, and press **Enter**.



3. Select [Manage Array] from Main Menu, and press **Enter**.



4. All the created arrays are displayed in [List of Arrays]. Press Ctrl and B. The confirmation message appears. Select [Y].  
[Mark Bootable] is set.
5. Make sure that [Mark Bootable] has been set, exit the Array Configuration Utility and reboot the server.  
You will see an asterisk [\*] at the front of the array to which the [Mark Bootable] has been set in [List of Arrays] dialog box.  
The setting becomes valid once the system has been restarted.

## Configuring Motherboard Jumpers

With the pre-installed SETUP utility, you can set passwords to protect the data stored in the server against access from unauthorized users.

If you forget the passwords, your only option is to clear them. The following describes how to clear these passwords. You can also use the following procedure to clear the CMOS data in the server.



### Notes:

- *Clearing the CMOS data resumes the factory-set configuration data.*
  - *After clearing CMOS, you must run the BIOS SETUP utility and execute the following menus to reconfigure your motherboard:*
    - *Load Setup Defaults in the Exit menu*
    - *Memory Retest of Memory Configuration in the Advanced menu*
    - *Processor Retest of Processor Settings in the Main menu*
    - *SATA RAID Enable in the Advanced menu (if your internal SATA hard disk drives are configured with the SATA HostRAID feature).*
- 



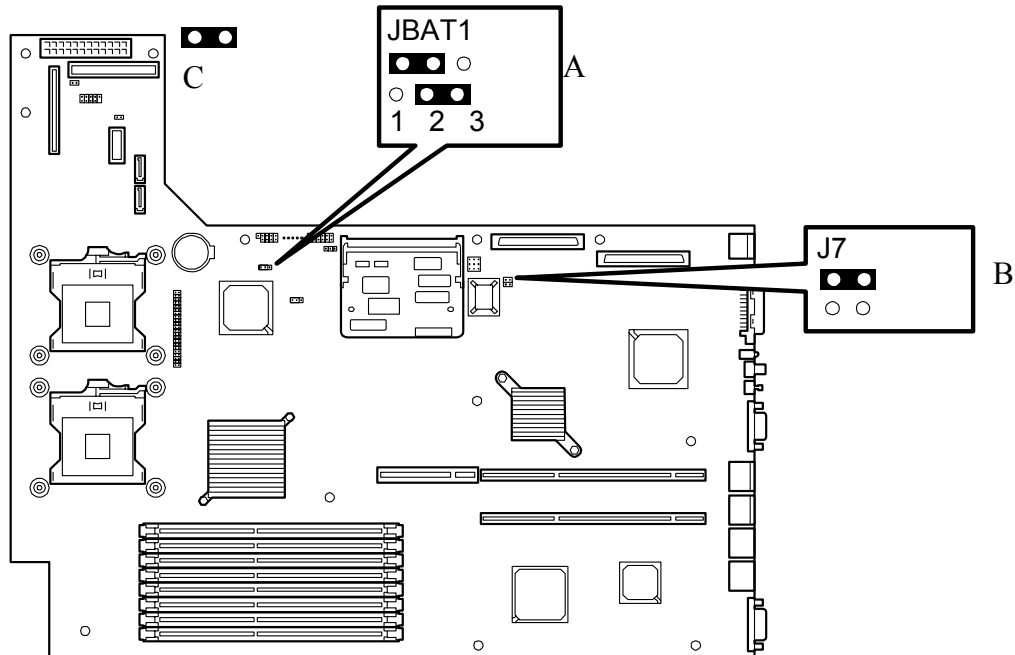
### Caution

- *Do not change any other switch settings. Any change may cause the server to fail or malfunction.*
  - *Never attempt to disassemble, repair, or alter the server on any occasion other than described in this guide. Failure to follow this instruction may cause an electric shock or fire as well as malfunctions of the server.*
- 

*To clear passwords or the CMOS data:*

1. Power off the server and disconnect the power cord and all the cables connected on the rear of the server.

2. Remove the logic cover.
3. Locate the position of the jumpers on the motherboard:



A Clear CMOS jumper  
1-2 = Normal  
2-3 = Clear CMOS

B Clear password jumper  
Closed = Normal  
Open = Clear password

C Jumper shown closed

**Figure 4 - 1 : Clear CMOS & Clear Password Jumpers**

4. For clearing the BIOS password, remove the jumper strap on the BIOS password clear jumper.
5. For Clearing the CMOS, move the jumper strap to the CMOS clear position (2-3).
6. Wait for about 5 seconds and reinstall the jumper block to the default position.
7. Reinstall the logic cover.
8. Plug the power cord and all the cables to the server and turn on the server.
9. Press **F2** when prompted to run the BIOS Setup utility, and select "Load Setup Defaults" at the Exit menu.

**Note:** If the onboard SATA RAID feature is used in the SATA hard disk drive model, change the parameter of the "SATA RAID Enable" in the Advanced menu from [Disable] to [Enable].

This page is intentionally left blank.

# 4

## Upgrading Your Server

## **General Safety Information**

---

### **Warning**

The DC push-button on/off switch on the front panel does not turn off completely the server AC power. Also, +5vdc is present on the system board whenever the AC power cord is connected between the server and an AC outlet. Before doing the procedures in this manual, make sure that your system is powered off and unplug the AC power cord from the back of the chassis.

Failure to disconnect power before opening your server can result in personal injury and equipment damage.

---

---

### **Caution**

Operating your system with the upper access panel removed can damage your server components.

For proper cooling and airflow, always replace the upper access panel before powering on your server.

---

---

### **Warning**

Avoid burns: If the server has been running, any installed processor and heat sink on the processor board(s) will be hot.

To avoid a burn, be careful when removing or installing components that are located near processors.

---

Contact your sales representative or dealer for a list of approved optional peripheral devices.

## **Static Precautions**

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground when handling system components.

Electronic devices can be easily damaged by static electricity. To prevent damage, keep them in their protective packaging when they are not installed in your server.

## ***Equipment Log***

Use the equipment log form (product configuration record table) located at the end of this manual to record the model and serial number of your server, installed options, and any other pertinent information specific to your server. You will need this information when configuring your server.

[See “Equipment Log” on page I-1.](#)

## ***Tools Recommended for Upgrading Your Server***

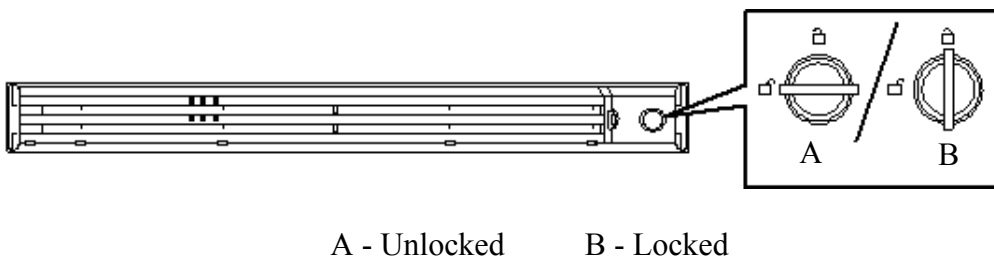
Depending on the upgrade, you will need one or more of the following tools:

- Phillips screwdriver (#1 bit and #2 bit)
- Flat-head screwdriver
- Small needle nose pliers
- Pen or pencil
- ESD workstation or antistatic wrist strap (recommended)

## Preparing Your Server for Upgrade

To prepare your server for installation or removal of server components:


1. Observe the safety and static precautions listed under “General Information” and “Static Precautions” at the beginning of this chapter.
2. Shutdown the operating system (OS).
3. If necessary, to power off the server remove the front bezel ([See “Removing the Front Bezel” on page 2-24.](#)) then press the POWER switch on the front panel of the server.  
The POWER lamp goes out.
4. Unlock and remove the front bezel. ([See “Removing the Front Bezel” on page 2-24.](#))



**Figure 4 - 1 : Unlocking the Front Bezel**

5. Power off the peripheral devices.
6. Unplug the server power cord(s) from the AC wall outlet(s).

---

 **Note:** If the server power cord is connected to a power control unit such as an UPS (Uninterruptible Power Supply), refer to the UPS user's guide for proper power-off procedures.

---

7. Unplug the I/O cables connected to the rear panel of your server.

## ***Installing and Removing a Hard Disk Drive***

The server has three device bay slots to install hard disks with the SCA2 interface in the disk bay of the front of the server.



### **Caution**

- Do not use any hard disks that are not approved by your sales representative. Installing a third-party hard disk may cause a failure of the server as well as the hard disk. Purchase hard disks of the following models:

#### SCSI hard disk drives:

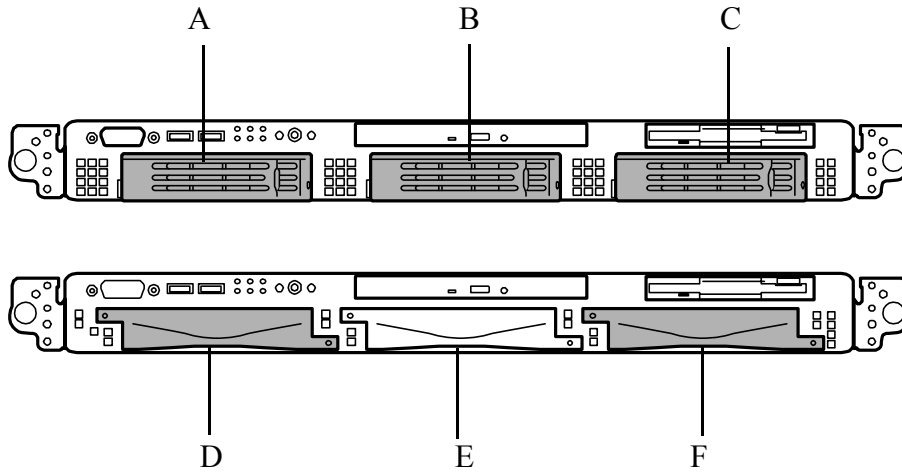
- 36.3 GB, 10,000 rpm, Ultra 320
- 73.2 GB, 10,000 rpm, Ultra 320
- 146 GB, 10,000 rpm, Ultra 320
- 36.3 GB, 15,000 rpm, Ultra 320
- 73.2 GB, 15,000 rpm, Ultra 320

#### SATA hard disk drives:

- 80 GB, 7,200 rpm, serial ATA
- 120 GB, 7,200 rpm, serial ATA
- 250 GB, 7,200 rpm, serial ATA

- To make an array configuration, specify RAID0, RAID1 or RAID5 as the RAID level.
-

All drive slots may contain a hard disk approximately 25.4 mm (1 inch) high. The drive IDs are always assigned to hard disks as shown below.



**Figure 4 - 2 : Hard Disk Drives IDs**

A - SCSI ID0

B - SCSI ID1

C - SCSI ID2

D - Channel 1

E - Not used

F - Channel 2


The hard disk drive bays are connected to the SCSI connector on the motherboard when the server is shipped. To use the hard disk drives in a disk array configuration, reconnect the cable from the connector on the motherboard to which the SCSI controller is connected to the disk array controller connector.

A dummy block or tray is installed in the hard disk drive bays. The purpose of a dummy block is to increase the cooling effect in the server. Install a dummy block in slots not containing a hard disk drive.

## ***Installing a Hard Disk Drive (SCSI hot-swap HDD model)***

Take the following steps to install a hard disk drive. This procedure applies to all the hard disk drive bays. See the next section for the procedure installing a hard disk drive in the flex bay.

---

 **Note:** Any hard disk can be installed or removed in or from the server only by removing the front bezel.

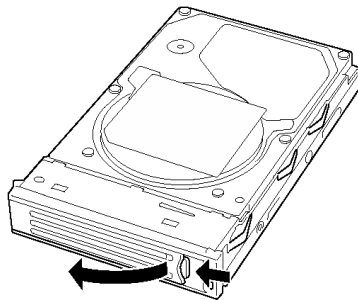
---

---

### **Caution**

- In the disk array configuration, use the hard disks having the same specification including the capacity.
  - Do not press the POWER switch during the installation or removal of the hard disk drive if your server is running.
- 

1. Read section “Preparing Your Server for Upgrade” on page 4 - 4.
2. Unlock the front bezel with the security key and remove the front bezel.
3. Locate the slot in which you are going to install a hard disk drive. The server has three slots.
4. Install hard disk drives in ascending order of the SCSI ID numbers starting from the leftmost slot. The SCSI IDs assigned to the slots are all determined.
5. Remove the dummy block or tray if installed and keep it for future use.
6. Unlock the hard disk drive handle.



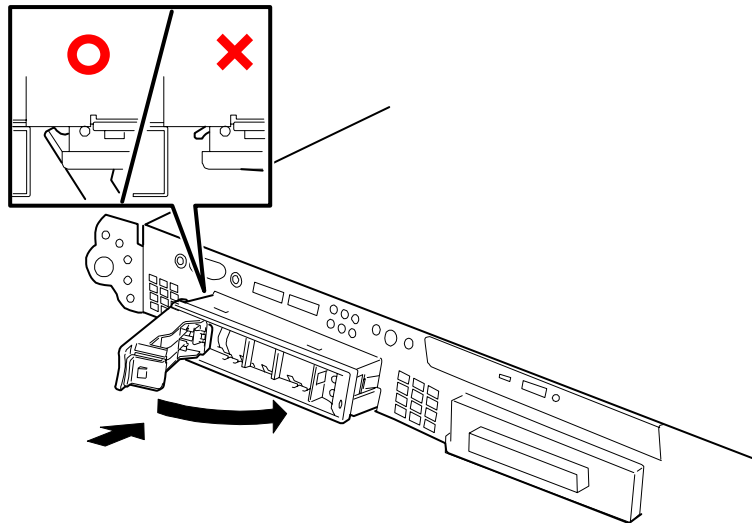
**Figure 4 - 3 : Unlocking the Hard Disk Drive Handle**

7. Firmly hold the additional hard disk drive (with the tray provided) and handle, and insert it into the slot.

---

 **Caution**

- Push the hard disk drive until it docks with the SCSI back-plane connector.
- Carefully hold the hard disk drive with both hands.
- Do not press the POWER switch during the installation or removal of the hard disk drive if your server is running.




- 
8. Slowly close the handle until you hear a “click”.  
The handle is locked.

---

 **Caution**

Be careful not to get your finger caught between the handle and tray. Try to push the drive further to check that it is firmly secured.

---


 **Note:** Check that the handle is hooked to the frame after having inserted the hard disk drive.

---

9. Install the front bezel.
10. Engage the tabs (located on the left side of the front bezel) with the server frame, install the front bezel, and lock it with the security key.

## ***Installing a Hard Disk Drive (SATA fixed HDD model)***

---

 **Note:** Hard disks can be installed or removed in or from the server only by opening the front bezel.

---

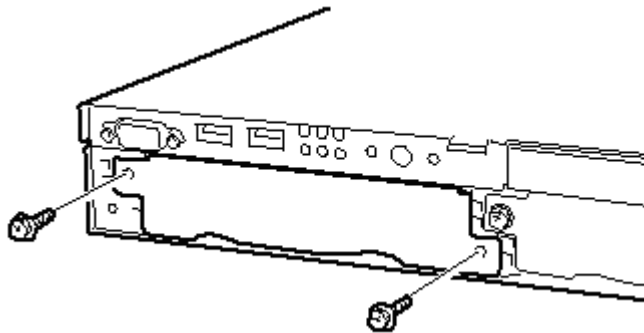
---

### **Caution**

In the disk array configuration, hard disks configuring a specific pack should have the same specification including the capacity.

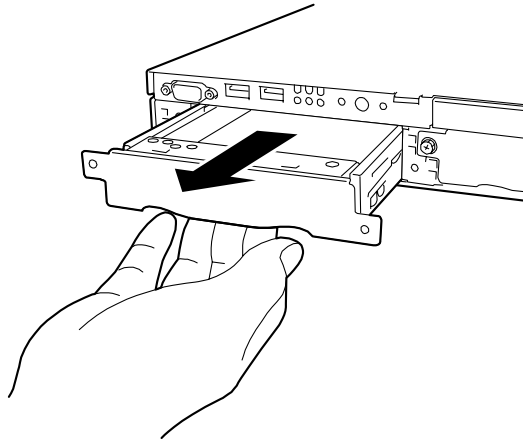
---

1. Read section “Preparing Your Server for Upgrade” on page 4 - 4.
2. Unlock of the front bezel with the security key and remove the front bezel.
3. Check the slot in which the hard disk is installed.
4. Remove the two screws securing the drive carrier.



***Figure 4 - 4 : Removing the Screws Securing the Drive Carrier***

5. Remove the drive carrier.



**Figure 4 - 5 : Removing the Drive Carrier**

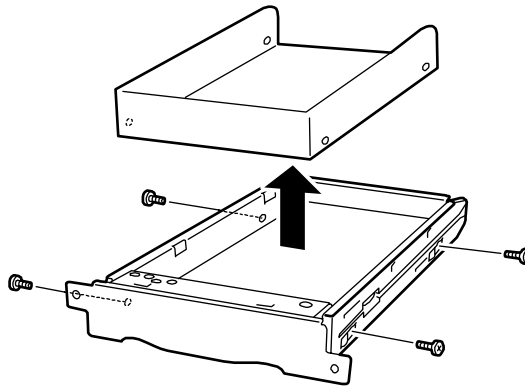


### Caution

To maintain the cooling effect in the server, install the dummy tray in the vacant slot of the disk bay.

---

6. Remove the four screws securing the drive tray.
7. Remove the drive tray from the carrier.




**Figure 4 - 6 : Removing the Drive Tray from the Carrier**

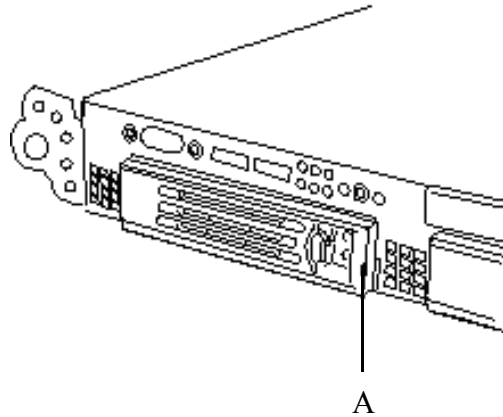
8. Place the hard disk onto the carrier, with its connector facing the rear of the carrier.
9. Secure the hard disk in the carrier with the four screws removed in step 6.
10. Install the drive carrier into the hard disk bay and secure the carrier to the chassis with the two screws removed in step 5.
11. Reinstall the side cover.
12. Close the front bezel.

## Removing a Hard Disk Drive (SCSI hot-swap HDD model)

---

 **Note:** If removing a failing hard disk drive, confirm the slot in which the DISK lamp of the hard disk drive is amber before starting the removal.

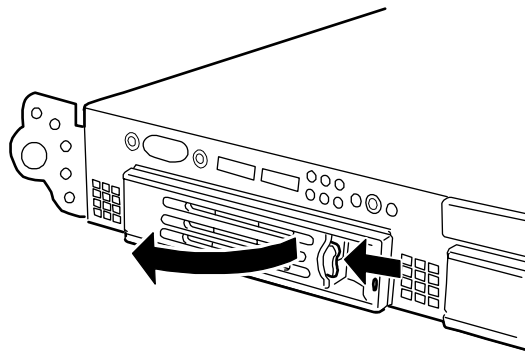
---



A - DISK Lamp

**Figure 4 - 7 : Hard Disk Drive DISK lamp**

1. Read section “Preparing Your Server for Upgrade” on page 4 - 4.
2. Unlock the front bezel with the security key and remove the front bezel.
3. Push the lever to unlock and open the handle.



**Figure 4 - 8 : Unlocking the Hard Disk Drive**



### Caution

Do not press the POWER switch during the installation or removal of the hard disk drive if your server is running.

---

4. Firmly hold the handle and hard disk drive and pull out the hard disk drive.
5. If using the server with the hard disk drive removed, install the dummy block in the empty slot.
6. Reinstall the front bezel.

When the hard disks are in the disk array configuration, you can restore the state before an error using the auto-rebuild feature that stores the data in the old hard disk into a new one.

The auto-rebuild feature is available for the RAID1, RAID5, or RAID010 disk array configuration.

Auto-rebuild is carried out when you hot-swap a failed hard disk with a new one (replace the disk while the server is powered). While auto-rebuild is in progress, the DISK lamp flashes green and amber alternatively to indicate it.



## Caution

- When auto-rebuild fails, the DISK lamp lights in amber. Remove and install the hard disk again to restart auto-rebuild.
  - If the disk array monitoring utility is installed, it may display or act as follows:
    - Displays "Rebuild was cancelled" on the screen while auto-rebuild is in progress.
    - Appears to stop and restart auto-rebuild.
  - If the DISK lamp does not light in amber after auto-rebuild, however, auto-rebuild has completed successfully.
- 

## ***Removing a Hard Disk Drive (SATA fixed HDD model)***


Remove the hard disk in the reverse procedure of the installation.

In the disk array configuration, the auto rebuild function can be used. The auto rebuild function can record the information saved in a defected hard disk into the new replaced disk to recover the server to the state before the occurrence of the fault.

The auto rebuild function is valid for disk arrays set to RAID1. See "[See "Configuring Your Server" on page 3-1.](#)" for details.

## ***Installing and Replacing a Power Supply Unit (Servers with SCSI HDDs only)***

---

 **Note:** The following procedures apply to the 120Rf-1 SCSI hot-swap HDD model server.

---

Your 120Rf-1 SCSI hot-swap HDD model server contains one or two power supplies. The second power supply is optional and provides a redundant configuration that ensures continued operation of the system in the unlikely event one of the power supplies fails

### ***Installing a Power Supply Unit***

1. Read section [“Preparing Your Server for Upgrade” on page 4 - 4.](#)

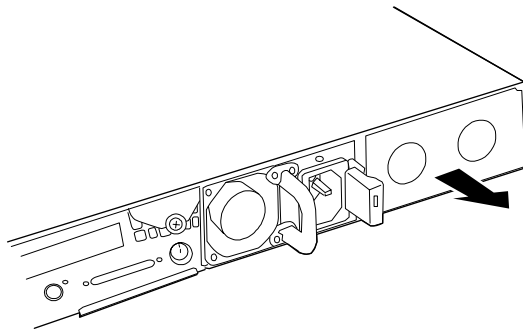
---

#### **Caution**

Turn off the power. Failure to do so causes the server to malfunction or fail.

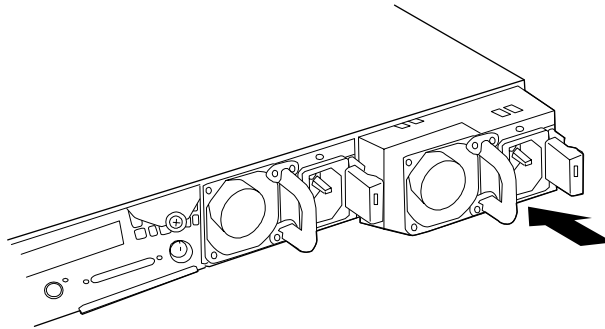
---

2. Pull the cable arm toward the rear of the server and confirm the slot for installing an optional power supply unit.
3. Hold and pull the lever of the blank cover and remove the blank cover.



**Figure 4 - 9 : Removing the Blank Cover**

4. Keep the removed blank cover for future use.
5. Insert the power supply unit in the server.

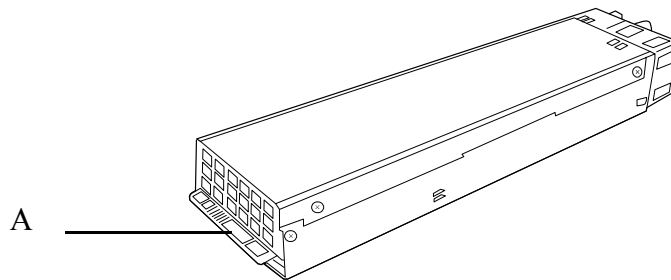


**Figure 4 - 10 : Inserting the Power Unit in the Server**



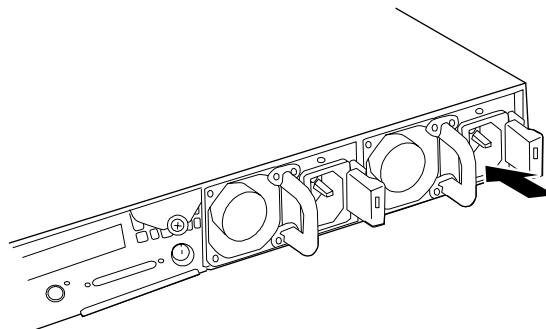
### Caution

Do not touch the terminals A of the power supply unit.



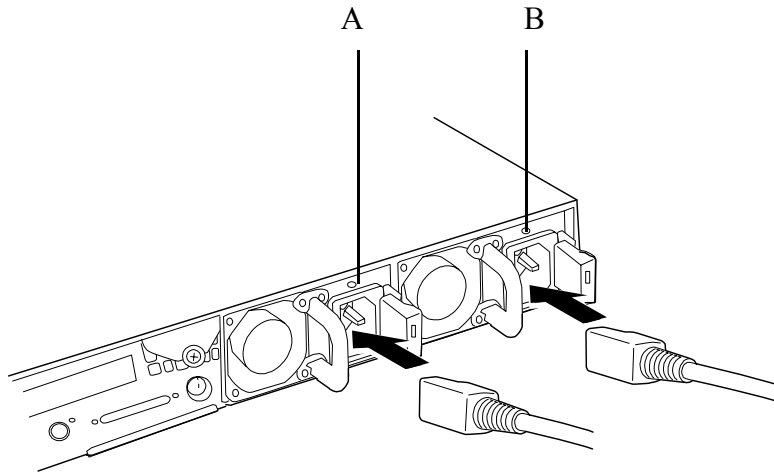
A - Gold-plated connectors

- 
6. Grasp the handle and firmly push the power supply until you hear a “click”. The power supply unit is locked.



**Figure 4 - 11 : Locking the Power Unit Supply**

7. Connect two power cords. Use the power cord provided with the standard power supply unit and the one provided with the server.  
The AC POWER lamps flash when the power cords are connected.



A - Power supply unit 1 (Standard)    B - Power supply unit 2 (Option)

**Figure 4 - 12 : Connecting the Power Cords**

8. Power on the server.  
The AC POWER lamps go on.
9. Confirm, by the STATUS lamp or on the POST screen, that there are no errors related to the power supply units.  
See “step 3” chapter for details on the error messages.
10. If the AC POWER lamps are off, reinstall the power supply units. If the same error message still appears, contact your sales representative.

## Replacing a Failing Power Supply Unit

Replace only a failing power supply unit.


---

### **Caution**

Do not remove a power supply unit operating normally.

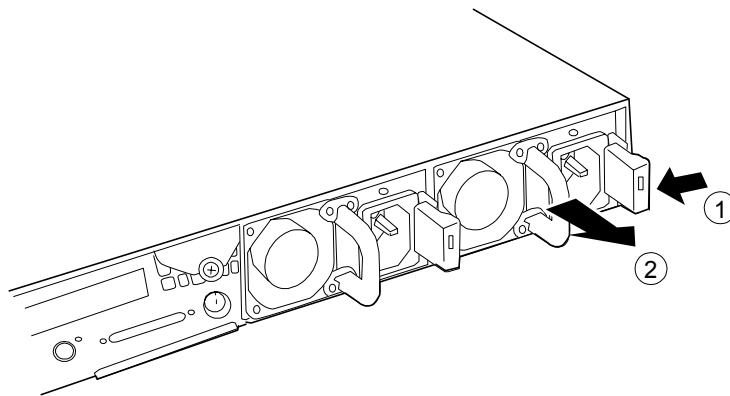
---

---

 **Note:** If one power supply unit fails while the server contains two power supply units in a redundant configuration, the failing power supply unit can be replaced with the system operating (power-on state).

---

1. Locate the failing power supply unit by the AC POWER lamp on the rear of each power supply unit. (The lamp of the failing power supply unit is amber.)
2. Shutdown the server.
3. To turn off the power, press the POWER switch.
4. Disconnect the power cord from the failing power supply unit.
5. Hold the handle of the failing power supply unit.
6. While pressing the lever (1), pull the power supply unit (2) to remove it from the chassis.



**Figure 4 - 13 : Removing the Power Supply form the Chassis**

7. If operating the server with a single power supply unit without installing a new one, install the blank cover you removed in step 3 of power supply unit installation procedure.



## Caution

To maintain the cooling effect in the server, install the blank cover in the vacant slot.

---

8. Install the new power supply unit. [See “Installing a Power Supply Unit” on page 4 - 13.](#)
9. Check that the power supply unit is installed correctly.



**Note:** *If one of the two power supply units of the server is replaced while the power is on, the POWER lamp of the new power supply unit goes on.*

*(If it is replaced while the power is off, the lamp flashes. The lamp goes on when you power on the server.)*

---

## ***Removing and Replacing the Top Cover***

The top cover is made of two separate parts:

- the front part (drive cover) that has be removed to install or remove a 5.25-inch optical device,
- the rear part (logic cover) that has to be removed to install or remove DIMMs or PCI boards.

This section explains how to:

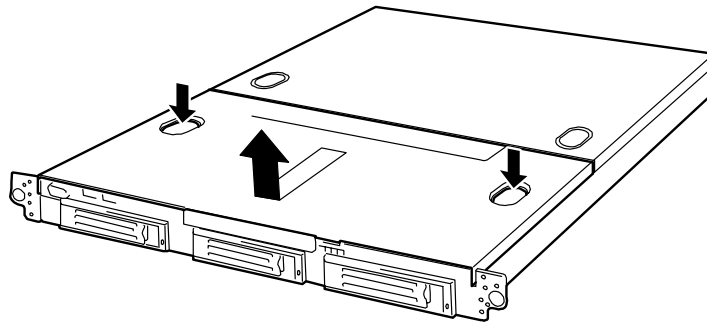
- Remove and install the drive cover
- Remove and install the logic cover.

## ***Removing and Installing the Drive Cover***

Open the drive cover when installing/removing a fan assembly, a processor, and backup file device, or reconnecting an internal cable.

### ***Removing the Drive Cover***

1. Read section “Preparing Your Server for Upgrade” on page 4 - 4.
2. Pull out the server from the rack.
3. Slide the drive cover toward the rear of the server while pressing the lock button on the cover.
4. Lift off the drive cover from the server.



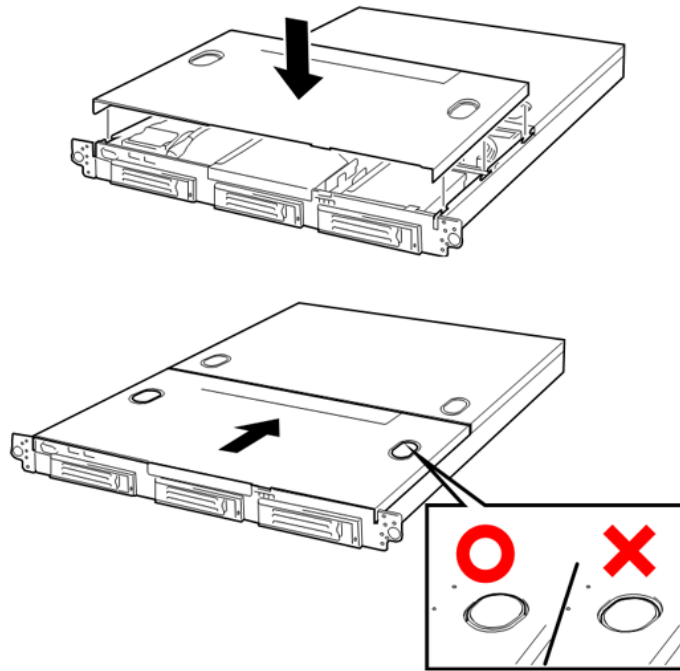
**Figure 4 - 14 : Removing the Drive Cover from the Chassis**

### ***Installing the Drive Cover***

When installing the drive cover, check that the tab of the cover is securely inserted into the slot in the server frame.

1. Slide the drive cover toward the rear of the server until you hear a “click”.  
The drive cover is locked.

2. Check the release button for normal state.



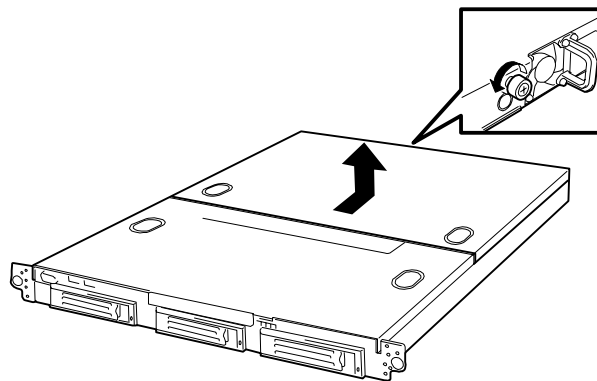
**Figure 4 - 15 : Installing the Drive Cover from the Chassis**

## Removing and Installing the Logic Cover

Open the logic cover when installing/removing a DIMM, processor, and PCI add-in card or reconnecting an internal cable.

### Removing the Logic Cover

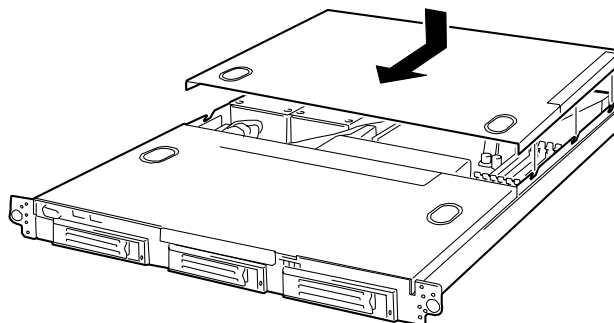
1. Read section “Preparing Your Server for Upgrade” on page 4.
2. Pull out the server from the rack.
3. Remove the captive thumbscrew at the rear of the server (see Figure 4 - 5 below).
4. Slide the logic cover toward the rear of the server and lift off the cover from the server.



**Figure 4 - 16 : Removing the Logic Cover**

### Installing the Logic Cover


1. Slide the logic cover toward the rear of the server and secure the cover with the captive thumbscrew.



**Figure 4 - 17 : Installing the Logic Cover**

2. Check that the tab of the cover is securely inserted into the slot in the server frame.

---


 **Note:** If the logic cover cannot be closed firmly, remove the drive cover before installing the logic cover.

---

## Installing or Removing Random Access Memory

The DIMM (Dual Inline Memory Module) is installed in a DIMM socket on the motherboard in the server. The motherboard contains six DIMM board slots.

---

 **Note:** Up to 16GB of memory (2GB DIMM x 8) can be installed. (The DIMMs installed as standard need to be replaced in this case.)

---

---

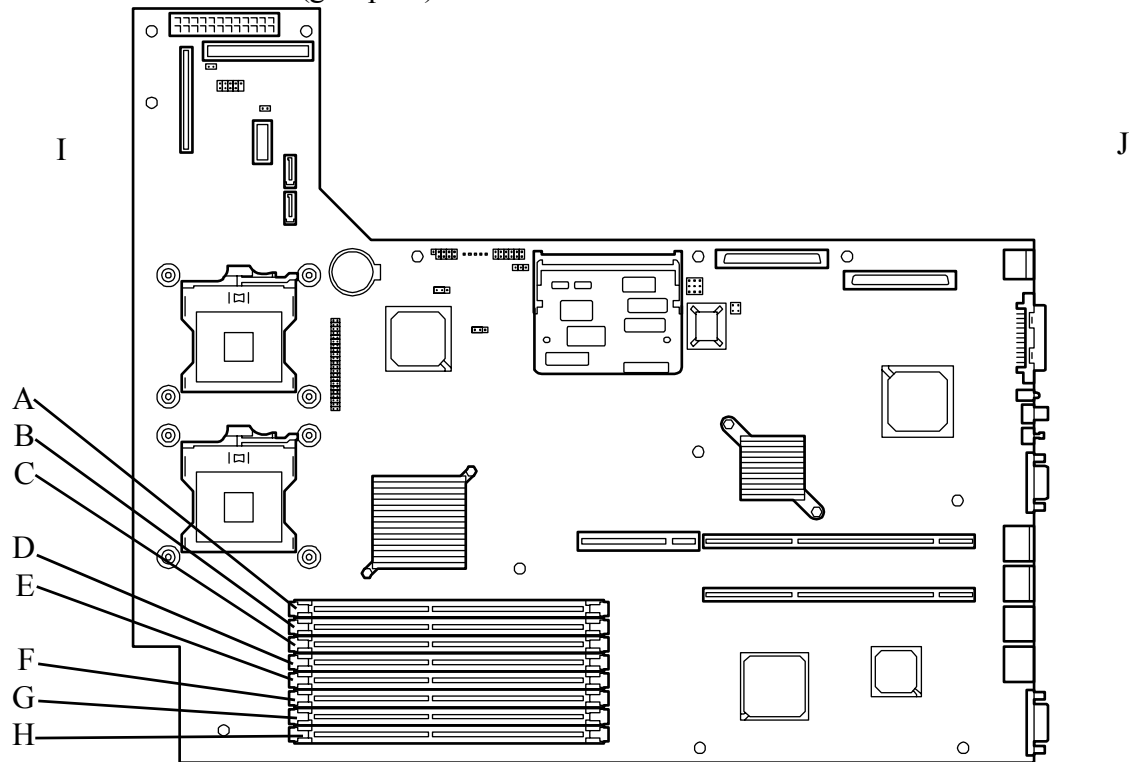
### Caution

- The DIMM is easily affected by static electricity. Handle the DIMM after making your body contact with a metallic frame section of the server to discharge the static electricity on your body. Do not make bare hands contact with terminals and components on the DIMM. In addition, do not put the DIMM on a desk directly. See “Static Precautions” on page 4 - 2 for details about the static electricity.
  - Use a DIMM approved by NEC. If an unapproved third party's DIMM is installed in the server, the DIMM and the server may be defected. You will be charged by any repair of a malfunction or defect caused by such a device within the warranty period.
-

## DIMMs Installation Order

DIMMs are installed in the sockets in pairs and in the following order:

1. G and H (group #4)
1. E and F (group #3)
2. C and D (group #2)
3. A and B (group #1).



A - DIMM #1	B - DIMM #2
C - DIMM #3	D - DIMM #4
E - DIMM #5	F - DIMM #6
G - DIMM #7	H - DIMM #8
I - Front	J - Rear

**Figure 4 - 18 : 120Rf-1 Motherboard**

**Caution**

- Install two additional DIMMs for each group\*1 because the server uses interleaved memory. If DIMMs of different specifications\*2 are installed in a bank, the server does not operate normally.
- \*1 A group is a unit of two DIMM slots. Each pair of DIMM slots #1 and #2 (Group #1), #3 and #4 (Group #2), #5 and #6 (Group #3), #7 and #8 (Group #4) in the figure is a group. (The symbols are also printed on the mother board.)
- \*2 DIMM specification is shown on the label attached to the DIMM as follows:.

---

400/B/512/R12 C10 S

---

Frequency Buffered Capacity Raw address Column address Single side

---

## Installing DIMMs

**Caution**

The server supports DIMMs of only the low-profile type (30 mm (1.2 inches) in height). It does not support DIMMs exceeding the specified height.

