Enterprise Storage Server

Service Guide
2105 Models E10/E20, F10/F20, and Expansion Enclosure
Volume 3

Chapters 7, 8, 9, 10, 11, and 12

SY27-7609-06

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Note
Before using this information and the product it supports, be sure to read the general information under “Notices” on page ix.

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Safety notices are printed throughout this book. Danger notices warn you of conditions or procedures that can result in death or severe personal injury. Caution notices warn you of conditions or procedures that can cause personal injury that is neither lethal nor extremely hazardous. Attention notices warn you of conditions or procedures that can cause damage to machines, equipment, or programs.

Translated Safety Notices

Several countries require that caution and danger safety notices be shown in their national languages.

Translations of the caution and danger safety notices are provided in a separate document, *IBM Storage Solution Safety Notices* book, form number GC26-7229.

Environmental Notices

This section contains information about:

- Product recycling for this product
- Environmental guidelines for this product

Product Recycling

This unit contains recyclable materials. These materials should be recycled where processing sites are available and according to local regulations. In some areas, IBM provides a product take-back program that ensures proper handling of the product. Contact your IBM representative for more information.

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Electronic Emission Notices

Federal Communications Commission (FCC) Statement

Note: 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.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

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

Industry Canada Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conform à la norme NMB-003 du Canada.

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This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

Conformity with the Council Directive 73/23/EEC on the approximation of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits is based on compliance with the following harmonized standard: EN60950.

Germany Only

Zulassungsbescheinigung laut Gesetz ueber die elektromagnetische Vertraeglichkeit von Geraeten (EMVG) vom 30. August 1995.

Dieses Geraet ist berechtigt, in Uebereinstimmung mit dem deutschen EMVG das EG-Konformitaetszeichen - CE - zu fuehren.

Der Aussteller der Konformitaetserklaeung ist die IBM Deutschland.

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Korean Government Ministry of Communication (MOC) Statement

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Using This Service Guide

This guide is for service representatives who are taught to install and repair the IBM 2105 Enterprise Storage Server. Internal components of this machine are designed and certified to be serviced by trained personnel only.

Where to Start

Start all service actions at ″Entry MAP for All Service Actions″ in chapter 2 of *Enterprise Storage Server Service Guide, Volume 1*.

Attention: When performing any service action on the IBM 2105 Enterprise Storage Server, follow the directions given in ″Entry MAP for All Service Actions″ in chapter 2 of *Enterprise Storage Server Service Guide, Volume 1*, or from the service terminal. This ensures that you use the correct remove, replace, or repair procedure, including the correct power on/off procedure, for this machine. Failure to follow these instructions can cause damage to the machine and might or might not also cause an unexpected loss of access to customer data.

Limited Vocabulary

This manual uses a specific range of words so that the text can be understood by IBM service representatives in countries where English is not the primary language.

Publications

This section describes the ESS library and publications for related products. It also gives ordering information.

ESS Product Library

The ESS is an IBM Enterprise architecture-based product. See the following publications for more information on the ESS:

- *Enterprise Storage Server Service Guide 2105 Models E10/E20, F10/F20, and Expansion Enclosure, Volume 1* book, GC27–7605

  This is volume 1 of this book.
- *Enterprise Storage Server Service Guide 2105 Models E10/E20, F10/F20, and Expansion Enclosure, Volume 2* book, GC27–7608

  This is volume 2 of this book.
- *2105 Model 100 Attachment to ESS Service Guide* book, SY27-7615

  This guide is for service representatives who are taught to install and repair a VSS attached to an ESS.
- *ES Connection Link Fault Isolation, SY22-9533* book, form number SY22-9533
- *Maintenance Information for S/390 Fiber Optic Links (ESCON, FICON, Coupling Links, and Open System Adapters)* book, form number SY27-2597.
- *IBM Enterprise Storage Server Introduction and Planning Guide* book, GC26-7294

  This book introduces the product and lists the features you can order. It also provides guidelines on planning for installation and configuration of the ESS.
- *IBM Enterprise Storage Server User's Guide* book, SC26-7295

  This book provides instructions for setting up and operating the ESS.
- *IBM Enterprise Storage Server SCSI Command Reference* book, SC26-7297

  This book describes the functions of the ESS and gives reference information such as channel commands, sense bytes, and error recovery procedures.

- *Enterprise Storage Serve Parts Catalog* book, S127-0974
- *IBM Storage Solutions Safety Notices* book, GC26-7229

  This book provides translations of the Danger and Caution notices used in the ESS publications.
- *IBM Enterprise Storage Server Web Users Interface Guide* book, SC26-7346
- *IBM Enterprise Storage Server Host Systems Attachment Guide* book, SC26-7296
- *IBM Enterprise Storage Server System/390 Command Reference* book, SC26-7298
- *DFSMS/MVS Software Support for the IBM Enterprise Storage Server* book, SC26-7318
- *IBM Enterprise Storage Server Quick Configuration Guide* book, SC26-7354
- *IBM Enterprise Storage Server Configuration Planner* book, SC26-7353

  This book provides work sheets for planning the logical configuration of ESS. This book is only available on the product Web site:
  http://www.ibm.com/storage/ess

Ordering Publications

All of the above publications are available on a CD-ROM that comes with the ESS. You can also order a hard copy of each of the publications. For additional CD-ROMs, order:

- ESS Service Documents CD-ROM, SK2T-8771
- ESS Customer Documents CD-ROM, SK2T-8770

Related Publications

The following publications provide information on software products that the IBM Enterprise Storage Server supports:

- *IBM Subsystem Device Driver* book, SH26-7291
- *IBM Storage Area Network Data Gateway Installation and User's Guide* book, SC26-7304
- *IBM Advanced Copy Services* book, SC35-0355
- *IBM S/360, S/370, and S/390 Channel to Control Unit Original Equipment Manufacture's Information* book, SH26-7291

Web Sites

- IBM Storage home page:
  http://www.storage.ibm.com/
- IBM Enterprise Storage Server home page:
  http://www.ibm.com/storage/ess
  http://www.storage.ibm.com/hardsoft/product/refinfo.htm

Other Related Publications

The following is a list of other related books.

7133 Model D40 Serial Disk Systems Service Guide book, GY33-0192
7133 Model D40 Serial Disk System Installation Guide book, GA33-3279
7133 SSA Disk Subsystem Service Guide book, SY33-0185
7133 Models 010 and 020 SSA Disk Subsystem Installation Guide book, GA33-3260
IBM Versatile Storage Server Service Guide, 2105 Models B09 and 100 book, SY27-7603
IBM Input/Output Equipment, Installation Manual–Physical Planning , GC22-7064
IBM Storage Solutions Safety Notices , GC26-7229
Electrical Safety for IBM Customer Engineers S229-8124

Chapter 7: 2105 Model Exx/Fxx and Expansion Enclosure Locations

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Location Codes

The 2105 Model Exx/Fxx and Expansion Enclosure storage facility uses Physical Location Codes or AIX Location Codes to provide mapping of the failing field replaceable units. The location codes are produced by the system unit's firmware and AIX.

For quick access to the FRU location diagrams, find the FRU in the chapter table of contents on page , and go to the indicated page.

For a list of which FRU location codes are available in this chapter, see the chapter table of contents on page .

AIX Location Codes

The basic formats of the AIX location codes are:

- For non-SCSI devices/drives
  AB-CD-EF-GH
- For SCSI devices/drives
  AB-CD-EF-G,H

For planars, cards, and non-SCSI devices the location code is defined as:

```
AB-CD-EF-GH
 |  |  |  |
 |  |  |  Device/FRU/Port ID
 |  |  Connector ID
 |  devfunc Number, Adapter Number or Physical Location
 Bus Type or PCI Parent Bus
```

- The AB value identifies a bus type or PCI parent bus as assigned by the firmware.
- The CD value identifies adapter number, adapter's devfunc number, or physical location. The devfunc number is defined as the PCI device number times 8, plus the function number.
- The EF value identifies a connector.
- The GH value identifies a port, address, device, or FRU.

Adapters and cards are identified with just AB-CD.

The possible values for AB are:

00 Processor bus

01 ISA bus

02 EISA bus

03 MCA bus

04 PCI bus used in the case where the PCI bus cannot be identified

05 PCMCIA busses

xy For PCI adapters where X is equal to or greater than 1. The x and y are characters in the range of 0-9, A-H, J-N, P-Z (O, I, and lower case are omitted) and are equal to the parent bus's IBM, aix-loc Open Firmware Property.

The possible values for CD depend on the adapter/card.

For pluggable PCI adapters/cards, CD is the device's devfunc number (PCI device number times 8, plus the function number). The C and D are characters in the range of 0-9, and A-F (hex numbers). This allows the location code to uniquely identify multiple adapters on individual PCI cards.

For pluggable ISA adapters, CD is equal to the order the ISA cards defined/configured either by SMIT or the ISA Adapter Configuration Service Aid.

For integrated ISA adapters, CD is equal to a unique code identifying the ISA adapter. In most cases this is equal to the adapter's physical location code. In cases where a physical location code is not available, CD will be FF.

EF is the connector ID. It is used to identify the adapter's connector that a resource is attached to.

GH is used to identify a port, device, or FRU. For example:

- For async devices GH defines the port on the fanout box. The values are 00 to 15.
- For a diskette drive H defines which diskette drive 1 or 2. G is always 0.
- For all other devices GH is equal to 00.

For integrated adapter, EF-GH is the same as the definition for a pluggable adapter. For example, the location code for a diskette drive is 01-D1-00-00. A second diskette drive is 01-D1-00-01.

For SCSI the location code is defined as:

```
AB-CD-EF-G,H
 |  |  | | |
 |  |  | | Logical Unit address of the SCSI Device
 |  |  | Control Unit Address of the SCSI Device
 |  |  Connector ID
 |  devfunc Number, Adapter Number or Physical Location
 Bus Type or PCI Parent Bus
```

Where AB-CD-EF are the same as non-SCSI devices.

G defines the control unit address of the device. Values of 0 to 15 are valid.

H defines the logical unit address of the device. Values of 0 to 255 are valid.

There is also a bus location code that is generated as '00-XXXXXXXX' where XXXXXXXX is equivalent to the node's unit address.

Examples of physical location codes displayed by AIX are:

- Processor Card in slot 1 of planar 1

  P1-C1
- Memory DIMM in system planar slot 2

Locations

P1-M2

- Memory DIMM 12 in card in slot 2 of system planar

  U1-P1-M2.12

Examples of AIX location codes displayed are:

- Integrated PCI adapter

  10-80 Ethernet

  10-60 Integrated SCSI Port 1

  30-58 Integrated SCSI Port 2

- Pluggable PCI adapters

  20-58 to 20-5F
  Any PCI card in slot 1

  20-60 to 20-67
  Any PCI card in slot 2

  10-68 to 10-6F
  Any PCI card in slot 3

  10-70 to 10-77
  Any PCI card in slot 4

  10-78 to 10-7F
  Any PCI card in slot 5

  30-60 to 30-67
  Any PCI card in slot 6

  30-68 to 30-6F
  Any PCI card in slot 7

  30-70 to 30-77
  Any PCI card in slot 8

  30-78 to 30-7F
  Any PCI card in slot 9

- Integrated ISA adapters

  01-D1 Diskette adapter

  01-R1 Parallel port adapter

  01-S1 Serial port 1 adapter

  01-S2 Serial port 2 adapter

  01-S3 Serial port 3 adapter

  01-K1 Keyboard adapter

- Non-integrated ISA adapters

  01-01 First ISA card defined/configured

  01-02 Second ISA card defined/configured

- Device attached to SCSI controller

  10-60-00-4,0 Device attached to Integrated SCSI Port 1

Physical Location Codes

Physical location codes provide a mapping of logical functions in a platform (or expansion sites for logical functions, such as connectors or ports) to their specific locations within the physical structure of the platform.

Location Code Format

The format for the location code is an alphanumeric string of variable length, consisting of a series of location identifiers, separated by the standard dash (-) or slash (/) character. The series is hierarchical; that is, each location identifier in the string is a physical child of the one preceding it.

- The - (dash) separator character represents a normal structural relationship where the child is a separate physical package and it plugs into (or is connected to) the parent. For example, P1-C1 is a CPU card (C1) plugged into a planar (P1), or P1-M1 is a memory card (M1) plugged into a planar (P1).
- The / (slash) separator character separates the base location code of a function from any extended location information. A group of logical devices can have the same base location code because they are all on the same physical package, but may require extended location information to describe the connectors they support. For example, P2/S1 describes the location of the serial port 1 controller and its connector (S1), which is located on planar P2 (its base location code), but the / indicates that further devices can be connected to it at the external S1 serial connector. The keyboard controller and its connector likewise have location code P2/K1, which means they have the same base location code (P2) as serial port 1, but a different external connector. In contrast, the location code P2-K1 actually points to the device connected to connector K1; that is, the keyboard. The location code P2/Z1 indicates an integrated SCSI controller which drives connector Z1, while location codes of P2-Z1-... point to the actual SCSI bus and devices.

Each location identifier consists of one alpha prefix character that identifies a location type, and a decimal integer number (typically one or two digits) that identifies a specific instance of this location type. Certain location types may also support secondary sub-locations, which are indicated by appending a period (″.″) character and a sub-location instance number.

Specifically, the format of a location code is defined as follows:

pn[.n][- or /]pn[.n][- or /]...

Where p is a defined alpha location type prefix, n is a location instance number, and [.n] is a sub-location instance number (where applicable). Sub-location notation is used only for location types which have clearly defined and limited expansion sites; for example, memory SIMMs slots on a memory card. Primarily, the [.n] sub-location notation is intended for use as an abbreviation of the location code in cases where:

1. Based on the device structure, the abbreviated sub-location code conveys the same information in a more concise form than an additional level of location identifier -- for example:
   - P1-M1.4 (pluggable DIMM 4 on Memory Card 1 on Planar 1), rather than P1-M1-M4
   - P1-C1.1 (pluggable CPU 1 on CPU Card 1 on Planar 1), rather than P1-C1-C1
   - P2-Z1-A3.1 (LUN 1 at SCSI ID 3 on integrated SCSI bus 1 from Planar 2), rather than P2-Z1-A3-A1
2. The sub-location is either a basic physical extension or sub-enclosure of the base location, but does not represent additional function or connectivity; for example, a drawer in a rack (U1.2) or a riser card on an I/O planar (P2.1).

2105 Model Exx/Fxx and Expansion Enclosure Location Code Legend

A = Address (SCSI ID) <0-15> -or- SSA Connector if for SSA Card

B = Host Bay (Bx) where ″x″ = 1...2 -or- SSA Connector if for SSA Card

C = Card or CPU Processor (Cx) or Cache Module on a card (Cx.1), where ″x″ = 1..2

Locations

D = Diskette Drive (D1) or Disk Drive Module (Dxx)...where ″xx″ = 01...16

E = Ethernet

F = Fan or sensor (Fxx), where ″x″ = Fan 01...99

G = Rack Power Control Card, Remote Power Control Card (Gx), where ″x″ = 1...2

H = Ultra SCSI Host Card (Hx)...where ″x″ = Ultra SCSI Host Card slot

I = I/O Planar Card slot (Ix), where ″x″ = 1...9

J = Connector (Jxx), where ″xx″ = 1...99, A...Z

K = SSA Device Card Slot (Kx), where ″x″ = 1...9

L = LCD Operator Panel (L1)

M = Memory Card (Mx), where ″xx″ = 1...2

N = Connector (Nxx), where ″xx″ = 01...99

O = unused

P = Planar or Backplane (Px), where ″x″ = 1...9

Q = Power / Cooling for Storage Cage, in between the Storage Cage (Qx), where ″x″ = 1...2

R = Rack (Rx), where ″x″ = Rack 1...3

S = Slot Port (Sx), where ″x″ = Serial Port 1...3

T = Cluster Bay (Tx), where ″x″ = 1...2

U = Storage Cage / Electronics Cage (Ux), where ″x″ = 1...4

V = Voltage (Power Supply or Battery) (Vxx), where ″xx″ = 01...99

W = DDM bay (Wx), where ″x″ = 1...6

X = Extra-Function Card (i.e. Service Processor) (Xx), where ″x″ = 1...9

Y = SSA 7133 Drawer (Yx), where ″x″ = 0...8

Z = SCSI Card, ESCON Card, Fibre Channel Card (Zx) connector, where ″x″ = 1...2

Locating a DDM Bay or SSA DASD Model 020 or 040 Drawer in a 2105 Rack

Use the following procedure to locate a DDM bay or SSA DASD Model 020 or 040 drawer in a 2105 Model Exx/Fxx, 2105 Expansion Enclosure, or 2105 Model 100 rack.

Note: If you already know where the rack is located, its model number, and the configuration of its DDM bays and SSA DASD Model 020 or 040 drawers, skip this procedure and go to Table 1 on page 8.

1. Record the location code of the DDM bay or SSA DASD Model 020 or 040 drawer you are locating. The first two characters of the DDM bay or SSA DASD Model 020 or 040 drawer location code (**R#-**) indicate what rack they are mounted in. Reference Figure 1 on page 7 and Figure 2 on page 7 the two possible subsystem configurations.
2. Locate the rack number (R#-) in the following list and go to the page or step indicated:
   - **R1-** (2105 Model Exx or Fxx), go to “Rack Location Codes for DDM Bays in a 2105 Model Exx/Fxx” on page 8
   - **R2-** (2105 Expansion Enclosure), go to “Rack Location Codes for DDM Bays in a 2105 Expansion Enclosure” on page 9
   - **R2-** (2105 Model 100), go to “Rack Location Codes for SSA DASD Model 020 or 040 Drawers in a 2105 Model 100” on page 11

- **R3-** (2105 Model 100), go to “Rack Location Codes for SSA DASD Model 020 or 040 Drawers in a 2105 Model 100” on page 11
- **R4-** (2105 Model 100), go to “Rack Location Codes for SSA DASD Model 020 or 040 Drawers in a 2105 Model 100” on page 11

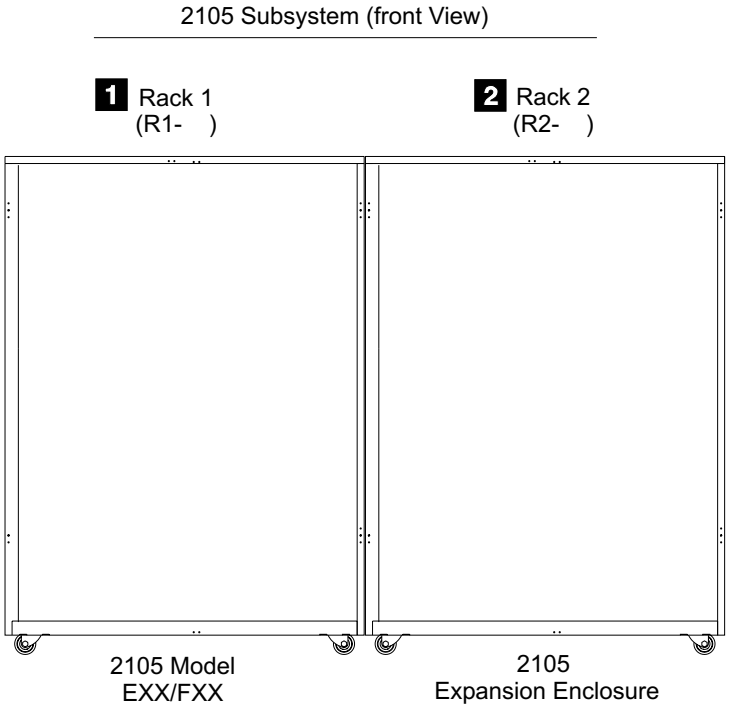

Figure 1. 2105 Model Exx/Fxx and Expansion Enclosure Rack Locations in a Subsystem (S007745n)

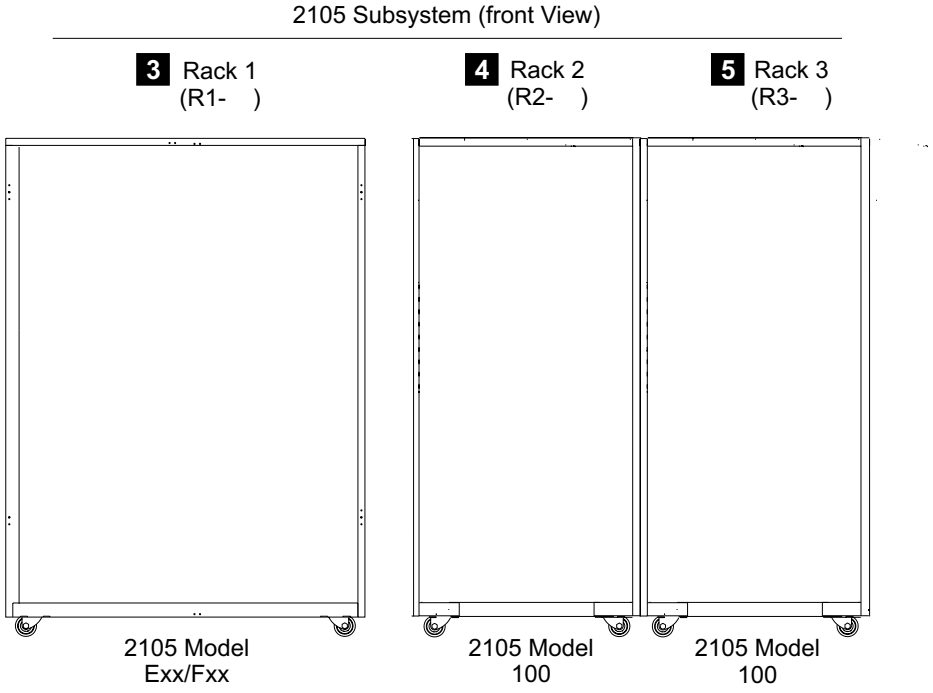

Figure 2. 2105 Model Exx/Fxx with attached 2105 Model 100 Racks (S008855n)

Rack Location Table

Use the following table to locate a DDM bay or SSA DASD Model 020 or 040 drawer in a 2105 Model Exx/Fxx, 2105 Expansion Enclosure, or 2105 Expansion Enclosure.

Table 1. 2105 DDM bay and SSA DASD Model 020 and 040 Locations

Rack Location Code	2105 Model	DDM bays Installed (Rx-Ux-Wxx)	7133 Drawers Installed (Rx-Yxx)	DDM bay or SSA DASD Model 020 and 040 Location Diagram
R1-	Exx/Fxx	Yes (all)		Go to Figure 3 on page 9.
R2-	Expansion Enclosure	Yes (all)		Go to Figure 4 on page 10.
R2-	100		Yes (all)	Go to Figure 5 on page 11.
R3-	100		Yes (all)	Go to Figure 5 on page 11.

Rack Location Codes for DDM Bays in a 2105 Model Exx/Fxx

The following diagram shows the location codes of the DDM bays mounted in a 2105 Model Exx/Fxx.

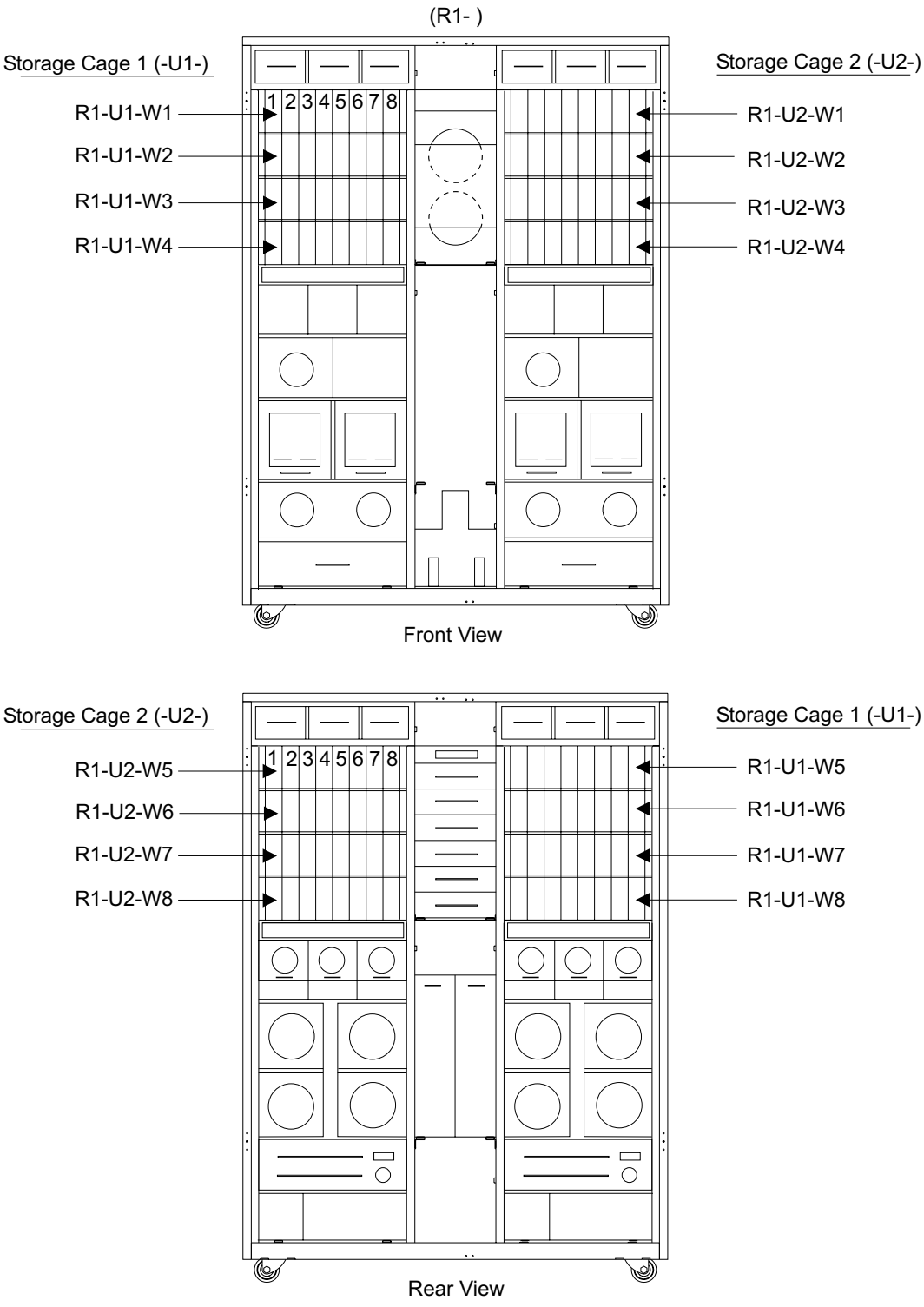

Figure 3. R1- Location Codes for DDM Bays in a 2105 Model Exx/Fxx (S007740s)

Rack Location Codes for DDM Bays in a 2105 Expansion Enclosure

The following diagram shows the location codes of the DDM bays mounted in a 2105 Expansion Enclosure.

