GP 7000F

M200, M200R, M400A, M400R, M600, M600R

Edition December 1999

Copyright and Trademarks

1 Preface

This manual contains the operating instructions for the GranPower7000 (GP 7000F) system from Fujitsu Siemens Computers. A chapter about the connection of Siemens specific devices precedes the actual operating instructions.

2 Console connections to GP 7000F

This chapter describes connections to the M200, M200R, M400A, M400R, M600 and M600R models of the Fujitsu Siemens Computers GP 7000F system with a view to attaching existing components of Siemens devices to Fujitsu equipment. Graphical or serial consoles can be connected.

⚠ The GP 7000F systems do not support SIDATA (installation by customer is not allowed).

2.1 Graphical console

It is preferable to connect graphical consoles.
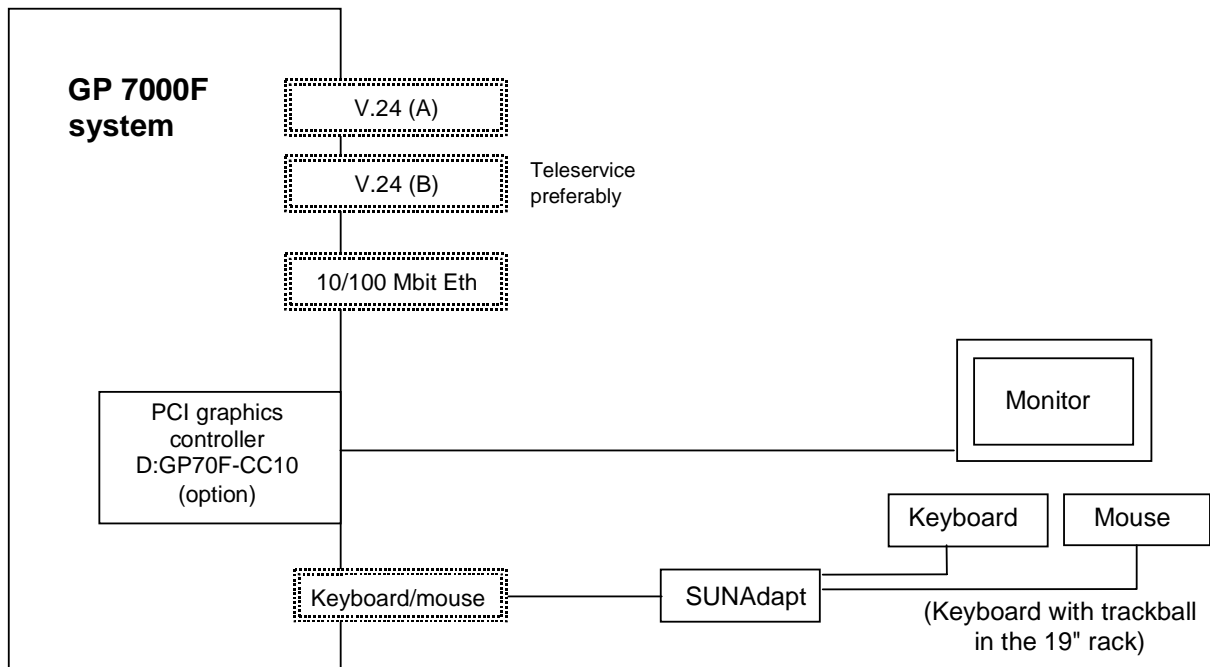
The following technical requirements must be met in order to connect graphical consoles:

– PCI graphics controller D:GP70F-CC10
  The GP 7000F models can be made into a workstation or server with a graphical console by means of a PCI graphics card featuring a frame buffer.

– An RM keyboard and mouse can be connected via the D:GP70F-AN10 interface converter. All models in the GP 7000F server family have a Sun-compatible keyboard/mouse interface. The adapter converts the interface signals to allow the keyboard and 3-button mouse featuring a PC-compatible interface to be connected to the server.


PS/2 mouse
PS/2 keyboard
Sun keyboard/
mouse interface
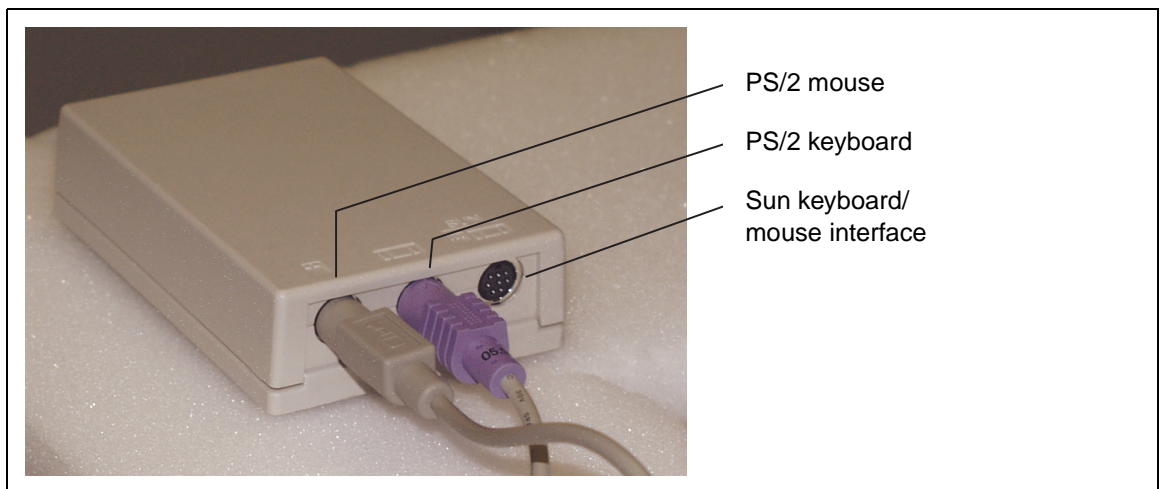
Keyboard/mouse adapter

– Monitor (CRT or LCD)

– Keyboard

– Mouse

The same monitor, keyboard and mouse types have been released as for the Siemens systems.

2.2 Serial console

A converter is used here to convert the 25-pin connector of the GP 7000F system to the usual 9-pin V.24/COM connector. This converter is preinstalled at the factory. A VT100 or VT200 emulation must be available for a serial console to be used.
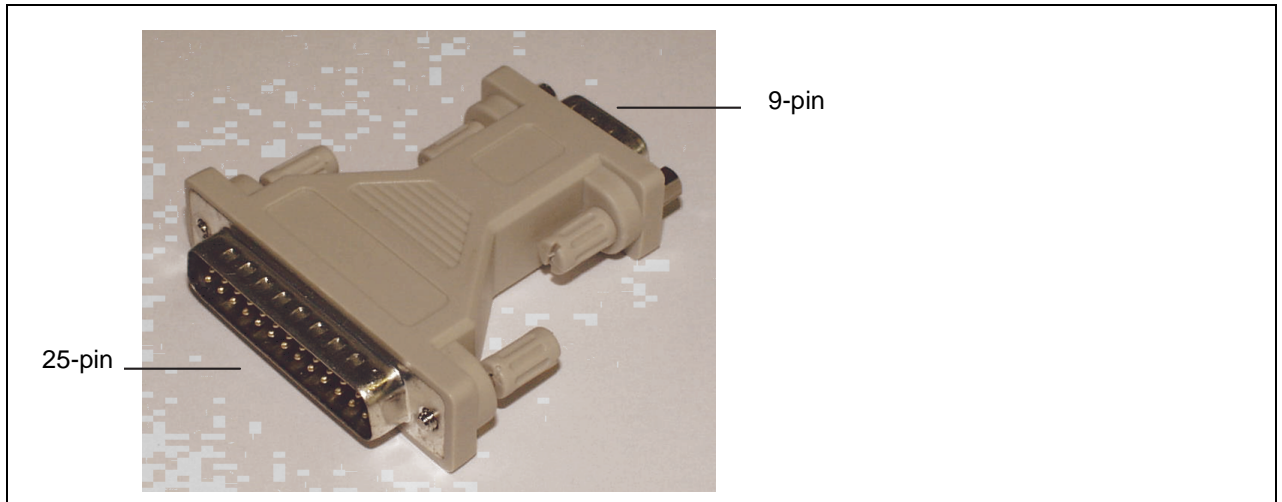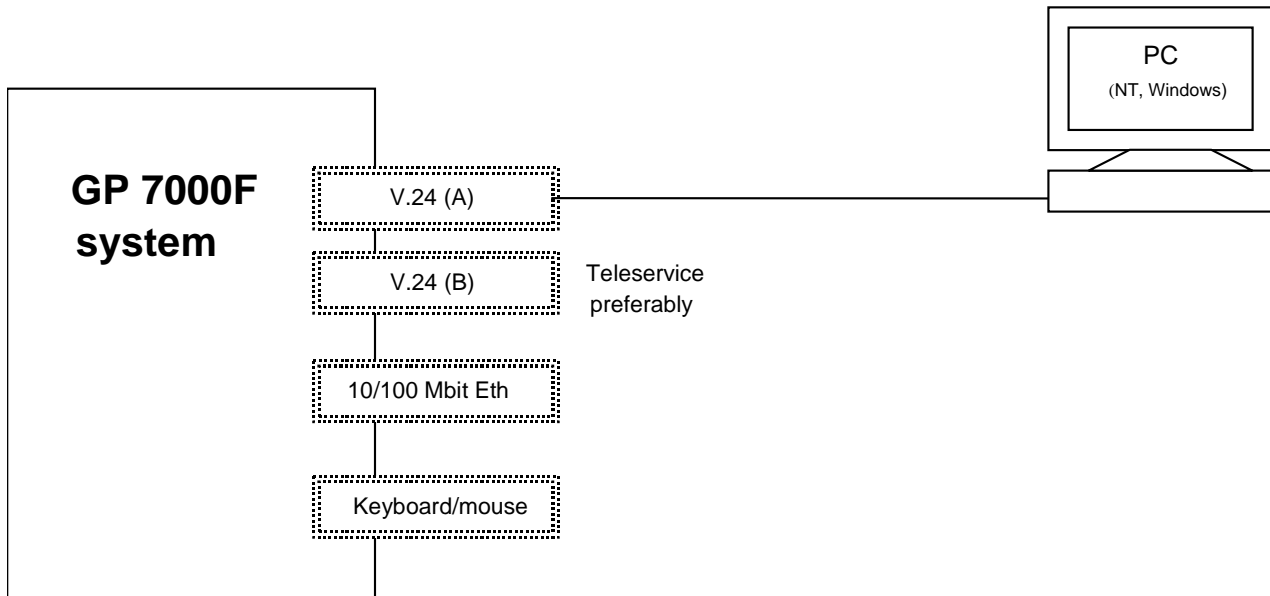

25/9-pin converter

2.2.1   LAN console

A Solaris PC is connected as a LAN console via an RCA (Remote Communication Adapter) attached to the V.24 console interface. Up to six servers can be attached to one RCA.
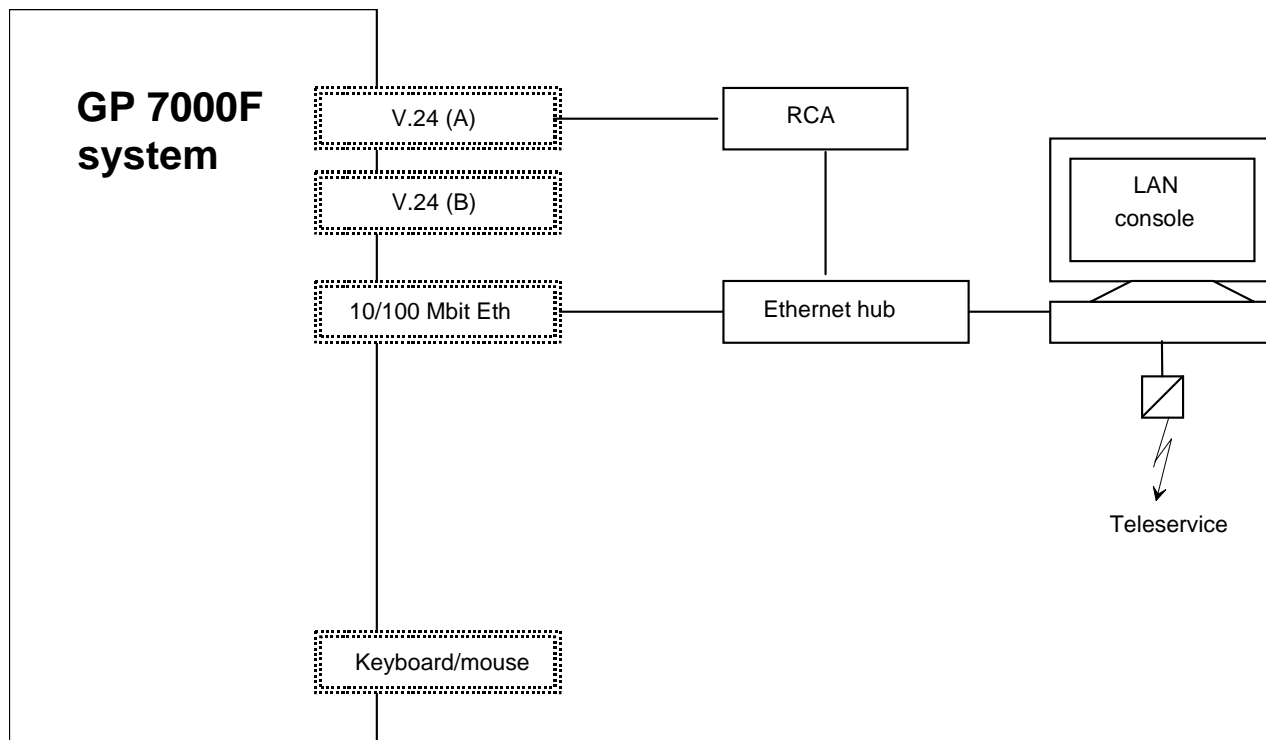
2.2.2　Standard PC with terminal emulation

a)　Windows 98 or NT (with NetTerm, for instance, but not with HyperTerminal)

b)　LINUX (with Minicom or Seyon)

c)　Solaris (cu)

2.2.3 TC20 or T100

Use of these terminals is intended as a migration solution only.
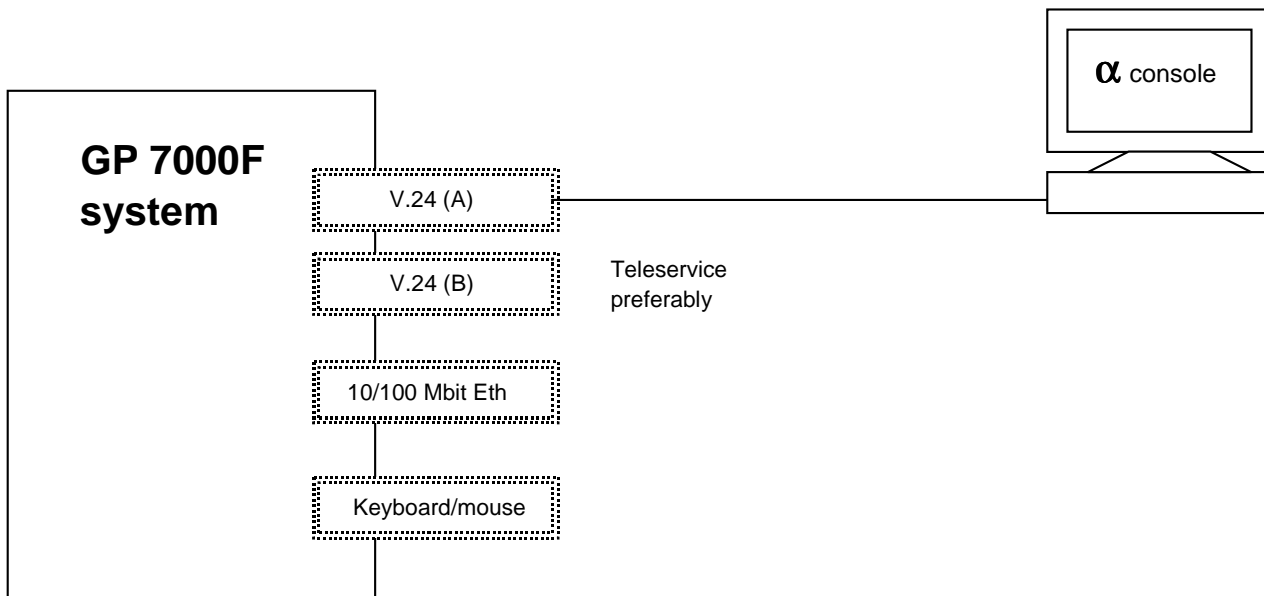
When operating with the LAN console, TC20 or T100 it is not possible to access the Open Boot PROM using the BREAK signal.

2.3 Teleservice

The teleservice modem has to be connected via V.24 to the system board. The modem has to be ordered separately owing to national variants.

If a LAN console is used, connection of the modem is to the LAN console PC. Thus one teleservice port serves all connected servers.

GP 7000F USER'S MANUAL

FUJITSU

IMPORTANT READING

FOR SAFE OPERATION

Handling of This Manual

This manual contains important information regarding the use and handling of this product. Read this manual thoroughly. Pay special attention to the section "Important Warnings". Use the product according to the instructions and information available in this manual.

FUJITSU makes every effort to prevent users and bystanders from being injured or from suffering from damages to their property. Use the product according to this manual.

IMPORTANT NOTE TO USERS

READ CAREFULLY ALL THROUGHOUT THIS MANUAL BEFORE USING THE PRODUCT. INCORRECT USE OF THE PRODUCT MAY CAUSE UNEXPECTED DAMAGE TO THE USERS OR BYSTANDERS.

While all efforts have been made to ensure the accuracy of all information in this manual, FUJITSU assumes no liability to any party for any damage caused by errors or omissions or by statement of any kind in this manual, its updates or supplements, whether such errors are omissions or statements resulting from negligence, accidents, or any other cause. FUJITSU further assumes no liability for incidental or consequential damages arising from the use of this manual. FUJITSU disclaims all warranties regarding the information contained herein, whether expressed, implied, or statutory.

DO NOT MAKE MECHANICAL OR ELECTRICAL MODIFICATIONS TO THE EQUIPMENT. FUJITSU LIMITED IS NOT RESPONSIBLE FOR REGULATORY COMPLIANCE OR SAFETY OF A MODIFIED FUJITSU PRODUCT.

DO NOT REPAIR OR INSTALL THE EQUIPMENT BY USERS. IT SHOULD BE PERFORMED BY A TRAINED SERVICE ENGINNER.

THIS PRODUCT IS NOT DESIGNED FOR USE IN ON-LINE CONTROL EQUIPMENT IN HAZARDOUS ENVIRONMENTS SUCH AS OPERATION OF NUCLEAR FACILITIES, AIRCRAFT NAVIGATION OR CONTROL, OR DIRECT LIFE SUPPORT MACHINES. HENCE, IF THESE PRODUCTS ARE USED IN SUCH HAZARDOUS ENVIRONMENTS, FUJITSU LIMITED AND SUN MICROSYSTEMS, INC. DOES NOT WARRANT THEM AT ALL.

FUJITSU reserves all the right to make changes to any products herein to improve reliability, function, or design, without further notice and without obligation.

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A 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.

DOC Class A Notice

This class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numerique de la class A respecte toutes les exigences du Reglement sur le material brouiller du Canada.

Warning   This is a Class A product of Electromagnetic Interference (EMI) standard. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

VCCI/FCC label

The VCCI/FCC labels for models 200R, 400R, and the Expansion file unit (GP7B7FLxx) are affixed in the following locations:

ii

VCCI / FCC label

VCCI / FCC label
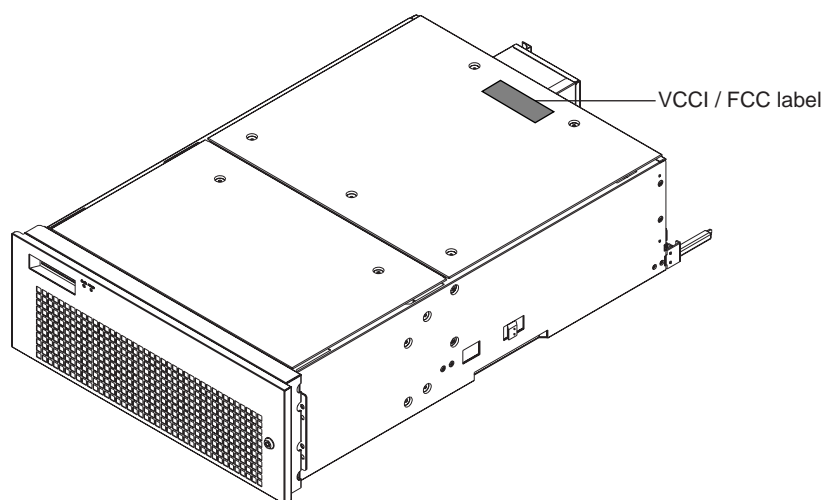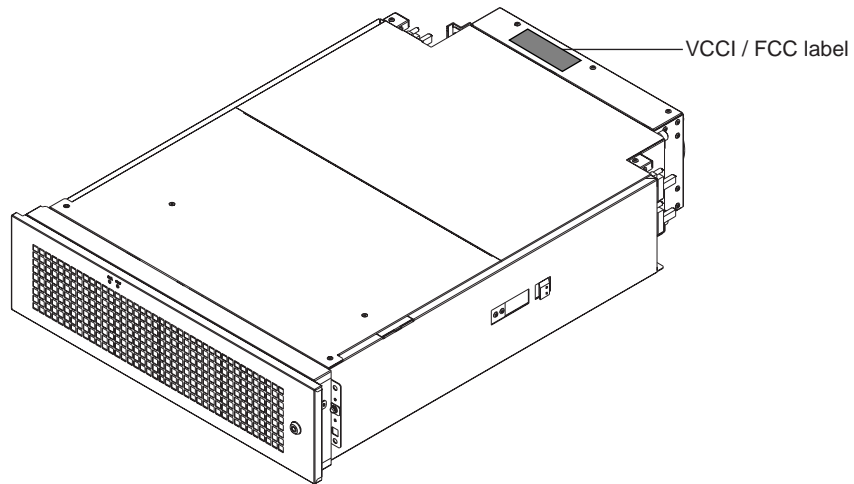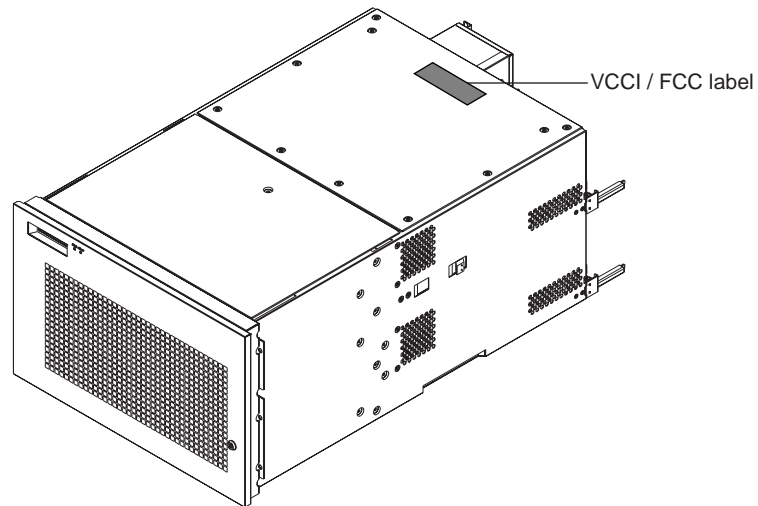
Laser Radiation Statement (EU)

Class 1 Laser Product

TRADEMARK ACKNOWLEDGMENTS

TRADEMARKS

Fujitsu and the Fujitsu logo are trademarks of Fujitsu Limited.

SPARC64 is a registered trademark or trademark of SPARC International, Inc. in the United States and other countries used under license by Fujitsu Ltd. Products bearing SPARC64 trademarks comply with SPARC V9 architecture developed by SPARC International, Inc. Products bearing the SPARC trademarks are based on an architecture originally developed by Sun Microsystems, Inc. "

Sun, the Sun logo, Sun Microsystems, Sun Microsystems Computer Corporation, the Sun Microsystems Computer Corporation logo, SunSoft, the SunSoft logo, Solaris, Solaris PEX, SunOS, SunLink, OpenWindows, Direct Xlib, SunSHIELD, NeWS, NeWSprint, SunInstall, DeskSet, ONC, ONC+, OpenBoot, Online DiskSuite, NFS, JumpStart, AnswerBook, the AnswerBook logo, SunDiag, ToolTalk, Sun PC, and Wabi are trademarks or registered trademarks of Sun Microsystems, Inc., in the U.S. and certain other countries.

UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Ltd.

All other product names mentioned herein are the trademarks of their respective owners.

THIS PUBLICATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR MERCHANTABILITY, FITNESS FOR A PARTICULAR POURPOSE, OR NONINFRINGEMENT.

THIS PUBLICATION COULD INCLUDE TECHNICAL INACCURACIES OR TYPOGRAPHICAL ERRORS. CHANGES ARE PERIODICALLY ADDED TO THE INFORMATION HEREIN; THESE CHANGES WILL BE INCORPORATED IN NEW EDITIONS OF THE PUBLICATION. FUJITSU LIMITED MAY MAKE IMPROVEMENTS AND/OR CHANGES IN THE PRODUCT(S) AND/OR THE PROGRAM(S) DESCRIBED IN THIS PUBLICATION AT ANY TIME.

Documents produced by FUJITSU may contain technology controlled under the Foreign Exchange and Foreign Trade Control Law of Japan. The document which contains such technology should not be exported from Japan or transferred to anyone other than residents of Japan without first obtaining license from the Ministry of International Trade and Industry of Japan in accordance with the above law.

Second Edition: November 1999

This manual may be best printed on A4 size. If it is printed on 8.5" (11" size, adjust your printer setting in advance.

The contents of this manual may be revised without prior notice.

The contents of this manual shall not be disclosed in any way or reproduced in any media without the express written permission of Fujitsu Limited.

All Rights Reserved, Copyright (c) FUJITSU LIMITED 1999

iv

Preface

This manual explains the function, configuration, and operation of GP7000F. This manual is intended for the experienced users who have a basic knowledge of computer systems.

The structure of this manual is as follows:

Introduction to Chapters

CHAPTER 1 Product Outline

   Chapter 1 describes the distinctive features of GP7000F.

CHAPTER 2 M200 Main Cabinet

   Chapter 2 explains the device configuration and operation of M200 Main Cabinet.

CHAPTER 3 M200R Main Cabinet

   Chapter 3 explains the device configuration and operation of M200R Main Cabinet.

CHAPTER 4 M400A Main Cabinet

   Chapter 4 explains the device configuration and operation of M400A Main Cabinet.

CHAPTER 5 M400R Main Cabinet

   Chapter 5 explains the device configuration and operation of M400R Main Cabinet.

CHAPTER 6 M600 Main Cabinet

   Chapter 6 explains the device configuration and operation of M600 Main Cabinet.

CHAPTER 7 M600R Main Cabinet

   Chapter 7 explains the device configuration and operation of M600R Main Cabinet.

CHAPTER 8 Expansion Disk Cabinet

   Chapter 8 describes the distinctive features of the GP7000F external disk cabinet.

CHAPTER 9 Expansion File Unit Type-2(GP7B7FLxx)

   Chapter 9 describes the distinctive features of the GP7000F rack mount expansion disk unit.

CHAPTER 10 Expansion File Unit(GP7B7FU1xx)

   Chapter 10 describes the distinctive features of the GP7000F rack mount expansion disk unit.

CHAPTER 11 Input-Output Units

   Chapter 11 explains the specifications of Input-Output units.

Conventions for Warning Messages

A warning message consists of a signal and statements. The signal consists of a symbol and a signal word or just a signal word.

The following are the signals and their meanings:

⚠ CAUTION

This indicates a hazardous situation could result in minor or moderate personal injury if the user does not perform the procedure correctly. This signal also indicates that damage to the product or other property, may occur if the user does not perform the procedure correctly.

IMPORTANT

This indicates information that could help the user use the product more efficiently.

In the text, the signal is centered, followed below by the indented message. A wider line space precedes and follows the message to show where the message begins and ends. The following is an example:

(Example)

⚠ CAUTION **Data destruction:** Do not press these buttons before installing the necessary software package. Otherwise, data may be destroyed. Turn off the system in the OBP prompt state if the software package is not installed.

Attention

Please forward any comments you may have regarding this manual.

To make this manual easier for users to understand, opinions from readers are needed. Please write your opinions or requests on the "Comment Form" sheet at the back of this manual and forward it to the address provided on the sheet.

Important Warnings

The following are cautions found in this manual. They have been compiled here with corresponding page references.

⚠ CAUTION   A hazardous situation could result in minor or moderate personal injury if the user does not perform the procedure correctly. Also, damage to the product or other property may occur.

Task	Warning
Normal Operation	Data destruction: Pressing the RESET switch while the system is running may destroy data.
System Installation	Be sure to install software packages from "Basic Software Extension" or "Enhanced Support Facility. Otherwise, above switch functions or proper messages on LCD panel are not guaranteed.
Terminal break command	If used improper commands at the ok prompt, the GP7000F may be destroyed. If you need to used any other commands except shown on this manual, you should well understand the function and usage of the command before using it.
Power Off	Be sure to eject backup tape media and any diskettes before power-off the system, if the media are installed. Other wise, the data on the media may be destroyed.
Normal Operation	Except in an emergency, never turn off the AC switch or disconnect the power cable wile the GP7000F main cabinet is turned on. If you do, data in the disk drive may be destroyed.

Task	Warning
System Installation	Install "Basic Software Extension" or "Enhanced Support Facility"before operating the system. Without this package, incorrect front panel operations and hardware errors may cause the system to shutdown or destroy data.
Disk Expansion Unit Installation	Be sure to replace the power supply fan when installing the Disk Expansion Unit. Otherwise, the system will shutdown or disk units will deteriorate due to a temperature rise in the M200 main cabinet caused by insufficient cooling.
Disk Expansion Unit Installation	If the installing location (slot) is not set or set incorrectly, the disk drive may not be hot-swappable. Data may be destroyed as a result of inadvertently replacing the different disk drive. Be sure to set the installing location (slot) correctly. Also, while replacing or initializing NVRAM, set the installing location again.
Normal Operation	Do not set the AC main line switch to OFF, not disconnect the power cable or RCI cable while the GP7000F main cabinet is powered on, unless absolutely necessary. Otherwise, the data may be destroyed in the disk units.
Normal Operation	Do not set the AC main line switch to OFF, nor disconnect the power cable or RCI cable while the GP7000F main cabinet is powered on, unless absolutely necessary. Otherwise, the data in the disk units may be destroyed.
Replacing Disk Drives	When replacing the disk unit,take the following precautions. If these precautions are not observed, the disk unit or its data may be destroyed.
Formatting Disk Drives	Carefully proceed formatting a disk drive. Once formatting a disk drive, data on the disk never restored, if you don't have backup files.
Handling Floppy Disks	Do not eject a floppy disk while the access LED is on, other wise the floppy disk or the data on the diskette may be destroyed. For information on the handling method, see Table 11.2, "Handling floppy disks."
Ejecting DAT cartridge	Data destruction: Do not press the eject switch during an operation (when the tape LED is blinking). If the eject switch is held down for about 5 seconds or pressed 3 times within a 5 minutes period, the forced ejection function may execute and the data being written may be destroyed.
Handling DAT cartridge	When using the data cartridge (DAT), take the following precautions. If these precautions are not observed, the DAT unit or its data may be destroyed.
Storing 8-mm cartridge	When using or storing the data cartridge, take the following precautions. If these precautions are not taken, the data on 8-mm tape may be destroyed.
Ejecting QIC cartridge	Data destruction: Do not press the eject switch during an operation. The forced ejection function may operate and data being written may be destroyed.
Storing QIC cartridge	When using or storing the data cartridge, take the following precautions. If these precautions are not taken, the QIC tape unit or its data may be destroyed.

ix

CONTENTS

i

ii

CHAPTER 7   M600R Main Cabinet   81

CHAPTER 8   Expansion Disk Cabinet   95

CHAPTER 9   Expansion File Unit Type-2 (GP7B7FLxx)   105

CHAPTER 10   Expansion File Unit (GP7B7FU1xx)   113

CHAPTER 11   Input-Output Units 121

CHAPTER 12   External Interfaces 145

CHAPTER 13   RCI Setting 153

CHAPTER 14   Troubleshooting 157

ILLUSTRATIONS

viii

TABLES

xii

1

CHAPTER 1 Product Outline

CONTENTS

1

1.1   Key Features

The GP7000F is SMP (Symmetric Multi-Processor) servers with 64-bit SPARC64 GP processors. Each model in the group has high-performance 64-bit processors, high-speed I/O interfaces and enhanced reliability, availability, and serviceability (RAS) features. The crossbar configuration is used as the system architecture of the GP7000F, and the performance of the multi-processor configuration has been improved almost linear scalability.

The GP7000F, which has excellent scalability and reliability, is an ideal server for not only group or department servers but also for mission-critical enterprise servers.

IMPORTANT

The availability of these products depends on the Sales and Support Companies. Please contact these companies.

High-performance SPARC64 GP Processor

- The SPARC64 GP is a high performance processor which has an out-of-order execution engine.
- The SPARC64 GP supports large size external cache of 2MB/4MB/8MB per processor as well as 64KB(instruction)+64KB(Data) on-chip cache.
- Error Correcting Code (ECC) is used for both on-chip and external cache.

High-performance Multi-Processor Platform

- Symmetric Multiprocessing (SMP) architecture
- The memory system has a high bandwidth, up to 8-way interleaving, and which enables fast access.
- A packet-based bus protocol, to enable a throughput of 1.3 to 1.6 GB/s per processor, is implemented.
- A crossbar configuration, which is based on a packet bus, enables high-level parallel operations of processors and memory modules, I/O and memory modules, and data transfer among processors. And, the system delivers scalable performance by installing additional processors and I/Os.
  - The crossbar switch enables parallel operations of several processors and I/Os.
  - The performance of the single bus is improved by expanding the bus width and high frequency operation.
  - The efficiency of bus usage is drastically improved by bus control in the packet exchange system.
- High-performance EDO DRAM (Extended Data Out DRAM) is used on the platform for the memory expansion.(M200, M600)
- High-performance SDRAM (Synchronous DRAM) is used on the platform for the memory expansion.(M200R, M400A, M400R, M600R)

2

High-speed I/O interface

- One built-in 40 MB/s UltraSCSI Single-Ended interface for internal devices.

- One built-in 100BASE-TX interface (10/100 Mbps, auto-sensing).

- The GP7000F has some 64-bits PCI (Peripheral Component Interconnect) buses.

- Additional interfaces, such as 100BASE-TX, FDDI, ATM, can be provided by installing PCI cards. Both short and long size PCI cards can be installed. (*1)

  *1) The maximum length of the cards that can be installed in PCI slots #8 to #12 of the M600R Main cabinet is 19.4cm.

High-performance, Large-capacity File Devices

- Up to 22, 7200rpm or 10000rpm, UltraSCSI disk drives can be built in. Note that the number of drives that can be installed depends on each model.

- The disk drives can be hot-swappable

- One CD-ROM drive unit is provided as standard.

- One tape drive can be built in as optional.

Reliability, Availability, and Serviceability (RAS) features

- Error Correction Code (ECC) is implemented for on-chip cache, external cache, memory module and data paths. The data for the I/O data path(PCI) is protected by parity.

Table 1.1   Data Protection for Components and Interfaces

Components and interfaces	Data protection method
Processor (on-chip & external cache)	By ECC (corrects 1 bit and detects 2 bit)
Memory	By ECC (corrects 1 bit and detects 2 bit)
Data path	By ECC (corrects 1 bit and detects 2 bit)
Address path	By parity
I/O bus (PCI)	By parity
Processor operation	Operation monitoring by an independent processor
Built-in basic SCSI, LAN, parallel	By parity, IP check sum

Note: The RS232C interface and a floppy disk on a standard configuration are not protected by parity.

- Power-on diagnostics are executed on the system components, such as processors, memory modules and so on, during initial power-on or reset of the system.

- Automatic System Reconfiguration (ASR) isolates faulty hardware components immediately after detecting it. The ASR function isolates not only faulty components detected during initial power-on but also those detected while the system is running. However, the ASR function cannot restart the system if errors are detected in the resources required for booting up the system, or in the basic components of the system.

3

- A SCF (System Control Facility), which has an integrated service processor, monitors the operation of SPARC64 GP processors, and reports erroneous events such as environmental monitoring explained below. With a GUI-based intelligent monitoring and reporting tool, which is provided in "Basic Software Extension" or "Enhanced Support Facility", administration and management of GP7000F is easy and less time consuming.

- The SCF monitors environmental temperature, powering and cooling conditions. This function prevents the system from environmental condition that can cause error or damages to the system.

  – Monitoring Environmental Temperature ; The guaranteed operating temperature of the system ranges from 5 to 35 degrees Celsius (41 to 95 degrees Fahrenheit). A warning message is displayed at about 35 degrees Celsius (95 degrees Fahrenheit). If the temperature reaches about 40 degrees Celsius (104 degrees Fahrenheit), the system is shut down automatically.

  – Monitoring Powers ; The power supplies are always monitored, and a message is displayed on the LCD panel, if power supply failure is detected. When the system doesn't have a redundant power supply, the system will be powered off immediately. Besides it, the integrated service processor monitors and controls DC-DC converter which provides power to the processor modules.