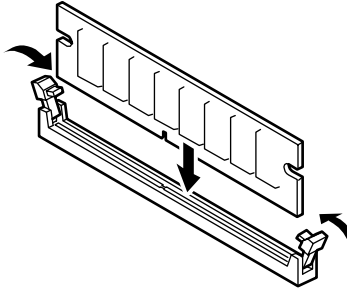
To install a DIMM module:

1. Read section [“Preparing Your Server for Upgrade” on page 4 - 4.](#)
2. Pull out the server from the rack.
3. Open the logic cover. [See “Removing the Logic Cover” on page 4 - 21](#)
4. Locate the socket in which a DIMM module is installed.
5. Open the levers at both ends of the socket.

**Caution**

To avoid damaging the lever, do not apply an excess force onto the lever.

6. Align the new module with an empty memory socket. Make sure the notch on the module aligns with the key in the socket. The module is designed to install into the socket in only one way.
7. Press the DIMM module firmly into the socket. If the DIMM is inserted into the DIMM socket, the lever is automatically closed.



8. Make sure the locking clips at either end of the module click closed. If the brackets don't secure themselves to the module, carefully remove the module, then reinstall it.
9. Replace the logic cover.
10. Install the server on the rack.
11. Power on the server and verify that POST displays no error messages.
12. If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 5.
13. Start the SETUP and select [Advanced] ® [Memory Configuration] to verify that the installed DIMM shows the status "Normal". (See Chapter 3 for details.)
14. Select "Yes" for [Reset Configuration Data] on the [Advanced] menu.  
This setting is required to change the hardware configuration data. (See Chapter 3 for details).

## Removing DIMMs

---

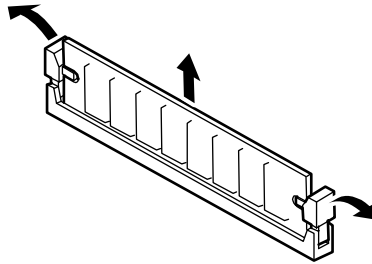
### Notes:

- To remove the failed DIMM, check the error message appearing in POST or ESMPRO to identify the DIMM socket (group) in which the failed DIMM is installed.
  - The server operates only when at least two DIMMs are installed.
- 

*To remove a DIMM module:*

1. Read section "Preparing Your Server for Upgrade" on page 4 - 4.

2. Pull out the server from the rack.
3. Open the logic cover. See “Removing the Logic Cover” on page 4 - 21
4. Open the levers at both sides of the socket from which you remove the DIMM. The DIMM is unlocked and ready for removal.



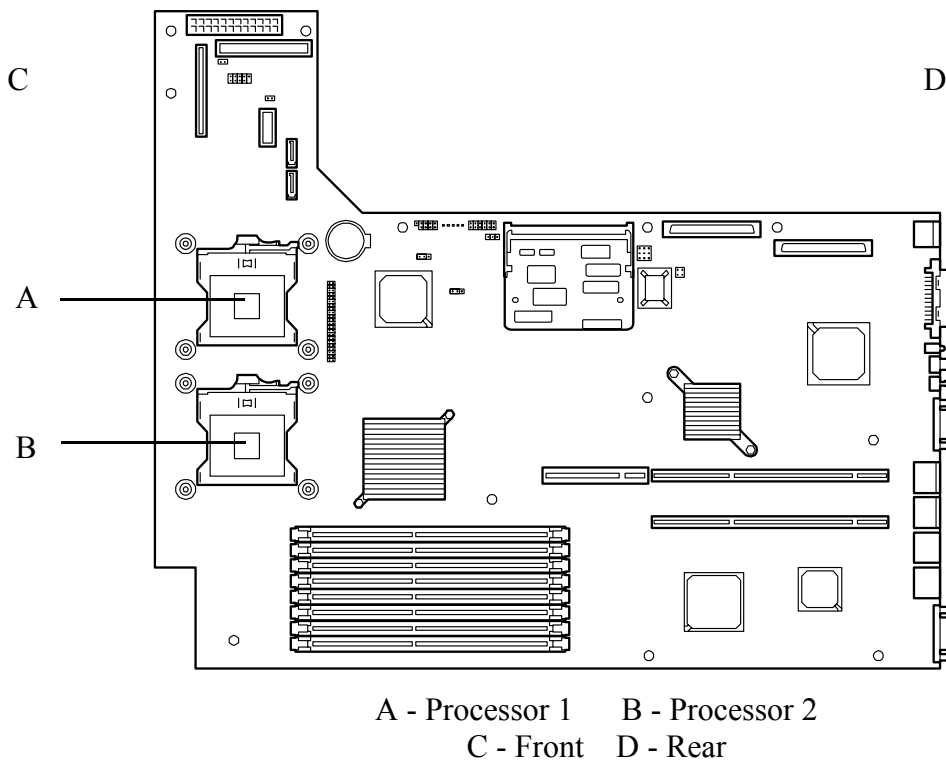
5. Replace the logic cover.
6. Install the server on the rack.

## Installing and Removing a Microprocessor


The 120Rf-1 server may have another CPU installed in addition to the standard CPU (Intel® Xeon™ Processor).

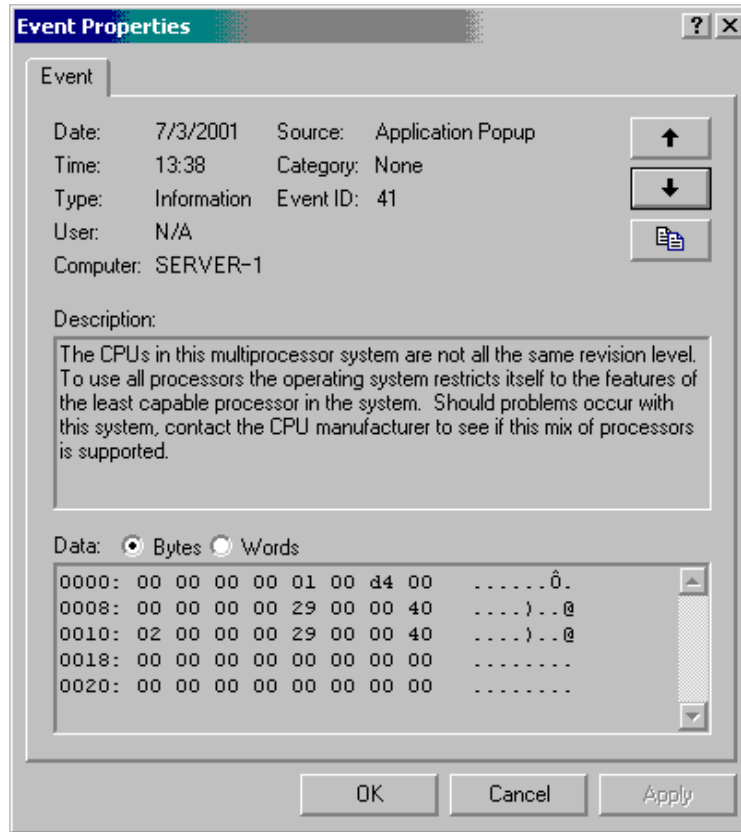
### Caution

- The CPU is easily affected by static electricity. Touch the metal frame of the server to discharge static electricity from your body before handling the CPU. Do not make bare hands contact with the CPU pins. Do not place the CPU directly on the desk. [See “Static Precautions” on page 4 - 2](#) for details about the static electricity.
- Do not operate the server until confirming that the additionally installed CPU is in normal state.
- Use a CPU approved by your sales representative. If an unapproved third party's CPU is installed in the server, the CPU and the server may be defected. You will be charged by any repair of a malfunction or defect caused by such a device within the warranty period.



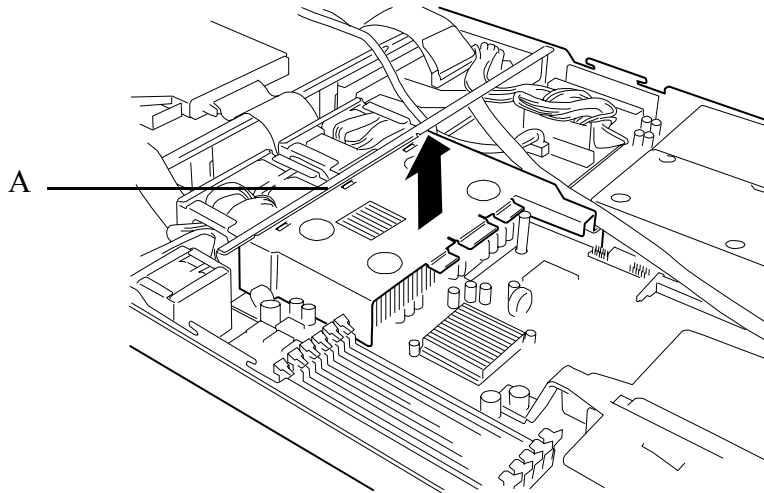
**Figure 4 - 19 : Processor Slots**

 **Note:** If the different revision of the processor is installed in the multiprocessor system, Windows logs the following information every startup. If this message is logged, it is no problem for operation.



## ***Installing a Microprocessor***

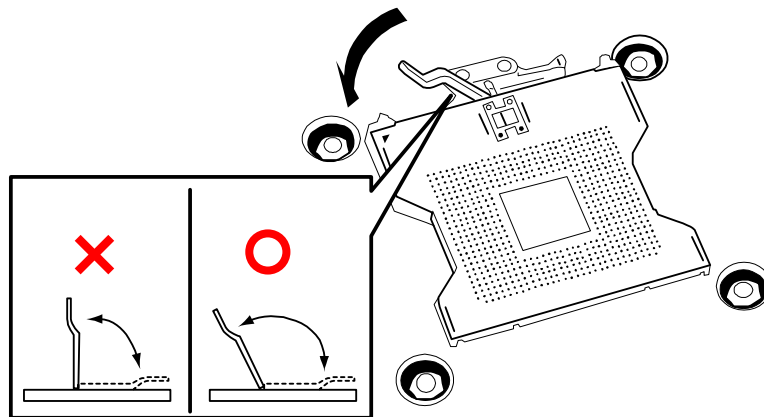
1. Read section “Preparing Your Server for Upgrade” on page 4 - 4.
2. Pull out the server from the rack (See “Removing the Server from the Rack Assembly” on page 2 - 17).
3. Remove the drive cover and the logic cover.
4. Remove the two screws securing the support arm.
5. Remove the support arm and the processor air duct from the chassis.



A - Support Arm

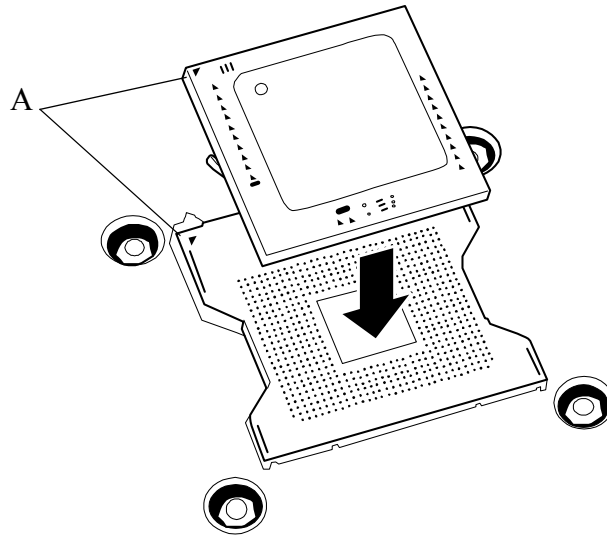
***Figure 4 - 20 : Removing the Support Arm and the Processor Air Duct***

6. Locate the CPU socket in which you want to install the CPU.
7. Lift the locking lever on the socket until it stops. The bar can be opened to approx. 120 degrees.



***Figure 4 - 21 : Opening the Locking Lever***

8. Aligning the pins of the CPU with the socket, insert the CPU slowly and gently into the socket.



A - Pin marks

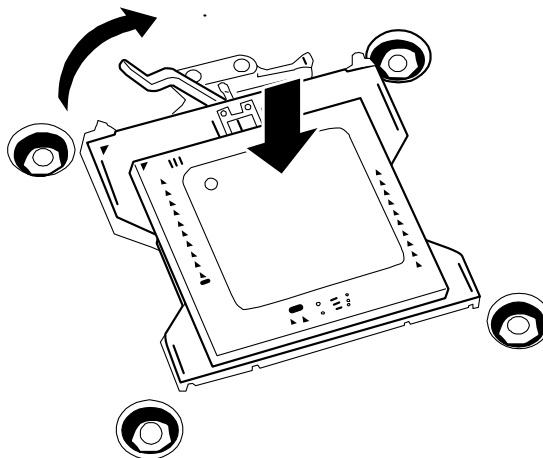
**Figure 4 - 22: Setting the CPU in the socket**



### Caution

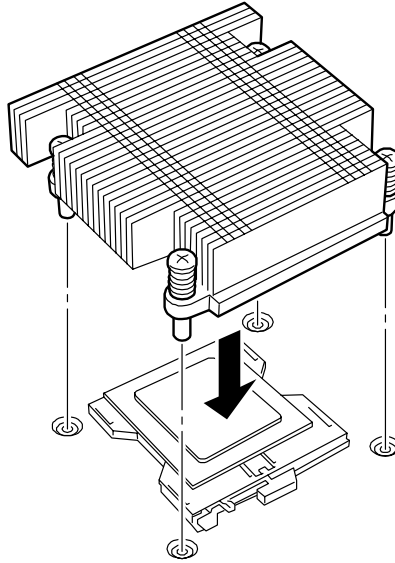
- Be aware of the CPU direction. Pin layouts on two corners among four differ from others to prevent an incorrect insertion. Check the pin mark and pin layout on the socket, and insert the CPU correctly.
- The mother board has "zero insertion force" sockets. If CPU does not drop easily into socket holes, make sure lever is in the full-open position.

9. Push the CPU lightly to the socket, and push down the lever to secure the CPU.




**Figure 4 - 23: Closing the Locking Lever**

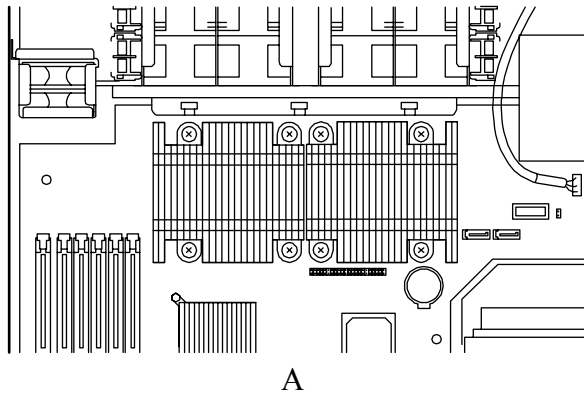
10. Install the heat sink on the CPU.



**Figure 4 - 24: Installing the Heat Sink**

---

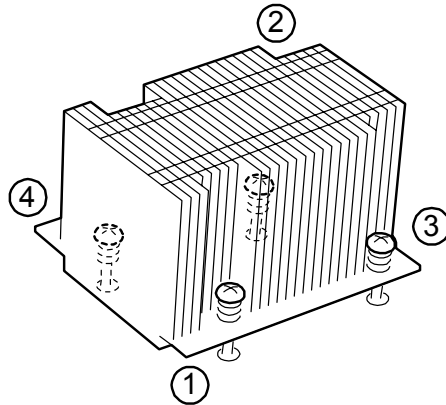
 **Note:** Take care of the direction of the heat sink:



A - Rear

---

11. Fix the heat sink clips with four screws.



**Figure 4 - 25: Fixing the Heat Sink with Screws**

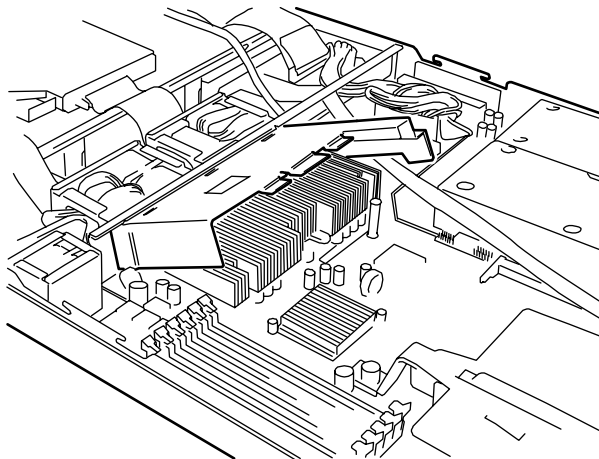
12. Make sure that the heat sink is level.

---

 **Notes:**

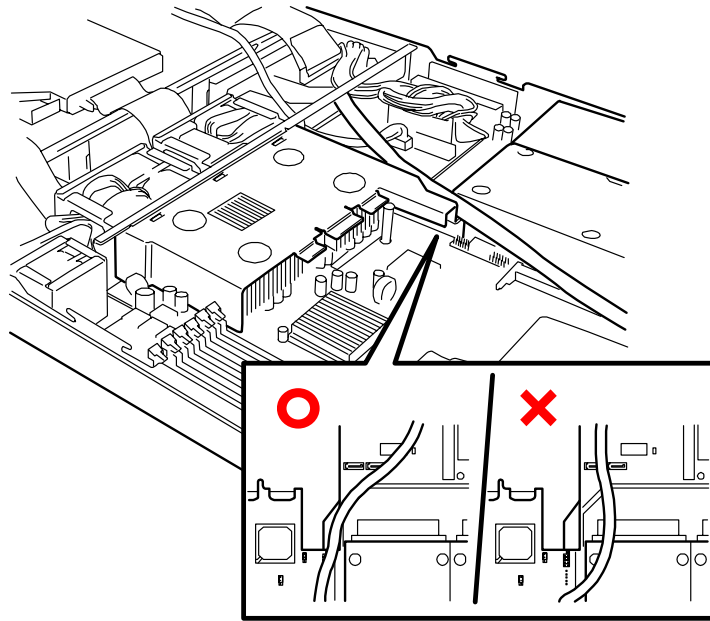
- If the heat sink is not level, remove it, and then install it again. The following probably causes the heat sink not to be level:
    - The CPU is not positioned correctly.
    - All screws are not completely tightened.
  - Do not move the secured heat sink.
- 

13. Install the processor air duct.




**Figure 4 - 26: Installing the CPU Air Duct**

14. Install the SCSI cable as shown in the figure below.



**Figure 4 - 27 : Installing the SCSI Cable**


---

 **Note:** Put the SCSI cable through the tunnel under the full-length riser card receiver of the bracket. Attach the bracket making sure that the cable is not caught in the bracket. Also make sure that the signal cable from the power supply unit that runs through the slit on the left side of the bracket is not caught when attaching the bracket.

---

15. Install the drive cover and the logic cover.
16. Install the server into the rack (see “Installing the Server into a Rack” on page 2 - 5).
17. Power on the server, start the SETUP utility, and set "Processor Retest" of "Processor Settings" on the Main menu to "Enable".
18. Check that POST displays no error messages.
19. If POST displays an error message, take a note on the message and see the POST error messages listed in “POST Error Messages” on page 4 - 62.
20. Set "Reset Configuration Data" on the Advanced menu to "Yes".  
This setting is required to change the hardware configuration data.  
See “BIOS Setup Utility” on page 3 - 3 for details.
21. To add one or more CPUs to the server in 1-CPU configuration to operate the server with more than one CPU, change the driver of [Computer] in the device manager to [ACPI multi-processor PC] and then update the system.

---

 **Note:** Step 21 is required when the Hyper-threading technology feature is disabled in the BIOS SETUP Utility.

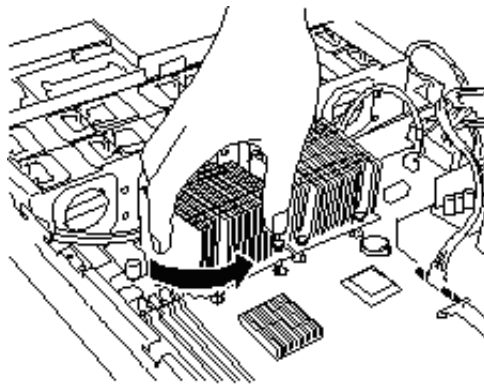
---

## Removing a Microprocessor



### Caution

- Do not remove any CPU unless it is failed.
- After the operation, heat may make the cool seat at the bottom of the heat sink adhere to the CPU. To remove the heat sink from the CPU, first turn the heat sink to the left and right slightly to make sure that the heat sink can be apart from the CPU. Removing the heat sink with it adhering to the CPU may cause the CPU and/or socket to be defected.



**Figure 4 - 28 : Removing the Heat Sink**

---

*To remove a microprocessor:*

1. Read section “Preparing Your Server for Upgrade” on page 4 - 4.
2. Pull out the server from the rack (See “Removing the Server from the Rack Assembly” on page 2 - 17).
3. Remove the drive cover and the logic cover.
4. Remove the SCSI cable.
5. Remove the support arm and the processor air duct from the chassis.
6. Remove the four screws securing the CPU heat sink then set the heat sink aside.
7. Lift the lever of the socket and pull out the CPU from its socket.
8. Install the removed CPU in an antistatic package.
9. Push the lever down to lock it.
10. Install the drive cover and the logic cover.
11. Install the server into the rack (see “Installing the Server into a Rack” on page 2 - 5).

*If a CPU is removed or replaced:*

1. Start BIOS Setup to select menus "Main" – "Processor Settings" – "Processor Retest" in the order to clear the error information on the removed CPU.  
When a CPU is replaced, select menus "Main" – "Processor Settings" to check that the ID and L2 Cache of the additional CPU are defined normally.  
See "BIOS Setup Utility" on page 3 - 3.
2. Set "Reset Configuration Data" on the Advanced menu to "Yes".  
This is required to update the hardware configuration information (see "BIOS Setup Utility" on page 3 - 3).

## ***Installing and Removing a PCI Board***

The server has a riser card assembly on the motherboard that enable installation of PCI boards. The riser card assembly can hold up to two PCI boards.

Insert PCI boards for network extension and file device function extension into PCI board slots in each riser card.



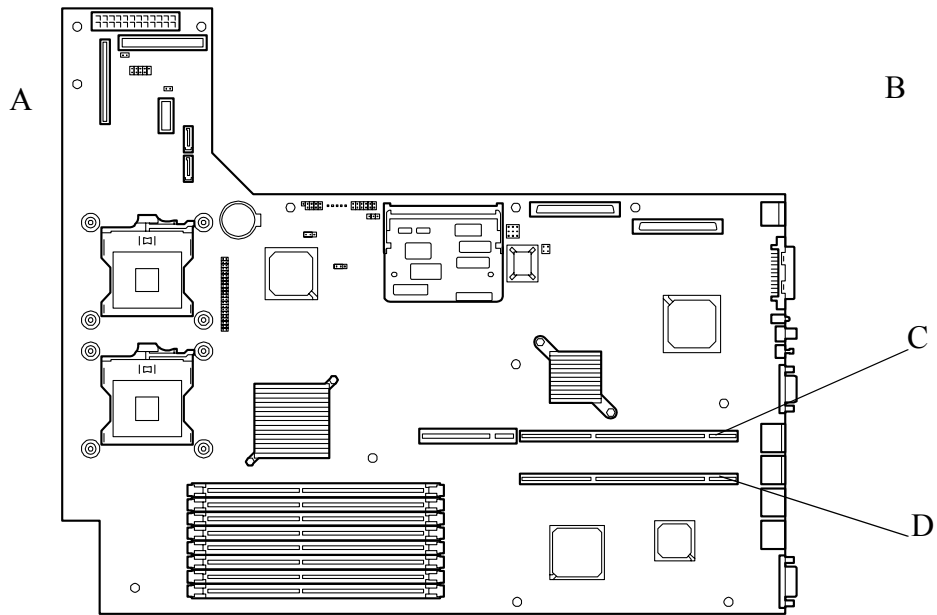
### **Caution**

- The PCI board is sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the PCI board. Do not touch the PCI board terminals or on-board parts by a bare hand or place the PCI board directly on the desk. See [“Static Precautions” on page 4 - 2.](#)
- Some restrictions are imposed on the combination of PCI boards which can be installed in the server. Contact your sales agent for details.
- A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.



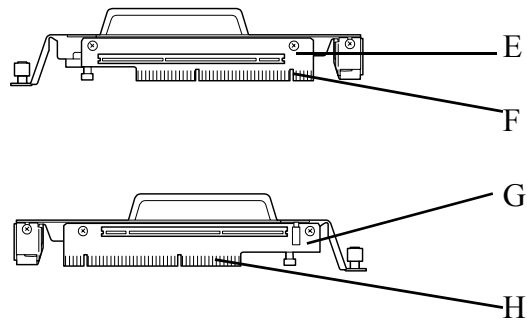
**Note:** Some PCI boards use an on-board expanded ROM. See the manual provided with the PCI board to determine whether expanded ROM needs to be loaded. Use the BIOS setup utility "SETUP" for the setting. For more information, see [“BIOS Setup Utility” on page 3-3.](#)

---



- A Front side
- B Rear side
- C Riser card slot 1B, for full-height PCI boards
- D Riser card slot 1C, for low-profile PCI boards


**Figure 4 - 29 : 120Rf-1 Motherboard**



- E PCI board slot (B)
- F Connect to riser card slot (B)
- G PCI board slot (C)
- H Connect to riser card slot (C)

**Figure 4 - 30 : PCI Board Slots**

---

 **Notes:** Observe the following notes on installing/removing a PCI board:

- Do not touch the terminals of the riser cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.
- The system detects the boot devices in order of the PCI bus slots 1C (low-profile PCI board) and then 1B (full-height PCI board).
- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from that described above, depending on the OS or the disk array BIOS utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

	Bus number	Device number	Function number
Onboard NIC1	2	1	0
Onboard NIC2	2	1	1
Slot 1C	2	2	X
Onboard SCSI Ch A (external)	2	3	0
Onboard SCSI Ch B (internal)	2	3	1
Slot 1B	3 *	7	X

\* The bus number may be 5 or greater depending on the board installed in Slot 1B.

- Set "Disabled" for the optional ROM of a LAN device not to be booted by using the BIOS SETUP utility.
  - If an additional LAN device is installed, it is hard to push the catch of the connector with your finger that is connected to the LAN port. Disconnect the connector pushing the catch with a standard screwdriver. At this time, be very careful for the screwdriver not to damage the LAN port or other ports.
  - If a bootable PCI board (e.g., a disk array controller, SCSI controller, or LAN card) is additionally installed, the boot priority is changed. After the additional installation, start the BIOS SETUP utility, select [Boot] and set the new boot priority.
  - Contact your service representative for the acceptable optional PCI board.
-

## Installing a PCI Board

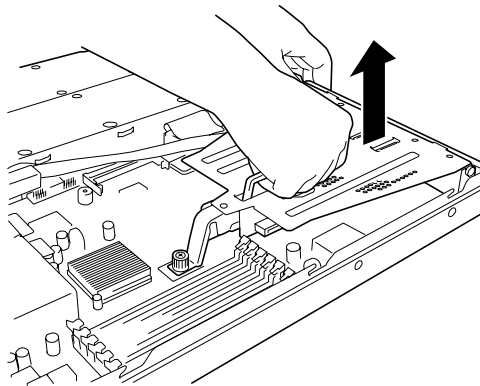


### Caution

- The full-height riser card is equipped with an "insulator (black)" to protect PCI boards. Do not remove the insulator, and handle it carefully. The insulator is not shown in the figures in this guide for simplifying the illustrations.
  - Each riser card supports low-profile or full-height PCI boards. Before installing a PCI board, check the type of the PCI board.
  - When installing a PCI board, check that the card connector matches the connector of the riser card.
- 

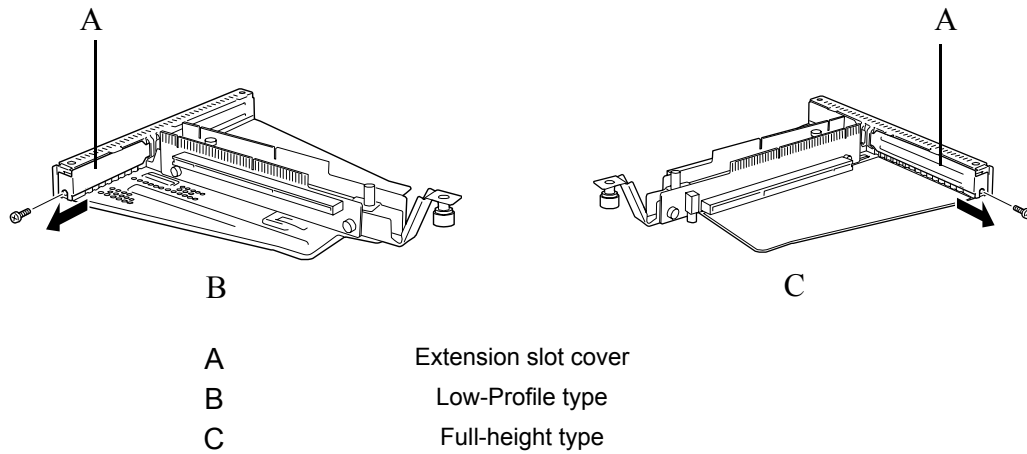
To install a PCI board on the riser card:

1. See the section [“Preparing Your Server for Upgrade” on page 4 - 4.](#)
2. Pull out the server from the rack (see [“Removing the Server from the Rack Assembly” on page 2 - 17.](#))
3. Remove the drive cover and the logic cover.
4. Lift straight up and remove the riser card assembly from the server.

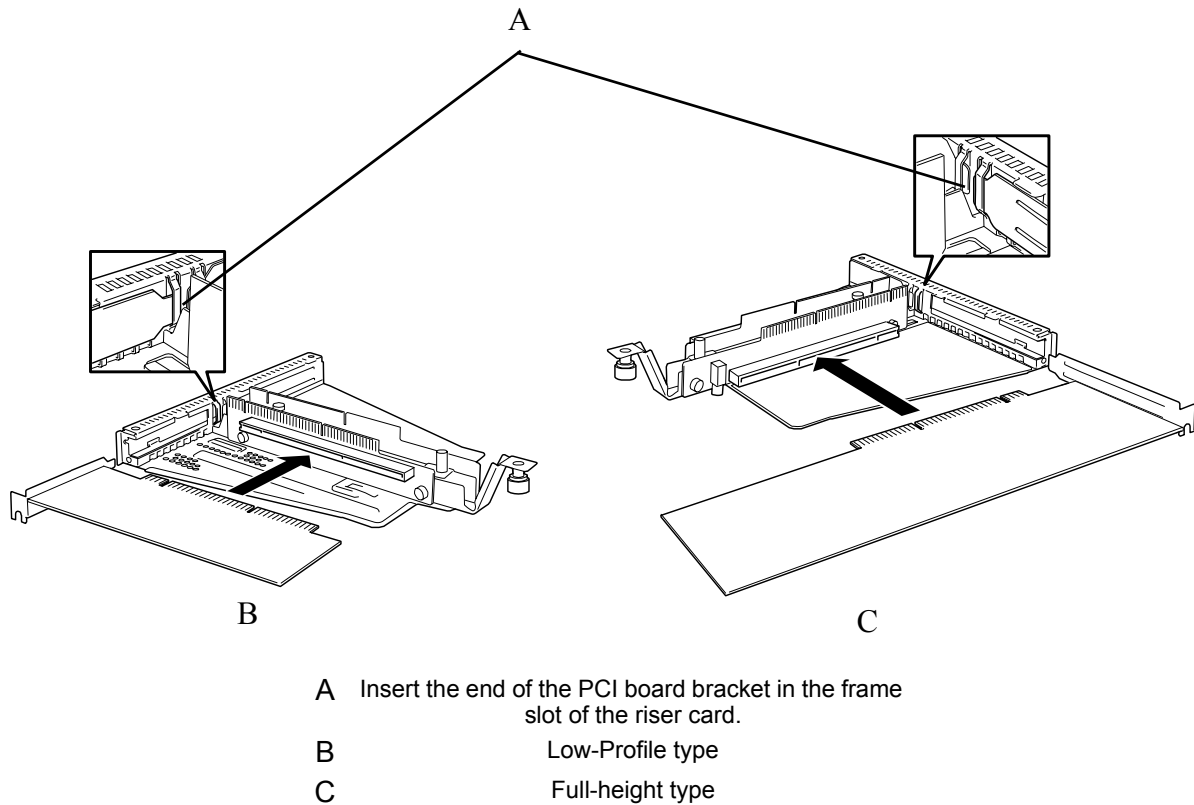


**Figure 4 - 31: Removing the Riser Card Assembly**

5. Remove the screw from the riser card and remove the extension slot cover.



6. Install the PCI board on the riser card.  
Align the PCI board terminal section with the riser card slot, and firmly push the PCI board until it is fully seated.




**Figure 4 - 32: Installing PCI Boards into the Riser Cards**

---

 **Caution**

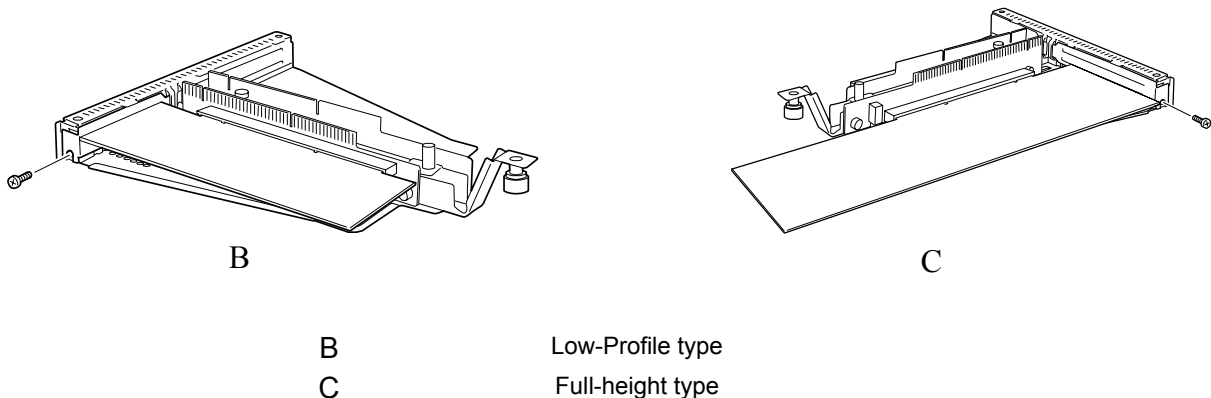
- Do not touch the terminals of the riser cards and PCI boards with your bare hand. Fingerprints and dust left on them cause the server to malfunction.
  - If you are unable to install a PCI board correctly, remove it, and then install it again. Be careful not to apply excess force to a PCI board or riser card. Doing so may damage the card.
- 

---

 **Note:** Check that the end of the PCI board bracket is inserted in the frame slot of the riser card.

---

7. Secure the PCI board with the screw you removed in step 5.



**Figure 4 - 33 : Securing the PCI Board**

---

 **Caution**

This step is to protect the terminals of the riser card from dust or fingerprints. Dust and fingerprints left on them cause the server to malfunction.

---

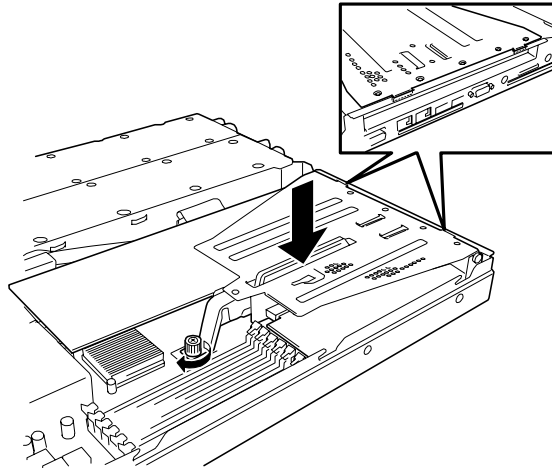
8. Insert the riser card assembly into the slot on the motherboard. Align the riser card terminal section with the slot on the motherboard, and firmly push the riser card until it is fully seated.
- 

 **Notes:**

- There are catches on the riser card frame that are used to secure the riser card to the cabinet. When inserting the riser card, confirm that the catches are correctly fit into the holes on the rear of the cabinet. After the insertion, push the riser

card with your fingers until you cannot see any part of the riser card terminal section. The riser card is now fully seated in the slot.

- Pay attention not to damage the components on the motherboard with the riser card when inserting it into the slot.
- 



**Figure 4 - 34 : Inserting the Riser Card Assembly into the Motherboard**

9. Install the components you removed previously.
10. Verify that POST displays no error messages.
11. If POST displays an error message, take a note on the message and see the POST error messages listed in “POST Error Messages” on page 4 - 62.
12. Run the BIOS SETUP utility and select "Yes" for [Advanced] ® [Reset Configuration Data].  
This setting is required to change the hardware configuration data. See “BIOS Setup Utility” on page 3 - 3 for details.

## **Removing a PCI Board**

Remove a PCI board in reverse order of the installation steps.

## Installing and Removing a Raid Controller Board

Using the optional RAID controller allows you to use hard disks in the device bays of the server and those in the optional expansion disk cabinet in the disk array configuration.



### Caution

- The disk array controller board is extremely sensitive to static electricity. Make sure to touch the metal frame of the Server to discharge static electricity from your body before handling the disk array controller board. Do not touch the disk array controller board terminals or on-board parts by a bare hand or place the disk array controller board directly on the desk. For static notes, see [“Static Precautions” on page 4 - 2](#).
  - Making hard disks in the disk array configuration or changing the RAID level initializes hard disks. If the hard disk to be configured in the array has your valuable data stored, make sure to make a backup copy of the data before installing the disk array controller board and configuring the array.
  - The disk array configuration requires at least two hard disks.
  - Use hard disks of the same capacity and performance (e.g., revolution) for each pack to configure them in the array.
- 



### Notes:

- *Before installing a disk array controller board, start the SETUP utility, select [Advanced] → [PCI Configuration], and check that [Enabled] is set for the parameter [PCI Slot xx ROM] (xx: PCI slot number).*
  - *A disk array configuration of RAID1 or RAID5 increases disk reliability. However, the actually available capacity becomes smaller than the total hard disk capacity in the disk array configuration.*
- 

When you use the onboard RAID controller, refer to the following documentation:

- SCSI RAID controller: Refer to [“RAID Configuration of SCSI Hard Disk Drives” on page 3-23](#).
- SATA RAID controller: Refer to [“RAID Configuration of SATA Hard Disk Drives” on page 3-39](#).