Locations

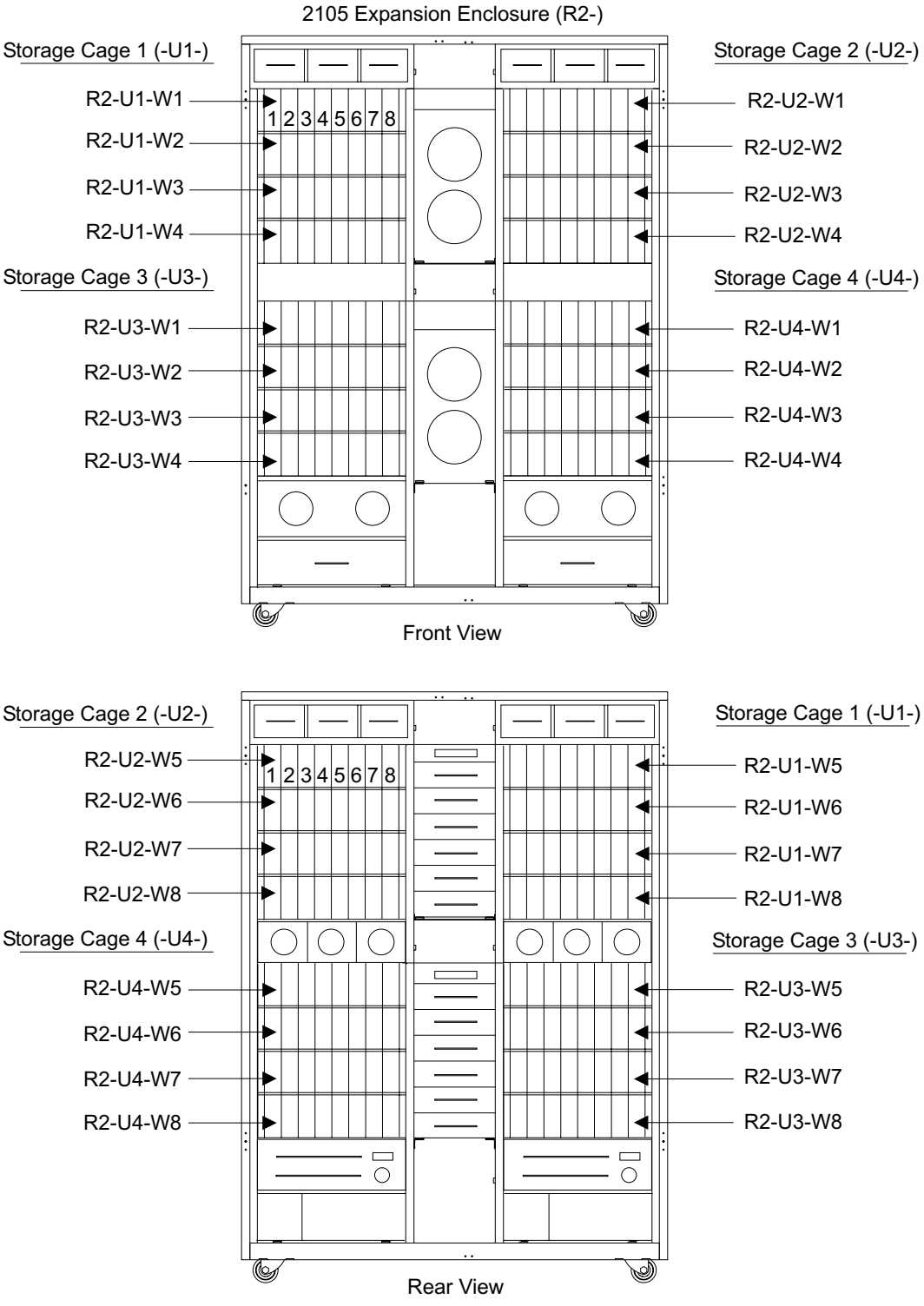

Figure 4. R2- and R3- Location Codes for DDM Bays in a 2105 Expansion Enclosure (S007741s)

Rack Location Codes for SSA DASD Model 020 or 040 Drawers in a 2105 Model 100

The following diagram shows the location codes of the SSA DASD Model 020 or 040 drawers mounted in a 2105 Model 100.

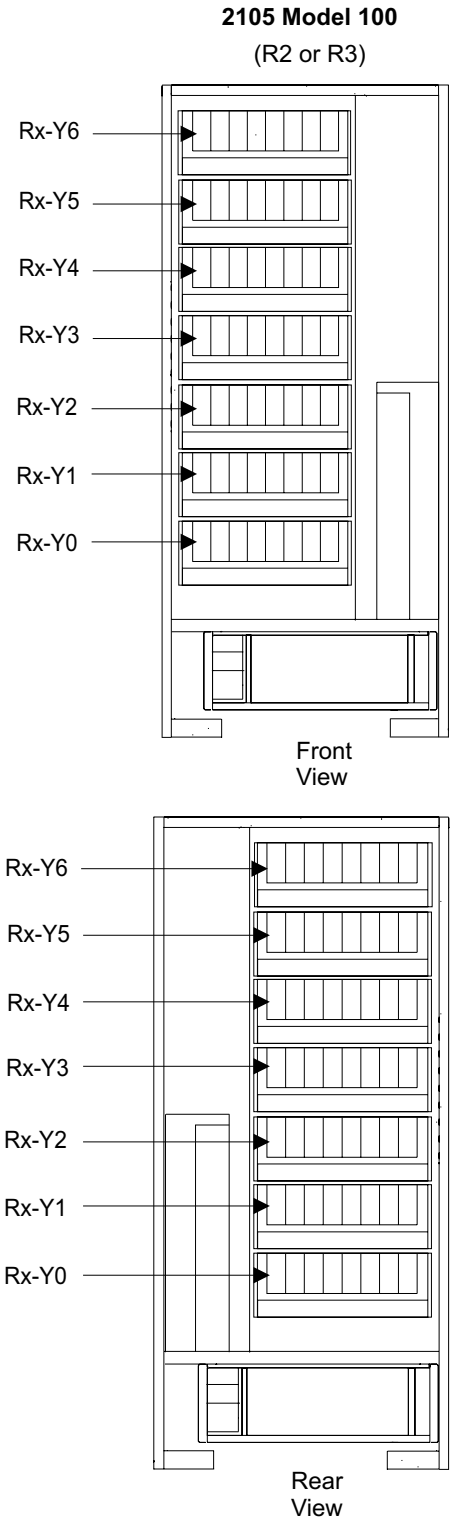

Figure 5. R2- and R3 Location Codes for SSA DASD Model 020 or 040 Drawers in a 2105 Model 100 (S008942s)

DDM Bay, Component Physical Location Codes

To locate a DDM bay in a 2105, see “Locating a DDM Bay or SSA DASD Model 020 or 040 Drawer in a 2105 Rack” on page 6.

- Controller card, lower left (Rx-Ux-Wx-C5) 1
- Host bypass card, upper left (Rx-Ux-Wx-C1) 2
- Disk Drive Module, DDM (DDM bay) (Rx-Ux-Wx-Dx) 3
  See “DDM Bay, Disk Drive Module Location Codes”
- Passthrough card, upper right (upper) (Rx-Ux-Wx-C2) 4
- Passthrough card, upper right (lower) (Rx-Ux-Wx-C4) 5
- Frame, (DDM bay) (Rx-Ux-Wx-P1) 6

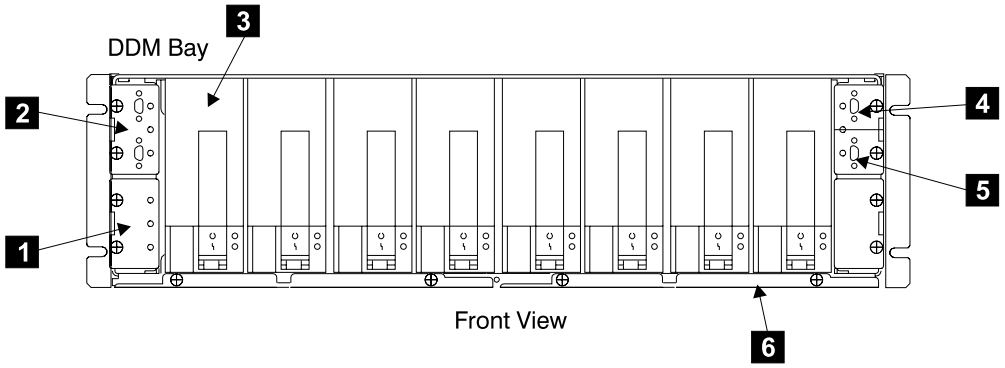

Figure 6. DDM bay Physical Location Codes (S008296l)

DDM Bay, Disk Drive Module Location Codes

To locate a DDM bay in a 2105, see “Locating a DDM Bay or SSA DASD Model 020 or 040 Drawer in a 2105 Rack” on page 6.

- (1) DDM 1, (Rx-Ux-Wx-D01)
- (2) DDM 2, (Rx-Ux-Wx-D02)
- (3) DDM 3, (Rx-Ux-Wx-D03)
- (4) DDM 4, (Rx-Ux-Wx-D04)
- (5) DDM 5, (Rx-Ux-Wx-D05)
- (6) DDM 6, (Rx-Ux-Wx-D06)
- (7) DDM 7, (Rx-Ux-Wx-D07)
- (8) DDM 8, (Rx-Ux-Wx-D08)

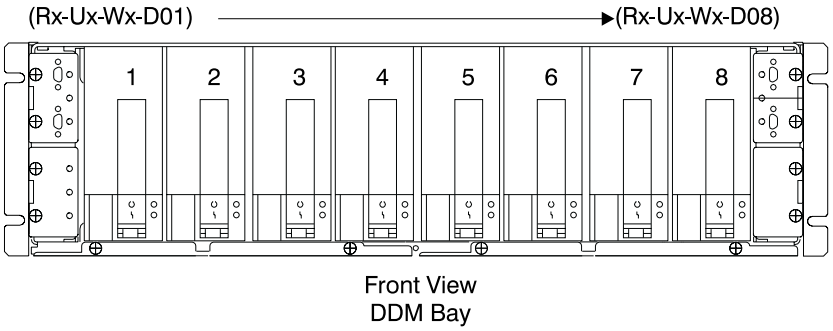

Figure 7. Disk Drive Locations in a DDM bay (S007706l)

Cluster Bay Location Codes, 2105 Model E10/E20

Location information for 2105 Model E10/E20 cluster bays follow:

Cluster Bay, Operator Panel Location Codes (E10/E20)

2105 Model E10/E20 2105 Model E10/E20

- Cluster Bay 1, operator panel, (R1-T1-L1) **1**
- Cluster Bay 2, operator panel, (R1-T2-L1) **2**

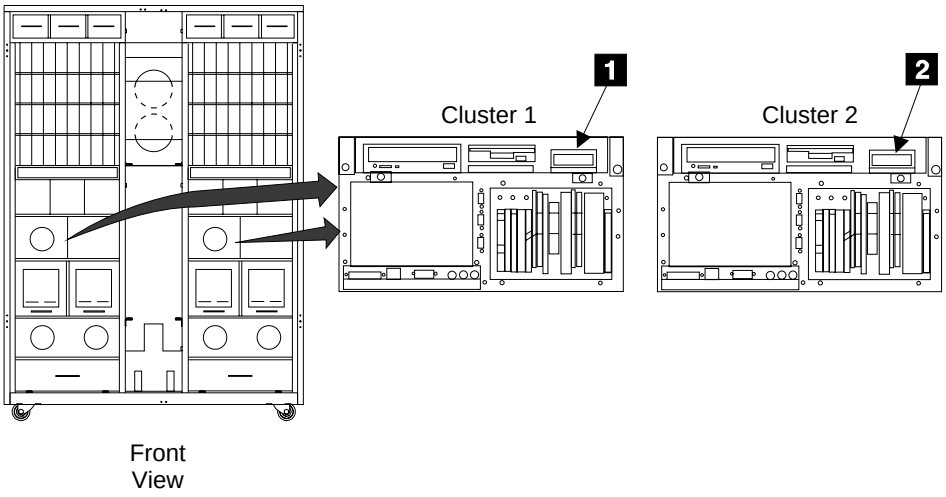

Figure 8. Cluster Bay Operator Panel Locations (S007687m)

Cluster Bay, Drives Location Codes (E10/E20)

- Diskette drive, (R1-Tx-P2-D1) **1**
- CD-ROM drive, (R1-Tx-P2-Z1-A3) **2**
- SCSI hard drive, (R1-Tx-P2-Z1-A0) **3**

Locations

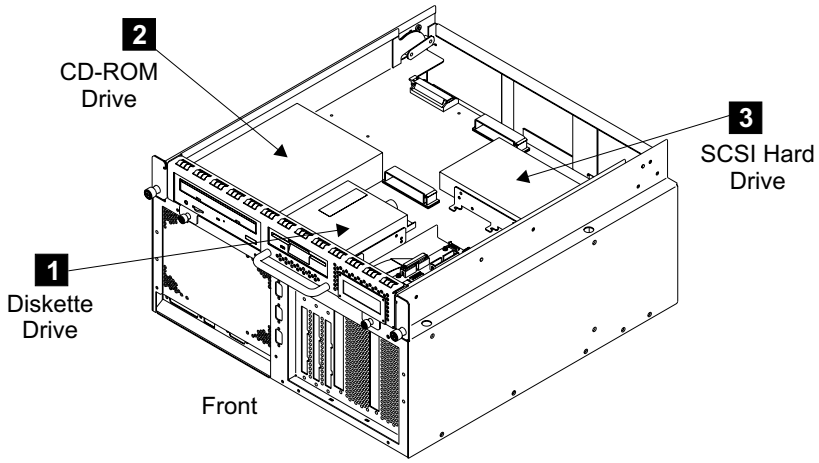

Figure 9. Cluster Bay Drive Locations (S008316m)

Cluster Bay, System, I/O, and Power Planar Location Codes (E10/E20)

- System planar, (R1-Tx-P1) 1
- I/O planar, (R1-Tx-P2) 2
- Cluster Bay Power planar, (R1-Tx-P3) 3

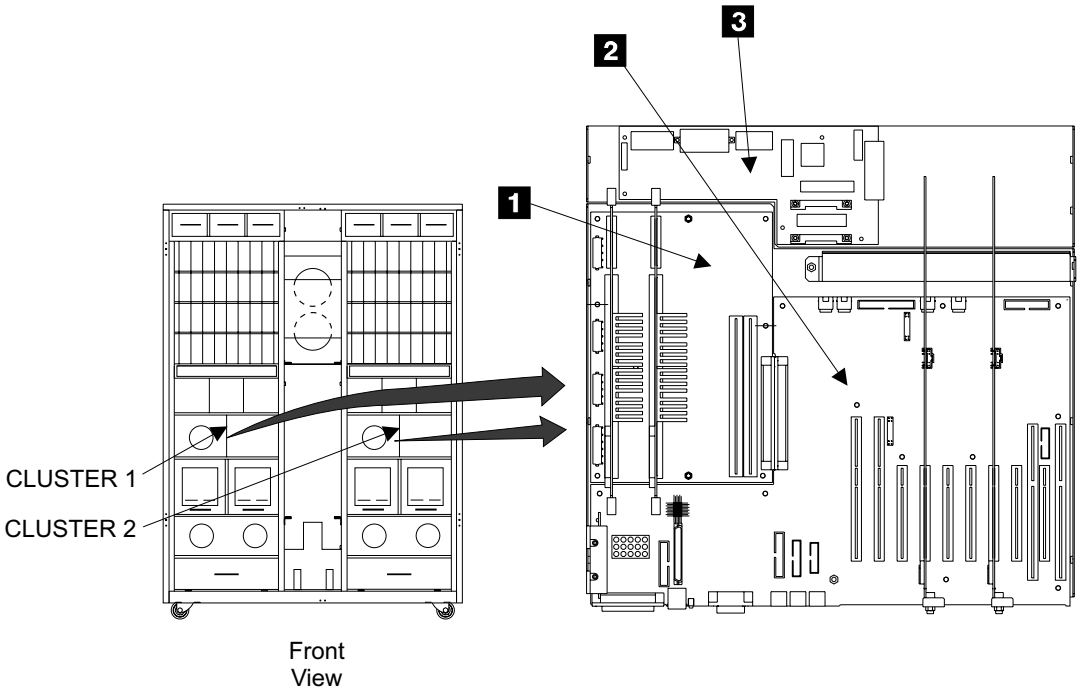

Figure 10. Cluster Bay Planar Locations (S008585n)

Cluster Bay, I/O Planar Battery Location Codes (E10/E20)

- I/O planar battery, (R1-Tx-P2-V2) 1

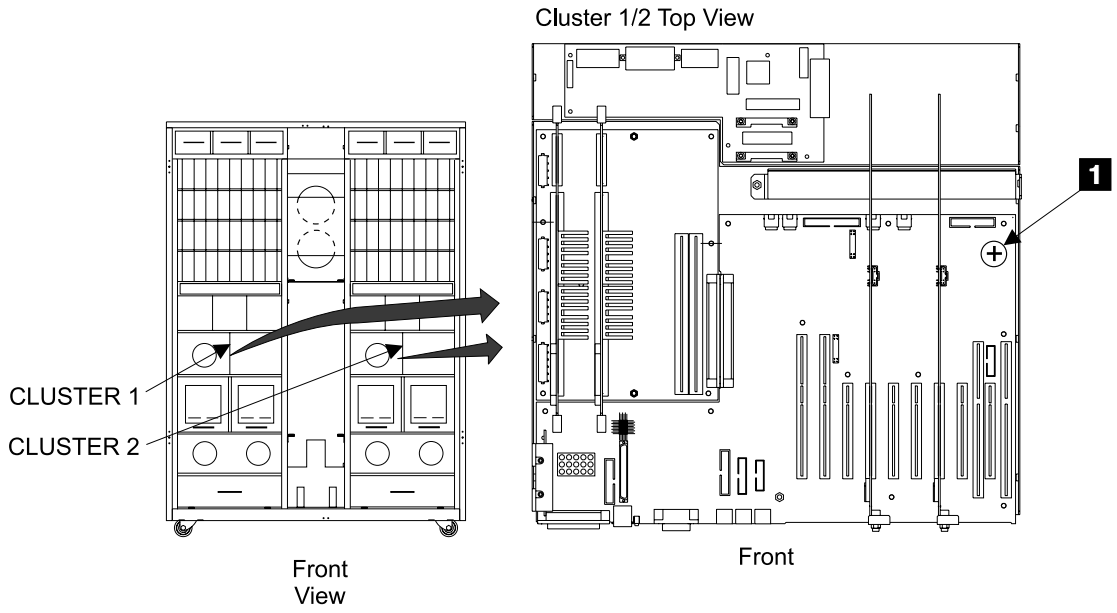

Figure 11. Cluster Bay I/O Planar Battery Locations (S008194n)

Cluster Bay, Service Processor Card Location Codes (E10/E20)

- Service processor card, (R1-Tx-P2-X1) **1**

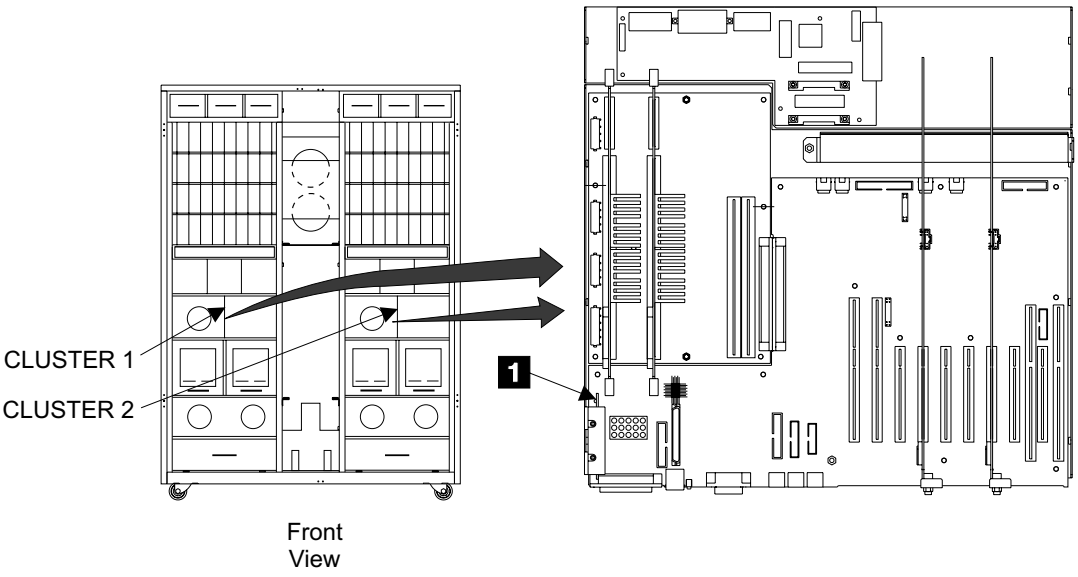

Figure 12. Cluster Bay Service Processor Card Locations (S008586n)

Cluster Bay, 332 MHz CPU Card Location Codes (E10/E20)

- 332 MHz CPU card 1, (R1-Tx-P1-C1) **1**
- 332 MHz CPU card 2, (R1-Tx-P1-C2) **2**

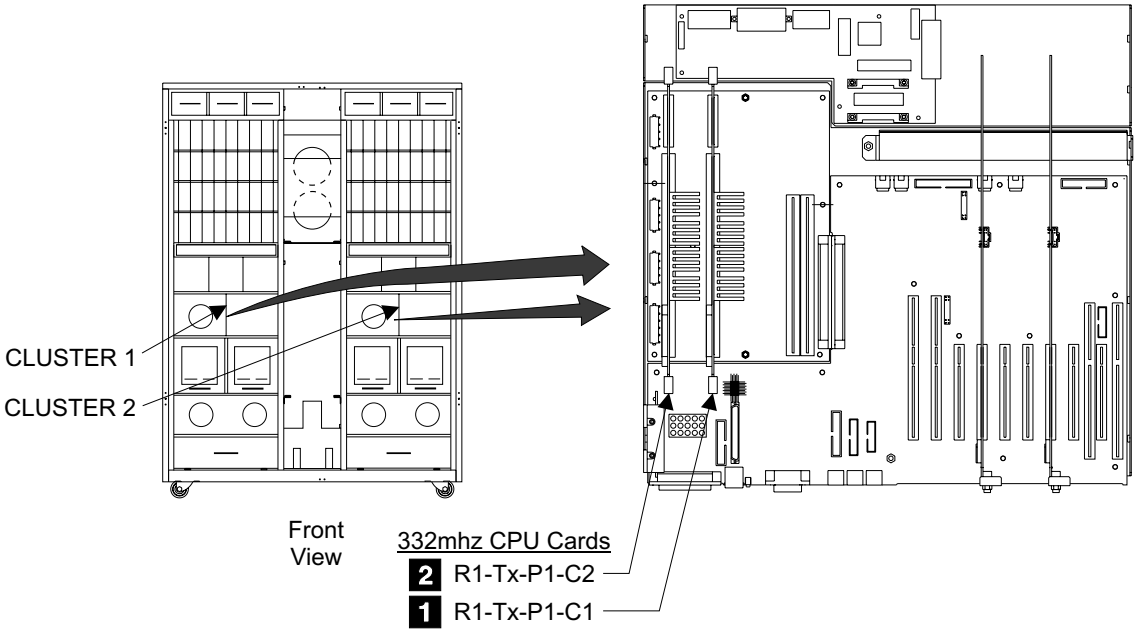

Figure 13. Cluster Bay 332 MHz CPU Card Locations (S008587n)

Cluster Bay, Memory Card Location Codes (E10/E20)