  – Monitoring Fans ; Several fans are installed inside the GP7000F main cabinet. If one of the fans breaks down, a warning message which indicates the defective fan is displayed on the LCD panel. And, if the fans cannot provide enough cooling, the system is shut down automatically.

- RCI (Remote Cabinet Interface) makes power cycle control of expansion I/O unit, such as Expansion Disk Unit and Expansion File Unit, which has the RCI interface.

- Status of LEDs and messages on LCD panel of GP7000F main cabinet as well as console messages make trouble shooting easy and less time consuming.

- All internal disk drives are hot-swappable, and these drives can be mirrored for higher data availability. In addition, redundant power supplies and fans are supported for higher availability.

- The front cover/panel has a lock key to prevent unauthorized access to the internal I/O devices as well as front panel switches.

1.2   Operator Panel

The operator panel has a set of status LEDs, switches, and a LCD panel. The switches as well as built-in I/O device are covered with a panel cover that can be locked with a key. It prevents incorrect operations and ensures security for the internal I/O device as well as the switches.
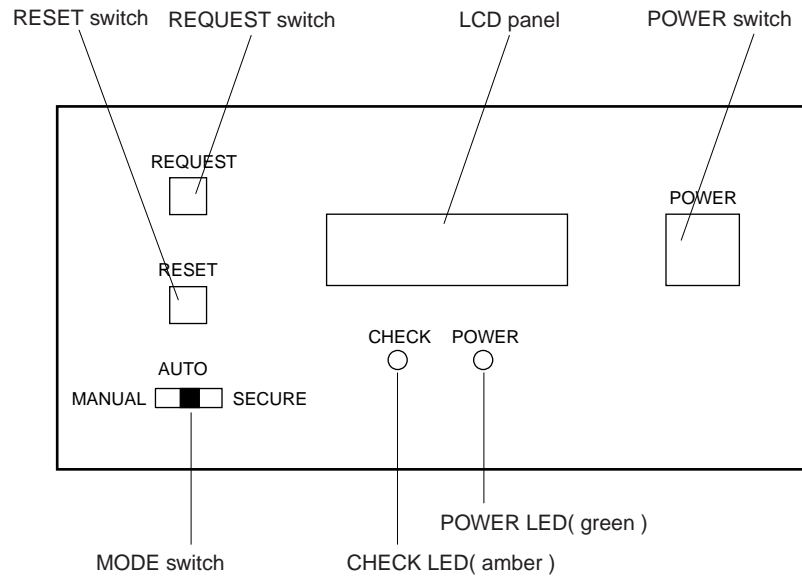
Figure 1.1   Operator Panel (M200, M600)
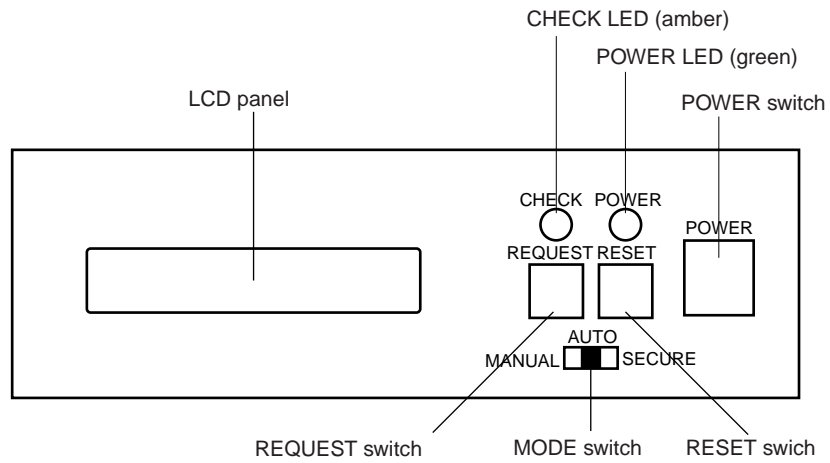
Figure 1.2   Operator Panel (M200R, M400A, M400R, M600R)

5

LED (CHECK LED/POWER LED)

The POWER LED indicates whether the system is turned on while the CHECK LED indicates system operation by lighting up or blinking.

Table 1.2   POWER LED

Status	Descriptions
ON	The power is on
OFF	The power is off

The user and system administrator can recognize the system operation status from the CHECK LED and messages that appear on the LCD panel.

Table 1.3   CHECK LED

Status	Descriptions
ON	The system is turned on, but the processors are not operating.
Blinking (quickly)	System down.
Blinking (slowly)	There are faulty components in the system. (The system is still operating)
OFF	The system is not turned on or it is operating normally

If the system administrator shuts down the system (when the AC main line switch is on) while there are degraded-mode components remaining in the system, the CHECK LED will continue to blink slowly to remind the system administrator there are faulty components to be diagnosed. Possible causes of a CHECK LED alarm are: errors in temperature monitoring, related components (such as the power supplies and fans) or degraded-mode components (such as processors and memory modules, etc.).

When the system is turned on, the CHECK LED lights up briefly. However, this is not an error unless the CHECK LED remains light up for more than three seconds, or begins to blink.

LCD   The LCD panel can display 2 rows of 16 digits. The messages displayed on it are status or results of the power-on diagnostics, and environmental events such as over temperature, etc. Therefore, when an error occurs, the user or system administrator can recognize the state of the hardware system easily by checking the messages displayed on the LCD panel as well as console messages.

Error messages remain on the LCD panel until the error is corrected. There is only one LCD panel, therefore, it displays messages in turn when there are several errors. Note that error events are corrected even though their message displayed on the panel is overwritten by messages of other events. However, since the initial diagnostics is allowed to report only one event, the next message of another event will be displayed on the panel after repaired a reported event.

Messages are erased from the panel when:

- an error event is corrected.

- the power of the main cabinet is cycled

- the AC main line switch is turned off, or

- the RESET switch is pressed (partial messages are erased).

When an error or an abnormal state occurs, record the messages displayed on the LCD panel and status of the CHECK LED. Then, contact the system administrator or service engineers. See 14 "Troubleshooting" for more information regarding the messages displayed on the LCD panel.

6

Switches   There are 4 switches on the operator panel, as below.

POWER switch

The user can turn on and off the system by pressing this switch. The POWER switch operation is managed by the setting of the MODE switch as well as software setting with "scftool". By pressing the POWER switch while the system is running, the system will be powered off after graceful shutdown. Refer to the user's guide of "Basic Software Extension" or "Enhanced Support Facility" for the information of the "scftool".

RESET switch

The user can reset the system forcibly with the RESET switch. Enabling the RESET switch is managed by the state of the MODE switch setting. If the user cannot restart the system with the RESET switch, check the LCD panel if there are any messages, then press this switch again.

⚠ CAUTION   Data destruction: Pressing the RESET switch while the system is running may destroy data.

REQUEST switch

The REQUEST switch is used by trained service engineers only for maintenance purpose. Do not use the REQUEST switch by users.

MODE switch

The MODE switch is used to set boot-up mode of the system as well as enabling/disabling the POWER, RESET and REQUEST switches. The MODE switch has 3 states as shown in the Table 1.4 . In the table below, YES means that a switch is enabled when the MODE switch is set to the position/state, while NO means a switch is disabled.

Table 1.4   MODE Switch Settings

	POWER switch	RESET switch	REQUEST switch	Remarks
MANUAL	YES	YES	YES	The system stops at ok prompt after the power-on diagnostics.
AUTO	YES	NO	NO	The system boots up automatically after the initial diagnostics.
SECURE	NO	NO	NO	The system boots up automatically after the initial diagnostics, and keyboard STOP+A command and terminal break command are ignored while Solaris is running.

Notes: At the maintenance of main cabinet, be sure to set the MODE switch to the MANUAL state even if the AC line switch is OFF.

The POWER, RESET and REQUEST switches must be pressed longer than 0.3 seconds for valid operation.

7

$\triangle$ CAUTION   Be sure to install software packages in the "Basic Software Extension" or "Enhanced Support Facility". Otherwise, above switch functions or proper messages on LCD panel are not guaranteed.

IMPORTANT

Under the MANUAL and AUTO state, keyboard STOP+A command and terminal break command will abort booting-up the system or halt the system while operating system is running. To prevent system down by unexpected break or STOP+A command, set MODE switch SECURE state.

1.3   External Interface

Various interfaces are available for peripherals and network connections.

PCI Interface

The GP7000F provides the PCI bus as the I/O interface. The PCI interface has the following characteristics:

- PCI Local Bus Specification, Rev 2.1 compliant.

- 64-bit bus widths, 33 MHz (5.0V) and 33/66 MHz (3.3V).

- Short and long size card can be installed into any of the PCI slots. (*1)

- Data paths are protected by parity.

  *1)   The maximum length of the cards that can be installed in PCI slots #8 to #12 of the M600R Main cabinet is 19.4cm.

Connector

The following connectors are installed on the back of the GP7000F main cabinet:

8

Table 1.5   Connectors and Switches

Connector/ Switch	Marking	Type	Remarks
RS232C	SERIAL A/B	Dsub/25 pin*	The same connector as Parallel
KB	KB	8-pin DIN	Connect a mouse via a keyboard
Parallel	PARALLEL	Dsub/25 pin*	AT compatible
10 Mb/100Mb Ethernet	LAN	RJ45	10 Mb/100 Mb automatic recognition
UPS	UPS	Dsub/9 pin	Connector to a UPS (Uninterruptable Power Supply) which has the UPA interface.
RCI	RCI	RJ11	Install a terminating resistor
PC	PC	8-pin DIN	For controlling power on for the main cabinet

*   This type will not operate if connected improperly. However, it does not affect the system performance.

The RS232C, Parallel and Ethernet interfaces use industry-standard connectors. Therefore, the user can connect them to various peripheral devices. For the specifications of the RS232C, parallel interface and UPS control interface, see 12 , "External Interfaces".

Table 1.6 shows other connectors and switches than the above:

Table 1.6   Connectors and Switches for Maintenance

Connector/ Switch	Marking	Type	Remarks
SCF/switch	No notation	Push pin	Unavailable
SCF/RS232C	No notation	Dsub/9 pin	Unavailable

IMPORTANT

The connector and switches in Table 1.6 are used only for the maintenance purpose by trained service engineers. If used for any other reason the server will malfunction.

9

1.4   Console

Serial Terminal

If your GP7000F has no local graphic console, a serial terminal, such as Personal Computer, should be attached to the GP7000F in order to install the system and to run diagnostic programs. To attach a serial terminal :

- Connect a terminal data cable to serial port A on your server.
- Set a terminal to receive 8bit per character, 1 stop bit and no parity at 9600 baud.

Refer to the document accompanying your terminal for more information about the terminal itself.

Terminal break command

You can disable to enter the OpenBoot mode from break command and keyboard STOP+A command, by the following proceedings.

- set no-break value to fw-option variable at the ok prompt, with the procedures as below.
- Then, running the system on SECURE mode, which you can set on the operator panel.

1 To display current setting, type `print-fw-options` command as below. Below shows default setting, and no default value means that the break command and STOP+A command are enabled.

```
ok print-fw-options
fw-options =
```

2 To disable break command and keyboard STOP+A command, type as below.

```
ok set-fw-options no-break
fw-options = no-break
```

3 To make sure the settings, type `print-fw-options` command and check the no-break value is set as below.

```
ok print-fw-options
fw-options = no-break
```

To enable the break command and STOP+A command, use the following command at the ok prompt. Note that the commands are enabled as the default of the GP7000F.

4 To display currrent setting, type `print-fw-options` command as below. The no-break value means the break command and keyboard STOP+A command are disabled.

```
ok print-fw-options
fw-options = no-break
```

5 To enable break command and keyboard STOP+A command, type as below.

```
ok clear-fw-options no-break
fw-options =
```

6 To make sure the setting, type `print-fw-options` command and check the no value is set as below.

```
ok print-fw-options
fw-options =
```

⚠ CAUTION   If used improper commands at the ok prompt, the GP7000F may be destroyed. If you need to used any other commands except shown on this manual, you should well understand the function and usage of the command before using it.

1.5   Power On/Off

Power On

After connected cables necessary to the system as well as console (or local graphic display), take the following procedures.

1   Turn on any peripherals and external IO devices attached to the main cabinet as well as a terminal (or local graphic display).

2   Set the AC main line switch to ON.

3   Press the POWER switch on the operator panel, when the mode switch is in MANUAL/AUTO mode. Note that power on function by pressing keyboard power-on key is not supported.

IMPORTANT

If a serial terminal is attached to the system, be sure to power on the terminal before the main cabinet is powered on, and never power off the terminal during the system is running. Otherwise, the system may be halted and it may destroy data.

Power Off

Before power-off the system, notify users that the system will be shut down. And, back-up the files if necessary.

1   Press the POWER switch on the operator panel, then the system will be powered off after a graceful shutdown.

2   Turn off any peripherals and external IO devices attached to the main cabinet as well as terminal(or local graphic display).

⚠CAUTION

Be sure to eject backup tape media and any diskettes before power-off the system, if the media are installed. Otherwise, the data on the media may be destroyed.

Except in an emergency, never turn off the AC switch or disconnect the power cable while the GP7000F main cabinet is turned on. If you do, data in the disk drives may be destroyed.

IMPORTANT

When turning on the main line switch under a state that the MODE switch is AUTO or SECURE, the GP7000F may be powered up automatically just turn on the main line switch if APCS(Auto Power Control System) software is installed in your GP7000F system.

To avoid powering up just turning on the main line switch even if the softwares is installed in your GP7000F system, turn on the main line switch under the state of the MODE switch is set to MANUAL position.

11

1.6   Installation of Basic Software Extension or Enhanced Support Facility

To enable support of GP7000F specific functions, software packages in the "Basic Software Extension" or "Enhanced Support Facility"are needed to install on the system. Please refer to the user's guide and installation guide of the "Basic Software Extension" or "Enhanced Support Facility" for more information.

⚠CAUTION	Install "Basic Software Extension" or "Enhanced Support Facility" before operating the system. Without this package, incorrect operator panel operations or hardware errors may cause the system to shut down or destroy data.

1.7   local-mac-address Property

The network interface of the Ethernet (100BASE-TX) is assigned a unique MAC (Media Access Control)adress, which represents the 48-bit ethernet address for the channel. The OpenBoot(R) firmware reports this MAC address via the local-mac-address property in the device nodes corresponding to the network interfaces.

A system is not obligated to use this assigned MAC address if it has a system-wide MAC address. In such cases, the system-wide MAC address applies to all network interfaces on the system.

The device driver, or any other adapter utility, can use the network device's MAC address (local-mac-address) while configuring it. In future Solaris releases, you will be able to use the channel's MAC address when booting over the network.

The mac-address property of the network device specifies the network device specifies the network address (system-wide or local-mac-address) used for booting the system. To start using the MAC address assigned to the network interface of the Ethernet (100BASE-TX), set the NVRAM configuration variable local-mac-address? to true.

```
OK  setenv  local-mac-address?  true
```

12

2

CHAPTER 2   M200 Main Cabinet

CONTENTS

13

2.1   Overview

Appearance
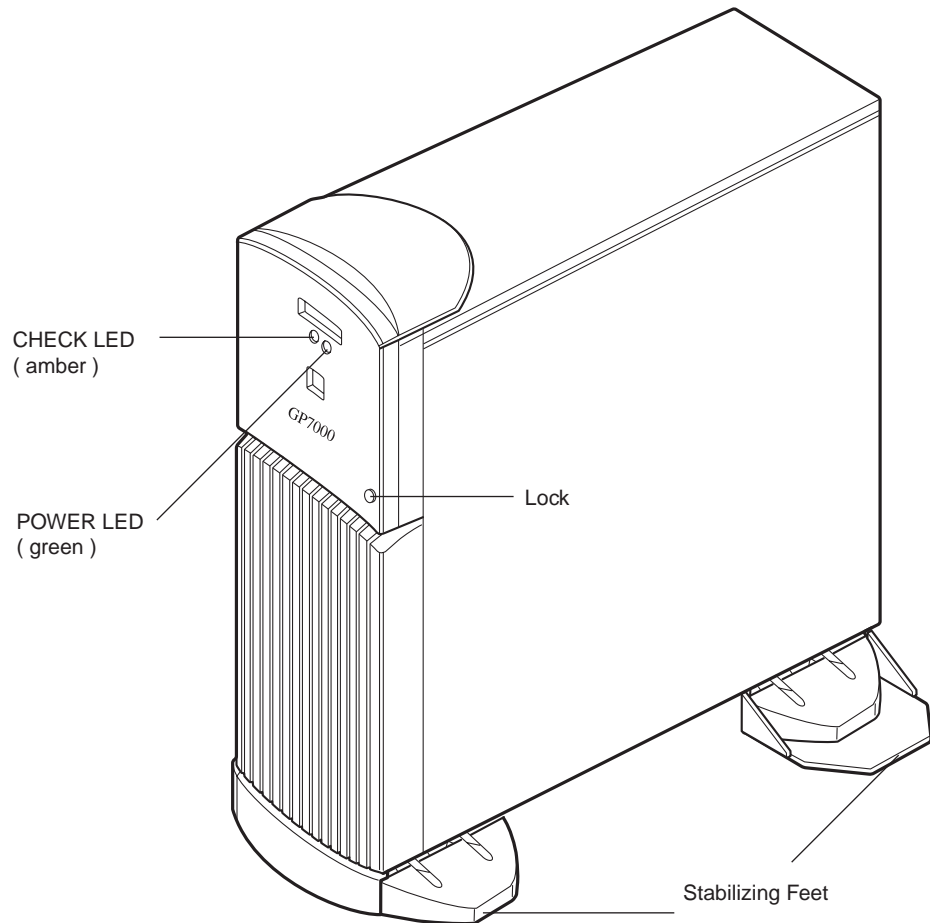
Figure 2.1   Front View of M200 Main Cabinet

Key Features

- Up to 2 processors

- 16 DIMM slots. Up to 4 gigabytes of memory.

- 64-bits width, 4 PCI buses provide 6 PCI slots (2*33/66MHz + 4*33MHz).

- Up to 8 UltraSCSI disk drive bays, which support hot-swap features.

- 1 CD-ROM unit and 1 floppy disk unit as the basic configuration.

- 1 tape unit can be installed.

- 1 100BASE-TX (auto-sensing 10/100Mbps), 2 Serial, 1 parallel, and 1 Keyboard/Mouse port

14

2.2 Device Configuration

The M200 main cabinet consists of the following components:

- Desk-side type cabinet

- Basic power supply and optional expansion power supply unit

- Cooling fans

- Systemboard

- Processor modules

- DIMM (Dual Inline Memory Module)

- Operator panel

- PCI card (option)

- SCSI-BP boards (1 basic board, 1 option board)

- Disk drive units

- CD-ROM unit

- Tape unit (optional QIC tape, 8-mm tape, or DAT)

- Floppy disk unit

The processor modules, DIMMs, PCI cards, tape drive unit, expansion power supply, disk expansion feature (SCSI-BP board), and disk drive units of the above components are available as options.

Front view of the M200 main cabinet
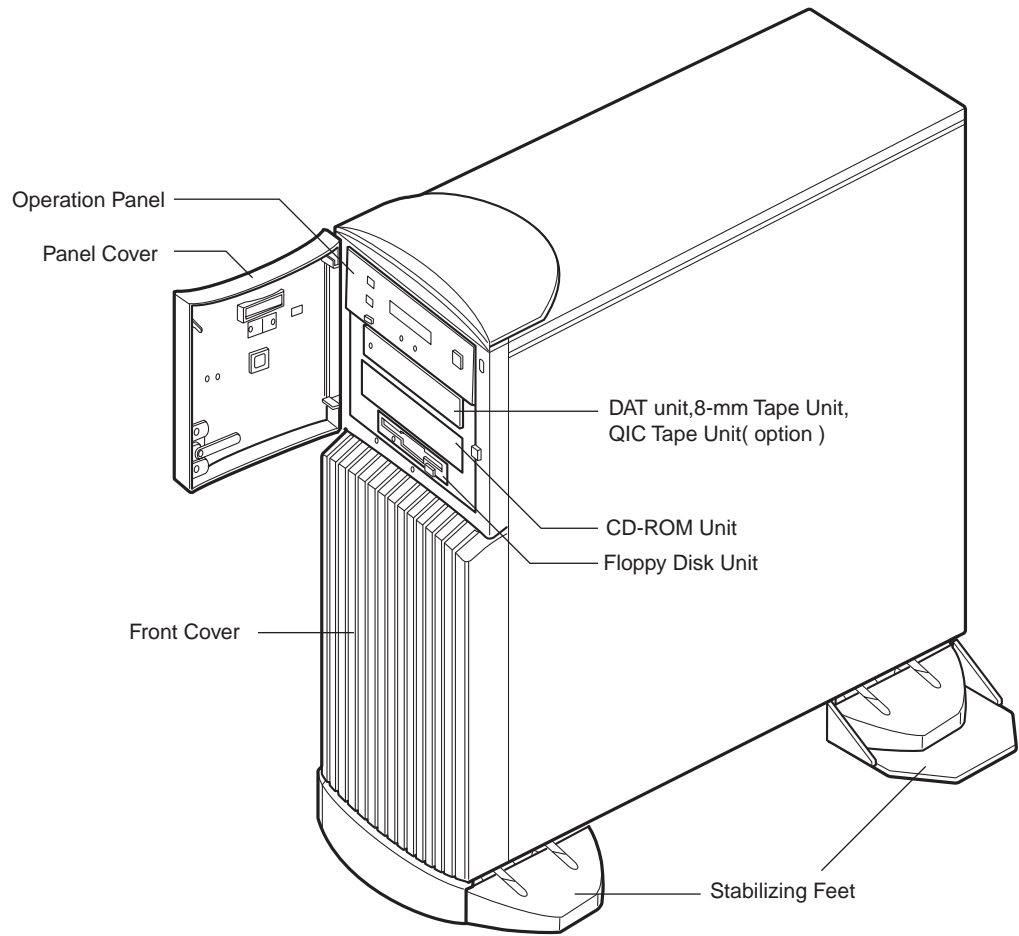
Figure 2.2   Open View of M200 Main Cabinet

Panel cover

The panel cover can be opened from its right side after unlocking it. Then, you can access switches on the operator panel, CD-ROM drive unit, Floppy drive unit, tape drive unit, and so on.

16

Fans   Table 2.1 lists the fans installed in the M200 main cabinet.

Table 2.1   Fans

Name	Shape	Location
Fan #0	120-mm (4.7 inch) square fan	Behind the Systemboard
Fan #1	120-mm (4.7 inch) square fan	Under the disk unit
Fan #2	92-mm (3.6 inch) square fan	Above the processor module
Fan #3	80-mm (3.1 inch) or 120-mm (4.7 inch) square fan (*1)	Behind the power supply
Fan #4	92-mm (3.6 inch) square fan	Side the PCI slot

*1   The 80-mm square fan is replaced by the 120-mm square fan when the expansion power supply is installed.

Power supplies

The M200 main cabinet has a basic power supply unit as well as DDC(DC-DC Converter)s dedicated to each processor module. When the Disk Expansion Unit is installed, The expansion power supply is required (when 5 to 8 disks are installed in the M200 main cabinet).

If the expansion power supply is not installed when the Disk Expansion Unit is installed, an indication that a mounting rule has been violated is reported on the LCD panel and power-on is inhibited. This checking function prevents faulty configurations. The checking function is executed when a disk cage is expanded regardless of whether a disk unit is installed.

The alarm detection feature is not implemented for the expansion power supply of the M200 main cabinet. If a failure occurs in the expansion power supply, the power cannot be supplied to the Disk Expansion Unit. In this case, the POWER LED on the disk expansion cage turns off. If an error occurs in the disk unit installed in the Disk Expansion Unit (because the power is not supplied), the expansion power supply may be at failed. Check the POWER LED on the expansion disk cage.

Stabilizing feet

The stabilizing feet prevent the M200 main cabinet from falling over when it is pushed from its side or if there is an earthquake. When installing the M200 main cabinet, be sure to install the stabilizing feet.

Rear of the M200 main cabinet

AC input, AC main line switch, power supply(FEP) and some connectors are located on the rear panel of the M200 main cabinet as shown in the Figure 2.3 .

17

RCI

AC Main Line Switch
AC Power Input

UPS
PC
100BASE-TX
Keyboard

PCI slot #6
PCI slot #5
PCI slot #4
PCI slot #3
PCI slot #2
PCI slot #1

RS232C
(Port A)

RS232C
(Port B)

Parallel
(AT Centrenics)

Stabilizing Feet
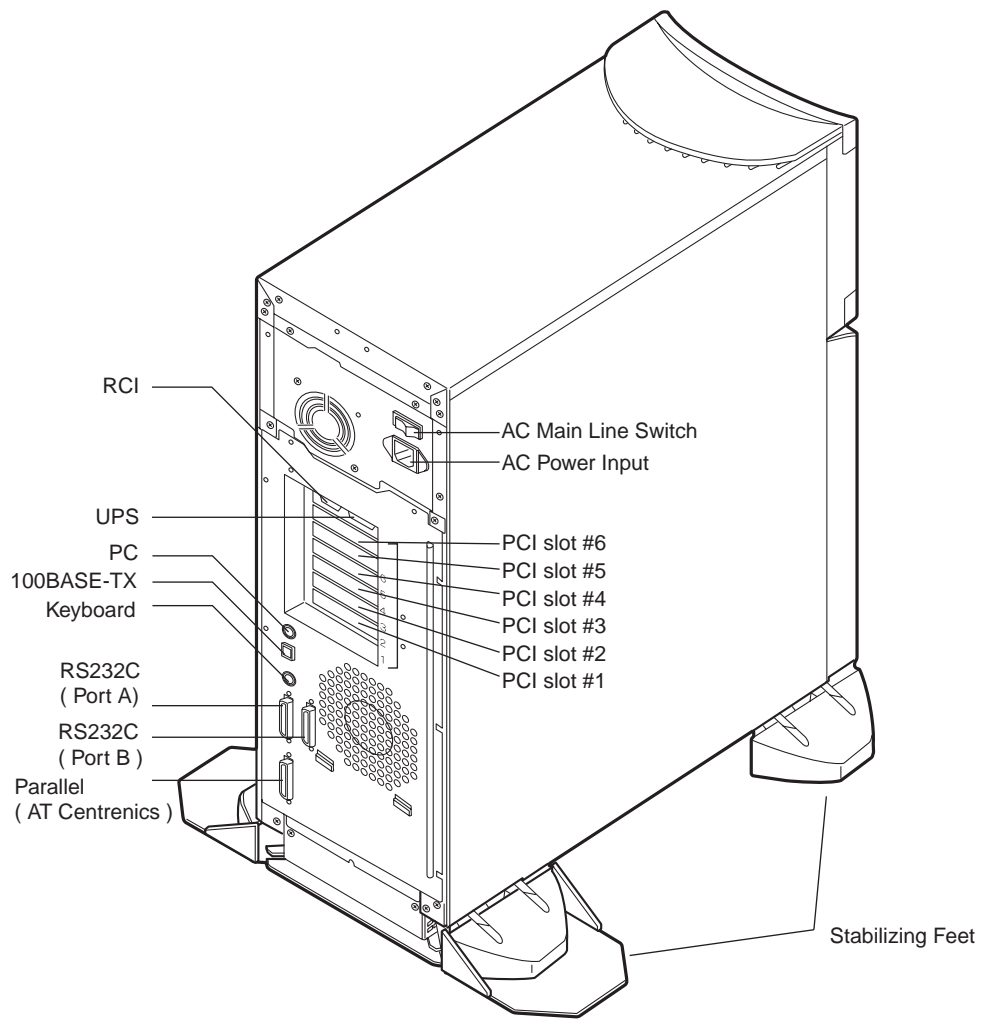
Figure 2.3   Rear View of M200 Main Cabinet

18

2.3   Systemboard

Systemboard layout

CPU module slots, memory module slots, and PCI slots are located on the Systemboard as described in Figure 2.4 .
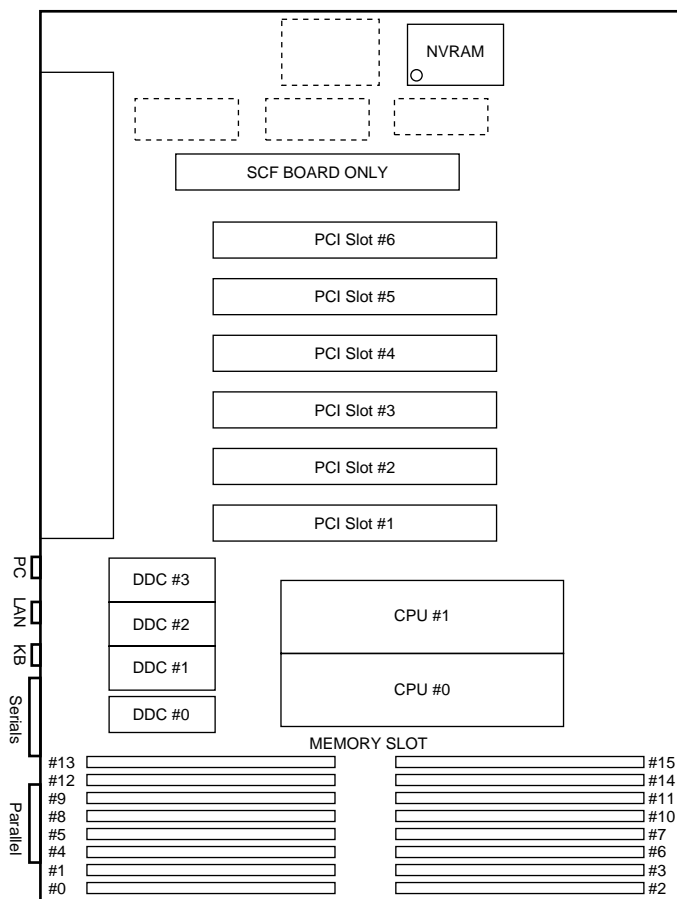
Figure 2.4   Systemboard Layout of M200

Processor Configuration

Up to 2 processors can be installed in the M200 main cabinet. When installing the processor modules, the following conditions must be satisfied:

● The installed processor modules must be the same type (including the cache size).

● Install a processor module in slot 0 before installing one in slot 1.

● When installing a processor module, install DC-DC converters along with the processor in the corresponding slot.

IMPORTANT

If any of the above conditions is not satisfied, the operation is not guaranteed.

19

Memory configuration

The M200 has 16 DIMM slots, allowing for as much as 4 gigabytes of main memory. When installing the DIMMs, the following conditions must be satisfied:

- When installing the first set of DIMM, install a set of 4 modules of the same size in slots 0 to 3.

- At subsequent memory expansions, install a set of 4 modules of the same size in slots 4, 5, 6, 7; and 8, 9, 10, 11; then 12, 13, 14, 15.

IMPORTANT

If any of the above conditions is not satisfied when installing the DIMMs, some DIMMs are degraded in the power-on diagnostics. When adding the memory modules, check that the DIMMs are installed correctly.

Memory ECC feature

The EDO DRAM is used as the memory element. The single-bit error correction and multiple-bits error detection features are available for a large capacity memory by using the Error Check Code (ECC) system. A single-bit error can be isolated down to the memory slot on which it occurred. A multiple-bit error can be isolated down to the pair of slots on which it occurred.

Checking the memory diagnostics

To check that the system recognizes installed memory modules correctly, execute the `show-post-results` command at the ok prompt. A module that does not satisfy any condition described in "Memory configuration" or a module judged to be faulty by memory diagnostics is treated as an invalid module. The screen below lists the command execution results related to memories and their meanings.

Example for normal operation

```
=== Memory =========
Type  :  EDO
SLOT#    Size[Valid(MB)/Existing(MB)]      Total
0-3     32/32 32/32 32/32 32/32      :  128/128 MB
4-7     32/32 32/32 32/32 32/32      :  128/128 MB
8-11    ----- ----- ----- -----      :  0/0 MB
12-15   ----- ----- ----- -----      :  0/0 MB
*=Error SLOT
```

In this example, a memory module has been placed in degraded mode.

```
  === Memory =========
Type  :  EDO
SLOT#    Size[Valid(MB)/Existing(MB)]      Total
0-3     32/32 32/32 32/32 32/32      :  128/128 MB
4-7      0/32  0/0*  0/32  0/32      :  0/96 MB
8-11    ----- ----- ----- -----      :  0/0 MB
12-15   ----- ----- ----- -----      :  0/0 MB
*=Error SLOT
```

20

The denominator indicates the size of the memory module for a slot (unit: megabytes); 0* indicates a faulty slot. The numerator indicates the size of the memory that is actually available for use. The numerator 0 indicates that no memory is used.

In this example, DIMMs are installed in slots 0 to 7. The size of each module is 32 megabytes except the one installed in slot 5. The initial system diagnostics detected an error in the module installed in slot 5 and placed the module in degraded mode, assuming there was no available space. As a result, the group of modules in slots 4 to 7 is not available for use.

2.4   Disk Units

Disk drive configuration

When the Disk Expansion Unit (which includes an expansion disk cage) is added, up to 8 disk units can be installed in the M200 main cabinet. Basic disk cage (bay #0 - #3) is connected to UltraSCSI bus, and the expansion disk cage (bay #0 - #3) is connected to another UltraSCSI bus. Each disk drive has two status LEDs. For the status of these LEDs, refer to 11 , "Input-Output Units."
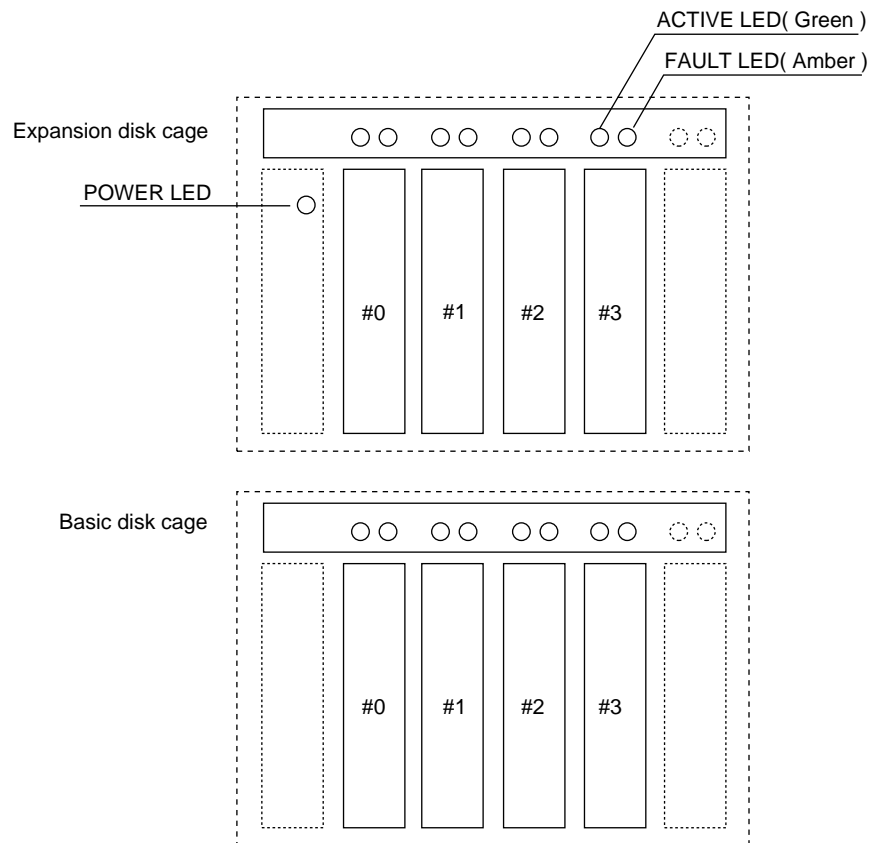
Figure 2.5   Disk Drive Bays of M200 Main Cabinet

21

Disk Expansion Unit

By using the Disk Expansion Unit, up to 8 disk drives can be installed in the M200 main cabinet. The Disk Expansion Unit consists of the following components:

- Disk cage (including SCSI-BP)
- PCI adapter (UltraSCSI Wide Single-Ended)
- Expansion power supply unit (requires changing to 120-mm (4.7 inch) square fan: included)
- Cables

⚠ CAUTION   Be sure to replace the power supply fan when installing the Disk Expansion Unit. Otherwise, the system will shutdown or disk units will deteriorate due to a temperature rise in the M200 main cabinet caused by insufficient cooling.

A Power LED is installed on the SCSI-BP board. If both ACTIVE LED and FAULT LED above a disk bay do not lights, check to see if the POWER LED on the SCSI-BP board is turned on. If this POWER LED does not turn on, disk expansion unit or its cable may be faulty.

When installing the Disk Expansion Unit, the installed location (slot) of the PCI card used for connection must be set. Below shows the setting procedure.

1 First, execute `show-scsi` command at the `ok` prompt, to get the path name of the UltraSCSI card and it's PCI slot. The followings example shows that a Ultra SCSI card is installed in PCI slot#6.

```
ok show-scsi
PCI#6 : /pci@1d,4000/scsi@5,1
PCI#6 : /pci@1d,4000/scsi@5
SCSI#0: /pci@1f,4000/scsi@3
ok
```

2 Then, set `led-control-1` to correspond to the PCI slot by using `setenv` command at the `ok` prompt. The followings example shows that a Disk Expansion Unit connection to SCSI Conector #1 of the UltraSCSI card in PCI slot#6.

```
ok setenv led-control-1 /pci@1d,4000/scsi@5
```

⚠ CAUTION   If the installing location (slot) is not set or set incorrectly, the disk drive may not be hot-swappable. Data may be destroyed as a result of inadvertently replacing the different disk drive. Be sure to set the installing location (slot) correctly.
Also, while replacing or initializing NVRAM, set the installing location again.