## Installing a SCSI RAID Controller Board

See [“Installing a PCI Board” on page 4 - 39.](#)

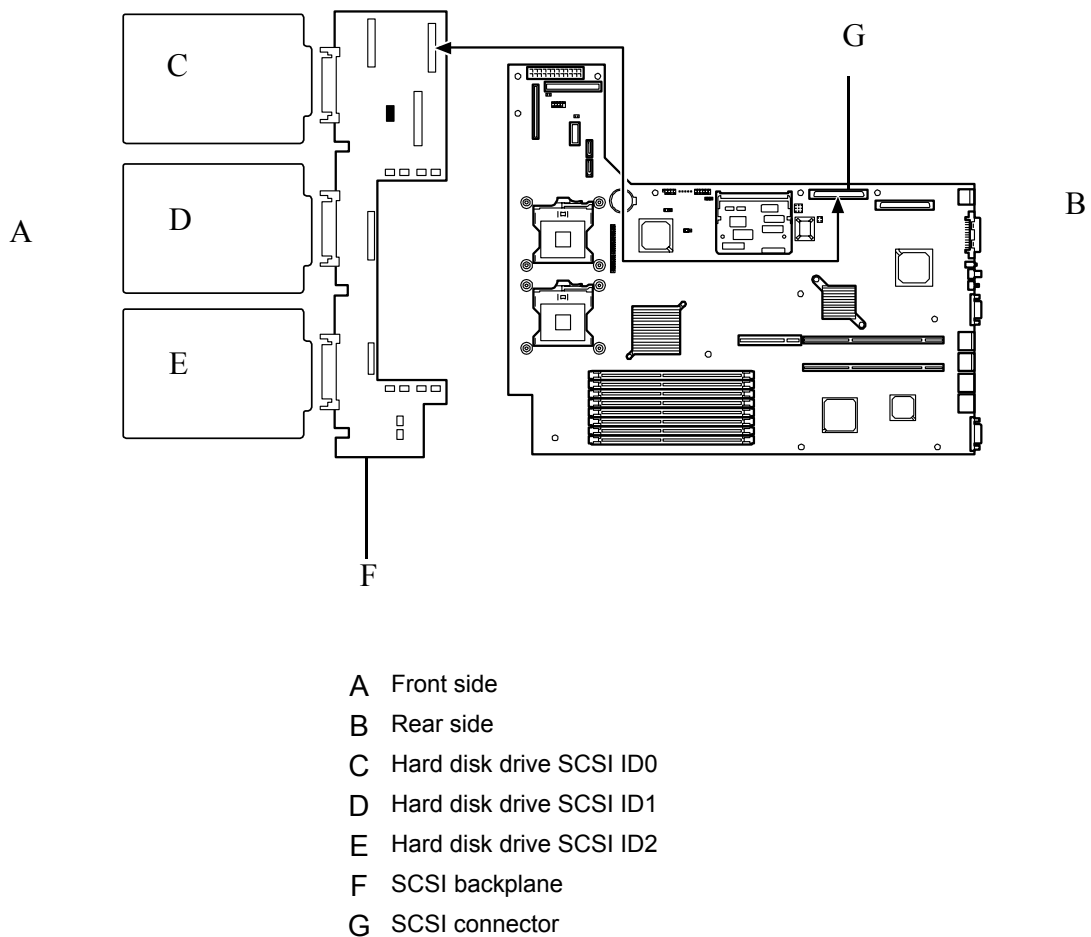
## Removing a SCSI RAID Controller Board

Remove a a SCSI RAID controller board in the reverse order of the installation steps.

## Use of internal hard disk drives in a RAID configuration

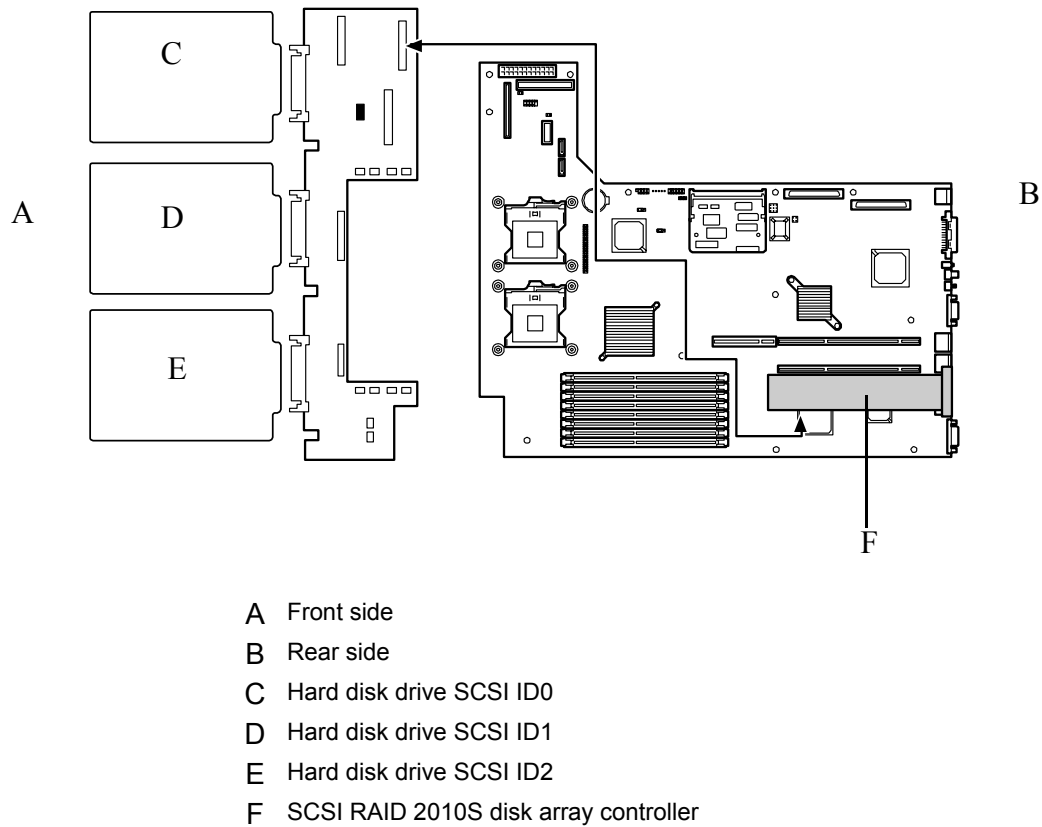
To use the internal hard disk drives in a RAID configuration in the server containing an optional SCSI RAID controller, reconnect the SCSI cables on the motherboard to the disk array controller.

The internal hard disk drive interface is connected to the SCSI connector on the motherboard at shipment.



**Figure 4 - 35 : Disk Array - Standard Configuration**

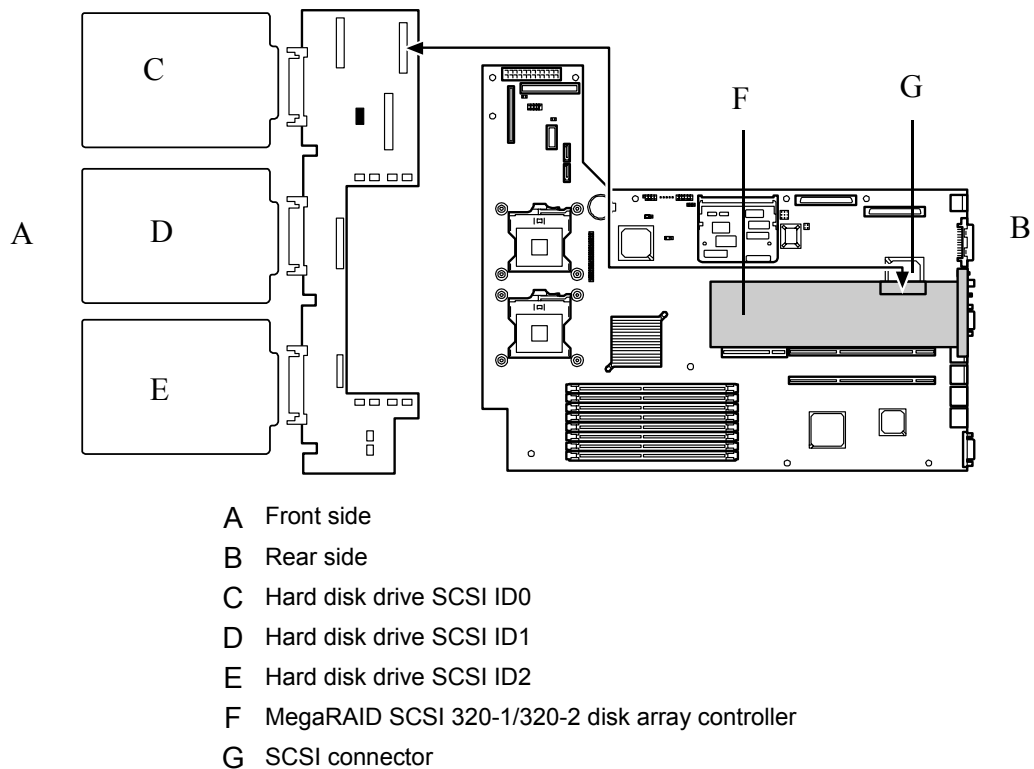
*Connecting the SCSI cable to an optional RAID controller in the low-profile PCI slot*



**Figure 4 - 36 : Disk Array - optional RAID controller in the low-profile PCI slot**

Connect the SCSI cable to the optional RAID controller in low-profile PCI slot to configure the disk array

*Connecting the SCSI cable to an optional RAID controller in the full-height PCI slot*



**Figure 4 - 37 : Disk Array - optional RAID controller in the full-height PCI slot**

Connect the SCSI cable to the optional RAID controller in full-height PCI slot to configure the disk array.

**Caution**

Some disk array controller boards have more than one channel (connector). They may have connectors for internal connection and external connection. However, the connectors may be under exclusive specification in consideration of the internal connection of the disk array controller board. Make sure that each connector (channel) is for internal connection or external connection. For the connectors and channels, see the manual provided with the disk array controller board.

### *SCSI cable connection*

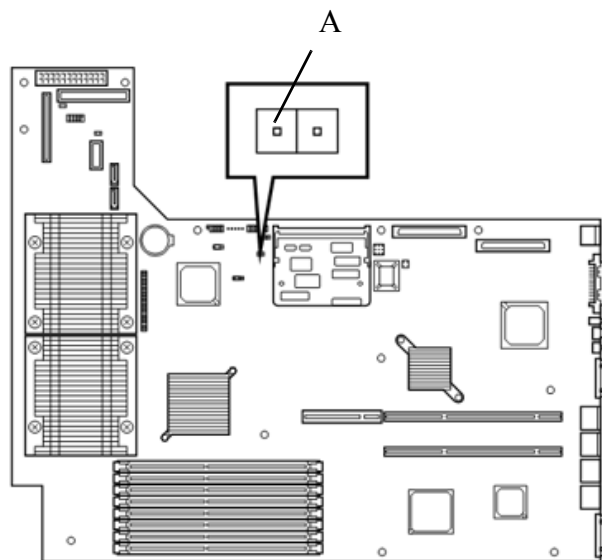
This section explains the procedure for connecting the internal hard disk drives to the MegaRAID SCSI 320-1 disk array controller board installed on the riser card dedicated to low-profile PCI boards.

1. Remove the fan duct.
2. Install the MegaRAID SCSI 320-1 to the low-profile side of the PCI riser card assembly.
3. Disconnect the SCSI cable from the motherboard.
4. Connect the connector of the SCSI cable to the disk array controller.

### *LED relay cable connection*

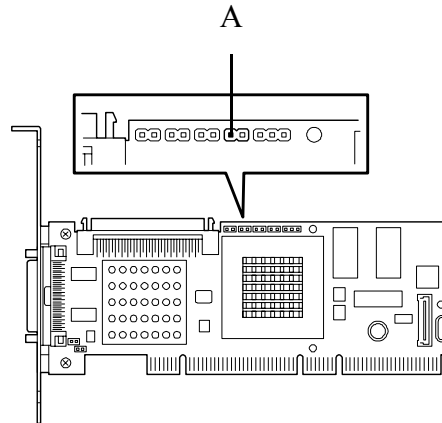
To indicate the status of access to the internal hard disk drives in a disk array configuration, connect the LED relay cable (connected on the motherboard) to the HDD LED connector of the disk array controller.

1. Connect the LED relay cable connector (black) to the LED Active pin on the disk array controller.  
Connect the pin having the red cable to the LED Active pin.  
Do not connect any pin having the black cable.
2. Check that the LED relay cable connector (brown) is connected to the HDD LED connector on the motherboard.



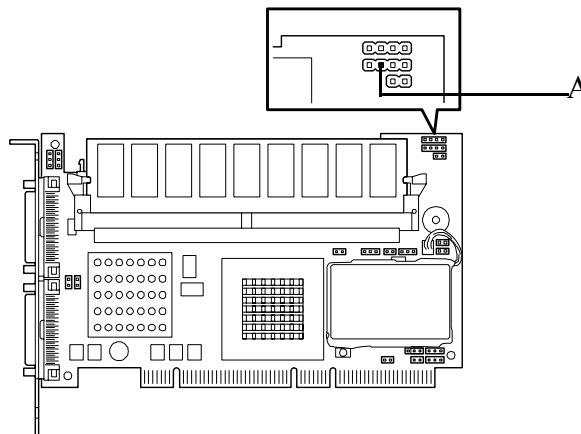
A Pin (red)

**Figure 4 - 38 : HDD LED Connector on the Motherboard**



A Pin (red)

**Figure 4 - 39 : LED Relay Cable Connection for MegaRAID SCSI 3201-1**



**Figure 4 - 40 : LED Relay Cable Connection for MegaRAID SCSI 320-2**

#### *Disk array configuration of internal hard disk drives*

- The server must contain more than one SCSI hard disk drive having the same capacity and the same rotational speed. (The minimum number of required disks depends on the configuration of RAID (Redundant Arrays of Inexpensive [Independent] Disks).)
- Select/set a RAID level "RAID0", "RAID1", or "RAID5" of disk array configuration.

When installing a system in an internal hard disk, you should use "Express Setup" to perform all the procedures for RAID configuration, OS installation, and then OS setup.

Use Express Setup even when not installing a system. Start Express Setup, select [OS Selection] → [Others]. The installer automatically performs all the procedures for RAID configuration, maintenance partition setting, and then maintenance utility installation.

When making the setup in manual mode, use the RAID configuration utility in the chip on the board. You can start the utility during execution of POST that automatically starts immediately after you turn on the server power switch. For details, see the online document in the EXPRESSBUILDER CD-ROM provided with the server. (The utility varies depending on the disk array controller board.) For details on the data transfer rate, RAID, and array configuration, see the manual provided with the disk array controller board as well as the online document.

### ***Use of a disk expansion unit in a disk array configuration***

A disk expansion unit is an exclusive device that can install up to 14 hard disk drives. (The number of hard disk drives depends on the model.) The server containing a disk array controller board can connect one or two of these devices. For details on the number of devices connected, see the manuals provided with the disk array controller and disk expansion unit.



#### **Caution**

A disk expansion unit is provided with no hard disk drives. You need to purchase hard disk drives separately.

---

An optional cable may be required to connect with a disk expansion unit. Refer to the manual coming with the disk expansion unit for details.

After connecting the disk expansion unit, use the RAID configuration utility in the chip on the board to set the disk expansion unit in a disk array configuration (RAID0, RAID1, or RAID5). (The utility varies depending on the board.)

For details on settings and the setting methods, see the online document in the EXPRESSBUILDER CD-ROM provided with the server or the manual provided with the board.


While a disk expansion unit is set in a disk array configuration, you can use the "Auto Rebuild" feature of the disk array controller to restore data if one of the hard disk drives installed in the disk expansion unit fails. (Replace the failing hard disk drive while the power is on. (Hot swapping))

## ***Installing and Removing a Redundant Hot-Swap Fan***

The 120Rf-1 SCSI hot-swap hard disk drive model can include five optional redundant hot-swap fans.

### ***Installing a Hot-Swap Fan***

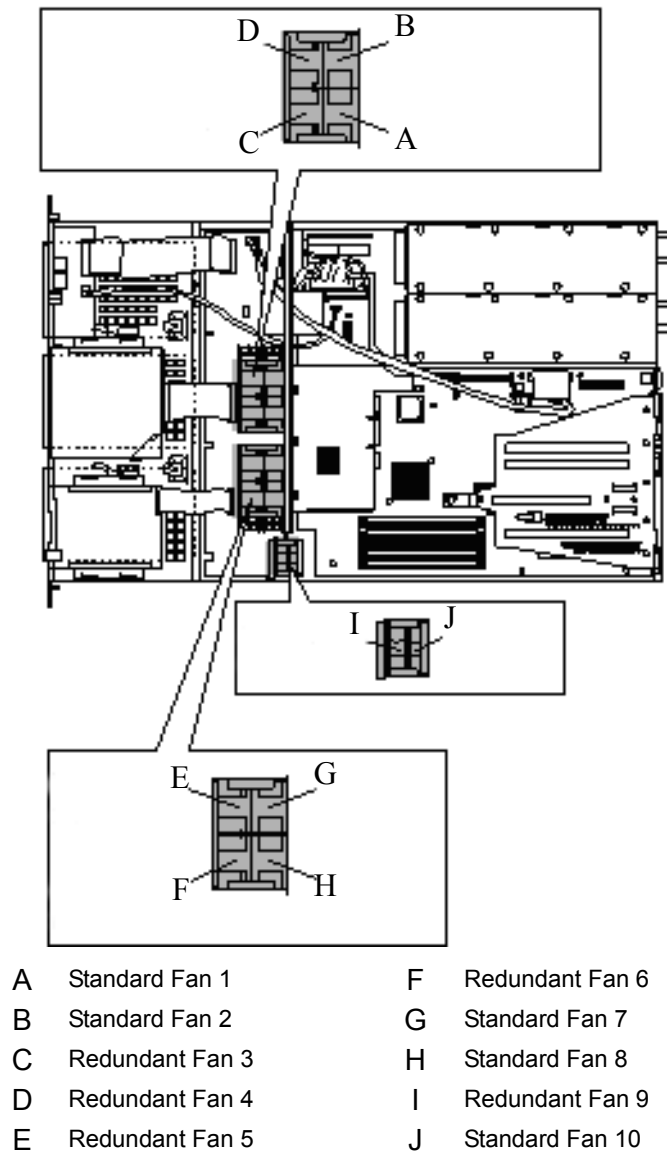
---

 **Note:** This section is only for the 120Rf-1 SCSI hot-swap hard disk drive model.

---

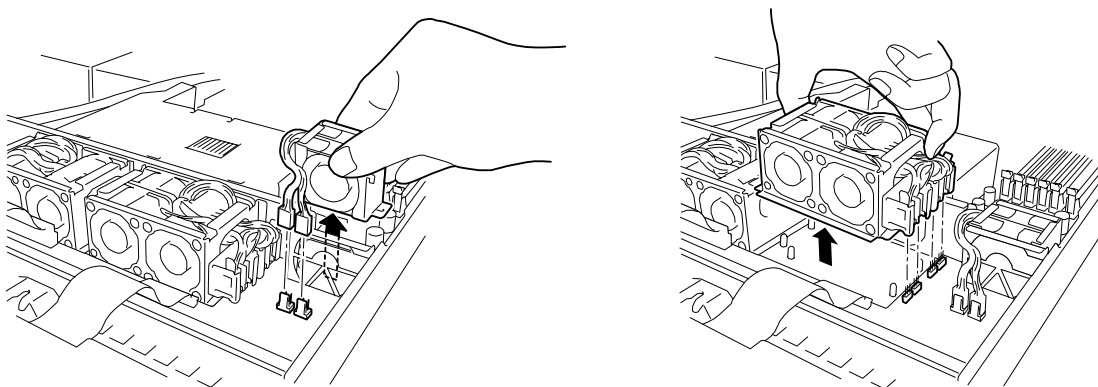
1. See the section [“Preparing Your Server for Upgrade” on page 4-4.](#)
2. Pull out the 120Rf-1 SCSI server from the rack (see [“Removing the Server from the Rack Assembly” on page 2-17.](#))
3. Open the drive cover.

4. Locate the installation slots.



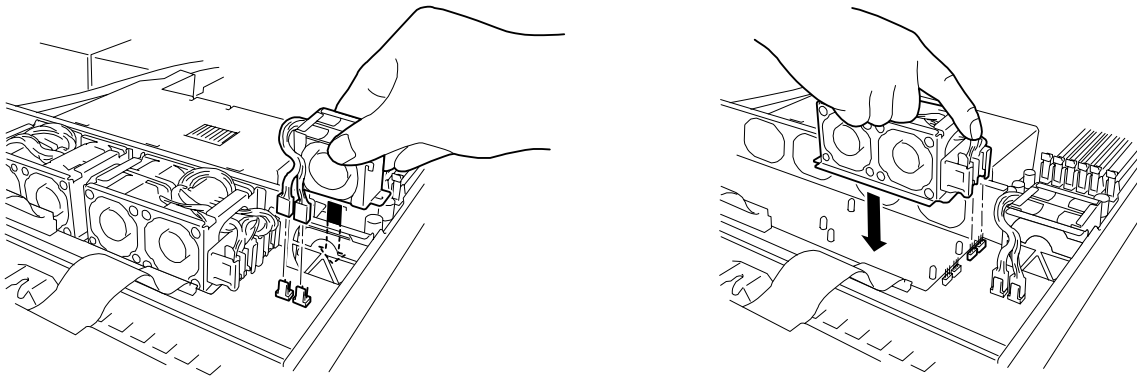
**Figure 4 - 41 : Hot-swap Fans Slots**

5. Disconnect the five fan cables from the motherboard and remove all the fans from the chassis.



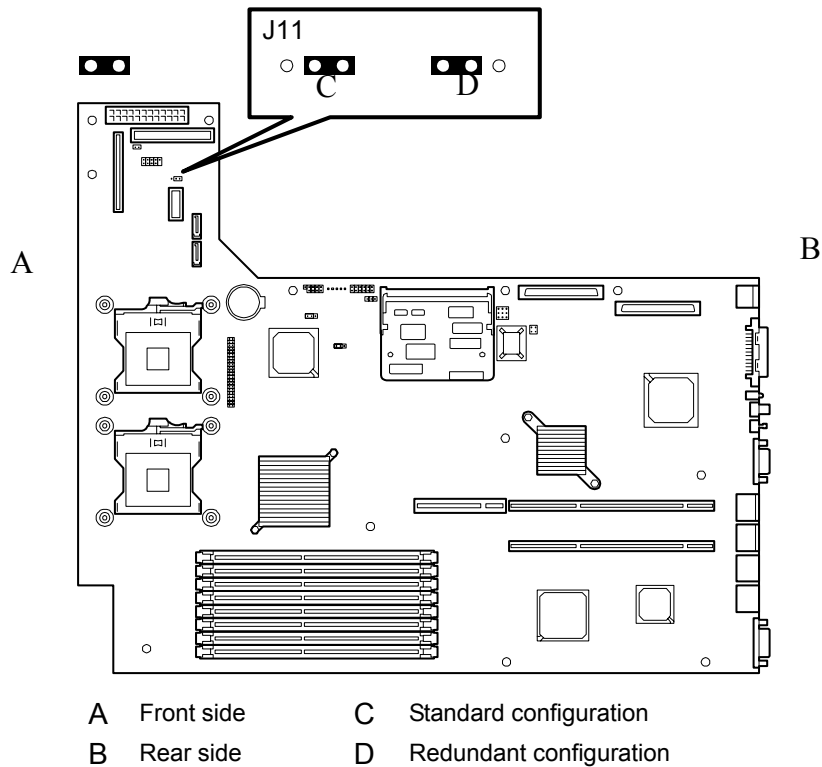
**Figure 4 - 42 : Removing the Fans from the Chassis**

6. Install the hot-swap fans as shown in the figures below.



**Figure 4 - 43 : Installing Hot-Swap Fans**

7. Change the jumper (J11) setting as shown in figure below.



**Figure 4 - 44: Changing Jumper J11 from Standard to Redundant**

### **Caution**


To avoid system malfunction, leave other jumpers at their default position.

If the remote management card (option) is installed in your server, follow these steps to configure the firmware program.

8. Place the EXPRESSBUILDER CD-ROM into the optical device drive and reboot the server.
9. Run "Initialize Remote Management Card".

## **Removing/Replacing a Hot-Swap Fan**

---

 **Note:** This section is only for the 120Rf-1 SCSI hot-swap hard disk drive model.

---

1. Pull out the 120Rf-1 SCSI server from the rack (see ["Removing the Server from the Rack Assembly" on page 2-17](#)).
2. Open the drive cover.
3. Locate the failed fan.  
Fault lamp on the fan turns on when a fan failure occurs. A fan failure is also indicated by ESMPRO and system event log.
4. While pressing release tabs on the top of the fan, pull the fan up to remove it from the fan slot.
5. Install the new fan into the vacant slot.

---

### **Caution**

If all the redundant fans are removed, change the jumper (J11) setting described earlier in the installation procedure.

---

## Installing a Board Management Controller

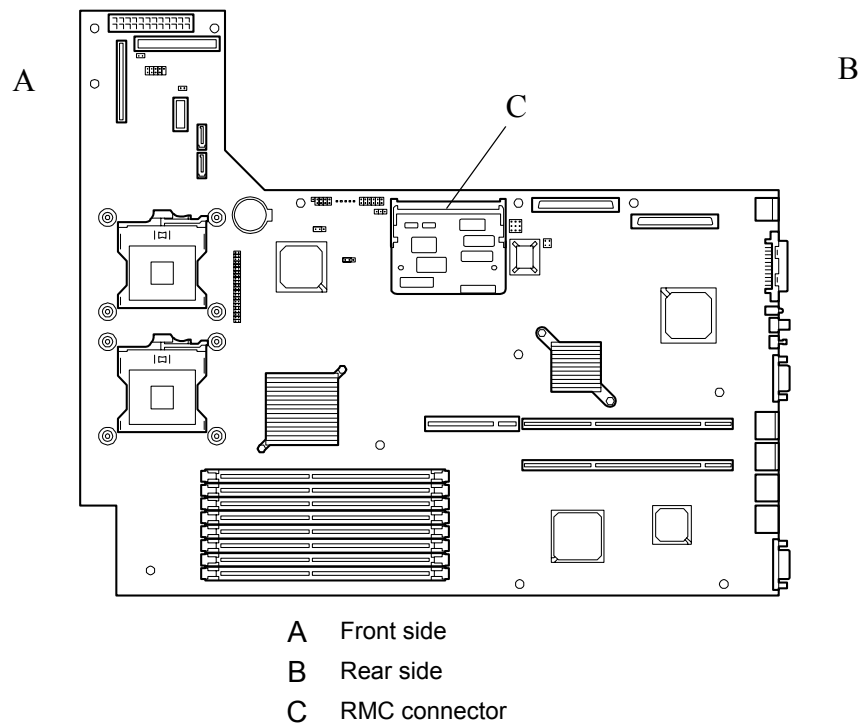
The Remote Management card (RMC) is an optional expansion card that includes the Baseboard Management Controller (BMC) based on IPMI 1.5.

See [“Remote Management Card \(RMC\) - optional” on page 1-14](#) for the detailed functions of RMC.




### Caution

The RMC is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the RMC. Do not touch the RMC terminal pins with your hands bare or place the RMC directly on the desk. For static notes, see [“Static Precautions” on page 4-2](#).

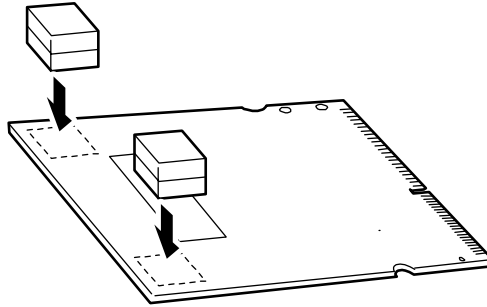


**Figure 4 - 45: Remote Management Card Connector**

 **Note:** The illustrations in this subsection might slightly differ from your optional remote management card.

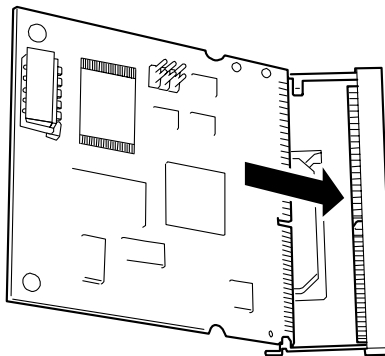
## Installing a Remote Management Card

1. See section [“Preparing Your Server for Upgrade” on page 4-4](#).
2. Pull out the server from the rack.
3. Open the logic cover.
4. Stick the shock absorbers to the back of the RMC.  
Refer to the manual that comes with the RMC for detail location.



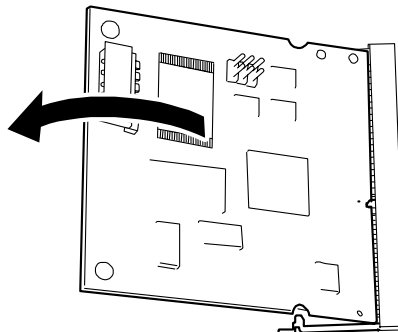
**Figure 4 - 46: Sticking the Shock Absorbers to the RMC**

5. Insert the RMC into the RMC connector.  
Align the notch in the bottom of the RMC with the keyed socket on the RMC connector.



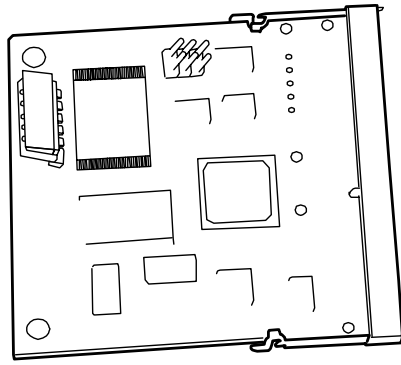
**Figure 4 - 47: Inserting the RMC in its Connector**

6. Press down the RMC until it locks.



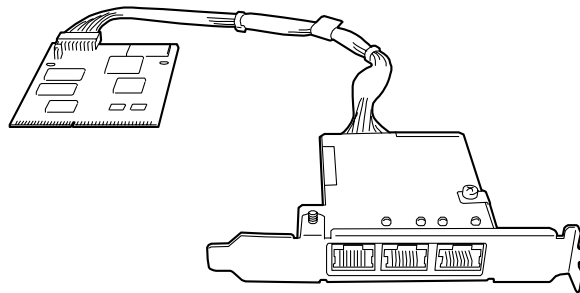
**Figure 4 - 48: Locking the RMC**

7. Check to see that the RMC is fixed with both levers on the RMC connector.



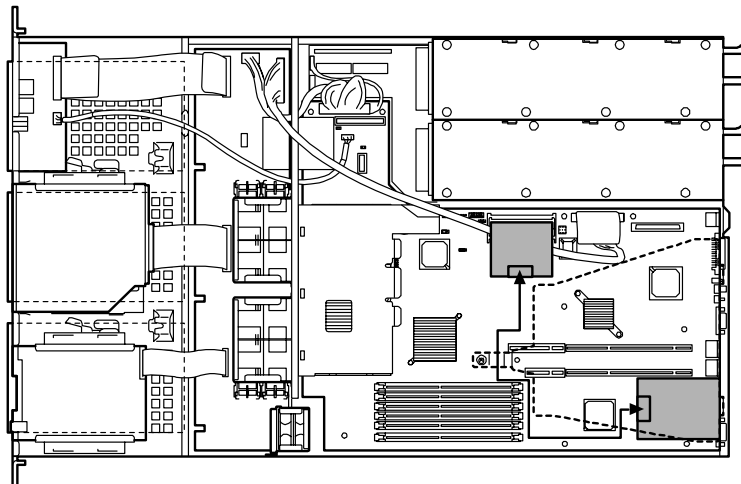
**Figure 4 - 49: RMC Locking Levers**

8. In the case of an Advanced Remote Management Card (ARMC) only:
  - Assemble the management network card to the ARMC as shown in the figure below.



**Figure 4 - 50 : ARMC Internal Cable**

- Connect the management network card to the riser card.
- Route the cable as shown in the figure below.



**Figure 4 - 51: Internal Cable Routing**

- Plug the ARMC card into the mezzanine connector on the motherboard.

9. Reassemble the server.
10. Turn on the server and check that the no error messages other than the following message are displayed on the POST screen.

H/W Configuration of BMC is corrupted.  
!!Update BMC H/W Configuration by configuration tool!!  
!!Refer to BMC configuration manual!!

See [“POST Error Messages” on page 4-62](#).

11. Place the EXPRESSBUILDER CD-ROM into the optical device drive and reboot the server.
12. Run "Initialise Remote Management Card".
13. Run BIOS SETUP utility and check to see that the menus related to the RMC are displayed.  
Refer to [“BIOS Setup Utility” on page 3-3](#) for details. If no additional menus are displayed, reinstall the RMC.
14. In the BIOS SETUP utility, select "Yes" for [Reset Configuration Data] in the [Advanced] menu.  
This setting is required to change the hardware configuration data. See [“BIOS Setup Utility” on page 3-3](#) for details.
15. Reboot the server and run EXPRESSBUILDER to save system information.
16. If the advanced remote management card is installed and KVM console feature is used, update the graphics accelerator.



**Note:** Refer to the manual that comes with an optional advanced remote management card for the monitor resolution.

---

17. Uninstall ESMPRO Agent if installed.
18. Re-install ESMPRO Agent.  
To correct the system information and event log from the management PC, ESMPRO Agent must be installed in the server.

## Removing a Remote Management Card

1. See section [“Preparing Your Server for Upgrade” on page 4-4](#).

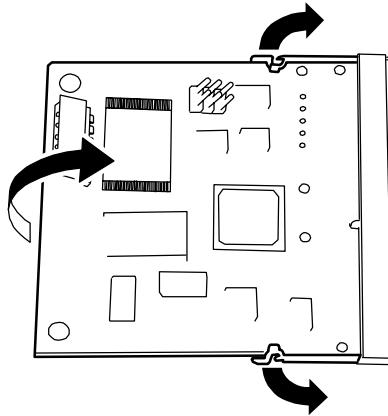


### Caution

The remote management card logic monitors and logs system voltage changes. When removing the RMC from the motherboard, you may experience a 3 - 4 second delay from the time your system powering down.

---

2. Pull out the server from the rack.
3. Open the logic cover.
4. Open the levers on the both sides of the RMC connector to unlatch the RMC.



**Figure 4 - 52: Unlocking the RMC**

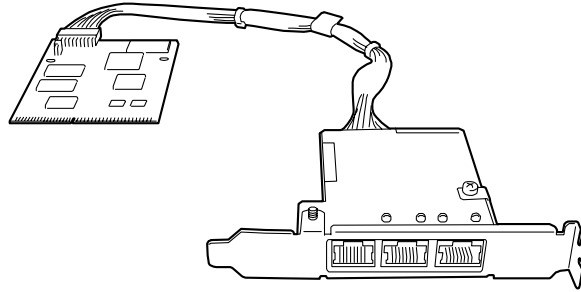
5. Remove the RMC from the connector.
6. Run BIOS SETUP utility and check to see that menus related to the RMC are not displayed in the Server menu.  
See [“BIOS Setup Utility” on page 3-3](#) for details.
7. Run BIOS SETUP utility and select "Yes" for [Reset Configuration Data] in the [Advanced] menu.  
This setting is required to change the hardware configuration data. See [“BIOS Setup Utility” on page 3-3](#) for details.
8. Uninstall ESMPRO Agent if it is installed.
9. (Re)install ESMPRO Agent.  
To correct the system information and event log from the management PC, ESMPRO Agent must be installed in the server.

## Replacing the optional RMC by an optional ARMC

Follow these steps to replace the RMC with an optional Advanced Remote Management card (ARMC).

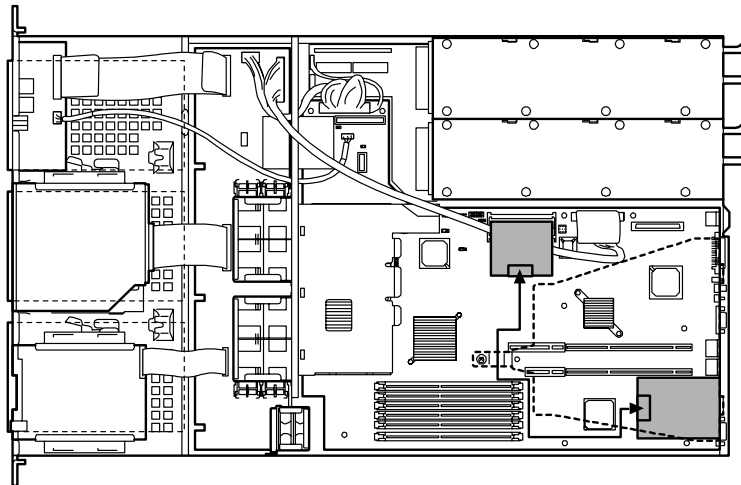
1. See section [“Preparing Your Server for Upgrade” on page 4-4](#).

2. Pull out the server from the rack.
3. Open the logic cover.
4. Assemble the management network card to the ARMC as shown in the figure below.



**Figure 4 - 53 : ARMC Internal Cable**

5. Connect the management network card to the riser card.
6. Route the cable as shown in the figure below.



**Figure 4 - 54: Internal Cable Routing**

7. Plug the ARMC card into the mezzanine connector on the motherboard.
8. Reassemble the server.
9. Turn on the server and check that no error messages other than the following message are displayed on the POST screen.  
H/W Configuration of BMC is corrupted.  
!!Update BMC H/W Configuration by configuration tool!!  
!!Refer to BMC configuration manual!!  
Refer to [“POST Error Messages” on page 4-62](#) for more information on the POST error messages.

## Replacing the Battery

All motherboards use a battery to maintain system configuration information. If it fails to maintain system configuration, replace it with an identical rated battery from the same manufacturer.



### Caution

Removing the battery from the motherboard causes the computer to lose system configuration information. Before removing it, run Setup and record the system configuration settings.

Use this information to restore the server after replacing the battery.

---

*To replace the battery on the motherboard:*

1. Turn off and unplug the server and any external options connected to the server.
2. Remove the top cover. [See “Removing and Replacing the Top Cover” on page 4 - 18.](#)
3. Locate the battery on the motherboard. [See “Motherboard” on page 1 - 11.](#)
4. Carefully remove the battery from the battery socket on the motherboard.



### Warning

The battery may explode if it is incorrectly replaced or improperly discarded.

Use only an identical rated battery from the same manufacturer.

---

5. With the positive (+) side facing up, press the new battery into the socket.
6. Replace the server top cover.
7. Connect external peripherals and power cables.
8. Run Setup to reconfigure server parameters.

# Error Messages

## Error Messages

If an error occurs in the server, an error message appears on the display unit connected to the server.

### *Error Messages after Power-on*

Powering on the server automatically starts the self-diagnostic program, POST (Power On Self-Test). When the POST detects any error, it displays an error message and its measure on the display unit.

Follow the table below to troubleshoot such errors. However, even when there is no hardware failure, use of the keyboard or mouse at the following timing causes the POST to assume a keyboard controller error and stop processing.

- Immediately after the server is powered
- Immediately after the system is rebooted in response to a keyboard instruction (simultaneous key entry of **Ctrl** + **Alt** + **Delete**)
- Immediately after the system is rebooted in response to an OS instruction
- During hardware initialization following restart of the POST

When the POST detects a hardware failure due to the above reason, restart the server once again. If the same error message reappears, you may assume there is no hardware error. To ensure normal operation of the server, however, make sure to follow the following restrictions.