- Memory card 1, (R1-Tx-P1-M1) 1
- Memory card 2, (R1-Tx-P1-M2) 2

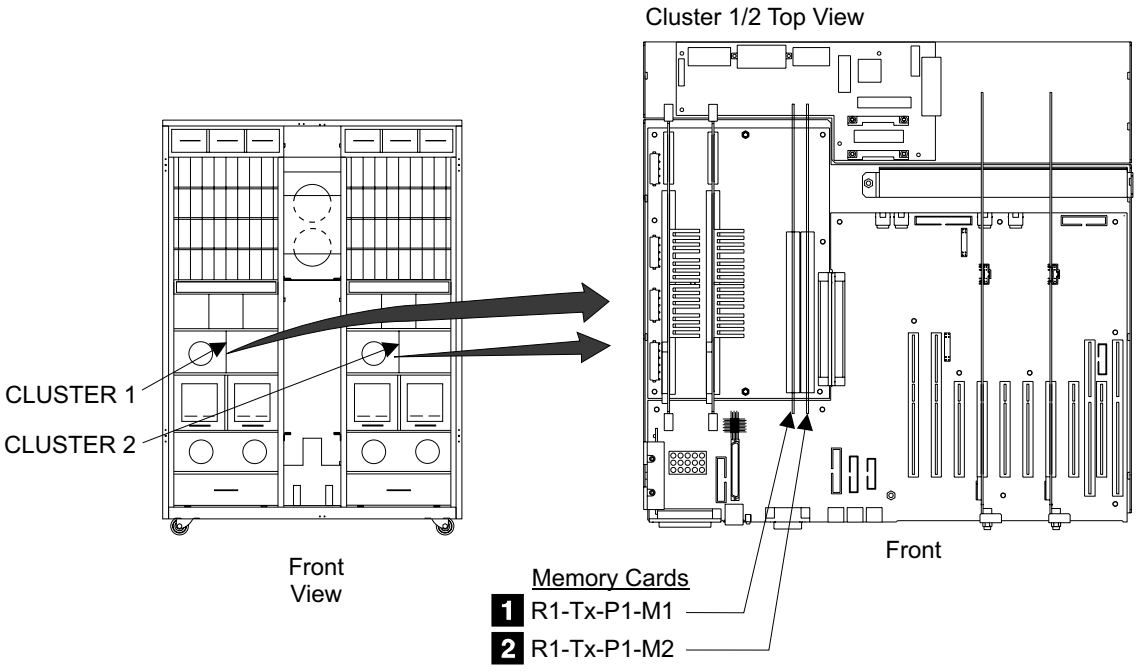

Figure 14. Cluster Bay Memory Card Locations (S008588n)

Cluster Bay, Memory Card, Memory Module Location Codes (E10/E20)

- memory module 1, (R1-Tx-P1-Mx.1) **1**
- memory module 2, (R1-Tx-P1-Mx.2) **2**
- memory module 3, (R1-Tx-P1-Mx.3) **3**
- memory module 4, (R1-Tx-P1-Mx.4) **4**
- memory module 5, (R1-Tx-P1-Mx.5) **5**
- memory module 6, (R1-Tx-P1-Mx.6) **6**
- memory module 7, (R1-Tx-P1-Mx.7) **7**
- memory module 8, (R1-Tx-P1-Mx.8) **8**
- memory module 9, (R1-Tx-P1-Mx.9) **9**
- memory module 10, (R1-Tx-P1-Mx.10) **10**
- memory module 11, (R1-Tx-P1-Mx.11) **11**
- memory module 12, (R1-Tx-P1-Mx.12) **12**
- memory module 13, (R1-Tx-P1-Mx.13) **13**
- memory module 14, (R1-Tx-P1-Mx.14) **14**
- memory module 15, (R1-Tx-P1-Mx.15) **15**
- memory module 16, (R1-Tx-P1-Mx.16) **16**

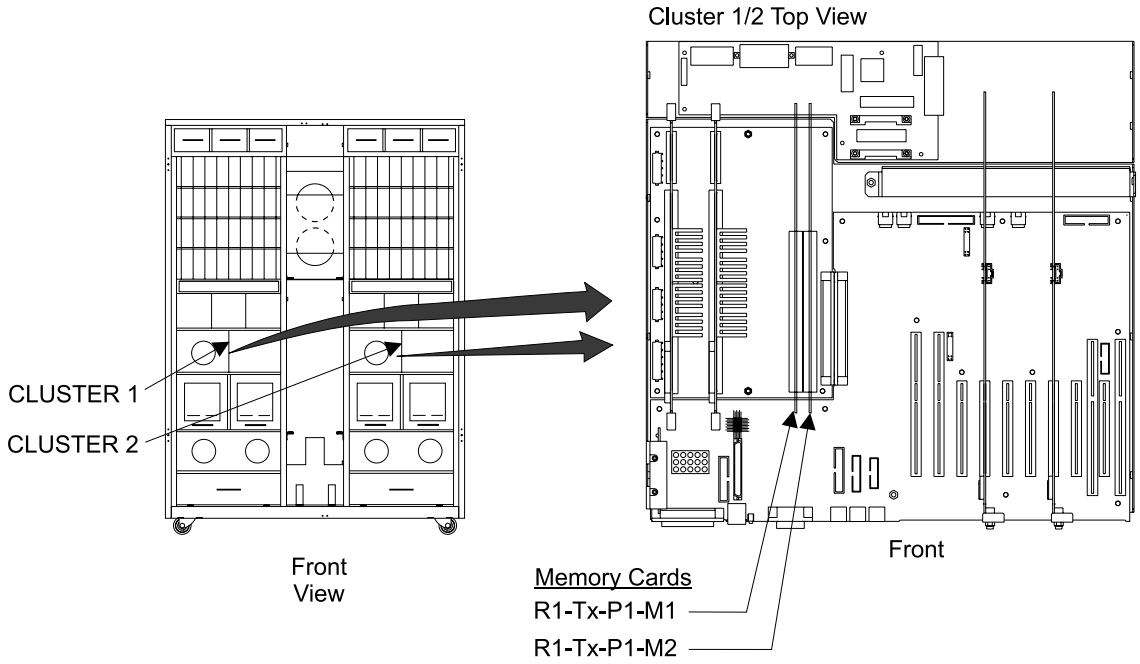

Figure 15. Cluster Bay Memory Card Locations (S008192n)

Locations

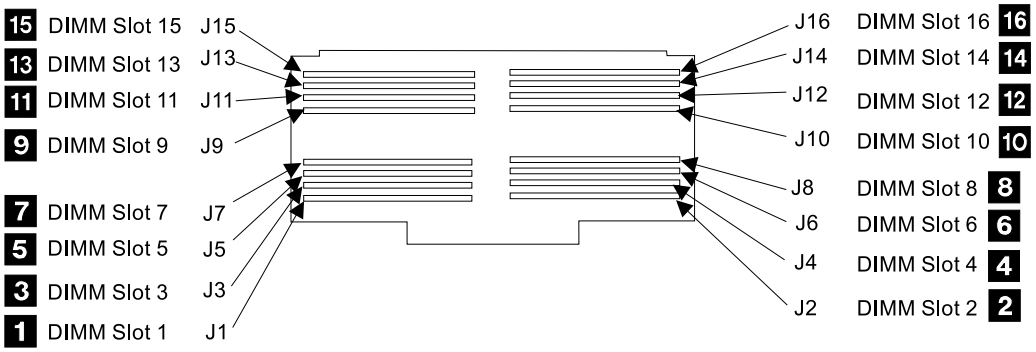

Figure 16. Cluster Bay Memory Card Memory Module Locations (S008208l)

Cluster Bay, SSA Device Card Location Codes (E10/E20)

- SSA device card, (R1-Tx-P2-K1) 1
- SSA device card, (R1-Tx-P2-K2) 2
- SSA device card, (R1-Tx-P2-K3) 3
- SSA device card, (R1-Tx-P2-K9) 4

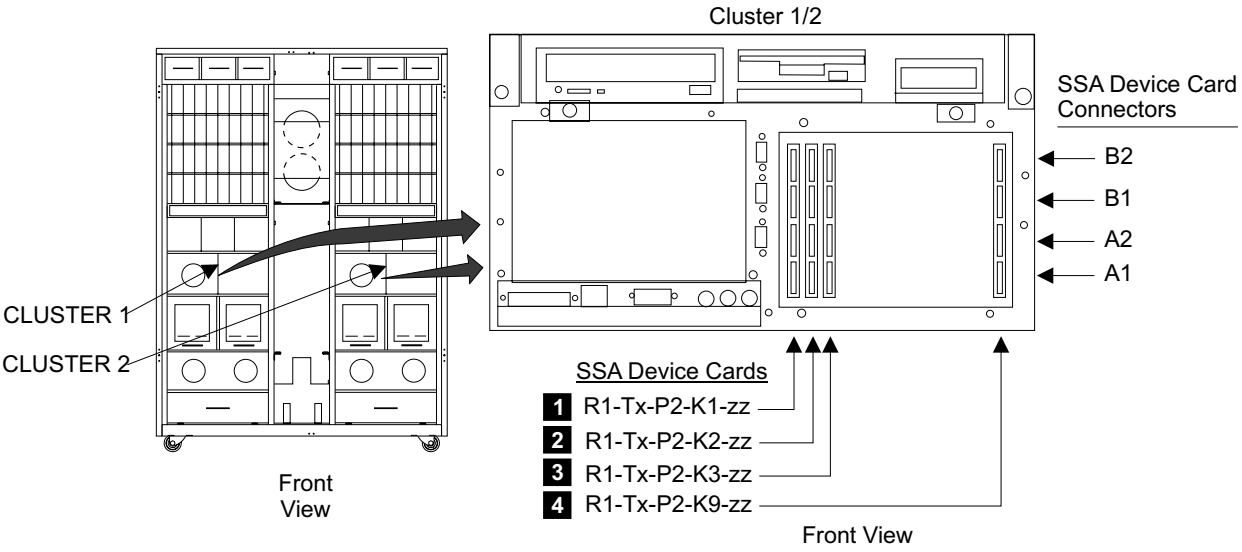

Figure 17. Cluster Bay SSA Device Card Locations (S008589m)

Cluster Bay, SSA Device Card Dram Module Location Codes (E10/E20)

- SSA device card DRAM module, (R1-Tx-P2-Kx-M1) 1

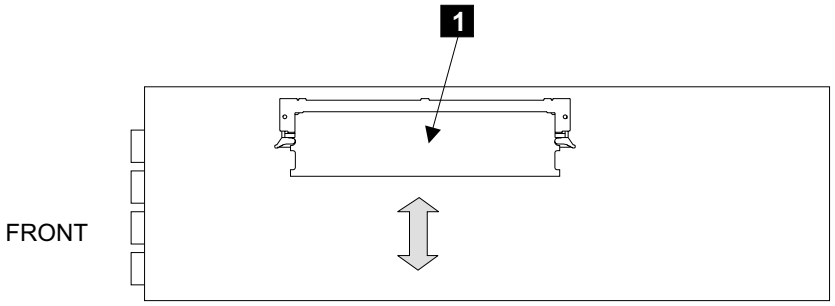

Figure 18. Cluster Bay SSA Device Card DRAM Module Locations (S008590l)

Cluster Bay, NVS Memory and Top Card Crossover Location Codes (E10/E20)

- NVS memory card 1, (R1-Tx-P2-I5) **1**
- NVS memory card 2, (R1-Tx-P2-I6) **2**
- NVS top card crossover, (R1-Tx-P2-I5 to I6) **3**

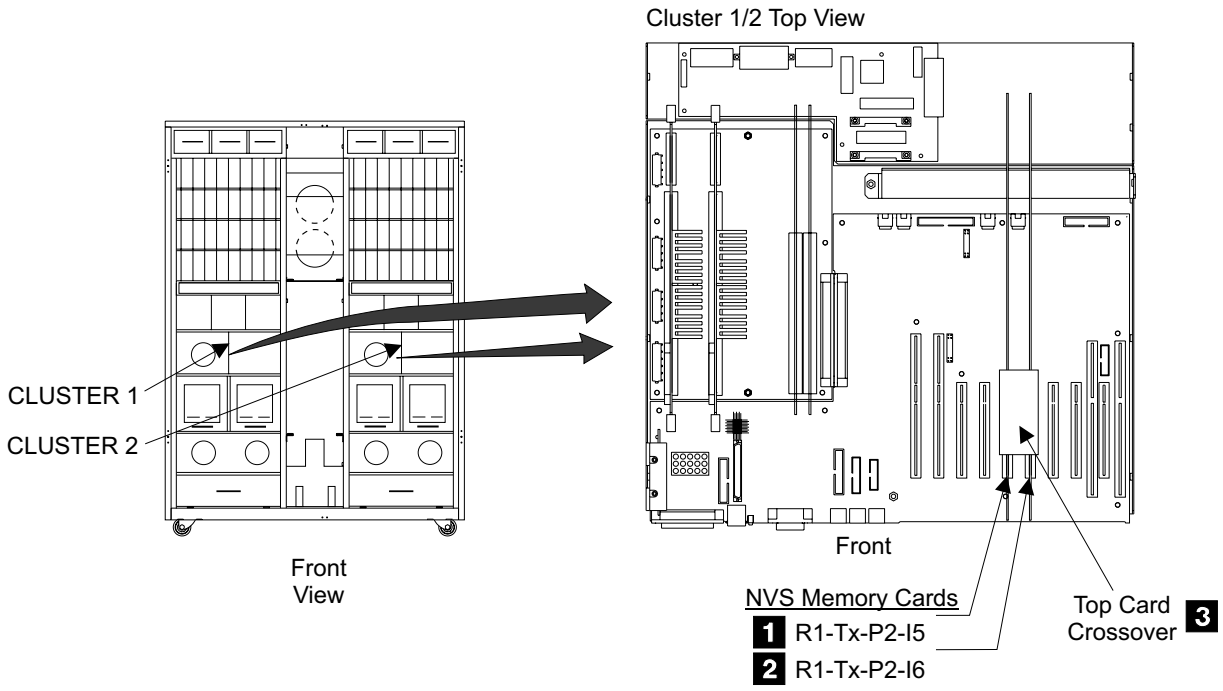

Figure 19. Cluster Bay NVS Memory Card Locations (S008591n)

Cluster Bay, NVS Cache Module Location Codes (E10/E20)

- NVS cache module 1, (R1-Tx-P2-Ly-M1) **1**
- NVS cache module 2, (R1-Tx-P2-Ly-M2) **2**
- NVS cache module 3, (R1-Tx-P2-Ly-M3) **3**

Locations

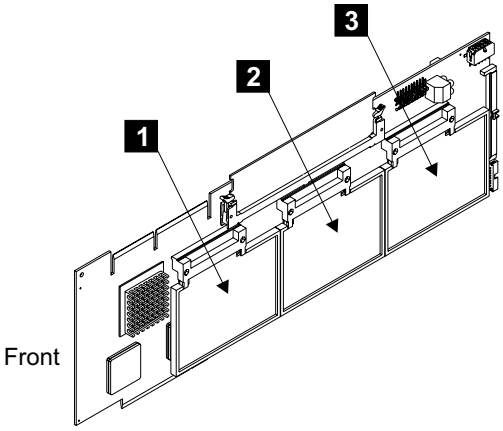

Figure 20. Cluster Bay NVS Cache Module Locations (S008592m)

Cluster Bay, I/O Attachment Card Location Codes (E10/E20)

- I/O attachment card, (R1-Tx-P2-I4) **1**
- I/O attachment card, (R1-Tx-P2-I7) **2**

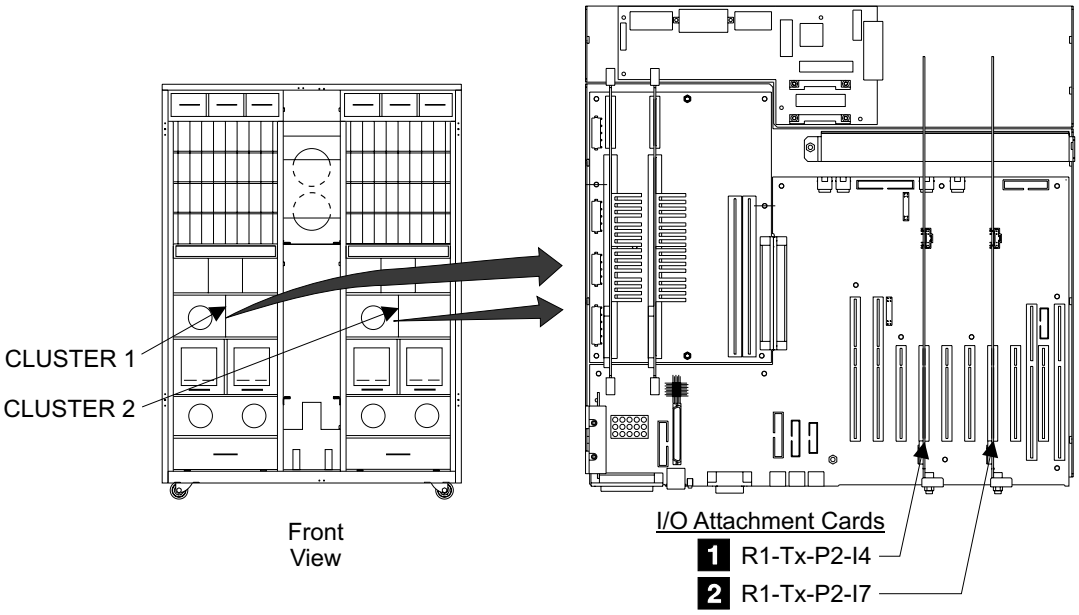

Figure 21. Cluster Bay I/O Attachment Card Locations (S008593n)

Cluster Bay, Cable Location Codes (E10/E20)

- Cluster Bay 1, (R1-T1-) or Cluster Bay 2, (R1-T2-)
  - Serial Interface Cable (S1 = R1-Tx-P2-S1.1) (S2 = R1-Tx-P2-S2.1)
  - Serial Interface Cable (S1), (R1-Tx-P2-S3.1)
  - Power Planar Cable (IB11), (R1-Tx-P3-IB11.1)
  - Power Planar Cable (IB12), (R1-Tx-P3-IB12.1)
  - Power Planar Cable (IB15), (R1-Tx-P3-IB15.1)
  - Service Processor Card Cable, (R1-Tx-P2-X1.1)

  - SCSI Drive Signal Cable, (R1-Tx-P2-Z1.1)
  - CPU Card 1 Cable, (R1-Tx-P1-C1.1)
  - CPU Card 2 Cable, (R1-Tx-P1-C2.1)
  - Cluster Bay Power Planar to Docking Connector Cable, (R1-Tx-N1.1)
  - NVS Card Cable (Card 1 = R1-Tx-P1-M1.1) (Card 2 = R1-Tx-P1-M2.1)
  - Cluster Operator Panel Cable, (R1-Tx-P2-L1.1)
  - Diskette Drive Signal Cable, (R1-Tx-P2-D1.1)
  - Cluster Drive Power Cable, (R1-Tx-P3-IB16.1)
- Use the cluster cable removal and replacement procedure to locate any of the cables listed above, see ″Cables, Cluster Bay″ in chapter 4 of the *Enterprise Storage Server Service Guide, Volume 2*.

Cluster Bay Location Codes, 2105 Model F10/F20

Location information for 2105 Model F10/F20 cluster bays follow:

Cluster Bay, Operator Panel Location Codes (F10/F20)

- **2105 Model F10/F20:**
  - Cluster Bay 1, operator panel, (R1-T1-L1) **1**
  - Cluster Bay 2, operator panel, (R1-T2-L1) **2**

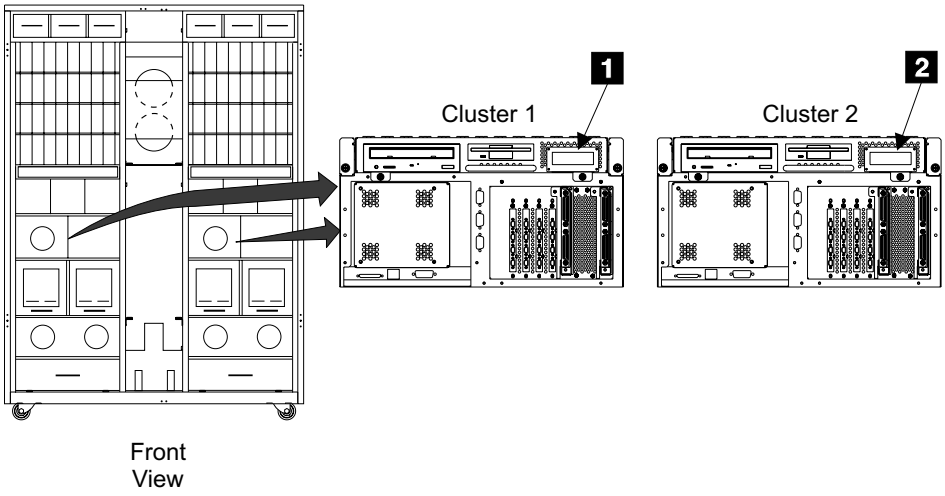

Figure 22. Cluster Bay Operator Panel (S008772m)

Cluster Bay, Drives Location Codes (F10/F20)

- Diskette drive (R1-Tx-P2-D1) **1**
- CD-ROM drive (R1-Tx-P2-Z1-A3) **2**
- SCSI hard drive (R1-Tx-P2-Z1-A0) **3**

Locations

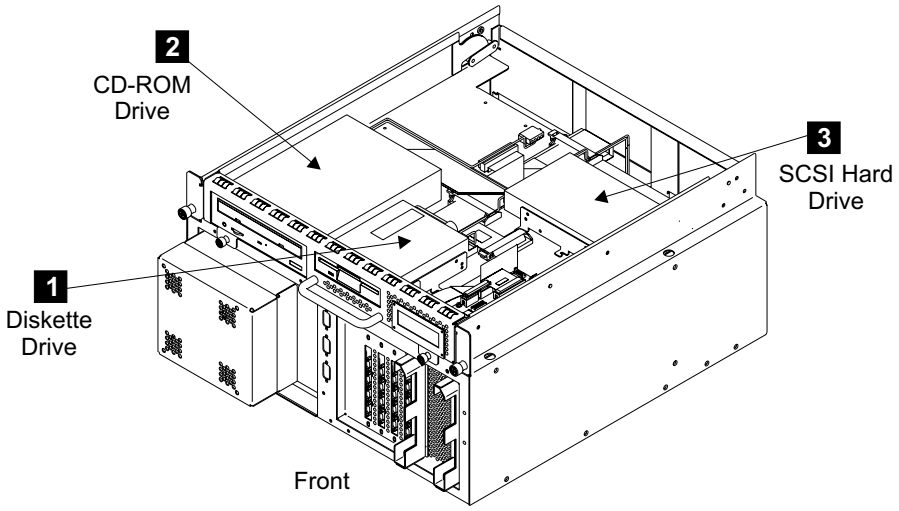

Figure 23. Cluster Bay Drive Locations (S008776m)

Cluster Bay, System, I/O, and Power Planars Location Codes (F10/F20)

- System planar (R1-Tx-P1) 1
- I/O planar (R1-Tx-P2) 2
- Cluster Bay Power planar (R1-Tx-P3) 3
- Communications cables 4
- SSA device card and I/O attachment card cables 5

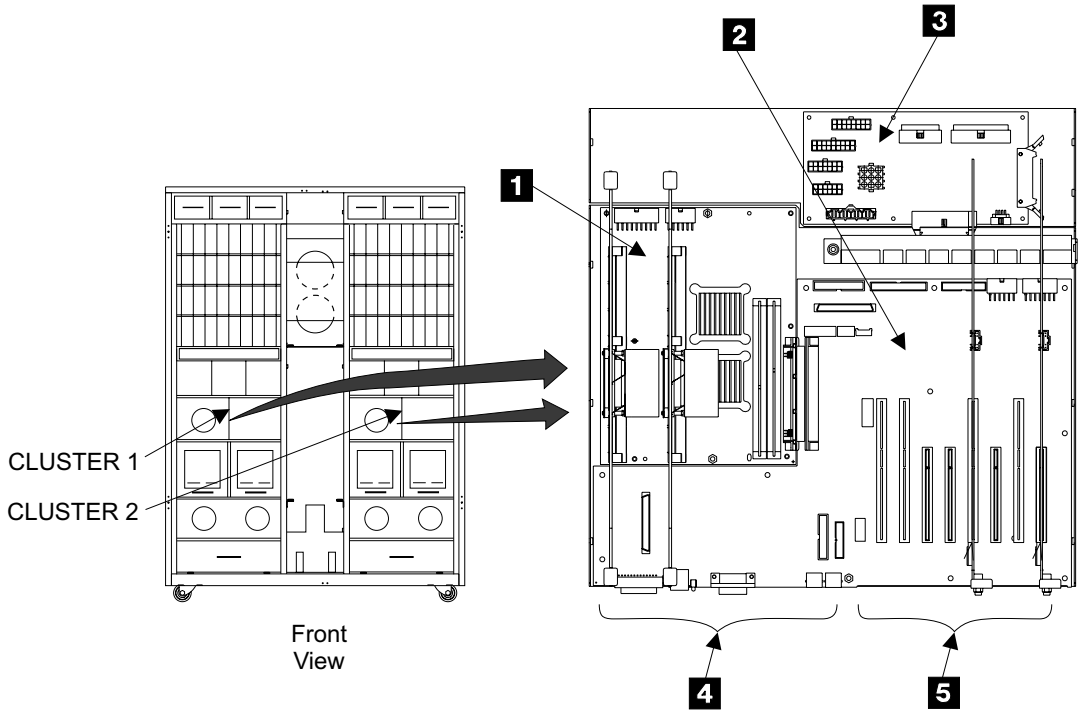

Figure 24. Cluster Bay Planar Locations (S008778n)

Cluster Bay, I/O Planar Battery Location Codes (F10/F20)