22

2.5 PCI Slots

PCI slots configuration

PCI slots are located on the Systemboard as described in Figure 2.4 , and each PCI slots has the following specifications. There are 4 separate PCI Bus channels: A, B, C, and D. All PCI slots provide for the full 64-bit data path and can accommodate both 32-bit and 64-bit data path cards. The specifications for the PCI slots are described in Table 2.2 .

Table 2.2   PCI Slot Specifications

PCI slot #	PCI Bus	Slot width / card width (bits)	PCI clock (MHz)	Card input voltage
6	D	64 / 32,64	33	5 V or Universal
5	D	64 / 32,64	33	5 V or Universal
4	D	64 / 32,64	33	5 V or Universal
3	C	64 / 32,64	33	5 V or Universal
2	B	64 / 32,64	33 / 66	3.3 V or Universal
1	A	64 / 32,64	33 / 66	3.3 V or Universal

2.6 Installation

Notes on installation:

- Do not block the ventilation slits.

- Do not install the M200 main cabinet where it will be exposed to sunlight or sources of heat.

- Do not install the M200 main cabinet in dusty places or places where it will be exposed to corrosive gas or sea breeze.

- Keep the M200 main cabinet isolated from vibration. Install the M200 main cabinet on a level surface so that it does not tilt.

- Make sure that the AC power supply source is grounded properly. Otherwise, the M200 main cabinet may malfunction.

- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable when the power is on.

- Do not place anything on the M200 main cabinet. Do not use the cabinet of the M200 main cabinet as a work space.

- To prevent condensation in the M200 main cabinet, do not raise the ambient temperature rapidly, in winter. Use the M200 main cabinet only after it has warmed up sufficiently.

- Do not install the M200 main cabinet near a noise generating device such as a photocopier, air conditioner, or welder.

- Take electrostatic prevention measures. Note that some carpets generates static electricity easily and can cause the M200 main cabinet to malfunction.

- When moving the M200 main cabinet, do not pull on the front cover. Otherwise, the main cabinet may be damaged.

23

IMPORTANT

If the above conditions are not satisfied, the M200 main cabinet may be damaged. Be sure to follow these precautions.

Installation specifications
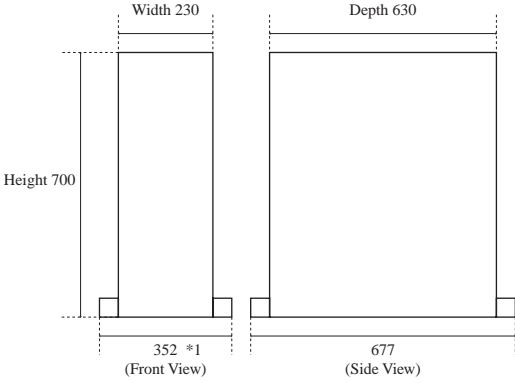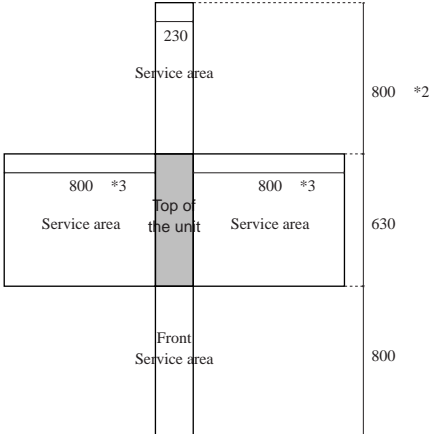
Table 2.3   Installation Specifications of M200 Main Cabinet (1)

Item		Specification	
Mass		Up to 43kg (approx.94.9 lb)	
Power condition	Input voltage	Single phase 100 to 120 VAC (+-10%)	Single phase 200 to 240 VAC (+-10%)
	Input frequency	50/60 Hz (+2 to -4%)	
Maximum consumption current		5.0 A	2.5 A
Leakage current		3.5 mA or less	3.5 mA or less
Ground resistance		100ohm or less (class C installation standard)	
Temperature condition	Operating	5 to 35 degrees Celsius (+41 to +95 F) (*1)	
	Not operating	0 to 50 degrees Celsius (+32 to +122F)	
Humidity condition	Operating	20 to 80%RH (no condensation)	
	Not operating	8 to 80% RH (no condensation)	
Vibrations condition	Operating	0.2 G	
	Idle	0.4 G	
Noise		47 db (A) (*2)	
Installation		standalone type	

*1:   If the ambient temperature exceeds 35 degrees Celsius (+95 F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*2:   The indicated noise is the mean value of the measurements obtained in an anechoic chamber with less echoic influence. The actual noise measured at the installation site may be greater than the indication noise due to surrounding noise and echoes.

Table 2.4   Installation Specifications of M200 Main Cabinet (2)

Item	Specification
External dimension (unit:mm)	
Service area (unit:mm)	

*1:   The unit width including the Stabilizing Feet is 352 mm (13.9 inch).

*2:   For the rear space, if 800 mm (31.5 inch) or more space is available by moving the cabinet when repair the cabinet or provide any services for it, 200 mm (7.8 inch) of space is acceptable for regular use. However, when optical cables are laid out, more than 300 mm (11.8 inch) of space between the rear side of the unit and wall is required.

*3:   For the side space, if 800 mm (31.5 inch) or more space is available by moving the cabinet when repair the cabinet or provide any services for it, the service area as described in Table 2.4 is not necessary for regular use.

*4:   A minimum of 50 mm (1.9 inch) of clearance is required above the top of the unit.

*5:   The unit depth of the cabinet at the bottom including the skirt is 677 mm (26.7 inch).

25

3

CHAPTER 3　　M200R Main Cabinet

CONTENTS

27

3.1   Overview

Appearance
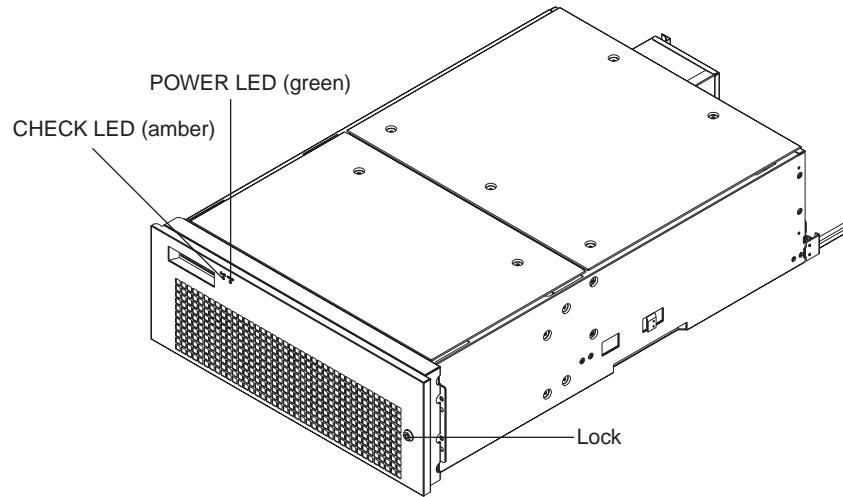
Figure 3.1   Front View of M200R Main Cabinet

Key Features

- Up to 2 processors

- 16 DIMM slots, up to 4 gigabytes of memory.

- 64-bits width, 4 PCI buses provide 6 PCI slots (2*33/66MHz + 4*33MHz).

- 2 UltraSCSI disk drive bays, which support hot-swap features.

- 1 CD-ROM unit and 1 floppy disk unit as the basic configuration.

- 1 100BASE-TX (auto-sensing 10 / 100 Mbps), 1 UltraSCSI(differencal), 2 Serial, 1 Parallel, 1 Keyboard/Mouse port

- N+1 redundant power supply units, and fan units, which support hot-swap feature.

28

3.2   Device Configuration

The M200R main cabinet consists of the following components:

- RackMount type cabinet

- Basic power supply and option redundant power supply unit

- Cooling fans

- Systemboard

- Processor modules

- DIMM (Dual Inline Memory Module)

- Operator panel

- PCI card (option)

- Disk drive units

- CD-ROM unit

- Floppy disk unit

The processor modules, DIMMs, PCI cards, redundant power supply, and disk drive units of the above components are available as options.

Front view of the M200R main cabinet
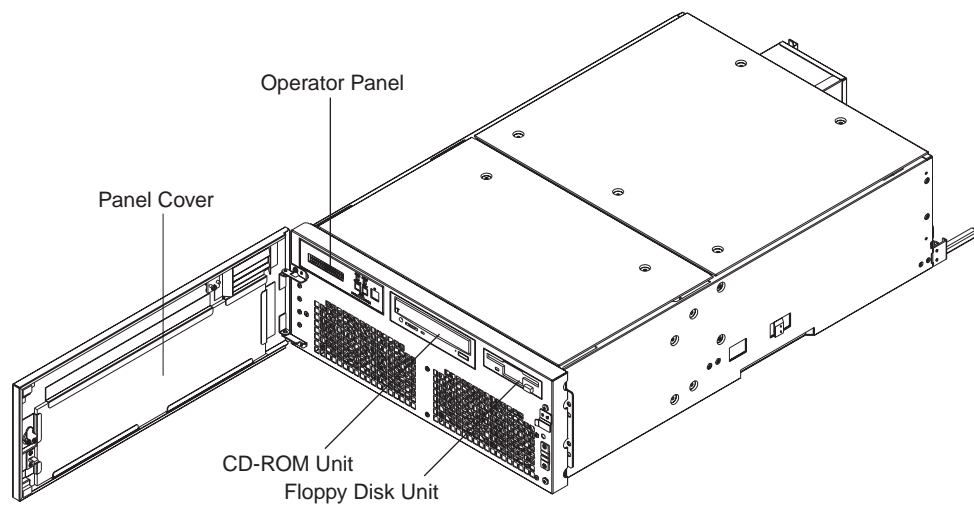
Figure 3.2   Open View of M200R Main Cabinet

Panel cover

The panel cover can be opened from its right side after unlocking it. Then you can access switches on the operator panel, CD-ROM unit, Floppy drive unit, and so on.

29

Fans   The Table 3.1 lists the fans installed in the M200R main cabinet.

Table 3.1   Fans

Name	Tray #	Location
Fan #0	Tray #0	Right (front view) of the cabinet
Fan #1		
Fan #2	Tray #1	Left (front view) of the cabinet
Fan #3		
Fan #10	Tray #5	Rear of the cabinet
Fan #11		
Fan #14	Tray #7	Above the processer module
Fan #15		
Fan #16	Tray #8	Side the PCI slot
Fan #17		

Power supplies

The M200R main cabinet has 2 kinds of power supply units as well as DDC (DC-DC Converter).
FEP (Front End Bulk Power) unit has AC input, and provide +48V(to BE). BE (Back End Power)
has +48V input, and provide +12V or +5V or +3.3V to some internal components.

Table 3.2   Power Supply Units

	Standard	Redundant
FEP	1	2
BE(5V)	2	3
BE(3.5V)	2	3

30

Rear of the M200R main cabinet

AC input, power supplies (FEP) and some connectors are located on the rear of the M200R main cabinet as shown in the Figure 3.3
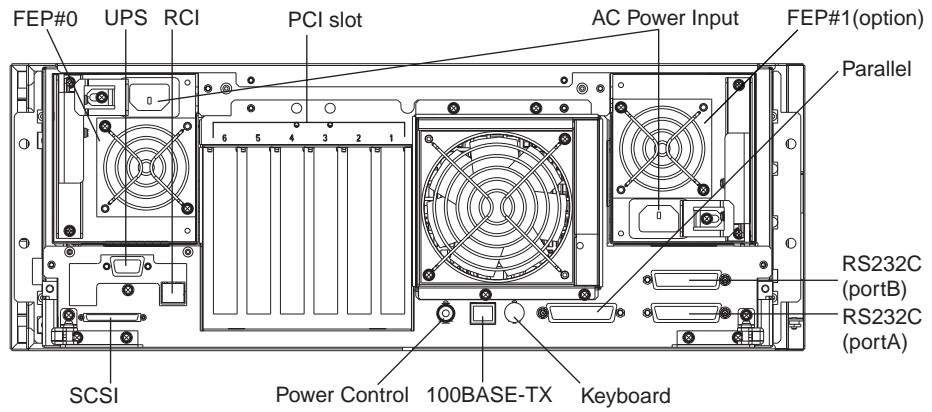
Figure 3.3   Rear View of M200R Main Cabinet

31

3.3   Systemboard

Systemboard

CPU module slots and memory module slots are located on Systemboard as described in Figure 3.4 .
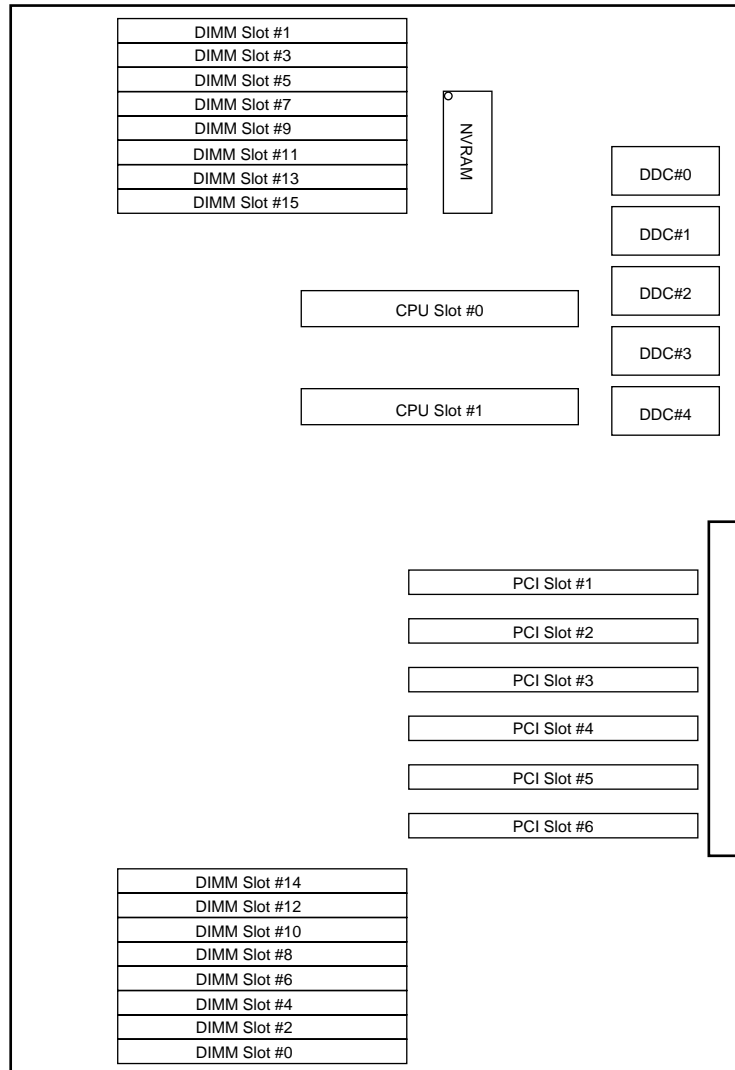
Figure 3.4   Systemboard Layout of M200R

Processor Configuration

Up to 2 processors can be installed in the M200R main cabinet. When installing the processor modules, the following conditions must be satisfied:

- The installed processor modules must be the same type (including the cache size).

- Install a processor module in slot 0 before installing one in slot 1.

- When installing a processor module, install DC-DC converters along with the processor in the corresponding slot.

IMPORTANT

If any of the above conditions is not satisfied, the operation is not guaranteed.

Memory configuration

The M200R has 16 memory slots, allowing for as much as 4 gigabytes of main memory. When installing the memory modules, the following conditions must be satisfied:

- When installing the first set of DIMM, install a set of 4 modules of same size in slots 0, 1, 2, and 3.

- At subsequent memory expansions, install a set of 4 modules of the same size in slots 4, 5, 6, 7, and 8, 9, 10, 11, then 12, 13, 14, 15.

IMPORTANT

If any of the above conditions is not satisfied when installing the DIMMs, some DIMMs are degraded in the power-on diagnostics. When expanding the memory modules, check that the DIMMs are installed correctly.

Memory ECC feature

The SDRAM is used as the memory chip. The single-bit error correction and multiple-bit error detection features are available for a large capacity memory by using the Error Check Code (ECC) system. A single-bit error can be isolated down to the memory slot on which it occurred. A multiple-bit error can be isolated down to the pair of slots on which it occurred.

Checking results of the memory diagnostics

To check that the system recognizes installed memory modules correctly, execute the "show-post-results" command at the ok prompt. A module that does not satisfy any condition described in "Memory configuration" or a module judged to be faulty by memory diagnostics is treated as an invalid module. The screen below lists the command execution results related to memories and their meanings.

33

Example for normal operation

```
=== Memory ===================
Type : SDRAM
SLOT#       Size [ Valid (MB) / Existing (MB) ]              Total
00- 0- 3    256 / 256   256 / 256   256 / 256   256 / 256   : 1024 / 1024 MB
00- 4- 7    256 / 256   256 / 256   256 / 256   256 / 256   : 1024 / 1024 MB
00- 8-11    256 / 256   256 / 256   256 / 256   256 / 256   : 1024 / 1024 MB
00-12-15    256 / 256   256 / 256   256 / 256   256 / 256   : 1024 / 1024 MB
* = Error SLOT
```

Example of a slot #4 error

```
=== Memory ===================
Type : SDRAM
SLOT#       Size [ Valid (MB) / Existing (MB) ]              Total
00- 0- 3    256 / 256   256 / 256   256 / 256   256 / 256   : 1024 / 1024 MB
00- 4- 7      0 /   0*    0 / 256     0 / 256     0 / 256   :    0 /  768 MB
00- 8-11    256 / 256   256 / 256   256 / 256   256 / 256   : 1024 / 1024 MB
00-12-15    256 / 256   256 / 256   256 / 256   256 / 256   : 1024 / 1024 MB
* = Error SLOT
```

Note: If a memory error is detected, an asterisk is displayed in the Size field for the
            corresponding slot. In this example, an error in slot #4 is detected in the initial
            diagnostics operation. Modules in slots 5 to 7 are recognized as normal modules but
            also become invalid.

3.4   Disk Units

Disk drive configuration

Up to 2 disk drives can be installed in the base configuration of the M200R main cabinet. To install
more than 3 disk drive units, the Expansion File Unit must also installed.

34

3.5   PCI Slots

PCI slots configuration

PCI slots are located on the Systemboard as described in Figure 3.4 . There are 4 separate PCI Bus
channels: A, B, C, and D. All PCI Bus slots provide for the full 64-bit data path and can
accommodate both 32-bit and 64-bit data path cards. The specifications for the PCI slots are
described in the Table 3.3 .

Table 3.3   PCI Slot Specifications

PCI slot #	PCI Bus	Slot width / card width (bits)	PCI clock (MHz)	Card input voltage
6	D	64 / 32, 64	33	5 V or Universal
5	D	64 / 32, 64	33	5 V or Universal
4	D	64 / 32, 64	33	5 V or Universal
3	C	64 / 32, 64	33	5 V or Universal
2	B	64 / 32, 64	33 / 66	3.3 V or Universal
1	A	64 / 32, 64	33 / 66	3.3 V or Universal

35

3.6   Installation

Purpose   The following installation instruction is intended to provide the product safety requirements which must be addressed when the end-use product manufacturer installs this product in their equipment. Note that the acceptability of the combination of this product in a rack should be re-determined by an appropriate certification body, if that combination is differ from the Table 3.4 .

Safety Installation Instruction:

- This unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature inside of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the unit in an environment compatible with the manufacturer's maximum rated ambient temperature.

  – Consideration for adjustment of air condition like air circulation should be given to prevent the internal rack ambient from exceeding the Max. Operating ambient temperature of this unit.

  – Maximum operating ambient temperature of this unit : 35 deg C.

- Installation of the unit in a rack should be such that the amount of air flow required for safe operation of the unit is not compromised.

  – This unit has ventilation openings at front and rear face of the unit.

  – Do not cover or close these ventilation openings to prevent overheating.

- Mounting of the unit in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading. To keep stability of entire rack, please fix the rack to wall or floor by suitable means.

  – Be careful about injury during installation of this unit into rack.

  – Do not install this unit into your rack where the unit may make the entire rack unstable.

  – Mass of this unit with maximum configuration : 40 kg.

- If the unit is supplied from Power Strip or Service Outlet of other units, it may overload the Power Supply Cord of the Power Strip or other units.

  – Confirm that the current rating of Power Strip or Service Outlet exceeds the combined ratings of all equipment it is supplying.

  – Electrical ratings of this unit : Rated 100 - 240Vac, 4.0 - 1.5 A, 50/60 Hz, 1 phase

- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.q., use of power strips).

36

IMPORTANT

High Leakage Current may flow through Power Strip Earthing Conductor, if all power supply cords of this unit are connected to one Power Strip. Earth connection essential before connecting supply.

Table 3.4   Mounting Combination for Expansion Rack

Rack-Mount Units	Mounting Portion Priority in the Rack
Communication Swichable Unit	Upper
Expansion File Unit Type-2	
Disk Array Unit (GP-DxxxxU)	
GP7000F Model 200R/400R	
Disk Array Unit (GR700/720)	
Outlet and/or Outlet Type-2	
GP7000F Model 600R	Lower

Note: Each rack-mount unit should be mounted in the lowest available portion with the priority indicated in the Table 3.4 .

Notes on Installation

- Do not install this file unit where it will be exposed to sunlight or sources of heat.

- Do not install this file unit in dusty places or places where it will be exposed to corrosive gas or sea breeze.

- Keep this file unit isolated from vibration. Install this file unit on a level surface to prevent it from tilting.

- Do not run a cable under a unit or overextend a cable. Do not disconnect the power cable while the power is on.

- Do not place anything on this file unit. Do not use this file unit as a desk.

- To prevent condensation in this file unit, do not raise the room temperature rapidly in the winter. Use the cabinet only after sufficiently warming it.

- Do not install this cabinet near noisy devices such as a photocopier, air conditioner, or welder.

- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause this file unit to malfunction.

IMPORTANT

If the above conditions are not satisfied, this file unit may be damaged. Be sure to follow above precautions.

37

Installation specifications

Table 3.5   Installation Specifications of M200R (1)

Item		Specification	
Mass		Up to 40kg (approx.88 lb)	
Power condition	Input voltage	Single phase 100 to 120 VAC (+-10%)	Single phase 200 to 240 VAC (+-10%)
	Input frequency	50/60 Hz (+2 to -4%)	
Maximum consumption current		4.0 A	2.0 A
Leakage current (1 for each cable)		3.5 mA or less	3.5 mA or less
Ground resistance		100ohm or less (class C installation standard)	
Temperature condition	Operating	5 to 35 degrees Celsius (+41 to +95 F) (*1)	
	Not operating	0 to 50 degrees Celsius (+32 to +122F)	
Humidity condition	Operating	20 to 80%RH (no condensation)	
	Not operating	8 to 80% RH (no condensation)	
Vibrations condition	Operating	0.2 G	
	Idle	0.4 G	
Noise		50 db (A) (*2)	
Installation		Rack mount type (4pitches)	

*1:   If the ambient temperature exceeds 35 degrees Celsius (+95F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*2:   The indicated noise is the mean value of the measurements obtained in an anechoic chamber with less echoic influence. The actual noise measured at the installation site may be greater than the indication noise due to surrounding noise and echoes.

Table 3.6   Installation Specifications of M200R (2)

Item	Specification
External dimension (unit:mm)	Width 482 Depth 779 Height 174 (Front of the cabinet) (Side of the cabinet)
Service area (unit:mm)	650^{*2} 695^{*3} Rear Service area 1000 Top of the cabinet 930^{*2} 925^{*3} 800 Service area Drawer area *1 800 Service area 800 Front Service area 800

*1:   Keep the drawer area so that the CPU shelf can be pulled out from the main cabinet during installing some internal option products and providing maintenance of the CPU shelf.

*2:   When this unit is installed in a expansion rack:GP7B7RK1U/RK2U/RK3U/RK4U.

*3:   When this unit is installed in a expansion rack:GP727RK1U/RK2U.

39

4

CHAPTER 4   M400A Main Cabinet

CONTENTS

4.1   Overview

Appearance
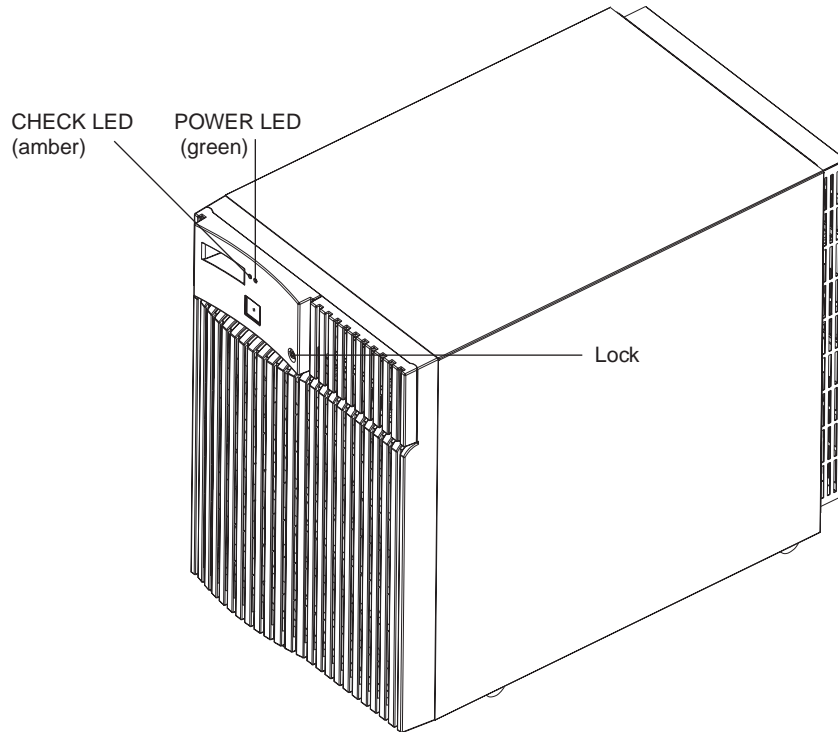
Figure 4.1   Front View of M400A Main Cabinet

Key Features

- Up to 4 processors

- Up to 32 DIMM slots, 8 gigabytes of memory.

- Up to 64-bits width, 8 PCI buses provide 12 PCI slots (4*33/66MHz + 8*33MHz).

- Up to 22 UltraSCSI disk drive bays, which support hot-swap features.

- 1 CD-ROM unit and 1 floppy disk unit as the basic configuration.

- 1 tape unit can be installed.

- 1 100BASE-TX (auto-sensing 10 / 100 Mbps), 2 Serial, 1 Parallel, 1 Keyboard/Mouse port

- N+1 redundant power supply units, and fan units, which support hot-swap feature.

42

4.2   Device Configuration

The M400A main cabinet consists of the following components:

- Floor stand cabinet

- Basic power supply and option redundant power supply unit

- Cooling fans

- Systemboard

- Processor modules

- DIMM (Dual Inline Memory Module)

- Operator panel

- PCI card (option)

- Disk drive units

- CD-ROM unit

- Tape unit (optional QIC tape, 8-mm tape, or DAT)

- Floppy disk unit

The processor modules, DIMMs, PCI cards, tape drive unit, redundant power supply, and disk drive units of the above components are available as options.

Front view of the M400A main cabinet
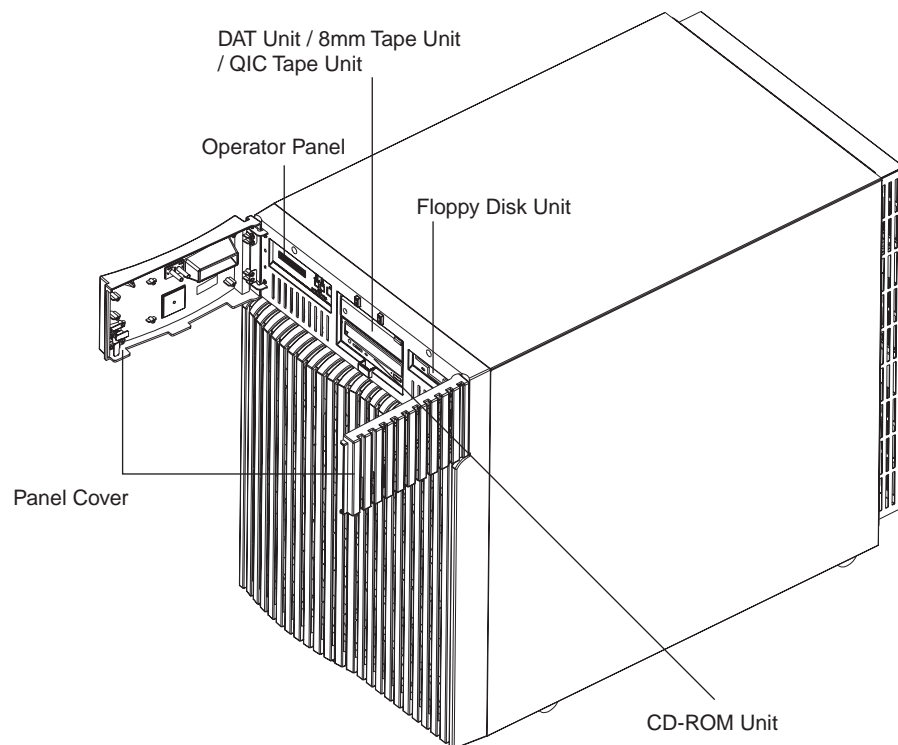
Figure 4.2   Open View of M400A Main Cabinet

43

Panel cover

The panel cover can be opened from its right side after unlocking it. Then you can access switches on the operator panel, CD-ROM unit, Floppy drive unit, tape unit, and so on.

Fans   The Table 4.1 lists the fans installed in the M400A main cabinet.

Table 4.1   Fans

Name	Tray #	Location
Fan #0	Tray #04	Right (front view) of the cabinet
Fan #1		
Fan #3	Tray #01	Center (front view) of the cabinet
Fan #4	Tray #02	Left (front view) of the cabinet
Fan #5		
Fan #10	Tray #05	Bottom (rear view) of the cabinet
Fan #11		
Fan #12	Tray #06	Upper (rear view) of the cabinet
Fan #13		
Fan #14	Tray #07	Above the processer module
Fan #15		
Fan #16	Tray #08	Side the PCI slot
Fan #17		
Fan #18	Tray #09	Above the processer module (System expansion unit)
Fan #19		
Fan #20	Tray #10	Side the PCI slot (System expansion unit)
Fan #21		

Power supplies

The M400A main cabinet has 2 kinds of power supply units as well as DDC (DC-DC Converter). FEP (Front End Bulk Power) unit has AC input, and provide +48V(to BE). BE (Back End Power) has +48V input, and provide +12V or +5V or +3.3V to some internal components. The power supplies must be configured according to the system hardware configuration as described in Table 4.2 .

Table 4.2   Power Supply Units

	Without an Expansion System Board		With an Expansion System Board	
	Standard	Redundant	Standard	Redundant
FEP	2	3	3	4
BE(5V)	3	4	5	6
BE(3.5V)	2	3	3	4

44

Rear of the M400A main cabinet

AC input, AC main line switch, power supplies (FEP) and some connectors are located on the rear of the M400A main cabinet as shown in the Figure 4.3
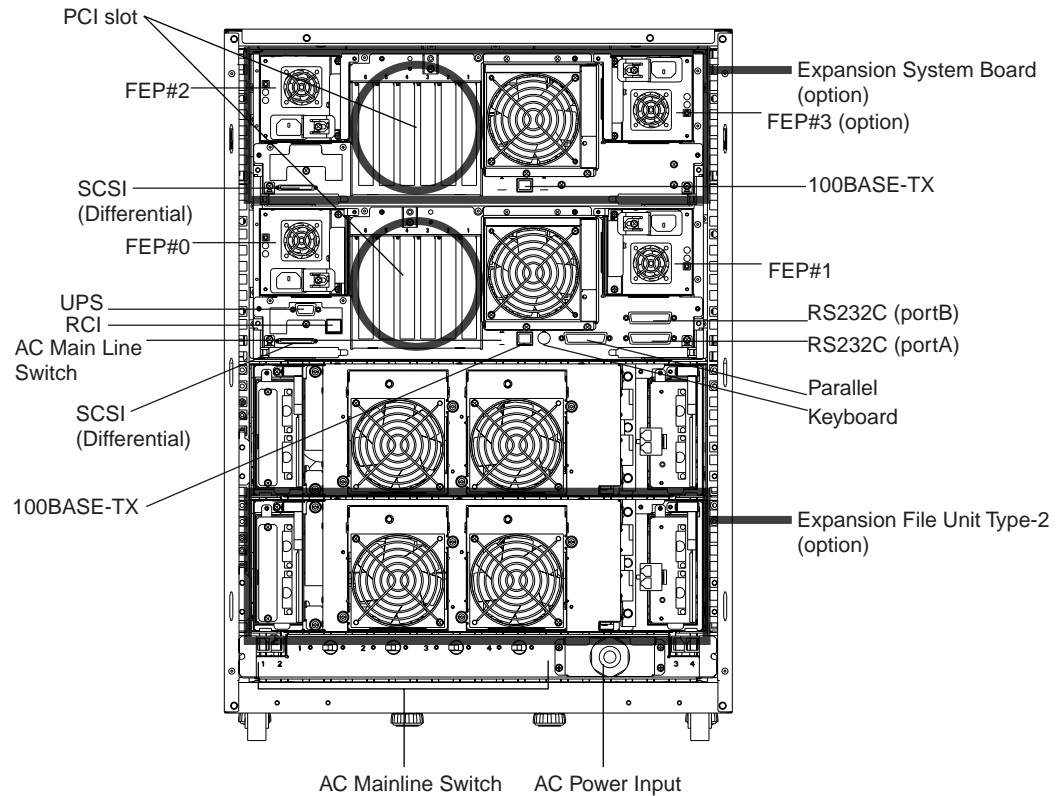
Figure 4.3   Rear View of M400A Main Cabinet

45

4.3   Systemboard

Systemboard

CPU module slots and memory module slots are located on Systemboard as described in Figure 4.4 .

Base System Board

Expansion System Board
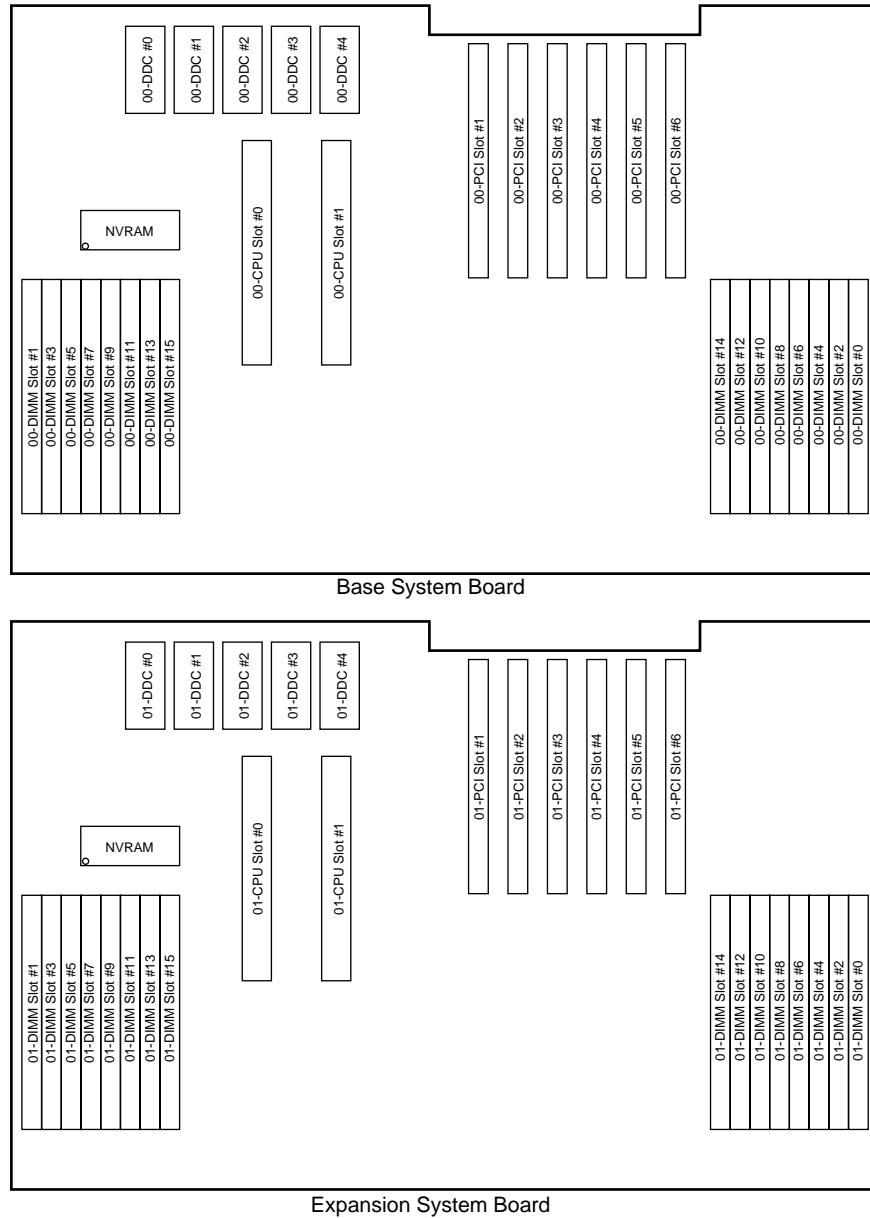
Figure 4.4   Systemboard Layout of M400A

46

Processor Configuration

Up to 4 CPU can be installed in the M400A main cabinet. When installing the processor modules, the following conditions must be satisfied:

- The installed processor modules must be the same type (including the cache size).