- Do not make any keyboard entry or use the mouse before the memory count appears on the screen following the server power-on.
- Do not make any keyboard entry or use the mouse before the start-up message of the SCSI Configuration Utility appears on the screen following the server reboot.




**Note:** Take a note on the on-screen message before contacting your sales agent. The alarm indication would be a great help for maintenance.

---

## POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. The following table lists error messages and actions to take.

 **Note:** Take a note on the messages displayed before consulting with your sales agent. Alarm messages are useful information for maintenance.

**Table 4 - 1: POST Error Messages**

Error code	Error message	Recommended Action
0200	Failure Fixed Disk	Contact your service representative.
0210	Stuck Key.	Disconnect the keyboard and connect it again.
0213	Keyboard locked - Unlock key switch.	Release the lock of the key switch. If the error cannot be corrected in spite of the release of the lock, contact your service representative.
0220	Monitor type does not match CMOS Run SETUP.	Start the SETUP. If the error cannot be corrected in spite of the start of SETUP, contact your service representative.
0230	System RAM Failed at offset.	Contact your service representative.
0231	Shadow Ram Failed at offset.	
0232	Extended RAM Failed at address line.	
0250	System battery is dead - Replace and run SETUP.	Contact your service representative to replace the battery. (After restarting the computer, start the SETUP to provide the setting again.)
0251	System CMOS checksum bad - Default configuration used.	The default values have just been set. Start the SETUP to provide the setting again. If the error cannot be corrected, contact your service representative.
0252	Password checksum bad - Passwords cleared.	The password has just been cleared. Start the SETUP to provide the setting again.
0260	System timer error.	Start the SETUP to set the date and time again. If the same error occurs successively in spite of the resetting, contact your service representative.
0270	Real time clock error.	
0271	Check date and time setting.	
02B0	Diskette drive A error.	Start the SETUP to set the "Legacy Floppy A" in the Main menu again. If the same error occurs successively in spite of the resetting, contact your service representative.
02B2	Incorrect Drive A type - run SETUP.	Start the SETUP to provide the setting again. If the error cannot be corrected, contact your service representative.
02D0	System cache error - Cache disabled.	The cache cannot be used. Contact your service representative.
02D1	System Memory exceeds the CPU's caching limit.	Contact your service representative.
02F4	EISA CMOS not writeable.	
02F5	DMA Test Failed.	
02F6	Software NMI Failed.	
02F7	Fail-safe Timer NMI Failed.	

Table 4 - 1: POST Error Messages (Continued)

Error code	Error message	Recommended Action
0B22	Processors are installed out of order.	Request the maintenance to replace the CPU.
0B28	Unsupported Processor detected on Processor 1.	Make sure that the server supports the CPU. If you are not sure, contact your service representative to request the maintenance.
0B29	Unsupported Processor detected on Processor 2.	
0B30	FAN1 Alarm occurred.	Contact your service representative to replace the fan.
0B31	FAN2 Alarm occurred.	
0B32	FAN3 Alarm occurred.	
0B33	FAN4 Alarm occurred.	
0B34	FAN5 Alarm occurred.	
0B35	FAN6 Alarm occurred.	
0B36	FAN7 Alarm occurred.	
0B37	FAN8 Alarm occurred.	
0B38	FAN9 Alarm occurred.	
0B39	FAN10 Alarm occurred.	
0B5F	Forced to use Processor with error	Because an error is detected in every CPU, the system is forcibly started. Contact your service representative.
0B60	DIMM group #1 has been disabled	Contact your service representative.
0B61	DIMM group #2 has been disabled	
0B62	DIMM group #3 has been disabled	
0B70	The error occurred during temperature sensor reading.	Contact your service representative.
0B71	System Temperature out of the range.	Contact your service representative to replace the fan.
0B74	The error occurred during voltage sensor reading.	Contact your service representative.
0B75	System voltage out of the range.	
0B80	BMC Memory Test Failed.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B81	BMC Firmware Code Area CRC check failed.	
0B82	BMC core Hardware failure.	
0B83	BMC 1BF or 0BF check failed.	
0B8B	BMC progress check timeout.	
0B8C	BMC command access failed.	
0B8D	Could not redirect the console - BMC Busy -	
0B8E	Could not redirect the console - BMC Error -	
0B8F	Could not redirect the console - BMC Parameter Error -	
0B90	BMC Platform Information Area corrupted.	
0B91	BMC update firmware corrupted.	
0B92	Internal Use Area of BMC FRU corrupted.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B93	BMC SDR Repository empty.	Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.

Table 4 - 1: POST Error Messages (Continued)

Error code	Error message	Recommended Action
0B94	IPMB signal lines do not respond.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B95	BMC FRU device failure.	
0B96	BMC SDR Repository failure.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B97	BMC SEL device failure.	
0B98	BMC RAM test error.	
0B99	BMC Fatal hardware error.	
0B9A	Management controller not responding.	Update the RMC firmware. If the error cannot be corrected, contact your service representative.
0B9B	Private I2C bus not responding.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B9C	BMC internal exception.	
0B9D	BMC A/D timeout error.	
0B9E	SDR repository corrupt.	
0B9F	SEL corrupt.	
0BB0	SMBIOS – SROM data read error.	Contact your service representative.
0BB1	SMBIOS – SROM data checksum bad.	
8100	Memory Error detected in DIMM group #1.	Contact your service representative to replace the DIMM in the relevant group.
8101	Memory Error detected in DIMM group #2.	
8102	Memory Error detected in DIMM group #3.	
None	Expansion ROM not initialized – PCI Mass Storage Controller in slot n (n: slot number)	Disable initialization of the optional device expansion ROM by using the BIOS SETUP utility (see Chapter 3).
	H/W Configuration of BMC is corrupted. !! Update BMC F/W Configuration by configuration tool !! !! Refer to BMC configuration manual !!	Use EXPRESSBUILDER to configure the optional remote management card .

## ***How to Identify BIOS Revision Level***

To identify your system's current BIOS revision level, perform either one or the other of the following procedures:

1. Power-on or reboot the system.
2. When logo displays, press the **ESC** key.
3. The BIOS revision level is displayed. Immediately press **Pause** to have time to read the BIOS version.

or

1. Power-on or reboot the system. "Press <F2> to enter SETUP" displays.
2. Press **F2**.
3. In the **Server** menu, select **System Management** and press **ENTER**. The BIOS revision level is displayed.

This page is intentionally left blank.

# 5

## **Solving Problems**

## Problems Solving

This chapter helps you identify and solve problems that may occur during system installation or while using your system. The first section of this chapter tells you how to reset your system in the event of problems. The next few sections provide troubleshooting checklists and procedural steps that help you isolate specific system problems. The last section includes BIOS and system user information.

---

### **Warning**

The DC push-button on/off switch on the front panel does not turn off completely the system AC power. +5vdc is present on the system board whenever the AC power cord is connected between the system and an AC outlet. Before doing the procedures in this manual, make sure that your system is powered off and unplug the AC power cords from the back of the chassis. Not disconnecting power before opening your system can result in personal injury and equipment damage

---

---

### **Caution**

Running your system with the top cover removed can damage your system components.  
For proper cooling and airflow, always replace the top cover before powering on your server.

---

## Static Precautions

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground when handling system components.

Electronic devices can be easily damaged by static electricity. To prevent damage, keep them in their protective packaging when they are not installed in your system.

## Resetting the Server

There are two ways to reset the server.

---

### Caution

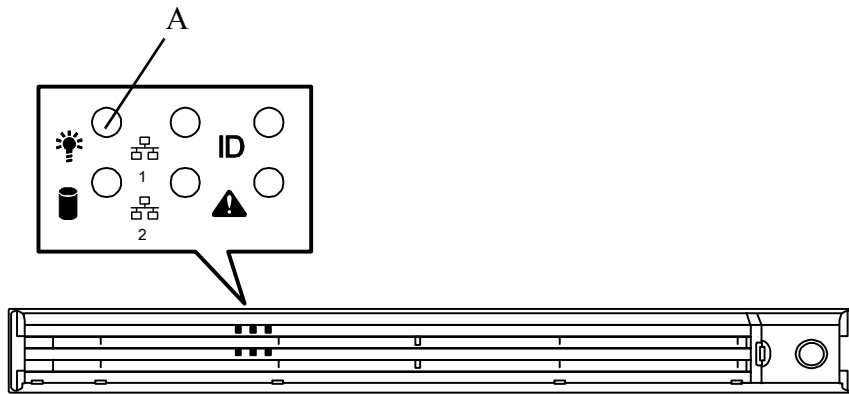
Resetting the server clears the DIMM memory and the data in process.

To reset the server when it is not frozen, make sure that no processing is in progress.

---

#### ■ Hard reset

Press the power switch (A) at the front of the server. ([See “Forcing a Power Shutdown” on page 2 - 27.](#))



---

### Caution

If the remote power-on function is used, cycle the power once to load the OS, and turn off the power again in the normal way.

If the processor is heated excessively, the circuit for protecting expensive components is activated. If so, the POWER/SLEEP switch cannot be used to control the power because the system is entered into the reset status. Pull out the power cord and turn off the power. After a while, check the operation environment (including the ambient temperature). Then connect the power cord and turn on the power. Wait a while before powering the system on again.

---

#### ■ Soft reset

If the server halts before starting the OS, press and hold **Ctrl** and **Alt** and press **Delete**. This restarts the server.

## Troubleshooting Guide

This section provides you a guide to identify a problem and locate its source.

---

### Warning

The system power and any peripheral devices should be turned off before connecting or disconnecting peripheral devices to or from the system.

Otherwise, you could permanently damage the system or peripheral devices.

---

1. Turn off the server and any peripheral devices. Disconnect all external peripherals from the system, except for the keyboard and monitor. The system's power cord must be plugged into a grounded electrical outlet.
2. Make sure your keyboard and monitor are properly connected to the system. Turn the monitor on, then adjust its brightness and contrast controls to suit your preference (see your monitor's documentation).
3. Turn the system on. If the power indicator does not light up, but the system seems to be operating normally, the indicator may need replacement.
4. Monitor the power-on self test (POST) execution. Each time you turn on the system, the POST checks the system board, memory, keyboard, and certain peripheral devices.
5. Check the following during the POST:
  - (Error Message Line 1)
  - (Error Message Line 2)
  - Press **F1** to continue,
  - **F2** to enter Setup
  - You should note the error and press **F2** to resume the boot-up process, or **F1** to enter Setup.
6. Errors that prevent the boot process from continuing (fatal errors) are communicated by a series of audible beeps. If this type of error occurs, record the information and refer to "Beep Codes" on page 8.

## System Viewers

Monitor the occurrence of fault by ESMPRO during the system operation.

Especially take note on whether any alert is reported to ESMPRO Manager on the management PC. Check whether any alert is reported on the Operation Window, Data Viewer, or Alert Viewer of ESMPRO Manager.

## ***Problems at initial System Start-up***

Problems that occur at initial system start-up are often caused by incorrect installation of components or incorrect configuration. Hardware failure is a less frequent cause.

- Are all cables properly connected and secure?
- Is AC power available at the wall outlet?
- Are the configuration settings correct in Setup? Are all drivers properly installed?
- Are all the expansion cards fully seated in their slots on the motherboard?
- Are all DIMMs installed correctly?
- Is the processor fully seated in its socket on the motherboard?
- Are switches and jumpers on the system board correct (if they have been changed from their original default settings)?
- Are all jumper and switch settings on optional add-on cards and peripheral devices set correctly? Check the documentation included with these devices for details. Ensure that there are no system resource conflicts between hardware components. (For example, two add-on cards could inadvertently share the same interrupt, resulting in a conflict.)
- Are adapter cards and disk drives correctly installed?
- Is the keyboard properly connected to the system and is it connected in the right PS/2 port?
- Is a bootable diskette installed in your system's floppy drive A:?
- Is the hard disk properly formatted or defined?
- Is the operating system properly loaded? Check the operating system documentation.

## ***Problems After the System Has Been Running Correctly***

After the system hardware and software have been running correctly, problems can indicate equipment failure. Use the checklist below to try and correct the situation.

If the problem recurs after you have checked these items, refer to the Troubleshooting Guide section earlier in this chapter.

- If you are running software from a diskette or an optical device, try using a new copy.
- If you are running software from a hard disk drive, make sure that all of the necessary files are installed. There may be a problem with the copy on the hard disk. Reinstall the software on the hard disk and try again.
- If problems appear intermittently, there may be a loose cable, dirt in the keyboard (if keyboard input is incorrect), or other random component failures.
- A transient voltage spike, power cut, or brownout may have occurred. Symptoms of voltage spikes include a flickering video display, unexpected system reboots, and the system not responding to user commands. If necessary, exit any open applications and shut down your system power. Reboot the system, then load the software and try again.
- Voltage spikes can occasionally cause the heads of the disk drive to contact the disk. This can corrupt or destroy data files. If you are experiencing voltage spikes on the AC electrical power line, install an uninterruptible power supply between the power outlet and the system's power cord.

## ***Problems Running New Application Software***

Problems occurring when you run new application software are usually related to the software. Faulty equipment is much less likely, especially if other software runs correctly. Use the checklist below to see if the situation may be easily corrected. If the problem persists after you have checked these items, contact the software vendor's customer service.

- Does the system meet the minimum hardware requirements for the software? Refer to the software documentation.
- Is the software an authorised copy? Unauthorised copies often do not work. Obtain an authorised copy of the software.
- If you are running the software from an optical device or a diskette, is it a good copy?
- If you are running the software from an optical device, is the disc scratched or dirty?
- Is the software correctly installed? Were all necessary procedures followed and files installed?
- Are the correct device drivers installed?
- Is the software correctly configured for the system?
- Are you using the software correctly?

## Beep Codes

If an error occurs during the POST, the server beeps, indicating the type of error.

Each number indicates the number of short beeps, and a hyphen indicates a pause. For example, the beep interval 1-5-2-1 indicates 1 beep, pause, 5 beeps, pause, 2 beeps, pause, and 1 beeps notifying that a checksum error occurred on ROM.

**Table 5 - 1: POST Error Beep Codes**

Beeps	Error	Recommended Action
1-2	Option ROM initialization error	1. Check if the optional add-in card is properly installed. 2. Run the BIOS setup utility to check the IRQ assignment. 3. Ask your service representative to replace the add-in card or motherboard..
3-3	ROM checksum error	Replace the motherboard.
1-2-2-3		
1-3-1-1	DRAM refresh test error	1. Check if the DIMM is properly installed. 2. Remove the DIMM once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed DIMM or mother board.
1-3-1-3	Keyboard controller error	1. Check if the keyboard is properly connected. 2. Replace the mother board
1-3-3-1	No memory or capacity check error	1. Check if the DIMM is properly installed. 2. Remove the DIMM once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed DIMM or mother board
1-3-4-1	DRAM address error	
1-3-4-3	DRAM test Low Byte error	
1-4-1-1	DRAM test High Byte error	
1-5-1-1*	CPU startup error	1. Check if the CPU is properly installed. 2. Remove the CPU once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed CPU.
1-5-2-1*	No CPU installed	
1-5-4-4*	Abnormal voltage	
2-1-2-3	BIOS ROM copyright test error	Replace the motherboard.
2-2-3-1	Unexpected interrupt test error	

\* Beeps only when the optional remote management card is installed in your system.

## Problems and Suggestions

Contact your Authorised Service Representative if the suggested actions do not solve the problem.

**Table 5 - 2: Problems and Suggestions**

Problems	What to do
Application software problems	<p>Make sure all cables are installed correctly.</p> <p>Verify that your system hardware configuration is set correctly. In Setup, check the values against the system settings that you previously recorded. If an error is evident (wrong type of drive specified, for example), make the change in Setup and reboot the system. Record your change.</p> <p>Make sure the software is properly configured for the system. Refer to the software documentation for information. Try a different copy of the software to see if the problem is with the copy you are using.</p> <p>If other software runs correctly on the system, contact the vendor of the failing software.</p>
Characters on screen are distorted or incorrect	<p>Make sure the brightness and contrast controls are properly adjusted. Make sure the monitor's video signal cable and power cables are properly installed. (Shut down system power before reconnecting cables.) Make sure your monitor is compatible with the video mode you have selected. (Check your monitor's documentation.)</p>
Characters do not appear on screen	<p>Make sure the monitor is plugged in and turned on. Are the brightness and contrast controls properly adjusted? Make sure that the video signal cable is properly connected. (Turn the system power off before reconnecting cables). Make sure your system's video adapter card is installed, enabled. Reboot the system.</p>
CMOS RAM settings are wrong	<p>If system settings stored in CMOS RAM change for no apparent reason (for example, the time of day is in error), the backup battery may no longer have enough power to maintain the settings. Replace the battery.</p>
Diskette drive light does not go on when drive is in use or is tested by POST.	<p>Make sure the power and signal cables for the drive are properly installed. Check that the drive is properly configured and enabled in Setup.</p>
Hard drive light does not go on when drive is in use or is tested by POST.	<p>Make sure the power and signal cables for the drive are properly installed. Make sure the front panel connector is securely attached to the system board headers. Check that the drive is properly configured and enabled in Setup. Check the drive manufacturer's manual for proper configuration for remote hard disk drive activity.</p>
Power on light does not go on	<p>If the system is operating normally, check the connector between the system board and the front panel. If OK, the light may be defective.</p>

## **Problems with NEC Express Server**

### **No screen display appears and beep occurs.**

- Is the DIMM board installed securely?
  - Check whether the DIMM board is inserted into the mating connector securely.
  - Make sure the jumper switches have been returned to their original positions after CMOS clearing. See "Configuring Mother Board Jumpers" in Chapter 4 for the positions of the jumper switches.

### **Fail to power on the server:**

- Is the server is properly supplied with power?
  - Check if the power cord is connected to a power outlet (or UPS) that meets the power specifications for the server.
  - Check the power cord for broken shield or bent plugs.
  - Make sure the power breaker for the connected power outlet is on.
  - If the power cord is plugged to a UPS, make sure the UPS is powered and it outputs power. See the manual that comes with the UPS for details.  
Power supply to the server may be linked with the connected UPS using the CMOS Setup utility of the server.  
<Menu to check: [Advanced] - [AC-LINK]>
- Did you press the POWER/SLEEP switch?
  - Press the POWER/SLEEP switch on the front of the server to turn on the power (the POWER/SLEEP lamp lights).

### **Fail to power off the server**

- Is the power switch enabled?
  - Restart the server and start the BIOS setup utility
- Is the server running in secure mode?
  - The power switch is disabled in the Secure Mode (Forced shutdown is also not available). To release the Secure Mode, enter the password specified with the BIOS Setup utility.

### **POST fails to complete:**

- Is the DIMM board installed?
  - At least two DIMM boards are required for operation.
  - Installed DIMMs must be the same speed and must all be registered.
  - DIMMs must be populated in pairs and in the following order: #5 and #6, #3 and #4, then #1 and #2.

- Is the memory size large?
  - The memory check may take a few seconds if the memory size is large. Wait for a while.
  - Did you perform any keyboard or mouse operation immediately after you started the server?
  - If you perform any keyboard or mouse operation immediately after start-up, POST may accidentally detect a keyboard controller error and stops proceeding. In such a case, restart the server once again. Do not perform any keyboard or mouse operation until the BIOS start-up message appears when you restart the server.
- Does the server contain appropriate memory boards or PCI devices?
  - Operation of the server with unauthorized devices is not guaranteed.

**Fail to access to internal or external devices (or such devices fail to operate):**

- Are cables properly connected?
  - Make sure that the interface cables and power cord are properly connected. Also make sure that the cables are connected in the correct order.
- Is the power-on order correct?
  - When the server has any external devices connected, power on the external devices first, then the server.
- Did you install drivers for connected optional devices?
  - Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.
- Is BIOS configuration correct?
  - When the server has PCI devices connected, make sure to set the PCI device interrupt and others with the BIOS SETUP utility of the server. (Most PCI devices generally do not require any change to the configuration, but some boards do require specific settings. Refer to the manual that comes with the board for details to make correct settings.  
<Menus to check: [Advanced] - [PCI Configuration] - [PCI Slot xx ROM] x: PCI slot number>
  - Some devices connected to the serial or parallel port may require I/O port address or operation mode settings. Refer to the manual that comes with the board for details to make correct settings.  
<Menu to check: [Advanced] - [Peripheral Configuration]>

**The POWER switch and sleep feature are disabled:**

- Is the server in the Secure Mode?
  - In the Secure Mode, the POWER switch and sleep feature are disabled. To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

**The keyboard or mouse fails to operate:**

- Is the cable properly connected?
  - You must use the provided keyboard/mouse branch cable (Y cable) for this server. Make sure that the cable is connected to the correct connector on the rear of the server.
  - The keyboard or mouse does not operate if it is connected when the server is powered (not applicable to USB devices). Power off the server first and connect it properly.
- Is BIOS configuration correct?
  - The keyboard and mouse may be disabled with the BIOS SETUP utility of the server. Check the settings with the BIOS SETUP utility.  
<Menus to check: [Advanced] - [Numlock]>
- Are the server drivers installed?
  - Refer to the manual that comes with your OS to check that the keyboard and mouse drivers are installed. (These drivers are installed along with the OS.) Some OS's allow you to change the keyboard and mouse settings. Refer to manual that comes with your OS to check that the keyboard and mouse settings are correct.
- Is the server in the Secure Mode?
  - In the Secure Mode, the keyboard and mouse are disabled. To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

**Fail to access (read or write) to the floppy disk:**

- Does the floppy disk drive contain a floppy disk?
  - Insert a floppy disk into the floppy disk drive until it clicks.
- Is the floppy disk write-protected?
  - Place the write-protect switch on the floppy disk to the "Write-enabled" position.
- Is the floppy disk formatted?
  - Use a formatted floppy disk or format the floppy disk in the floppy disk drive. Refer to the manual that comes with the OS for formatting a floppy disk.

■ Is BIOS configuration correct?

- The floppy disk drive may be disabled with the BIOS SETUP utility of the server. Check the setting with the BIOS SETUP utility.  
<Menus to check:  
[Main] - [Floppy A]  
[Security] - [Diskette Write Protect]

■ Is the server in the Secure Mode?

- In the Secure Mode, write access to the floppy disk may be disabled. To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

**Fail to access to the CD-ROM:**

■ Is the CD-ROM properly set in the optical device drive?

- The tray is provided with a holder to secure the CD-ROM. Make sure that the CD-ROM is placed properly in the holder.

■ Is the CD-ROM applicable to the server?

- The CD-ROM for Macintosh is not available for use.
- For the disk which does not conform to the CD standard, the playback of such a disk with the optical device drive is not guaranteed.

**Inserted the correct CD-ROM but the message like the following is displayed:**

The CD-ROM is not inserted or the wrong CD-ROM is inserted.  
Please insert the correct CD-ROM.  
OK

■ Is the data side of the CD-ROM dirty or scratched?

- Take the CD-ROM out of the optical device drive, check that it is not dirty or scratched, reset and click [OK].

**Fail to access the hard disk**

(Refer to the documentation supplied with the disk array controller.)

■ Is the hard disk applicable to the server?

- Operation of any device that is not authorized by NEC is not guaranteed.

■ Is the hard disk properly installed?

■ Is the hard disk properly configured?

**Fail to access the external SCSI devices:**

- Is the SCSI device applicable to the server?
  - Operation of any SCSI device that is not authorized by NEC is not guaranteed.
- Is the cable connection changed?
- Are SCSI devices properly configured?
  - When the server has external SCSI devices connected, devices settings, including SCSI ID and terminator, are required. Refer to the manual that comes with the SCSI device for details.
- Are the SCSI controllers (including optional controllers) properly configured?
  - Use the BIOS SETUP utility for proper configuration of SCSI devices connected to the SCSI connector on the mother board. When the server has an optional SCSI controller installed and SCSI devices connected to it, use the BIOS SETUP utility that comes with the optional SCSI controller for proper configuration. See the manual that comes with the optional SCSI controller for details.

***The server is not found on the network:***

- Is the LAN cable connected?
  - Make sure to connect the LAN cable to the network port on the rear of the server. Also make sure that the LAN cable to use conforms with the network interface standard.
- Is the BIOS configuration correct?
  - The internal LAN controller may be disabled with the BIOS SETUP utility of the server. Check the setting with the BIOS SETUP utility.
- Have the protocol and service already configured?
  - Install the distinctive network driver for the server. Make sure that the protocol, such as TCP/IP, and services are properly specified.
- Is the transfer speed correct?
  - Open the network property dialog box in control panel to specify the "Link Speed & Duplex" value the same as the value specified for HUB.

***Wake on LAN does not start from standby state.***

- Is Hub set to Auto-Negotiation? Or, Is the client set to Auto-Negotiation/optimum speed?
  - For both hub and client, Wake on LAN does not start from the standby state if the speed is fixed to 1000Mbps.

## **Problems with the Windows Operating Systems**

### **Cannot install the operating system correctly**

- Did you check the notes on installing the operating system?

During installation, the following warning is registered in the System Log of the Event Viewer:

“Error detected on the device \Device\CdRom0 during the paging operation”

- There is no problem on this issue.

### **Fail to start the OS:**

- Is a floppy disk in the floppy disk drive?
  - Take out the floppy disk and restart the server.
- Is the EXPRESSBUILDER CD-ROM in the optical device drive?
  - Take out the EXPRESSBUILDER CD-ROM and restart the server.
- Is the OS broken?
  - Use recovery process to recover the system. (Windows 2000 only)

### **The OS presents unstable operation:**

- Did you update the system?
  - Installing a network drive after installation of the OS may cause unstable operation. Use the EXPRESSBUILDER CD-ROM to update the system.

### **The system does not restart when a stop error occurs, though the system is adjusted to automatically restarting:**

- When the system does not restart automatically, restart it manually.

### **The system restarts when a stop error occurs, though the system is NOT adjusted to automatically restarting:**

- There is no problem about this issue. Check the System Event Log to check that STOP error occurred.

### **Cannot turn the power OFF at the blue screen:**

- If you want to turn off the power at the blue screen, execute forced shutdown (forced shutdown: continue to press POWER/SLEEP switch for 4 seconds). The power will not be turned off if you press the switch for less than 3 seconds.

### **The PXE boot (network boot) fails or the server is not found on the network:**

- Is the cable connected properly?
  - Connect the proper cable to the network port on the rear of the Express server. In addition, make sure that the used cable conforms to the network interface standard.

- Is BIOS configuration correct?
  - The internal LAN controller may be disabled with the CMOS Setup utility of the server. Check the setting with the BIOS setup utility.
- Have the protocol and service already configured?
  - Install the distinctive network driver for the server. Make sure that the protocol, such as TCP/IP, and services are properly specified.
- Is the transfer speed correct?
  - Open the network property dialog box in control panel to specify the link speed and duplex value the same as the value specified for HUB.

## Problems with EXPRESSBUILDER

When the server does not boot from the EXPRESSBUILDER CD-ROM, check the following:

- Did you set the EXPRESSBUILDER during POST and restart the server?
  - If you do not set the EXPRESSBUILDER during POST and restart the server, an error message will appear or the OS will boot.
- Is BIOS configuration correct?
  - The boot device order may be specified with the CMOS Setup utility of the server. Use the CMOS Setup utility to change the boot device order to boot the system from the CD-ROM drive first.  
<Menu to check: [Boot]>
- Is an error message appeared?
  - When an error occurs while the EXPRESSBUILDER is in progress, the following message appears. After this message appears, check the error and take the appropriate corrective action according to the message listed in the table below.

**Table 5 - 3: Error Messages**

Message	Cause and Solution
This machine is not supported	This EXPRESSBUILDER version is not designed for this server. Execute the EXPRESSBUILDER on the compliant server.
NvRAM access error	An access to the nonvolatile memory (NvRAM) is not acceptable.
Hard disk access error	The hard disk is not connected or it is failed. Check whether the hard disk is correctly connected.
The system-specific information does not exist on the baseboard. Please restore the backup data or write the data by using [System Information Management] of the Off-line Maintenance Utility. Only the authorized personnel are allowed to do this operation.	The system-specific information can't be acquired on the motherboard.

## Problems with Express Setup

The following message appears when you try to install Express Setup to the hard disk that has smaller capacity than the specified partition size:

“The specified partition size has exceeded the capacity of the hard disk. The setup created the partition at the maximum size that can be reserved on the hard disk. Setup will continue the process.”

Then the system displays the OK button.

- It is not an abnormal condition. Press **Enter** to continue the installation.

The message “Press R to retry” can not be displayed correctly when copying the files from CD-ROM or checking CD-ROM:

- Press **R**. When the message appears again even if you press **R**, restart the Express Setup from the beginning. In case the same result occurred after the restart of installation, contact Maintenance Service Company and ask them to check the optical device drive.

**Express Setup terminated and asks to input setup information.**

- There are some errors on the specified setup information. Follow the instruction to input the correct value. It is not necessary to cancel the installation. On Windows 2000, you might be asked to press **Enter** again after the last reboot of the setup.

**[Complete] appears on the [Role of Computer] screen.**

- If you select [Complete] here, the setup will select the default value of Express Setup for the later specification to continue the process.

**Table 5 - 4: Default Value for Windows 2000**

Specification of network Protocol	
Protocol	TCP/IP[DHCP Specified]
Service	Select sharing Microsoft network files and printer.
Client	Microsoft network client.
Component	SNMP, IIS (Excluding Windows 2000 Professional / Windows Server 2003)
Application	ESMPRO Agent
	Power Console Plus (if optional RAID controller is installed)

**The following error log is included in the event log while operating the system:**

Event ID	16
Source	iANSMiniport
Type	Error
Category	None
Description	Team #0:The last adapter has lost link. Network connection has been lost.

- Though the above error is included in the event log when specifying the teaming, the LAN driver can work properly.

**[Complete] does not appear on [Role of Computer] screen.**

- The [Complete] does not appear if the Setup File that has already been created is loaded.
- [Complete] appears only when you first entered the [Role of Computer] screen. Once you go to the next screen from [Role of Computer], the [Complete] will not appear even if you enter [Back] to go back to the [Role of Computer] screen.

**Select [Use Existing Array] at [New/Existing RAID Configuration], but the OS is installed in the whole area of the disk.**

- Is there any other partition than the partition to re-use (excluding maintenance area)? If no other partition exist, the setup will reserve the whole area of the disk to install operating system.

**Specified to join the Domain, but the system is installed as Workgroup.**

- When the setup fails to join the Domain during the installation, it will install the system as Workgroup. Open [System] in Control Panel to specify joining the Domain.

**Specified large value as partition size, but when Windows 2000 is actually started, the system partition is created by 4095 MB.**

- Is the [Partition Size] specified by the value larger than the real area? If you want to create one partition in all area of the hard disk (excluding the maintenance area) to install the OS, specify [All Area].
- Are you specifying over 200 GB for the partition size?  
Specify less than 200 GB for the partition size.

**Windows 2000 started with different display resolution from the specified value.**

- If the specified display resolution can not be used, the system will use the nearest value or the default value of the driver.

**Entered the incorrect Product ID/CD key.**

- Even if you entered the incorrect Product ID/CD key, Express Setup will start. However, the setup will stop and asks you to re-enter the correct value. Also in this case, input request will occur when rebooting after GUI setup completed during Express Setup. If these 2 inputs are done correctly, there is no problem on Windows 2000 setup.

**Unable to specify the details of Network adapter.**

- In Express Setup, you can not specify the details of Network adapter. Specify them from Control Panel after starting Windows 2000.

**Windows 2000 is started with Network adapter that has not been specified during Express Setup**

- Windows 2000 will install the recognized Network adapter specified as default value. If you want to modify the specification, it can be done from Control Panel after starting Windows 2000. Also, the Network adapter that has been specified during Express Setup but that is not connected will not be setup, though the protocol will only be installed.

**Connected more than two Network adapter and specified different protocol for each adapter, but all the protocols are specified on either adapter.**

- It's a design. Each adapter is specified so that all the installed protocols can be used. The value that can not be specified during Express Setup will all be specified by default value.

**When more than two Network adapter are specified, the detailed specification of TCP/IP protocol are all set to use DHCP.**

- When more than two Network adapter are specified, the detailed specification of the protocol may all be set by default value. Re-specify the details from Control Panel.

**Not more than two Network adapter is connected, but the detailed specification of the protocol are set by default.(e.g. Specified IP Address on TCP/IP, but DHCP is specified)**

- Are you specifying more than two protocols?  
In this case, the situation will be the same as connecting more than two Network adapter, so the detailed specification of the protocol are all set by default. Re-specify the details from Control Panel after starting the OS.

***Problems with Disk Array Configuration***

Refer to the manual supplied with the RAID controller.

## ***Problems with Master Control Menu***

**The master control menu fails to appear:**

- Is your system Windows NT 4.0 or later, or Windows 95 or later?
  - The CD-ROM Autorun feature is supported by Windows NT 4.0 and Windows 95. The older versions do not automatically start from the CD-ROM.
- Is **Shift** pressed?
  - Setting the CD-ROM with **Shift** pressed down cancels the Autorun feature.
- Is the system in the proper state?
  - The menu may not appear depending on the system registry setting or the timing to set the CD-ROM. In such a case, start the Explorer and run \MC\1ST.EXE in the CD-ROM.

## ***Problems with Configuration Diskette Creator***

**The bit map of the Configuration Diskette Creator window is not displayed correctly during setting of setup information. (When the Trekking command is used)**

- If the specified number of colors is fewer than 256 in the display setting, the bit map is not displayed correctly, but the setup information can be displayed correctly.

**The Point to Point tunneling protocol cannot be set.**

- The protocol is not supported at present. After installation, set the protocol through Control Panel. In this case, rebooting is not necessary.

**The details of a network adapter cannot be set.**

- Configuration Diskette Creator is unable to set the details of network adapters. Start Windows 2000/2003, and set the details through Control Panel.

**More than one network board is connected during setting of setup information, but TCP/IP cannot be set for each network.**

- Perform the installation procedure during DHCP setting. To create a temporary IP configuration, perform the installation procedure during DHCP setting, and then set TCP/IP again through Control Panel.

## Collecting Event Log

This section describes on how to collect the log of various events that occurred on the server.



### Caution

If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

---

1. Click [Management Tool]: [Event Viewer] from the Control Panel.
2. Select the type of the log to collect.  
On [Application Log], the events related to the running application is archived.  
On [Security Log], the events related to the security is archived.  
On [System Log], the events occurred at the item which configures Windows system is archived.
3. Click [Save as...] in the [Run] menu.
4. Input the file name of archived log in the [File Name] box.
5. Select the type of the log file you want to save in the [File Type] list box and click [OK].

For more information, refer to Windows Online Help.

## ***Collecting Configuration Information***

This section describes how to collect the information on hardware configuration and inside specification.

In order to collect information, "Diagnostic Program" is used.



### **Caution**

If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

---

1. Point to [Settings] in Start menu, and click [Control Panel].  
The [Control Panel] dialog box appears.
2. Double-click [Management Tool], and double-click [Computer Management].  
The [Computer Management] dialog box appears.
3. Click [System Tool]: [System Information].
4. Click [Save as System Information File] in the [Operation] menu.
5. Enter the file name to save in the [File Name] box.
6. Click [Save].

## ***Collecting Dr. Watson Diagnostic Information***

Dr. Watson collects diagnostic information related to application errors. The location to save the information can be specified as you like.

## Memory Dump

If an error occurs, the dump file should be saved to acquire necessary information.

If you saved the dump to DAT, write down that it is saved as "NTBackup" or "ARCServe" on the label. You can specify the location to save the diagnostic information as you like...



### Caution

- Consult with your sales agent before dumping the memory. Dumping the memory while the server is in process may affect the system operation.
  - Restarting the system due to an error may display a message indicating insufficient virtual memory. Ignore this message and proceed. Restarting the system may result in dumping improper data.
- 

### *Preparing for Memory Dumping*

Memory dumping with the DUMP switch may disable the server to restart. In such a case, it is required to force the server to shut down. This forced shutdown, however, is not available if "Enable" is selected for "Power Switch Inhibit" on the Security menu of the BIOS setup utility, SETUP, because this setting disables POWER switch operation.

*To change the setting to enable the forced shutdown and restart of the server:*

1. Power on the server and start the BIOS setup utility.
2. Select "Disable" for "Power Switch Inhibit" in the Security menu.
3. Save the configuration data and exit the SETUP.

## ***Backup IPMI Information***

This section describes on how to collect IPMI information. To collect the information, ESMPRO Agent must be installed.

1. Select [Program] → [ESMPRO Agent] → [ESRAS Utility] from the Start pop-up menu.  
The [ESRAS Utility] window appears.
2. Select [Latest Information] from the Tree View to collect the information of local computer.  
If the data is displayed, it means the data is collected normally.
3. Click [Backup Current IPMI Information] from the [File] menu.
4. Check the computer name to backup the information.
5. Specify the backup file name to save and the location to save it, and click [Backup].

## Off-Line Maintenance Utility

The Off-line Maintenance Utility is an OS-independent maintenance program. When you are unable to start the OS-dependent ESMPRO to troubleshoot a problem, the Off-line Maintenance Utility can be used.



### Caution

- The Off-line Maintenance Utility is intended for use of your sales agent. The EXPRESSBUILDER CD-ROM and the Off-line Maintenance Utility Bootable FD you have created contain a file that describes operation of the utility, but do not attempt to use the utility by yourself. Contact your sales agent and follow instructions.
  - Starting the Off-line Maintenance Utility disables any access from a client to the server.
- 

## Starting the Off-line Maintenance Utility

The Off-line Maintenance Utility may be started in many ways.

You can set the Off-line Maintenance Utility to automatically start at an error occurrence in addition to starting it manually.



### Caution

Do not start the Off-line Maintenance Utility while the server is in successful operation.

---

#### ■ From the CD-ROM

Set the EXPRESSBUILDER CD-ROM in the optical device drive and reboot the system.

After the menu is displayed on the screen, select "Tools" - "Off-line Maintenance Utility".

The Off-line Maintenance Utility program starts from the CD-ROM.

#### ■ From the floppy disk

Set the Off-line Maintenance Utility Bootable FD in the floppy disk drive and reboot the system.

The Off-line Maintenance Utility program starts from the boot disk.

The Off-line Maintenance Utility Bootable FD is created by selecting "Tools" - "Create Support FD" on the EXPRESSBUILDER.

■ Manual start (by pressing F4)

When the Off-line Maintenance Utility is installed, press **F4** while the start-up screen of the server is on screen. The Off-line Maintenance Utility starts from the hard disk.

■ Automatic start (OS panic)

When a critical error occurs during OS operation, shut down and restart the system. The Off-line Maintenance Utility automatically starts. (You need to select "Start the Off-line Maintenance Utility when an error occurs." in the ESMPRO Agent beforehand.)

■ Automatic start (OS boot retry out)

If the OS boot monitoring feature is enabled, the Off-line Maintenance Utility automatically starts when after three consecutive OS boot failures.

## ***Features of Off-line Maintenance Utility***

The Off-line Maintenance Utility provides the following features. (Available features vary depending on the way you started the Off-line Maintenance Utility.)

---

 **Caution**

See the on-line help for details of the Off-line Maintenance Utility. For further information, ask your sales agent.