- I/O planar battery (R1-Tx-P2-V2) **1**

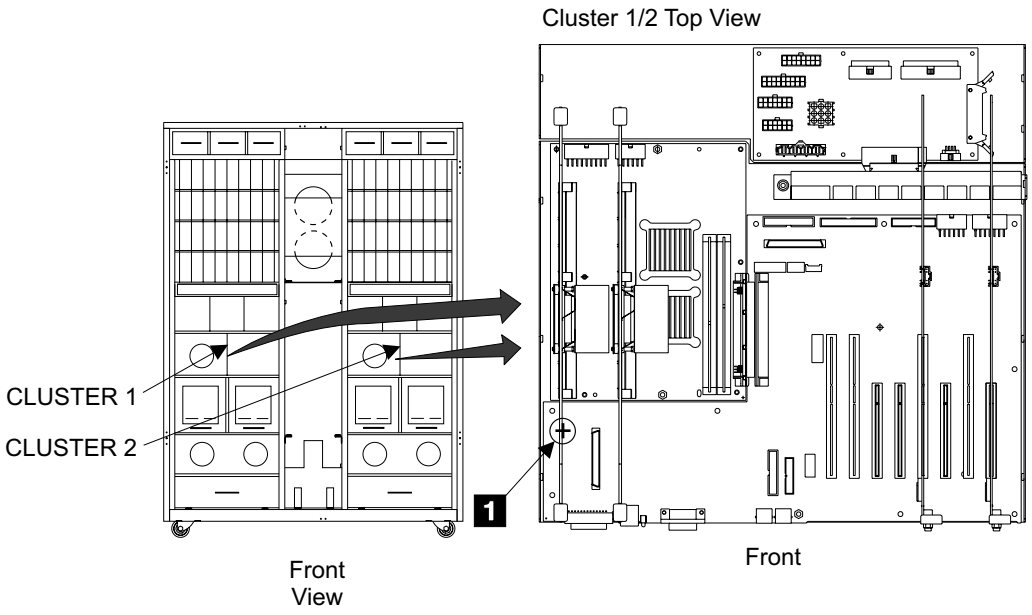

Figure 25. I/O Planar Battery Removal (S008790n)

Cluster Bay, 255 MHz CPU Card Location Codes (F10/F20)

- 255 MHz CPU card 1, (R1-Tx-P1-C1) **1**
- 255 MHz CPU card 2, (R1-Tx-P1-C2) **2**

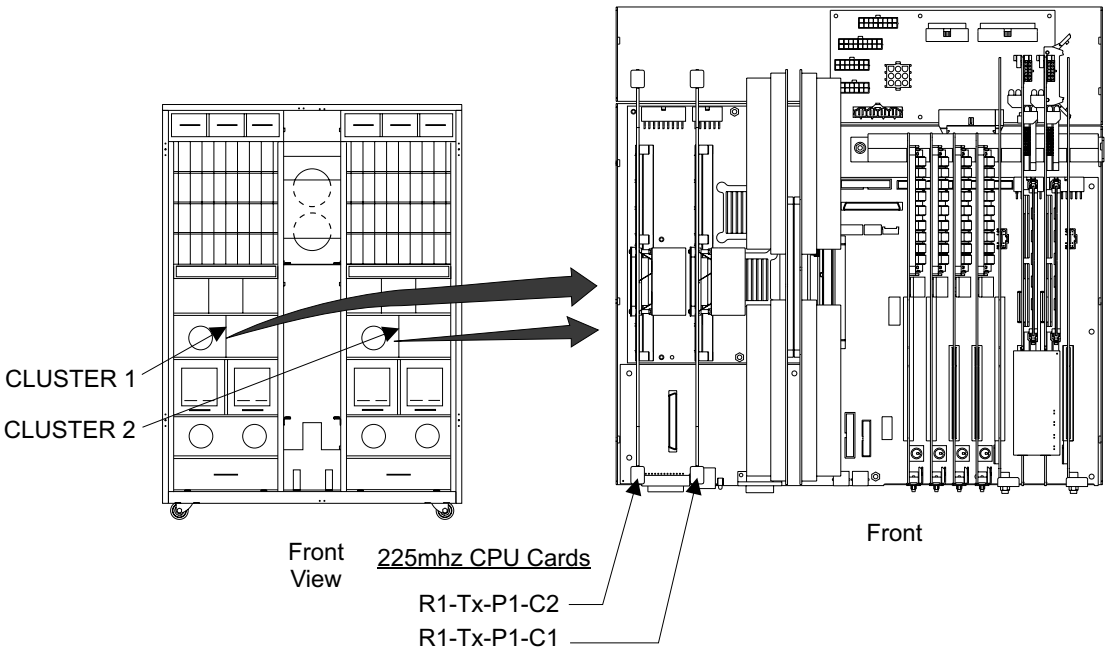

Figure 26. 2105 Model F10/F20 Cluster Bay Locations (S008781n)

Cluster Bay, Memory Card Location Codes (F10/F20)

- Memory card 1, (R1-Tx-P1-M1) **1**
- Memory card 2, (R1-Tx-P1-M2) **2**

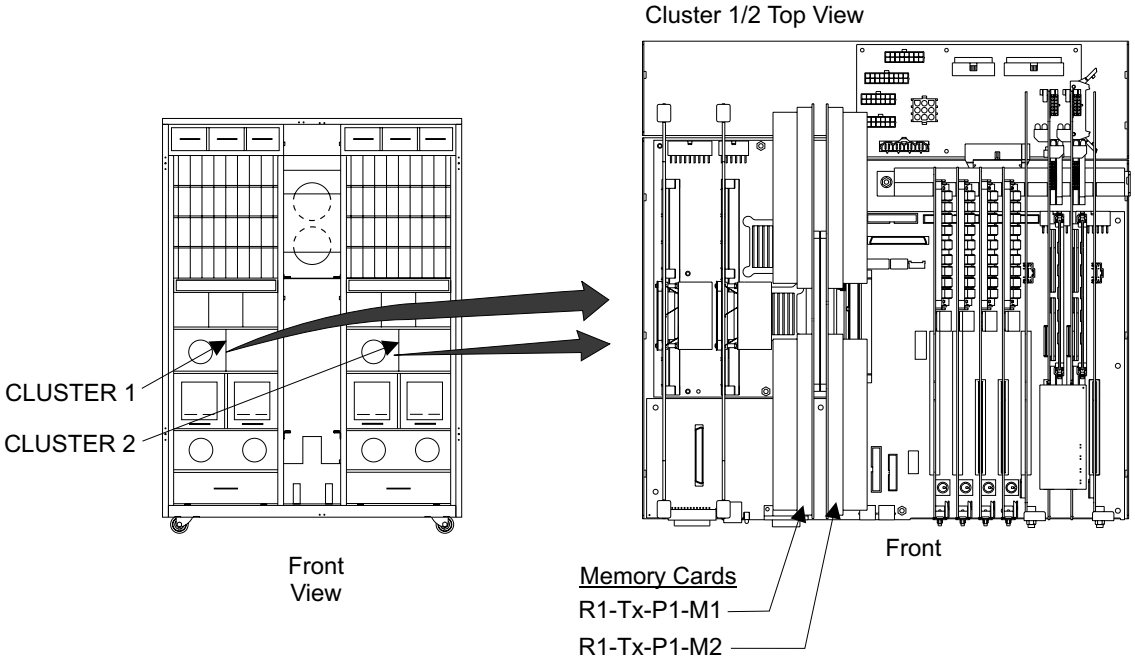

Figure 27. 2105 Model F10/F20 Cluster Bay Locations (S008782n)

Cluster Bay, Memory Card, Memory Module Location Codes (F10/F20)

- memory module 1 (R1-Tx-P1-Mx.1) **1**
- memory module 2 (R1-Tx-P1-Mx.2) **2**
- memory module 3 (R1-Tx-P1-Mx.3) **3**
- memory module 4 (R1-Tx-P1-Mx.4) **4**
- memory module 5 (R1-Tx-P1-Mx.5) **5**
- memory module 6 (R1-Tx-P1-Mx.6) **6**
- memory module 7 (R1-Tx-P1-Mx.7) **7**
- memory module 8 (R1-Tx-P1-Mx.8) **8**
- memory module 9 (R1-Tx-P1-Mx.9) **9**
- memory module 10 (R1-Tx-P1-Mx.10) **10**
- memory module 11 (R1-Tx-P1-Mx.11) **11**
- memory module 12 (R1-Tx-P1-Mx.12) **12**
- memory module 13 (R1-Tx-P1-Mx.13) **13**
- memory module 14 (R1-Tx-P1-Mx.14) **14**
- memory module 15 (R1-Tx-P1-Mx.15) **15**
- memory module 16 (R1-Tx-P1-Mx.16) **16**

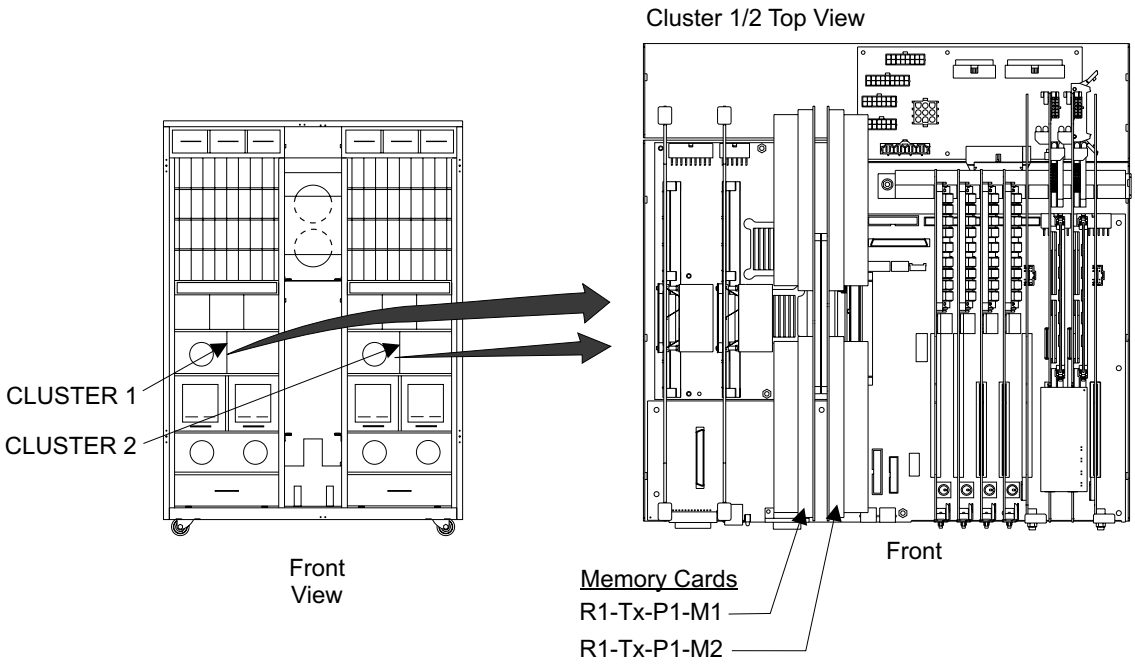

Figure 28. 2105 Model F10/F20 Cluster Bay Locations (S008782n)

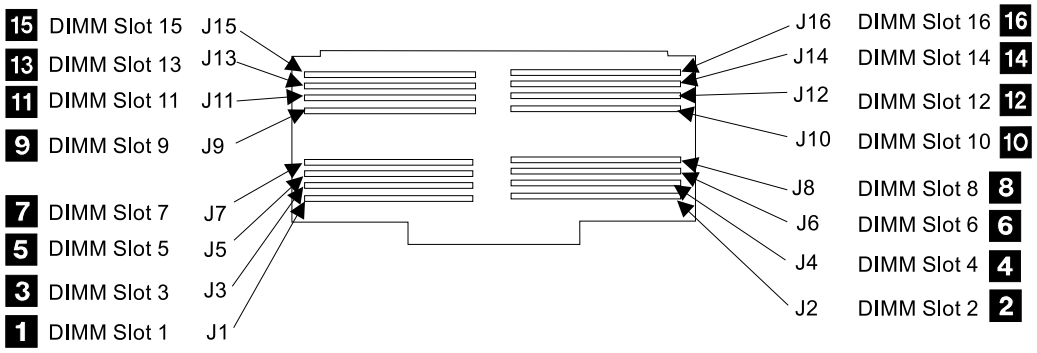

Figure 29. 2105 Model F10/F20 Cluster Bay Memory Card Memory Module Locations (S008208l)

Cluster Bay, SSA Device Card Location Codes (F10/F20)

- SSA device card (R1-Tx-P2-K1) 1
- SSA device card (R1-Tx-P2-K2) 2
- SSA device card (R1-Tx-P2-K3) 3
- SSA device card (R1-Tx-P2-K4) 4

Locations

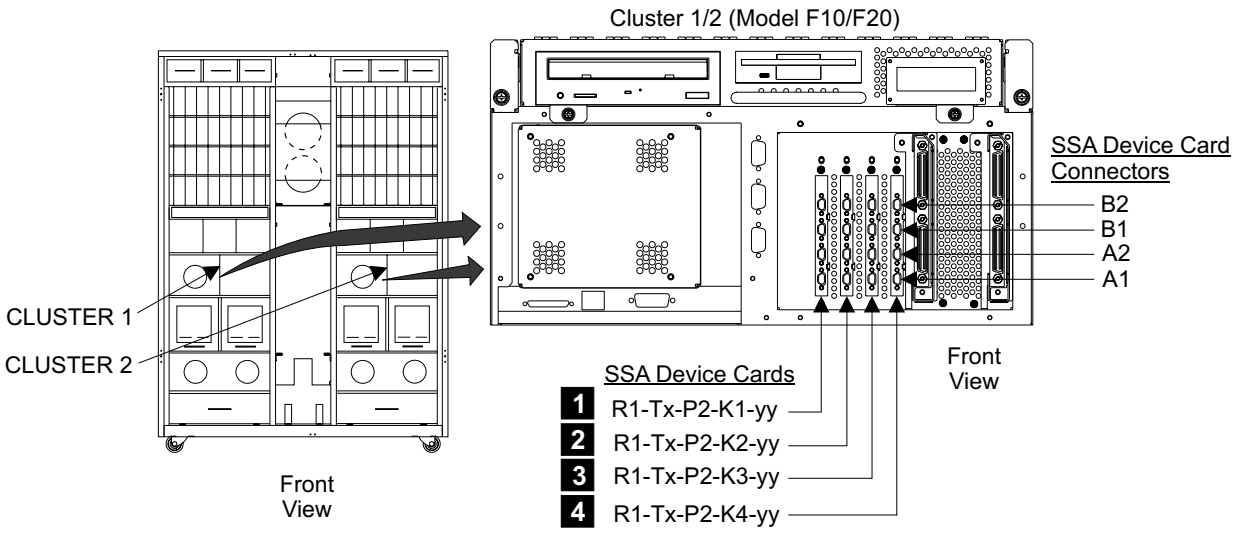

Figure 30. SSA Device Card Removal (S008773m)

Cluster Bay, SSA Device Card Dram Module Location Codes (F10/F20)

- SSA device card DRAM module, (R1-Tx-P2-Kx-M1) **1**

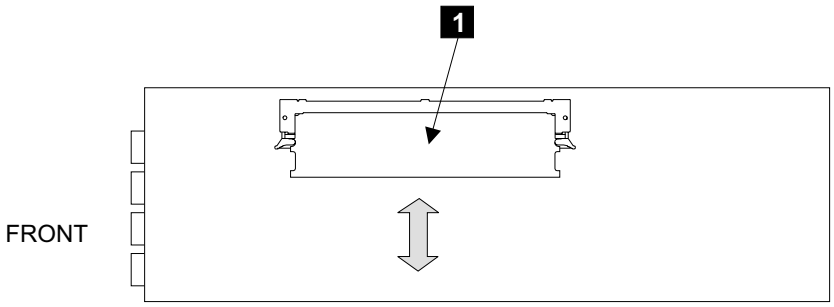

Figure 31. Cluster Bay SSA Device Card DRAM Module Locations (S008590l)

Cluster Bay, NVS Memory and Top Card Crossover Location Codes (F10/F20)

- NVS memory card 1, (R1-Tx-P2-I6) **1**
- NVS memory card 2, (R1-Tx-P2-I7) **2**
- NVS top card crossover, (R1-Tx-P2-I6 to I7) **3**

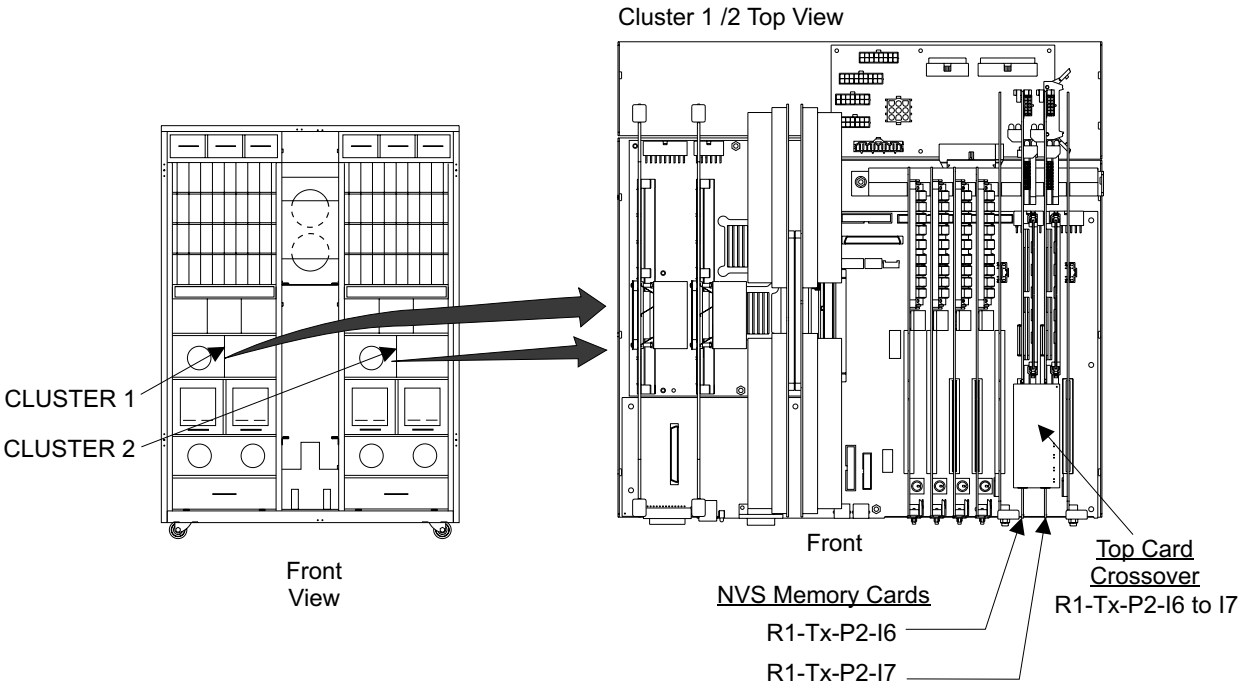

Figure 32. 2105 Model F10/F20 Cluster Bay Locations (S008783n)

Cluster Bay, NVS Cache Module Location Codes (F10/F20)

- NVS cache module 1, (R1-Tx-P2-Ly-M1) **1**
- NVS cache module 2, (R1-Tx-P2-Ly-M2) **2**
- NVS cache module 3, (R1-Tx-P2-Ly-M3) **3**

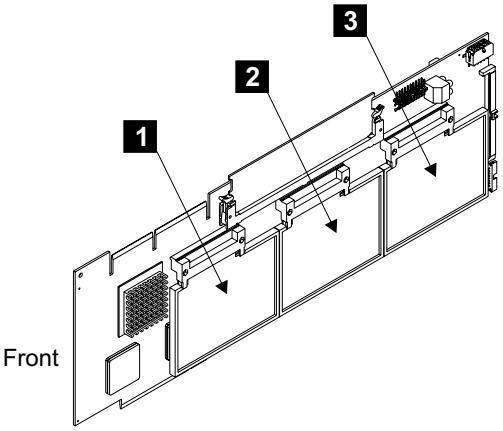

Figure 33. Cluster Bay NVS Remove and Replace (S008592m)

Cluster Bay, I/O Attachment Card Location Codes (F10/F20)

- I/O attachment card (R1-Tx-P2-I5) **1**
- I/O attachment card (R1-Tx-P2-I8) **2**

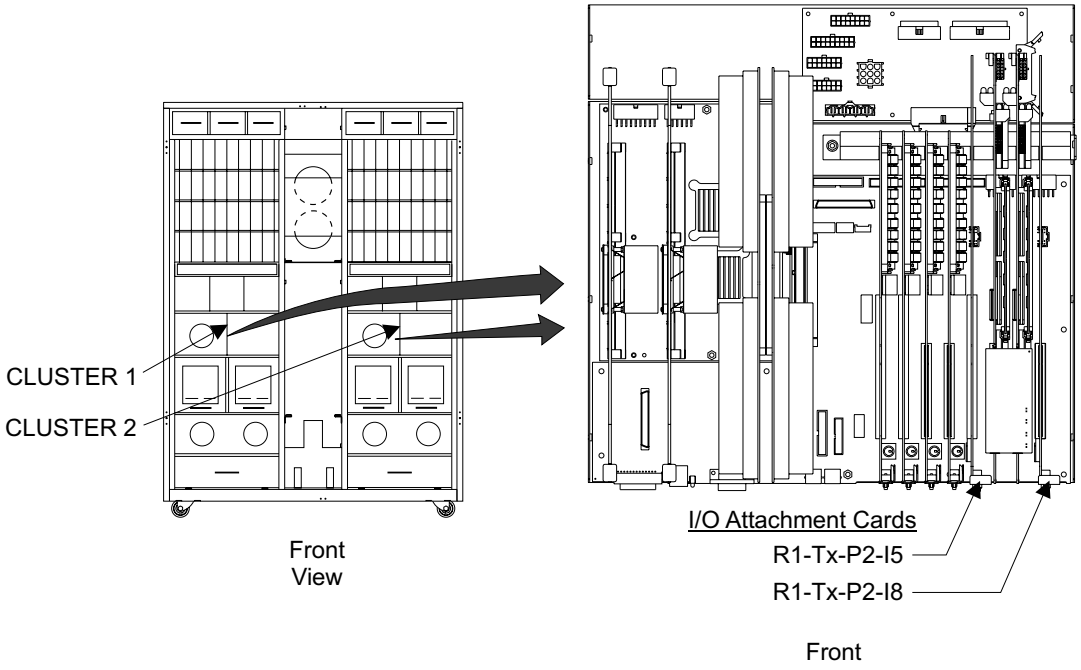

Figure 34. 2105 Model F10/F20 Cluster Bay Locations (S008780n)

Cluster Bay, Fan Location Codes (F10/F20)

- Cluster 1, cluster bay fan, (R1-T1-F5)
- Cluster 2, cluster bay fan, (R1-T2-F5)

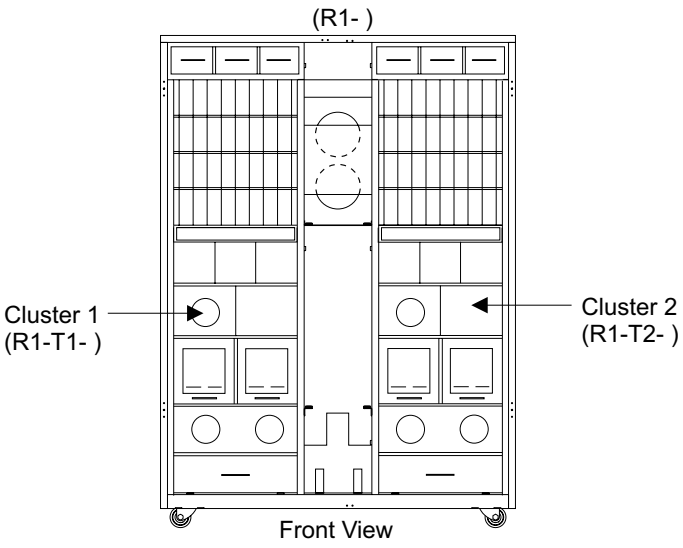

Figure 35. 2105 Model E10/E20 Cluster Locations (S008091m)

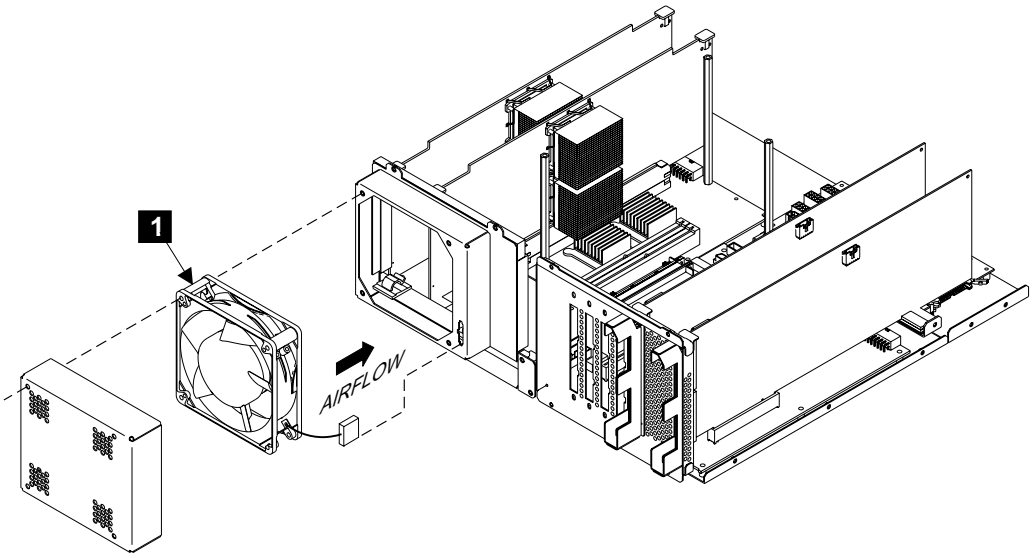

Figure 36. Cluster Bay Fan Removal (S008808m)

Cluster Bay, Cable Location Codes (F10/F20)

- Cluster Bay 1, (R1-T1-) or Cluster Bay 2, (R1-T2-)
  - Serial Interface Cable (S1/S2), (S1 = R1-Tx-P2-S1.1) (S2 = R1-Tx-P2-S2.1)
  - Serial Interface Cable (S3), (R1-Tx-P2-S3.1)
  - Power Planar Cable (IB11), (R1-Tx-P3-IB11.1)
  - Power Planar Cable (IB12), (R1-Tx-P3-IB12.1)
  - Power Planar Cable (IB13), (R1-Tx-P3-IB13.1)
  - Power Planar Cable (IB14), (R1-Tx-P3-IB14.1)
  - Power Planar Cable (IB15), (R1-Tx-P3-IB15.1)
  - SCSI Drive Signal Cable, (R1-Tx-P2-Z1.1)
  - Cluster Bay Power Planar to Docking Connector Cable, (R1-Tx-N1.1)
  - Cluster Operator Panel Cable, (R1-Tx-P2-L1.1)
  - Diskette Drive Signal Cable, (R1-Tx-P2-D1.1)
  - Cluster Internal Power Cable, (R1-Tx-P3-IB17.1)
  - Cluster Drive Power Cable, (R1-Tx-P3-IB18.1)
  - NVS Crossover to I/O Attachment Card Cable, (R1-Tx-P2-I5 to I6)

Use the cluster cable removal and replacement procedure to locate any of the cables listed above, see ″Cables, Cluster Bay″ in chapter 4 of the *Enterprise Storage Server Service Guide, Volume 2*.