- Install a processor module in slot 0 before installing one in slot 1.

- When installing a processor module, install DC-DC converters alog with the processor in the corresponding slot.

IMPORTANT

If any of the above conditions is not satisfied, the operation is not guaranteed.

Memory configuration

Using the Expansion System Board's option the M400A has 32 memory slots, allowing for as much as 8 gigabytes of main memory. When installing the memory modules, the following conditions must be satisfied:

- When installing the first set of DIMM, install a set of 4 modules of same size in slots 0, 1, 2, and 3.

- At subsequent memory expansions, install a set of 4 modules of the same size in slots 4, 5, 6, 7, and 8, 9, 10, 11, then 12, 13, 14, 15.

- The same memory installation rules (described above) apply when using the Expansion System Board.

IMPORTANT

If any of the above conditions is not satisfied when installing the DIMMs, some DIMMs are degraded in the power-on diagnostics. When expanding the memory modules, check that the DIMMs are installed correctly.

Memory ECC feature

The SDRAM DRAM is used as the memory chip. The single-bit error correction and multiple-bit error detection features are available for a large capacity memory by using the Error Check Code (ECC) system. A single-bit error can be isolated down to the memory slot on which it occurred. A multiple-bit error can be isolated down to the pair of slots on which it occurred.

Checking results of the memory diagnostics

To check that the system recognizes installed memory modules correctly, execute the "show-post-results" command at the ok prompt. A module that does not satisfy any condition described in "Memory configuration" or a module judged to be faulty by memory diagnostics is treated as an invalid module. The screen below lists the command execution results related to memories and their meanings.

47

Example for normal operation

```
=== Memory ===================
Type : SDRAM
SLOT#      Size [ Valid (MB) / Existing (MB) ]              Total
00- 0- 3   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
00- 4- 7   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
00- 8-11   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
00-12-15   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01- 0- 3   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01- 4- 7   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01- 8-11   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01-12-15   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
* = Error SLOT
```

Example of a slot #4 error

```
=== Memory ===================
Type : SDRAM
SLOT#      Size [ Valid (MB) / Existing (MB) ]              Total
00- 0- 3   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
00- 4- 7     0 /   0*     0 / 256      0 / 256      0 / 256   :    0 /  768 MB
00- 8-11   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
00-12-15   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01- 0- 3   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01- 4- 7   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01- 8-11   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01-12-15   256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
* = Error SLOT
```

Note: If a memory error is detected, an asterisk is displayed in the Size field for the corresponding slot. In this example, an error in slot #4 is detected in the initial diagnostics operation. Modules in slots 5 to 7 are recognized as normal modules but also become invalid.

4.4   Disk Units

Disk drive configuration

Up to 7 disk dirves can be installed in To install more than 8 disk drive units, the File Unit Expansion Kit and/or Expansion File Unit Type-2 must be installed.

48

4.5   PCI Slots

PCI slots configuration

PCI slots are located on the systemboard as described in Figure 4.4 . There are 7 separate PCI Bus channels: A, B, C, D, E, F, G, and H. All PCI Bus slots provide for the full 64-bit data path and can accommodate both 32-bit and 64-bit data path cards. The specifications for the PCI slots are described in the Table 4.3 .

Table 4.3   PCI Slot Specifications

	PCI slot #	PCI Bus	Slot width / card width (bits)	PCI clock (MHz)	Card input voltage
(00)	6	D	64 / 32, 64	33	5 V or universal
	5	D	64 / 32, 64	33	5 V or universal
	4	D	64 / 32, 64	33	5 V or universal
	3	C	64 / 32, 64	33	5 V or universal
	2	B	64 / 32, 64	33 / 66	3.3 V or universal
	1	A	64 / 32, 64	33 / 66	3.3 V or universal
(01)	6	H	64 / 32, 64	33	5 V or universal
	5	H	64 / 32, 64	33	5 V or universal
	4	H	64 / 32, 64	33	5 V or universal
	3	G	64 / 32, 64	33	5 V or universal
	2	F	64 / 32, 64	33 / 66	3.3 V or universal
	1	E	64 / 32, 64	33 / 66	3.3 V or universal

Note: When you use 7 PCI slots or more, optional PCI Extension System Board must be added to the M400R main cabinet.

49

4.6   Installation

Notes on installation:

- Do not block the ventilation slits.

- Do not install the M400A main cabinet where it will be exposed to sunlight or sources of heat.

- Do not install the M400A main cabinet in dusty places or places where it will be exposed to corrosive gas or sea breeze.

- Keep the M400A main cabinet isolated from vibration. Install the M400A main cabinet on a level surface so that it does not tilt.

- Make sure that the AC power supply source is grounded properly. Otherwise, the M400A main cabinet may malfunction.

- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable when the power is on.

- Do not place anything on the M400A main cabinet. Do not use the cabinet of the M400A main cabinet as a work space.

- In winter, to prevent condensation in the M400A main cabinet, do not raise the ambient temperature rapidly. Use the M400A main cabinet only after it has warmed up sufficiently.

- Do not install the M400A main cabinet near a noise generating device such as a photocopier, air conditioner, or welder.

- Take electrostatic prevention measures. Note that some carpets generates static electricity easily and can cause the M400A main cabinet to malfunction.

- When moving the M400A main cabinet, do not pull on the front cover. Otherwise, the main cabinet may be damaged.

IMPORTANT

If the above conditions are not satisfied, the M400A main cabinet may be damaged. Be sure to follow these precautions.

50

Installation specifications
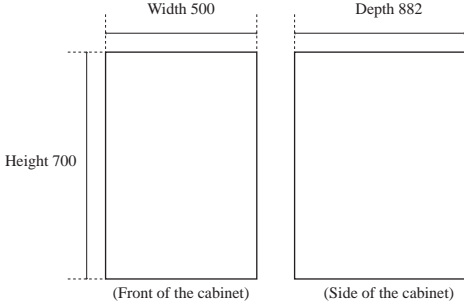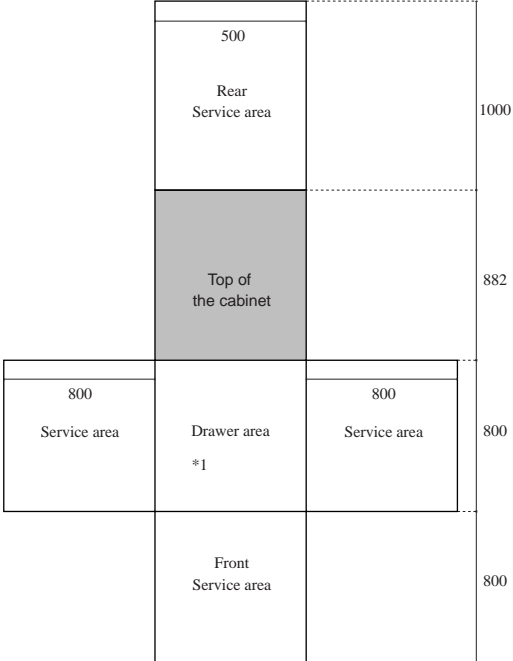
Table 4.4   Installation Specifications of M400A Main Cabinet (1)

Item		Specification	
Mass		Up to 175kg (approx.385 lb)	
Power condition	Input voltage	Single phase 100 to 120 VAC (+-10%)	Single phase 200 to 240 VAC (+-10%)
	Input frequency	50/60 Hz (+2 to -4%)	
Maximum consumption current		13.5 A	6.75 A
Leakage current (1 for each cable)		3.5 mA or less	3.5 mA or less
Ground resistance		100ohm or less (class C installation standard)	
Temperature condition	Operating	5 to 35 degrees Celsius (+41 to +95 F) (*1)	
	Not operating	0 to 50 degrees Celsius (+32 to +122F)	
Humidity condition	Operating	20 to 80%RH (no condensation)	
	Not operating	8 to 80% RH (no condensation)	
Vibrations condition	Operating	0.2 G	
	Idle	0.4 G	
Noise		47 db (A) (*2)	
Installation		Floor Stand type	

*1:   If the ambient temperature exceeds 35 degrees Celsius (+95 F) during operation, a
        warning message is output. Take steps to rectify the problem immediately.

*2:   The indicated noise is the mean value of the measurements obtained in an anechoic
        chamber with less echoic influence. The actual noise measured at the installation site
        may be greater than the indication noise due to surrounding noise and echoes.

Table 4.5   Installation Specifications of M400A Main Cabinet (2)

Item	Specification
External dimension (unit:mm)	Width 500 Depth 882 Height 700 (Front of the cabinet) (Side of the cabinet)
Service area (unit:mm)	500 Rear Service area 1000 Top of the cabinet 882 800 Drawer area *1 800 800 Service area Service area Front Service area 800

*1:   Keep the drawer area so that the CPU shelf can be pulled out from the main cabinet during installing some internal option products and providing maintenance of the CPU shelf.

52

5

CHAPTER 5   M400R Main Cabinet

5.1   Overview

Appearance

POWER LED (green)
CHECK LED (amber)
Lock

Figure 5.1   Front View of M400R Main Cabinet

Key Features

- Up to 4 processors

- Up to 32 DIMM slots, 8 gigabytes of memory.

- Up to 64-bits width, 8 PCI buses provide 12 PCI slots (4*33/66MHz + 8*33MHz).

- 2 UltraSCSI disk drive bays, which support hot-swap features.

- 1 CD-ROM unit and 1 floppy disk unit as the basic configuration.

- 1 tape unit can be installed.

- 1 100BASE-TX (auto-sensing 10 / 100 Mbps), 2 UltraSCSI(differencal), 2 Serial, 1 Parallel, 1 Keyboard/Mouse port

- N+1 redundant power supply units, and fan units, which support hot-swap feature.

54

5.2   Device Configuration

The M400R main cabinet consists of the following components:

- Rack-mount cabinet
- Basic power supply and option redundant power supply unit
- Cooling fans
- Systemboard
- Processor modules
- DIMM (Dual Inline Memory Module)
- Operator panel
- PCI card (option)
- Disk drive units
- CD-ROM unit
- Tape unit (optional QIC tape, 8-mm tape, or DAT)
- Floppy disk unit

The processor modules, DIMMs, PCI cards, tape drive unit, redundant power supply, and disk drive units of the above components are available as options.

Front view of the M400R main cabinet
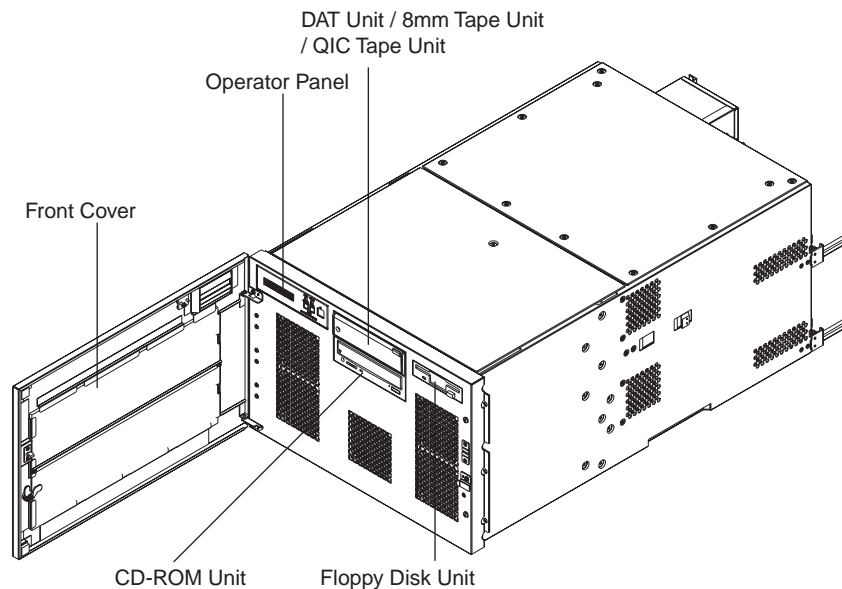
Figure 5.2   Open View of M400R Main Cabinet

Panel cover

The panel cover can be opened from its right side after unlocking it. Then you can access switches on the operator panel, CD-ROM unit, Floppy drive unit, tape unit, and so on.

55

Fans   The Table 5.1 lists the fans installed in the M400R main cabinet.

Table 5.1   Fans

Name	Tray #	Location
Fan #0	Tray #04	Right (front view) of the cabinet
Fan #1		
Fan #3	Tray #01	Center (front view) of the cabinet
Fan #4	Tray #02	Left (front view) of the cabinet
Fan #5		
Fan #10	Tray #05	Bottom (rear view) of the cabinet
Fan #11		
Fan #12	Tray #06	Upper (rear view) of the cabinet
Fan #13		
Fan #14	Tray #07	Above the processer module
Fan #15		
Fan #16	Tray #08	Side the PCI slot
Fan #17		
Fan #18	Tray #09	Above the processer module (System expansion unit)
Fan #19		
Fan #20	Tray #10	Side the PCI slot (System expansion unit)
Fan #21		

Power supplies

The M400R main cabinet has 2 kinds of power supply units as well as DDC (DC-DC Converter),
FEP (Front End Bulk Power) unit has AC input, and provide +48V(to BE). BE (Back End Power)
has +48V input, and provide +12V or +5V or +3.3V to some internal components. The power
supplies must be configured according to the system hardware configuration as described in
Table 5.2 .

Table 5.2   Power Supply Units

	Without an Expansion System Board		With an Expansion System Board	
	Standard	Redundant	Standard	Redundant
FEP	2	3	3	4
BE(5V)	3	4	5	6
BE(3.5V)	2	3	3	4

56

Rear of the M400R main cabinet

AC input, power supplies (FEP) and some connectors are located on the rear of the M400R main cabinet as shown in the Figure 5.3 .

Figure 5.3   Rear View of M400R Main Cabinet

57

5.3   Systemboard

Systemboard

CPU module slots and memory module slots are located on Systemboard as described in Figure 5.4 .

Base System Board

Expansion System Board
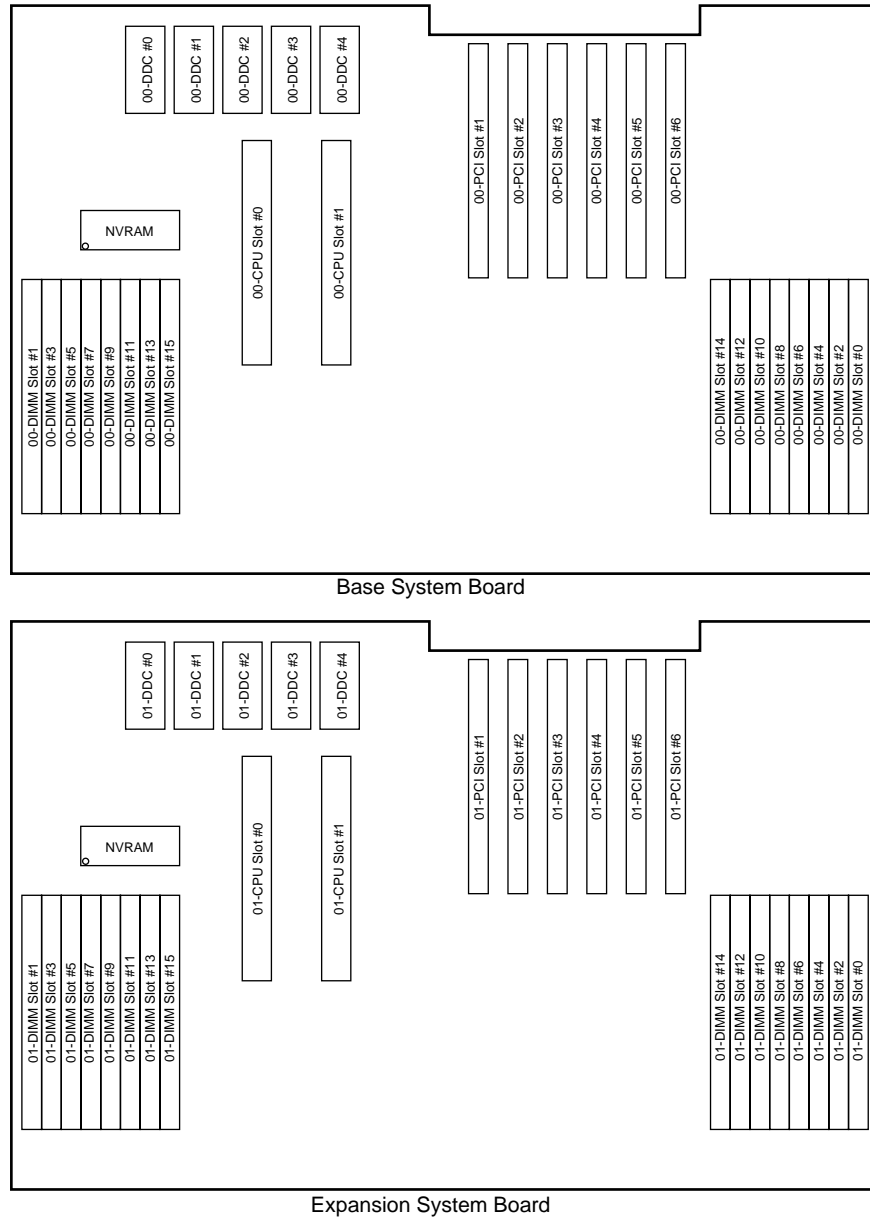
Figure 5.4   Systemboard Layout of M400R

58

Processor Configuration

Up to 4 CPU can be installed in the M400R main cabinet. When installing the processor modules, the following conditions must be satisfied:

- The installed processor modules must be the same type (including the cache size).

- Install a processor module in slot 0 before installing one in slot 1.

- When installing a processor module, install a DC-DC converter along with the processor in the corresponding slot.

IMPORTANT

If any of the above conditions is not satisfied, the operation is not guaranteed.

Memory configuration

Using the Expansion System Board's option the M400R has 32 memory slots, allowing for as much as 8 gigabytes of main memory. When installing the memory modules, the following conditions must be satisfied:

- When installing the first set of DIMM, install a set of 4 modules of same size in slots 0, 1, 2, and 3.

- At subsequent memory expansions, install a set of 4 modules of the same size in slots 4, 5, 6, 7, and 8, 9, 10, 11, then 12, 13, 14, 15.

- The same memory installation rules (described above) apply when using the Expansion System Board.

IMPORTANT

If any of the above conditions is not satisfied when installing the DIMMs, some DIMMs are degraded in the power-on diagnostics. When expanding the memory modules, check that the DIMMs are installed correctly.

Memory ECC feature

The SDRAM is used as the memory chip. The single-bit error correction and multiple-bit error detection features are available for a large capacity memory by using the Error Check Code (ECC) system. A single-bit error can be isolated down to the memory slot on which it occurred. A multiple-bit error can be isolated down to the pair of slots on which it occurred.

Checking results of the memory diagnostics

To check that the system recognizes installed memory modules correctly, execute the "show-post-results" command at the ok prompt. A module that does not satisfy any condition described in "Memory configuration" or a module judged to be faulty by memory diagnostics is treated as an invalid module. The screen below lists the command execution results related to memories and their meanings.

59

Example for normal operation

```
=== Memory ===================
Type : SDRAM
SLOT#       Size [ Valid (MB) / Existing (MB) ]          Total
00- 0- 3    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
00- 4- 7    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
00- 8-11    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
00-12-15    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01- 0- 3    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01- 4- 7    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01- 8-11    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01-12-15    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
* = Error SLOT
```

Example of a slot #4 error

```
=== Memory ===================
Type : SDRAM
SLOT#       Size [ Valid (MB) / Existing (MB) ]          Total
00- 0- 3    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
00- 4- 7      0 /   0*     0 / 256      0 / 256      0 / 256   :    0 /  768 MB
00- 8-11    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
00-12-15    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01- 0- 3    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01- 4- 7    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01- 8-11    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
01-12-15    256 / 256    256 / 256    256 / 256    256 / 256   : 1024 / 1024 MB
* = Error SLOT
```

Note: If a memory error is detected, an asterisk is displayed in the Size field for the corresponding slot. In this example, an error in slot #4 is detected in the initial diagnostics operation. Modules in slots 5 to 7 are recognized as normal modules but also become invalid.

5.4   Disk Units

Disk drive configuration

Up to 2 disk drives can be installed in the base configuration of the M400R main cabinet. To install more than 3 disk drive units, the Expansion File Unit Type-2 must also installed.

60

5.5   PCI Slots

PCI slots configuration

PCI slots are located on the systemboard as described in Figure 5.4 . There are 7 separate PCI Bus channels: A, B, C, D, E, F, G, and H. All PCI Bus slots provide for the full 64-bit data path and can accommodate both 32-bit and 64-bit data path cards. The specifications for the PCI slots are described in the Table 5.3 .

Table 5.3   PCI Slot Specifications

	PCI slot #	PCI Bus	Slot width / card width (bits)	PCI clock (MHz)	Card input voltage
(00)	6	D	64 / 32, 64	33	5 V or universal
	5	D	64 / 32, 64	33	5 V or universal
	4	D	64 / 32, 64	33	5 V or universal
	3	C	64 / 32, 64	33	5 V or universal
	2	B	64 / 32, 64	33 / 66	3.3 V or universal
	1	A	64 / 32, 64	33 / 66	3.3 V or universal
(01)	6	H	64 / 32, 64	33	5 V or universal
	5	H	64 / 32, 64	33	5 V or universal
	4	H	64 / 32, 64	33	5 V or universal
	3	G	64 / 32, 64	33	5 V or universal
	2	F	64 / 32, 64	33 / 66	3.3 V or universal
	1	E	64 / 32, 64	33 / 66	3.3 V or universal

Note: When you use 7 PCI slots or more, optional Expansion System Board must be added to the M400R main cabinet.

61

5.6   Installation

Purpose   The following installation instruction is intended to provide the product safety requirements which must be addressed when the end-use product manufacturer installs this product in their equipment. Note that the acceptability of the combination of this product in a rack should be re-determined by an appropriate certification body, if that combination is differ from the Table 5.4 .

Safety Installation Instruction:

- This unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature inside of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the unit in an environment compatible with the manufacturer's maximum rated ambient temperature.

  – Consideration for adjustment of air condition like air circulation should be given to prevent the internal rack ambient from exceeding the Max. Operating ambient temperature of this unit.

  – Maximum operating ambient temperature of this unit : 35 deg C.

- Installation of the unit in a rack should be such that the amount of air flow required for safe operation of the unit is not compromised.

  – This unit has ventilation openings at front and rear face of the unit.

  – Do not cover or close these ventilation openings to prevent overheating.

- Mounting of the unit in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading. To keep stability of entire rack, please fix the rack to wall or floor by suitable means.

  – Be careful about injury during installation of this unit into rack.

  – Do not install this unit into your rack where the unit may make the entire rack unstable.

  – Mass of this unit with maximum configuration : 65 kg.

- If the unit is supplied from Power Strip or Service Outlet of other units, it may overload the Power Supply Cord of the Power Strip or other units.

  – Confirm that the current rating of Power Strip or Service Outlet exceeds the combined ratings of all equipment it is supplying.

  – Electrical ratings of this unit : Rated 100 - 240Vac, 7.5 - 3.0 A, 50/60 Hz, 1 phase

- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.q., use of power strips).

62

IMPORTANT

High Leakage Current may flow through Power Strip Earthing Conductor, if all power supply cords of this unit are connected to one Power Strip. Earth connection essential before connecting supply.

Table 5.4   Mounting Combination for Expansion Rack

Rack-Mount Units	Mounting Portion Priority in the Rack
Communication Swichable Unit	Upper
Expansion File Unit Type-2	
Disk Array Unit (GP-DxxxxU)	
GP7000F Model 200R/400R	
Disk Array Unit (GR700/720)	
Outlet and/or Outlet Type-2	
GP7000F Model 600R	Lower

Note: Each rack-mount unit should be mounted in the lowest available portion with the priority indicated in the Table 5.4 .

Notes on Installation

- Do not install this file unit where it will be exposed to sunlight or sources of heat.

- Do not install this file unit in dusty places or places where it will be exposed to corrosive gas or sea breeze.

- Keep this file unit isolated from vibration. Install this file unit on a level surface to prevent it from tilting.

- Do not run a cable under a unit or overextend a cable. Do not disconnect the power cable while the power is on.

- Do not place anything on this file unit. Do not use this file unit as a desk.

- To prevent condensation in this file unit, do not raise the room temperature rapidly in the winter. Use the cabinet only after sufficiently warming it.

- Do not install this cabinet near noisy devices such as a photocopier, air conditioner, or welder.

- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause this file unit to malfunction.

IMPORTANT

If the above conditions are not satisfied, this file unit may be damaged. Be sure to follow above precautions.

63

Installation specifications

Table 5.5   Installation Specifications of M400R

Item		Specification	
Mass		Up to 65kg (approx.143 lb)	
Power condition	Input voltage	Single phase 100 to 120 VAC (+-10%)	Single phase 200 to 240 VAC (+-10%)
	Input frequency	50/60 Hz (+2 to -4%)	
Maximum consumption current		7.5 A	3.75 A
Leakage current (1 for each cable)		3.5 mA or less	3.5 mA or less
Ground resistance		100ohm or less (class C installation standard)	
Temperature condition	Operating	5 to 35 degrees Celsius (+41 to +95 F) (*1)	
	Not operating	0 to 50 degrees Celsius (+32 to +122F)	
Humidity condition	Operating	20 to 80%RH (no condensation)	
	Not operating	8 to 80% RH (no condensation)	
Vibrations condition	Operating	0.2 G	
	Idle	0.4 G	
Noise		47 db (A) (*2)	
Installation		Rack mount type (7pitches)	

*1:   If the ambient temperature exceeds 35 degrees Celsius (+95F) during operation, a
           warning message is displayed. Take steps to rectify the problem immediately.

*2:   The indicated noise is the mean value of the measurements obtained in an anechoic
           chamber with less echoic influence. The actual noise measured at the installation site
           may be greater than the indication noise due to surrounding noise and echoes.

64

Table 5.6   Installation Specifications of M400R (2)

Item	Specification
External dimension (unit:mm)	Width 482 / Depth 814 / Height 307 / (Front of the cabinet) / (Side of the cabinet)
Service area (unit:mm)	650^{*2} / 695^{*3} / Rear Service area / 1000 / Top of the cabinet / 930^{*2} / 925^{*3} / 800 Service area / 800 Drawer area *1 / 800 Service area / 800 / Front Service area / 800

*1:   Keep the drawer area so that the CPU shelf can be pulled out from the main cabinet during installing some internal option products and providing maintenance of the CPU shelf.

*2:   When this unit is installed in a expansion rack:GP7B7RK1U/RK2U/RK3U/RK4U.

*3:   When this unit is installed in a expansion rack:GP727RK1U/RK2U.

65

6

CHAPTER 6   M600 Main Cabinet

CONTENTS

6.1   Overview

Appearance

CHECK LED(amber)   POWER LED(green)

Lock
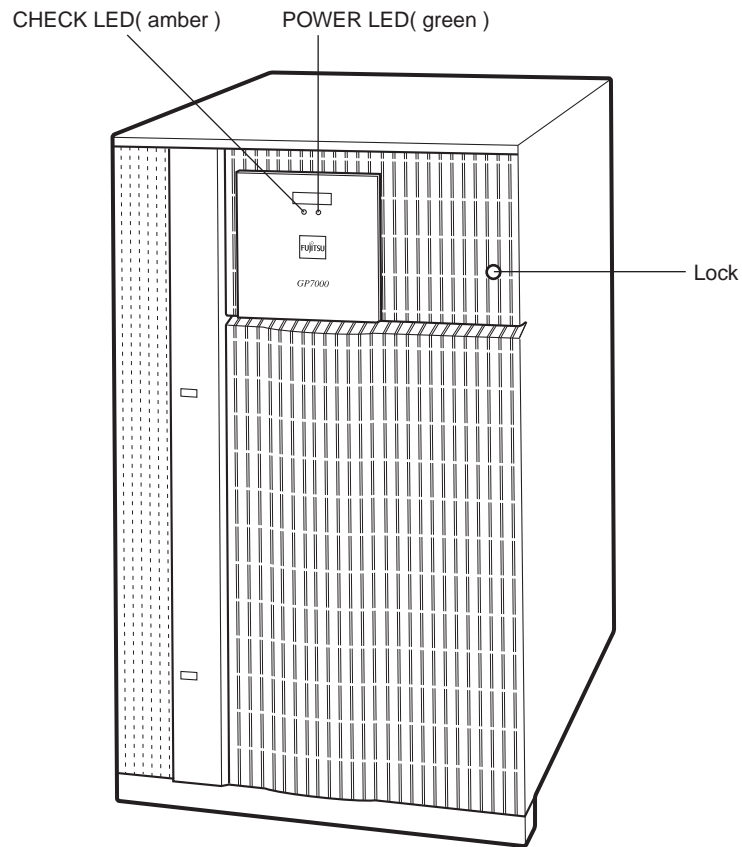
Figure 6.1   Front View of M600 Main Cabinet

Key Features

- Up to 8 processors

- 32 DIMM slots, up to 8 gigabytes of memory.

- 64-bits width, 7 PCI buses provide 13 PCI slots (4*33/66MHz + 9*33MHz).

- Up to 22 UltraSCSI disk drive bays, which support hot-swap features.

- 1 CD-ROM unit and 1 floppy disk unit as the basic configuration.

- 1 tape unit can be installed.

- 1 100BASE-TX (auto-sensing 10 / 100 Mbps), 2 Serial, 1 Parallel, 1 Keyboard/Mouse port

- N+1 redundant power supply units, and fan units, which support hot-swap feature.

68

6.2   Device Configuration

The M600 main cabinet consists of the following components:

- Floor stand cabinet

- Basic power supply and option redundant power supply unit

- Cooling fans

- Systemboard, PCI IO board

- Processor modules

- DIMM (Dual Inline Memory Module)

- Operator panel

- PCI card (option)

- Disk drive units

- CD-ROM unit

- Tape unit (optional QIC tape, 8-mm tape, or DAT)

- Floppy disk unit

The processor modules, DIMMs, PCI cards, tape drive unit, redundant power supply, and disk drive units of the above components are available as options.

Front view of the M600 main cabinet
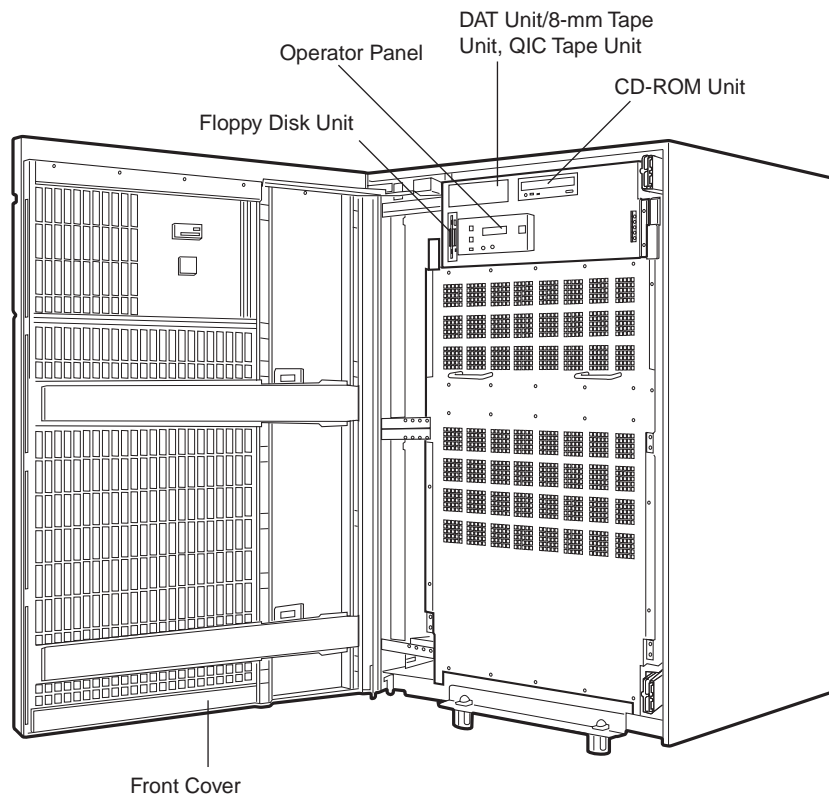
Figure 6.2   Open View of M600 Main Cabinet

69

Panel cover

The panel cover can be opened from its right side after unlocking it. Then you can access switches on the operator panel, CD-ROM unit, Floppy drive unit, tape unit, and so on.

Fans   The Table 6.1 lists the fans installed in the M600 main cabinet.

Table 6.1   Fans

Name	Tray #	Location
Fan #0	Tray #01	Upper, Left (front view) of the cabinet
Fan #1		
Fan #2		
Fan #3	Tray #02	Upper, Right (front view) of the cabinet
Fan #4		
Fan #5		
Fan #6	Tray #03	Bottom, Left (front view) of the cabinet
Fan #7		
Fan #8		
Fan #9		
Fan #10	Tray #04	Bottom, Right (front view) of the cabinet
Fan #11		
Fan #12		
Fan #13	Tray #05	Upper, Center Left-hand (front view) of the cabinet
Fan #14	Tray #06	Upper, Center Right-hand (front view) of the cabinet
Fan #15	Tray #07	Bottom, Left (rear view) of the cabinet
Fan #16		
Fan #17	Tray #08	Bottom, Left (rear view) of the cabinet
Fan #18		
Fan #19	Tray #09	Bottom, Right (rear view) of the cabinet
Fan #20		
Fan #21	Tray #10	Bottom, Right (rear view) of the cabinet
Fan #22		

Power supplies

The M600 main cabinet has 2 kinds of power supply units as well as DDC (DC-DC Converter) dedicated each processor module. FEP (Front End Bulk Power) unit has AC input, and provide +45V(to PPU) and +5V(to SCF). PPU (Power Processing Unit) has +45V input, and provide +12V or +5V or +3.3V or +2V to some internal components. The power supplies must be configured according to the system hardware configuration as described in Table 6.2 .

70

Table 6.2   Power Supply Units

	Number of CPUs								Number of PCI cards	
	1	2	3	4	5	6	7	8	1 - 6	7 - 13
FEP	2		3(FEP#2)						2	
PPU2	1								1	
PPU3	2				3(PPU#2)				2	
PPU3-io	1								1	2(PPU3#4)
PPU5	1								1	2(PPU5#1)
PPU12	2								2	

Note: In the Table 6.2 above, ( ) indicate additional power supply unit #.

Rear of the M600 main cabinet

AC input, AC main line switch, power supplies (FEP) and some connectors are located on the rear of the M600 main cabinet as shown in the Figure 6.3
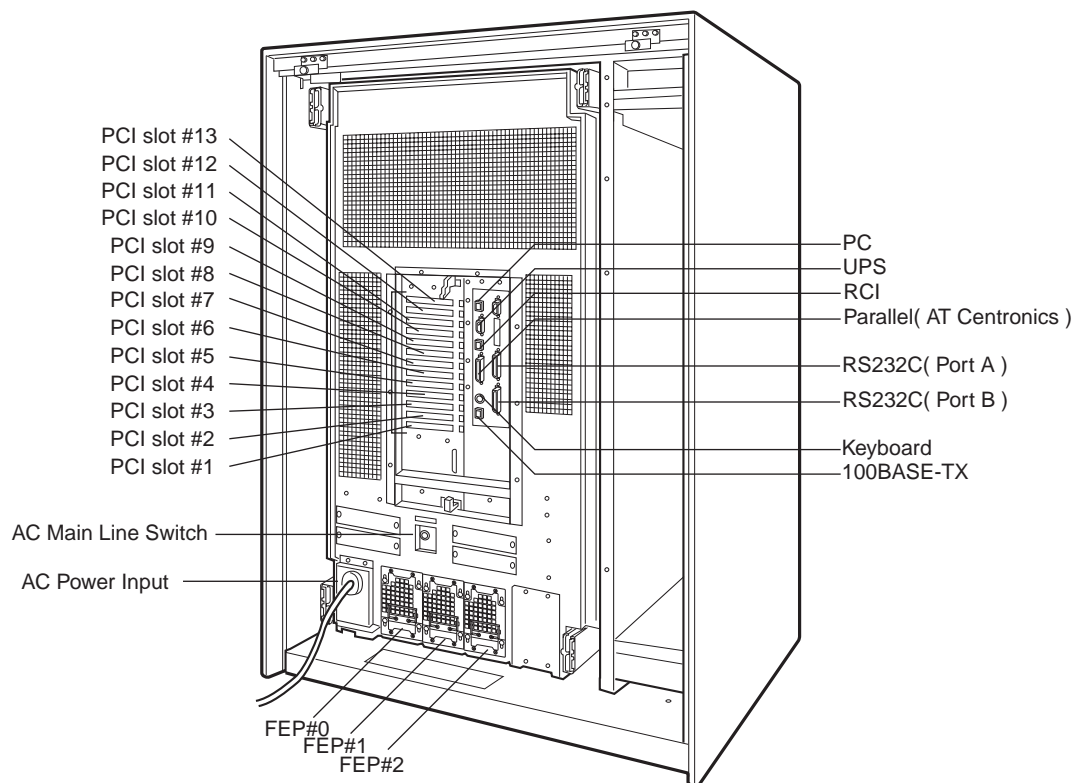
Figure 6.3   Rear View of M600 Main Cabinet

71

6.3   Systemboard

Systemboard

CPU module slots and memory module slots are located on Systemboard as described in Figure 6.4 .
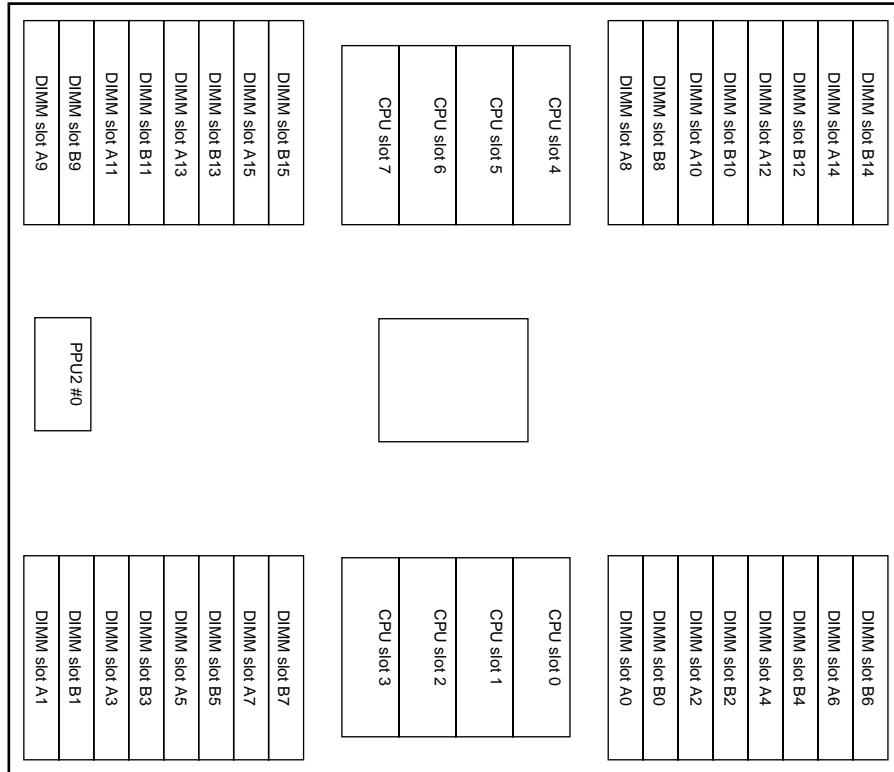
Figure 6.4   Systemboard Layout of M600

72

Processor Configuration

Up to 8 CPU configuration is supported as described in Table 6.3 .