---

■ IPMI Information Viewer

Provides the functions to view the system event log (SEL), sensor data record (SDR), and field replaceable unit (FRU) and to make a backup copy of them.

Using this feature, you can find system errors and events to determine a maintenance part.

■ BIOS Setup Viewer

Provides the functions to export the current configuration data defined with the SETUP utility to a text file.

■ System Information Viewer

Provides the functions to view information on the processor and the BIOS and export it to a text file.

■ System Information Management

Provides the function to make a back-up copy of your data.

Without the backup data, the system-specific information and/or configuration may not be restored.

Only the authorized personnel is allowed to restore the backup data.

■ Start of Utilities

With the EXPRESSBUILDER, you can start the following utilities installed in the maintenance partition.

- System Management\*
- System Diagnostics
- Maintenance Partition Update

■ Chassis Identify\*

This function can distinguish the machine with the lamp or buzzer of the machine. This is convenient if you have to distinguish a machine among many machines on the rack.

\* Available only when the optional remote management card is installed.

## ***If You Need Assistance***

If you have a problem with your server, first review the sections of Solving Problems.



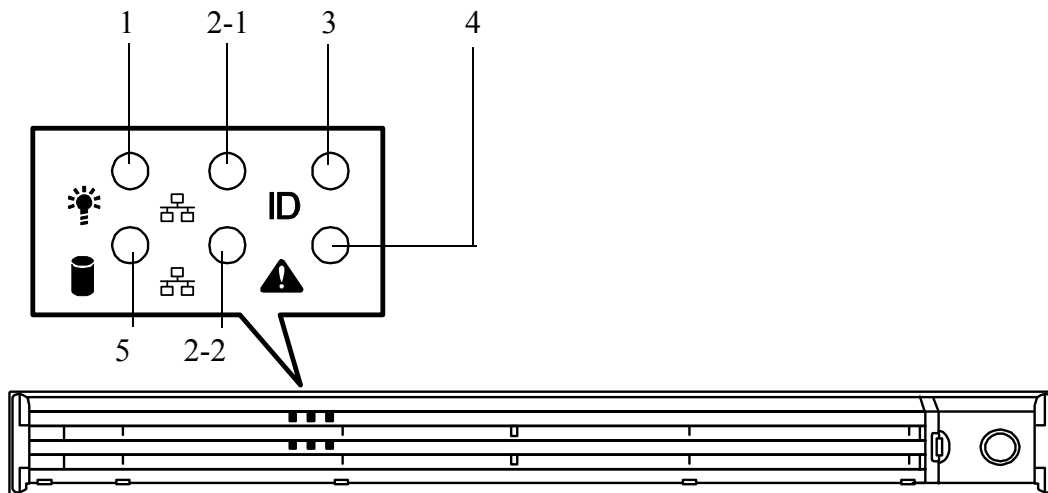
**Note:** *Refer to the warranty booklet delivered with your system to find out how to contact the local office in your country.*

---

For technical support such as BIOS upgrades, consult our Web site at the following address: <http://www.nec-computers.com>.

## Status Indicators

This section explains the indication and meanings of the server lamps.



**Figure 5 - 1 : 120Rf-1 Front Lamps**

- 1 Power lamp (green)
- 2 ACT lamp (green)
- 3 UID lamp (blue)
- 4 Status lamp (green)
- 5 Disk access lamp (green/amber)

### POWER Lamp

The POWER lamp is on (green) while the server power switch is on. It is off while no power is supplied to the server.

The POWER lamp indicates that the server is running in the power-saving mode (sleep mode). If the OS supports the power-saving mode such as Windows 2000, running the command blinks the POWER lamp in green and place the server in the power-saving mode. Press the POWER switch to turn out the POWER lamp and place the server back in the normal mode.

The power-saving mode is only available when the OS supports the power-saving feature. Some OS's allow you to set the server to automatically turn in the power-saving mode when no access is made to the server for a certain period of time or to select the power-saving mode with a command.

## Status Lamp

The STATUS lamp is on (green) while the server is operating normally. (The rear panel also has the STATUS lamp on it.) If the STATUS lamp is off or turns amber and flashes, it indicates that the server is in abnormal state.

The table below explains the STATUS lamp indication, the meanings, and the procedures.

---

### Notes:

- If ESMPro or the offline maintenance utility is installed, you can confirm the cause of a failure by referring to the error log.
  - If shutdown processing can be performed through the operating system when you want to restart the system after turning the power off, restart the system by performing shutdown processing. If shutdown processing cannot be performed, restart the system by resetting, forcibly turning the power off, or disconnecting and then connecting the power cord.
- 

**Table 5 - 5: Status Lamp Indications**

Status lamp indication	Description	Procedure
On (green)	The server is operating normally.	—
Flashing (green)	The server is operating with the memory, CPU, or power supply unit in degraded state.  An uncorrectable memory error has often occurred.	Check the AC power lamp indication on the rear panel of the server.  Identify the device in degraded state by using the BIOS setup utility "SETUP," and replace it as soon as possible.
Off*	The power is off. POST is in progress. A CPU error occurred. A CPU temperature alarm was detected. (IEER) A timeout occurred when the time set for the watchdog timer arrived. A CPU bus error occurred. A memory dump request is made.	— Wait for a while. The status lamp turns green when POST is completed. Turn the power off and then turn it on. If the POST screen displays an error message, take notes of the message, and contact your sales representative. Wait until the memory dump is completed.
On (amber)*	A temperature alarm was detected.  A voltage alarm was detected. All the power supply units failed.	Check if the internal fans are clean and if the fan units are firmly connected.  If the status lamp indication does not change when the fans are normal, contact your sales representative. Contact your sales representative.

**Table 5 - 5: Status Lamp Indications (Continued)**

<b>Flashing (amber)*</b>	A voltage warning was detected.	Contact your sales representative.
	A fan alarm was detected.	Check if the fan units are firmly connected.  If the status lamp indication does not change when the fans are normal, contact your sales representative.
	A temperature warning was detected.	Check if the internal fans are clean and if the fan units are firmly connected.  If the status lamp indication does not change when the fans are normal, contact your sales representative.

\* Only when the optional remote management card is installed in your server.

## Disk Access Lamp

The DISK ACCESS lamp indicates the status of the hard disk mounted in the 3.5-inch disk bay.

The lamp turns green each time access is made to the hard disk.

When the DISK ACCESS lamp turns amber, it indicates that a hard disk failure has occurred. Check the hard disk lamp for the status of the failing hard disk.



## Caution

If a hard disk in the server is connected to the internal disk array controller (which is additionally mounted), the access lamp signal cable (connected to the connector on the mother board) must be connected from the disk array controller to the mother-board.

## ACT Lamp

The ACT lamp is green while the server is connected to the LAN. The lamp flashes while the server is accessed via the LAN (during transmission/reception of packets). The number next to the icon indicates the network port number on the rear panel of the server.

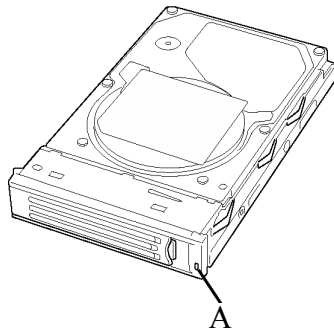
## UID Lamp (UID)

Pressing the UID switch toggles the front panel UID lamp (blue) and the motherboard UID lamp on and off. The motherboard UID lamp is visible through the rear of the chassis and allows you to locate the server you're working on from the rear of the servers on a rack.

## Disk Access Lamp

The disk access lamp of the floppy disk drive or optical device drive is on while the drive is accessed.

## Hard Disk Lamp (SCSI hot-plug HDD model only)



**Figure 5 - 2: Hard Disk Lamp**

The disk lamp (A) mounted in the 3.5-inch disk bay indicates the following depending on the status:


■ Flashing (green)

The lamp indicates that the hard disk is accessed.

■ On (amber)

The lamp indicates a failure of a hard disk mounted in disk array configuration.

---

 **Note:** Even if one of the hard disks fails in disk array configuration (RAID1 or RAID5), the server can continue operation. However, replace the disk as soon as possible, and perform reconstruction (rebuild) processing. (The failing disk can be replaced in hot swap mode.)

---

■ Flashing switching back and forth between green and amber

The lamp indicates that reconstruction (rebuild) processing is being performed for the hard disk. (This flashing does not indicate a failure.) When a failing hard disk is replaced in disk array configuration, the system rebuilds the data. (Auto-rebuild function) The lamp switches back and forth between green and amber during rebuild processing.

The lamp goes off when the rebuild processing finishes.  
It turns amber when the rebuild processing fails.

---

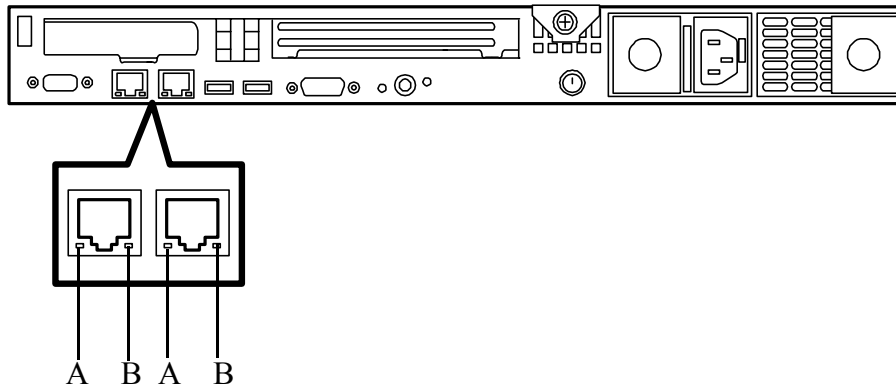
 **Caution**

If the server is turned off during rebuild processing, the processing is stopped. Restart the server, mount the new hard disk in hot swap mode, and then perform rebuild processing again. Observe the following notes on using the auto-rebuild function.

- Do not turn the power off. (Once the power is turned off, the auto-build function does not start.)
  - Let 90 seconds or more pass between when dismounting a failing hard disk and when mounting the new one.
  - Do not replace a failing hard disk while rebuild processing is being performed for another hard disk.
-

## LAN Connector Lamps

There are two lamps for each of the two LAN ports (connectors) on the rear panel.



- A     Speed Lamp
- B     LINK/ACT lamp

**Figure 5 - 3 : LAN Connector Lamps**

### ■ LINK/ACT lamps

Each LINK/ACT lamp indicates the status of the standard network port of the server. While power is supplied to the server and HUB and the connection is correct, the lamp is on (green).

The lamp turns green and flashes while the network port is transmitting/receiving data.

If the lamp does not go on when the LINK state is placed, check if the network cable is in normal state and if it is connected correctly. If the lamp does not go on yet when the network cable is normal, the network (LAN) controller may be faulty. In this case, contact your sales representative.

### ■ Speed lamp

This lamp indicates whether each of the network ports normally equipped with the server is operated through the 1000BASE-T, 100BASE-TX or 10BASE-T network interface.

If the lamp is lit orange, the network port is operated through 1000BASE-T. If the lamp is lit green, the network port is operated through 100BASE-TX.

If the lamp is off, the network port is operated through 10BASE-T.

# Appendix A: Specifications

## SCSI Hot-Swap HDD Model Specifications

Table A - 1: 120Rf-1 SCSI Specifications

Express5800 120Rf-1 SCSI hot-swap hard disk drive model			
Cabinet design		Rack-mount type (1U)	
CPU	Frequency	min: 2,8 GHz ; max: 3,6 GHz	
	Type	Intel® Xeon™ Processor	
	L2 Cache	minimum 1 MB on Die (ECC)	
	Number of processors	1 (max: 2)	
	Packaging	604 pin PPGA	
Chipset		Intel E7520	
FSB		800MHz	
Memory	Minimum	512 MB (2*256 MB)	
	Maximum	16 GB (The standard DIMM must be replaced.)	
	Architecture	2 way interleave	
	Connectors	8 memory connectors 184-pin wide	
	Expansion unit	2 DIMMs (256MB/512MB/1GB/2GB)	
	Memory module	SDRAM DIMM (Low Profile DDR2-400 Buffered Type)	
	Error check	ECC	
Graphics (VRAM)		ATI RADEON 7000 (VRAM 16MB)	
Hard Disk Drive (maximum)		900 GB (300 GB × 3) (Hot Swap)	
Hard Disk Bay		Slots: 3 RAID: RAID0, RAID1, RAID5 (option)	
Floppy Disk Drive		3.5-inch drive × 1 (standard)	
Optical device Drive (standard)		ATAPI interface × 1 (Load on tray type, 24x)	
Device Bays	5.25-inch	1 bay	
	3.5-inch	Slim FDD (2 mode) *1	
SCSI Interface	Non RAID Configuration	2 channel Ultra 320 SCSI	
	RAID Configuration	Software RAID: RAID 0 and 1 support	
	Floppy connector	Hardware RAID: RAID 0, 1 and 5 support	
Disk Array Configuration		2 boards max	
PCI-X Slots	Low Profile	1 slot (64bit/ 66MHz PCI-X)	
	Full Height	1 slot (64bit/ 133MHz PCI-X)	
External interface	Keyboard/ Mouse	MINI DIN 6-pin connector (1 port)	
	USB	4-pin (Front: 2 ports; Rear: 2 ports)	
	Serial	DB9 compatible (2 ports)	
	Network	10/100/1000BASE-T (2 ports)	
	Video	MINI D-Sub 15-pin (1 port)	
	LAN	10/100/1000Base-T (2 ports)	
	SCSI	Ultra320 SCSI (1 port)	

**Table A - 1: 120Rf-1 SCSI Specifications (Continued)**

<b>Express5800 120Rf-1 SCSI hot-swap hard disk drive model</b>		
Power supply		100 to 120 VAC $\pm 10\%$ , 200 to 240 VAC $\pm 10\%$ , 50/60 Hz $\pm 1$ Hz 1+1 redundant option hot-swappable
Power consumption (maximum)		465 W
Cooling		5 + 5 (redundant option)
Weight (Max)		15 kg (20 kg)
External dimensions		425 (width) $\times$ 718* (depth) $\times$ 43 (height) mm
Environmental requirements	Temperature	10 to 35°C (operating), -10 to 55°C (non-operating, storage)
	Humidity	20 to 80% RH (no condensation)
Others		EXPRESSBUILDER supported, ESMPRO provided in the standard configuration

\* Excluding the front bezel.

# SATA Fixed HDD Model Specifications

Table A - 2: 120Rf-1 SATA Specifications

Express5800 120Rf-1 SCSI hot-swap hard disk drive model			
Cabinet design		Rack-mount type (1U)	
CPU	Frequency	min: 2,6 GHz ; max: 3,6 GHz	
	Type	Intel® Xeon™ Processor	
	L2 Cache	minimum 1 MB on Die (ECC) ; maximum 2 MB	
	Number of processors	1 (max: 2)	
	Packaging	604 pin PPGA	
Chipset		Intel E7520	
FSB		800MHz	
Memory	Minimum	512 MB (2*256 MB)	
	Maximum	16 GB (The standard DIMM must be replaced.)	
	Architecture	2 way interleave	
	Connectors	8 memory connectors 184-pin wide	
	Expansion unit	2 DIMMs (256MB/512MB/1GB/2GB)	
	Memory module	SDRAM DIMM (Low Profile DDR2-400 Buffered Type)	
	Error check	ECC	
Graphics (VRAM)		ATI RADEON 7000 (VRAM 16MB)	
Hard disk Drive (maximum)		500GB (250GB x2) (Hot Swap)	
Hard Disk Bay		Slots: 2 RAID0, RAID1	
Floppy Disk Drive		3.5-inch drive × 1 (standard	
Optical device Drive (standard)		ATAPI interface × 1 (Load on tray type, 24x)	
Device Bays	5.25-inch	1 bay	
	3.5-inch	Slim FDD (2 mode) *1	
SCSI Interface	Non RAID Configuration	2 channel Ultra 320 SCSI	
	RAID Configuration	Software RAID: RAID 0 and 1 support	
	Floppy connector	Hardware RAID: RAID 0, 1	
Disk Array Configuration		2 boards max	
PCI-X Slots	Low Profile	1 slot (64bit/ 66MHz PCI-X)	
	Full Height	1 slot (64bit/ 133MHz PCI-X)	
LAN	On board LAN	2 channel Gigabit (Intel 82546GI *1)	
PCI-X Slots	Low Profile	1 slot (64bit/ 66MHz PCI-X)	
	Full Height	1 slot (64bit/ 133MHz PCI-X)	
External interface	Keyboard/ Mouse	MINI DIN 6-pin connector (1 port)	
	USB	4-pin (Front: 2 ports; Rear: 2 ports)	
	Serial	DB9 compatible (2 ports)	
	Network	10/100/1000BASE-T (2 ports)	
	Video	MINI D-Sub 15-pin (1 port)	
	LAN	10/100/1000Base-T (2 ports)	
	SCSI	Ultra320 SCSI (1 port)	

Table A - 2: 120Rf-1 SATA Specifications (Continued)

Express5800 120Rf-1 SCSI hot-swap hard disk drive model		
BIOS	Phoenix BIOS	ISA Flash ROM 4 MB
		Power On Self Test (POST)
	Supports:	Plug n Play
		Advanced Configuration and Power Interface (PI) 1.0
		Advanced Power Management (APM) 1.2
		S3 mode
		Y2K
		PC2001
		Desktop Management Interface
Power supply		100 to 120 VAC ±10%, 200 to 240 VAC ±10%, 50/60 Hz ±1 Hz
Power consumption (maximum)		425 W
Cooling		5
Weight (Max)		15 kg (17 kg)
External dimensions		425 (width) × 718* (depth) × 43 (height) mm
Environmental requirements	Temperature	10 to 35°C (operating), -10 to 55°C (non-operating, storage)
	Humidity	20 to 80% RH (no condensation)
Others		EXPRESSBUILDER supported, ESM PRO provided in the standard configuration

\* Excluding the front bezel.

# Appendix B:

## Interrupt Requests

**Table B - 3: Interrupt Requests**

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	12	Mouse
1	Keyboard	13	Numeric processor
2	-	14	Primary IDE
3	COM2 serial port (PCI)	15	Secondary IDE
4	COM 1 serial port (PCI)	16	USB
5	PCI	17	VGA
6	Floppy disk drive	18	-
7	PCI	19	USB
8	Real-time clock	30	LAN1
9	ACPI compliant system	31	LAN2
10	PCI	49	Adaptec SCSI
11	PCI	50	Adaptec SCSI

This page is intentionally left blank.

# Appendix C: Maintenance

This chapter describes the daily maintenance of the server and precautions when relocating or storing the server.

## ***Making Backup Copies***

We recommend you make backup copies of your valuable data stored in hard disks of the server on a regular basis. For backup storage devices suitable for the server and backup tools, consult with your sales agent.

When you have changed the hardware configuration or BIOS configuration, select "System Information Management" and then "Save" of the Off-line Maintenance Utility to make a backup copy of the system information.

Also make a backup copy of the disk array configuration data if your system is in the array configuration. When your hard disks have been auto-rebuilt due to a failure, it is recommended to make a backup copy of the configuration data. To make a backup copy of the configuration data, use the configuration utility that is resident in the FLASH memory on the optional disk array controller board. Refer to the manual supplied with the board.

## ***Cleaning***

Clean the server on a regular basis to keep the server in a good shape.

---

### **Warning**

- Do not disassemble, repair, or alter the server
  - Do not look into the optical device drive
  - Do not remove the lithium battery
  - Disconnect the power plug before working with the server
- 

---

### **Caution**

- Avoid installation in extreme temperature conditions
  - Make sure to complete board installation
  - Protect the unused connectors with the protective cap
-

## ***Cleaning the External Surfaces of the Server***



### **Caution**

- To avoid altering the material and color of the server, do not use volatile solvents such as thinner and benzene to clean the server.
- The power receptacle, the cables, the connectors on the rear panel of server, and the inside of the server must be kept dry. Do not moisten them with water.

For daily cleaning, wipe the external surfaces of the server with a dry soft cloth

If stains remain on the surfaces:

1. Make sure that the server is off-powered (the POWER/SLEEP lamp goes off).
2. Unplug the power cord of the server from a power outlet.
3. Wipe off dust from the power cord plug with a dry cloth.
4. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
5. Rub off stains on the server with the cloth prepared in Step 4.
6. Soak a soft cloth in water, squeeze it firmly, wipe the server with it once again.
7. Wipe the server with a dry cloth.
8. Wipe off dust from the fan exhaust opening on the rear of the server with a dry cloth.

## ***Cleaning the Interior of the Server***

One important item in a good maintenance program is regular and thorough cleaning of the interior of the server, especially around the motherboard.

Dust buildup inside the server can lead to several problems. As dust acts as a thermal insulator, a buildup can prevent proper system cooling. Excessive heat will shorten the life of server components. Also, dust may contain conductive or corrosive materials that can cause short circuits or corrosion of electrical contacts.

How often you should clean the interior of the server depends on the environment in which it is located. For most office environments, you probably should clean the server every 12 months. For more severe environments, clean the interior every 6 months.

To clean the interior of the server, you will need a small vacuum cleaner (with plastic tipped nozzle and electrostatic protection), a computer grade canned air, and a small brush.

---

 **Warning**

Unplug all power cords before performing any maintenance. Voltage is present inside the server and display unit even after the power is turned off. All voltage is removed only when the power cord is unplugged.

---

 **Caution**

Do not use the brush made of chemical fabric, or the cleaning material that will generate an electrostatics.

---

*To clean the interior of the server:*

1. Turn off the server and unplug all power cables.
2. Remove the logic cover and the drive cover.
3. Use a small brush to loosen any dust and debris on the mother board.
4. Use computer grade canned air to blow dust off components on the motherboard.
5. Use a small vacuum cleaner with plastic tip to vacuum out dust and debris from the interior of the server.
6. Reinstall the logic cover and the drive cover.
7. Reconnect all power cables and turn on the server.

### ***Cleaning the Keyboard***

1. Power off the server and peripheral devices.  
The POWER/SLEEP lamp is off.
2. Wipe the keyboard surface with a dry cloth.

## ***Cleaning the Mouse***

The mouse operation depends on the degree of smoothness of the internal ball rotation. To keep the mouse ball clean, use the mouse in a place with little dust.

*To clean the mouse:*

1. Prepare cold or lukewarm water, neutral detergent, alcohol, two dry soft clothes, and cotton swabs.
2. Power off the server.  
The POWER/SLEEP lamp goes off.
3. Turn the mouse upside down, and rotate the mouse ball cover counterclockwise to remove it.
4. Take out the ball from the mouse. Cover the bottom of the mouse with your hand, and turn your hand holding the mouse (the mouse is on your palm with the button upward). The mouse ball is released onto your palm.
5. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
6. Rub off stains on the mouse ball. Softly wipe the mouse ball with the cloth prepared in Step 5.
7. Wipe the mouse ball with a dry soft cloth.
8. Wipe three small rollers inside the mouse with a cotton swab soaked with alcohol. Wipe stains slowly and carefully by rotating rollers with the tip of the cotton swab.
9. Blow out any dust from the mouse. Protect your eyes from the dust.
10. Put the mouse ball back into the mouse.
11. Place the mouse ball cover, and rotate it clockwise until it is locked.

## ***Cleaning an Optical Drive and CD-Rom/CD-RW/DVD-Rom***

A dust-accumulated tray or a dusty optical drive may cause the device not to read data correctly.

*To Clean an Optical Drive:*

1. Power the server.  
The POWER/SLEEP lamp is lit.
2. Press the optical drive tray Open/Close button on the front of the optical drive.  
The tray is opening.
3. Hold the CD-ROM/CD-RW or DVD-Rom and take it out from the tray.

---

**Note:** Do not touch the signal side of the CD-ROM with your hand.

---

4. Wipe the tray with a dry soft cloth.



### Caution

Do not wipe the lens of the optical drive. Doing so may damage the lens and may cause a malfunction of the drive.

---

5. Push on the tray front to close the tray.

*To Clean a CD-Rom or CD-RW or DVD-Rom:*

Wipe the signal side of the disk with a dry soft cloth.



### Caution

- Wipe disks from the center to the outside.
  - Use only CD-ROM cleaner if necessary. Cleaning a CD-ROM or CD-RW or DVD-ROM with record spray/cleaner, benzene, or thinner causes damage to the disk contents. At worst, inserting the disk into the server may cause failure.
-

## System Diagnostics

The System Diagnostics runs several tests on the server.

Use the System Diagnostics program in the EXPRESSBUILDER CD-ROM provided with the server to diagnose the server.

### Test Items

The following items are tested in system diagnostics.

- Memory
- CPU cache memory
- Hard disk used as a system



### Caution

When executing the System Diagnostics, make sure to remove the LAN cable.

Executing the System Diagnostics with the LAN cable connected, the network may be influenced.

---



**Note:** On checking the hard disk, no data is written into the disk.

---

## Starting and Ending the System Diagnostics

There are two ways to diagnose the server: to use the local console (keyboard) of the server itself, and to use the management PC via serial port (remote console).



### Caution

Use the serial port to execute System Diagnostics with remote console. The LAN connection is not for System Diagnostics.

---

Procedures to start the diagnostics program is as follows:

1. Shutdown the OS, and turn off the server. Then, unplug the power cord.
2. Disconnect all the LAN cables from the server.
3. Plug the power cord and turn on the server.
4. Reboot the server with the EXPRESSBUILDER CD-ROM.
5. Select [Tools].
6. Select [System Diagnostics].

The System Diagnostics starts and completes in three minutes.

When the diagnosis completes, the test window title shows "Test End".

- Diagnosis tool title: shows a name of this diagnosis and Version information.
- Test windows title: shows the progress of diagnosis. When it completes, it shows "Test End".
- Test Result: shows the information including time of start, end and progress, and result of the diagnosis.
- Guide line: shows a description of keys to navigate the window.
- Test window: Move the cursor and press **Enter** to view the detail of the diagnosis.

If an error is detected during the System Diagnostics, the test result shows "Abnormal End" in red color. Move the cursor and press **Enter** on the diagnosis which error occurred. Take a note of the error message showed, and contact your sales agent.

7. Follow the Guide line shown in the bottom of the screen and press **Esc** to show the End user Menu.
  - <Test Result> shows the screen of the diagnosis completed aforementioned.
  - <Device List> shows the information of all the devices connected.
  - <Log Info> shows the log information and error messages of the diagnosis. it can be saved to a floppy disk. To save the log information to a floppy disk, insert a formatted floppy disk to a floppy disk drive and select <Save [F]>.
  - <Option> change where to output log
  - <Reboot> Restarts the server.
8. Select <Reboot> in the Enduser Menu above.

The Express Server restarts and EXPRESSBUILDER boot the system.
9. Exit EXPRESSBUILDER, and remove the CD-ROM from the optical device drive.
10. Turn off the server and unplug the power cord from the receptacle.
11. Reconnect all the LAN cables to the server.
12. Plug the power cord.

This completes the System Diagnostics.

# Appendix D: Installing Windows Server 2003

This section describes the procedures for installing Windows Server 2003 without using Express Setup tool.

## ***Before Installing Windows Server 2003***

Please read carefully the following information BEFORE beginning your Windows Server 2003 Installation.

### ***Installing Service Pack***

You can install the Service Pack on the system. When the Service Pack is not delivered with your system, prepare it by yourself.

### ***Updating System***

If you change the configuration of the system, update your system with the EXPRESSBUILDER CD-ROM delivered with your system.

### ***Re-installing to the Hard Disk which has been upgraded to Dynamic Disk***

If you want to leave the existing partition when installing the system on the hard disk upgraded to Dynamic Disk, note the following issue:

- Do not select the partition where the operating system had been installed as the partition to install the operating system newly.
- Select "Use the current File System" for the format of operating system partition.

### ***Manual Installation when the Disk Array Controllers are Connected***

If you keep the disk array controllers connected during installation process, pop-up messages may appear. This does not affect on system behavior. Click [YES] and continue the installation.

### ***Magneto-Optical device***

If you specify the file system as NTFS with a MO Device connected during the installation, the file system will not be converted normally. Disconnect the MO device and restart the installation from the beginning.

## Partition Size

The minimum required partition size for installation of Windows Server 2003 is:

- 2900 MB + Paging file size + Dump file size
- Paging file size (recommended) = installed memory \* 1.5
- Dump file size = Installed memory size + 12 MB



### Caution

- The above paging file size is necessary for collecting debug information (memory dump). If you set the default value of paging file size smaller than the 'recommended' value, the accurate debug information (memory dump) may not be collected.
  - The maximum paging file size which can be set on one partition is 4095 MB. If the above paging file size exceeds 4095 MB, specify 4095 MB for the paging file size.
  - The dump file size for a system with more than 2 GB memory installed is '2048 MB + 12 MB'.
- 

For example, if installed memory size is 512 MB, the minimum required partition size is:  
 $2900 \text{ MB} + (512 \text{ MB} * 1.5) + (512 \text{ MB} + 12 \text{ MB}) = 4192 \text{ MB}$ .

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Appendix F and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

(If the disk does not have enough free space to enable the file size to be written, then after installing the system using the "Size required for installation + Paging file size," install an additional new disk.)

## ***Installing Microsoft Windows Server 2003***

You will need the following for Windows Server 2003 installation:

- EXPRESSBUILDER CD-ROM
- Microsoft Windows Server 2003 Standard Edition (CD-ROM)
- User's Guide
- Getting Started
- Windows Server 2003 OEM-DISK for EXPRESSBUILDER

Before installing, create Windows Server 2003 OEM-DISK for EXPRESSBUILDER.

### ***Creating "Windows 2003 OEM-DISK for EXPRESSBUILDER"***

You can create Windows 2003 OEM-DISK for EXPRESSBUILDER with the following two procedures:

#### ***Creating from the menu which appears when running EXPRESS5800 Server with EXPRESSBUILDER***

Use this procedure if you have only EXPRESS5800 Server to create Windows 2003 OEM-DISK for EXPRESSBUILDER.

- If you have only EXPRESS5800 Server to create Windows Server 2003 OEM-DISK for EXPRESSBUILDER, use this procedure.
  1. Prepare a 3.5-inch floppy disks.
  2. Turn on your EXPRESS5800 Server.
  3. Insert the EXPRESSBUILDER CD-ROM in the optical device drive.
  4. Press the **RESET** switch or press **Ctrl + Alt + Delete** to reboot the server.(You may also turn off and then on again to reboot the server.)  
The system will boot from the CD-ROM and EXPRESSBUILDER starts.
  5. Select [Create Support Disk] from [Tools].
  6. Select [Windows Server 2003 OEM-DISK for EXPRESSBUILDER] from [Create Support Disk] menu.
  7. Insert a diskette in the floppy disk drive according to the on-screen instruction. Windows Server 2003 OEM-DISK for EXPRESSBUILDER will be created.
  8. Write-protect and label the diskette, then keep it in a safe place.

### *Creating Windows 2003 OEM-DISK from [Master Control Menu]*

Use this procedure if Windows Server 2003 or Windows 2000 can be operated on EXPRESS5800 Server.

[Master Control Menu] runs on the following operating systems.

- Windows Server 2003
- Windows 2000
- Windows Me/98/95
- Windows NT 4.0
- Windows XP

You can create Windows Server 2003 OEM-DISK for EXPRESSBUILDER from [Master Control Menu], if you have the computer on which one of the above operating system operates.

Follow the steps below:

1. Prepare a 3.5-inch floppy disks.
2. Run the operating system.
3. Insert the EXPRESSBUILDER CD-ROM in the optical device drive.  
[Master Control Menu] is displayed.
4. Click [Setup] with left mouse button and click [Make OEM-DISK] and then [for Windows Server 2003].



**Note:** You can do the same operation using the menu displayed by a right-click.

---

5. Insert the floppy disk into the floppy disk drive according to the message.  
Windows Server 2003 OEM-DISK for EXPRESSBUILDER will be created.
6. Write-protect and label the diskette, then keep it safely.

## Windows Server 2003 Clean Installation

This section explains how to perform a clean installation of Windows Server 2003.

1. Turn the system on.
2. Insert the Windows Server 2003 CD-ROM in the optical device drive.
3. Press **Ctrl + Alt + Delete** to reset the system.

After a bootable operating system has been installed on the hard disk, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

If no bootable operating system exists on the hard disk, this step is unnecessary. The Windows Server 2003 setup screen will be displayed.

If the screen is not displayed, **Enter** was not pressed properly.

Retry after turning the system off then on again.

4. If the RAID controller (including embedded HostRAID feature) or SCSI controller is installed, press **F6** in a few seconds when the window is in one of the following states:
  - "Setup is inspecting your computer's hardware configuration..." is displayed.
  - A screen with a solid blue background is displayed.



**Note:** There is no visible indication on screen when F6 has been pressed.

---

5. When the following message is displayed, press **S**.

Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices.

The following message is displayed.

Please insert the disk labeled  
manufacturer-supplied hardware support disk  
into Drive A:  
\*Press ENTER when ready.

6. Insert the Windows Server 2003 OEM-DISK for EXPRESSBUILDER into the floppy drive, and press **Enter**.  
SATA Model: A list of mass storage devices is displayed.

SCSI Model: Select the [Adaptec Ultra320 SCSI Cards (WinXP/Server 2003 IA-32)] and press **Enter**.


7. Select the proper SCSI Adapter and press **Enter**.
8. Follow the on-screen instructions to complete the installation.
9. After installation is completed, be sure to follow the procedures described in "Driver Installation and Advanced Settings" and "Updating the System" later in this guide.

## Upgrade installation

Procedures below upgrade the installed Windows 2000 to Windows Server 2003.

1. Power on the system and start Windows 2000.
2. Log on as an administrator.
3. Insert the Windows Server 2003 CD-ROM into the optical device drive. [Select an operation] dialog box is displayed.


---

 **Note:** If the [Select an operation] dialog box does not appear, start \SETUP.EXE from optical device drive.

---

4. Select [Install Windows Server 2003].  
A dialog box asks to select the upgrade or clear installation.
5. Select "Upgrade (recommended)" and click **Next**.  
Follow the messages and continue.  
The system will restart after copying the files.


---

 **Note:** You can leave the Windows Server 2003 CD-ROM in the optical device drive.

---

6. If the RAID controller (including embedded HostRAID feature) is installed, press **F6** while the message "Setup is inspecting your computer's hardware configuration..." is displayed.

---

 **Note:** There is no visible indication on screen when **F6** has been pressed.

---

7. When the following message is displayed, press **S**.

Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices.

The following message is displayed.

<p>Please insert the disk labeled manufacturer-supplied hardware support disk into Drive A: *Press ENTER when ready.</p>
--

8. Insert the Windows Server 2003 OEM-DISK for EXPRESSBUILDER in the floppy disk drive, and press **Enter**.  
A list of mass storage devices is displayed.  
SCSI Model: Select the [Adaptec Ultra320 SCSI Cards (WinXP/Server 2003 IA-32)] and press **Enter**.
9. If the optional board is installed, select the proper SCSI Adapter and press **Enter**.
10. Follow the on-screen instructions.
11. Update the system.
12. Install the driver and make detailed settings.

■ SCSI controller

The following message may appear on the display during the upgrade installation to Windows Server 2003. In this case;

Please type D:/i386 and click OK. (D: CD-Drive)

Insert disk

The file 'adpu160m.sys' on Adaptec Windows 2000 Family Manager set V1.12 S2 is needed.

■ Type the path where the file is located, and then click OK.

■ If PROSET II is already installed, uninstall the PROSET II before upgrading.

If the teaming function is enabled, disable the function before uninstalling PROSET II.

■ During upgrade installation, [Disk Insert] dialog box may be displayed. If it is displayed, click **Cancel**.

■ When the upgrade installation is completed, [Device Driver Wizard] dialog box may be displayed. If it is displayed, click **Cancel**, then update the system.

## ***Reinstallation to Multiple Logical drives***

This section describes the procedure for reinstalling the operation system if the multiple logical drives exist.

### ***Before Re-installing the Operation System***

Be sure to make backup copies before re-installing the operation system just in case.

### ***Re-installing the Operation System***

1. Start the clean installation following the procedure described in this guide.
2. Specify the partition in which you want to install the operating system when the following message appears:

The following list shows the existing partitions and unpartitioned space on this computer.

Use the UP and DOWN ARROW keys to select an item in the list.

\* Cannot modify the drive letter of your system or boot volume. Confirm the proper drive letter is assigned and then, continue the setup.

3. Continue the clean installation following the procedure described earlier in this chapter.
  - \* The drive letter of the re-installed system may differ from the one of the previous system. If you need to modify the drive letter, follow the procedure "Modifying the Drive Letter".

### ***Modifying the Drive Letter***

Be careful that the drive letter of the system or boot volume cannot modify with the following procedure.

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].
2. Specify the [Disk Management] in the left side of the window.
3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Path...].
4. Click [Yes].
5. Choose the [Assign a drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes]:

Changing the drive letter of a volume may cause programs to no longer run.  
Are you sure you want to change this drive letter?

8. Close the [Computer Management].

## **Updating the System**

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.
2. Insert the EXPRESSBUILDER CD-ROM into the optical device drive.  
[Master Control Menu] is displayed on the screen.
3. Click [Setup] with left mouse button and click U[Update EXPRESS5800 system] section.
4. Follow the on-screen instructions to continue system update.
5. Click [Restart Computer] to restart the system.
6. Remove the EXPRESSBUILDER CD-ROM from the optical device drive immediately after clicking [Restart Computer].



### **Caution**

If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

---

## ***Driver Installation and Device Settings***

This section describes how to install and setup various standard drivers mounted on the device.

For information on installing and setting up a driver that is not described in this section, please refer to the document delivered with the driver.

### ***PROSet***

PROSet is a utility that checks the function of network contained in network driver.

Using PROSet enables the following items:

- Verify detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhance throughput between the switches.

PROSet is necessary to use these features.

#### ***To install PROSet:***

1. Insert the EXPRESSBUILDER CD-ROM into the optical device drive.
2. The [Windows Explorer] dialog starts.
  - a. In the case of the standard start menu, click Start menu and click [Windows Explorer].
  - b. In the case of the classic start menu, click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "PROSet.exe" in the following directory:  
<CD-ROM DriveLetter>:\WINNT\DOTNET\BC1\PROSet\WS03XP32  
The [Intel(R) PROSet - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

### ***Network Driver***

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and duplex mode need to be specified manually.

#### ***[When PROSet is not installed]***

1. The [Local Area Connection Properties] dialog box is displayed.

- Procedure with the standard start menu: click Start menu, [Control Panel], [Network Connections], and [Local Area Connection].
- Procedure with the classic start menu:
  - a. Click Start menu, Click [Settings] and Click [Network Connections]. The [Network Connections] dialog box is displayed.
  - b. Right-click [Local Area Connection] and click [Properties] from pop-up menu.
- 2. Click [Configure].  
The property dialog box for network adapter is displayed.
- 3. Click [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.
- 4. Click [OK] on the property dialog box for network adapter.