SSA DASD Drawer Component Physical Location Codes, Model 020 Drawer

To locate a SSA DASD Model 020 drawer in a 2105, see “Locating a DDM Bay or SSA DASD Model 020 or 040 Drawer in a 2105 Rack” on page 6.

1 Drawer power control panel, (Rx-Yxx-C9)

2 Disk Drive Module (front), DDM (Model 020 drawer) (Rx-Yxx-Dxx),

See “7133 Drawer, Disk Drive Module Location Codes” on page 31

Locations

3 Back-power card, (left) (Rx-Yxx-C5)
4 Front backplane assembly, (Rx-Yxx-P1)
5 Back backplane assembly (Rx-Yxx-P2)
6 Bypass card, upper right (Rx-Yxx-C2)
7 Bypass card, lower right (Rx-Yxx-C6)
8 Disk Drive Module, (rear) DDM (Model 020 drawer) (Rx-Yxx-Dxx),
See “7133 Drawer, Disk Drive Module Location Codes” on page 31
9 Fan-and-power-supply assembly, (Rx-Yxx-V3)
10 Fan-and-power-supply assembly, (Rx-Yxx-V2)
11 Fan-and-power-supply assembly, (Rx-Yxx-V1)
12 Bypass card, upper left, (Rx-Yxx-C1)
13 Bypass card, lower left (Rx-Yxx-C5)
14 Back-power card, (right) (Rx-Yxx-C6)
15 Power-distribution tray, (right) (Rx-Yxx-V9)
16 Power-distribution tray, (left) (Rx-Yxx-V10)

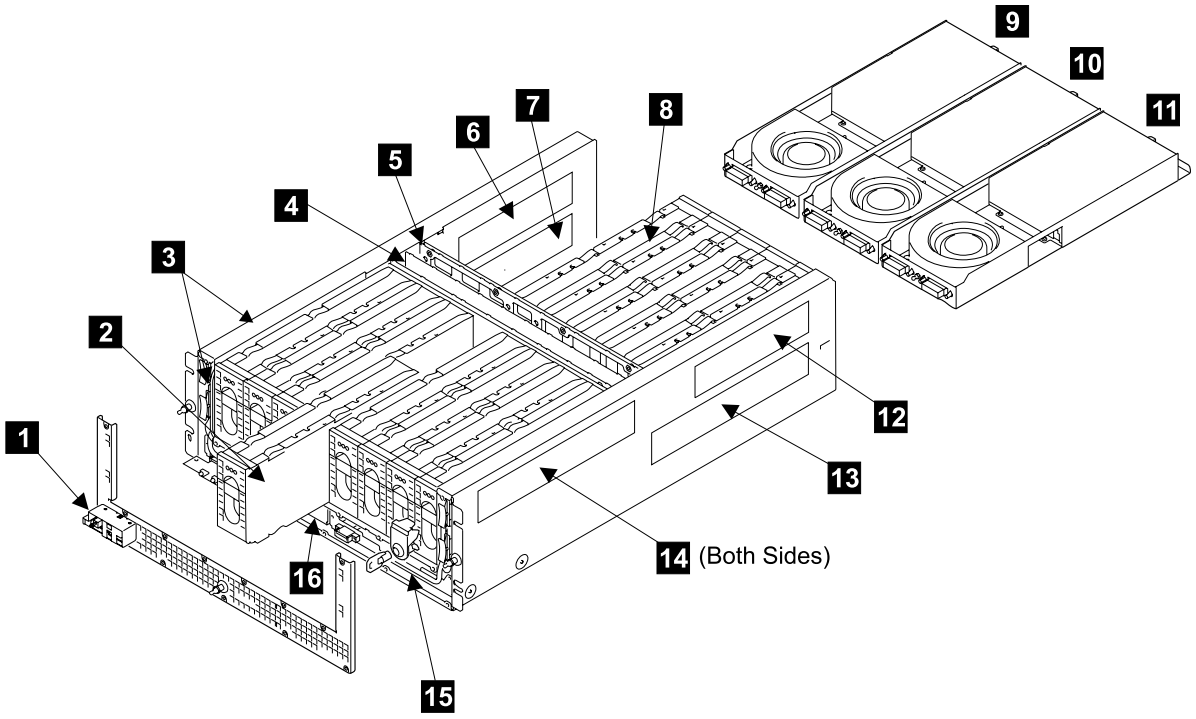

Figure 37. 7133 Model 020 Physical Location Codes (S008297n)

SSA DASD Drawer Component Physical Location Codes, Model 040 Drawer

To locate a SSA DASD Model 040 drawer in a 2105, see “Locating a DDM Bay or SSA DASD Model 020 or 040 Drawer in a 2105 Rack” on page 6.

1 Controller card, (Rx-Yxx--CA)
2 Bypass card, lower right (Rx-Yxx-C6)
3 Bypass card, upper right (Rx-Yxx-C2)
4 Frame assembly, (Rx-Yxx-P1)

5 Disk Drive Module, (rear) DDM (Model 040 drawer) (Rx-Yxx-Dxx)

See “7133 Drawer, Disk Drive Module Location Codes”

6 Power Supply 2, (Rx-Yxx-V2)

7 Power Supply 1, (Rx-Yxx-V1)

8 Bypass card, upper left (Rx-Yxx-C1)

9 Bypass card, lower left (Rx-Yxx-C5)

10 Disk Drive Module, (front) DDM (Model 040 drawer) (Rx-Yxx-Dxx)

See “7133 Drawer, Disk Drive Module Location Codes”

11 Fan assembly, right (Rx-Yxx-F3)

12 Fan assembly, center (Rx-Yxx-F2)

13 Fan assembly, left (Rx-Tx-F1)

14 Operator panel assembly (The drawer operator panel on 7133 Model 040 drawer is not used during drawer isolation procedures.) (Rx-Tx-L1)

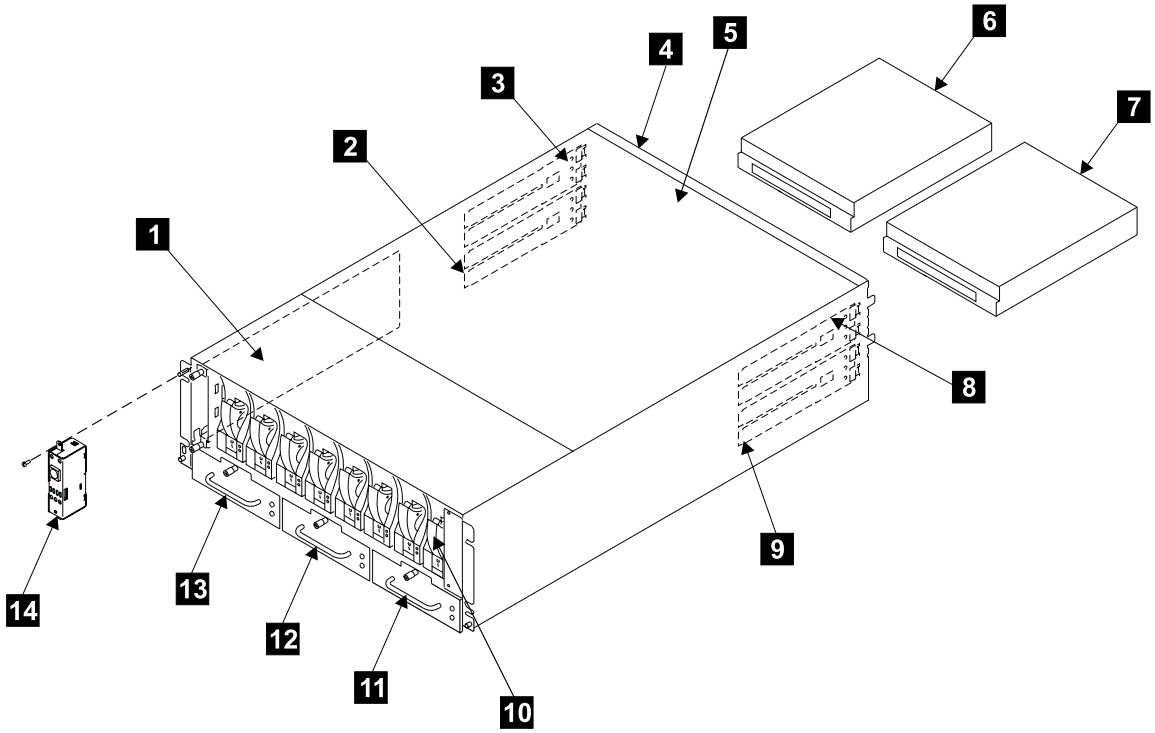

Figure 38. SSA DASD Model 040 Physical Location Codes (S008298n)

7133 Drawer, Disk Drive Module Location Codes

To locate a SSA DASD Model 020 or 040 drawer in a 2105, see “Locating a DDM Bay or SSA DASD Model 020 or 040 Drawer in a 2105 Rack” on page 6.

- (1) DDM 1, (R2-Yxx-D01)
- (2) DDM 2, (R2-Yxx-D02)
- (3) DDM 3, (R2-Yxx-D03)
- (4) DDM 4, (R2-Yxx-D04)

Locations

- (5) DDM 5, (R2-Yxx-D05)
- (6) DDM 6, (R2-Yxx-D06)
- (7) DDM 7, (R2-Yxx-D07)
- (8) DDM 8, (R2-Yxx-D08)
- (9) DDM 9, (R2-Yxx-D09)
- (10) DDM 10, (R2-Yxx-D10)
- (11) DDM 11, (R2-Yxx-D11)
- (12) DDM 12, (R2-Yxx-D12)
- (13) DDM 13, (R2-Yxx-D13)
- (14) DDM 14, (R2-Yxx-D14)
- (15) DDM 15, (R2-Yxx-D15)
- (16) DDM 16, (R2-Yxx-D16)

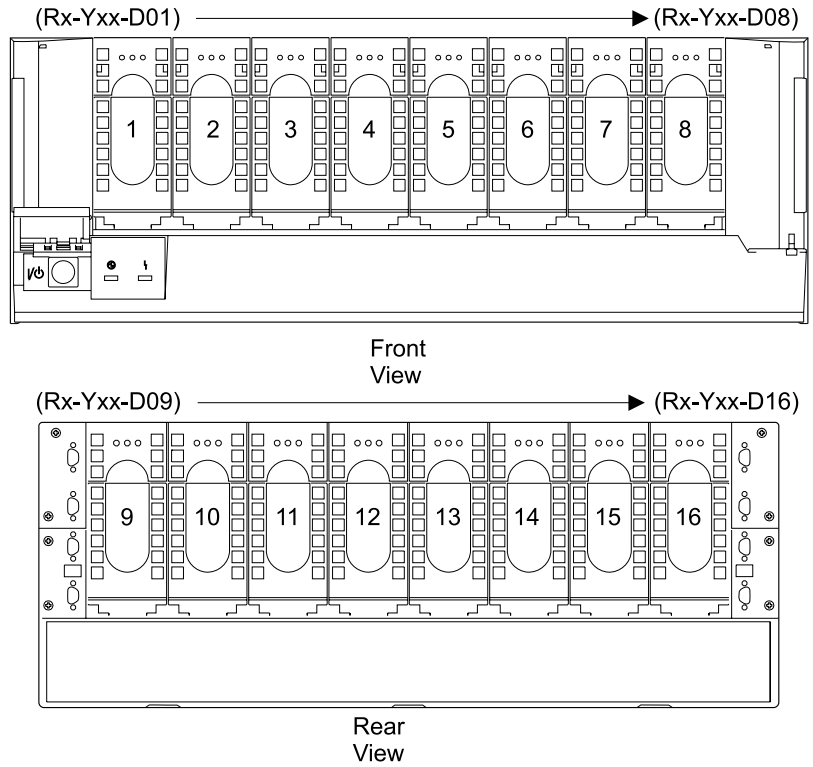

Figure 39. Disk Drive Module Locations in a SSA DASD Drawer (S007705n)

2105 Model Exx/Fxx SSA Device Card Location Codes

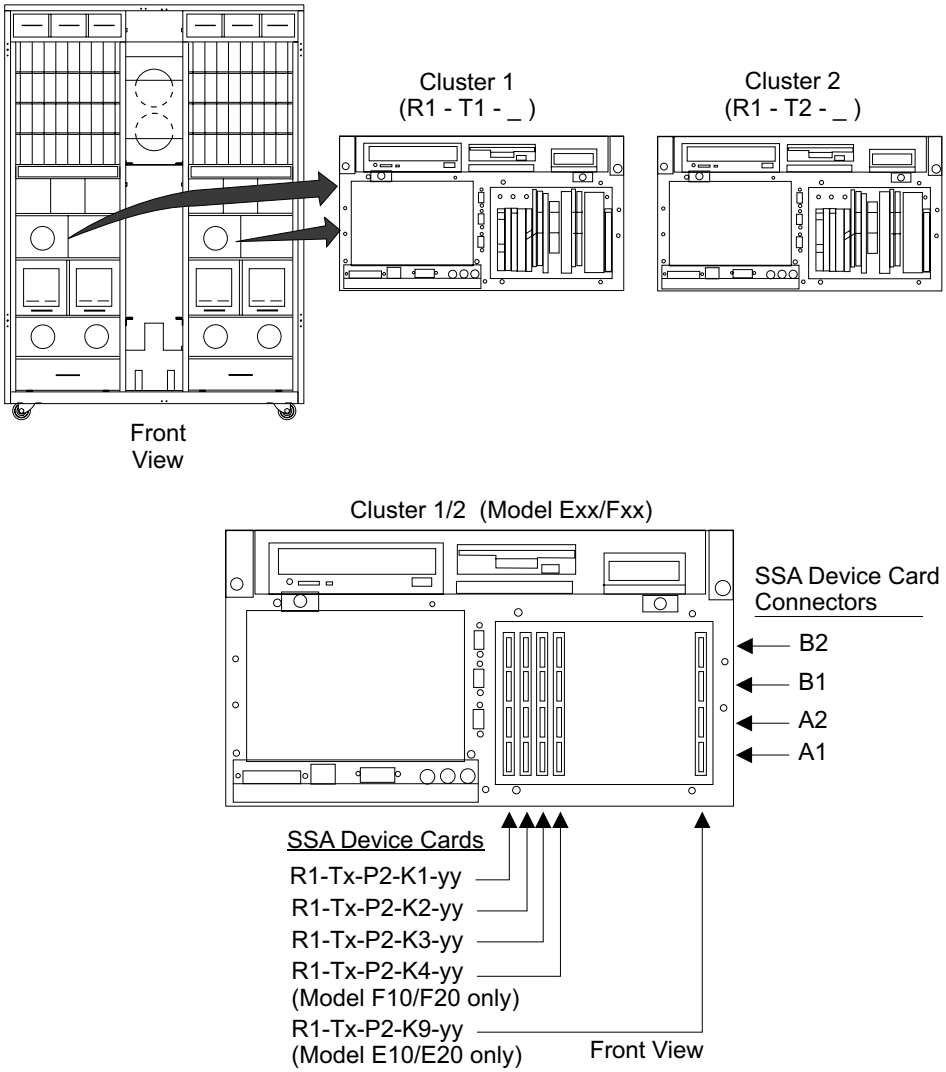

Figure 40. Cluster Bay and SSA Device Card Locations (S008178q)

2105 Model Exx/Fxx SCSI Host Card Location Codes

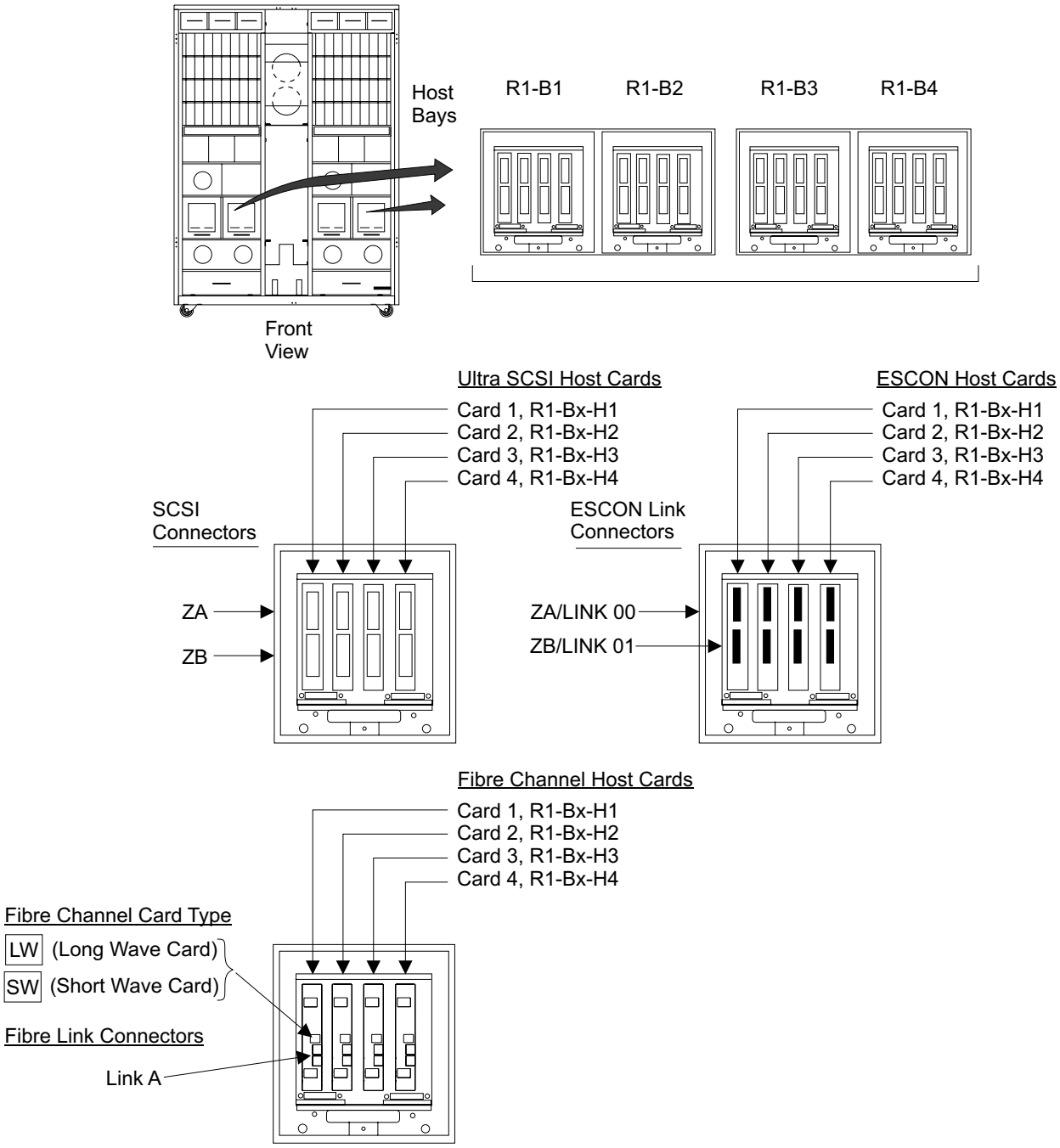

Figure 41. 2105 Model Exx/FxxHost Bay SCSI Card Locations (S008024r)

Locating an SSA Cable

Use the information on this page to locate each end of an SSA cable. There are four possible SSA cable connection configurations:

- SSA device card to DDM bay, (R1-Tx-P2-Kx-yy to Rx-Ux-Wxx-Jxx)
- SSA device card to 7133, (R1-Tx-P2-Kx-yy to R2-Yx-Jxx)
- DDM bay to DDM bay, (Rx-Ux-Wxx-Jxx to Rx-Ux-Wxx-Jxx)

- 7133 to 7133, (R2-Yx-Jxx to R2-Yx-Jxx)

The cables in each SSA cable loop are indicated by colored tape near the SSA cable connectors. See, “Locating an SSA Cable Loop Using Colored Labels” on page 36 for the color associated with each SSA loop.

SSA Device Card and Connector Locations

The SSA device card and connector location codes are in the format **R1-Tx-P2-Kx-yy**, where:

- *R1* is rack 1 (2105 Model E10/E20)
- *Tx* is the cluster bay, 1 or 2
- *P2* is cluster bay planar 2
- *Kx* is the card location slot, 1, 2, 3, or 9
- *yy* is the cable connector, A1, A2, B1, or B2

To locate an SSA device card and cable connector, see Figure 42.

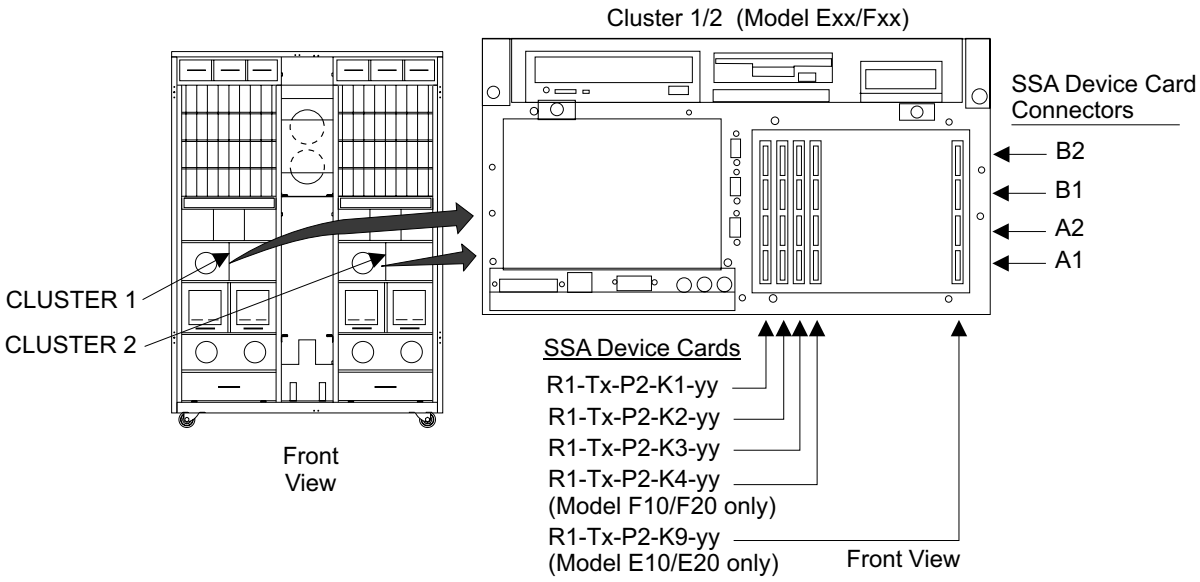

Figure 42. Cluster Bay SSA Device Card and SSA Connector Locations (S008022m)

DDM Bay SSA Connector Locations

The DDM bay SSA connector location codes are in the format **Rx-Ux-Wxx-Jxx**, where:

- *Rx* is the rack, 1 or 2
- *Ux* is the storage cage, 1, 2, 3, or 4
- *Wxx* is the DDM bay, 1, 2, 3, 4, 5, 6, 7, or 8
- *Jxx* is the DDM bay cable connector, JC, J1, JD, or J8

To locate an DDM bay in a 2105 rack, see “Locating a DDM Bay or SSA DASD Model 020 or 040 Drawer in a 2105 Rack” on page 6. To locate the 7133 SSA cable connector, see Figure 43 on page 36.

Locations

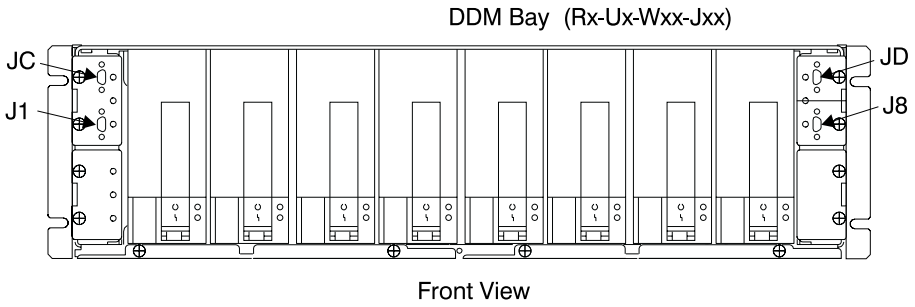

Figure 43. DDM bay and SSA Cable Connector Locations (S007693l)

7133 Drawer and SSA Connector Locations

The 7133 drawer SSA connector location codes are in the format **Rx-Yx-Jxx**, where:

- *Rx* is rack 2, 3, or 4
- *Yx* is the 7133, 1, 2, 3, 4, 5, 6, 7, or 8
- *Jxx* is the 7133 cable connector, J4, J5, J8, J9, J1, J16, J13, or J12

To locate a 7133 drawer, see “Locating a DDM Bay or SSA DASD Model 020 or 040 Drawer in a 2105 Rack” on page 6. To locate the 7133 SSA cable connector, see Figure 44.