Table 6.3   CPU Module Configurations

	CPU Slot #								Additional Power Supply units
	0	1	2	3	4	5	6	7	
2CPU	Yes	-	-	-	Yes	-	-	-	-
3CPU	Yes	-	Yes	-	Yes	-	-	-	1DDC,1FEP
4CPU	Yes	-	Yes	-	Yes	-	Yes	-	1DDC
5CPU	Yes	Yes	Yes	-	Yes	-	Yes	-	1DDC,1PPU
6CPU	Yes	Yes	Yes	-	Yes	Yes	Yes	-	1DDC
7CPU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	1DDC
8CPU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	1DDC

IMPORTANT

If any of the above conditions is not satisfied, the operation is not guaranteed.

Memory configuration

The M600 has 32 memory slots, allowing for as much as 8 gigabytes of main memory. When intsalling the memory modules, the following conditions must be satisfied:

- When installing the first set of DIMM, install a set of 4 modules of same size in slots 0 and 1 of both groups A and B.

- At subsequent memory expansions, install a set of 4 modules in slots 2 and 3 of both groups A and B. Then, install a set of 8 modules in slots 4 to 7 of both groups A and B. Finally, install a set of 16 modules in slots 8 to 15 of both groups A and B. The modules installed in the slots of a group must have the same size.

- Alternatively, install the set of 4 or 8 or 16 modules of same size in just group A. The set of modules must be installed in the lowest available slots. However, ASR (Automatic System Reconfiguration) from memory failure may not work, in this memory configuration.

IMPORTANT

If any of the above conditions is not satisfied when installing the DIMMs, some DIMMs are degraded in the power-on diagnostics. When expanding the memory modules, check that the DIMMs are installed correctly.

Memory ECC feature

The EDO DRAM is used as the memory chip. The single-bit error correction and multiple-bit error detection features are available for a large capacity memory by using the Error Check Code (ECC) system. A single-bit error can be isolated down to the memory slot on which it occurred. A multiple-bit error can be isolated down to the pair of slots on which it occurred.

73

Checking results of the memory diagnostics

To check that the system recognizes installed memory modules correctly, execute the "show-post-results" command at the ok prompt. A module that does not satisfy any condition described in "Memory configuration" or a module judged to be faulty by memory diagnostics is treated as an invalid module. The screen below lists the command execution results related to memories and their meanings.

Example for normal operation

```
=== Memory =========
Type  :  EDO
Group    SLOT#    Size[Valid(MB)/Existing(MB)          Total
A        0-3      256/256 256/256 256/256 256/256
         4-7      256/256 256/256 256/256 256/256
         8-11     -----   -----   -----   -----
         12-15    -----   -----   -----   -----:  2048/2048 MB
B        0-3      256/256 256/256 256/256 256/256
         4-7      256/256 256/256 256/256 256/256
         8-11     -----   -----   -----   -----
         12-15    -----   -----   -----   -----:  2048/2048 MB
*=Error  SLOT
```

Example of a slot #4 error

```
=== Memory =========
Type  :  EDO
Group    SLOT#    Size[Valid(MB)/Existing(MB)        Total
A        0-3      256/256 256/256 256/256 256/256
         4-7      256/256 256/256 256/256 256/256
         8-11     -----   -----   -----   -----
         12-15    -----   -----   -----   -----:  2048/2048 MB
B        0-3       0 /256  0 /256  0 /256  0 /256
         4-7       0 / 0*  0 /256  0 /256  0 /256
         8-11     -----   -----   -----   -----
         12-15    -----   -----   -----   -----:    0 /1792 MB
*=Error  SLOT
```

Note: If a memory error is detected, an asterisk is displayed in the Size field for the corresponding slot. In this example, an error in slot #4 of group B is detected in the initial diagnostics operation. Modules in slots 0 to 3 and 5 to 7 of group B are recognized as normal modules but also become invalid.

74

6.4　Disk Units

Disk drive configuration

Up to 2 disk drives can be installed in the base configuration of the M600 main cabinet. To install more than 3 disk drive units, the Expansion File Unit must also installed.

6.5　PCI Slots

PCI slots configuration

PCI slots are located on the PCI IO board as described in Figure 6.5 . There are 7 separate PCI Bus channels: A, B, C, D, E, F, and G. All PCI Bus slots provide for the full 64-bit data path and can accommodate both 32-bit and 64-bit data path cards. The specifications for the PCI slots are described in the Table 6.4 .

PCI slot #13
PCI slot #12
PCI slot #11
PCI slot #10
PCI slot #9
PCI slot #8
PCI slot #7
PCI slot #6
PCI slot #5
PCI slot #4
PCI slot #3
PCI slot #2
PCI slot #1
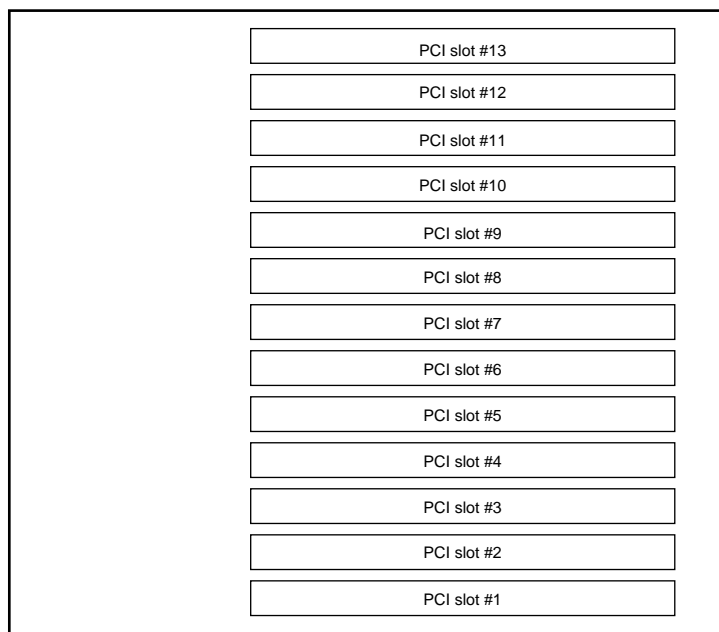
Figure 6.5　　PCI IO Board Layout of M600

75

Table 6.4   PCI Slot Specifications

PCI slot #	PCI Bus	Slot width / card width (bits)	PCI clock (MHz)	Card input voltage
12	D	64 / 32, 64	33/66	3.3 V or universal
11	F	64 / 32, 64	33/66	3.3 V or universal
10	E	64 / 32, 64	33	5 V or universal
9	E	64 / 32, 64	33	5 V or universal
8	E	64 / 32, 64	33	5 V or universal
7	H	64 / 32, 64	33/66	3.3 V or universal
6	C	64 / 32, 64	33	5 V or universal
5	C	64 / 32, 64	33	5 V or universal
4	C	64 / 32, 64	33	5 V or universal
3	G	64 / 32, 64	33	5 V or universal
2	B	64 / 32, 64	33/66	3.3 V or universal
1	A	64 / 32, 64	33	5 V or universal

Note: When you use 7 PCI slots or more, optional PCI Extension PSU must be added to the M600 main cabinet.

76

6.6 Installation

Notes on installation:

- Do not block the ventilation slits.

- Do not install the M600 main cabinet where it will be exposed to sunlight or sources of heat.

- Do not install the M600 main cabinet in dusty places or places where it will be exposed to corrosive gas or sea breeze.

- Keep the M600 main cabinet isolated from vibration. Install the M600 main cabinet on a level surface so that it does not tilt.

- Make sure that the AC power supply source is grounded properly. Otherwise, the M600 main cabinet may malfunction.

- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable when the power is on.

- Do not place anything on the M600 main cabinet. Do not use the cabinet of the M600 main cabinet as a work space.

- In winter, to prevent condensation in the M600 main cabinet, do not raise the ambient temperature rapidly. Use the M600 main cabinet only after it has warmed up sufficiently.

- Do not install the M600 main cabinet near a noise generating device such as a photocopier, air conditioner, or welder.

- Take electrostatic prevention measures. Note that some carpets generates static electricity easily and can cause the M600 main cabinet to malfunction.

- When moving the M600 main cabinet, do not pull on the front cover. Otherwise, the main cabinet may be damaged.

IMPORTANT

If the above conditions are not satisfied, the M600 main cabinet may be damaged. Be sure to follow these precautions.

77
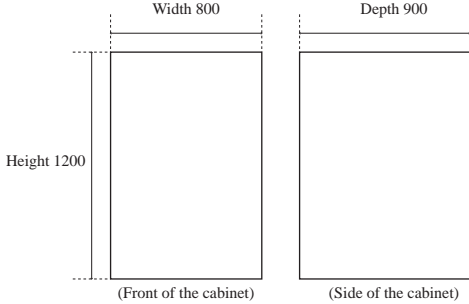
Installation specifications

Table 6.5   Installation Specifications of M600 Main Cabinet (1)

Item		Specification	
Mass		Up to 250kg (approx.552 lb) (*1)	
Power condition	Input voltage	Single phase 100 to 120 VAC (+-10%)	Single phase 200 to 240 VAC (+-10%)
	Input frequency	50/60 Hz (+2 to -4%)	
Maximum consumption current		13.4 A	6.6 A
Leakage current (1 for each cable)		2.2 mA or less	4.7 mA or less
Ground resistance		100ohm or less (class C installation standard)	
Temperature condition	Operating	5 to 35 degrees Celsius (+41 to +95 F) (*2)	
	Not operating	0 to 50 degrees Celsius (+32 to +122F)	
Humidity condition	Operating	20 to 80%RH (no condensation)	
	Not operating	8 to 80% RH (no condensation)	
Vibrations condition	Operating	0.2 G	
	Idle	0.4 G	
Noise		55 db (A) (*3)	
Installation		Floor Stand type	

*1:   The mass shows M600 main cabinet without Expansion File Units.

*2:   If the ambient temperature exceeds 35 degrees Celsius (+95 F) during operation, a warning message is output. Take steps to rectify the problem immediately.

*3:   The indicated noise is the mean value of the measurements obtained in an anechoic chamber with less echoic influence. The actual noise measured at the installation site may be greater than the indication noise due to surrounding noise and echoes.

Table 6.6   Installation Specifications of M600 Main Cabinet (2)

Item	Specification
External dimension (unit:mm)	Width 800 Depth 900 Height 1200 (Front of the cabinet) (Side of the cabinet)
Service area (unit:mm)	800 Rear Service area 1000 Top of the cabinet 900 800 800 800 Service area Drawer area *1 Service area 800 Front Service area 800

*1:   Keep the drawer area so that the CPU shelf can be pulled out from the main cabinet during installing some internal option products and providing maintenance of the CPU shelf.

7

CHAPTER 7　　　M600R Main Cabinet

CONTENTS

81

7.1   Overview

Appearance
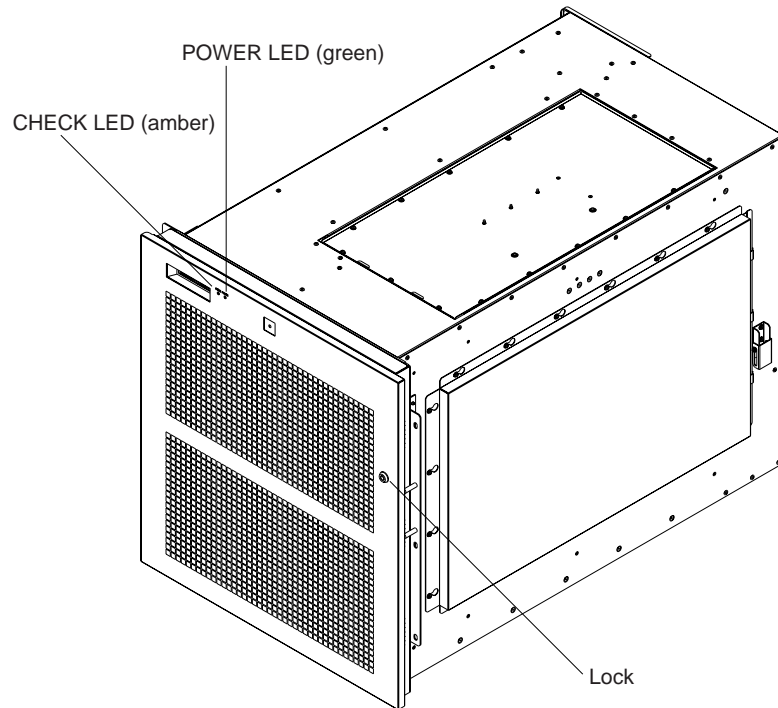
Figure 7.1   Front View of M600R Main Cabinet

Key Features

- Up to 8 processors

- 32 DIMM slots, up to 16 gigabytes of memory.

- 64-bits width, 8 PCI buses provide 12 PCI slots (4*33/66MHz + 8*33MHz).

- 2 UltraSCSI disk drive bays, which support hot-swap features.

- 1 CD-ROM unit and 1 floppy disk unit as the basic configuration.

- 1 tape unit can be installed.

- 1 100BASE-TX (auto-sensing 10 / 100 Mbps), 2 Serial, 1 Parallel, 1 Keyboard/Mouse port

- N+1 redundant power supply units, and fan units, which support hot-swap feature.

7.2   Device Configuration

The M600R main cabinet consists of the following components:

- Rack-mount cabinet
- Basic power supply and option redundant power supply unit
- Cooling fans
- Systemboard, PCIBPR board, PCIRSR board, PCIIO2 board
- Processor modules
- DIMM (Dual Inline Memory Module)
- Operator panel
- PCI card (option)
- Disk drive units
- CD-ROM unit
- Tape unit (optional QIC tape, 8-mm tape, or DAT)
- Floppy disk unit

The processor modules, DIMMs, PCI cards, tape drive unit, redundant power supply, and disk drive units of the above components are available as options.

Front view of the M600R main cabinet
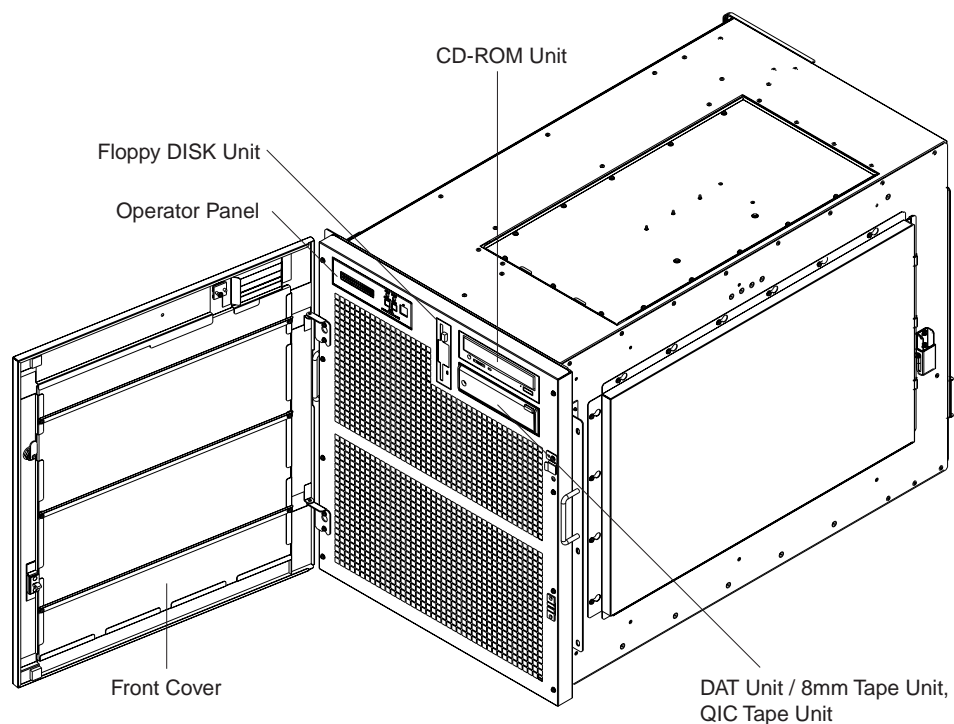
Figure 7.2   Open View of M600R Main Cabinet

83

FEP#2
(additional)

FEP#3
(redundant option)
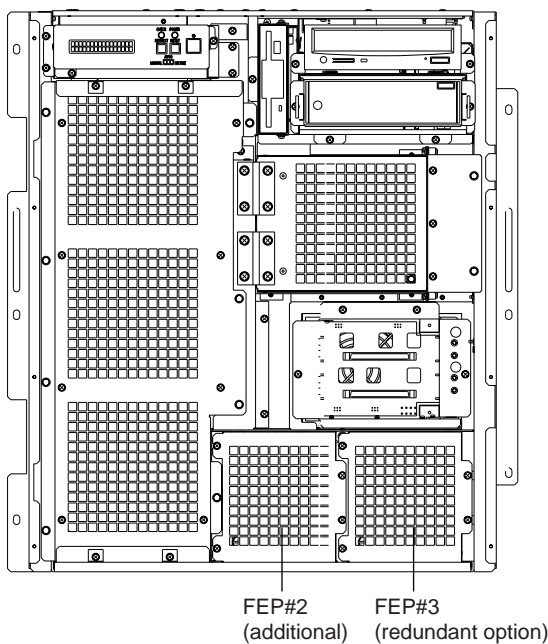
Figure 7.3   Front View of M600R Main Cabinet (remove Front cover)

Panel cover

The panel cover can be opened from its right side after unlocking it. Then you can access switches on the operator panel, CD-ROM unit, Floppy drive unit, tape unit, and so on.

Fans   The Table 7.1 lists the fans installed in the M600R main cabinet.

Table 7.1   Fans

Name	Tray #	Location
Fan #0	Tray #01	Front, Left (front view) of the cabinet
Fan #1		
Fan #2		
Fan #3	Tray #02	Front, Above the Disk drive slots
Fan #4	Tray #03	
Fan #5	Tray #04	Rear, Above the PCI Slots
Fan #6	Tray #05	
Fan #7	Tray #06	Rear, Right (rear view) of the cabinet
Fan #8		
Fan #9		
Fan #10	Tray #07	Right (front view), side the PCI slots from #8 to #12
Fan #11	Tray #08	

Power supplies

The M600R main cabinet has 2 kinds of power supply units as well as DDC (DC-DC Converter) dedicated each processor module. FEP (Front End Bulk Power) unit has AC input, and provide +45V(to PPU) and +5V(to SCF). PPU (Power Processing Unit) has +45V input, and provide +12V or +5V or +3.3V or +2V to some internal components. The power supplies must be configured according to the system hardware configuration as described in Table 7.2 .

Table 7.2   Power Supply Units

	Number of CPUs							
	1	2	3	4	5	6	7	8
FEP	2		3(FEP#2)					
PPU2	1							
PPU3	2				3(PPU#2)			
PPU3-io	1							
PPU5	1							
PPU12	2							

Note: In the Table 7.2 above, ( ) indicate additional power supply unit #.

Rear of the M600R main cabinet

AC input, AC main line switch, power supplies (FEP) and some connectors are located on the rear of the M600R main cabinet as shown in the Figure 7.4
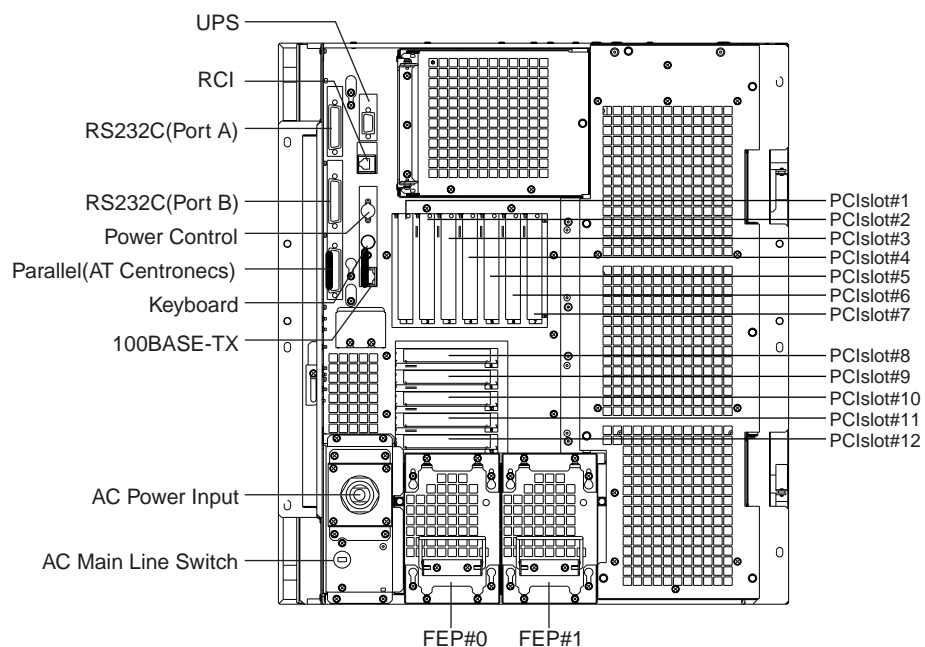
Figure 7.4   Rear View of M600R Main Cabinet

85

7.3   Systemboard

Systemboard

CPU module slots and memory module slots are located on Systemboard as described in Figure 7.5 .

DIMMslot A1		PPU2 #0		DIMMslot A9
DIMMslot B1				DIMMslot B9
DIMMslot A3				DIMMslot A11
DIMMslot B3				DIMMslot B11
DIMMslot A5				DIMMslot A13
DIMMslot B5				DIMMslot B13
DIMMslot A7				DIMMslot A15
DIMMslot B7				DIMMslot B15
CPUslot 3				CPUslot 7
CPUslot 2				CPUslot 6
CPUslot 1				CPUslot 5
CPUslot 0				CPUslot 4
DIMMslot A0				DIMMslot A8
DIMMslot B0				DIMMslot B8
DIMMslot A2				DIMMslot A10
DIMMslot B2				DIMMslot B10
DIMMslot A4				DIMMslot A12
DIMMslot B4				DIMMslot B12
DIMMslot A6				DIMMslot A14
DIMMslot B6				DIMMslot B14

Figure 7.5   Systemboard Layout of M600R

86

Processor Configuration

Up to 8 CPU configuration is supported as described in Table 7.3 .

Table 7.3   CPU Module Configurations

	CPU Slot #								Additional Power Supply units
	0	1	2	3	4	5	6	7	
2CPU	Yes	-	-	-	Yes	-	-	-	-
3CPU	Yes	-	Yes	-	Yes	-	-	-	1DDC,1FEP
4CPU	Yes	-	Yes	-	Yes	-	Yes	-	1DDC
5CPU	Yes	Yes	Yes	-	Yes	-	Yes	-	1DDC,1PPU
6CPU	Yes	Yes	Yes	-	Yes	Yes	Yes	-	1DDC
7CPU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	1DDC
8CPU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	1DDC

IMPORTANT

If any of the above conditions is not satisfied, the operation is not guaranteed.

Memory configuration

The M600R has 32 memory slots, allowing for as much as 16 gigabytes of main memory. When installing the memory modules, the following conditions must be satisfied:

- When installing the first set of DIMM, install a set of 4 modules of same size in slots 0 and 1 of both groups A and B.

- At subsequent memory expansions, install a set of 4 modules in slots 2 and 3 of both groups A and B. Then, install a set of 8 modules in slots 4 to 7 of both groups A and B. Finally, install a set of 16 modules in slots 8 to 15 of both groups A and B. The modules installed in the slots of a group must have the same size.

- Alternatively, install the set of 4 or 8 or 16 modules of same size in just group A. The set of modules must be installed in the lowest available slots. However, ASR (Automatic System Reconfiguration) from memory failure may not work, in this memory configuration.

IMPORTANT

If any of the above conditions is not satisfied when installing the DIMMs, some DIMMs are degraded in the power-on diagnostics. When expanding the memory modules, check that the DIMMs are installed correctly.

Memory ECC feature

The SDRAM is used as the memory chip. The single-bit error correction and multiple-bit error detection features are available for a large capacity memory by using the Error Check Code (ECC) system. A single-bit error can be isolated down to the memory slot on which it occurred. A multiple-bit error can be isolated down to the pair of slots on which it occurred.

87

Checking results of the memory diagnostics

To check that the system recognizes installed memory modules correctly, execute the "show-post-results" command at the ok prompt. A module that does not satisfy any condition described in "Memory configuration" or a module judged to be faulty by memory diagnostics is treated as an invalid module. The screen below lists the command execution results related to memories and their meanings.

Example for normal operation

```
=== Memory =========
Type  :  SDRAM
Group   SLOT#    Size[Valid(MB)/Existing(MB)        Total
A       0-3     256/256 256/256 256/256 256/256
        4-7     256/256 256/256 256/256 256/256
        8-11    -----   -----   -----   -----
        12-15   -----   -----   -----   -----:  2048/2048 MB
B       0-3     256/256 256/256 256/256 256/256
        4-7     256/256 256/256 256/256 256/256
        8-11    -----   -----   -----   -----
        12-15   -----   -----   -----   -----:  2048/2048 MB
*=Error SLOT
```

Example of a slot #4 error

```
=== Memory =========
Type  :  SDRAM
Group   SLOT#    Size[Valid(MB)/Existing(MB)       Total
A       0-3     256/256 256/256 256/256 256/256
        4-7     256/256 256/256 256/256 256/256
        8-11    -----   -----   -----   -----
        12-15   -----   -----   -----   -----:  2048/2048 MB
B       0-3      0 /256  0 /256  0 /256  0 /256
        4-7      0 / 0*  0 /256  0 /256  0 /256
        8-11    -----   -----   -----   -----
        12-15   -----   -----   -----   -----:   0 /1792 MB
*=Error SLOT
```

Note: If a memory error is detected, an asterisk is displayed in the Size field for the corresponding slot. In this example, an error in slot #4 of group B is detected in the initial diagnostics operation. Modules in slots 0 to 3 and 5 to 7 of group B are recognized as normal modules but also become invalid.

7.4   Disk Units

Disk drive configuration

Up to 2 disk drives can be installed in the base configuration of the M600R main cabinet. To install more than 3 disk drive units, the Expansion File Unit must also installed.

88

7.5 PCI Slots

PCI slots configuration

PCI slots are located on the PCIBPR board and PCIRSR board as described in Figure 7.6 and Figure 7.7 . There are 8 separate PCI Bus channels: A, B, C, D, E, F, and G. All PCI Bus slots provide for the full 64-bit data path and can accommodate both 32-bit and 64-bit data path cards. The specifications for the PCI slots are described in the Table 7.4 .

```
┌─────────────────────────────────────────────┐
│          ┌─────────────────────────┐         │
│          │        PCIslot#7        │         │
│          └─────────────────────────┘         │
│          ┌─────────────────────────┐         │
│          │        PCIslot#6        │         │
│          └─────────────────────────┘         │
│          ┌─────────────────────────┐         │
│          │        PCIslot#5        │         │
│          └─────────────────────────┘         │
│          ┌─────────────────────────┐         │
│          │        PCIslot#4        │         │
│          └─────────────────────────┘         │
│          ┌─────────────────────────┐         │
│          │        PCIslot#3        │         │
│          └─────────────────────────┘         │
│          ┌─────────────────────────┐         │
│          │        PCIslot#2        │         │
│          └─────────────────────────┘         │
│          ┌─────────────────────────┐         │
│          │        PCIslot#1        │         │
│          └─────────────────────────┘         │
└─────────────────────────────────────────────┘
```
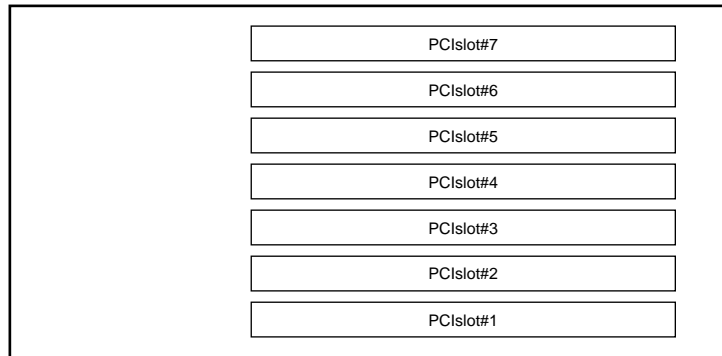
Figure 7.6   PCIBPR Board Layout of M600R

```
┌─────────────────────────────────────────────┐
│          ┌─────────────────────────┐         │
│          │        PCIslot#8        │         │
│          └─────────────────────────┘         │
│          ┌─────────────────────────┐         │
│          │        PCIslot#9        │         │
│          └─────────────────────────┘         │
│          ┌─────────────────────────┐         │
│          │        PCIslot#10       │         │
│          └─────────────────────────┘         │
│          ┌─────────────────────────┐         │
│          │        PCIslot#11       │         │
│          └─────────────────────────┘         │
│          ┌─────────────────────────┐         │
│          │        PCIslot#12       │         │
│          └─────────────────────────┘         │
└─────────────────────────────────────────────┘
```
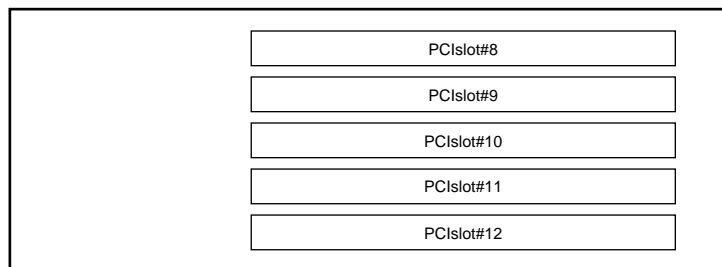
Figure 7.7   PCIRSR Board Layout of M600R

Table 7.4   PCI Slot Specifications

PCI slot #	PCI Bus	Slot width / card width (bits)	PCI clock (MHz)	Card input voltage
12	D	64 / 32, 64	33/66	3.3 V or universal
11	F	64 / 32, 64	33/66	3.3 V or universal
10	E	64 / 32, 64	33	5 V or universal
9	E	64 / 32, 64	33	5 V or universal
8	E	64 / 32, 64	33	5 V or universal
7	H	64 / 32, 64	33/66	3.3 V or universal
6	C	64 / 32, 64	33	5 V or universal
5	C	64 / 32, 64	33	5 V or universal
4	C	64 / 32, 64	33	5 V or universal
3	G	64 / 32, 64	33	5 V or universal
2	B	64 / 32, 64	33/66	3.3 V or universal
1	A	64 / 32, 64	33	5 V or universal

90

7.6   Installation

Purpose   The following installation instruction is intended to provide the product safety requirements which must be addressed when the end-use product manufacturer installs this product in their equipment. Note that the acceptability of the combination of this product in a rack should be re-determined by an appropriate certification body, if that combination is differ from the Table 7.4 .

Safety Installation Instruction:

- This unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature inside of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the unit in an environment compatible with the manufacturer's maximum rated ambient temperature.

  - Consideration for adjustment of air condition like air circulation should be given to prevent the internal rack ambient from exceeding the Max. Operating ambient temperature of this unit.

  - Maximum operating ambient temperature of this unit : 35 deg C.

- Installation of the unit in a rack should be such that the amount of air flow required for safe operation of the unit is not compromised.

  - This unit has ventilation openings at front and rear face of the unit.

  - Do not cover or close these ventilation openings to prevent overheating.

- Mounting of the unit in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading. To keep stability of entire rack, please fix the rack to wall or floor by suitable means.

  - Be careful about injury during installation of this unit into rack.

  - Do not install this unit into your rack where the unit may make the entire rack unstable.

  - Mass of this unit with maximum configuration : 100 kg.

- If the unit is supplied from Power Strip or Service Outlet of other units, it may overload the Power Supply Cord of the Power Strip or other units.

  - Confirm that the current rating of Power Strip or Service Outlet exceeds the combined ratings of all equipment it is supplying.

  - Electrical ratings of this unit : Rated 100 - 240Vac, 13.4 - 6.6 A, 50/60 Hz, 1 phase

- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.q., use of power strips).

IMPORTANT

High Leakage Current may flow through Power Strip Earthing Conductor, if all power supply cords of this unit are connected to one Power Strip. Earth connection essential before connecting supply.

Table 7.5   Mounting Combination for Expansion Rack

Rack-Mount Units	Mounting Portion Priority in the Rack
Communication Swichable Unit	
Expansion File Unit Type-2	
Disk Array Unit (GP-DxxxxU)	Upper
GP7000F Model 200R/400R	↕
Disk Array Unit (GR700/720)	
Outlet and/or Outlet Type-2	Lower
GP7000F Model 600R	

Note: Each rack-mount unit should be mounted in the lowest available portion with the priority indicated in the Table 7.5 .

Notes on Installation

- Do not install this unit where it will be exposed to sunlight or sources of heat.

- Do not install this unit in dusty places or places where it will be exposed to corrosive gas or sea breeze.

- Keep this unit isolated from vibration. Install this unit on a level surface to prevent it from tilting.

- Do not run a cable under a unit or overextend a cable. Do not disconnect the power cable while the power is on.

- Do not place anything on this unit. Do not use this unit as a desk.

- To prevent condensation in this unit, do not raise the room temperature rapidly in the winter. Use the cabinet only after sufficiently warming it.

- Do not install this cabinet near noisy devices such as a photocopier, air conditioner, or welder.

- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause this unit to malfunction.

IMPORTANT

If the above conditions are not satisfied, this unit may be damaged. Be sure to follow above precautions.

Installation specifications

Table 7.6   Installation Specifications of M600R

Item		Specification	
Mass		Up to 100kg (approx.220 lb)	
Power condition	Input voltage	Single phase 100 to 120 VAC (+-10%)	Single phase 200 to 240 VAC (+-10%)
	Input frequency	50/60 Hz (+2 to -4%)	
Maximum consumption current		13.4 A	6.6 A
Leakage current (1 for each cable)		2.2 mA or less	2.2 mA or less
Ground resistance		100ohm or less (class C installation standard)	
Temperature condition	Operating	5 to 35 degrees Celsius (+41 to +95 F) (*1)	
	Not operating	0 to 50 degrees Celsius (+32 to +122F)	
Humidity condition	Operating	20 to 80%RH (no condensation)	
	Not operating	8 to 80% RH (no condensation)	
Vibrations condition	Operating	0.2 G	
	Idle	0.4 G	
Noise		55 db (A) (*2)	
Installation		Rack mount type (12pitches)	

*1:   If the ambient temperature exceeds 35 degrees Celsius (+95F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*2:   The indicated noise is the mean value of the measurements obtained in an anechoic chamber with less echoic influence. The actual noise measured at the installation site may be greater than the indication noise due to surrounding noise and echoes.

Table 7.7   Installation Specifications of M600R (2)

Item	Specification
External dimension (unit:mm)	Width 482 Depth 787 Height 530 (Front of the cabinet) (Side of the cabinet)
Service area (unit:mm)	650*2 695*3 Rear Service area 1000 Top of the cabinet 930*2 925*3 800 Service area Drawer area *1 800 Service area 800 Front Service area 800

*1:   Keep the drawer area so that the CPU shelf can be pulled out from the main cabinet during installing some internal option products and providing maintenance of the CPU shelf.

*2:   When this unit is installed in a expansion rack:GP7B7RK1U/RK2U/RK3U/RK4U.

*3:   When this unit is installed in a expansion rack:GP727RK1U/RK2U.

94

8

CHAPTER 8   Expansion Disk Cabinet

CONTENTS

95

8.1   Product Outline

Key Features

- 2 separate 40MB/s differential UltraSCSI connections to the host per Expansion Disk Cabinet.