*[When PROSet is installed]*

1. The [Intel PROSet] dialog box is displayed.
  - Procedure with the standard start menu: click Start menu, point to [Control Panel] and click [Intel PROSet].
  - Procedure with the classic start menu:
    - a. Click Start menu, point to [Settings] and click [Control Panel].
    - b. Double-click [Intel(R) PROSet] on the [Control Panel] window.
2. Click [(Network Adapter Name)] in the list.
3. Click [Speed] and specify the [Link Speed & Duplex Settings] value the same as the value specified for HUB.
4. Click [Apply] and click [OK].

Also, add or delete any protocols and services if necessary.

You can operate the process on the property dialog box for local area network which can be displayed from [Network and Dial-up Connection].

---

 **Note:** We recommend you to add [Network Monitor] at [AddingServices]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setup for TroubleProcess" later in this document.

---

## **Re-install the Network Driver**

The network driver will be installed automatically.

## **Graphics Accelerator Driver**

Update Graphics Accelerator Driver Mounted in Standard.

1. Insert the EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer]
3. Run "SETUP.EXE" in the following directory.

<CD-ROM Drive Letter>:\WINNT\VIDEO\RADEON7000\W2K3\SETUP.EXE

\*Install the graphics accelerator driver in the following directory if you communicate your server with the remote KVM console. (Optional advanced remote management card must be installed in your server to use the remote KVM console.)

<CD-ROM Drive Letter>:\N8115-02\VIDEO\RADEON7000\SETUP.EXE

4. Follow the message to continue the installation.
5. Remove the EXPRESSBUILDER CD-ROM from the CD-ROM drive, follow the direction on the screen and restart the system.

### ***Installing SCSI Controller Driver***

If you use SCSI controller driver, install it according to the following procedure:

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click the SCSI Controller driver which Device Manager lists as unknown device.
3. Click [Update Driver].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select "Don't search. I will choose the driver to install" and click [Next].
6. Click [Have Disk..].
7. Insert "Windows Server 2003 OEM-DISK for EXPRESSBUILDER" into the floppy disk drive, enter "a:\\" into "copy manufacturer's file from:" and click [OK].
8. Specify the relevant driver and click [Next].

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

### ***Installing RAID Controller Driver***

To additionally install a RAID controller in a system containing Windows 2003, connect the controller and take the following steps to install the driver:

1. When the [Found New Hardware Wizard] dialog box appears, click [Next].

2. When the [Install Hardware Device Drivers] dialog box appears, select [Search for a suitable driver for my device (Recommended)], and click [Next].
3. When the [Locate Driver Files] dialog box appears, select [Floppy disk drives], insert "Windows Server 2003 OEM-DISK for EXPRESSBUILDER" into the floppy disk drive, and click [Next].
4. When the [Driver Files Search Results] dialog box appears, click [Next].
5. Copying of the driver is completed, and the [Completion of the new hardware detection wizard] dialog box below appears. Click [Complete].

### **Available Switch Options for Windows Server 2003 Boot.ini File**

Many different switches will be available if you edit Boot.ini file.

For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 833721

"Available switch options for the Windows XP and the Windows Server 2003 Boot.ini files"

If your system has a memory capacity in excess of 4GB in its installing, adding /PAE switch in Boot.ini file will enable the system to be installed with over 4GB of memory.

However, the Microsoft operating system products which support /PAE switch option are limited.

Refer to the following article in Microsoft Knowledge Base to check the supported products.

- Microsoft Knowledge Base - Article ID: 291988

"A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

Below is the example on how to add /PAE switch to Boot.ini file.

1. Click [Start], point to [Settings], and then click [Control Panel].
2. In [Control Panel], double-click [System].
3. Click the [Advanced] tab, and then click [Settings] under [Setup and Recovery].
4. Under [System Setup], click [Edit] to open [Boot.ini].
5. Add "/PAE" to [Operating Systems] section in [Boot.ini] file, and then save it.

<Example of Boot.ini file>

[boot loader]

timeout=30

default=multi(0)disk(0)rdisk(0)partition(2)\WINDOWS

[operating systems]


multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, Standard" /fastdetect

multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, Standard, PAE" /fastdetect /PAE

C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console" /  
cmdcons

This is the end of editing Boot.ini file.

---

 **Note:** *If you choose one of the items in the "Default operating system" drop-down list box in [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.*

---

## ***Setting for Collecting Memory Dump (Debug Information)***


Set for collecting memory dump using the procedure described in Appendix F.

This page is intentionally left blank.

# Appendix E :Installing Windows 2000

This section describes the procedures for installing Windows 2000 without using the Express Setup tool.

---

 *Note: Windows 2000 is not anymore available for sale, however, if you own Windows 2000 setup disks, you can install it on your Express 5800 server.*

---

## **Before Installing Windows 2000**

Please read carefully the following information BEFORE starting your Windows 2000 Installation.

### **Installing Service Pack**

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

### **Updating System**

If you change the configuration of the system, update your system with the EXPRESSBUILDER CD-ROM delivered with your system.

### **Re-installing to the Hard Disk which has been upgraded to Dynamic Disk**

If you want to leave the existing partition when installing the system on the hard disk upgraded to Dynamic Disk, note the following issue:

- Do not select the partition that OS had been installed as the partition to install the OS newly.
- Select "Use the current File System" for the format of OS partition.

### **Partition Size**

The minimum required partition size for the installation of Windows 2000 is:

1000MB + Paging file size + Dump file size

Paging file size (recommended) = installed memory \* 1.5

Dump file size = Installed memory size + 12 MB

---

 Notes:

- The above paging file size is necessary for collecting debug information (memory dump). If you set the default value of paging file size smaller than the 'recommended' value, the accurate debug information(memory dump) may not be collected.
  - The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
  - The dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
- 

For example, if installed memory size is 512MB, the minimum required partition size is  $1000 + (512 \times 1.5) + (512 + 12) = 2292\text{MB}$ .

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that the debugging information (equivalent to the dump file size) is to be written to a separate disk.  
(If the disk does not have enough free space to enable the file size to be written, then after installing the system using the "Size required for installation + Paging file size," install an additional new disk.)

## ***Installing Windows 2000***


Items required:

- EXPRESSBUILDER CD-ROM
- Microsoft Windows 2000 Server (CD-ROM)
- Windows 2000 Service Pack (CD-ROM)
- User's Guide
- Getting Started
- Windows 2000 OEM-DISK for EXPRESSBUILDER

### ***Creating "Windows 2000 OEM-DISK for EXPRESSBUILDER"***

Before installing, create Windows 2000 OEM-DISK for EXPRESSBUILDER.

---

 *Note: If you already have a "Windows 2000 OEM-DISK for EXPRESSBUILDER" for the Express5800 Server on which you are going to install Windows 2000, you do not need to create it again.*

---

You can create Windows 2000 OEM-DISK for EXPRESSBUILDER with the following two procedures.

- Create from the menu which appears when running Express5800 Server with EXPRESSBUILDER.

If you have only Express5800 Server to create Windows 2000 OEM-DISK for EXPRESSBUILDER, use this procedure.

1. Prepare three 3.5-inch floppy disks.

2. Turn on your Express5800 Server.
3. Set the EXPRESSBUILDER CD-ROM in the CD-ROM drive of the server.
4. Press the RESET switch or press Ctrl, Alt and Delete to reboot the server .(You may also turn off and then on again to reboot the server.)  
The system will boot from the CD-ROM and EXPRESSBUILDER starts.
5. Select [Create Support Disk] from [Tools].
6. Select [Windows 2000 OEM-DISK for EXPRESSBUILDER] from [Create Support Disk] menu.  
Set a floppy disk in the floppy disk drive according to the instruction on the screen.  
The Windows 2000 OEM-DISK for EXPRESSBUILDER will be created.  
Write-protect the floppy disk, label it, and store it in a safe place.

■ Create from [Master Control Menu]

You can create the Windows 2000 OEM-DISK for EXPRESSBUILDER from the [Master Control Menu], if you have a computer on which one of the following operating systems is running.

- Windows Server 2003
- Windows 2000
- Windows Me/98/95
- Windows NT 4.0
- Windows XP

Follow the steps below.

1. Prepare three 3.5-inch floppy disks.
2. Run the operating system.
3. Set the EXPRESSBUILDER CD-ROM in the CD-ROM drive of the server.  
[Master Control Menu] will display.
4. Click on [Setup], select [Make OEM-DISK] and then [for Windows 2000].



*Note: A contextual menu allowing the same process is available with a right-click.*

---

5. When prompted, insert the floppy disk into the floppy disk drive.  
The Windows 2000 OEM-DISK for EXPRESSBUILDER will be created.  
Write-protect the floppy disk, label it, and store it in a safe place.


## **Windows 2000 Clean Installation**

This section explains how to perform a clean installation of Windows 2000.

1. Turn on the system power.

2. Insert the Windows 2000 CD-ROM in the CD-ROM drive.
3. Press **Ctrl + Alt + Delete** to reset the system.  
After a bootable operating system has been installed on the hard disk, press Enter while the message "Press any key to boot from CD..." is displayed at the top of the screen.  
If no bootable operating system exists on the hard disk, this step is unnecessary.  
The Windows 2000 setup screen will display.  
If the screen is not displayed, **Enter** was not pressed properly. Turn off the system, and return to step 1.
4. If a SCSI controller is installed, press **F6** the few seconds while the window is in either of the following states.
  - "Setup is inspecting your computer's hardware configuration ..." is displayed.
  - A screen with a solid blue background is displayed.

---

 *Note: There is no visible indication on screen when F6 has been pressed.*

---

5. When the following message is displayed, press S.

"Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices."

The following message is displayed.

"Please insert the disk labeled manufacturer-supplied hardware support disk into Drive A: \*Press ENTER when ready."

6. Insert the Windows 2000 OEM-DISK for EXPRESSBUILDER into the floppy drive, and press **Enter**.  
A list of mass storage devices is displayed.
7. Select the proper SCSI Adapter and press Enter.

Continue performing tasks according to the subsequent messages that display.

Once the installation is complete, make sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of this manual.

## **Updating the System -Installing Service Pack -**

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.

2. Insert the EXPRESSBUILDER CD-ROM into CD-ROM drive. Master Control Menu automatically displays on the screen.
3. Click on [Setup] with left mouse button and click on [Update Express5800 system] section.
4. Continue your work for system update as the following message.
5. Click on [Restart Computer] to restart the system.
6. Remove the EXPRESSBUILDER CD-ROM from the CD-ROM drive immediately after clicking on [Restart Computer]



### Caution

If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

---

## Driver Installation and Advanced Settings

This section describes how to install and setup various standard drivers for the devices installed in the server.

For more information on installing and setting up a driver that is not described in this section, please refer to the document attached to the driver.

### PROSetII



### Caution

The onboard controller does not support the teaming feature.

---

PROSetII is a utility that confirms the function of network contained in the network driver. Be sure to install it in order to enable the following features:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Specify teaming.

Configuring several network adapters as a team provides the server an environment tolerant on any trouble and enhance throughput between the switches.

PROSetII is necessary to use these features.

Follow the procedure below to install PROSetII.

1. Insert the EXPRESSBUILDER CD-ROM into the CD-ROM drive.

2. Click Start menu, point to [Program], [Accessory] and click [Explorer].
3. Run "PROSET.MSI" in the following directory.  
<CD-ROM  
DriveLetter>:\WINNT\W2K\PC62C\HD1\WINDOWS\PROSET2\IA32\PRO  
SET.MSI  
The [Intel(R) PROSetII - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.


### Network Driver

[When PROSet II is not installed]

1. Click Start menu and click [Network and Dial-Up Connection].  
The [Network and Dial-Up Connection] dialog box appears.
2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.  
The [Local Area Connection Properties] dialog box appears.
3. Click [Configure].  
The property dialog box for network adapter appears.
4. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.
5. Click [OK] on the property dialog box for network adapter.
6. Click [OK] on the [Local Area Connection Properties] dialog box.

Also, add or delete any protocols and services if necessary. You can operate the process from [Network and Dial-up Connection] to display the property dialog box for local area network.

---

 *Note: We recommend you to add [Network Monitor] at [Adding Services]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble.*

---

[When PROSet II is installed]

1. Double-click [IntelR PROSet II] on the [Control Panel] window.  
The [IntelR PROSet II] dialog box appears. Double-click the [IntelR PROSet II] icon.
2. Put the cursor to the network driver in the list.
3. Click the [Advanced] and specify the same value for [Link Speed & Duplex] as for HUB.

Specify the other network driver using the same procedure.

### *Display Driver*

Install the display driver using the following procedure.

1. Insert the EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Run the "CD-ROM drive name:\WINNT\VIDEO\W2K\setup.exe".  
Follow the message on the screen.  
When the message "Digital Signature Not Found" message appears, click on [Yes].
3. Remove the EXPRESSBUILDER CD-ROM and restart the system following a message on the screen.

### *USB 2.0 Driver*

USB 2.0 Driver is pre-installed. When restoring the system or re-installing the system, the driver is automatically installed during the update process.

# Appendix F: Installing and Using Utilities

This section describes how to use the EXPRESSBUILDER CD-ROM that comes with your server and to install the utilities stored on the EXPRESSBUILDER.

## EXPRESSBUILDER

EXPRESSBUILDER is an automated software integration tool that helps simplify the process of installing and configuring your server. It provides a flexible, guided installation process for system administrators to install Microsoft® Windows® 2000 or Microsoft® Windows Server™ 2003.

To install other operating systems, please contact your service representative for more information on the operating systems certified on the server.

---

 **Note:** Before using EXPRESSBUILDER for initial setup, complete the hardware configuration.

---

EXPRESSBUILDER includes three distinct programs:

■ DOS-based with local console

Used to set up the server at the first time. This program is also used to diagnose the server and to install/uninstall the management utilities on the maintenance partition of the system drive.

■ DOS-based with remote console

Used to set up the server from the management workstation by accessing the server over the network or via serial port B.

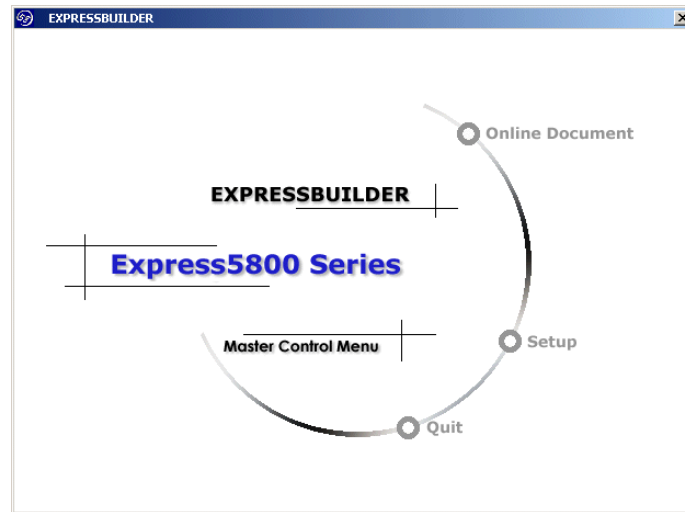
---

 **Note:**

- This menu is displayed only when an optional remote management card is installed in your system.
  - You cannot run this program if a keyboard is connected to the server.
-

■ Windows-based

This program is called "Master Control Menu" and runs under the Microsoft Windows system (Windows 95 or later and Windows NT 4.0 or later). You can install the several applications and read the documentation from this menu.



### ***EXPRESSBUILDER for DOS-Based with Local Console***

This subsection describes the procedures necessary to use EXPRESSBUILDER for DOS-based with local console.

#### ***Starting EXPRESSBUILDER***

The following procedure instructs you to start EXPRESSBUILDER.

---

 **Caution**

Do not remove the EXPRESSBUILDER CD-ROM while EXPRESSBUILDER is running.

---

1. Turn on first the peripheral devices and then the server.
2. Insert the EXPRESSBUILDER CD-ROM supplied with your server into the CD-ROM drive of your server.
3. Ensure that the floppy disk drive is empty.
4. Press the RESET switch or press **Ctrl, Alt, and Delete** to reboot from the EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

EXPRESSBUILDER boots up displaying the top menu..

## Express Setup

"Express Setup" is intended for the initial setup of the server. Its automatic installation mode guides the user easily through the process by detailing specific hardware features and providing screen prompts for software selection and configuration. The program loads the utilities and drivers, applies RAID settings, partitions the disk, and installs the desired operating system.

If you install Windows Server 2003 or Windows 2000, after a few tasks are completed, all that remains to be done is to remove the EXPRESSBUILDER CD-ROM, insert the Windows CD-ROM, input a product ID number, and acknowledge the license agreement.



### Caution

- The Express Setup is intended for the initial setup of the server system and, therefore, the Express Setup clears the contents of the hard disk.
- If applicable, once the Express setup has started, do not remove the "Configuration Diskette" from the floppy disk drive until you are asked to do so.

## Tools

"Tools" is also intended for initial setup of the server. It allows additional installation options and allows the user to quickly create utility support disks, run the Off-line Maintenance Utility and system diagnostic utility, set up a maintenance partition, and update the various BIOS programs.

**Table F - 1: Tools Menu**

Tools Menu	
Save/Restore RAID Configuration Data	RAID Board: Present
Off-line Maintenance Utility	Total Drives: 1
System Diagnostics	Drives in Group: 1
Create Support Disk	Hot Spares: 1
Setup Maintenance Partition	RAID Level: 7
BIOS/FW/etc. Update	Write Mode: WRITE_THRU
Initialize Remote Management Card	Maint Part: Present
System Management	
Help	
Return to the Top Menu	

■ Save/Restore RAID Configuration Data

The item allows the configuration information on the disk array system to be saved or restored from the floppy disk.

If the HostRAID and LSI-Logic disk array controllers are used together, the configuration information of HostRAID is saved or restored. If the Adaptec Zero channel raid controller (ZCR) and LSI-Logic disk array controller are used together, the configuration information of ZCR is saved or restored.

---

 **Warning**

In these cases, If you want to save or restore the configuration information of LSI-Logic disk array controller, refer to the "Power Console Plus User's Guide".

---

- Save Disk Array Configuration Data

The configuration information on the disk mirroring controller is saved into the floppy disk. If you set or change RAID, always use this function to save the configuration information into a floppy disk.

---

 **Warning**

Some Disk Array Controllers do not support this function. In that case, this menu will not be shown.

---

- Restore Disk Array Configuration Data

The configuration information saved in a floppy disk is restored to NVRAM and hard disk on the disk mirroring controller.

If the configuration information is broken or changed by mistake, restore the configuration information.

When the defective disk array controller is replaced, the configuration information on the hard disk must be saved into the disk array controller.

However, if the configuration information on the new disk mirroring controller is saved into a hard disk, use this function to restore the configuration information.

---

 **Warning**

■ Some Disk Array Controllers do not support this function. In that case, this menu will not be shown.

- Please do not use this function, except for maintenance.
- 

- **Off-line Maintenance Utility**

The Off-line Maintenance Utility is an OS-independent maintenance program that performs preventive maintenance and error analysis for your server. See the online help for details.

- **System Diagnostics**

Executes various tests on the server system to check if the server functions are normal and if the connection between the server and additional board is normal.

After the System Diagnostics is executed, a system check program assigned to each model starts.

- **Create Support Disk**

The EXPRESSBUILDER CD-ROM contains a number of device drivers and utilities that you can put on floppy disks and load onto your system.

Use this menu to create a support disk by copying from the EXPRESSBUILDER CD-ROM. If your system is running a Windows operating system, you may find it more convenient to use EXPRESSBUILDER for Windows-based to make support disks

Write the displayed title on the floppy disk label, which is useful for management in the future. Customers are to provide a floppy disk to create a support disk.

- **Windows Server 2003 OEM-DISK for EXPRESSBUILDER**

Creates a support disk used for the installation of Windows Server 2003 Standard Edition and Windows Server 2003 Enterprise Edition. (No need to create this disk when installing the operating system with the Express Setup.)

- **Windows 2000 OEM-DISK for EXPRESSBUILDER**

Creates a support disk used for the installation of Windows 2000 Server and Windows 2000 Advanced Server. (This disk is used for Windows 2000 clean installation and for Recovery for Windows 2000 system.) (Not required when installing the operating system with the Express Setup.)

- **ROM-DOS Startup FD**

Creates a support disk used to start the ROM-DOS system.

- **Off-line Maintenance Utility Bootable FD**

Creates a support disk used to activate the Off-line Maintenance Utility.

- **System Management FD**

Creates a support disk used to activate the System Management.

## ■ Setup Maintenance Partition

The Maintenance partition is a specific partition for the server that is created on your system disk. About 55MB of the maintenance partition includes the various maintenance utilities and executable commands.

---

### **Warning**

- Do not reset or turn off the server while running this menu. If this process is interrupted, the system will not start anymore.
  - The existence of the maintenance partition may be identified from the operating system. In order to retain the Configuration Data, do not delete the partition.
- 

---

### **Notes:**

- *The maintenance partition, once created, cannot be recreated again.*
  - *When the maintenance partition does not exist, some menu items do not appear.*
- 

#### - Create Maintenance Partition

EXPRESSBUILDER creates a maintenance partition of about 55MB on the system disk (or disk array system) as work area. The various utilities are installed when the maintenance partition is created successfully or when the maintenance partition is already created.

#### - Install Maintenance Partition Utilities

Various utilities are installed in the maintenance partition from the CD-ROM.

#### - Update Maintenance Partition Utilities

Various utilities are copied in the Maintenance Partition from the update disk. This menu is only used when the update disk is supplied from your service representative or attached with your system.

#### - FDISK

Executes the FDISK command of the ROM-DOS system. You can create/delete partitions, etc.

■ BIOS/FW/etc. Update

This menu allows you to update the software module such as BIOS and firmware of the server by using the update disk (3.5-inch floppy disk) that is distributed from NEC customer service representative.

After rebooting the system, an update program starts automatically from the floppy disk, and the various BIOS and firmware programs are updated.

---

 **Warning**

Do not turn off the server while the update program is running. If this process is interrupted, the system will not start anymore.

---

■ Initialize Remote Management Card

"Initialize Remote Management Card" is used to configure the Remote Management Card with correct parameters of the system installed it.

■ System Management

The parameters of the BMC (Baseboard Management Controller) are set for remote control and alert.

■ Help

Displays explanations about various functions of EXPRESSBUILDER.

■ Return to the Top Menu

Choosing this menu returns to the Top Menu.

## ***EXPRESSBUILDER for DOS-based with Remote Console***

This subsection describes the procedures necessary to use EXPRESSBUILDER for DOS-based with remote console.

EXPRESSBUILDER contains the remote console feature that allows the system administrator to set up the server from the management workstation (management PC) via the network or the server's COM B (serial) port.

---

 **Warning**

- Do not use this feature on any other computer than the server, or on any other server obtained without EXPRESSBUILDER. Doing so may cause a failure of the server.
- When a keyboard is connected to the server, the remote console feature is disabled. (Nothing is displayed on the management PC.)

- If you fail to configure the disk array controller from the remote console, try again using the server console.
  - The system may fail to operate with the transfer rate of 115.2 Kbps for serial console redirection. Specify any other transfer rate than 115.2 Kbps.
- 

## Starting

The following two methods are available to start the server.

- Running EXPRESSBUILDER from the management PC via LAN
- Running EXPRESSBUILDER from the management PC via direct connection (COM B)

For the procedure for starting EXPRESSBUILDER for DOS-based with Remote Console, see "Dianascope".

---

## Warning

- Do not change the boot device order in BOOT menu in BIOS SETUP. EXPRESSBUILDER cannot be used if the CD-ROM drive is not the first boot device.
  - To use this feature, you need 3.5-inch floppy disk. Please prepare the floppy disk.
- 

---

 **Notes:** *The following items of BIOS setup information will be set as shown below.*

- LAN Controller:[Enabled]
  - Serial Port A:[Enabled]  
Base I/O Address:[3F8]  
Interrupt:[IRQ 4]
  - Serial Port B:[Enabled]  
Base I/O Address:[2F8]  
Interrupt:[IRQ 3]
  - BIOS Redirection Port:[Serial B]
  - Baud Rate:[19.2K]
  - Flow Control:[CTS/RTS]
  - Console Type:[PC ANSI]
-

## Top Menu

Top menu items are listed below:

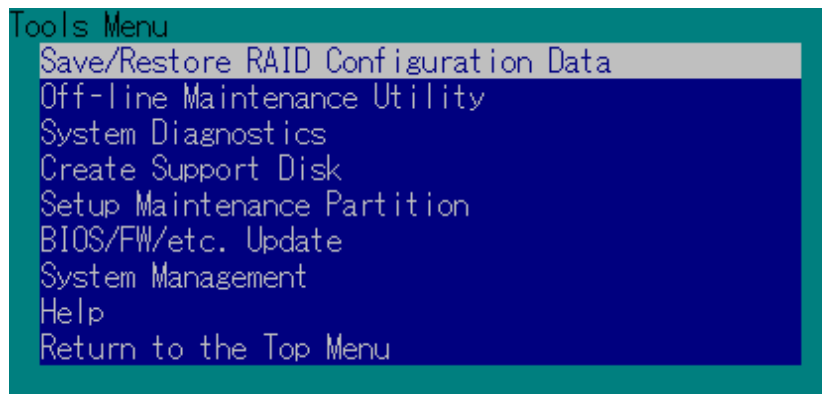
- Setup: automatically sets up the server.
- Tools: launch the features of EXPRESSBUILDER individually.
- Help: help message on EXPRESSBUILDER.
- Quit: quit EXPRESSBUILDER.

## Setup

EXPRESSBUILDER checks the hardware configuration of the server. The disk array and maintenance partition are automatically configured.

## Tools

When you select the [Tools] on the Top Menu, the following screen appears.



The menu items available only in remote console operation among those described in section "EXPRESSBUILDER for DOS-based with Local Console" are displayed. See the previous subsection for detailed explanation of menu items.

---

### **Warning**

The following differs from the [Tools] menu in the local console mode.

- Test items and operation method of System Diagnostics.
- 

## ***EXPRESSBUILDER for Windows-Based (Master Control Menu)***

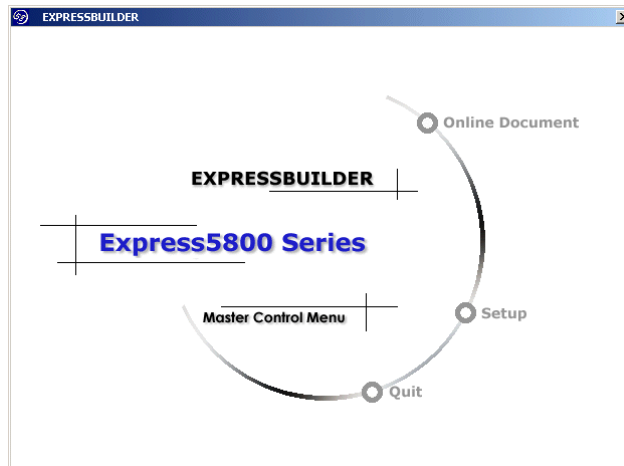
The Master Control Menu is used to,

- Read the User's Guide or the other documents,
- Update the Express5800 system, and
- Install the management software.

---

 **Notes:**

- *Master Control Menu requires Microsoft Windows 95 (or later) or Windows NT 4.0 (or later).*
  - *Some documents are provided in the PDF format. Use the Adobe Acrobat Reader to read these documents.*
- 



Insert the EXPRESSBUILDER CD-ROM into the CD-ROM drive, the Master Control Menu appears on the screen automatically. If the Autorun function is invalid in your system, run the \MC\1ST.EXE file in the CD-ROM directly. Some items are grayed-out when the logon user does not have administrator authority, or if the item is not proper for the system.

To use Master Control Menu,

- Click on [Online Document], [Setup] or [Quit], or
- Click the right mouse button on Master Control Menu window.


## Configuration Diskette Creator

"Configuration Diskette Creator" is a tool used to create the [Configuration Diskette] that is used for configuring the server with the Express Setup.

If you use the Configuration Diskette created by the Express Setup and Configuration Diskette Creator to operate the setup, you can automatically setup the OS and several utilities, except for a few key inputs required to confirm the specification.

If needed, you can also re-install the system with the same specification. We recommend you to create a [Configuration Diskette] to setup the servers.

---


 **Note:** You can install Windows Server 2003 and Windows 2000 without a [Configuration Diskette]. Also, you can modify/newly create the [Configuration Diskette] during the setup with EXPRESSBUILDER.

---

### Creating Configuration Diskette

This section describes how to specify setup information required for OS installation and the creation of the [Configuration Diskette]. Follow the procedure below.

---

 **Note:** In the procedure below, the folder name that is specified when installing Trekking command is assumed as [Configuration Diskette Creator].

---

1. Start the OS.
2. Insert the EXPRESSBUILDER CD-ROM into the CD-ROM drive.
3. Click [Setup] on the Master Control Menu.
4. Click [Configuration Diskette Creator].
5. Click [Create New Information files] from the [File] menu.
6. Specify each item and click [OK].
7. Follow the on-screen instructions to specify each item on the dialog box and click [Next].

---

 **Note:** If you click on [Cancel], all the values already entered will be deleted.

---

Once you have finished completing the specification of setup information, the [Save Setup Information] dialog box will appear.

8. Make sure that the [Configuration Diskette] check box is checked, and type a file name for the Setup File in [File Name].
9. Insert a 1.44MB floppy disk into the floppy disk drive and click [OK].

The [Configuration Diskette] is created; we recommend you label it and store it in a safe place. Use it to install Windows Server 2003 or Windows 2000.

If you want to modify an existing information file, click [Modify Information Files] on the Configuration Diskette Creator Window. Refer to the Help file for more information.

## ***Installing Optional Mass Storage Driver***

To install an optional Mass Storage Driver supported by the Express Setup, follow the procedure below to create a [Configuration Diskette].

1. Display the Configuration Diskette Creator window.
2. From the [File] menu, click [Create new information files].
3. Specify each item and click on [OK].
4. Follow the message to specify each item on the dialog box and click on [Next].



***Note: If you click on [Cancel], all the values already entered will be deleted.***

---

5. When [User and application setup] is displayed, check [Apply OEM-FD for mass storage device].
6. When the [Save Setup Information] dialog box is displayed, confirm that the [Configuration Diskette] check box is checked, and input file name for the Setup File in [File Name].
7. Insert a 1.44MB floppy disk into the floppy disk drive and click [OK].

## ESMPRO

ESMPRO lets a system administrator manage remote servers across a network. ESMPRO monitors server hardware and software configurations, failures, and performance.

Using the log data collected by ESMPRO, a system administrator can track long-term and short-term performance, monitor server usage, create graphs to record trends, and check server failure rates. The administrator can use the information collected to create more efficient data routing procedures and optimize the server usage.



### Caution

For installation procedure and detailed explanations on ESMPRO, refer to the online documentation provided on the EXPRESSBUILDER CD-ROM.

---

## Functions and Features

ESMPRO offers many functions and features for managing remote servers across a network. These features help the system administrator perform daily system operation, system extension, and transfer tasks. Some features of ESMPRO Manager include:

- Hardware and software server configuration
  - Hardware resources mounted in servers, such as the CPU, memory, disks, disk arrays, and LAN boards.
  - Software resources, such as operating system information and the drivers running on each server.
- Server failures
  - On-screen real-time displays provide the system administrator with the failure type, location, cause, and suggested corrective action.
  - Failure data includes hardware failure information such as system board temperature, memory failure, crashes, and software failure information.
- Performance
  - ESMPRO monitors server performance and displays server usage on the screen and displays information, such as the rate of CPU load, memory usage, disk usage, and LAN traffic. Usage threshold values can help the system administrator monitor and prevent server overloads.

## ***Adaptec Storage Manager™ - Browser Edition***

Adaptec Storage Manager™ - Browser Edition (hereinafter abbreviated to ASMBE) is a management utility for the HostRAID system and provides RAID functions through the SCSI interface in your server. You can use the following functions for HostRAID by installing ASMBE in your system.

### ***Features***

- Maintaining ZCR and HostRAID storage system
- Making a consistency check on redundant disk arrays
- Recording ZCR and HostRAID events into the event log
- Omitting the installation of client software into each management PC if ASMBE is installed.

Before attempting to operate ASMBE, read the "Adaptec Storage Manager™ - Browser Edition User's Guide" included on the EXPRESSBUILDER CD-ROM. The manual explains the ASMBE installation procedure and notes on operating ASMBE.

## **Power Console Plus**

Power Console Plus is a utility used to control the RAID system of the disk array controllers (SecuRAID) produced by LSI Logic.

Using Power Console Plus enables operations (e.g., monitoring and maintenance) of RAID systems that are constructed on local Express servers and Express servers connected through networks (TCP/IP). The operations can be done online on graphical screens without the system being stopped.

### **Major Functions**

Power Console Plus provides the following features:

- Support for the Wizard function in order to facilitate configuration
- Makes it possible to change of RAID levels
- Compatible with SAF-TE
- Performance monitor support
- Supports enclosure functions such as temperature monitoring, power monitoring, and fan monitoring
- Enables the settings of Write, Read, and Cache policies for each logical drive
- Supports the save and restore functions for configuration
- Enables the display of the SCSI transfer rate

### **Components**

Power Console Plus consists of the following five components:

- **SNMP Agent (not supported)**
- **MegaRAID Service Monitor**  
Enables ESMPRO to monitor the SecuRAID controller by registering event logs. Install MegaRAID Service Monitor in the Express server in which the SecuRAID controller is mounted.
- **MegaRAID Client**  
Controls the RAID system on graphical screens. Install MegaRAID Client in the Express server in which the SecuRAID controller mounted or in the management PC that is connected through the Express server and network.
- **MegaRAID Server**  
Enables control of the SecuRAID controller via the network. Install MegaRAID Server in the Express server in which the SecuRAID controller mounted.
- **MegaRAID Registration Server**

Enables control of the SecuRAID controller via the network. Install in one of Express servers and management PCs that are connected through network. The above components must be installed correctly for establishing the environment to use Power Console Plus.

Power Console Plus components to be installed are different between the target servers and management PC.

■ **Server** (Express server in which the SecuRAID controller is mounted):

Install the following three components in this server:

- MegaRAID Service Monitor
- MegaRAID Server
- MegaRAID Client

■ **Management PC** (Management PC that monitors and controls servers via the TCP/IP network)

When managing array on Terminal Server working on Windows NT Server Version 4.0 Terminal Server Edition, prepare PC, and install Management PC component. Management PC does not guarantee operation on Client, which used Terminal Server, Terminal Server Emulator, WBT.

Start Power Console Plus of management PC, after the Power On machine that installed "Server" and "Management Server".

Install the following component in this PC:

- MegaRAID Client

■ **Management server** (Machine that manages all servers that are monitored and controlled by management PCs):

Install the following component in one of the servers or management PCs:

- MegaRAID Registration Server

## **Server Setup**

This section explains the Power Console Plus setup in the Express server in which the SecuRAID controller is mounted.

### **Operating Environment**

■ **Hardware**

- Machine: Express5800 series connected with the AMI disk array controller (A)
- Memory: Size large enough for OS operation + 8MB or more
- Free space of the hard disk: 5MB or more
- Display unit: Screen size 1024 × 768 or larger

- Required peripheral equipment: Network Interface card, CD-ROM unit, Pointing device such as a mouse

■ **Software**

- Microsoft Windows NT version 4.0 (Windows NT Version 4.0 Service Pack 5 or later + Internet Explorer 4.01 Service Pack 2 or later)
- Microsoft Windows 2000

## ***Management PC Setup***

This section explains Power Console Plus setup in a computer that manages servers via the network (TCP/IP).

### ***Operating Environment***

■ **Hardware**

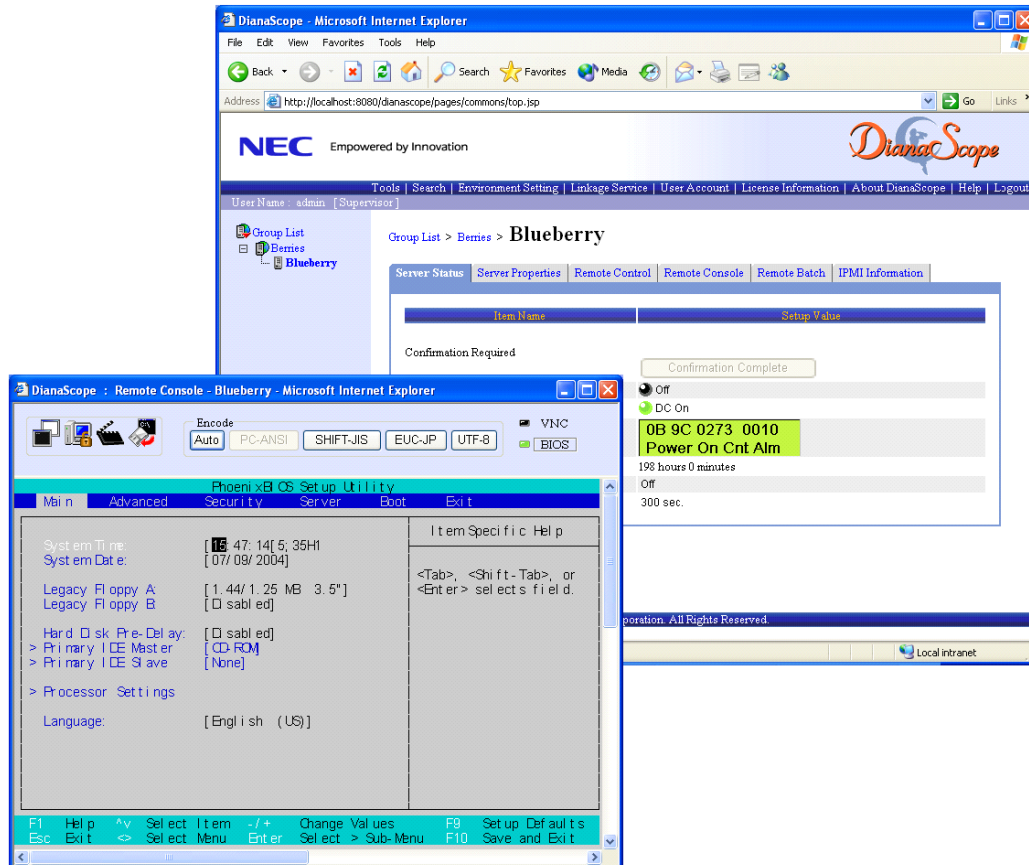
- Machine: Express5800 series, PC/AT-compatible machine (which contains Intel Pentium or a CPU at least equivalent to it)
- Memory: Size large enough for OS operation + 8MB or more
- Free space of the hard disk: 5 MB or more
- Display unit: Screen size 1024 × 768 or larger
- Required peripheral equipment: Network Interface card, CD-ROM unit, Pointing device such as a mouse

■ **Software**

- Microsoft Windows NT Version 4.0 (Windows NT Version 4.0 Service Pack 5 or later + Internet Explorer 4.01 Service Pack 2 or later)
- Microsoft Windows 2000
- Microsoft Windows 95/98/Me

# DianaScope

DianaScope is a software used for the remote management of the Express5800 series. See the online documents for details on the functions and installation of DianaScope.



**Note:** You need the server license to activate DianaScope for this product.

The online documents explain general information about servers to be managed by DianaScope. This section explains specific notes on managing this product remotely from DianaScope.

- This product can be managed remotely from DianaScope only when it is equipped with a remote management card or advanced remote management card.
- This product does not support the remote FD function.