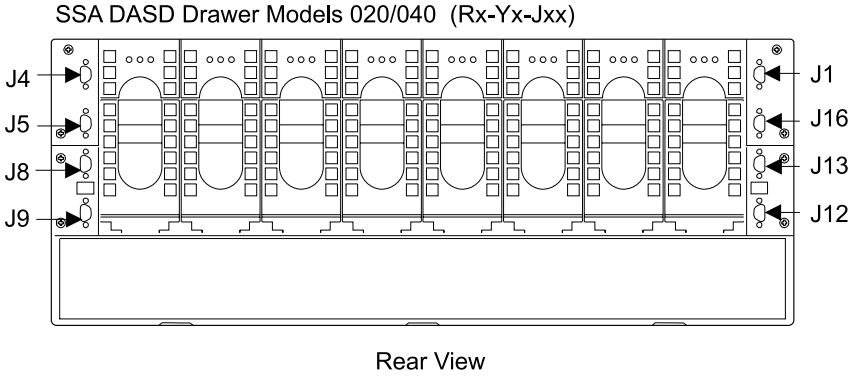

Figure 44. 7133 Drawer and SSA Cable Connector Locations (S007651l)

Locating an SSA Cable Loop Using Colored Labels

All of the SSA cables in the 2105 subsystem have colored tape on the cable near each connector. The short cables that run between adjacent DDM bays do not have colored tape. All of these connectors on an SSA loop should have the same color of tape. See Table 2 on page 37 for the color of these SSA loop connectors. All of these connectors on any DDM bay or SSA DASD drawer should have the same color tape.

All of the SSA cables that are pre-installed by manufacturing will have the colored tape. The loop that the short cables are part of can easily be determined by looking at the cables on the other end of the DDM bays. When SSA cables are added, replaced, or moved (reconfigured) in the field, the correct colored tape should be added to each cable.

Table 2. SSA Cable Loop Color Marking

SSA Device Card	Loop A (Connectors A1 and A2)	Loop B (Connectors B1 and B2)
K1, (R1-T1-K1 and R1-T2-K1)	Green	Red
K2, (R1-T1-K2 and R1-T2-K2)	Gray	Orange
K3, (R1-T1-K3 and R1-T2-K3)	Violet	Yellow
K4 (2105 Model F10/F20 only), (R1-T1-K4 and R1-T2-K4)	Blue	Brown
K9 (2105 Model E10/E20 only), (R1-T1-K9 and R1-T2-K9)	Blue	Brown

Locating a CPI Cable Using Colored Labels

All of the CPI cables in the 2105 subsystem have colored tape on the cable near each connector. See Figure 45 on page 39. All of these connectors on an CPI should have the same color of tape. See Table 3 for the color of these CPI connectors.

All of the CPI cables that are pre-installed by manufacturing will have the colored tape. When CPI cables are replaced in the field, the correct colored tape should be added to each cable.

Go to the correct cluster bay model table:

- **2105 Model E10/E20**, Table 3
- **2105 Model F10/F20**, Table 4 on page 38

Table 3. CPI Cable Locations and Color Marking (2105 Model E10/E20)

CPI Cable Location Code	Cable Cluster Bay Connector	Cable Host Bay Connector	Cable Connector Color
R1-T1-P2-I4/JB.1	Cluster Bay 1, slot 4-B (local)	Host Bay 1-B (local)	Green
R1-T1-P2-I7/JB.1	Cluster Bay 1, slot 7-B (local)	Host Bay 2-B (local)	Yellow
R1-T1-P2-I4/JA.1	Cluster Bay 1, slot 4-A (remote)	Host Bay 3-A (remote)	Gray
R1-T1-P2-I7/JA.1	Cluster Bay 1, slot 7-A (remote)	Host Bay 4-A (remote)	Violet
R1-T2-P2-I4/JB.1	Cluster Bay 2, slot 4-B (local)	Host Bay 3-B (local)	Red
R1-T2-P2-I7/JB.1	Cluster Bay 2, slot 7-B (local)	Host Bay 4-B (local)	Blue
R1-T2-P2-I4/JA.1	Cluster Bay 2, slot 4-A (remote)	Host Bay 1-A (remote)	Orange
R1-T2-P2-I7/JA.1	Cluster Bay 2, slot 7-A (remote)	Host Bay 2-A (remote)	Brown

Locations

Table 4. CPI Cable Locations and Color Marking (2105 Model F10/F20)

CPI Cable Location Code	Cable Cluster Bay Connector	Cable Host Bay Connector	Cable Connector Color
R1-T1-P2-I5/JB.1	Cluster Bay 1, slot 5-B (local)	Host Bay 1-B (local)	Green
R1-T1-P2-I8/JB.1	Cluster Bay 1, slot 8-B (local)	Host Bay 2-B (local)	Yellow
R1-T1-P2-I5/JA.1	Cluster Bay 1, slot 5-A (remote)	Host Bay 3-A (remote)	Gray
R1-T1-P2-I8/JA.1	Cluster Bay 1, slot 8-A (remote)	Host Bay 4-A (remote)	Violet
R1-T2-P2-I5/JB.1	Cluster Bay 2, slot 5-B (local)	Host Bay 3-B (local)	Red
R1-T2-P2-I8/JB.1	Cluster Bay 2, slot 8-B (local)	Host Bay 4-B (local)	Blue
R1-T2-P2-I5/JA.1	Cluster Bay 2, slot 5-A (remote)	Host Bay 1-A (remote)	Orange
R1-T2-P2-I8/JA.1	Cluster Bay 2, slot 8-A (remote)	Host Bay 2-A (remote)	Brown

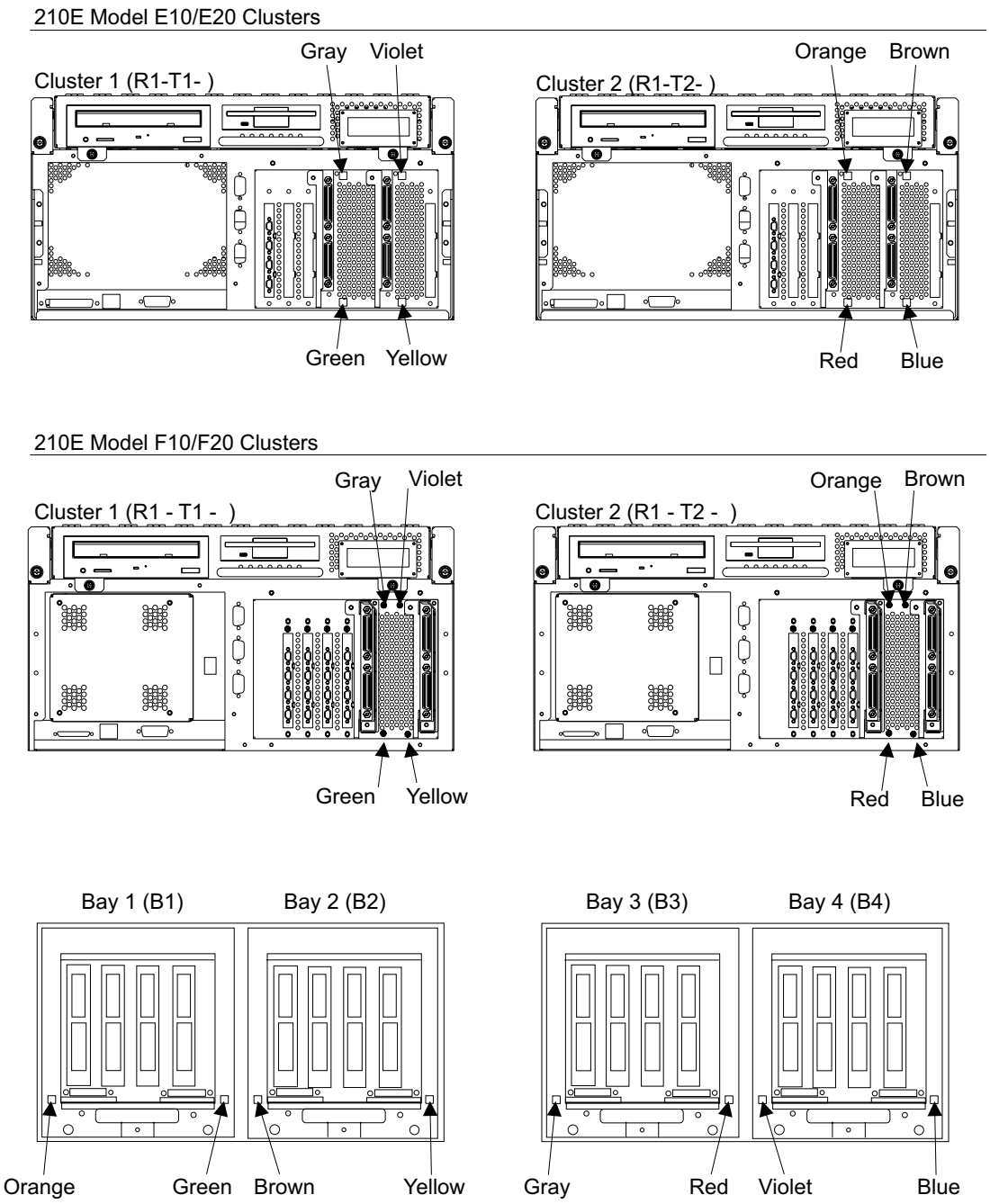

Figure 45. CPI Cable Connector Color Coding (S008292r)

Primary Power Supply Location Codes, 2105 Model Exx/Fxx and Expansion Enclosure

- **2105 Model Exx/Fxx:**
  - Primary power supply 1, right (R1-V1) **1**
  - Primary power supply 2, left (R1-V2) **2**
- **2105 Expansion Enclosure:**
  - Primary power supply 1, right (R2-V1) **3**
  - Primary power supply 2, left (R2-V2) **4**

Primary Power Supply, 2105 Model Exx/Fxx and Expansion Enclosure

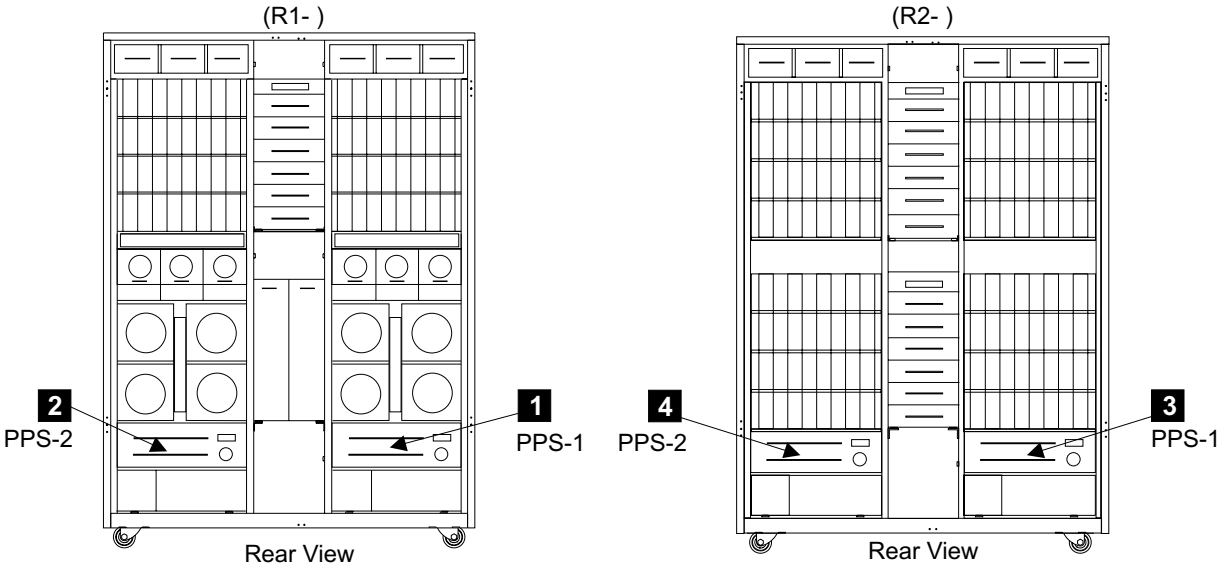

Figure 46. 2105 Model Exx/Fxx and Expansion Enclosure Primary Power Supply Locations (S008665m)

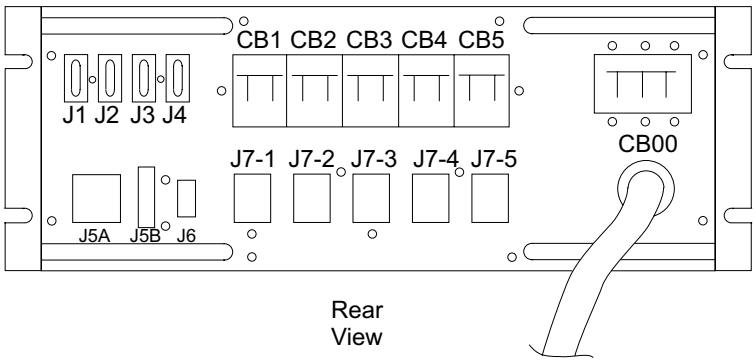

Figure 47. Primary Power Supply Connector and CB Locations (S008496l

Primary Power Supply Fan Locations, 2105 Model Exx/Fxx and Expansion Enclosure

- **2105 Model E10/E20:**
  - Primary Power Supply 1, Fan 1, (R1-V1-F1) **1**
  - Primary Power Supply 1, Fan 2, (R1-V1-F2) **2**
  - Primary Power Supply 2, Fan 1, (R1-V2-F1) **3**
  - Primary Power Supply 2, Fan 2, (R1-V2-F2) **4**
- **2105 Expansion Enclosure:**
  - Primary Power Supply 1, Fan 1, (R2-V1-F1) **5**
  - Primary Power Supply 1, Fan 2, (R2-V1-F2) **6**
  - Primary Power Supply 2, Fan 1, (R2-V2-F1) **7**
  - Primary Power Supply 2, Fan 2, (R2-V2-F2) **8**

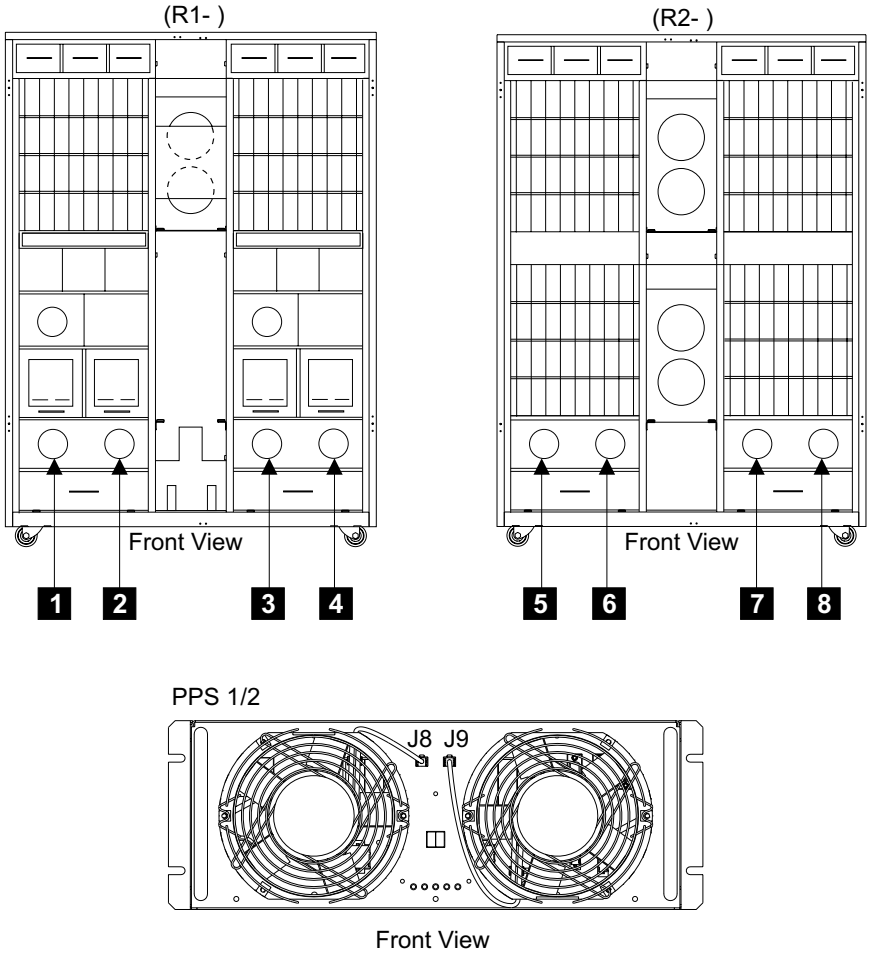

Figure 48. Primary Power Supply Fan Locations (S008669p)

390 V Battery Set Locations, 2105 Model Exx/Fxx and Expansion Enclosure

- **2105 Model E10/E20:**
  - 390 V Battery 1, (R1-V3) **1**
  - 390 V Battery 2, (R1-V4) **2**
- **2105 Expansion Enclosure:**
  - 390 V Battery 1, (R2-V3) **3**
  - 390 V Battery 2, (R2-V4) **4**

390 V Battery Set Locations, 2105 Model Exx/Fxx and Expansion Enclosure

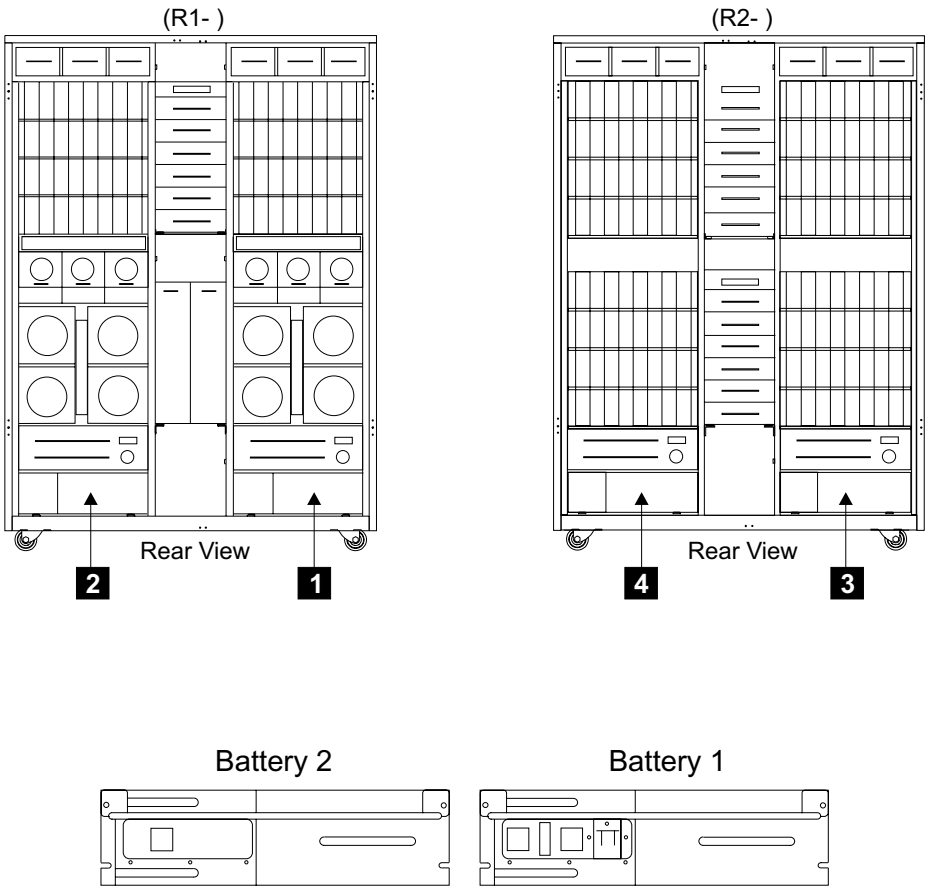

Figure 49. 390 V Battery Set Locations (S009025)

Rack, 2105 Model Exx/Fxx and Expansion Enclosure Storage Cage Power Supply Location Codes

- **2105 Model E10/E20:**
  - Storage cage 1 and 2:
    - Storage cage 1 and 2, power supply 1, (R1-Q1-V1) **1**
    - Storage cage 1 and 2, power supply 2, (R1-Q1-V2) **2**
    - Storage cage 1 and 2, power supply 3, (R1-Q1-V3) **3**
    - Storage cage 1 and 2, power supply 4, (R1-Q1-V4) **4**
    - Storage cage 1 and 2, power supply 5, (R1-Q1-V5) **5**
    - Storage cage 1 and 2, power supply 6, (R1-Q1-V6) **6**

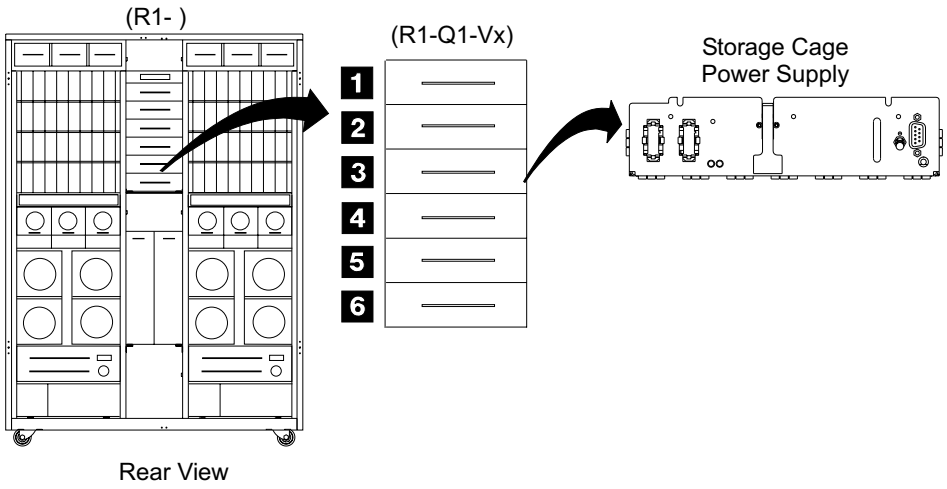

Figure 50. 2105 Model E10/E20 Storage Cage Power Supply Locations (S008222m)

- **2105 Expansion Enclosure:**
  - Storage cage 1 and 2:
    - Storage cage 1 and 2, power supply 1, (R2-Q1-V1) **10**
    - Storage cage 1 and 2, power supply 2, (R2-Q1-V2) **11**
    - Storage cage 1 and 2, power supply 3, (R2-Q1-V3) **12**
    - Storage cage 1 and 2, power supply 4, (R2-Q1-V4) **13**
    - Storage cage 1 and 2, power supply 5, (R2-Q1-V5) **14**
    - Storage cage 1 and 2, power supply 6, (R2-Q1-V6) **15**
  - Storage cage 3 and 4:
    - Storage cage 3 and 4, power supply 1, (R2-Q2-V1) **16**
    - Storage cage 3 and 4, power supply 2, (R2-Q2-V2) **17**
    - Storage cage 3 and 4, power supply 3, (R2-Q2-V3) **18**
    - Storage cage 3 and 4, power supply 4, (R2-Q2-V4) **19**
    - Storage cage 3 and 4, power supply 5, (R2-Q2-V5) **20**
    - Storage cage 3 and 4, power supply 6, (R2-Q2-V6) **21**

390 V Battery Set Locations, 2105 Model Exx/Fxx and Expansion Enclosure

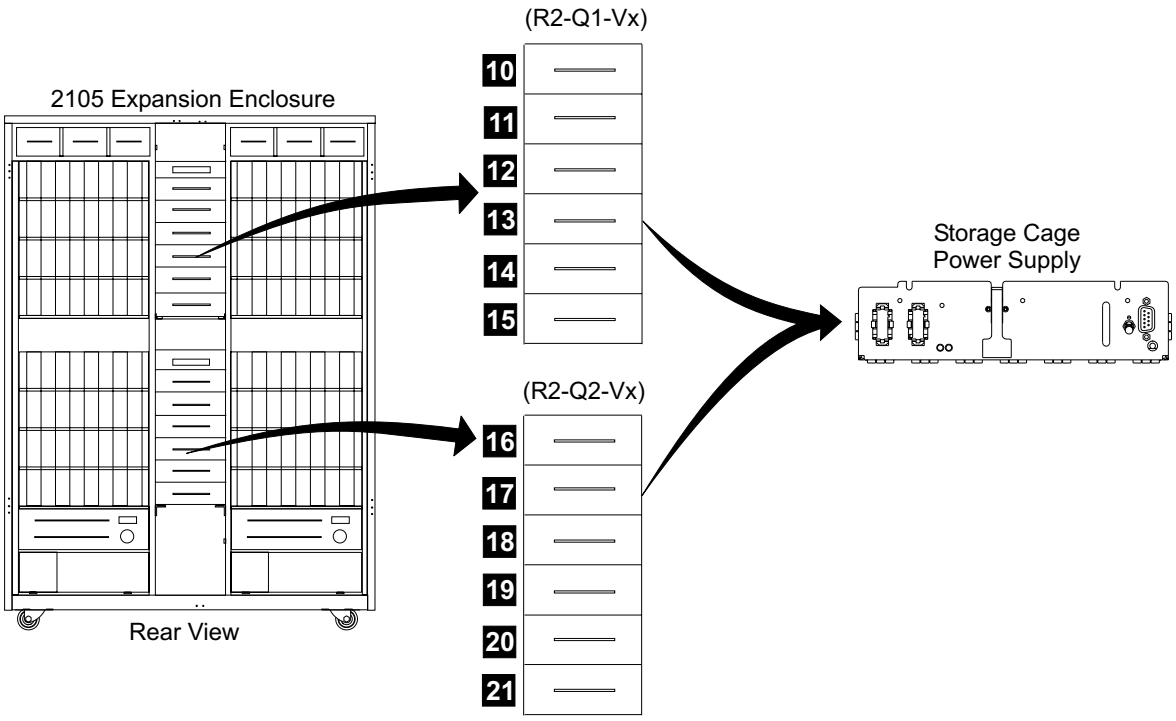

Figure 51. 2105 Expansion Enclosure Storage Cage Power Supply Locations (S008221n)