- Up to 5 UltraSCSI disk units can be installed per UltraSCSI bus, and up to 10 UltraSCSI disk units can be installed per Expansion Disk Cabinet.

- The disk units can be hot-swappable.

- The power supply unit can be configured redundantly, and it can be hot-swappable when configured redundantly.

- Fans are configured redundantly to continue working even if a fan is failed.

- The Expansion Disk Cabinet has some status LEDs inside the cabinet, as well as a CHECK LED and a POWER LED on the front panel. It makes easy to identify/isolate hardware problems.

- The Expansion Disk Cabinet is connected to the GP7000F main cabinet through a RCI (Remote Cabinet interface) cable as well as UltraSCSI interfaces. The RCI makes power cycle of the cabinet linking to the GP7000F main cabinet.

- The front panel has a lock key to prevent unauthorized access to the internal units in the Expansion Disk Cabinet.

Front View of the unit

Figure 8.1 shows the front view of the cabinet.
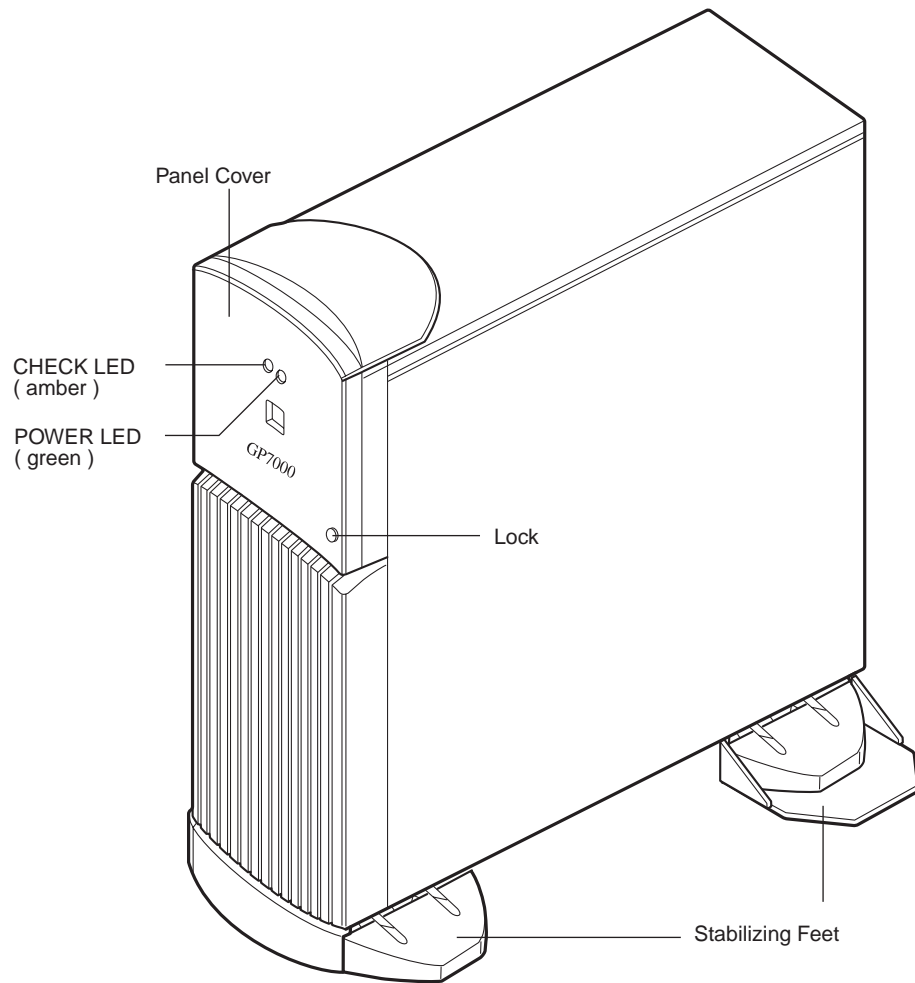
Figure 8.1   Front View of Expansion Disk Cabinet

8.2   Device Configuration

The Expansion Disk Cabinet consists of the following components.

- Desk side cabinet (system cabinet)
- Basic power supply unit (an optional power supply unit is available for redundant configuration)
- DC-DC converter
- Redundant cooling fans
- SCSI-BP boards
- Interface board
- Hot-swappable disk drives

97

Disk configuration

The Expansion Disk Cabinet has 2 UltraSCSI buses. Up to 5 drive units can be installed in the upper drive bays of the cabinet as shown in the Figure 8.2 below. Internally, they are connected to an interface board by a single-ended UltraSCSI bus. And, up to 5 drive units can be installed in the lower drive bays. Also, they are connected to an interface board by a single-ended UltraSCSI bus. The interface board has a single-ended to differential interface converter in it, and each interface board is connected to the host server by a differential UltraSCSI bus.

Each interface board has a POWER LED. If a FAULT LED and an ACTIVE LED of a disk bay that has a disk drive doesn't light up, check the POWER LED on the interface board in the cage if it is light up or not. A failed unit can be isolated by checking this POWER LED, a ACTIVE LED, a FAULT LED, and a POWER LED on the power supply unit.
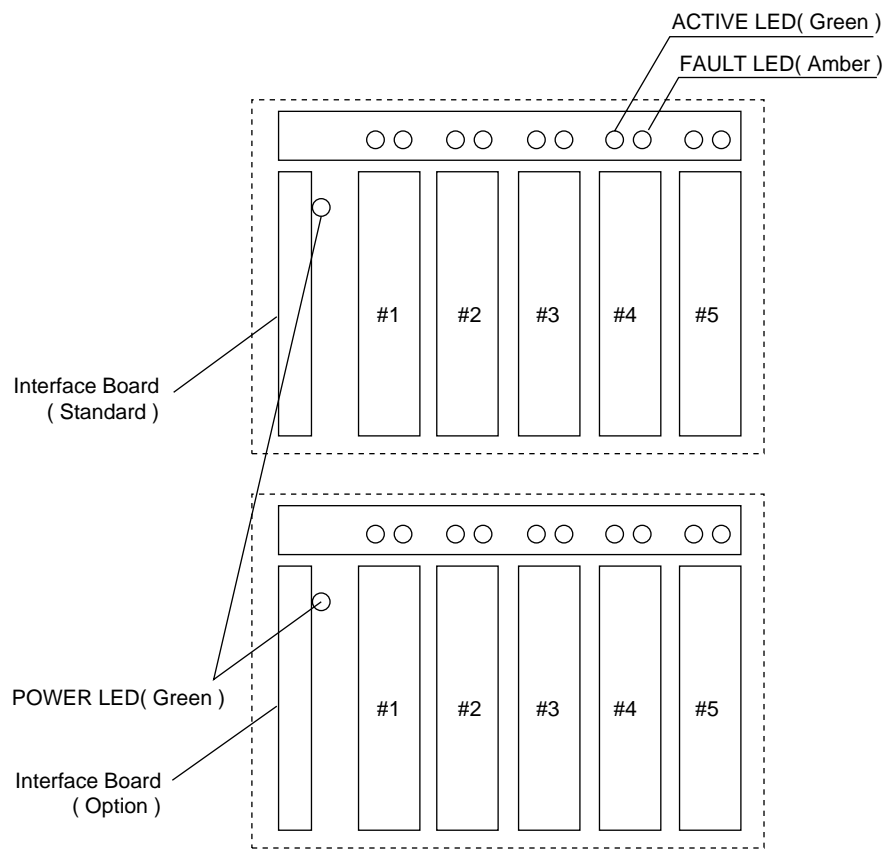
Figure 8.2   Drive Bays of Expansion Disk Cabinet

status LED

A POWER LED and a CHECK LED are installed on the front of the cabinet. The POWER LED indicates if the power is on or off. And, the CHECK LED indicates if there is any hardware errors or not. The CHECK LED operates as described below.

Table 8.1   CHECK LED Status

State	Indication	Remarks
Off	No errors	
Blinking	Identifying a device	Activated when a maintenance command is used to identify the target device.
On	Error	The cause of the error will be a power failure, or abnormal fan rotation.

When a power supply unit or fan unit is failed, the CHECK LED is lighted steadily. And, if a disk unit fail, its FAULT LED is lighted by software command to identify the faulty disk unit.

When a FAULT LED is lighted up according to hot-swap procedures, the CHECK LED is lighted steadily to identify an Expansion Disk Cabinet.

Disk units can be hot-swappable easily by opening the front cover of the cabinet. The front cover has a key lock in order to protect from unauthorized access to the internal units in the Expansion Disk Cabinet.

Stabilizing foot

The stabilizing feet prevent the expansion disk cabinet from toppling over if it is pushed or shaken, as during an earthquake. Be sure to attach these feet according to the installation condition as explained below:

- When the expansion cabinet is installed beside a GP7000F main cabinet, attach the stabilizing feet only to the opposite side of the main cabinet. Do not attach the stabilizing feet to the GP7000F main cabinet on the side next to the Expansion Cabinet as well.

- When the cabinet is installed as a standalone, attach the stabilizing feet on both sides of the cabinet.

99

Rear Panel

The Figure 8.3 shows the rear panel of Expansion Disk Cabinet.

SCSI OUT Connector

SCSI IN Connector(Option)

SCSI OUT Connector

SCSI IN Connector(Standard)

Service Pin
RCI Port

Power Supply Unit
(Standard)

AC Power Input
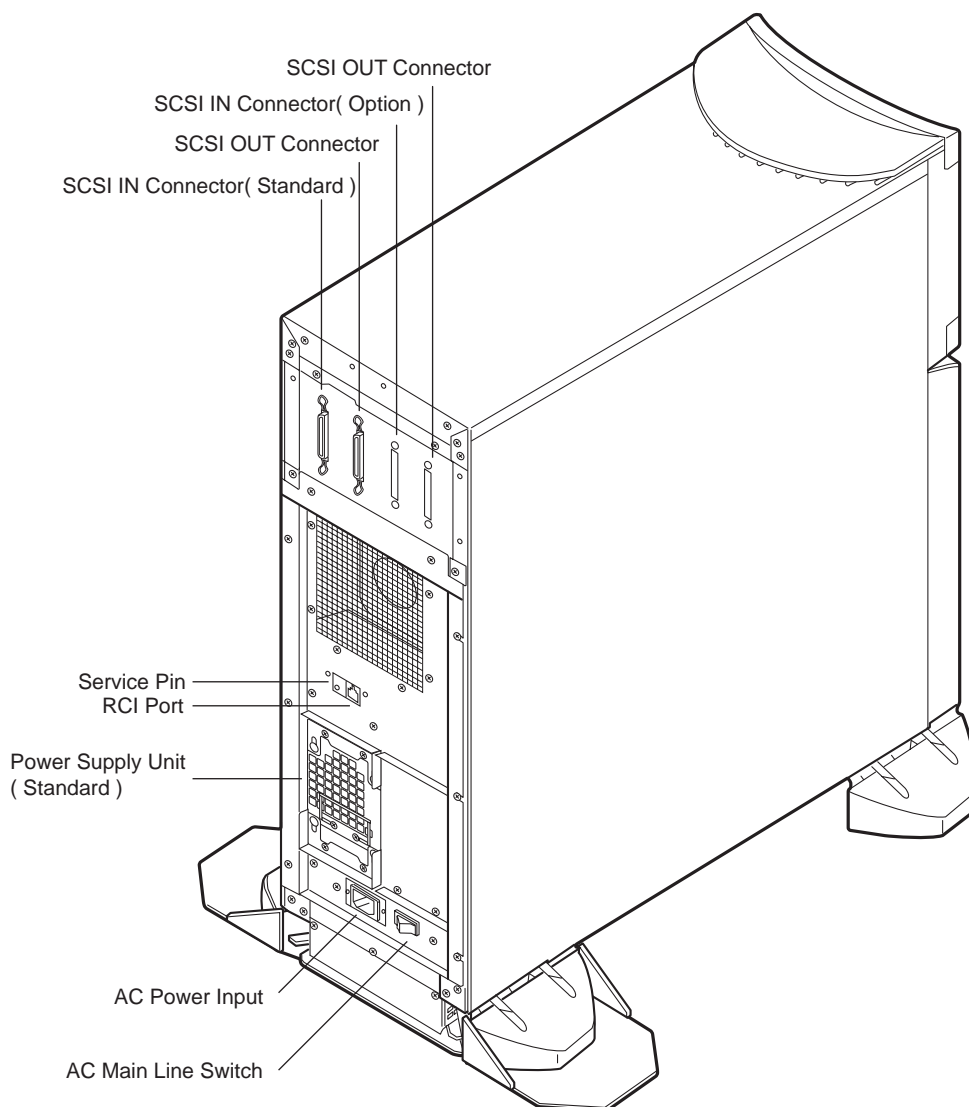
AC Main Line Switch

Figure 8.3   Rear View of Expansion Disk Cabinet

The Expansion Disk Cabinet is not powerd on/off by only the main line switch, but it is linked to power on/off of the GP7000F main cabinet. Note that this cabinet does not power on if the main line switch is OFF, even if the GP7000F main cabinet is powered on. Keep the main line switch set to ON for regular use.

Be sure to set the RCI configuration, which is detailed in Chapter13 , must be set properly when installing an Expansion Disk Cabinet.

The cabinet has 2 pair of SCSI IN/OUT connectors on it. When the cabinet is configured without expansion (optional) drive bays, a SCSI cable must be connected to the standard SCSI IN connector. Be sure to install an UltraSCSI differential terminator plug on SCSI OUT connector.

100

⚠ CAUTION

Do not set the AC main line switch to OFF, nor disconnect the power cable or RCI cable while the GP7000F main cabinet is powered on, unless absolutely necessary. Otherwise, the data may be destroyed in the disk units.

8.3 Hot System Replacement

Disk unit The SCA-II connector is used as the disk unit connector to enable hot system replacement of a faulty disk unit. The availability is improved by combining this feature with the disk mirroring feature. Two LEDs (ACTIVE and FAULT) are installed per disk unit to indicate the disk unit status. These LEDs operate as described below.

Table 8.2   LEDs

Name	Color	Status
ACTIVE LED	Green	Lights up when the SCSI commands are executed.
FAULT LED	Amber	Lights up when the hot replacement command is executed.

To hot-swap a disk unit, you need to use the software tool which is provided in "Basic Software Extension" or "Enhanced Support Facility". Please refer to user's guide of "Basic Software Extension" or "Enhanced Support Facility" for more information. The FAULT LED lights up according to the procedures described in the user's guide to identify the failed disk unit. If the FAULT LED does not light up even if you follows the procedures described in the user's manual, hot-swapping is not possible. In this case, power-off the entire system, then replace the disk unit.

When adding a new disk unit while the system is running, use the software tool, as well.

Power When the power supply units are configured redundantly, it can be hot-swapped. Each power supply unit has a POWER LED on it, and it lights steadily while the corresponding power supply is working. When the POWER LED doesn't light, it indicates that the power is turned off or the power unit has failed. Hot replacement of the power supply unit is possible only while the corresponding POWER LED is off.

Use a software tool, which is provided in "Basic Software Extension" or "Enhanced Support Facility", to how-swap a power supply unit. Please refer to user's guide of "Basic Software Extension" or "Enhanced Support Facility" for more information.

101

8.4   Installation

Notes on installation:

- Do not block the air vents.

- Do not install this cabinet where it is exposed to sunlight or heat.

- Do not install this cabinet in dusty places or places where it is exposed to corrosive gas or sea air.

- Keep this cabinet isolated from vibration. Install the cabinet on a level surface to prevent it from tilting.

- Make sure that the AC power supply source is grounded properly. Otherwise, this file unit may malfunction.

- Do not run a cable under a unit or allow a cable to become taut. Do not disconnect the power cable while the power is on.

- Do not place anything on this cabinet. Do not use the cabinet as a desk.

- To prevent condensation in this cabinet, do not raise the room temperature rapidly in the winter. Use the cabinet only after sufficiently warming it.

- Do not install this cabinet near noisy devices such as a photocopier, air conditioner, or welder.

- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause this cabinet to malfunction.

- When moving this cabinet, do not pull on the front cover. Otherwise, the cabinet may be damaged.

IMPORTANT

If the above conditions are not satisfied, the cabinet may be damaged. Be sure to follow these precautions.

Installation specifications
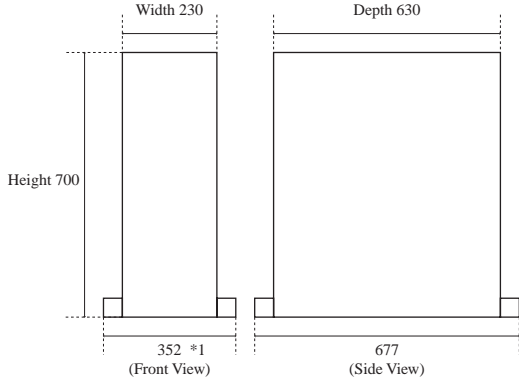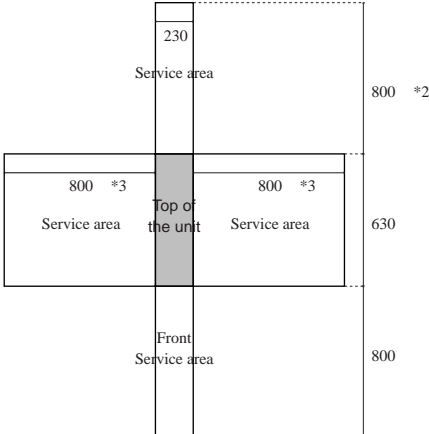
Table 8.3   Expansion Disk Cabinet Installation Specifications (1)

Item		Specification	
Mass		Up to 38kg	
Power condition	Input voltage	Single phase 100 to 120 VAC (+-10%)	Single phase 200 to 240 VAC (+-10%)
	Input frequency	50/60 Hz (+2 to -4%)	
Maximum consumption current		3 A	1.5 A
Leakage current(1 for each cable)		1.2 mA or less	2.7 mA or less
Ground resistance		100ohm or less (class C installation standard)	
Temperature condition	Operating	5 to 35 degrees Celsius (+41 to +95 F) (*1)	
	Not operating	0 to 50 degrees Celsius (+32 to +122F)	
Humidity condition	Operating	20 to 80%RH (no condensation)	
	Not operating	8 to 80% RH (no condensation)	
Vibrations condition	Operating	0.2 G	
	Idle	0.4 G	
Noise		47 db (A) (*2)	
Installation		Standalone type	

*1:   If the ambient temperature exceeds 35 degrees Celsius (+95F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*2:   The indicated noise is the mean value of the measurements obtained in an anechoic chamber with less echoic influence. The actual noise measured at the installation site may be greater than the indication noise due to surrounding noise and echoes.

103

Table 8.4   Installation Specifications of Expansion Disk Cabinet (2)

Item	Specification
External dimension (unit:mm)	
Service area (unit:mm)	

*1   The unit width including the Stabilizing Feet is 352 mm (13.8 inch).

*2   For the rear space, if 800 mm (31.5 inch) or more space is available by moving the cabinet when repair the cabinet or provide any services for it, 200 mm (7.8 inch) is sufficient for regular usual.

*3   For the side space, if 800 mm (31.5 inch) or more space is available by moving the cabinet when repair the cabinet or provide any services for it, the service area as described above Table is not necessary for regular usual.

104

9

CHAPTER 9   Expansion File Unit Type-2 (GP7B7FLxx)

CONTENTS

105

9.1   Product Outline

Key Features

- 2 separate 40MB/s differential UltraSCSI connections to the host per Expansion File Unit Type-2.

- By adding a File Unit Expansion Kit, the Expansion File Unit can accommodate up to 10 UltraSCSI disk units (5 UltraSCSI disk units is standard). Or by installing a Tape Unit Bay Kit, a maximum of any two: 8 mm, DAT, or QIC tape unit can be added.

- The disk units can be hot-swappable.

- The power supply unit can be configured redundantly, and it can be hot-swappable when configured redundantly.

- Fans are configured redundantly to continue working even if a fan is failed.

- The Expansion File Unit Type-2 has some status LEDs inside the cabinet, as well as a CHECK LED and a POWER LED on the front panel. It makes easy to identify/isolate hardware problems.

- The Expansion File Unit Type-2 is connected to the GP7000F main cabinet through a RCI (Remote Cabinet Interface) cable as well as UltraSCSI interfaces. The RCI makes power cycle of the cabinet linking to the GP7000F main cabinet.

Front View of the unit
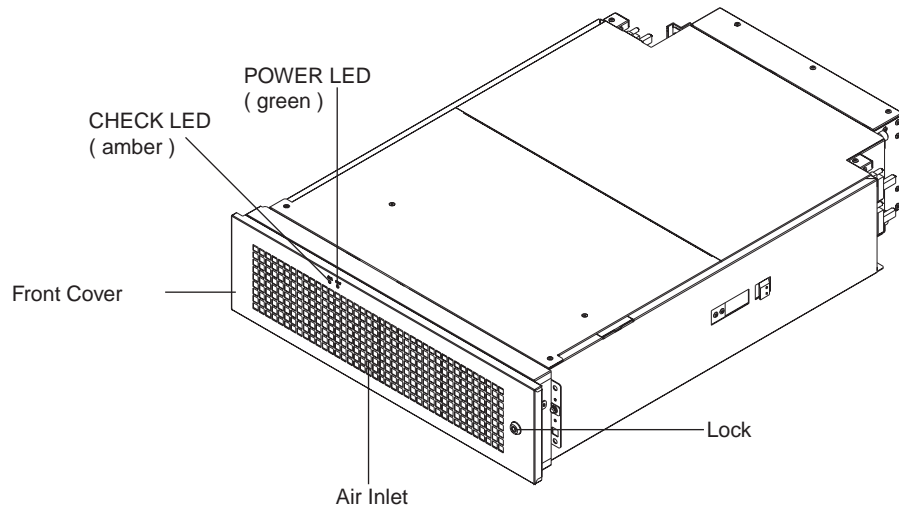
Figure 9.1   Front View of Expansion File Unit Type-2

106

9.2   Device Configuration

This file unit consists of the following components.

- Rack mount cabinet

- Basic power supply and expansion option power supply (for redundant configuration)

- DC-DC converter

- Cooling fans (redundant configuration)

- SCSI-BP boards

- Interface board

- Hot-swappable disk drives

Disk configuration

Opening the unit's front cover, Figure 9.2 and Figure 9.3 shows the drive bays Figure 9.2 . Shows a Basic SCSI Unit and an File Unit Expansion Kit bay configuration. Figure 9.3 shows a Basic SCSI unit (SCSI bays #1~ #5) and an Tape Unit Bay Kit (tape bays #1 and #2) bay configuration. The Basic SCSI Unit (SCSI bays #1~ #5) and the File Unit Expansion Kit (bays #1~ #5) or the Tape Unit Bay Kit (tape bays #1 and #2) can be connected to the main processing unit by separate SCSI busses.

Up to 10 UltraSCSI disk units (5 UltraSCSI disk units is the standard) can be accommodated by installing an File Unit Expansion Kit to this unit. Or, by installing an Tape Unit Bay Kit, a maximum of any two: 8 mm, DAT, or QIC tape unit can be added.

Each interface board has a POWER LED. If a FAULT LED and an ACTIVE LED of a disk bay that has a disk drive doesn't light up, check the POWER LED on the interface board in the cage if it is light up or not. A failed unit can be isolated by checking this POWER LED, a ACTIVE LED, a FAULT LED, and a POWER LED on the power supply unit.
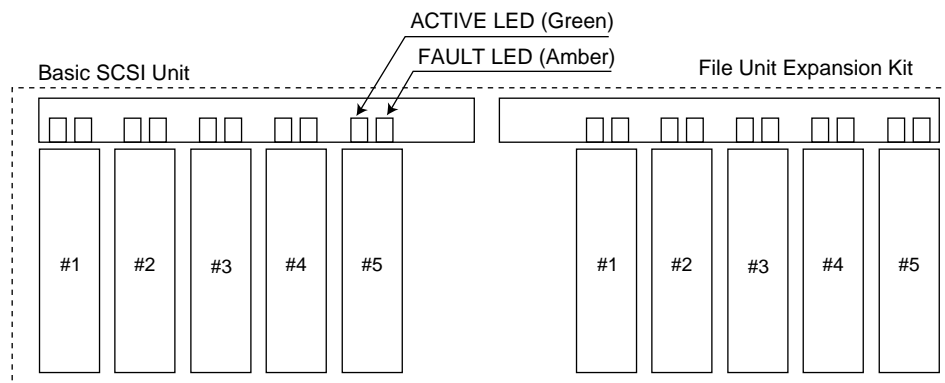
Figure 9.2   Drive Bays of Expansion File Unit Type-2

ACTIVE LED (Green)

FAULT LED (Amber)

Basic SCSI Unit

Tape Unit Bay Kit

#1   #2   #3   #4   #5

tape bays
#2

tape bays
#1
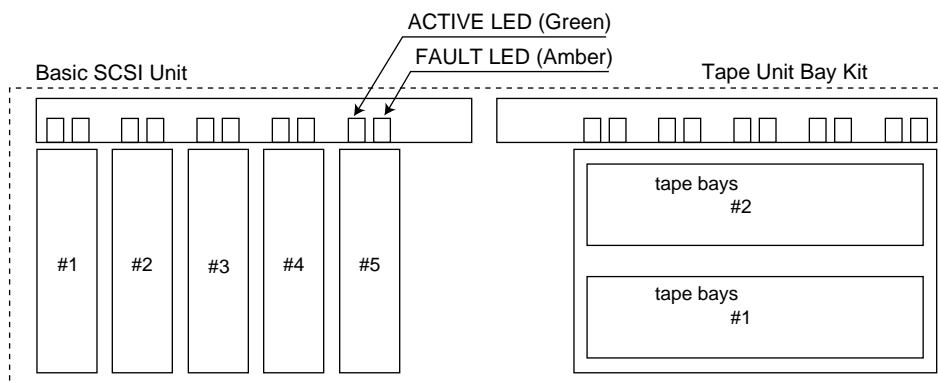
Figure 9.3   Drive Bays of Expansion File Unit Type-2

status LED

A POWER LED and a CHECK LED are installed on the front of the cabinet. The POWER LED indicate if the power is on or off. And, the CHECK LED indicates if there is any hardware errors or not. The CHECK LED operates as described in the Table 9.1 .

Table 9.1   CHECK LED Status

State	Indication	Remarks
Off	No errors	
Blinking	Identifying a device	Activated when a maintenance command is used to identify the target device.
On	Error	The cause of the error will be a power failure, or abnormal fan rotation.

When a power supply unit or fan unit is failed, the CHECK LED is lighted steadily. And, if a disk unit fail, its FAULT LED is lighted by software command to identify the faulty disk unit.

When a FAULT LED is lighted up according to hot-swap procedures, the CHECK LED is blinking to identify an Expansion Disk Cabinet.

Disk units can be hot-swappable easily by opening the front cover of the cabinet.

Rear Panel

The Figure 9.4 shows the rear panel of Expansion File Unit Type-2.

SCSI OUT   Standard SCSI OUT

SCSI IN   RCI port   SCSI IN
Expansion File Unit Board   Service Pin
or Expansion Tape Board

Figure 9.4   Rear View of Expansion File Unit Type-2

108

The Expansion File Unit Type-2 is not powerd on/off by only the main line switch, but it linked to power on/off of the GP7000F main cabinet. Note that this file unit does not power on if the main line switch is OFF, even if the GP7000F main cabinet is powered on. Keep the main line switch set to ON for regular use.

Be sure to set the RCI configuration, which is detailed in Chapter13 , must be set properly when installing an Expansion File Unit Type-2.

The cabinet has 2 pair of SCSI IN/OUT connectors on it. When the cabinet is configured without expansion (optional) drive bays, a SCSI cable must be connected to the standard SCSI IN connector. Be sure to install an UltraSCSI differential terminator plug to the SCSI OUT connector.
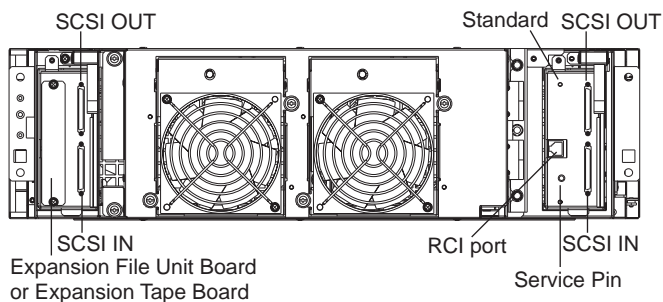
⚠CAUTION	Do not set the AC main line switch to OFF, nor disconnect the power cable or RCI cable while the GP7000F main cabinet is powered on, unless absolutely necessary. Otherwise, the data in the disk units may be destroyed.

9.3   Hot System Replacement

Disk unit   The SCA-II connector is used as the disk unit connector to enable hot system replacement of a faulty disk unit. The availability is improved by combining this feature with the disk mirroring features. Two LEDs (ACTIVE and FAULT) are installed per disk unit to indicate the disk unit status. These LEDs operate as described below.

Table 9.2   LEDs

Name	Color	Status
ACTIVE LED	Green	Lights up when the SCSI commands are executed.
FAULT LED	Amber	Lights up when the hot replacement command is executed.

To hot-swap a disk unit, you need to use the software tool which is provided in "Basic Software Extension" or "Enhanced Support Facility". Please refer to user's guide of "Basic Software Extension" or "Enhanced Support Facility"for more information. The FAULT LED lights up according to the procedures described in the user's guide to identify the failed disk unit. If the FAULT LED does not lights up even if you follows the procedures described in the user's guide, hot-swapping is not possible. In this case, power-off the entire system, then replace the disk unit.

When adding a new disk unit while the system is running, use the software tool, as well.

Power   When the power supply units are configured redundantly, it can be hot-swapped. Each power supply unit has a POWER LED on it, and it lights steadily while the corresponding power supply is working. When the POWER LED doesn't light, it indicates that the power is turned off or the power unit has failed. Hot replacement of the power supply unit is possible only while the corresponding POWER LED is off.

Use a software tool, which is provided in "Basic Software Extension" or "Enhanced Support Facility", to how-swap a power supply unit. Please refer to user's guide of "Basic Software Extension" or "Enhanced Support Facility" for more information.

9.4   Installation

Purpose   The following installation instruction is intended to provide the product safety requirements which must be addressed when the end-use product manufacturer installs this product in their equipment. Note that the acceptability of the combination of this product in a rack should be re-determined by an appropriate certification body, if that combination is differ from the Table 9.3 .
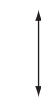
Safety Installation Instruction:

- This unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature inside of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the unit in an environment compatible with the manufacturer's maximum rated ambient temperature.

  – Consideration for adjustment of air condition like air circulation should be given to prevent the internal rack ambient from exceeding the Max. Operating ambient temperature of this unit.

  – Maximum operating ambient temperature of this unit : 35 deg C.

- Installation of the unit in a rack should be such that the amount of air flow required for safe operation of the unit is not compromised.

  – This unit has ventilation openings at front and rear face of the unit.

  – Do not cover or close these ventilation openings to prevent overheating.

- Mounting of the unit in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading. To keep stability of entire rack, please fix the rack to wall or floor by suitable means.

  – Be careful about injury during installation of this unit into rack.

  – Do not install this unit into your rack where the unit may make the entire rack unstable.

  – Mass of this unit with maximum configuration : 30 kg.

- If the unit is supplied from Power Strip or Service Outlet of other units, it may overload the Power Supply Cord of the Power Strip or other units.

  – Confirm that the current rating of Power Strip or Service Outlet exceeds the combined ratings of all equipment it is supplying.

  – Electrical ratings of this unit : Rated 100 - 240Vac, 3.0 - 1.5 A, 50/60 Hz, 1 phase

- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.q., use of power strips).

110

IMPORTANT

High Leakage Current may flow through Power Strip Earthing Conductor, if all power supply cords of this unit are connected to one Power Strip. Earth connection essential before connecting supply.

Table 9.3   Mounting Combination for Expansion Rack

Rack-Mount Units	Mounting Portion Priority in the Rack
Communication Swichable Unit	
Expansion File Unit Type-2	
Disk Array Unit (GP-DxxxxU)	Upper
GP7000F Model 200R/400R	↑ ↓
Disk Array Unit (GR700/720)	
Outlet and/or Outlet Type-2	Lower
GP7000F Model 600R	

Note: Each rack-mount unit should be mounted in the lowest available portion with the priority indicated in the Table 9.3 .

Notes on Installation

- Do not install this file unit where it will be exposed to sunlight or sources of heat.

- Do not install this file unit in dusty places or places where it will be exposed to corrosive gas or sea breeze.

- Keep this file unit isolated from vibration. Install this file unit on a level surface to prevent it from tilting.

- Do not run a cable under a unit or overextend a cable. Do not disconnect the power cable while the power is on.

- Do not place anything on this file unit. Do not use this file unit as a desk.

- To prevent condensation in this file unit, do not raise the room temperature rapidly in the winter. Use the cabinet only after sufficiently warming it.

- Do not install this cabinet near noisy devices such as a photocopier, air conditioner, or welder.

- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause this file unit to malfunction.

IMPORTANT

If the above conditions are not satisfied, this file unit may be damaged. Be sure to follow above precautions.

111

Installation specifications

Table 9.4   Installation Specifications of Expansion File Unit Type-2

Item		Specification	
Mass		Up to 30kg (approx.70 lb)	
Power condition	Input voltage	Single phase 100 to 120 VAC (+-10%)	Single phase 200 to 240 VAC (+-10%)
	Input frequency	50/60 Hz (+2 to -4%)	
Maximum consumption current		3.0 A	1.5 A
Leakage current (1 for each cable)		1.2 mA or less	2.7 mA or less
Ground resistance		100ohm or less (class C installation standard)	
Temperature condition	Operating	5 to 35 degrees Celsius (+41 to +95 F) (*1)	
	Not operating	0 to 50 degrees Celsius (+32 to +122F)	
Humidity condition	Operating	20 to 80%RH (no condensation)	
	Not operating	8 to 80% RH (no condensation)	
Vibrations condition	Operating	0.2 G	
	Idle	0.4 G	
Noise		50 db (A) (*2)	
Installation		Rack mount type (3 pitches)	

*1:   If the ambient temperature exceeds 35 degrees Celsius (+95F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*2:   The indicated noise is the mean value of the measurements obtained in an anechoic chamber with less echoic influence. The actual noise measured at the installation site may be greater than the indication noise due to surrounding noise and echoes.

10

CHAPTER 10　　Expansion File Unit (GP7B7FU1xx)

CONTENTS

10.1   Product Outline

Key Features

- 2 separate 40MB/s differential UltraSCSI connections to the host per Expansion File Unit.

- Up to 5 UltraSCSI disk units can be installed per UltraSCSI bus, and up to 10 UltraSCSI disk units can be installed per Expansion File Unit.

- The disk units can be hot-swappable.

- The power supply unit can be configured redundantly, and it can be hot-swappable when configured redundantly.

- Fans are configured redundantly to continue working even if a fan is failed.

- The Expansion File Unit has some status LEDs inside the cabinet, as well as a CHECK LED and a POWER LED on the front panel. It makes easy to identify/isolate hardware problems.

- The Expansion File Unit is connected to the GP7000F main cabinet through a RCI (Remote Cabinet Interface) cable as well as UltraSCSI interfaces. The RCI makes power cycle of the cabinet linking to the GP7000F main cabinet.

Front View of the unit
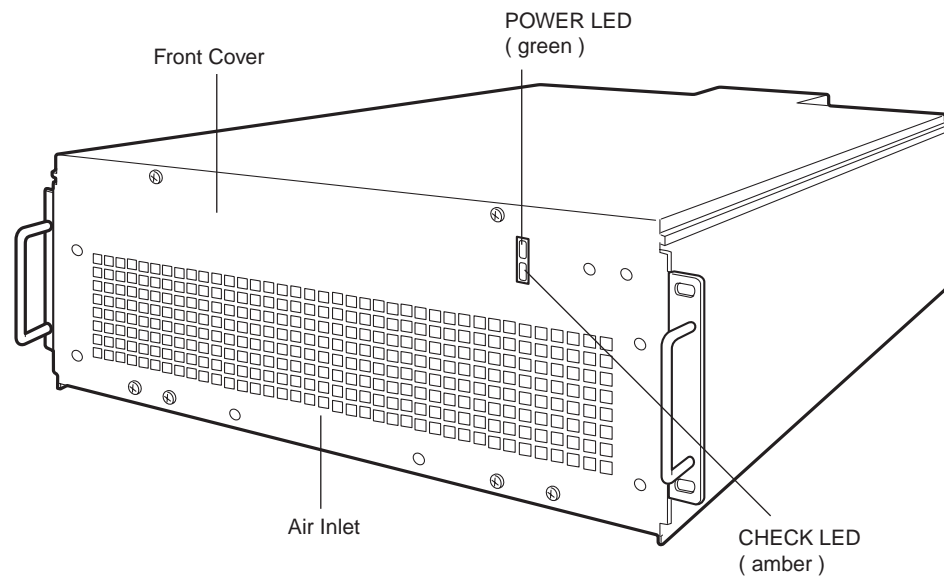
Figure 10.1   Front View of Expansion File Unit

114

10.2   Device Configuration

This file unit consists of the following components.

- Rack mount cabinet

- Basic power supply and expansion option power supply (for redundant configuration)

- DC-DC converter

- Cooling fans (redundant configuration)

- SCSI-BP boards

- Interface board

- Hot-swappable disk drives

Disk configuration

The Expansion File Unit has 2 UltraSCSI buses. Up to 5 drive units can be installed in the half portion of the cabinet as indicated in Figure 10.2 . Internally, they are connected to an interface board by a single-ended UltraSCSI bus. And, up to 5 drive units can be installed another half portion of the cabinet. Also, they are connected to an interface board by a single-ended UltraSCSI bus. The interface board has a single-ended to differential interface converter in it, and each interface board is connected to the host by a differential UltraSCSI bus.