This page is intentionally left blank.

# Appendix G: Installing the Operating System with Express Setup

This section describes information on using Express Setup to install and configure the following operating systems to the server:

- Microsoft® Windows® Server 2003 Standard Edition / Microsoft® Windows® Server 2003 Enterprise Edition
- Microsoft® Windows® 2000 Server / Microsoft® Windows® 2000 Advanced Server

---

 *Note: Windows 2000 is not anymore available for sale, however, if you own Windows 2000 setup disks, you can install it on your Express 5800 server.*

---

To use the server with the other operating systems described in this section, contact your service representative.



## Caution

Before installing the operating system, adjust the system date and time by using the BIOS setup utility "SETUP".

---

### About Express Setup

"Express Setup" contained in your EXPRESSBUILDER CD-ROM is intended for initial setup of the server. Its automatic installation mode guides the user easily through the process by detailing specific hardware features and providing screen

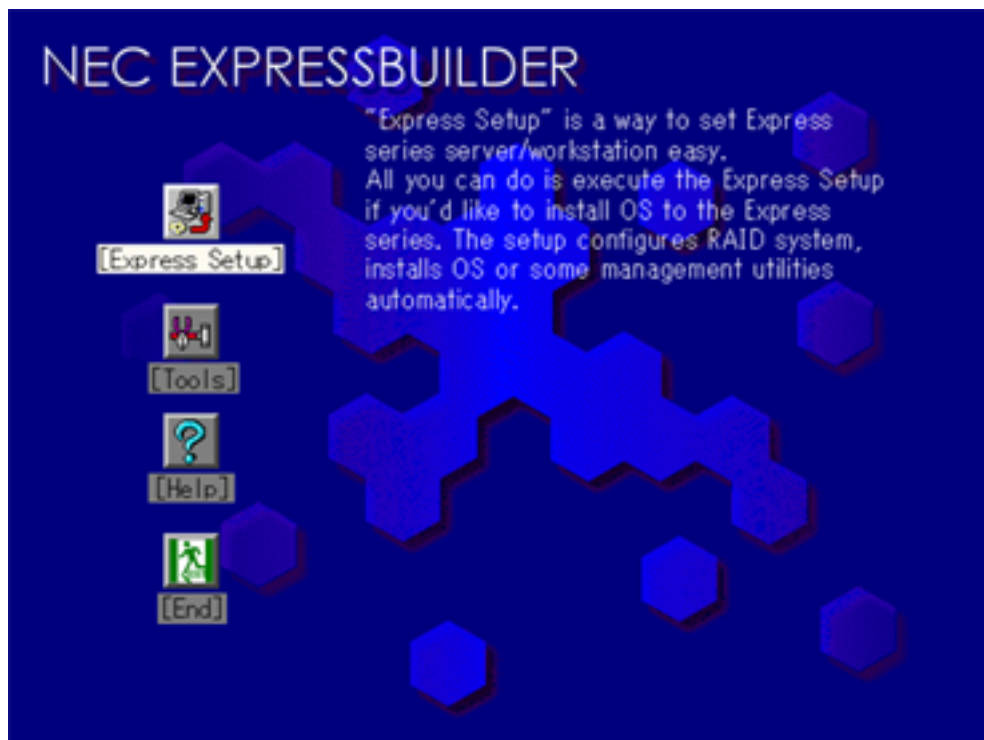
prompts for software selection and configuration. The program loads the utilities and drivers, applies RAID settings, partitions the disk, and installs the desired operating system.



## Caution

Express Setup is intended for the initial setup of the server system. Therefore, it clears the contents of the hard disk.

---



For Microsoft Windows Server 2003 and Windows 2000, Express Setup configures your server and installs the operating system. After a few tasks are completed, all that remains to be done is to remove the EXPRESSBUILDER CD-ROM and set the Windows CD-ROM, input a product ID number, and acknowledge the license agreement.

For the other operating systems, Express Setup initializes the target disk(s), creates the maintenance partition, and installs the various maintenance utilities from the EXPRESSBUILDER CD-ROM to lead your server to ready-to-install for the desired operating system.

Express Setup uses the "Configuration Diskette". The Configuration Diskette is a floppy disk that includes the configuration information for the server setup used in the automatic installation mode. Express Setup will perform all the process of the setup using the information in the floppy disk. During this procedure, you do not have to be in front of the Express server to verify the state of the setup. Also, using the same Configuration Diskette used before allows you to re-setup your server with the same condition as before.

Express Setup includes two types of installation method:

■ Quick start

Quick start uses the Configuration Diskette on which the configuration parameters for server setup were pre-loaded before starting the Express Setup. The configuration parameters are loaded by using the Configuration Diskette Creator.

■ Normal start

Normal start is used to create the Configuration Diskette after starting the Express Setup.

---

 **Note:**

■ You can create the Configuration Diskette in advance using the "Configuration Diskette Creator" included in EXPRESS-BUILDER.


■ If you create the Configuration Diskette in advance, you can abbreviate the items that is necessary to input or select during Express Setup. (You can also create or modify the setup information restored in Configuration Diskette during Express Setup.) If you have a computer other than your servers that is running with Windows 95/98/Me/XP, Windows NT 3.51 or later, or Windows 2000, Windows Server 2003, we recommend you to edit setup information from the computer in advance using Configuration Diskette Creator.

---

## Microsoft Windows Server 2003

This subsection provides information on installing Microsoft® Windows® Server 2003 Standard Edition / Enterprise Edition in the server. Read instruction in this section before proceeding with the installation.

---

 *Note: If you install Windows Server 2003 without using Express Setup, see Appendix D.*

---

### Installation Notice

Read these precautions before installing Windows Server 2003.

#### *Supported Operating System on this Model*

The server supports the following edition: Microsoft Windows Server 2003 Standard Edition and Microsoft Windows Server 2003 Enterprise Edition (hereinafter, referred to as "Windows Server 2003")

If you wish to install another operating system, contact your sales dealer or the maintenance service representative.

#### *BIOS Settings*

Before installing Windows Server 2003, check that the BIOS specification of the hardware is correct.

#### *ESMPRO Agent*

On Windows Server 2003 systems, the ESMPRO Agent needs the necras.sys driver. To install the necras.sys, run the System update from EXPRESSBUILDER CD-ROM.

#### *Windows Server 2003*

Express Setup can install the Windows Server 2003 operating system. However, note the following restrictions:



### Caution

- Before starting the installation, complete all the process of adding the optional device and the setup of Express server mainframe (BIOS and optional board specification)
- Another documentation for the installation of Windows Server 2003 is attached to the other software package sold separately. Refer to this document when installing Windows Server 2003 on this model.

- After completing Express Setup, see "Setup for Solving Problems" described later to specify the settings for trouble recovery such as "Specifying Memory Dump".
- 

### Installing on the Mirrored Volume

If you want to install Windows Server 2003 on the volume that is mirrored using "Disk Management", disable the mirroring before operating the installation to set back to the basic disk, and enable the mirroring again after the installation has completed.

Creating, invalid, delete mirror volume can be operated from "Disk Management" in "Computer Management".

### Connecting a Magneto-Optical Device

Connect the magneto-optical device after the operating system has been successfully installed.

### Connecting Medias such as DATs

Connect any drives that are not mandatory after the operating system has been successfully installed.

### Connecting Hard Disk Drive

Connect the data disk after the operating system has been successfully installed..

If you create multiple logical drives in your system, refer to [Reinstallation to Multiple Logical drives \(Appendix D\)](#).

### Creating Partition Size

The minimum size for the partition where the system is to be installed can be calculated from the following formula.

Size necessary to install the system + Paging File Size + Dump File Size

Size necessary to install the system= 2900 MB

Paging File Size (Recommended)= Mounted Memory Size × 1.5

Dump file Size= Mounted Memory Size + 12 MB



### Caution

- The above paging file size is necessary for collecting debug information (memory dump). If you set the default value of paging file size smaller than the 'recommended' value, the accurate debug information (memory dump) may not be collected.
- The maximum paging file size which can be set on one partition is 4095 MB. If the above paging file size exceeds 4095 MB, specify 4095 MB for the paging file size.

- The maximum dump file size for the system with more than 2 GB memory mounted is '2048 MB + 12 MB'.
  - If you install any application program or the like, add necessary space to the partition to install these programs.
- 

For example, if the mounted memory size is 512 MB, the minimally required partition size will be calculated by the above formula as follows:

$$2900 \text{ MB} + (512 \text{ MB} * 1.5) + (512 \text{ MB} + 12 \text{ MB}) = 4192 \text{ MB}$$

#### **Re-installing to the hard disk which has been upgraded to Dynamic Disk**

You cannot re-install Windows Server 2003 with the current partition of the hard disk upgraded to Dynamic Disk.

If you want to keep the current partition, see [“Appendix D: Installing Windows Server 2003” on page 1](#) in order to re-install the system.

#### **About the Maintenance Partition (area displayed as “MAINT E P”)**

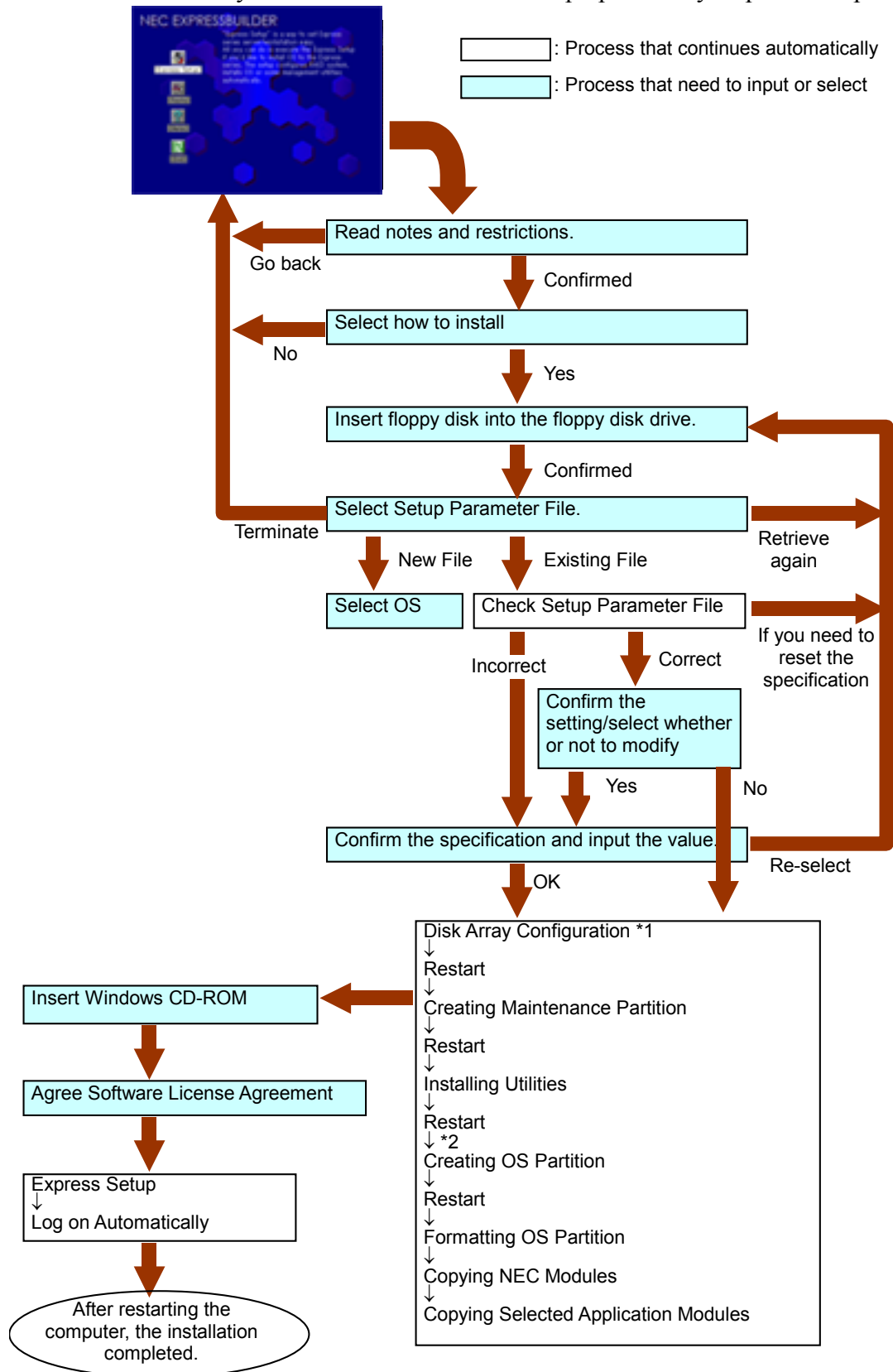
The maintenance partition (used for server maintenance) is reserved in the head of Hard Disk Drive (size of approximately 50MB).

This area is used for saving some maintenance utilities.

Do not delete the maintenance partition.

## Setup Flow

This section visually describes the flow of the setup operated by Express Setup.



\*1

The process is operated only when Disk Array Controller Board is connected and the configuration is specified.


\*2

If you select [Others], the process is completed here.

## Installing Microsoft Windows Server 2003

Express Setup proceeds the setup by specifying the necessary information on the wizard. You can also save the setup information created on the wizard in a floppy disk as a setup file.

---

 **Note:** Prepare a floppy disk to use as Configuration Disk if you want to save the parameters or use the drivers located on the "OEM-Disk for Mass Storage Device" that ships with optional boards. When using the floppy disk, the Express setup can continue the setup without any need for you to specify the parameters.

---

1. Turn the power of peripheral devices on, and then turn on the server.

---

 **Note:**


- If you operate installing Windows Server 2003 with a Magneto-Optical device connected, the installation may not be complete successfully. In such a case, detach the MO device and then re-install the system from the beginning.
  - Connect the hard disk drive on which the operating system is not going to be installed (data hard disk drive) after installing the operating system.
  - If you create multiple logical drives in your system, refer to ["Re-installing the Operation System" on page D - 9](#).
- 

2. Insert EXPRESSBUILDER CD-ROM into the optical device drive.
3. Ensure that the floppy disk drive is empty.
4. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot from EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

The system boots from the CD-ROM and EXPRESSBUILDER starts.

5. Click [Express Setup].  
When asked if you intend to use a Configuration Diskette or Parameters File, choose either Yes or No.
6. Read the on-screen message carefully and click [OK].


---

 **Note:** If an operating system is already installed on the hard disk, you will be prompted to confirm that you want to proceed with the installation.

---

7. The message "Insert Configuration Diskette" appears. If applicable, insert "Configuration Diskette" into floppy disk drive and click [OK].

---

 *Note: If you do not have "Configuration Diskette", insert a blank floppy disk formatted by 1.44 MB into the floppy disk drive and click [OK].*


---

### **[Using the specified Configuration Diskette]**

The Setup File included in "Configuration Diskette" is displayed.

- a. Select the Setup File name to use during the installation.

---

 *Note: If there is any problem that can not be modified in the Setup File you selected, the message to set another "Configuration Diskette" appears. In such case, verify the floppy disk you inserted.*

---

After the Setup File is specified, the message "Are you sure you want to modify the information?" is displayed.

- b. If you want to edit the information file, click [Modify]. If you do not want to edit the information file and continue the installation, click [Skip].
  - Click [Modify]. Go to step 8.
  - Click [Skip]. Go to step 9.

### **[Using Blank disk]**

- a. Click the box under [Setup File Name: (A)] or press A.  
The input box appears.
- b. Input a file name. and click [Use]
- c. [Operating System to Install] appears.  
The OS supported by the computer is displayed in the list.
- d. Select [Windows Server 2003] you want to install from the list box.

8. Verify the contents specified during OS installation.

If Disk Array Controller Board is connected to Express server mainframe, the [Configure RAID] screen appears. Verify the specification, modify if necessary, and then click [Next].

Next, [Basic Information] screen appears. Verify the specification, modify if necessary, and then click [Next]. ("Supported Computer" shown in the screen differs according to the model.)

After that, click [Next], [Back], or [Help] on the screen to continue. Modify the specification each time if necessary.

---

 **Caution**

- Reserve the partition to install the OS more than the minimally required size.
- If you select "Use Existing Array" at "New/Existing RAID Configuration", the information included in the first partition (excluding maintenance partition) will all be formatted and deleted. The information included in the other partition will be retained. The figure below describes the partition which information will be deleted when maintenance partition exists.

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Fourth Partition Retained
--	--------------------------------	--------------------------------	---------------------------------

- You can not re-install the system with the existing partition that is upgraded to Dynamic Disk remained. Do not select "Use Existing Array" at "New/Existing RAID Configuration".
  - If you specify other than 4095 MB for the "Installing Partition", it is necessary to convert to NTFS.
  - If "Use Existing Array" at "New/Existing RAID Configuration" is selected but the partition other than the one to install Windows Server 2003 does not exist (excluding maintenance partition), Express Setup will reserve the maximum area of the hard disk to install Windows Server 2003.
  - You cannot go to the next screen if the specification is incorrect.
- 

---

 **Note:**

- If you click [Cancel] in [Basic Information] screen, the screen will go back to select the Setup File. [Cancel] exists only in [Basic Information] screen.
  - If you click [OK] in [Role of Computer] screen, the setup automatically selects default value for the later specification to continue the installation.
- 

Once all the specifications are reviewed, the system reboots.

**9.** Copy the modules for the optional mass storage driver.

If you want to install the optional mass storage driver, insert the floppy disk corresponding to the mass storage driver into floppy disk drive and follow the message to operate the installation.

**10.** Follow the message and take the EXPRESSBUILDER CD-ROM and Configuration Diskette out of the optical device drive, and insert Windows

Server 2003 CD-ROM into the optical device drive.  
[Software License Agreement] screen appears.

11. Read the contents carefully and click [I agree.] or press **F8** if you do agree. If you do not agree, click [I disagree] or press **F3**.

---

 **Caution**

- If you do not agree to this agreement, the setup terminates and Windows Server 2003 will not be installed.
  - If "NetWare Gateway (and Client) Service" is specified to install, the window to specify the details of "NetWare Gateway (and Client) Service" pops up on the first logon. Specify the appropriate value.
- 

The Setup using Express Setup has completed.

## ***Installing and Setting Device Drivers***

Follow these steps to install and configure the device drivers.

### ***PROSet***

PROSet is a utility that verifies the function of network contained in network driver.

Using PROSet enables the following items:

- Verify detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhance throughput between the switches.

PROSet is necessary to utilize these features.

### **To install PROSet:**

1. Insert the EXPRESSBUILDER CD-ROM into the optical device drive.
2. The [Windows Explorer] dialog starts.
  - \* Procedure with the standard start menu  
Click Start menu and click [Windows Explorer].
  - \* Procedure with the classic start menu  
Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "PROSet.exe" in the following directory.  
CD-ROM DriveLetter:\WINNT\DOTNET\BC5\PROSet\WS03XP32  
The [Intel(R) PROSet - InstallShield Wizard] dialog starts.

4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

### *Network Driver*

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and duplex mode need to be specified manually.

#### **[When PROSet is not installed]**

1. The [Local Area Connection Properties] dialog box is displayed.
  - \* Procedure with the standard start menu
    - a. Click Start menu, Click [Control Panel], Click [Network Connections], and Click [Local Area Connection].
  - \* Procedure with the classic start menu
    - a. Click Start menu, Click [Settings] and Click [Network Connections].  
The [Network Connections] dialog box is displayed.
    - b. Right-click [Local Area Connection] and click [Properties] from pop-up menu.
2. Click [Configure].  
The property dialog box for network adapter is displayed.
3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.
4. Click [OK] on the property dialog box for network adapter.


#### **[When PROSet is installed]**

1. The [Intel PROSet] dialog box appears.
  - \* Procedure with the standard start menu  
Click Start menu, point to [Control Panel] and click [Intel PROSet].
  - \* Procedure with the classic start menu
    - a. Click Start menu, point to [Settings] and click [Control Panel].
    - b. Double-click [Intel(R) PROSet] on the [Control Panel] window.
2. Click [(Network Adapter Name)] in the list.
3. Click the [Speed] and specify the [Link Speed & Duplex Settings] value the same as the value specified for HUB.
4. Click [Apply] and click [OK].

Also, add or delete any protocols and services if necessary.

You can process in the property dialog box for local area network which can be displayed from [Network and Dial-up Connection].

---

 *Note: We recommend you to add [Network Monitor] at [AddingServices]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" described later in this chapter.*

---

### *Optional Network Board Driver*

If you want to use an optional Network Board (Gigabit adapter), the network driver will be installed automatically. Therefore, the driver attached to the Network board should not be used.

If you want to use an optional Network Board, install the driver stored in EXPRESSBUILDER CD-ROM.

In case of using a 100 MB adapter


"CD-ROM Drive Letter:\WINNT\DOTNET\BC5\PRO100\WS03XP32"

If the installation procedure is not clear, refer to the installation procedure described in the section "Installation of the Optional Network Board Driver".

### **Installing the Optional Network Board Driver**

1. Start Device Manager.
2. Click [Network adapters] and Double-Click [(Network Adapter Name)]. [(Network Adapter Name) Properties] is displayed.

---

 *Note: [(Intel(R) PRO/1000...)] is the name of On-Board adapter. All other names show the Optional Network Board.*

---

3. Click the [Driver] tab and click [Update Driver...]. [Hardware Update Wizard] is displayed.
4. Select the [Install from a list or specific location(Advanced)] radio button and click [Next].
5. Select the [Search for the best driver in these locations] radio button and check off the [Search removable media (floppy, CD-ROM...)] check box.

6. Check the [Include this location in the search] check box and when using a 100 MB adapter, specify  
**[CD-ROM driveletter:\WINNT\DOTNET\BC5\PRO1000\WS03XP32]**
7. Click [Next].
8. Click [Finish].

### ***Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)***

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhance the through put by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

---

### **Caution**

- AFT/ALB setup must be operated after installing the drivers and restarting the system.
  - All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.
- 

### **If you want to use AFT/ALB feature:**

1. Double-click [Intel(R) PROSet Wired] on the [Control Panel] dialog box.  
The [Intel(R) PROSet for Wired Connections] dialog box appears.
2. Put the mouse cursor on "Intel(R) PRO/1000 MT Dual Port Network Connection" in the list and right-click.  
Pull-down menu appears.
3. Select [Add to Team>] and then click [Create New Team...].  
The [Teaming Wizard] dialog box appears.
4. Select "Adapter Fault Tolerance" or "Adaptive Load Balancing" and click [Next].
5. Check the adapter to join the team and click [Next].
6. Click [Finish].
7. The setup will go back to [Intel(R) PROSet for Wired Connections] dialog box, so click [OK].
8. Restart the system.

### *Installing SCSI Controller Driver*

To install SCSI controller driver low profile (ini-A101U2W):

1. Click on [Start] menu and [Control Panel] and [Administrative Tools] and [Computer Management].
2. Start [Device Manager].
3. Double click the SCSI Controller driver which Device Manager lists as unknown device.
4. Click [Update Driver].
5. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
6. Select "Don't search. I will choose the driver to install" and click [Next].
7. Click [Have Disk..].
8. Insert "Windows Server 2003 OEM-DISK for EXPRESSBUILDER" into the floppy disk drive, enter "a:\\" into "copy manufacturer's file from:" and click [OK].
9. Specify the following driver and click [Next]:  
The installation of the driver is completed.
10. Restart the system according to the message on the screen.

### *Installing RAID Controller Driver*

To additionally install the Mega RAID SCSI 320-1/320-2 disk array controller cards in a system containing Windows 2003, connect the controller and take the following steps to install the driver:

1. When the [Found New Hardware Wizard] dialog box appears, click [Next].
2. When the [Install Hardware Device Drivers] dialog box appears, select [Search for a suitable driver for my device (Recommended)], and click [Next].
3. When the [Locate Driver Files] dialog box appears, select [Floppy disk drives], insert "Windows Server 2003 OEM-DISK for EXPRESSBUILDER" into the floppy disk drive, and click [Next].
4. When the [Driver Files Search Results] dialog box appears, click [Next].

Copying of the driver is completed, and the [Completion of the new hardware detection wizard] dialog box below appears. Click [Complete].

### *Graphics Accelerator Driver*

Update Graphics Accelerator Driver mounted in standard.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer]
3. Run "SETUP.EXE" in the following directory. <CD-ROM Drive Letter>:\N8115-02\VIDEO\RADEON7000\W2K3\SETUP.EXE

\*Install the graphics accelerator driver in the following directory if you communicate your server with the remote KVM console. (Optional advanced

remote management card must be installed in your server to use the remote KVM console.)

<CD-ROM Drive Letter>:\N8115-02\VIDEO\RADEON7000\SETUP.EXE

4. Follow the message to continue the installation.

Remove the EXPRESSBUILDER CD-ROM from the CD-ROM drive, follow the on-screen directions and restart the system.

#### *Available switch options for Windows Server 2003 Boot.ini file.*

Many different switches will be available if you edit Boot.ini file. For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 833721

"Available switch options for the Windows XP and the Windows Server 2003 Boot.ini files"

If your system has a memory capacity in excess of 4GB in its installing, adding /PAE switch in Boot.ini file will enable the system to be installed with over 4GB of memory.

However, the Microsoft operating system products which support /PAE switch option are limited.

Refer to the following article in Microsoft Knowledge Base to check the supported products.

- Microsoft Knowledge Base - Article ID: 291988

"A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

Below is the example on how to add /PAE switch to Boot.ini file.

1. Click [Start], point to [Settings], and then click [Control Panel].
2. In [Control Panel], double-click [System].
3. Click the [Advanced] tab, and then click [Settings] under [Setup and Recovery].
4. Under [System Setup], click [Edit] to open [Boot.ini].
5. Add "/PAE" to [Operating Systems] section in [Boot.ini] file, and then save it.

<Example of Boot.ini file>

[boot loader]

timeout=30

default=multi(0)disk(0)rdisk(0)partition(2)\WINDOWS

[operating systems]


multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, Standard" /fastdetect

multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, Standard, PAE" /fastdetect /PAE

C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console" /cmdcons

This is the end of editing Boot.ini file.

---

 **Note:** If you choose one of the items in the "Default operating system" drop-down list box in [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.

---

## Setting for Solving Problems

Setup the following issue in advance so that your computer can recover from any trouble precisely and as soon as possible when it should occur.

### Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in the server.

---

#### **Caution**

- The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
  - If any trouble occur after specifying the process below, the message to inform that the system is in short of virtual memory may appear, but continue to start the system. If you re-start the system in such case, memory dump may not be stored correctly.
- 

Follow the procedure below to specify.:

1. Select [Control Panel] and click [System].  
The [System Properties] dialog box is displayed.
2. Select [Advanced] tab.
3. Click [Settings] on the [Startup and Recovery] group box.

---

#### **Caution**

- To specify "Complete Memory Dump" to write the debug information is recommended.  
If the installed memory size is larger than 2 GB, "Complete Memory Dump" cannot be specified, then specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area more than the size of "the memory capacity installed on Express server + 12 MB".

- In case the installed memory size exceeds 2 GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.
- 

4. Specify "Complete memory dump" and modify [Dump file:] in the [Write debugging information] group box.  
e.g. Write the debug information in D drive in the file named MEMORY.DMP.  
D:\MEMORY.DMP
5. Click [Settings] on the [Performance] group box.  
The [Performance Options] window is displayed.
6. Click [Advanced] tab on the [Performance Options] window.
7. Click [Change] on the [Virtual memory] group box.
8. Modify [Initial Size] in the [Paging file size for selected drive] box to the value larger than [Recommended], and click [Set].

---

 **Caution**

- Be sure to create memory dump with the size described above on the OS partition. If [Default Size] of the paging file is specified to the value smaller than "Recommended" value, the correct debug information (memory dump) may not be collected.
  - For more information on "Recommended" value, see "Partition Size to be Created" described earlier.
  - To prepare for the situation when any trouble occurred, we recommend you to press dump switch to verify that the dump will be collected normally in advance.
  - In case the memory is expanded, re-specify the paging file to suit the new memory size.
- 

9. Click [OK].  
The message to restart the system may appear according to the modified specification. In such case, follow the message to restart the system.

### *Windows Dr. Watson*


Windows Dr. Watson is a debugger for application errors. If any application error is detected, Dr. Watson diagnoses the server and logs diagnostic information (log).

Follow the procedure below and specify Dr. Watson to collect diagnostic information.:

1. Click [Run] on Start menu.

2. Type "drwtsn32.exe" in the [Open] box, and click [OK].  
The [Dr. Watson for Windows] dialog box appears.
3. Specify the location to store the diagnostic information in the [Log File Path] box.  
The diagnostic information will be stored with the file name "DRWTSN32.LOG".


---

 *Note: You cannot specify network pass. Specify the pass on local computer.*

---

4. Specify the location of crash dump file in the [Crash Dump] box.

---

 *Note: "Crash Dump File" is a binary file that can be read with Windows Debugger.*

---

5. Check the following check box on the [Option] box.
  - ☐ Dump Symbol Table
  - ☐ Dump All Thread Contexts
  - ☐ Add To Existing Log File
  - ☐ Create Crash Dump FileFor more information on each function above, refer to Online Help.
6. Click [OK].

### **Network Monitor**

Using Network Monitor helps you to investigate and manage with network trouble. To use Network Monitor, you need to restart the system after the installation has completed, so we recommend to install Network Monitor before any network trouble may occur.

1. Point to [Settings] from Start menu and click [Control Panel].  
The [Control Panel] dialog box is displayed.
2. Double-click [Add/Remove Programs].  
The [Add/Remove Programs] dialog box is displayed.
3. Click [Add/Remove Windows Component].  
The [Windows Components Wizard] dialog box is displayed.

4. Check the [Management and Monitoring Tools] check box of the component ON and click [Next].
5. If the setup asks to install the disk, insert Windows Server 2003 CD-ROM into the optical device drive and click [OK].
6. Click [Complete] in the [Windows Component Wizard] dialog box.
7. Click [Close] in the [Add/Remove Application] dialog box.
8. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor].

For information on how to operate Network Monitor, refer to Online Help.

### ***Installing Maintenance Utilities***

Various maintenance utilities are contained in your EXPRESSBUILDER CD-ROM. See Appendix E.

### ***Updating the System***

Update the system in the situation below:

- Modified system configuration.
- Recovered the system using recovery process.

Log on to the system with the account that has administrative authority (e.g. Administrator) and insert the EXPRESSBUILDER CD-ROM into the optical device drive.

[Setup Software] in [Master Control Menu] screen is displayed, right-click the item. Click [Update the System] from the menu and the setup will start. Follow the on-screen instructions.

### ***Making Backup Copies of System Information***

The system information includes the current BIOS settings and any specific information for the server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

1. Set the NEC EXPRESSBUILDER CD-ROM in the optical device drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a diskette in the floppy disk drive.
6. Select [Save].

## ***Exceptional Setup***

This section explains how to setup the server by the exceptional way. You usually do not have to do as follows. If you want to install other boards by using a driver floppy disk, set the server as follows. Detailed information is provided in the manual of the mass storage device.

### ***Installation of mass storage device not supported by ExpressSetup***


If you would like to install the OS when the system has new mass storage device not supported by EXPRESSBUILDER, you have to setup as follows.

1. Read the manual supplied with the mass storage device before setting the server.
2. If the mass storage device is disk array controller, configure the RAID system before running the EXPRESSBUILDER.
3. Boot the system from EXPRESSBUILDER CD-ROM.
4.
  - (a) When the message “Do you want to use the parameters file...” appears, select “Yes”.
  - (b) When the dialog of Disk array configuration appears, check “Use Existing Array”
  - (c) Check “Apply OEM-FD for Mass storage device”
5. Copy the driver for the mass storage device in the ExpressSetup.
6. Insert the FD attached the mass storage device into the FD drive.
7. Follow the on-screen instructions to continue the ExpressSetup.

## Microsoft Windows 2000

This subsection provides information on installing Microsoft® Windows® 2000 in the server. Read instruction in this section before proceeding the installation.

---

 *Note: If you install Windows 2000 without using Express Setup, see "Appendix G: Installing the Operating System with Express Setup" on page G - 1.*

---

### Installation Notice

This section explains precautions and matters you should be aware of before beginning installation in order to install Windows 2000 correctly.

#### Supported Operating System on this Model

The server supports the following edition: Microsoft Windows 2000 Server (hereinafter, referred to as "Windows 2000")

On installing other operating system, contact sales dealer or the maintenance service representative.

#### BIOS Specification

Before installing Windows 2000, verify that the BIOS specification of the hardware is correct. On BIOS specification, there are some items to specify for the new functions provided from Windows 2000 (Plug and Play, support for USB interface and so on). See Chapter 3 to specify them.

#### ESMPRO Agent

On Windows 2000 systems, the ESMPRO Agent needs the necras.sys driver. To install the necras.sys, run the System update from EXPRESSBUILDER CD-ROM.

### Windows 2000

Express Setup can install Windows 2000 operating system. However, note the following issue:

---

#### **Caution**

- Before starting the installation, complete all the process of adding the optional device and the setup of Express server mainframe (BIOS and optional board specification)
- The document for installing Windows 2000 is also attached to the other software package which is sold separately from NEC, but refer to this document when you install Windows 2000 on this model.

- After completing Express Setup, see "Setting for Solving Problems" described later to specify the settings for trouble recovery such as "Specifying Memory Dump".
- 

## ***Installing on the Mirrored Volume***

If you want to install Windows 2000 on the volume that is mirrored using "Disk Management", invalid the mirroring before operating the installation to set back to the basic disk, and valid the mirroring again after the installation has completed.

Creating, invalid, delete mirror volume can be operated from "Disk Management" in "Computer Management".

## ***Connecting Hard Disk Drive***

Connect data disk after installing the operating system.

If you create multiple logical drives in your system, refer to ["Reinstallation to Multiple Logical drives" on page 9 \(Appendix D\)](#).

## ***Creating Partition Size***

The minimum size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system + Paging File Size + Dump File Size

Size necessary to install the system= 1000 MB

Paging File Size (Recommended)= Mounted Memory Size  $\times$  1.5

Dump file Size= Mounted Memory Size + 12 MB



### **Caution**

- The above paging file size is necessary for collecting debug information (memory dump). If you set the default value of paging file size smaller than the 'recommended' value, the accurate debug information (memory dump) may not be collected.
  - The maximum paging file size which can be set on one partition is 4095 MB. If the above paging file size exceeds 4095 MB, specify 4095 MB for the paging file size.
  - The dump file size for the system with more than 2 GB memory mounted is '2048 MB + 12 MB'.
  - If you install any application program or the like, add necessary space to the partition to install these programs.
-

For example, if the mounted memory size is 512 MB, the minimally required partition size will be calculated by the above formula as follows:

$$1000 \text{ MB} + (512 \text{ MB} * 1.5) + (512 \text{ MB} + 12 \text{ MB}) = 2292 \text{ MB}$$



**Notes:** *If you want to install using Express Setup, calculate the minimally required partition size as follows:*

- *If you do not apply Windows 2000 Service Pack, the larger value of either one: 'Minimum Partition Size' described above, or '4095 MB'.*
  - *If you want to apply Windows 2000 Service Pack, the larger value of either one: 'Minimum Partition Size' described above + 850 MB or '4095 MB'.*
- 

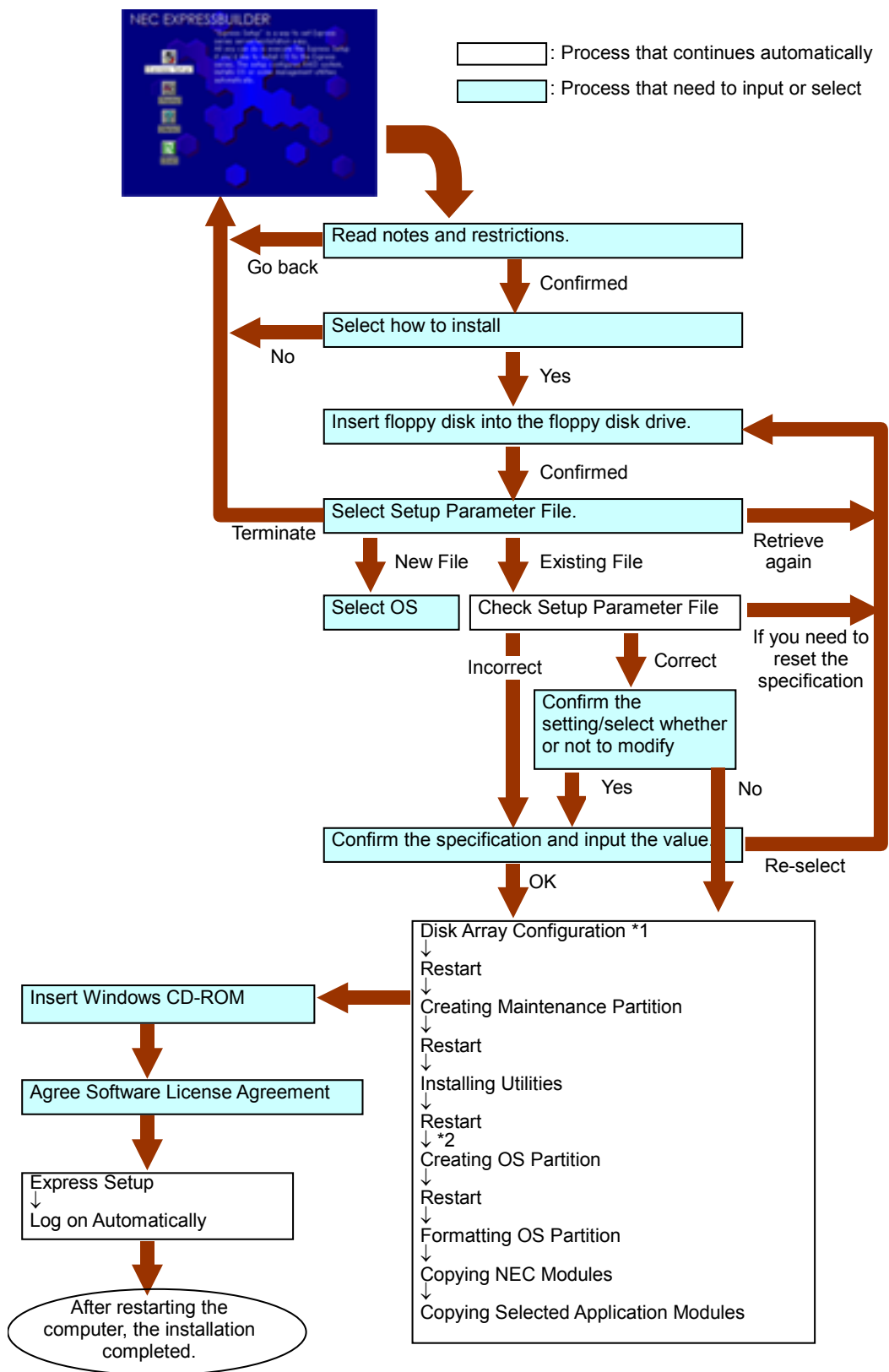
### ***Re-installing to the hard disk which has been upgraded to Dynamic Disk***

You cannot re-install Windows 2000 with the current partition of the hard disk upgraded to Dynamic Disk kept remained.