2105 Model Exx/Fxx and Expansion Enclosure Storage Cage Fan (Top) Location Codes

- **2105 Model Exx/Fxx and Expansion Enclosure** (Top Fans):

  Note: Storage cage fans are not installed in 2105 Model E10/E20 positions: **2** , **5** , **8** , and **11** .
  - Storage cage 1 (U1):
    - Storage cage 1 fan 1, front (R1-, R2-U1-F1) **1**
    - Storage cage 1 fan 2, front (R1-, R2-U1-F2) **2**
    - Storage cage 1 fan 3, front (R1-, R2-U1-F3) **3**
    - Storage cage 1 fan 4, rear (R1-, R2-U1-F4) **4**
    - Storage cage 1 fan 5, rear (R1-, R2-U1-F5) **5**
    - Storage cage 1 fan 6, rear (R1-, R2-U1-F6) **6**
  - Storage cage 2 (U2):
    - Storage cage 2 fan 1, front (R1-, R2-U2-F1) **7**
    - Storage cage 2 fan 2, front (R1-, R2-U2-F2) **8**
    - Storage cage 2 fan 3, front (R1-, R2-U2-F3) **9**
    - Storage cage 2 fan 4, rear (R1-, R2-U2-F4) **10**
    - Storage cage 2 fan 5, rear (R1-, R2-U2-F5) **11**
    - Storage cage 2 fan 6, rear (R1-, R2-U2-F6) **12**

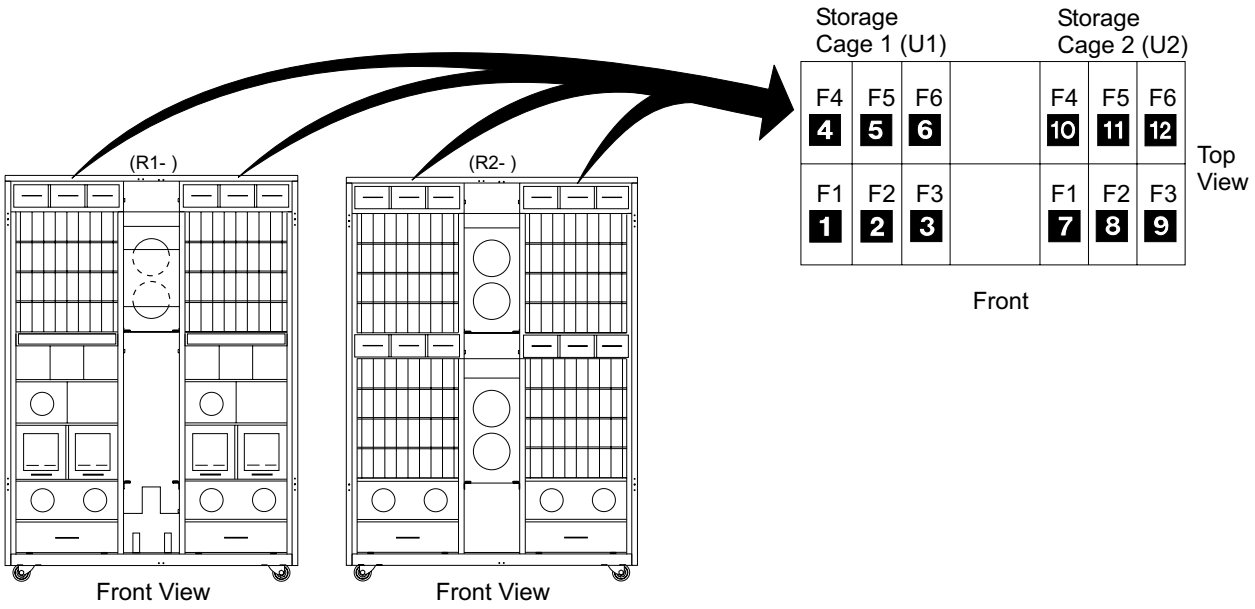

Figure 52. Storage Cage Fan Locations (S008251n)

2105 Model Exx/Fxx and Expansion Enclosure Storage Cage Fan (Center) Location Codes

- **2105 Model E10/E20:**
  - Storage cage 1, fan 1, (R1-Q1-F1) **1**
  - Storage cage 1, fan 2, (R1-Q1-F2) **2**
- **2105 Expansion Enclosure:**
  - Storage cage 1, fan 1, (R2-Q1-F1) **3**
  - Storage cage 1, fan 2, (R2-Q1-F2) **4**
  - Storage cage 2, fan 1, (R2-Q2-F1) **5**
  - Storage cage 2, fan 2, (R2-Q2-F2) **6**

390 V Battery Set Locations, 2105 Model Exx/Fxx and Expansion Enclosure

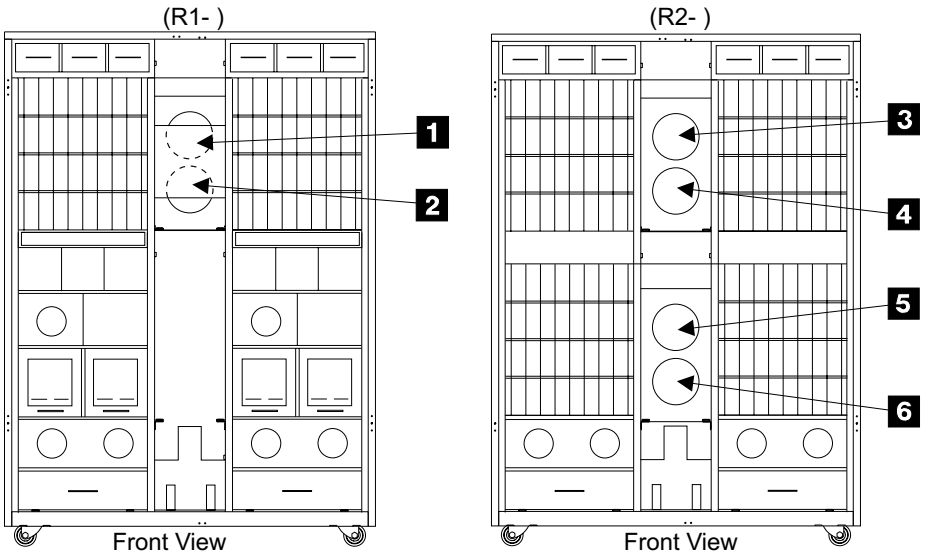

Figure 53. Storage Cage Fan (Center) Locations (S007669m)

2105 Model Exx/Fxx and Expansion Enclosure Storage Cage Fan/Power Sense Card Location Codes

- **2105 Model E10/E20:**
  - Storage cage fan/power sense card 1, (R1-Q1-C1) **1**
- **2105 Expansion Enclosure:**
  - Storage cage fan/power sense card 1, (R2-Q1-C1) **2**
  - Storage cage fan/power sense card 1, (R2-Q2-C1) **3**

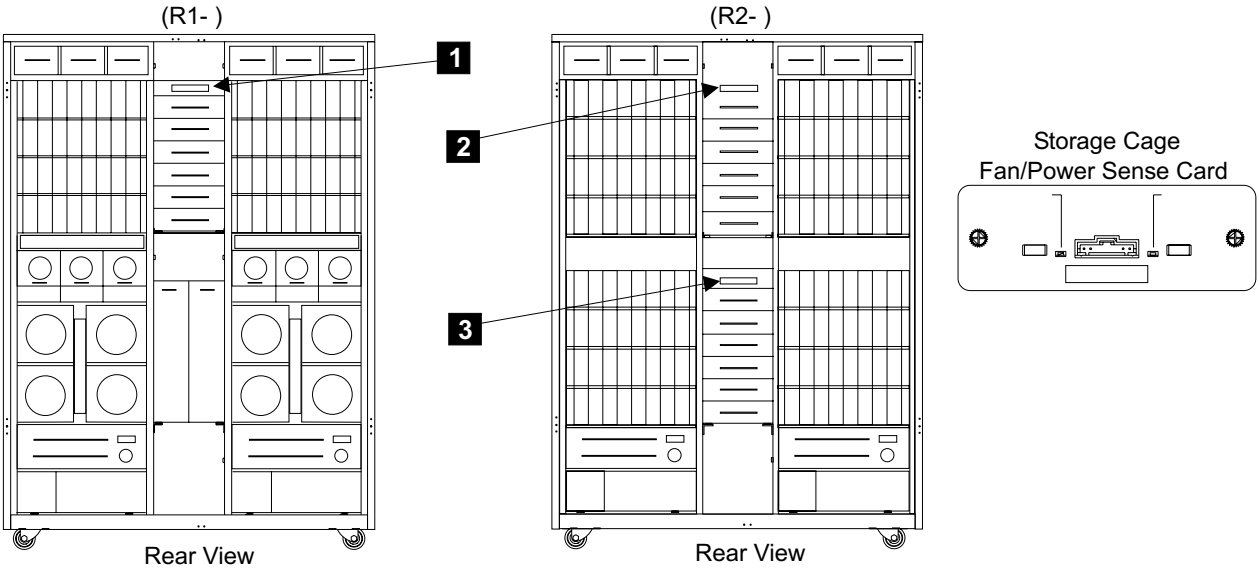

Figure 54. Storage Cage Fan/Power Sense Card Locations (S008220m)

2105 Model Exx/Fxx and Expansion Enclosure Storage Cage Power Planar Location Codes

- **2105 Model E10/E20:**
  - Storage cage (1) power planar, (R1-Q1-P1) **1**
- **2105 Expansion Enclosure:**
  - Storage cage (1) power planar, (R2-Q1-P1) **2**
  - Storage cage (2) power planar, (R2-Q2-P1) **3**

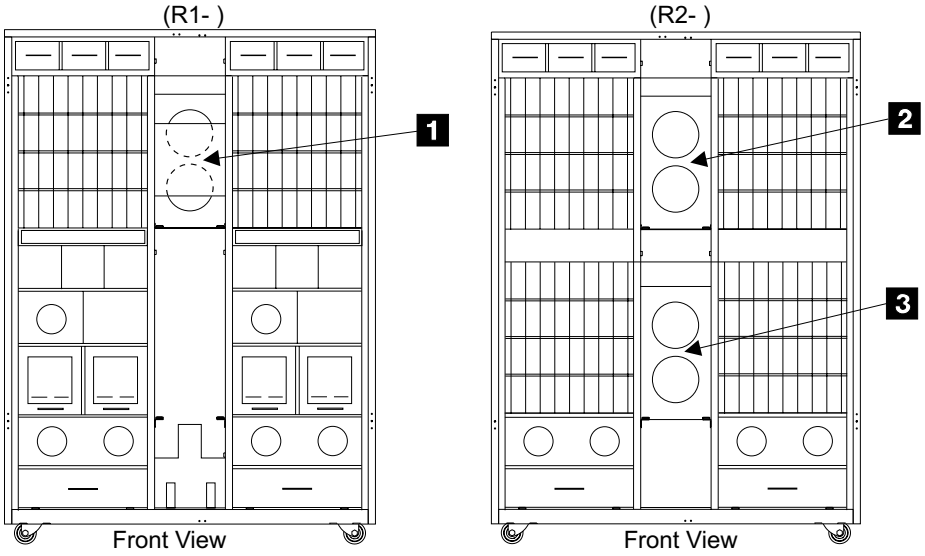

Figure 55. Storage Cage Power Planar Locations (S008082m)

2105 Model E10/E20 Electronics Cage Fan Location Codes

- **2105 Model E10/E20:**
  - Electronics cage 1:
    - Electronics cage 1 fan 1, (R1-T1-F1) **1**
    - Electronics cage 1 fan 2, (R1-T1-F2) **2**
    - Electronics cage 1 fan 3, (R1-T1-F3) **3**
    - Electronics cage 1 fan 4, (R1-T1-F4) **4**
  - Electronics cage 2:
    - Electronics cage 2 fan 1, (R1-T2-F1) **5**
    - Electronics cage 2 fan 2, (R1-T2-F2) **6**
    - Electronics cage 2 fan 3, (R1-T2-F3) **7**
    - Electronics cage 2 fan 4, (R1-T2-F4) **8**

390 V Battery Set Locations, 2105 Model Exx/Fxx and Expansion Enclosure

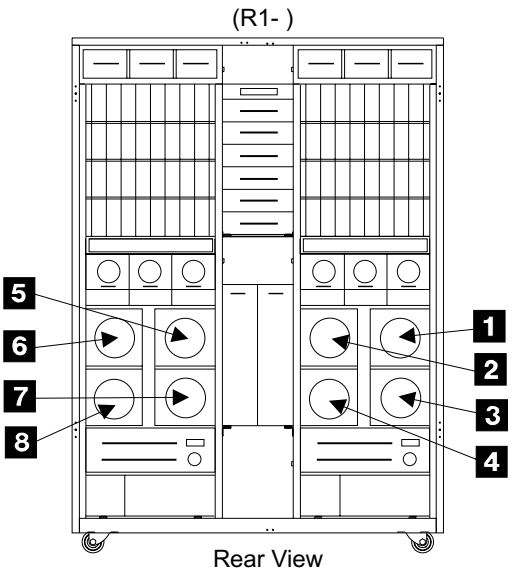

Figure 56. Electronics Cage Fan Locations (S007671m)

2105 Model E10/E20 Electronics Cage Power Supply Location Codes

- **2105 Model E10/E20:**
  - Electronics cage 1
    - Electronics cage 1 power supply 1, (R1-T1-V1) 1
    - Electronics cage 1 power supply 2, (R1-T1-V2) 2
    - Electronics cage 1 power supply 3, (R1-T1-V3) 3
  - Electronics cage 2
    - Electronics cage 2 power supply 1, (R1-T2-V1) 4
    - Electronics cage 2 power supply 2, (R1-T2-V2) 5
    - Electronics cage 2 power supply 3, (R1-T2-V3) 6

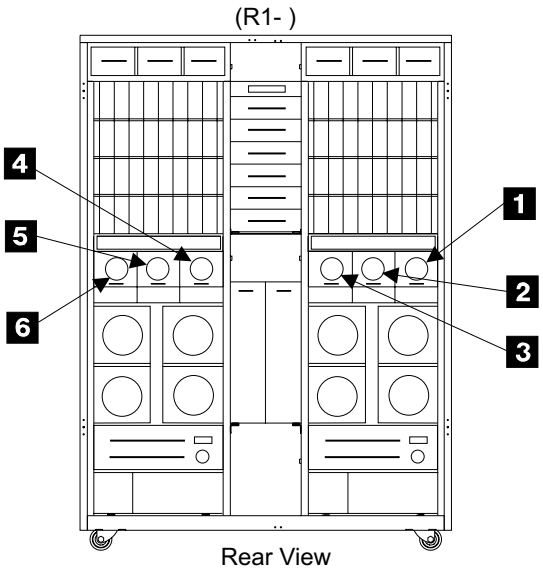

Figure 57. Electronics Cage Power Supply (S007673m)

2105 Model Exx/Fxx and Expansion Enclosure Electronics Cage Power Planar Location Codes

- **2105 Model E10/E20:**
  - Electronics cage 1 (rear right)
    - Electronics cage power planar (Top), (R1-T1-P4) **1**
    - Electronics cage power planar (lower right), (R1-T1-P5) **2**
    - Electronics cage power planar (lower left), (R1-T1-P6) **3**
  - Electronics cage 2 (rear left)
    - Electronics cage power planar (Top), (R1-T2-P4) **4**
    - Electronics cage power planar (lower right), (R1-T2-P5) **5**
    - Electronics cage power planar (lower left), (R1-T2-P6) **6**

390 V Battery Set Locations, 2105 Model Exx/Fxx and Expansion Enclosure

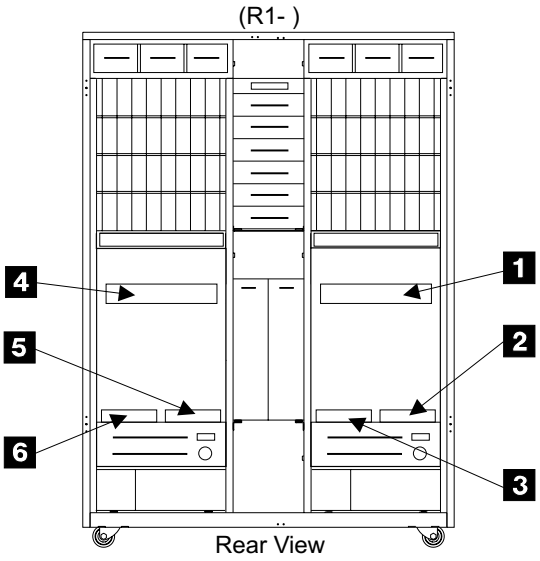

Figure 58. Electronics Cage Power Planar Locations (S007672m)

2105 Model E10/E20 Electronics Cage Sense Card Location Codes

- **2105 Model E10/E20:**
  - Electronics cage 1 sense card, (R1-T1-C1) **1**
  - Electronics cage 2 sense card, (R1-T2-C1) **2**

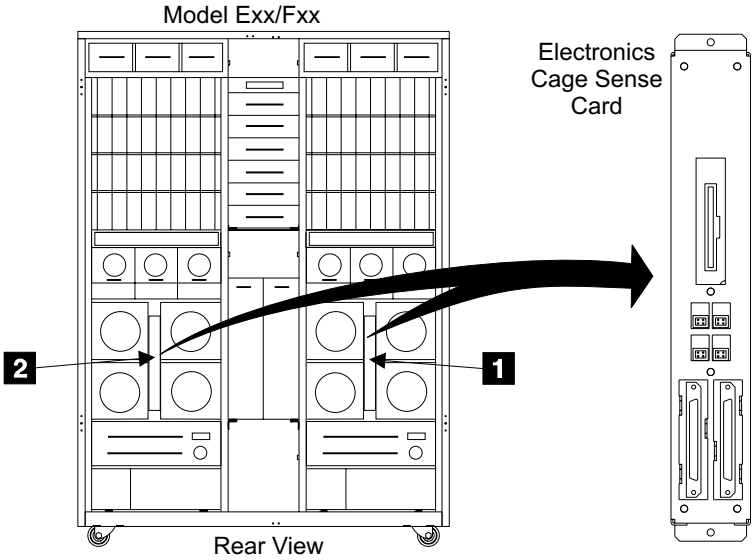

Figure 59. Electronics Cage Sense Card Locations (S008219m)

2105 Model E10/E20 Rack Power Control (RPC) Card Location Codes

- **2105 Model E10/E20:**
  - Rack power control card 1 sense card, (R1-G1) **1**
  - Rack power control card 2 sense card, (R1-G2) **2**

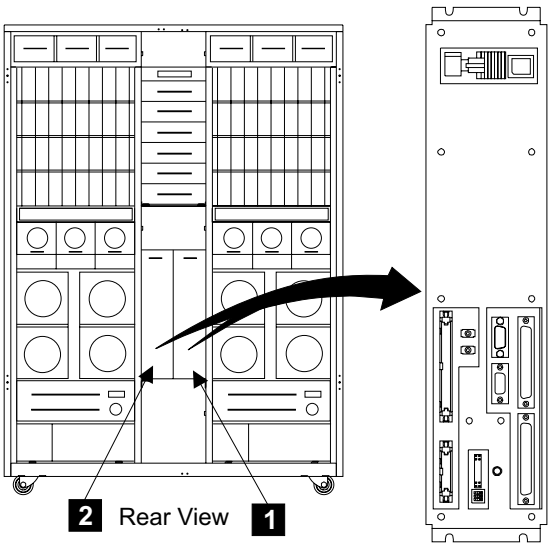

Figure 60. Rack Power Control (RPC) Card Locations (S008510m)

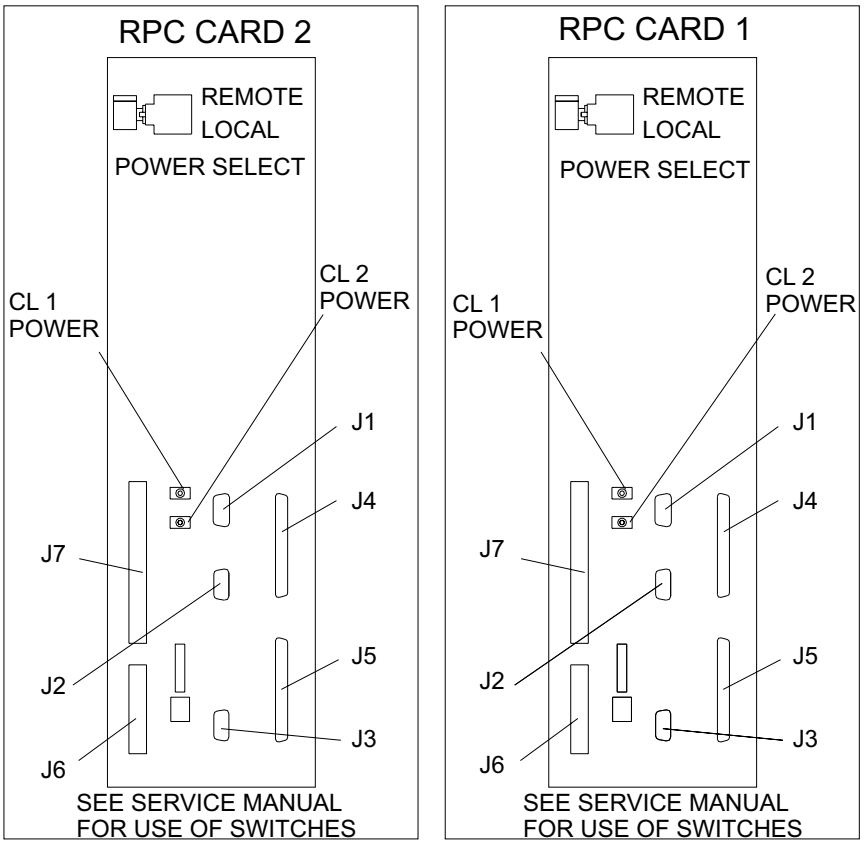

Figure 61. Rack Power Control (RPC) Card Connector Locations (S008659p)

Chapter 8: Service Terminal

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Service Terminal General Information

This section covers the general information on the service terminal hardware and its operation.

Service Terminal Overview

The service terminal provides the human interface necessary to service the 2105 subsystem.

The service terminal connects to cluster bay 1 or 2, in a 2105 Model Exx/Fxx, with the service terminal cable. This cable connects the serial port, on the service terminal, to the S2 connector on the front of cluster bay 1 or 2. The service terminal is powered by its external AC adapter, connected to customer provided AC. The service terminal may have internal batteries that it can operate on but this is not recommended.

The service terminal can be either an IBM3151 ASCII terminal or a workstation that is running an IBM3151 ASCII terminal emulator program.

Entry Point for All Service Terminal Activities

Following initial setup, the service terminal can operate in the two menu options shown below, depending on the state of the cluster or the options chosen by the service support representative:

Service Terminal Setup

- “Service Terminal Setup and 2105 Configuration Verification” on page 54.

Normal Service Activities

- “Service Login Operation Connection, with Cluster IML Complete” on page 57

Service Terminal Setup and 2105 Configuration Verification

The service terminal is the service support representatives primary interface to the 2105 storage subsystem. The service terminal is connected to a cluster bay by the service support representative at the time of service.

Getting Started

The 2105 storage facility can have one, two, or three racks. All configurations require one 2105 Model Exx/Fxx control unit rack. The service terminal connects only to cluster bay 1 or cluster bay 2 in the 2105 Model Exx/Fxx rack. The service terminal must be able to emulate an IBM 3151 ASCII terminal via a serial interface connection.

Preparing the Service Terminal for Use With the 2105

1. Open the front cover of the 2105 Model Exx/Fxx.
2. Press the latches on the front service terminal table **1** and pull the table out until it stops.

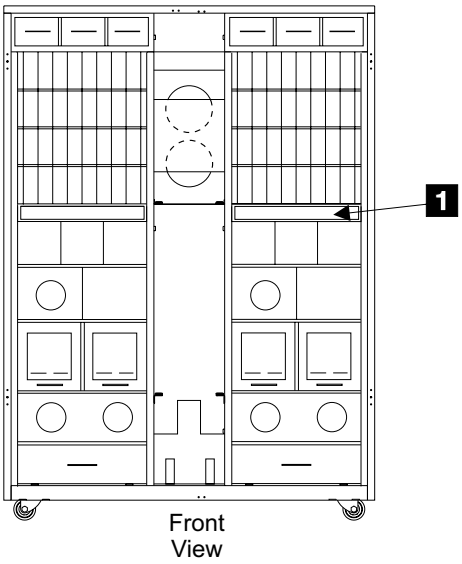

Figure 62. Accessing the Service Terminal Table (S007635m)

3. Place the notebook PC service terminal on the pullout service terminal table and connect the AC adapter cable and the service terminal interface cable to the service terminal (9-pin connector).
4. Connect the AC adapter to the utility power cord in the front tailgate area.