Each interface board has a POWER LED. If a FAULT LED and an ACTIVE LED of a disk bay that has a disk drive doesn't light up, check the POWER LED on the interface board in the cage if it is light up or not. A failed unit can be isolated by checking this POWER LED, a ACTIVE LED, a FAULT LED, and a POWER LED on the power supply unit.

Figure 10.2   Drive Bays of Expansion File Unit

115

status LED

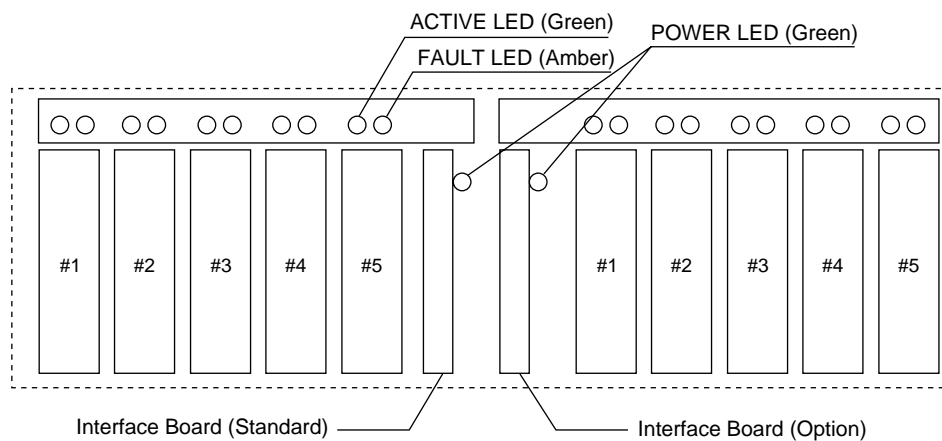A POWER LED and a CHECK LED are installed on the front of the cabinet. The POWER LED indicate if the power is on or off. And, the CHECK LED indicates if there is any hardware errors or not. The CHECK LED operates as described in the Table 10.1 .

Table 10.1   CHECK LED Status

State	Indication	Remarks
Off	No errors	
Blinking	Identifying a device	Activated when a maintenance command is used to identify the target device.
On	Error	The cause of the error will be a power failure, or abnormal fan rotation.

When a power supply unit or fan unit is failed, the CHECK LED is lighted steadily. And, if a disk unit fail, its FAULT LED is lighted by software command to identify the faulty disk unit.

When a FAULT LED is lighted up according to hot-swap procedures, the CHECK LED is lighted steadily to identify an Expansion Disk Cabinet.

Disk units can be hot-swappable easily by opening the front cover of the cabinet.

Rear Panel

The Figure 10.3 shows the rear panel of Expansion File Unit.
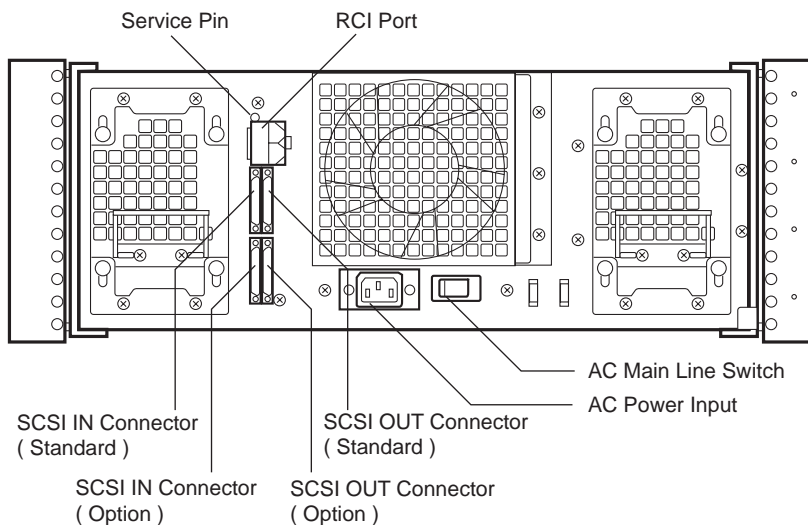
Figure 10.3   Rear View of Expansion File Unit

The Expansion File Unit doesn't power on/off by only the main line switch, but it linked to power on/off of the GP7000F main cabinet. Note that this file unit does not power on if the main line switch is OFF, even if the GP7000F main cabinet is powered on. Keep the main line switch set to ON for regular use.

Be sure to set the RCI configuration, which is detailed in Chapter13 , must be set properly when installing an Expansion File Unit.

The cabinet has 2 pair of SCSI IN/OUT connectors on it. When the cabinet is configured without expansion (optional) drive bays, a SCSI cable must be connected to the standard SCSI IN connector.

116

Be sure to install an UltraSCSI differential terminator plug to the SCSI OUT connector.

⚠ CAUTION	Do not set the AC main line switch to OFF, nor disconnect the power cable or RCI cable while the GP7000F main cabinet is powered on, unless absolutely necessary. Otherwise, the data in the disk units may be destroyed.

10.3 Hot System Replacement

Disk unit The SCA-II connector is used as the disk unit connector to enable hot system replacement of a faulty disk unit. The availability is improved by combining this feature with the disk mirroring features. Two LEDs (ACTIVE and FAULT) are installed per disk unit to indicate the disk unit status. These LEDs operate as described below.

Table 10.2   LEDs

Name	Color	Status
ACTIVE LED	Green	Lights up when the SCSI commands are executed.
FAULT LED	Amber	Lights up when the hot replacement command is executed.

To hot-swap a disk unit, you need to use the software tool which is provided in "Basic Software Extension" or "Enhanced Support Facility". Please refer to user's guide of "Basic Software Extension" or "Enhanced Support Facility" for more information. The FAULT LED lights up according to the procedures described in the user's guide to identify the failed disk unit. If the FAULT LED does not lights up even if you follows the procedures described in the user's guide, hot-swapping is not possible. In this case, power-off the entire system, then replace the disk unit.

When adding a new disk unit while the system is running, use the software tool, as well.

Power When the power supply units are configured redundantly, it can be hot-swapped. Each power supply unit has a POWER LED on it, and it lights steadily while the corresponding power supply is working. When the POWER LED doesn't light, it indicates that the power is turned off or the power unit has failed. Hot replacement of the power supply unit is possible only while the corresponding POWER LED is off.

Use a software tool, which is provided in "Basic Software Extension" or "Enhanced Support Facility", to how-swap a power supply unit. Please refer to user's guide of "Basic Software Extension" or "Enhanced Support Facility" for more information.

117

10.4   Installation

Purpose   The following installation instruction is intended to provide the product safety requirements which must be addressed when the end-use product manufacturer installs this product in their equipment. Note that the acceptability of the combination of this product in a rack should be re-determined by an appropriate certification body, if that combination is differ from the Table 10.3 .
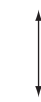
Safety Installation Instruction:

- This unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature inside of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the unit in an environment compatible with the manufacturer's maximum rated ambient temperature.

  – Consideration for adjustment of air condition like air circulation should be given to prevent the internal rack ambient from exceeding the Max. Operating ambient temperature of this unit.

  – Maximum operating ambient temperature of this unit : 35 deg C.

- Installation of the unit in a rack should be such that the amount of air flow required for safe operation of the unit is not compromised.

  – This unit has ventilation openings at front and rear face of the unit.

  – Do not cover or close these ventilation openings to prevent overheating.

- Mounting of the unit in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading. To keep stability of entire rack, please fix the rack to wall or floor by suitable means.

  – Be careful about injury during installation of this unit into rack.

  – Do not install this unit into your rack where the unit may make the entire rack unstable.

  – Mass of this unit with maximum configuration : 32 kg.

- If the unit is supplied from Power Strip or Service Outlet of other units, it may overload the Power Supply Cord of the Power Strip or other units.

  – Confirm that the current rating of Power Strip or Service Outlet exceeds the combined ratings of all equipment it is supplying.

  – Electrical ratings of this unit : Rated 100 - 240Vac, 3.0 - 1.5 A, 50/60 Hz, 1 phase

- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.q., use of power strips).

118

IMPORTANT

High Leakage Current may flow through Power Strip Earthing Conductor, if all power supply cords of this unit are connected to one Power Strip. Earth connection essential before connecting supply.

Table 10.3 Mounting Combination for Expansion Rack

Rack-Mount Units	Mounting Portion Priority in the Rack
Communication Swichable Unit	
Expansion File Unit Type-2	Upper
Disk Array Unit (GP-DxxxxU)	↑
GP7000F Model 200R/400R	↓
Disk Array Unit (GR700/720)	Lower
Outlet and/or Outlet Type-2	
GP7000F Model 600R	

Note: Each rack-mount unit should be mounted in the lowest available portion with the priority indicated in the Table 10.3 .

Notes on Installation

- Do not install this file unit where it will be exposed to sunlight or sources of heat.

- Do not install this file unit in dusty places or places where it will be exposed to corrosive gas or sea breeze.

- Keep this file unit isolated from vibration. Install this file unit on a level surface to prevent it from tilting.

- Do not run a cable under a unit or overextend a cable. Do not disconnect the power cable while the power is on.

- Do not place anything on this file unit. Do not use this file unit as a desk.

- To prevent condensation in this file unit, do not raise the room temperature rapidly in the winter. Use the cabinet only after sufficiently warming it.

- Do not install this cabinet near noisy devices such as a photocopier, air conditioner, or welder.

- Take electrostatic prevention measures. Note that some carpets generate static electricity easily and can cause this file unit to malfunction.

IMPORTANT

If the above conditions are not satisfied, this file unit may be damaged. Be sure to follow above precautions.

119

Installation specifications

Table 10.4   Installation Specifications of Expansion File Unit

Item		Specification	
Mass		Up to 32kg (approx.70 lb)	
Power condition	Input voltage	Single phase 100 to 120 VAC (+-10%)	Single phase 200 to 240 VAC (+-10%)
	Input frequency	50/60 Hz (+2 to -4%)	
Maximum consumption current		3.0 A	1.5 A
Leakage current (1 for each cable)		1.2 mA or less	2.7 mA or less
Ground resistance		100ohm or less (class C installation standard)	
Temperature condition	Operating	5 to 35 degrees Celsius (+41 to +95 F) (*1)	
	Not operating	0 to 50 degrees Celsius (+32 to +122F)	
Humidity condition	Operating	20 to 80%RH (no condensation)	
	Not operating	8 to 80% RH (no condensation)	
Vibrations condition	Operating	0.2 G	
	Idle	0.4 G	
Noise		50 db (A) (*2)	
Installation		Rack mount type (4 pitches)	

*1:   If the ambient temperature exceeds 35 degrees Celsius (+95F) during operation, a warning message is displayed. Take steps to rectify the problem immediately.

*2:   The indicated noise is the mean value of the measurements obtained in an anechoic chamber with less echoic influence. The actual noise measured at the installation site may be greater than the indication noise due to surrounding noise and echoes.

120

11

CHAPTER 11   Input-Output Units

11.1   Disk Units

Key features

The following features of the disk units are applied for the GP7000F main cabinet, Expansion Disk Cabinet and Expansion File Unit.

- 3.5-inch UltraSCSI wide disk drive, up to 40 MB/s transfer rate.

- SCA-II (Single Connector Attachment II) connector, which support hot-swap.

- Geographical SCSI addressing, which depend upon disk drive bay, simplifies SCSI address selection.

Hot-swapping a disk unit

The hot swap feature, combined with disk mirroring, improves system availability. The system administrator or service engineers can determine the status of disk unit using the software management command for disk mirroring. In addition, each disk unit has two status LEDs along each disk drive bay.

Table 11.1   Disk Units LEDs

Name	Color	Status
ACTIVE LED	Green	Lights when the SCSI command is executed.
FAULT LED	Amber	Lights when the hot replacement command is executed.

IMPORTANT

To hot-swap a disk unit, you need to use the software tool which is provided in "Basic Software Extension" or "Enhanced Support Facility". Please refer to user's guide of the "Basic Software Extension" or "Enhanced Support Facility" for more information. The FAULT LED lights up according to the procedures described in the user's guide to identify the failed disk unit. If the FAULT LED does not light up even if you follow the procedures described in the user's guide, hot-swapping is not possible. In this case, power-off the entire system, then replace the disk unit.

When adding a new disk unit while the system is running, use the software tool, as well.

The POWER LED is installed in the disk cage. If the FAULT LED and ACTIVE LED of a disk drive bay that has a disk drive doesn't light up, check the POWER LED if it is light up or not.

122

⚠CAUTION	When replacing the disk unit, take the following precautions. If these precautions are not taken, the disk unit or its data may be destroyed.

- Do not subject the disk unit to strong shocks.

- Do not bring a device generating a strong electromagnetic field such as a motor or a loudspeaker near the disk unit.

- Do not store the disk unit where condensation may occur or where the temperature or humidity changes rapidly.

Disk format

The disk units are pre-formatted. If you need to format a disk drive, you can format a disk drive with a format utility. The format utility performs auto-configuration, when you enter type at the format> prompt and select Auto configure as the disk type.

⚠CAUTION	Carefully proceed formatting a disk drive. Once formatting a disk drive, data on the disk never restored, if you don't have backup files.

Backing Up the Data

The disk drive units are very reliable. However, an accidental failure is possible. If a failure occurs, data recovery from the disk unit may not be possible, or may take a long time. To protect against such failures, regular back-ups onto tape are highly recommended.

11.2   Floppy Disk Units

Front Panel

The floppy disk drive is compatible with AT and supports three modes: 1.44 MB, 1.2 MB, and 720 KB. The eject button and Access LED are installed on the front panel of the floppy disk unit. A floppy disk can be ejected by pressing the eject button. Ensure that the Access LED is off before ejecting a floppy disk. The green Access LED lights when the floppy disk is accessed.
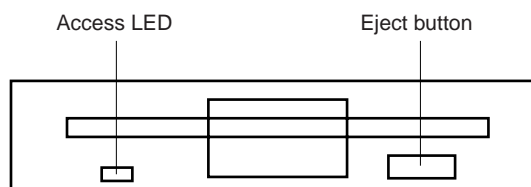
Access LED   Eject button

Figure 11.1   Floppy Disk Unit Front Panel

123

Inserting floppy disks

Insert floppy disks with the label facing opposite side of the eject button as shown in Figure 11.2 . A disk has been inserted properly if a clicking sound is heard and the eject button comes out.
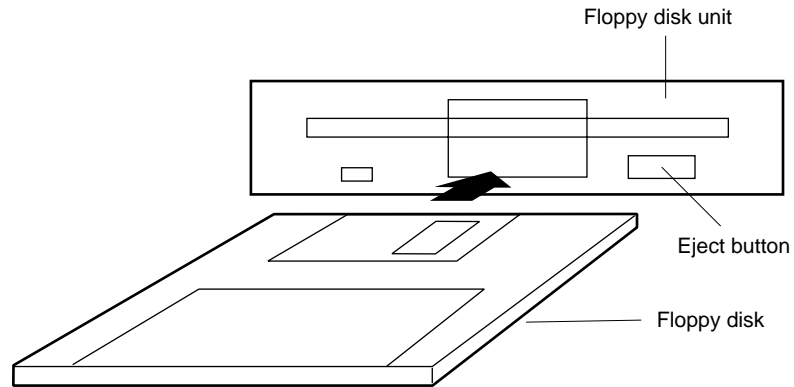
Figure 11.2   Inserting Floppy Disks

Ejecting floppy disks

Press the eject button on the floppy disk unit, then remove the floppy disk.

Before removing the floppy disk, be sure to execute eject command on Solaris or to execute eject operation on your application program.
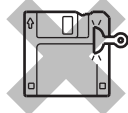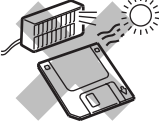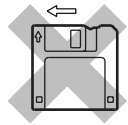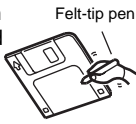
IMPORTANT

You need to format new floppy disk with fdformat command on Solaris, before you use them. Please refer to on-line manual for more information about the fdformat command.

⚠ CAUTION	Do not eject a floppy disk while the access LED is on, otherwise the floppy disk or the data on the diskette may be destroyed. For information on the handling method, see Table 11.2 , "Handling floppy disks."

124

Table 11.2   Handling Floppy Disks

1	Keep floppy disks away from magnets; otherwise,disk data may corrupted.	5	Avoid pinching floppy disks with paper clips.
2	Do not expose floppy disks to heat or sunlight.	6	Do not bend floppy disks.
3	Avoid opening floppy disk shutters or allowing anything to come into direct contact with the disk surface.	7	When storing floppy disks on a shelf,place them in a floppy disk storage box or store them vertically.
4	Write information on disk labels before applying the labels to floppy disks. When writing information on labels already applied to floppy disks, use a soft point pen such as a felt-tips pen.	8	Do not clean the surface of a floppy disk.

125

11.3   CD-ROM Unit

Front Panel

A headphone jack is installed on the front panel, so the CD-ROM unit can also be used to enjoy music. To play music on the CD-ROM unit, install the appropriate software driver to support the audio function.
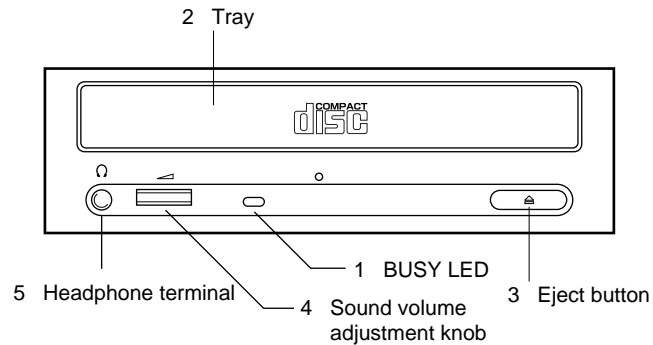
Figure 11.3   CD-ROM Unit Front Panel

1 BUSY LED

Green LED lights when the CD-ROM is accessed

2 Tray   Used to mount a CD-ROM.

3 Eject button

Press this button to open and close the tray.

4 Volume control

When using headphones, use this dial to control the sound volume.

5 Headphone terminal

Connect headphone's mini-plug to this jack.

To use headphones, sound software is required. Check the software support.

IMPORTANT

The SCSI ID of the CD-ROM unit is set to 4.

Installing a CD-ROM disk

1   When the system is powered on, check that the BUSY LED on the CD-ROM unit doesn't light.

2   Pressing the Eject button, the tray comes out.

3   Place the CD-ROM disk on the tray.

4   Press the Eject button. The tray goes in, and the disk is mounted in the drive.

126

Ejecting a CD-ROM disk

1   If the system is running, check that the disk is in use or not. If the disk is in use, the process should be killed to eject the CD-ROM disk. Note that you should warn the users beforehand, if you kill a process.

2   Press the Eject button. The tray comes out.

3   Remove the CD-ROM disk, then press the Eject button. The tray goes in.

Only CD-ROM disks with the mark shown in the figure below can be used in this CD-ROM unit.

Figure 11.4   Mark on CD-ROM Disk

IMPORTANT

1   Do not scratch the surface of a CD-ROM disk. Pay special attention when removing a CD-ROM disk from its case.

2   Do not widen the center hole of a CD-ROM disk.

3   Do not write on a CD-ROM disk with a ball-point pen or pencil.

4   Do not clean a CD-ROM disk with benzene, paint thinner, water, record spray, or an antistatic agent.

5   Do not expose a CD-ROM disk to sunlight or heat.

6   Do not store a CD-ROM disk in a place that undergoes a rapid environmental change.

7   If a CD-ROM disk is not being used, remove it from the CD-ROM unit and store it in its case to protect it from dust, scratching, and breakage.

Cleaning the optical lens

After the CD-ROM drive has been used for a long time, the optical lens for data reading may become dirty, causing data on the CD-ROM disk to be read incorrectly. To clean the optical lens:

1   Use the small brush provided with the CD-ROM cleaning disk to straighten the special brush for cleaning on the rear surface of the CD-ROM cleaning disk.

2   Press the Eject button. The tray of the CD-ROM unit comes out.

3   Place the CD-ROM cleaning disk on the tray of the CD-ROM unit with the red triangle mark towards you.

4   Press the Eject button. The tray of the CD-ROM unit goes in.

5   Wait for about 20 seconds.

    (If there are clicking sounds or the disk rotates fast, this is not a sign of a failure.)

6   Check that the BUSY LED is off, then press the Eject button and remove the CD-ROM cleaning disk.

127

7   Use the attached small brush to remove dust from the special cleaning brush of the CD-ROM cleaning disk. Then, store the brush in the case.

If the CD-ROM disk is dirty, clean it from the center to the circumference using a soft cloth. Do not clean using a circular motion.

11.4   Tape Unit

Overview   One of the following tape units shown below can be installed into the main cabinet as an option.

- DAT (DDS-3) unit: up to 24 Gigabytes/cartridge (compressed)

- 8-mm tape unit: up to 14 Gigabytes/cartridge (compressed)

- 1/4-inch cartridge (QIC) tape unit: up to 2.5 Gigabytes/cartridge

  Data can also be read from and written to a 150-megabyte QIC tape.

IMPORTANT

The SCSI ID of these tape units is set to 5 for 1st expansion, or 3 for 2nd expansion (only applied for Expansion File Unit Type-2)

Hot replacement feature

Hot replacement can be performed for the tape drive in the main cabinet. The tape unit is used as a simple backup device. If tape unit failures occur, such as tape snagging, the hot replacement feature can be used to replace the unit without shutdown the system.

128

11.5   DAT Unit

This section describes the front panel indicators and buttons of the 4-mm DAT unit, and explains how to use the DAT unit.

Setting in operating system

Before using the DAT unit, the /kernel/drv/st.conf file must be modified. The modification is described below.

Setting an Internal DAT

1 Copy the original st.conf file as below.

```
# cp /kernel/drv/st.conf /kernel/drv/st.conf.old
```

2 Add the following to the `/kernel/drv/st.conf` file.

```
tape-config-list =
          "HP        C1537A", "HP DDS3 4mm DAT", "HP_data2";
HP_data2 = 1,0x34,1024,0xd639,4,0x00,0x13,0x24,0x3,3;
```

IMPORTANT

The space between HP and C1537A must be 6 spaces. If the effective tape-config-list has been defined, separate the above description with a "," and add it to the file like the following example.

```
Tape-config-list =
          "EXABYTE EXB-8505", "Exabyte 8mm EXB-8505", "EXBT-8SC",
          "HP        C1537A", "HP DDS3 4mm DAT", "HP_data2";
EXBT-8SC = 1,0x35,0,0xce39,2,0x15,0x8c,1;

HP_data2 = 1,0x34,1024,0xd639,4,0x00,0x13,0x24,0x3,3;
```

3 Remove the contents of the `/dev/rmt` directory as follow.

```
# cd /dev/rmt
# rm *
```

4 Do a reconfigure boot as follow.

```
# cd /
# touch /reconfigure
# shutdown -y -i0
```

5 Then, make a reconfigure boot as follow.

```
ok boot -r
```

129

Front Panel

The DAT unit has two LEDs and Eject switch as shown in Figure 11.5 .
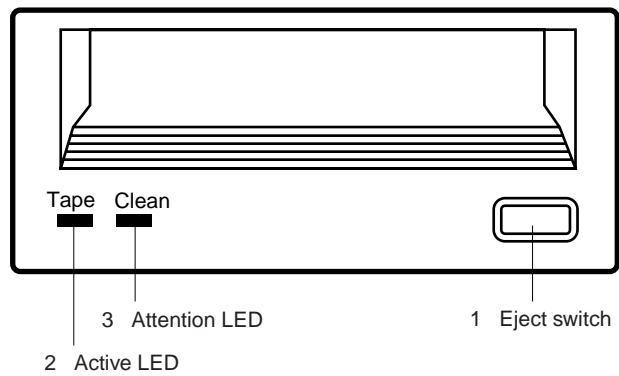
Figure 11.5   DAT Unit Front Panel

This section describes the functions of the switches and LEDs of the DAT unit.

1 Eject switch

A data cartridge can be removed by pressing the eject switch. If the processor inhibits removal of a data cartridge, it cannot be removed by pressing the eject switch.

⚠ CAUTION | Data destruction: Do not press the eject switch during an operation (when the tape LED is blinking). If the eject switch is held down for about 5 seconds or pressed 3 times within a 5-minutes period, the forced ejection function will be executed and the data being written may be destroyed.

2 Active LED

The Active LED lights steady when the data cartridge is loaded and the tape unit is ready to operate. The Active LED blinks when the tape unit is operating. For details, refer to Table 11.3 .

3 Attention LED

When the Attention LED blinks, the head of the tape unit should be cleaned using a cleaning tape or a cartridge is near the end of it's useful life. The Attention LED lights steady on continuously when the tape unit fails. For details, refer to Table 11.3 .

130

Table 11.3   LED Displays on The DAT Unit

LED status display		Indication
Active (green)	Attention (Amber)	
Off	Off	No data cartridge is loaded.
On		A data cartridge is loaded.
Blinking (slow)		Loading or unloading a tape, or the tape unit is being self-diagnosed.
Blinking (fast)		Operating (reading or writing)
Any status	On	The tape unit has failed.
	Blinking (slow)	Errors have occurred in the data cartridge on operation. Use a cleaning cartridge to clean the magnetic head. (*1)

*1   If the Attention LED is still blinking after cleaning the head, repeat the operation with a different tape. If this clears the signal, the first tape is nearing the end of its life. Blinking of the Attention LED is cleared when a new tape is loaded or when the drive is power-cycled.

Tape cartridge information

This tape drive supports 60 m, 90 m, 120 m or 125 m DDS cartridges as shown in Table 11.4 .

Table 11.4   DAT Cartridge Capacity

Format	Length	Native capacity	Compressed capacity
DDS-1	60 m	1.3 Gbytes	2.6 Gbytes
DDS-1	90 m	2.0 Gbytes	4.0 Gbytes
DDS-2	120 m	4.0 Gbytes	8.0 Gbytes
DDS-3	125 m	12.0 Gbytes	24.0 Gbytes

Note: The compressed capacity is assuming a data compression ratio of 2:1.

When specifying the data format to be used (native or compressed) for your DAT unit, use the following device codes:

native   /dev/rmt/xl[n]

compress /dev/emt/xc[n]

Where x refers to the number specific to your system. To get this number, look in the /dev/rmt directory to find the entry that corresponds to the SCSI ID 5.

[n] is an optional parameter specifying no rewind.

131

IMPORTANT

Never use DAT audio media. Always use computer grade media with a DDS-1, DDS-2 and DDS-3 logos as shown in Figure 11.6 or with a MRS (Media Recognition System) logo as shown in Figure 11.7 . The MRS is used on all DDS-2 and DDS-3 tapes with the logos shown in Figure 11.6 . Note that non-MRS cartridges are allowed to read only.

Figure 11.6   DDS Logos

Figure 11.7   DDS Media Recognition System Logo

Inserting a data cartridge

* Check that the Active LED and Attention LED are off. If the Active LED is on, a data cartridge is already inserted.

* Insert the data cartridge into the slot on the front panel. Be careful to insert the data cartridge in the direction indicated by the label, and push gently on the cartridge.

* The DAT unit takes it automatically and starts loading the tape. The Active LED blinks while the tape is being loaded.

* About 14 seconds is required to complete tape loading. When the tape is loaded, the Active LED lights steady.
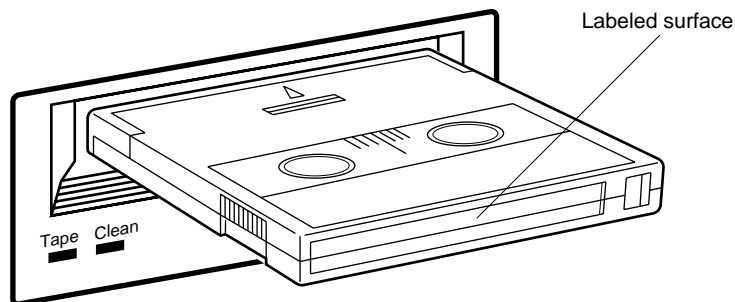
Figure 11.8   Inserting a Data Cartridge in The DAT Unit

132

Removing a data cartridge

1 Check that the Active LED is off (the DAT unit is not operating).

2 Press the eject switch to rewind and unload the tape. The Active LED blinks while the tape is being rewound and unloaded.

3 After the tape has been rewound, the data cartridge is ejected. Up to 120 seconds is required to eject the tape. After the tape is ejected, the Active LED goes off.

Write-protecting a data cartridge

Data cartridges have a write-protection tab to protect important data from being overwritten by mistake.
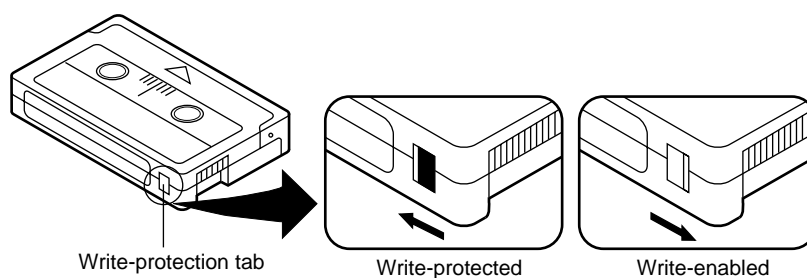
Figure 11.9   DAT Data Cartridge Write-protection Tab

⚠CAUTION   When using the data cartridge (DAT), take the following precautions. If these precautions are not observed, the DAT unit or its data may be destroyed.

- Do not allow a magnet or magnetized object near a data cartridge.

- Do not expose the tape or turn the tape reel unnecessarily.

- Do not spill coffee or any other liquid over a data cartridge.

- Do not leave a data cartridge where it may be exposed to high temperature, high humidity, dust, or sunlight.

- Do not drop a data cartridge or subject it to any other strong shock.

- If the ambient temperature or humidity changes rapidly, wait for data cassettes to adapt to the new conditions before mounting them in the DAT unit.

- When a data cartridge is not being used, store it outside the DAT unit (do not leave it in the DAT unit).

- Rewrite magnetic tape cartridges in storage that contain important data every six months.

- When storing data cartridges for a long time, the following environmental conditions must be satisfied:

  Temperature: 5 to 32 degrees Celsius (+41 to +89 F)

  Humidity: 20 to 60% (Condensation not allowed)

  Maximum wet bulb temperature: 26 degrees Celsius (+78.8 F)

133

- Each data cartridge has an expendable service life. If the Attention LED blinks frequently or continuously after the magnetic head has been cleaned, the life of the data cartridge has expired. Generally, replace data cartridges with new ones after they have been used 300 times.

Cleaning the magnetic head

After the DAT unit has been used for a long time, the magnetic head will accumulate dust or magnetic powder from the tapes. If the magnetic head is left dirty, it may damage a tape, or deposit dust or magnetic powder onto a tape and thus cause errors or data destruction. Therefore, use a cleaning cartridge to clean the magnetic head.

Clean the magnetic head when:

- The DAT unit has been operating for more than 25 hours.

- One month has passed since the last head cleaning

- The Attention LED is blinking

- The cleaning instruction message is output to the console display.

When a cleaning cartridge is inserted into the DAT unit in the same way as a data cartridge, head cleaning will start automatically. Head cleaning takes about 30 seconds. The cleaning cartridge is ejected automatically after cleaning is completed.

Replacing the cleaning cartridge, when the cleaning cartridge is used, a portion of the cleaning tape is moved from the left reel to the right reel as shown in the figure above. Each part of the tape is used once only.
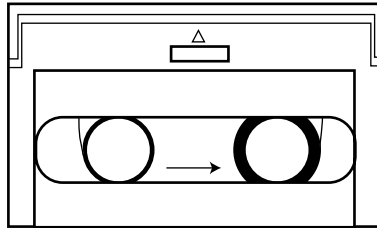
Replace the cleaning cartridge when there is no more tape on the left reel.

IMPORTANT

Do not use any method other than a DDS-approved cleaning cartridge which has a DDS logo on it.

11.6   8-mm Tape Unit

This section describes front panel indicators and buttons of the 8-mm tape unit, and explains how to use the 8-mm tape unit.

Setting in operating system

Before using the 8-mm tape unit, the /kernel/drv/st.conf file must be modified by the following steps.

1 Copy an original `st.conf` file as below.

```
# cp /kernel/drv/st.conf /kernel/drv/st.conf.old
```

2 Add the following to the `/kernel/drv/st.conf` file.

```
tape-config-list =
          "EXABYTE EXB-8505", "Exabyte 8mm EXB-8505", "EXBT-8SC";
EXBT-8SC = 1,0x35,0,0xce39,2,0x15,0x8c,1;
```

IMPORTANT

If the effective tape-config-list has been defined, separate the above description with a "," and add it to the file like the following example.

```
Tape-config-list =
          "HP        C1537A", "HP DDS3 4mm DAT", "HP_data2",
          "EXABYTE EXB-8505", "Exabyte 8mm EXB-8505", "EXBT-8SC";
HP_data2 = 1,0x34,1024,0xd639,4,0x00,0x13,0x24,0x3,3;
EXBT-8SC = 1,0x35,0,0xce39,2,0x15,0x8c,1;
```

3 Then, make a reconfigure boot as below.

```
ok boot -r
```

When specifying the data format to be used by your 8-mm tape unit, use the following density code.

data format	Density code	Device number *
8200 format	0x14 (14h)	/dev/rmt/xl[n]
8500 format	0x15 (15h)	/dev/rmt/xm[n]
8200c format	0x90 (90h)	/dev/rmt/xh[n]
8500c format	0x8c (8ch)	/dev/rmt/xc[n]

*   The x in this column refers to the number specific to your system. To get this number, look in the /dev/rmt directory and find the entry that corresponds to the SCSI ID 5.

[n]: no rewind

135

Front Panel.

The 8-mm tape unit has three LEDs and an eject switch as shown in Figure 11.10 .
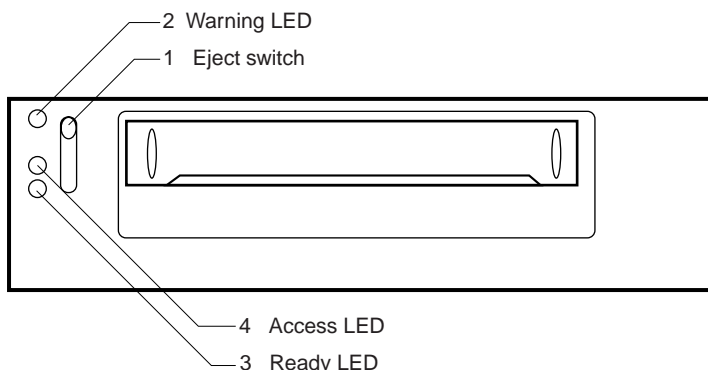
Figure 11.10   8-mm Tape Unit Front Panel

1 Eject switch

This switch is used to rewind, unload, and eject the 8-mm data cartridge.

2 Warning LED

If this LED blinks, an error may be occurred in this unit. If Warning LED and Ready LED blink together, this unit requires cleaning. And, it will light at reset or initial power-on phase.

3 Ready LED

This LED lights, when 8-mm data cartridge is inserted and finished loading the tape. And, it will light at reset or initial power-on phase, also.

4 Access LED

This LED lights steady or blinks, when the 8-mm drive is working (reading or writing a tape). And, it will light at reset or initial power-on phase, also.

Tape cartridge information

This tape drive unit uses EXATAPE 112m or EXATAPE 160mXL 8-mm tape cartridges, which have typical storage capacity of 5 - 14 Gbytes.

Table 11.5   8-mm Tape Cartridge Capacity

Tape Length	EXB-8500	EXB-8500c
160 m	10 Gbytes	14 Gbytes
120 m	5 Gbytes	7 Gbytes

Note that the 8-mm tape unit can read tape written in EXB-8200 format, when the cartridge is set to write-protected.

IMPORTANT

Never use 8-mm video media. Always use computer grade media.

136

Inserting a data cartridge

1 Check that the Access LED and Ready LED are off. Do not insert a cartridge during its power-on self test.

2 Insert the tape cartridge into the 8-mm tape unit. Be careful to insert the data cartridge in the direction indicated by the label, and push gently on the cartridge.

3 The 8-mm tape unit pulls in the cartridge automatically and starts loading the tape. The Ready LED lights after the tape has being loaded.

Removing a data cartridge

1 Check that the 8-mm tape unit is not operating (the Access LED is off).

2 Press the eject switch to wind back and unload the tape. Then, the Ready LED turns off, the tape is wound back, and the data cartridge is ejected.

Notes on handling tape cartridges

● When reading data, it is recommended that the data cartridge is write-protected.

● When a data cartridge is not being used, be sure to store it outside the 8-mm tape unit. Never leave a data cartridge in the 8-mm tape unit for a long time.

● The 8-mm tape unit may fail to load the data cartridge and may eject it instead. If this happens, insert the data cartridge again, making sure that it is correctly oriented.