If you want to keep the current partition remained, see Appendix D to re-install the system.

## Setup Flow

This section visually describes the flow of the setup operated by Express Setup.



## Installing Windows 2000

This section describes how to setup the system using Express Setup.

Prepare the Configuration Diskette. You can proceed to the installation if you do not have the Configuration Diskette prepared in advance, but one floppy disk formatted by MS-DOS 1.44 MB is necessary in such a case. For the Configuration Diskette, use the blank disk in EXPRESSBUILDER package or prepare other floppy disk personally.



### Caution

- If you modified the system configuration, run "System Update".
  - If you want to modify or add Graphics Accelerator Driver or the drivers of Network Adapter and so on, see Appendix D.
- 

1. Turn the power of peripheral device on, and then turn on the server.



#### Notes:

- Connect the hard disk on which the OS is not going to be installed after installing OS.
  - If you create multiple logical drives in your system, refer to "Re-installing the operation system when multiple logical drives exist" (Appendix E).
- 

2. Insert EXPRESSBUILDER CD-ROM into the optical device drive.
3. Ensure that the floppy disk drive is empty.
4. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot from the EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)  
The system will boot from the CD-ROM and EXPRESSBUILDER starts.
5. Click [Express Setup].  
"Note" is displayed.
6. Read the instruction carefully and click [OK].  
The message "Insert Configuration Diskette" is displayed.
7. Insert "Configuration Diskette" into the floppy disk drive and click [OK].



*Note: If you do not have "Configuration Diskette", insert a blank floppy disk formatted by 1.44 MB into the floppy disk drive and click [OK].*


---

### **[Using the specified Configuration Diskette]**

The Setup File included in "Configuration Diskette" is displayed.

- a. Select the Setup File name to use during the installation.

---

 *Note: If there is any problem that can not be modified in the Setup File you selected, the message to set another "Configuration Diskette" appears. In such case, verify the floppy disk you inserted.*

---

After the Setup File is specified, the message "Are you sure you want to modify the information?" is displayed.

- b. If you want to edit the information file, click [Modify]. If you do not want to edit the information file and continue the installation, click [Skip].
  - Click [Modify]. Go to step 8.
  - Click [Skip]. Go to step 9.

### **[Using Blank disk]**

- a. Click the box under [Setup File Name: (A)] or press A.  
The input box appears.
  - b. Input a file name. and click [Use]
  - c. [Operating System to Install] appears.  
The OS supported by the computer is displayed in the list.
  - d. Select [Windows 2000] you want to install from the list box.
8. Verify the contents specified during OS installation.

If Disk Array Controller Board is connected to Express server mainframe, the [Configure RAID] screen is displayed. Verify the specification, modify if necessary, and then click [Next].

Next, [Basic Information] screen is displayed. Verify the specification, modify if necessary, and then click [Next]. ("Supported Computer" shown in the screen differs according to the model.)

After that, click [Next], [Back], or [Help] to continue. Modify the specification each time if necessary.



## Caution

- Reserve the partition to install the OS more than the minimally required size.
- If you select "Use Existing Array" at "New/Existing RAID Configuration", the information included in the first partition (excluding maintenance partition) will all be formatted and deleted. The information included in the other partition will be retained. The figure below describes the partition which information will be deleted when maintenance partition exists.

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Fourth Partition Retained
--	--------------------------------	--------------------------------	---------------------------------

- You cannot re-install the system with the existing partition that is upgraded to Dynamic Disk remained. Do not select "Use Existing Array" at "New/Existing RAID Configuration".
  - If "Create New Partition" at "New/Existing RAID Configuration" is selected, do not specify the value for the partition more than 120 GB.
  - If you specify other than 4095 MB for the "Installing Partition", it is necessary to convert to NTFS.
  - If "Use Existing Array" at "New/Existing RAID Configuration" is selected but the partition other than the one to install Windows 2000 does not exist (excluding maintenance partition), Express Setup will reserve the maximum area of the hard disk to install Windows 2000.
  - You cannot go to the next screen if the specification is incorrect.
  - On specification, an error may occur in relationship with the specified contents of the former screen and require to go back to modify the specification.
  - During the setup, the screen to specify the partition that Windows 2000 is to be installed is displayed. The first 55 MB area displayed on the screen is a partition that is used to store the configuration information or utilities unique of the server. We do not recommend to delete this area, but if you do not want to reserve this 55 MB area, perform the installation by manual setup. It is impossible to delete this area by Express Setup.
  - If you specify other than 120 GB for the actual area, you may not create the partition specified as the entire area in sizes more than 120 GB.
-

---

 **Notes:**

- If you click [Cancel] in [Basic Information] screen, the screen will go back to select the Setup File. [Cancel] exists only in [Basic Information] screen.
  - If you click [OK] in [Role of Computer] screen, the setup automatically selects default value for the later specification to continue the installation.
- 

When all the specification has completed, the system reboots automatically.

**9.** Copy the modules for the optional mass storage driver.

If you want to install the optional mass storage driver, insert the floppy disk attached to mass storage driver into floppy disk driver and follow the message to operate the installation.

**10.** Follow the message and take EXPRESSBUILDER CD-ROM and Configuration Diskette out of the optical device drive, and insert Windows 2000 CD-ROM into the optical device drive.

[Software License Agreement] screen is displayed.

**11.** Read the contents carefully and click [I agree.] or press **F8** if you do agree. If you do not agree, click [I disagree] or press **F3**.

---

 **Caution**

- If you do not agree to this agreement, the setup terminates and Windows 2000 will not be installed.
  - If "NetWare Gateway (and Client) Service" is specified to install, the window to specify the details of "NetWare Gateway (and Client) Service" pops up on the first logon. Specify the appropriate value.
- 

**12.** If you selected [Apply] on [Apply Service Pack] at Basic Information, follow the procedure below.

- a. Follow the message to take Windows 2000 CD-ROM out of the optical device drive.
- b. Follow the message to insert Windows 2000 Service Pack 1 or later into the optical device drive.

Windows 2000 and the specified application will be installed automatically and logon to the system. Install and configure the device drivers.

The Setup using Express Setup has completed.

## ***Installing and Setting Device Drivers***

Follow these steps to install and configure the device drivers.

## **PROSet**

PROSet is a utility that verifies the function of network contained in network driver. Be sure to install it. Using PROSet enables the following issues:

- Verify detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Specify teaming.

Configuring several network adapters as one team provides the server an environment tolerant on any trouble and enhance throughput between the switches.

PROSet is necessary to use these features.

Follow the procedure below to install PROSet:

1. Insert the EXPRESSBUILDER CD-ROM into the optical device drive.
2. Click Start menu, point to [Program], [Accessory] and click [Explorer].
3. Run "PROSET.EXE" in the following directory.  
    <CD-ROM Drive Letter>:\WINNT\W2K\BC3\PROSET\WIN2K  
    The [Intel(R) PROSet - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.


## **Network Driver**

### **[When PROSet is not installed]**

1. Click Start menu and click [Network and Dial-Up Connection].  
    The [Network and Dial-Up Connection] dialog box is displayed.
2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.  
    The [Local Area Connection Properties] dialog box is displayed.
3. Click [Configure].  
    The property dialog box for network adapter is displayed.
4. Click [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.
5. Click [OK] on the property dialog box for network adapter.
6. Click [OK] on the [Local Area Connection Properties] dialog box.

Also, add or delete any protocols and services if necessary. You can operate the process from [Network and Dial-up Connection] to display the property dialog box for local area network.

---

 *Note: We recommend you to add [Network Monitor] at [AddingServices]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" described later in this chapter.*

---

#### **[When PROSet is installed]**

1. Double-click [IntelR PROSet] on the [Control Panel] window.  
The [IntelR PROSet] dialog box is displayed. Double-click the [IntelR PROSet] icon.
2. Put the cursor to the network driver in the list.
3. Click [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

Also specify the other network driver with the same procedure as above.

#### **Optional Network Board Driver**

If you want to use an optional Network Board (Gigabit adapter), install the driver stored in EXPRESSBUILDER CD-ROM.

Refer to the re-installation procedure described in Appendix E.

Network Driver for 100 MB adapters

[<CD-ROM Drive Letter>:\WINNT\W2K\BC3\PRO100\WIN2K]

Network Driver for Gigabit adapters

[<CD-ROM Drive Letter>:\WINNT\W2K\BC3\PRO1000\WIN2K]

#### **Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)**

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhance the through put by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

---

#### **Caution**

- AFT/ALB setup must be operated after installing the drivers and restarting the system.

- All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.
- 

**To use AFT/ALB feature:**

1. Double-click [Intel(R) PROSet Wired] on the [Control Panel] dialog box.  
The [Intel(R) PROSet for Wired Connections] dialog box appears.
2. Put the mouse cursor on "Intel(R) PRO/1000 MT Network Connection" in the list and right-click.  
Pull-down menu appears.
3. Select [Add to Team] and then click [Create New Team...].  
The [Teaming Wizard] dialog box appears.
4. Select "Adapter Fault Tolerance" or "Adaptive Load Balancing" and click [Next].
5. Check the adapter to join the team and click [Next].
6. Click [Finish].
7. The setup will go back to [Intel(R) PROSet for Wired Connections] dialog box, so click [OK].
8. Restart the system.

**Graphics Accelerator Driver**

Update Graphics Accelerator Driver mounted in standard.

If you want to use optional Graphics Accelerator Driver board, follow the document attached to the board to install the driver.

1. Insert the EXPRESSBUILDER CD-ROM into the optical device drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "Setup.exe" in the following directory.  
<CD-ROM Drive Letter>:\WINNT\VIDEO\W2K\setup.exe.
4. Follow the on-screen instructions to continue the installation.  
If the dialog message "Digital Signature could not be found." is displayed, select [Yes] to continue.
5. Remove the EXPRESSBUILDER CD-ROM from the optical device drive, follow the on-screen instructions and restart the system.

**USB 2.0 Driver**

USB 2.0 Driver is pre-installed.

When restoring the system or re-installing the system, the driver is automatically installed in the process of updating the system.

## Setting for Solving Problems

Setup the following issue in advance so that your computer can recover from any trouble precisely and as soon as possible when it should occur.

### *Memory Dump (Debug Information)*

This section describes the procedures for collecting memory dump (debug information) in the server.



### Caution

- The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
  - If any trouble occur after specifying the process below, the message to inform that the system is in short of virtual memory may appear, but continue to start the system. If you restart the system in such case, memory dump may not be stored correctly.
- 

Follow the procedure below to specify.

1. Point to [Settings] in Start menu and click [Control Panel].  
The [Control Panel] dialog box appears.
2. Double-click [System].  
The [System Properties] dialog box appears.
3. Click [Advanced].
4. Click [Startup and Recovery].
5. Enter the location to write the debug information to the text box.  
e.g. Write debug information in D drive in the file named "MEMORY.DMP".  
D:\MEMORY.DMP

---

 **Caution**

- It is recommended to specify "Complete Memory Dump" to write the debug information. If the installed memory size is larger than 2 GB, "Complete Memory Dump" cannot be specified, then specify "Kernel Memory Dump" instead.
  - Specify the drive where there is a free area bigger than the size of "the memory capacity installed on the Express server + 12 MB".
  - In case the installed memory size exceeds 2 GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.
- 

6. Click [Performance Options].
7. Click [Change] on the [Virtual Memory] dialog box.
8. Modify [Initial Size] in the [Paging File Size for Selected Drive] box to the value larger than [Recommended Size], and click [Specify].

---

 **Caution**

- Be sure to create memory dump with the size described above on the OS partition. If [Default Size] of the paging file is specified to the value smaller than "Recommended" value, the correct debug information (memory dump) may not be collected.
  - For more information on "Recommended" value, see "Partition Size to be Created" described earlier.
  - To prepare for the situation when any trouble occurred, we recommend you to press dump switch to verify that the dump will be collected normally in advance.
  - In case the memory is expanded, re-specify the paging file to suit the new memory size.
- 


9. Click [OK].  
The message to restart the system may appear according to the modified specification. In such case, follow the message to restart the system.

### Windows 2000 Dr. Watson

Windows 2000 Dr. Watson is a debugger for application errors. If any application error is detected, Dr. Watson diagnoses the server and logs diagnostic information (log). Follow the procedure below and specify Dr. Watson to collect diagnostic information.

1. Click [Run] on Start menu.
2. Type "drwtsn32.exe" in the [Open] box, and click [OK].  
The [Dr. Watson for Windows 2000] dialog box appears.
3. Specify the location to store the diagnostic information in the [Log File Path] box.  
The diagnostic information will be stored with the file name "DRWTSN32.LOG".


---

 *Note: You cannot specify network pass. Specify the pass on local computer.*

---

4. Specify the location of crash dump file in the [Crash Dump] box.

---

 *Note: "Crash Dump File" is a binary file that can be read with Windows Debugger.*

---

5. Check the following check box on the [Option] box.

- ☐ Dump Symbol Table
- ☐ Dump All Thread Contexts
- ☐ Add To Existing Log File
- ☐ Create Crash Dump File

For more information on each function above, refer to Online Help.

6. Click [OK].

### Network Monitor

Using Network Monitor helps you to investigate and manage with network trouble. To use Network Monitor, you need to restart the system after the installation has completed, so we recommend to install Network Monitor before any network trouble may occur.

1. Point to [Settings] from Start menu and click [Control Panel].  
The [Control Panel] dialog box is displayed.
2. Double-click [Add/Remove Programs].  
The [Add/Remove Programs] dialog box is displayed.
3. Click [Add/Remove Windows Component].  
The [Windows Components Wizard] dialog box is displayed.
4. Check the [Management and Monitoring Tools] check box of the component ON and click [Next].

5. If the setup asks to install the disk, insert Windows 2000 CD-ROM into the optical device drive and click [OK].
6. Click [Complete] in the [Windows Component Wizard] dialog box.
7. Click [Close] in the [Add/Remove Application] dialog box.
8. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor].

For information on how to operate Network Monitor, refer to Online Help.

## ***Updating the System - Installing Service Pack***

Update the system in the situation below:

- Modified system configuration.
- Recovered the system using recovery process.

Log on to the system with the account that has administrative authority (e.g. Administrator) and insert the EXPRESSBUILDER CD-ROM into the optical device drive of the server.

[Setup Software] in [Master Control Menu] screen is displayed, right-click the item. Click [Update the System] from the menu and the setup will start. After that, follow the on-screen instructions to continue the setup process and apply Service Pack.

## ***Making Backup Copies of System Information***

The system information includes the current BIOS settings and any specific information for the server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

1. Insert the EXPRESSBUILDER CD-ROM in the optical device drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a floppy disk in the floppy disk drive.
6. Select [Save].

## ***Exceptional Setup***

This section explains how to setup with the exceptional way. You usually do not have to do as follows. If your system has any Mass storage devices, you have to set as follows depending on your system. The detailed information is provided by the manual of the Mass storage device.

*Installation of Mass storage device not to be supported by ExpressSetup*

If you would like to install or re-install the OS when the system has new mass storage device not to be supported by EXPRESSBUILDER, you have to set as follows.

1. Read the manual supplied with the mass storage device before setting the server.
2. If the mass storage device is disk array controller, configure the RAID system before running the EXPRESSBUILDER.
3. Boot the system from EXPRESSBUILDER CD-ROM.
4. (a) When the dialog of Disk array configuration appears, check "Use Existing Array".  
(b) Check "Apply OEM-FD for Mass storage device".
5. Copy the driver for the mass storage device in the ExpressSetup.  
Set the FD attached the mass storage device to the FD drive.  
Follow the on-screen instructions to continue the ExpressSetup.

## HostRAID

The following is an overview of HostRAID and explains the setup procedure.

---

### **Caution**

Read the following instruction before using HostRAID Function:

To enable HostRAID on your system, set the array configuration to "Mark Bootable" before starting the system by performing the following steps. This setting is essential to obtain memory dump data that is required for recovery activities by a service person in the event of a system failure. The setting is required for both seamless installation and manual installation.

[How to Set Mark Bootable]

- Start the system.
- When the following message is displayed on the screen, press the <Ctrl> and <A> keys at the same time: "Press <Ctrl><A> for Adaptec RAID Configuration Utility"
- The RAID Configuration Utility menu will be displayed after a while. Select [Array Configuration Utility] and press the <Enter> key.
- Select [Manage Arrays] in the main menu and press the <Enter> key.
- An array that has been created is displayed in [List of Arrays]. Press the <Ctrl> and <B> keys at the same time. Select [Y] on the confirmation message.
- "Mark Bootable" has been set. You can confirm the setting by checking if the array displayed in [List of Arrays] is prefixed with "\*".
- After confirming the setting, close the Array Configuration Utility and restart the system. The setting becomes effective after restart.

For details about the Array Configuration Utility, see ["RAID Configuration of SATA Hard Disk Drives" on page 3 - 39](#)

---

## Overview of HostRAID

HostRAID provides RAID feature through the onboard serial ATA interface in your system.

HostRAID consists of the driver that controls disk arrays and "Adaptec Storage Manager - Browser Edition" (hereinafter referred to as "ASMBE") that is a disk array management utility.

The software products are mandatory for HostRAID to function normally. Be sure to install both software products. For the driver, refer to the setup procedure explained in this manual. For ASMBE, refer to the "HostRAID™ (SATA) Adaptec Storage Manager™ Browser Edition User's Guide."

## Overview of the specifications

Hard disk drive:	One hard disk drive for each channel (two hard disk drives max.)
RAID level:	RAID0 or RAID1
Operating system:	Microsoft Windows Server 2003 Standard Edition/Enterprise Edition Microsoft Windows 2000 Server/ Advanced Server
Configuration Method of disk arrays:	BIOS setup utility, EXPRESS-BUILDER and ASMBE

## Features


- HostRAID enables the BIOS utility to select the disk array/standard SATA for each channel.
- Since the JAVA-based management utility ASMBE uses the browser (IE5.5 or later), the software does not need to be installed into each client PC for management. (The software must be installed in each server.)

## Notes

The following explains general notes on HostRAID:

For notes on the BIOS setup utility, refer to Chapter 3 of this manual. For notes on ASMBE, refer to HostRAID™ (SATA) Adaptec Storage Manager™ Browser Edition User's Guide.

---

 *Note: You may view or print the HostRAID Adaptec Storage Manager™ Browser Edition User's Guide from the EXPRESSBUILDER CD-ROM.*

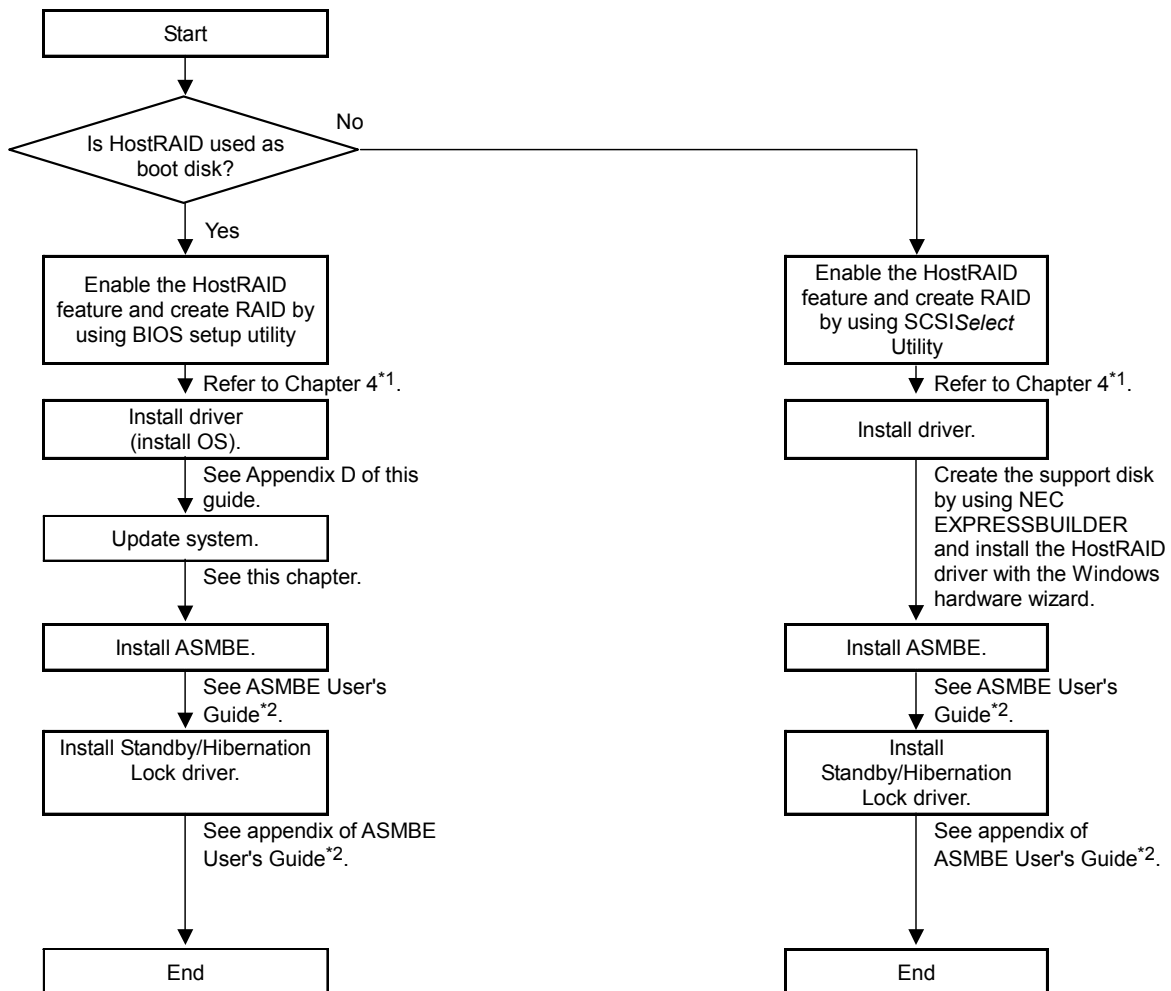
---

- Only a hard disk drive can be connected to a channel with which HostRAID is enabled through the BIOS setup utility.
- To connect a device other than a hard disk drive, disable HostRAID and use it as the standard SATA.
- In addition to driver installation, ASMBE installation is mandatory for using HostRAID functions. For the installation of ASMBE, refer to the "HostRAID™ (SATA) Adaptec Storage Manager™ Browser Edition User's Guide."

- If you replace a hard disk drive being used with HostRAID, please replace the hard disk drive after power-off of the system. Be sure to check the PORT number of the hard disk drive to be replaced in ASMBE in advance.
- HostRAID does not permit the use of the standby/hibernation mode of ACPI functions.
- Use ASMBE to maintain HostRAID, but do not use any other utilities.
- If the following messages are included in the application log or in the log generated by the ASMBE, your RAID system operates normally.
  - Spare test failed for pool spare (bus=%2, ch=%3, id=%4)
  - Test of all spares completed with %1 failures

### HostRAID Setup Flow

The flowchart below shows the HostRAID system setup procedure.



\*1 You can create RAID by using the EXPRESSBUILDER. In this case, the only thing you need to do is to set the HostRAID feature to "Enabled" by using BIOS setup utility.

\*2 ASMBE User's Guide: HostRAID Adaptec Storage Manager™ Browser Edition User's Guide.

You may view or print the HostRAID™ (SATA) Adaptec Storage Manager™ Browser Edition User's Guide from the EXPRESSBUILDER CD-ROM.

This page is intentionally left blank.

# Appendix H: Restrictions



## Caution

This document describes the restrictions on Express5800 120Rf-1. Please read below notices carefully and make sure to follow them.

**Table H - 1: 120Rf-1 Restrictions**

List of Restrictions	
<b>1</b>	<b>Note on the transfer rate of the onboard controller</b>
	The mother board includes the two network interface controllers that supports 10Base-T, 100Base-TX, and 1000Base-T networks and a capable of full or half duplex.  Both controllers can automatically detect and switch for network speed and transfer mode connected to the HUB. However, for proper network operation, specify the "Link Speed & Duplex".
<b>2</b>	<b>Server Management Software</b>
	The EXPRESSBUILDER CD-ROM that comes with the server contains the ESMPRO utility.  NEC recommends that you should install the ESMPRO for effective use of the reliability enhancement features of the server.



**Note:** If you have any questions about this document, please contact your sales representative.

This page is intentionally left blank.

# Equipment Log

Use this equipment log form to record pertinent information about your system. You will need some of this information to run the System Setup Utility. Be sure to update the equipment log when you add options.

Record the model and serial numbers of the system components, dates of component removal or replacement, and the name of the vendor from whom the component was purchased. Be sure to record the same information for any components added to the system, such as a power supply, hard disk drives, add-in boards, or printers.

Record the model and serial numbers of the unit and system board. The model and serial numbers of the system unit are recorded on a label attached to the rear of the unit.

The location of serial numbers on add-in boards, hard disk drives, and external equipment, such as video displays or printers, varies from one manufacturer to another. Literature accompanying these products should illustrate or describe the location of model and serial numbers.

# Hardware

Main Unit						
	Model name		Serial No.		Date installed	
CPU						
#1	Clock		Serial No.		Date installed	
	Clock		Serial No.		Date installed	
Memory						
#7, #8	Size		Serial No.		Date installed	
#5, #6	Size		Serial No.		Date installed	
#3, #4	Size		Serial No.		Date installed	
#1, #2	Size		Serial No.		Date installed	
Monitor						
	Type		Model name		Serial No.	
					Date installed	
Hard Disk						
ID0	Type		Serial No.			
	Capacity		Date installed			
	Type number					
ID1	Type		Serial No.			
	Capacity		Date installed			
	Type number					
ID2	Type		Serial No.			
	Capacity		Date installed			
Backup Device						
	Size		Capacity		Serial No.	
	Model name		Type number		Date installed	
PCI Slot #1B						
	Model name		Serial No.			
			Date installed			
PCI Slot #1C						
	Model name		Serial No.			
			Date installed			
Printer						
	Model name		Serial No.			
	Manufacturer		Date installed			
Additional cabinet for disk						

	Model name		Serial No.	
			Date installed	
External Peripheral Device 1				
	Model name		Serial No.	
	Manufacturer		Date installed	
External Peripheral Device 2				
	Model name		Serial No.	
	Manufacturer		Date installed	
External Peripheral Device 3				
	Model name		Serial No.	
	Manufacturer		Date installed	
External Peripheral Device 4				
	Model name		Serial No.	
	Manufacturer		Date installed	

## Software

Firmware version				
OS	Apply	Name:		Version
Application of RUR media		Name:		Version
File system	FAT	HPFS	NTFS	
	Others ( )			
Bundled software installed				
Licensed software installed				
Application running when a failure occurred				

# Index

## A

AC-LINK .....	3-12
ACT Lamp .....	5-33
Advanced Menu .....	3-6

## B

Backup Copies .....	C-1
Batteries .....	1-xvi
Disposing of .....	1-xvi
Replacing .....	1-xvi
Battery .....	4-60
Beep Codes .....	5-8
BIOS Revision Level .....	5-65
BIOS Setup Utility .....	3-3
BMC .....	4-54
Board Management Controller .....	4-54
Boot Menu .....	3-14

## C

CE marking .....	1-xiv
Cleaning .....	C-1
Clear CMOS .....	4-53
Clear password .....	4-53
Configuring	
MotherBoard Jumpers .....	4-52

## D

Disk Access Lamp .....	5-33
Drive cover .....	4-18

## E

Equipment Log .....	I-1
Error Messages .....	4-61
Exit Menu .....	3-15
EXPRESSBUILDER CD-ROM .....	1-25

## F

Features	
Standard Features .....	1-17

## I

Internal View .....	1-10
---------------------	------

## L

Lamp	
LAN Connector .....	5-36
Power .....	5-31
LAN Connector Lamp .....	5-36
Logic Cover .....	4-21
Logic cover .....	4-18

## M

Main Menu .....	3-4
Memory	
RAM .....	4-22
Motherboard .....	1-11
MotherBoard Jumpers	
Configuring .....	4-52

## P

Passwords .....	1-20
PCI Board .....	4-36
POST Error Messages .....	4-62
Power	
Connecting Power Cord .....	2-22
Forced Power Off .....	2-27
Off .....	2-27
On .....	2-26
Power Lamp .....	5-31
Power Supply	
Hot-swappable .....	4-13
Power supply	
SCSI HDD .....	4-13
Problem Solving .....	5-2, 5-5, 5-6, 5-7, 5-9
Problems After the System Has Been	
Running Correctly .....	5-6
Problems and Suggestions .....	5-9
Problems at initial System Start-up .....	5-5
Problems Running New Application	
Software .....	5-7
Processor .....	4-27

## R

RAID .....	3-22, 3-39
Configuring RAID .....	3-22
SATA Hard Disk Drives .....	3-39
SCSI Hard Disk Drives .....	3-23
Rear View .....	1-7
Redundant Hot-Swap Fan .....	4-50
Regulatory information .....	1-xvii

Remote Management Card	
Installation .....	4-55
Removal .....	4-58
Resetting	
Server .....	5-3

## S

SATA	
RAID configuration .....	3-39
SCSI	
RAID configuration .....	3-23
SCSISelect Utility .....	3-16
Security .....	1-20
Security Menu .....	3-10
Server	
Configuring .....	3-2
Forcing a power shutdown .....	2-27
Powering Off .....	2-27
Powering On .....	2-26
Resetting .....	5-3
Server Menu .....	3-11
Specifications .....	A-1, A-3
Status Lamp .....	5-32
System board Features .....	1-11
AC-Link .....	1-15
Degradation Feature .....	1-15
Memory .....	1-12
Network Controller .....	1-13
PCI Riser Slots .....	1-12
Processor .....	1-12
Remote Management Card (RMC) .....	1-14
Remote Power-On Feature .....	1-15
SCSI Controller .....	1-13
Video .....	1-12
Wake On LAN .....	1-15

## T

Top Cover .....	4-18, 4-19
Troubleshooting .....	5-4
Troubleshooting Guide .....	5-4

## U

UID Lamp .....	5-33
----------------	------

# List of Figures

Figure 1 - 1 : 120Rf-1 .....	1-2
Figure 1 - 2 : 120Rf-1 External View .....	1-3
Figure 1 - 3 : 120Rf-1 Front View with Front Bezel Closed .....	1-4
Figure 1 - 4 : 120Rf-1 Front View with Front Bezel Removed .....	1-5
Figure 1 - 5 : 120Rf-1 Rear View .....	1-7
Figure 1 - 6 : RJ45 Leds .....	1-9
Figure 1 - 7 : 120Rf-1 Internal View .....	1-10
Figure 1 - 8 : Motherboard .....	1-11
Figure 2 - 1 : Removing the Core Nut before Installing the Server .....	2-6
Figure 2 - 2 : Removing the Rails Assemblies from the Server .....	2-6
Figure 2 - 3 : Inner Rails .....	2-7
Figure 2 - 4 : Installing the Core Nuts on the 1U Rack .....	2-8
Figure 2 - 5 : Left and Right Side Rail Assemblies .....	2-8
Figure 2 - 6 : Rail Assembly Screws (S) .....	2-9
Figure 2 - 7 : Securing the Rail Assembly .....	2-9
Figure 2 - 8 : Locking the Sliding Rails .....	2-10
Figure 2 - 9 : Pushing the Server while Pressing the Release Levers (B) .....	2-11
Figure 2 - 10 : Tightening the Server Captive Thumb Screws (C) .....	2-12
Figure 2 - 11 : Installing the Cable Arm on the Rail Bracket .....	2-14
Figure 2 - 12 : Hooking the Arm Stopper A on the Slide Rail Bracket .....	2-14
Figure 2 - 13 : Locking the Stopper Bracket .....	2-15
Figure 2 - 14 : Installing Arm Stopper B into Guide of Inner Rail .....	2-15
Figure 2 - 15 : Inserting Arm Stopper B into Guide of Inner Rail .....	2-16
Figure 2 - 16 : The Optional Cable Arm Installed on .....	2-16
Figure 2 - 17 : Connecting Peripheral Devices .....	2-20
Figure 2 - 18 : Unlocking the Front Bezel .....	2-24
Figure 2 - 19 : Removing the Front Bezel .....	2-24
Figure 2 - 20 : Installing the Front Bezel .....	2-25
Figure 4 - 1 : Clear CMOS & Clear Password Jumpers .....	4-53
Figure 4 - 1 : Unlocking the Front Bezel .....	4-4
Figure 4 - 2 : Hard Disk Drives IDs .....	4-6
Figure 4 - 3 : Unlocking the Hard Disk Drive Handle .....	4-7
Figure 4 - 4 : Removing the Screws Securing the Drive Carrier .....	4-9
Figure 4 - 5 : Removing the Drive Carrier .....	4-10
Figure 4 - 6 : Removing the Drive Tray from the Carrier .....	4-10
Figure 4 - 7 : Hard Disk Drive DISK lamp .....	4-11
Figure 4 - 8 : Unlocking the Hard Disk Drive .....	4-11
Figure 4 - 9 : Removing the Blank Cover .....	4-13
Figure 4 - 10 : Inserting the Power Unit in the Server .....	4-14
Figure 4 - 11 : Locking the Power Unit Supply .....	4-14
Figure 4 - 12 : Connecting the Power Cords .....	4-15
Figure 4 - 13 : Removing the Power Supply form the Chassis .....	4-16
Figure 4 - 14 : Removing the Drive Cover from the Chassis .....	4-19
Figure 4 - 15 : Installing the Drive Cover from the Chassis .....	4-20
Figure 4 - 16 : Removing the Logic Cover .....	4-21
Figure 4 - 17 : Installing the Logic Cover .....	4-21

Figure 4 - 18 : 120Rf-1 Motherboard.....	4-23
Figure 4 - 19 : Processor Slots .....	4-27
Figure 4 - 20 : Removing the Support Arm and the Processor Air Duct .....	4-29
Figure 4 - 21 : Opening the Locking Lever.....	4-29
Figure 4 - 22 : Setting the CPU in the socket.....	4-30
Figure 4 - 23 : Closing the Locking Lever .....	4-30
Figure 4 - 24 : Installing the Heat Sink .....	4-31
Figure 4 - 25 : Fixing the Heat Sink with Screws .....	4-32
Figure 4 - 26 : Installing the CPU Air Duct .....	4-32
Figure 4 - 27 : Installing the SCSI Cable .....	4-33
Figure 4 - 28 : Removing the Heat Sink.....	4-34
Figure 4 - 29 : 120Rf-1 Motherboard.....	4-37
Figure 4 - 30 : PCI Board Slots .....	4-37
Figure 4 - 31 : Removing the Riser Card Assembly .....	4-39
Figure 4 - 32 : Installing PCI Boards into the Riser Cards .....	4-40
Figure 4 - 33 : Securing the PCI Board.....	4-41
Figure 4 - 34 : Inserting the Riser Card Assembly into the Motherboard.....	4-42
Figure 4 - 35 : Disk Array - Standard Configuration .....	4-44
Figure 4 - 36 : Disk Array - optional RAID controller in the low-profile PCI slot .....	4-45
Figure 4 - 37 : Disk Array - optional RAID controller in the full-height PCI slot .....	4-46
Figure 4 - 38 : HDD LED Connector on the Motherboard .....	4-47
Figure 4 - 39 : LED Relay Cable Connection for MegaRAID SCSI 3201-1 .....	4-48
Figure 4 - 40 : LED Relay Cable Connection for MegaRAID SCSI 320-2 .....	4-48
Figure 4 - 41 : Hot-swap Fans Slots .....	4-51
Figure 4 - 42 : Removing the Fans from the Chassis .....	4-51
Figure 4 - 43 : Installing Hot-Swap Fans .....	4-52
Figure 4 - 44 : Changing Jumper J11 from Standard to Redundant.....	4-52
Figure 4 - 45 : Remote Management Card Connector .....	4-54
Figure 4 - 46 : Sticking the Shock Absorbers to the RMC .....	4-55
Figure 4 - 47 : Inserting the RMC in its Connector .....	4-55
Figure 4 - 48 : Locking the RMC .....	4-55
Figure 4 - 49 : RMC Locking Levers .....	4-56
Figure 4 - 50 : ARMC Internal Cable .....	4-56
Figure 4 - 51 : Internal Cable Routing .....	4-56
Figure 4 - 52 : Unlocking the RMC .....	4-58
Figure 4 - 53 : ARMC Internal Cable .....	4-59
Figure 4 - 54 : Internal Cable Routing .....	4-59
Figure 5 - 1 : 120Rf-1 Front Lamps .....	5-31
Figure 5 - 2 : Hard Disk Lamp .....	5-34
Figure 5 - 3 : LAN Connector Lamps .....	5-36

# List of Tables

Table 1 - 1: Software Security Features .....	1-22
Table 3 - 1: Main Menu.....	3-3
Table 3 - 2: BIOS Setup Keys.....	3-3
Table 3 - 3: Main Menu.....	3-4
Table 3 - 4: Primary IDE Master Submenu.....	3-4
Table 3 - 5: Primary IDE Slave Submenu.....	3-5
Table 3 - 6: Secondary Master and Slave IDE and Serial ATA Channels Submenus .....	3-5
Table 3 - 7: Processor Settings Submenu.....	3-5
Table 3 - 8: Advanced Menu.....	3-6
Table 3 - 9: Memory Configuration Submenu .....	3-6
Table 3 - 10: PCI Configuration Submenu.....	3-7
Table 3 - 11: Embedded SCSI Submenu.....	3-7
Table 3 - 12: Embedded NIC (Dual Gbit) Submenu.....	3-7
Table 3 - 13: Embedded Video Controller Submenu .....	3-8
Table 3 - 14: Peripheral Configuration Submenu .....	3-8
Table 3 - 15: Advanced Chipset Control Submenu.....	3-8
Table 3 - 16: Security Menu.....	3-10
Table 3 - 17: Server Menu.....	3-11
Table 3 - 18: System Management Submenu.....	3-12
Table 3 - 19: Console Redirection Submenu .....	3-13
Table 3 - 20: Event Log Configuration Submenu .....	3-13
Table 3 - 21: Boot Menu .....	3-14
Table 3 - 22: Exit Menu .....	3-15
Table 3 - 23: SCSISelect - SCSI Bus Interface Definitions .....	3-18
Table 3 - 25: SCSISelect - Advanced Configuration .....	3-19
Table 3 - 24: SCSISelect - SCSI Device Configuration.....	3-19
Table 3 - 26: SCSISelect - HostRAID .....	3-20
Table 3 - 27: SCSISelect - SCSI Disk Utilities.....	3-21
Table 4 - 1: POST Error Messages.....	4-62
Table 5 - 1: POST Error Beep Codes.....	5-8
Table 5 - 2: Problems and Suggestions .....	5-9
Table 5 - 3: Error Messages .....	5-17
Table 5 - 4: Default Value for Windows 2000.....	5-18
Table 5 - 5: Status Lamp Indications .....	5-32
Table A - 1: 120Rf-1 SCSI Specifications.....	A-1
Table A - 2: 120Rf-1 SATA Specifications .....	A-3
Table B - 3: Interrupt Requests .....	B-1
Table F - 1: Tools Menu.....	F-4
Table H - 1: 120Rf-1 Restrictions .....	H-1

This page is intentionally left blank.