Appearance of the data cartridge

Figure 11.11 shows the appearance of the 8-mm tape data cartridge.
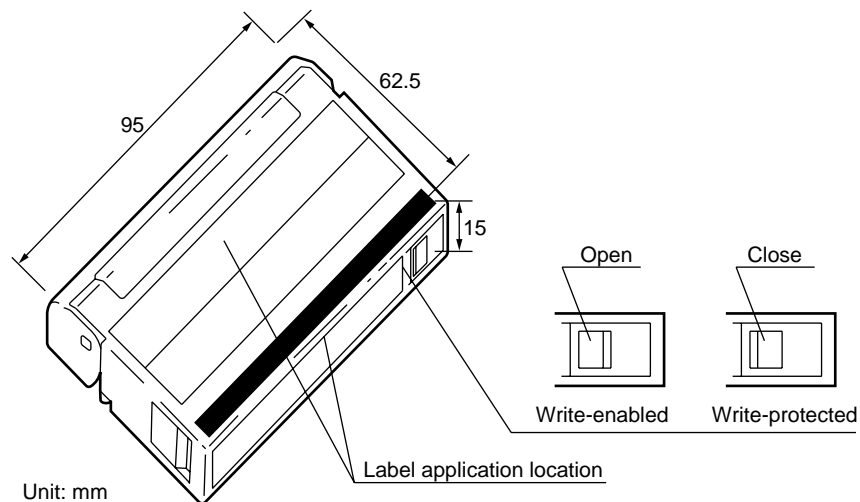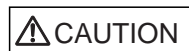

Figure 11.11   8-mm Tape Data Cartridge

⚠ CAUTION	When using or storing the data cartridge, take the following precautions. If these precautions are not taken, the 8-mm tape unit or its data may be destroyed.

137

- When storing the data cartridge for a long time, ensure the storage area meets the following environmental conditions and rewrite data once a year:

  Temperature: 5 to 32 degree Celsius (+41 to +89.6 F)

  Humidity: 20 to 60% RH

  Maximum wet bulb temperature: 24 degree Celsius (+75.2 F)

- If the ambient temperature or humidity changes rapidly, allow the data cartridge to adjust to the new environment before inserting it in the 8 mm tape unit.

- Do not subject the data cartridge to strong shock. Do not open the data cartridge.

- Do not place the data cartridge near a magnet or device generating a strong electromagnetic field.

- Apply the index label to the specified location.

- The data cartridge tape has a limited service life. Replace the data cartridge after using it 50 times (reference). The tape may wear out prematurely depending on the environment where it is used.

- Be sure to store data cartridges in the dedicated case.

Cleaning the magnetic head

By using the 8-mm tape unit for a long time, the built-in magnetic head is stained by dust or magnetic powder from the tapes. If the magnetic head is left stained, it may damage the tape used. Dust or magnetic powder on a tape may cause errors or result in data destruction. Use the cleaning cartridge to periodically clean the magnetic head.

Head cleaning cycle

Clean the magnetic head in the following cases:

- 8-mm tape motions of 30 hours or longer since the last head cleaning.

- One month has passed since the last cleaning.

- A tape or hardware error occurs.

  (Stains on the magnetic head may cause a hardware error.)

- LEDs or console message indicates to need the head cleaning.

- Both warning and ready LEDs on the 8 mm tape unit blink together.

How to use a Cleaning Cartridge

To clean the magnetic head, insert the cleaning cartridge the same way as the data cartridge. Head cleaning is completed automatically within about three minutes, then the cleaning cartridge is ejected. Do not use any other method than described in this section.

IMPORTANT

Use only Exabyte "Premium Cleaning Cartridge" or equivalents. Never use any other cleaning methods.

138

Appearance of the Cleaning Cartridge

Figure 11.12 shows the appearance of the cleaning cartridge.

Check sheet

The dimensions are the same as those of the data cartridge.
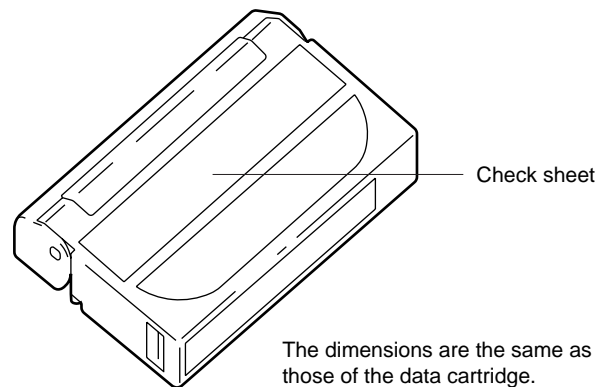
Figure 11.12   Cleaning Cartridge of The 8-mm Tape Unit

Replacing the cleaning cartridge
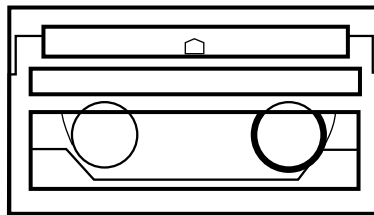
Figure 11.13   Cleaning Cartridge of The 8-mm Tape Unit

The tape in the cleaning cartridge is wound onto the right reel from the left reel (as shown in the figure above) each time the magnetic head is cleaned. The used portion of the tape is not rewound. When the entire length of the cleaning tape on the left reel is used up, the cleaning cassette can no longer be used.

Replace the cleaning cartridge with a new cartridge when there is no more tape on the left reel. Use either another Fujitsu labeled cleaning cartridge or an Exabyte "Premium Cleaning Cartridge"

IMPORTANT

When handling the cleaning cartridge, note the following items:

- Use the cleaning cartridge in the operating environment of the 8-mm tape unit.

- Do not allow condensation to form inside the cleaning cartridge.

- Do not subject the cleaning cartridge to strong shock. Do not open the cleaning cartridge.

139

11.7   QIC Tape Unit

This section describes front panel indicator and button of the QIC tape unit, and explains how to use the QIC tape unit.

Front Panel

The QIC tape unit has a LED and an eject button as shown in Figure 11.14 .
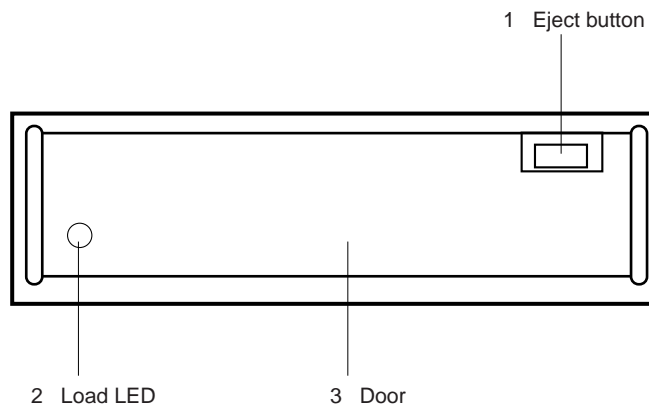
Figure 11.14   QIC Tape Drive Front Panel

This section describes the functions of the switche and LED on the QIC tape unit.

1 Eject button

The eject button is used to open the door when inserting and remove a tape. Except for inserting or removing a tape, be sure to keep the door closed while operating the QIC tape cartridge unit. If the QIC tape cartridge unit is used with the door open, data may not be read from or written to the tape because of dust.

⚠ CAUTION	Data destruction: Do not press the eject switch during an operation The forced ejection function may operate and data being written may be destroyed.

2 Load LED

The load LED lights in green when a data cartridge is inserted in the QIC tape cartridge unit. The load LED blinks in green when the QIC tape cartridge unit is operating.

If an error occurs in the QIC tape cartridge unit or a tape, the load LED lights in orange. If the QIC tape cartridge unit cannot be recovered, the load LED lights in red. In this case, contact the system administrator.

Tape cartridge information

This tape drive uses DC 9250 or equivalent 1/4-inch tape cartridges, which have maximum storage capacity of 2.5 Gbytes. The cartridges do not require preformatting.

Table 11.6   QIC Tape Cartridge Capacity

Format	Length	Capacity
QIC-2GB	356 m (1200 ft)	2.5 Gbytes
QIC-1000	232 m (760 ft)	1.0 Gbytes
QIC-525	311 m (1020 ft)	525 Mbytes
QIC-150	183 m (600 ft)	150 Mbytes
QIC-120	183 m (600 ft)	125 Mbytes
QIC-24	183 m (600 ft)	Read only

Inserting the data cartridge

1   Check that the load LED is off, then press the eject button.

If the load LED is on, a data cartridge is already inserted.

2   Insert the data cartridge slowly. Note that the cartridge is not fully inserted at this time.

3   Close the door. The data cartridge is fully inserted deeper and the load LED light up.

Removing the data cartridge

Remove the data cartridge from the QIC tape cartridge unit according to the following procedure:

1   Check that the QIC tape cartridge unit is not operating, then press the eject button to open the door. Part of the inserted data cartridge is ejected before stopping.

2   Remove the data cartridge manually.

Notes on handling

When handling data cartridges, note the following items:

● When reading data, the data cartridge should be write-protected.

● When a data cartridge is not to be used, store it outside the QIC tape cartridge unit (i.e., do not leave the data cartridge in the QIC tape cartridge unit).

IMPORTANT

After a QIC tape cartridge unit has been used for a long time , the built-in magnetic head will become stained by dust or magnetic powder from tapes. If the magnetic head is left stained, it may damage the tape. Dust or magnetic powder on the tape may cause errors or result in data destruction. To clean the magnetic head using a cleaning cartridge, read the section "Cleaning the magnetic head" in this chapter.

141

Head cleaning cycle

To clean the magnetic head when:

- The QIC tape cartridge unit is used for eight hours or longer from the last head cleaning.

- One month has passed since the last head cleaning.

- Tape errors occur frequently.

The QIC tape cartridge unit has a function that outputs a cleaning instruction message to the console display. When this message is output, clean the magnetic head.

Cleaning the magnetic head

To clean the magnetic head with a cleaning cartridge:

Use the ISSI(R) Data Products 1/4-inch cleaning cartridge (Model IS5404), or equivalent cleaning cartridge. Follow the instructions included with the kit.

1 Dampen the cleaning pad attached to the cleaning cartridge with cleaning fluid.

2 Insert the cleaning cartridge the same way as the data cartridge.

3 Close the door of the QIC tape cartridge unit. Head cleaning will starts automatically. When the door is open, head cleaning stops. Wait ten seconds, then open the door.

4 Remove the cleaning cartridge manually. Wait three minutes to dry the magnetic head before using the QIC tape cartridge unit.

Appearance of the data cartridge

Figure 11.15 shows the appearance of the data cartridge.
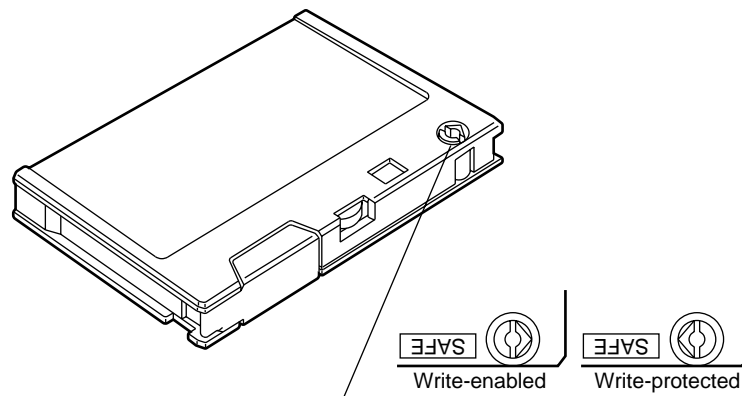
Figure 11.15   QIC Data Cartridge

⚠ CAUTION	When using or storing the data cartridge, take the following precautions. If these precautions are not taken, the QIC tape unit or its data may be destroyed.

- Use the data cartridge in the operating environment of the QIC tape cartridge unit.

- When storing the data cartridge for a long time, ensure the storage area meets the following environmental conditions and rewrite data once a year.

  Temperature: 5 to 45 degrees Celsius

  Humidity: 20 to 80% RH

  Maximum wet bulb temperature: 29 degrees Celsius

- If the ambient temperature or humidity changes rapidly, allow the data cartridge to adjust to the new environment before inserting it in the QIC tape cartridge unit.

- Do not subject the data cartridge to strong shock. Do not open the data cartridge.

- Do not place the data cartridge near a magnet or device generating a strong electromagnetic field.

- Attach the index label to the specified location.

- The data cartridge tape has a limited service life. Replace the data cartridge after using it 250 times (reference). The tape may wear out prematurely depending on the environment it is used in.

- Be sure to store data cartridges in their dedicated cases.

143

12

CHAPTER 12   External Interfaces

CONTENTS

12.1   UPS Control Interface

Overview   The UPS control interface is used to perform temporary data saving processing. In this processing, a reserved interruption for software occurs when the uninterruptible power supply (UPS) is used to backup a power failure in the commercial AC power supply. In addition to this type of UPS control interface, there are several other UPS units that use the general-purpose interface such as RS232C.

Connecting interfaces

The configurations and definitions of the signal lines to be connected to the UPS system are shown below. Do not use pin numbers unspecified below to connect to the UPS system.

Table 12.1   Definitions of UPS Signal Lines

Signal names	Definitions	Pin Nos.	Remarks
BPS	Signal indicating faulty UPS conditions	6	Enabled with ON.
BTL	Signal indicating that the UPS battery level has lowered and that ineffectual battery char ge may result after a certain period of time (*1)	7	Enabled with ON.
UPSON	Signal indicating the UPS is operating	8	
ACOFF	Signal notifying power failure in the commercial AC supply connected to the UPS (*2)	9	When power fails: ON When power is normal: OFF
SG	System ground signal	5	
ER (*4)	Signal indicating the main cabinet is operating (*3)	1	

ON indicates contacts are closed.

OFF indicates contacts are open.

*1   The normal power supply should be maintained by the UPS battery for at least 10 to 60 seconds after the connecting interface signal is turned on.

2   For momentary power supply interruption of the commercial AC power not exceeding two seconds, the normal battery power supply without activating ACOFF is recommended.

*3   This connecting interface signal identifies the status of the main cabinet to prevent supplying battery power in case the signal is in the OFF (LOW) state (the main cabinet is stopped), even though a power failure is detected by the UPS.

*4   ER signal may be left unused.

146
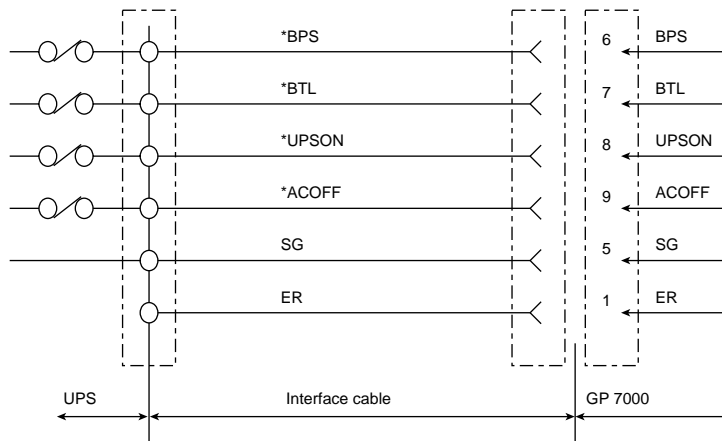
Figure 12.1   Signal Configuration

Electrical requirements:

The UPS control interface must meet the following electrical requirements:

Table 12.2   Input Circuits

Signal names	Input conditions
*BPS	* Dead-front relay contacts
*BTL	* Contact rating: 12 V DC, 10 mA or more
*UPSON	* Gold plated contacts or lead relays are recommended.
*ACOFF	

Table 12.3   Output Circuits

Signal names	Output conditions		
ER	Output voltages	VOH	3.76 V to 5.5 v
		VOL	0. to 0.4 v
	Output currents	IOH	max. -4 mA
		IOL	max. 4 mA

Signal Cables

Use shielded pair cables that meet the following specifications.

Connector shapes:

D-SUB 9-pin, Male connector (Female connector on the equipment side)

DEU-9PF-FO (Manufactured by Japan Aircraft Electronics Inc.) or equivalent

Cable length:

10 m or less

DC resistance:(per pair, both ways)

400 ohm/km or less

147

12.2   RS232C Interface

Overview   The RS232C interface is the interface standard adopted by EIA (Electronic Industries Association) in the USA in accordance with the CCITT (comite consultatif international telegraphique et telephonique) recommendation. The connections should be made after the specifications have carefully been checked for each of the adapters and controllers, since only the limited and necessary codes in the RS232C standard are supported in them. The RS232C interface is an unbalanced interface based on JISX5101 (former JISC6361) and CCITT V.24/V28.

Moreover, care must be taken not to confuse the signal names which may differ from equipment to equipment.

Electrical Rating Specifications

The following rating specifications must be met:

Table 12.4   Electrical Rating Specifications

Input circuits	Input thresholds	ON (0) at +3 V or higher, OFF (1) at -3 V or lower
	Input impedance	3 to 7 Kohm
	Maximum allowable input voltage	+-25 V
	Receiving margin	45% or more
	RV element used	SN75C1406 or SN75189AN (products of TI) or equivalent
Output circuits	Output voltages	+5 V to +15 V, -5 V to -15 V
	Output impedance	300ohm or less
	Maximum output current	+-0.5 A or less
	DV element used	SN75C1406 or SN75188AN or equivalent

Connecting cables

Use shielded pair cables that meet the following specifications. The signal return lines should be gathered together to be connected to the SG (signal ground) at both ends.

- DC resistance (per pair, both ways): 300 ohm/km or less

- Capacitance between lines (between pairs): 70 PF/m or less

- Cable length: 100 m or less

- Cable screen: Shielded cables

Table 12.5 lists the definitions of signal line.

148

Table 12.5   Definitions of Signal Lines

Signal names and pin Nos. on the host side	Voltage levels		Description	Pin Nos. on the I/O device side
(DSUB25P)	'0'-off (*1)	'1'-on (*1)		TERMINAL-25P
SD: 2	+8 V	-8 V	GP transmitting data signals	3
RD: 3	+8 V	-8 V	GP receiving data signals	2
RS: 4	-8 V	+8 V	Transmission request signal when the GP transmits the data	5
RS: 4	-8 V	+8 V	Transmission request signal	5
CS: 5	-8 V	+8 V	Request to transmit when the I/O device sends out the data	4
ER: 20	-8 V	+8 V	Status signal to indicate whether or not the host is ready for operation	6
DR: 6	-8 V	+8 V	Status signal to indicate whether or not the I/O device is ready for operation	20
CD: 8	-8 V	+8 V	Indicates that the I/O device receives the signal from the connected system normally	5-8(*2)
ST1:24	+8 V	-8 V	Reception timing for the I/O device to be supplied with the data from the GP	24
ST2:15	+8 V	-8 V	Transmission timing for the I/O device to supply the GP host with the data	15
RT: 17	+8 V	-8 V	Transmission timing for the I/O device to supply the GP host with the data	17
SG: 7	--	--	Used as a signal return line.	7

*1   Indicates the data signal logic or ON/OFF of the control line.

*2   Indicates the pin numbers short-circuited on the TERMINAL side connector.

149

Connection of signal lines

Figure 12.2 shows a configuration of signal line on connecting DCE device.
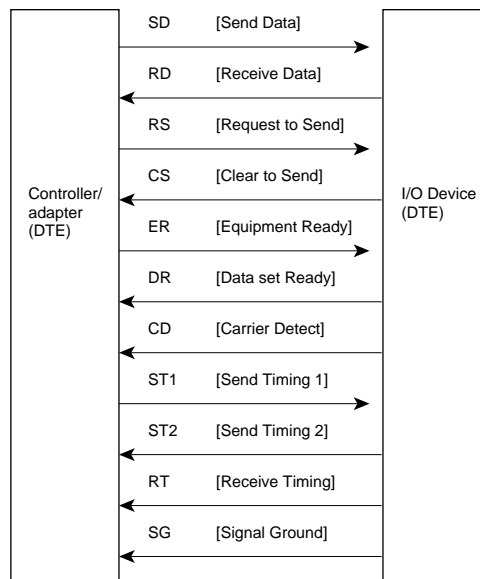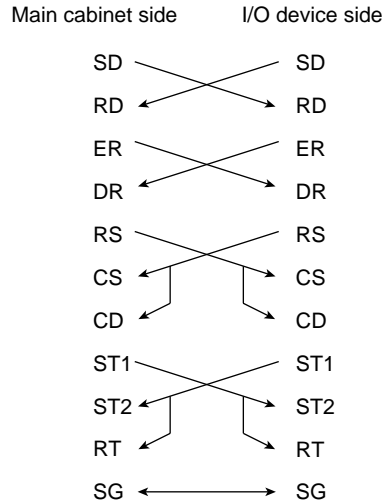

Figure 12.2   Configuration of Signal Line when Connecting DCE Device(Example)

The configuration of the signal line on connecting DTE device is shown below.

Note:
RS/CS flow control cannot be achieved by
this wiring

Figure 12.3   Configuration of Signal Line when Connecting DTE Line(Example)

150

12.3   Parallel Interface

Parallel interface

The Parallel interface is based upon IEEE1284. For details of the signal line configuration and electrical standard, refer to the IEEE1284 specifications. Besides the hardware verification mentioned above, the control codes (e.g., Chinese-character code and ESC sequence) supported by the connected system must be checked before attempting to use the interface.

In the GP7000F, "Compatible," "Nibble" and "Byte" modes are supported. "ECP (Extended Capabilities Port)" to "EPP (Enhanced Parallel Port)" modes are not supported as yet.

Terminal Distribution

IEEE1284-A from among IEEE1284 terminal distribution schemes is shown below. The following table shows the pin numbers, sources and signal names. Sources identify the communicating status, e.g., [from Host (H)], [from terminal (P)], and [bidirectional (Bi-Di)] (can be sent either from the host or terminal equipment). The signal names identify those supported in the respective modes. For the connecting information regarding the cables types, refer to the IEEE1284 specifications.

Table 12.6   IEEE1284-A Connector Terminal Distribution

Pin #	Source	Compatible	Nibble	Byte
1	H	NStrobe	HostClk	
2	Bi-Di*	Data 1 (Least Significant Bit)		
3	Bi-Di*	Data 2		
4	Bi-Di*	Data 3		
5	Bi-Di*	Data 4		
6	Bi-Di*	Data 5		
7	Bi-Di*	Data 6		
8	Bi-Di*	Data 7		
9	Bi-Di*	Data 8 (Most Significant Bit)		
10	P	NAck	PtrClk	
11	P	Busy	PtrBusy	
12	P	Perror	AckDataReq	
13	P	Select	Xflag	
14	P	NAutoFd	HostBusy	

Table 12.7   IEEE1284-A Connector Terminal Distribution (Continued)

Pin #	Source	Compatible	Nibble	Byte
15	P	NFault	nDataAvail	
16	N	NInit	nInit	
17	P	NSelection	1284 Active	
18		Signal Ground (nStrobe)		
19		Signal Ground (Data 1 and Data 2)		
20		Signal Ground (Data 3 and Data 4)		
21		Signal Ground (Data 5 and Data 6)		
22		Signal Ground (Data 7 and Data 8)		
23		Signal Ground (Busy and nFault)		
24		Signal Ground (PError, Select, and nAck))		
25		Signal Ground (nAutoFd, nSelectIn, and nInit)		

*   Data signals can be read by some but not all host devices.

152

13

CHAPTER 13   RCI Setting

CONTENTS

153

13.1   Overview

The remote cabinet interface (RCI) function turns on/off the power of the expansion unit along with the main unit. The RCI function also reports any error that occurring in an expansion unit to the main unit.

RCI displays the current node addresses, executes initialization, and requests the binding of a new node after hot system replacement. It supports the commands explained below.

13.2   RCI Commands

Overview   The RCI command has a function that displays the RCI configuration information, sets the node address, and incorporates the node during hot system replacement.

The following table lists the RCI commands:

rci-config	This command displays RCI configuration information. Use this command to check the host node address and references node device names after the RCI setting.
rci-config n m	This command initializes RCI and sets an address for the local host node. It does not connect the node. N is the node address number and m is the number of hosts (n=m). (Necessary command for initialization)
rci-configio-init	This command sets new addresses of all RCI nodes (host and I/O) and connects them. I/O node addresses are reassigned, starting with 1. Use this command in initial installation.
rci-configio	Use this command to add or remove a local node (I/O).

Notes

- In initial installation, execute an `rci-config` command by specifying n=1 and m=1. Then, execute an `rci-configio-init` command.

- When adding a host node, set the mode switch on the panel of a connected host node to "MANUAL." This masks a failure report caused by the node expansion. Then, use the RCI cable to connect the expansion target host and turn on the host. Execute an `rci-config n m` command and an `rci-configio` command in the host. Set the mode switch to the original position when the connection is complete.

- When adding an I/O node, set the mode switch on the panel of a connected host node to "MANUAL." Use the RCI cable to connect the expansion target host and turn on the host again. Then, execute an `rci-configio` command when the `ok` prompt is displayed.

154

The figure below shows a setting example.

```
ok rci-config
HOST:
addres: 000101ff mode: 010038a0 status: c000
LIST:
address      status    device-class    sub-class
000101ff     90        0001            01
000301ff     90        0100            01
000302ff     90        0201            01
```

13.3 Liquid Crystal Display (LCD) Specifications

A message is displayed when the service pin of an I/O node is pressed. Use this message to check the RCI address of the I/O node and the RCI cable connection to the node. The message is shown below.

```
ID: XXXX VER: yy
ST: zzzzzzzzzzzz
```

Explanation: xxxx: RCI address
            yy: RCI version
            zzzzzzzzzzzz: Neuron identifier

This message and current messages are displayed alternately for 20 to 30 seconds on the LCD panel of the main cabinet.

14

CHAPTER 14   Troubleshooting

CONTENTS

14.1   Overview

This chapter will give you some tips to isolate hardware problems of the GP7000F. The GP7000F has some hardware features to diagnose and monitor the hardware, and it makes trouble shooting easy and less time consuming.

- LCD panel shows hardware error messages, if it is found during power-on diagnostics or while the system is running. Also, the CHECK LED on the front panel light up, if the GP7000F has a problem.

- When the ok prompt are shown on a console display, some commands are available to show results of the power-on diagnostics.

- If problems are occurred while the operating system is running, error messages are displayed on the console and logged in the /var/adm/messages file. When the operating system is running, a variety of diagnostic program can be used to verify the hardware system. For more information about the diagnostic program, refer to the manuals of the "Basic Software Extension" or "Enhanced Support Facility".

Note that errors in I/O devices such as disk drives and PCI cards are not indicated both on the LCD panel nor the CHECK LED. Also, except for some system hardware such as processor modules, errors which are occurred while the operating system is running are not indicated by them. The system administrator should isolate such errors by the system console messages and the system log files.

14.2   Commands at the ok prompt

Results of initial diagnosis

The following commands are available at the ok prompt to show results of the initial diagnostic. Also, the diagnostic results can be referred to by using the prtdiag(1M) command while the operating system is running. For details of the LCD display messages, refer to Section 14.4 .

Table 14.1   The 'show-post-results' Command

show-post-results	Display results of the POST diagnostics for UPA frequency, UPA modules, PCI slots, memory, on board IO, etc.

If the operating system can't boot up while the power-on diagnostic has passed without any errors, check the system's boot device. The following commands are available at the ok prompt in order to identify SCSI bus and SCSI devices attached.

158

14.3   Initial Diagnosis Sequence

LCD display Sequence

The LCD display sequence is shown in the Figure 14.1 . There are many patterns in the second line. But, the following example shows only some of them.

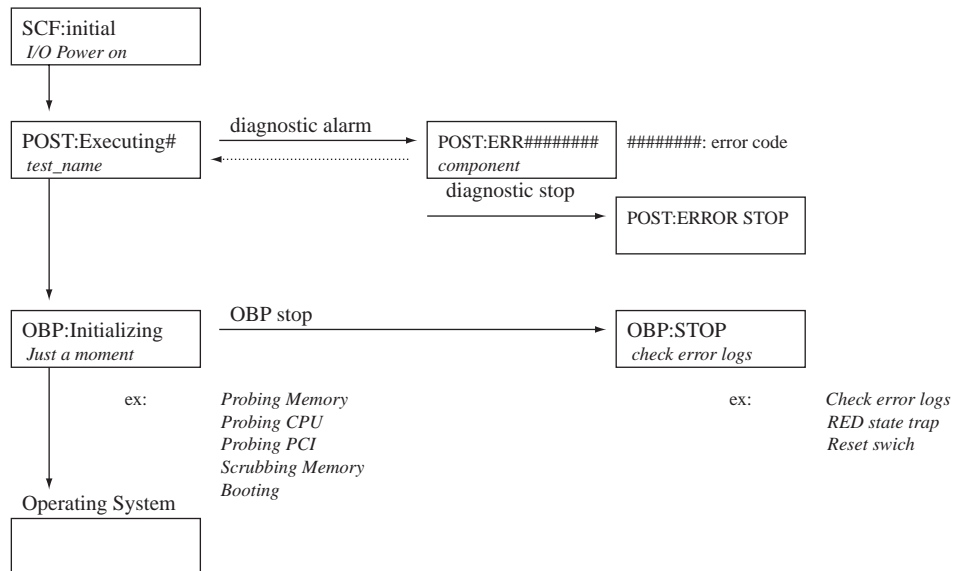Figure 14.1   Power-on Sequence

Note that if hardware error is found during the power-on sequence, GP7000F main cabinet is power cycled automatically to make sure any error detected during the power-on sequence.

If power-up processing is not performed after turning on the power switch, check to see if the AC main line switch is in the proper position and that the mode switch is set to SECURE.

159

OBP Error Messages

Table 14.2 shows just examples of the error messages displayed when faults are detected.

Table 14.2   OBP Error Messages

Message level (2nd line)	Location of detected abnormality
CPUn	n-th processor module
SLOTnn	Memory module for memory slot nn
Mem config error	Violation of memory module installation condition
U2P(Timer)#x	Controller timer
U2P#xy	PCI Interface
SCSI#x	SCSI Interface
PCIO(LAN	Ethernet Interface
SuperIO(ECPP)	Parallel Interface
SuperIO(KB)	Keyboard Interface
SuperIO(Mouse)	Mouse Interface
SuperIO(FDC)	Floppy Interface
ESCC(TTY)	Serial Interface
PCI#x	x-th PCI Slot
TOD/NVRAM	TOD/NVRAM chip

"0X-" displayed to top of LCD messages at M200R, M400A, and M400R. for example "0X-CPU#n".

14.4   SCF Error Messages

LCD Display Sequence

System problems encountered during the initial diagnostics and some hardware problems while the server is running are reported by messages on the LCD panel and by the status LEDs. Once the operating system has successfully running, it is also logged in message files, displayed on console, and shown by prtdiag(1M) command.

However, if the hardware system failed to boot up because of some hardware problems, the CHECK LED on the operator panel indicate to found problems by blinking, and the problem can be identified by the LCD messages displayed on it.

This section describes some of the error messages displayed on the LCD panel. If a hardware problem occurred, contact your system administrator or service engineers with the messages on the LCD panel or any other error indications/messages.

160

Power Unit configuration error

If there is any violation of system hardware configuration, such as insufficient power supply or DC-DC converter required by the processors, the power-on sequence will be halted. In this case, any of the following error messages will be shown on the LCD panel.

Table 14.3   Power Unit Configuration Error Messages

Message level (1st line)	Message content (2nd line)	Description
SCF:alarm	FEP Config. zxy0	Insufficiency of FEP (Front End Bulk Power) for the system x : alarmed FEP #, y : installed FEP #
	DDC Config. or 0X-DDC Config	Insufficiency or miss configuration of DDC (DC-DC Converter)
	PPU2 Config	Insufficiency or miss configuration of 2.5V PPU (Power Processing Unit)
	PPU3 Config.	Insufficiency or miss configuration of 3.3V PPU
	PPU3-io Config	Insufficiency or miss configuration of 3.3V PPU for IO
	PPU5 Config.	Insufficiency or miss configuration of 5.0V PPU
	PPU12 Config.	Insufficiency or miss configuration of 12.0V PPU
	BE Config	Insufficiency or miss configuration of BE (Back End Power)
	BE(3.3V) Config	Insufficiency or miss configuration of 3.3V BE (Back End Power)
	BE(12V/5V)Config	Insufficiency or miss configuration of 5V BE (Back End Power)
SCF:warning	DDC Config	Extra DDC is installed
	PPU3 Config	Extra 3.3V PPU is installed
	PPU3-io Config	Extra 3.3V PPU for IO is installed
	PPU5 Config	Extra 5.0V PPU is installed
	PPU12 Config	Extra 12.0V PPU is installed
	BE Config	Extra BE is installed
	BE(3.3V) Config	Extra 3.3V BE is installed
	BE(12V/5V)Config	Extra 5V BE is installed

161

Power, fan, environmental alarms

With a redundant configuration, if a power supply unit's failure occurs while the system is running, the system will display a message on operating system and will continue to running. However, a message may not be displayed for a non-redundant configuration, and the system will shut down immediately. The same applies to the fan failure. To identify the cause of the problem, message log file may be useful if the system can restart. The causes of this type of event are therefore continuously reported on the LCD panel after the system is powered down. However, the messages on the LCD panel will disappear if the Main Line switch is turned off.

Table 14.4   Power/Fan/Environmental Error Messages

Message level (1st line)	Message content (2nd line)	Description
SCF:warning	FAN m-n FAN m-n (x-y)	Rotation alarm is detected at fan n of fan traym. (x-y): When a plurality of events is detected
	FEP#n FEP#n (#m)	Abnormality is detected at n-th FEP(Front End Power) (#m): When a plurality of events is detected
	BE#n	
SCF:alarm	FAN m-n	Faulty rotation is detected at fan n of fan tray m.
	FAN m-n (x-y)	When a plurality of events is detected
	Thermal Inlet	Abnormal ambient temperature (exceeding approx. 40(degrees Celsius/104 F) is detected
	Thermal CPU	Abnormal in-cabinet temperature detected
	Sensor Inlet	Faulty ambient temperature sensor detected
	FEP#n FEP#n (#m)	Abnormality is detected at n-th FEP (#m): When a plurality of events is detected
	DDC#n or 0X-DDC#n	Abnormality is detected at n-th DDC
	BE#n	Abnormality is detected at n-th BE
	PPU2#n	Abnormality is detected at n-th 2.5V PPU (Power Processing Unit)
	PPU3#n	Abnormality is detected at n-th 3.3 V PPU
	PPU5#n	Abnormality is detected at n-th 5 V PPU
	PPU12#n	Abnormality is detected at n-th 12.0 V PPU
	FEP DC-ON 0x	Failed to power-up 0x FEP
	DDC DC-ON xx	Failed to power-up xx DDC
	PPU2 DC-ON 0x	Failed to power-up 0x 2.5V PPU
	PPU3 DC-ON 0x	Failed to power-up 0x 3.3 V PPU
	PPU5 DC-ON 0x	Failed to power-up 0x 5.0 V PPU
	PPU12 DC-ON 0x	Failed to power-up 0x 12.0 V PPU
	BE DC-ON 0x	Failed to power-up 0x BE

162

Processor Monitoring Error Messages

In the power-on diagnostics, the processors, external caches, memory modules, etc. are diagnosed. If a fault is detected in the processor during the power-on diagnostics and while the system is running, the following error messages will be shown on the LCD panel.

Table 14.5   Processor Monitoring Error Messages

Message level (1st line)	Message content (2nd line)	Description
SCF:alarm	CPU Hangup nn	Processor hang-up is detected in the power-up processing phase nn.
	CPU Hangup 00nn	Processor hang-up is detected in the operating system environment.

Lithium Battery

An alarm message notifying the initialization of the calendar will be displayed, when cables to the battery are temporarily disconnected to replace the lithium battery or when some other maintenance work is performed. In such a situation, check the cables, then power-on the system with the MODE switch is set to MANUAL. If the calendar is initialized due to some reason other than maintenance work but remains some error after replacing the lithium battery, any other unit should be repaired.

Table 14.6   Lithium Battery Error Messages

Message level (1st line)	Message content (2nd line)	Description
SCF: warning	Calendar Initial	The calendar information has been cleared for a moment due to battery replacement or discharge. During power-up phase, the information may be restored to reset the calendar automatically.
SCF: alarm	LiBATT	Reduced lithium battery output voltage detected.

163

Other Error Messages

An abnormality of the system monitoring feature itself as well as abnormality of main cabinet are indicated by error messages on the LCD panel.

Table 14.7   Other Error Messages

Message level (1st line)	Message content (2nd line)	Description
SCF: idling...	nnn min, POWER	nnn minutes passed after the power was turned on after restoring the power.
	RCI Mainte Mode	RCI mode has changed for maintenance
	I/O Power on	The power-on sequence for peripheral units is continuing.
SCF: warning	Please Levelup	Firmware upgrade processing is incomplete. Re-executing upgrade processing is required.
SCF: alarm	RCI Timeout	Communication processor time-out detected.
	FMEM Protected	Flush Memory is write-protected
	Syshalt nnnnnnnn	Halt on main cabinet detected.
SCF: stop	BUSerr nnnnnnnn	Halt due to bus error. Automatically reset. If the message is still displayed, however, the system monitoring feature is down.
	Error Message	Abnormality is detected within the system monitoring mechanism. If the message is still displayed, however, the system monitoring feature is down and power-on is disabled.
	SCF Watchdog	Hang-up due to watchdog detection. Automatically reset. If the message is still displayed, however, the system monitoring feature is down.

164

FUJITSU
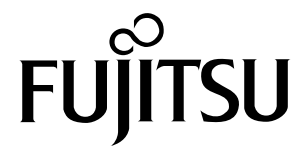
Free Manuals Download Website

http://myh66.com

http://usermanuals.us

http://www.somanuals.com

http://www.4manuals.cc

http://www.manual-lib.com

http://www.404manual.com

http://www.luxmanual.com

http://aubethermostatmanual.com

Golf course search by state

http://golfingnear.com

Email search by domain

http://emailbydomain.com

Auto manuals search

http://auto.somanuals.com

TV manuals search

http://tv.somanuals.com