   Note: Always operate the service terminal from AC power because the duration of the service activity may exceed the capacity of the service terminal battery.
5. Switch service terminal power on.
6. Determine if the service terminal is running an OS/2 or a Windows operating system.

   Is the service terminal running an OS/2 operating system?
   - **Yes**, go to step 7.
   - **No**, go to step 9 on page 55.
7. **OS/2 Operating System**: Determine if the service terminal is set up to run EBTERM in 2105 Direct Connect Mode:
   a. Double click on the EBTERM icon.
   b. Single click on menu option **Connect**.

c. If the Connect dialog box displays **2105 Direct Connect**, the service terminal is setup to run EBTERM in 2105 Direct Connect Mode.

Is the service terminal set up to run EBTERM in 2105 Direct Connect Mode?

- **Yes**, go to step 8.
- **No**, go to "Initial Setup of EBTERM Dialing Profile for 2105 Direct Connect".

8. Select the following service terminal option and go to the indicated page and step:
   - **Normal Service Activities**
     - Service Login Operation Connection, with Cluster IML Complete step 2 on page 57.
9. **Windows Operating System**: Determine if the service terminal is setup to run the NetTerm terminal emulator in Direct Connect IBM3151 emulation mode:

   Note: If the NetTerm icon is not available, you will need to download the NetTerm program from the software Library or contact your next level of support.

   a. Double click on the NetTerm icon.
   b. Single click on **File** and then **Phone Directory**.
   c. If the **Phone Directory** displays **IBM 2105 VSS/ESS (Direct Connect, IBM3151 emulation)**, the service terminal is setup to run NetTerm.

   Is the service terminal setup to run NetTerm?
   - **Yes**, 10.
   - **No**, go to "Initial Setup of NetTerm for Windows" on page 56
10. Select the following service terminal option and go to the indicated page and step:
    - **Normal Service Activities**
      - Service Login Operation Connection, with Cluster IML Complete step 2 on page 57.

Initial Setup of EBTERM Dialing Profile for 2105 Direct Connect

1. If the service terminal WAS previously setup to run EBTERM in 2105 Direct Connect Mode, go to step 4 on page 56.
2. Select the EBTERM icon and double click on it.
3. From the ″EBTERM Window″ select and click on menu options:
   Setup
   Configuration/Modem
   COM1, click black dot On (⊙)

   Note: This procedure assumes that the service terminals 9-pin serial connector is assigned as COM1. If COM1 is assigned to a different connector, use that connector.

   Select and click on the Enter box.

   Note: Ignore all items in the EBTERM (_) Configuration/Modem window except **COM1** and the Enter button.

   From the ″EBTERM Window″ select and click on menu options:
   Setup
   Dialing Profiles
   Add Profile
   Select and click on the next unused profile.

   In the ″EBTERM (_) Dialing Directory: Profile _″ dialog box, enter or select:
   - Host Location Description, enter `2105 Direct Connect`
   - Modem Initialization, delete all entries (blanks)
   - Number to Dial, delete all entries (blanks)

Service Terminal Setup

- Long Distance Profile, delete all entries (blanks)
- Response to Connect, delete all entries (blanks)
- Serial Port Speed, select **9600**
- Bit Setting, select **8/N/1**
- Serial Port Buffer, select **Ignore**
- Display buffer, remove the check mark
- Flow Control, XON/XOFF, remove the check mark
- CTS/RTS, remove the check mark
- Host Protocol, select **IBM 3151**
- Host Codepage, select **ASCII 437 U.S. English**
- Host Type, select **ASCII**
- Logon Script, select **None**

Select and click on the Enter box to continue.

4. Select the following service terminal option and go to the indicated page and step:
   Normal Service Activities
   – Service Login Operation Connection, with Cluster IML Complete step 2 on page 57.

Initial Setup of NetTerm for Windows

1. If the service terminal WAS previously setup to run NetTerm in the Direct Connect, IBM3151 emulation mode, go to step 19 on page 57.
2. Select the NetTerm icon and double click on it.
3. From the NetTerm window select **File** and then **Phone Directory**.
4. From the Phone Directory window select **Modem Test**.
5. From the Phone Directory window enter the following:
   - Name: `IBM 2105 VSS/ESS` (Direct Connect, IBM3151 emulation)
   - Emulation: `IBM-3151`
   - Connection: `Modem`
   - Keys: `IBM_3151`
6. From the Phone Directory window click on **Modem Settings**.
7. From the **Communications Setup** window click on **Modems**.
8. From the Select Modem window click on **No Modem**. Then click on **Modem Settings**. You will return to the Phone Directory window.
9. From the Communications Setup window enter the following:
   - Port: `COM1`
   - Baud Rate: `9600`
   - Data Bits: `8`
   - Parity: `None`
   - Stop Bits: `1`
   - Control: remove check marks from all boxes
10. Click on **OK**. You will return to the Phone Directory window.
11. From the Phone Directory window click on **Desktop**.
12. From the Desktop window, enter the following:
    - Autowrap box, check mark
    - Remove the check mark from the **Exit NetTerm on Disconnect** box.
13. From the Desktop window, click on **OK**. You will be returned to the Phone Directory window.
14. From the Phone Directory window, click on **Color**.

15. From the Screen Colors window place a check mark in the **Allow Graphics Rendition Code of 0 to Reset Colors to Default** check box.
16. From the Screen Colors window, click on **OK**. You will be returned to the Phone Directory window.
17. From the Phone Directory window, click on **Add**.
18. From the Phone Directory window, click on **OK**.
19. Select the following service terminal option and go to the indicated page and step:
    Normal Service Activities
    – Service Login Operation Connection, with Cluster IML Complete step 2.

Service Terminal Connection Problems

For all service terminal connection problems see ″MAP 6040: Service Terminal Login″ or ″MAP 6060: Service Terminal Login″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Service Login Operation Connection, with Cluster IML Complete

Do the following steps to activate Cluster Service Login following a completed Cluster IML (Operator panel Cluster 1 or 2 Message indicator stops blinking):

Attention: The 2105 and cable in this procedure are ESD-sensitive. Always wear an ESD wrist strap during this procedure. Follow the ESD procedures in ″MAP 6060: Service Terminal Login″ in chapter 4 of the *Enterprise Storage Server Service Guide, Volume 2*.

1. Set the service terminal on the 2105 service table and start the appropriate terminal emulator (i.e. EBTERM for OS/2 or NetTerm for Windows).

   Use “Service Terminal Setup and 2105 Configuration Verification” on page 54 to prepare the service terminal for service and to verify that the service terminal has been initialized to service the 2105.
2. Set the terminal emulator to the Direct Connect mode:
   - **OS/2 Operating System**:
     a. At the EBTERM window, select and click on the **Modify** menu option.
     b. At the **Modify** menu, verify that **Direct Connect Mode** has a check mark next to it. Set all other check marks on this menu off.

        Note: Single click to set check marks on or off.
     c. Go to step 3.
   - **Windows Operating System**, at the NetTerm window, single click on **File** and then **Phone Directory**
     – If the **Phone Directory** displays **IBM 2105 VSS/ESS (Direct Connect, IBM3151 emulation)**, the service terminal is setup to run NetTerm as Direct Connect. Go to step 3.
     – If the **Phone Directory** doesn’t display **IBM 2105 VSS/ESS (Direct Connect, IBM3151 emulation)**, then the service terminal needs to be setup again. Go to “Service Terminal Setup and 2105 Configuration Verification” on page 54 to prepare the service terminal for service and go to step 3. when complete.
3. Verify that the 2105 Model Exx/Fxx is powered on. The 2105 Model Exx/Fxx operator panel Power Complete indicator for the cluster bay you are attaching to should be on continuously.
4. Connect the service terminal to the cluster bay being serviced:
   a. Connect the service terminal interface cable to the serial port connector (9 pin) on the service terminal.
   b. Connect the other end of the cable to the S2 connector on the cluster bay being serviced, cluster bay 1 or cluster bay 2.

      Note: The service terminal interface cable is stored in the 2105 Model Exx/Fxx rack or connected to S2 on the front of cluster bay 1 or 2.

Service Login Connection

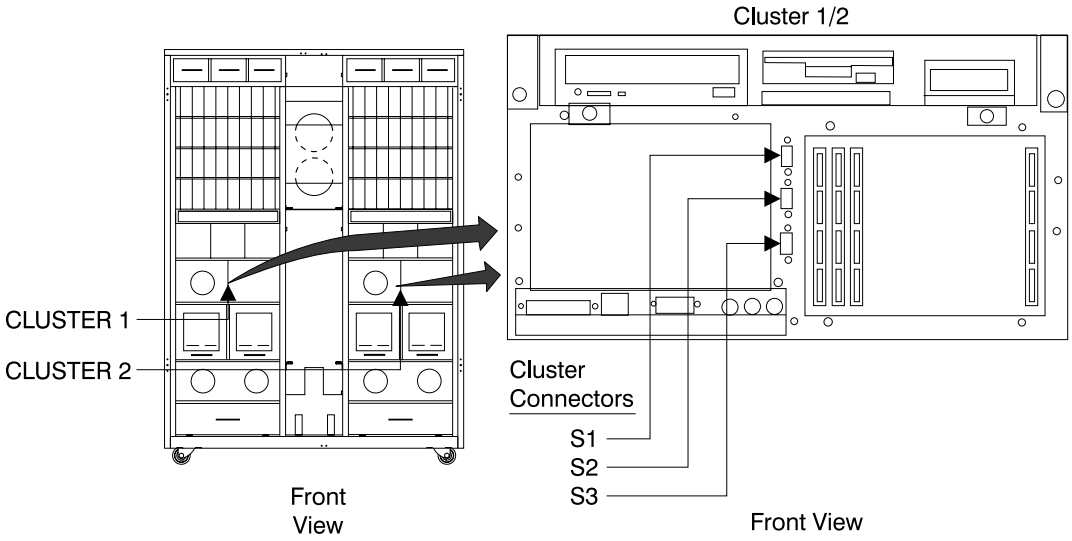

Figure 63. Cluster Bay Connectors for Service Terminal (S008027m)

5. Logically connect the service terminal to the cluster:
   - **OS/2 Operating System**:
     a. At the EBTERM window, select and click on the **Connect** menu option.
     b. At the **Connect** dialog box, click on **2105 Direct Connect**.
     c. Go to step 6.
   - **Windows Operating System**:
     a. At the NetTerm window, single click on **File** and then **Phone Directory**
     b. At the **Phone Directory**, click on **IBM 2105 VSS/ESS (Direct Connect, IBM3151 emulation)**, and then click on **Connect**.
     c. Go to step 6.
6. When the Copyright and Login screen is displayed, enter the Login ID of **SERVICE** and press Enter. When asked for the Service Password, take one of the following actions:
   - Early level service code, no password is required. Press Enter and go to step 7.
   - New level service code, the screen will display:

     ENTER PASSWORD DISPLAYED ON 2105 CLUSTER OP-PANEL service's Password

     The 2105 Cluster Op-panel will display the following:

     LOGIN PASSWORD:

     xyxyxy

   Enter the password displayed on the 2105 Cluster Op-panel and then press Enter.

   Note: Note: After three failed login attempts, a different password will be displayed. If the Copyright was not displayed.

   If the Copyright screen was not displayed and the cluster bay has been powered up for more than ten minutes, go to ″MAP 4360: Cluster Operator Panel Codes″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1* to repair the cluster bay problem.
7. See "Service Login Operation Menus, with Cluster IML Complete" on page 59, or select one of the following **Main Service Menu** activities:

Main Service Menu	Information on page:
Repair Menu	61

Install/Remove Menu 62
Configuration Options Menu 63
Licensed Internal Code Maintenance Menu 65
Machine Test Menu 66
Utility Menu 67

Service Login Operation Menus, with Cluster IML Complete

Figure 64 on page 60 is an overview of the six options available on the Cluster Service Login **Main Service Menu** and the options that are available with each of them. These are the AIX SMIT Service Screens that are available when the cluster IML is successful and AIX is up.

Note: An operating cluster can perform some service activities on a failing cluster with AIX down.

For instructions on connecting and activating the service terminal, see “Service Terminal Setup and 2105 Configuration Verification” on page 54.

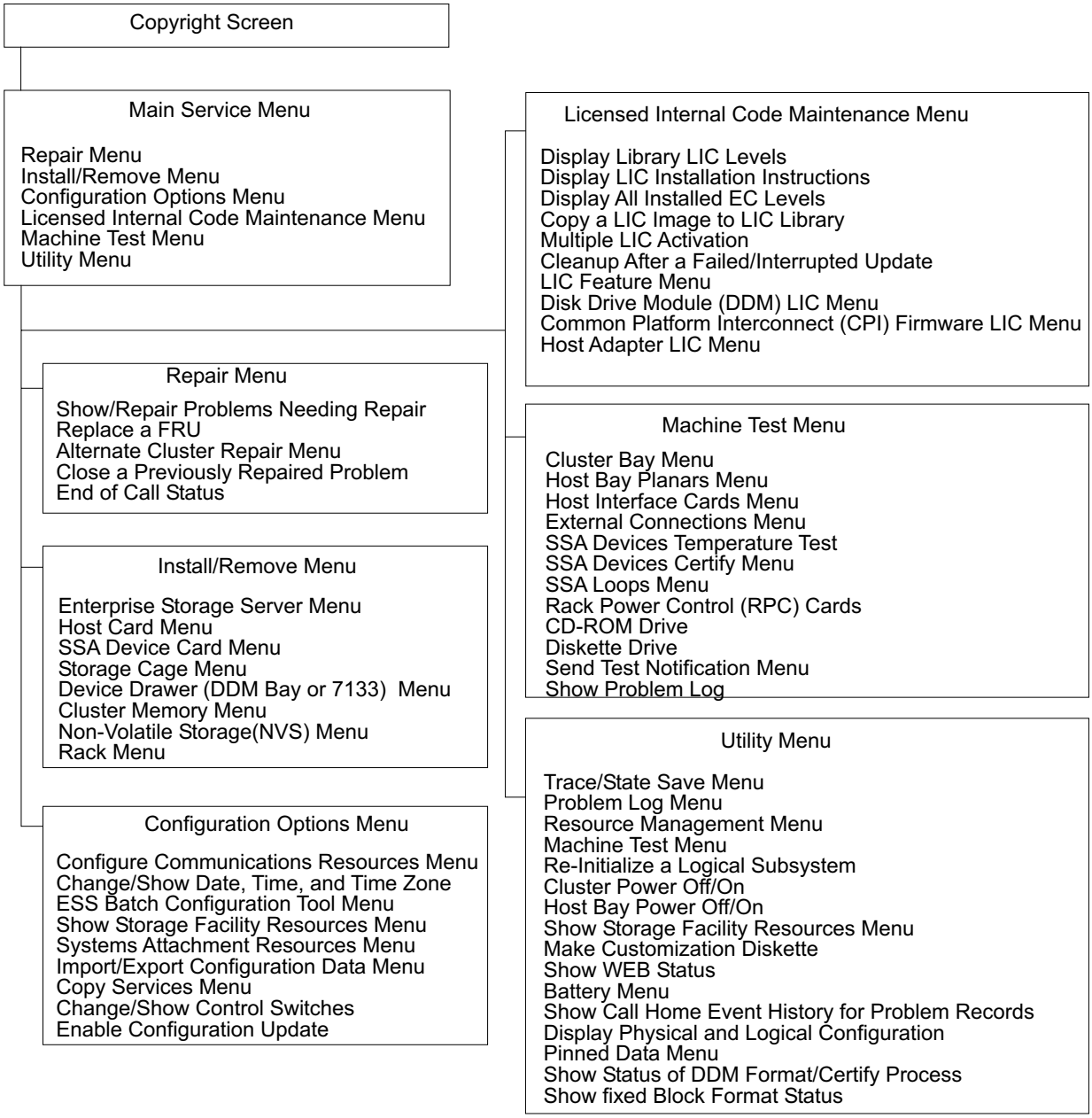

Figure 64. Main Service Menu Overview (S007692r)

Service Terminal Menus and Options

This section is an overview of the six options available on the Main Service Menu. To select an option, move the cursor to the desired option and press Enter.

Notes:

1. For a diagram showing the structure of the Main Service Menu and its options, see “Entry Point for All Service Terminal Activities” on page 53.
2. If soft-copy procedures (via CD-ROM) are being used to Install or Repair a 2105 subsystem, the following information on retracing may be useful.

Retrace Viewing Paths within a PDF File

To retrace your path within a PDF document and to go backwards one step, click on one of the following:

- **Go to Previous View** button on the command bar
- **Document > Go Back**

To go forward one step within a PDF document, click on one of the following:

- **Go to Next View** button on the command bar
- **Document > Go Forward**

Retrace Viewing Paths Through Other PDF Files

To retrace your path through/across multiple PDF documents, click on one of the following:

- **Document > Go Back Doc** for each step backward
- **Document > Go Forward Doc** for each step forward
- Hold down the Shift key and select either **Go Back** or **Go Forward**

  Note: This command will also open other PDF documents that are closed.

Repair Menu

The following menus and text describe the Repair Menu functions available with the service terminal.

```
          Main Service Menu
Repair_Menu
```

```
         Repair Menu
Show/Repair Problems Needing Repair
Replace a FRU
Alternate Cluster Repair Menu
Close a Previously Repaired Problem
End of Call Status
```

- Show/Repair Problems Needing Repair (Without Isolation)
  - Displays a list of problems to view or repair with the following information:
    - Problem ID, ESC, and SRN
    - Date problem occurred
    - Problem status
    - Problem description
  - Selecting a problem displays the following repair information:
    - FRU names
    - Probability the FRU will fix the problem
    - Physical location of the FRU.
    - Customer resource needed for the repair
  - This screen also has the instructions on how to begin the repair.
- Replace a FRU
  - Displays a list of FRU types then a list of specific FRUs of the type selected. Selecting one of the FRUs for replacement displays the replacement procedure.
    Cluster Bay FRUs
    Host Bay FRUs
    DDM bay or 7133 Drawer FRUs
    Rack Power and Cooling FRUs
    Device Power and Cooling FRUs
    Electronics Cage Power and Cooling FRUs
- Alternate Cluster Repair Menu

Repair Menu

- Displays a menu of alternate cluster repair utilities. This menu displays all of the functions required by the isolate procedures for alternate cluster repair and FRU replacement. The alternate cluster repair functions are:
  - Quiesce the Alternate Cluster
  - Resume the Alternate Cluster
  - Unconditionally Quiesce Alternate Cluster
  - Power Off the Alternate cluster
  - Power On the Alternate Cluster
  - Make A Customization Diskette
  - Export Configuration Data via Diskette
  - Set the Default Bootlist on the Alternate Cluster
  - Problem Log Menu

- Close a Previously Repaired Problem
  - Displays a list of problems that can be closed. Selecting one of the listed problems displays the problem details. The user can then close the selected problem or exit and select another problem.
- End of Call Status
  - Displays exception conditions that would make resources unavailable for customer use following a repair action. This option displays a list of open or pending problems, a list of quiesced resources and a list of fenced resources. All exception conditions listed need to be resolved to ensure all resources will be available for customer use.

Install/Remove Menu

The following menus and text describe the installation functions available with the service terminal.

```
           Main Service Menu
Repair Menu
 Install/Remove Menu
```

```
          Install/Remove Menu
Enterprise Storage Server Menu
Host Card Menu
SSA Device Card Menu
Storage Cage Menu
Device Drawer (DDM Bay or 7133 Drawer) Menu
Cluster Memory Menu
Non-Volatile Storage(NVS) Menu
Rack Menu
```

- Enterprise Storage Server Menu
  - Selecting an installation activity displays the screens to set the hardware in the correct state for the install, reinstall or relocate activity. The service support representative is then sent to Install chapter 5 in volume 2 of this book.
- Host Card Menu
  - Selecting the menu option that will guide the installation or removal of either single or multiple host adapter cards (ultra SCSI, ESCON, or Fibre), displays the screens to set the hardware in the correct state for the installation or removal.
- SSA Device Card Menu
  - Selecting the menu option that will guide the installation or removal of the SSA device card, displays the screens to set the hardware in the correct state for the installation or removal.
- Storage Cage Menu
  - Selecting the menu option that will guide the installation or removal of the Storage Bay, displays the screens to set the hardware in the correct state for the installation or removal.
- Device Drawer (DDM Bay or 7133 Drawer) Menu

  - Selecting the menu option that will guide the installation of the device drawer, displays the screens to set the hardware in the correct state for the installation or removal.
- Cluster Memory Menu
  - Selecting the menu option displays how much memory is installed in both clusters. Cluster memory modules are installed with an MES.
- Non-Volatile Storage (NVS) Menu
  - Selecting the menu option that will guide the installation or removal of Non-Volatile Storage (NVS) memory, displays the screens to set the hardware in the correct state for the installation or removal.
- Rack Menu
  - Selecting the menu option that will guide the installation or removal of a 2105 ESS Expansion rack or 2105 VSS Model 100 rack. This menu option displays the screens to set the hardware in the correct state for the installation or removal.

Configuration Options Menu

The following menus and text describe the configuration functions available with the service terminal.

```
           Main Service Menu
Repair Menu
Install/Remove Menu
 Configuration_Options_Menu
```

```
     Configuration Options Menu
Configure Communications Resources Menu
Change/Show Date, Time, and Time Zone
ESS Batch Configuration Tool Menu
Show Storage Facility Resources Menu
Import/Export Configuration Data Menu
Copy Services Menu
Change/Show Control Switches
```

- Configure Communications Resources Menu
  - Displays the following communications resource configuration options:
    - Change / Show TCP/IP Configuration
    - Change / Show Customer Information
    - Change / Show SIM Reporting Options
    - Change / Show Maximum Overall Problem Presentation Count
    - ESS Specialist Menu
    - Call Home / Remote Services Menu
    - E-mail Menu
    - SNMP Menu
    - Pager Menu
- Change/Show Date, Time, and Time Zone

  This option allows the date, time, and time zone to be displayed or changed.
- ESS Batch Configuration Tool Menu
  - This option displays the following ESS Batch Configuration Options:
    - Define a Storage Configuration
    - Review Defined Storage Configuration List
    - Clear a Defined Storage Configuration
    - Apply Defined Storage Configuration List
    - Display Status of Apply Process
- Show Storage Facility Resources Menu
  - This option displays the following Show / List functions:
    - Show Storage Facility Resources

Configuration Options Menu

- List Installed Host Cards
- List Installed SSA Device Cards
- List SSA Loops
- List Installed SSA Device Drawers
- List Device Drawers on an SSA Loop
- List DDMs on an SSA Loop
- List Installed SSA Device Drawer Cables
- List Installed Racks

- System Attachment Resources Menu
  - Displays the following system attachment resource options:
    - List Host Cards and Ports
    - Configure Fibre Channel Port
- Import/Export Configuration Data Menu
  - Displays the following configuration data import/export options:
    - Import Configuration Data via Diskette
    - Export Configuration Data via Diskette
- Copy Services Menu
  - Displays the following copy services configuration options:
    - Copy Services Server Menu
      - View Server Definitions
      - Change Server Definitions
      - Reset to Primary (Restart Copy Service with primary server as active server)
      - Reset to Backup (Restart Copy Services with backup server as active server)
      - Disable (Disable Copy Services)
      - Remove Server Definitions
    - Copy Services Client Menu
      - View Client Definitions
    - Configuration Duplication Menu
      - Format Diskette
      - Capture Configuration
      - Verify Configuration
      - Duplicate Configuration
      - Synchronize Configuration
- Change / Show Control Switches
  - Displays the following control switch options:
    - OS/390 (CKD) Logical Subsystem Limit
    - Open System (FB) Logical Subsystem Limit
    - Fibre Channel LUN Access Control
    - AS/400 LUN Serial Number Suffix
    - High Bandwidth Sequential Fast Write
    - Fast Check One Recovery
    - Report Electronic Bay Over Temperature
    - Report DDM Over Temperature
    - Allow Slower RPM Replacement
    - WEB Copy Services Commands for S/390 volumes
    - Reset All Switches to Default Values
- Enable Configuration Update
  - This option allows an Enable Configuration Update

Licensed Internal Code Maintenance Menu

The following menus and text describe the licensed internal code functions available with the service terminal.

```
           Main Service Menu
Repair Menu
Install/Remove Menu
Configuration Options Menu
 Licensed_Internal_Code_Maintenance_Menu
```

```
   Licensed Internal Code Maintenance Menu
Display Library LIC Levels
Display LIC Installation Instructions
Display all Installed EC Levels
Copy a LIC Image to LIC Library
Multiple LIC Activation
Cleanup After a Failed/Interrupted Update
LIC Feature Menu
Disk Drive Module (DDM) LIC Menu
Common Platform Interconnect (CPI) Firmware LIC Menu
Host Adapter LIC Menu
```

- Display Library LIC Levels and Resource Requirements
  - This option displays the code level and resource requirements for the LIC on the boot hard disk drive (Library), the CD-ROM, and Diskette.
- Display LIC Installation Instructions
  - This option displays the instructions used to install the LIC and any additional information about the installation.
- Display all Installed EC Levels
  - This option displays all LIC levels
- Copy a LIC Image to LIC Library
  - This option displays the instructions used to copy the LIC into the Next Level directory of both clusters prior to LIC activation.
- Multiple LIC Activation
  - This option displays the instructions used to activate multiple LIC/Firmware images as a single process. This option displays a list of LIC/Firmware that can be activated. One or more items displayed can be selected for activation.
- Cleanup After a Failed/Interrupted Update
  - This option removes all LIC files associated with a failed code load to a boot disk drive or with a failed code activation.
    - Cleanup A Failed Copy of a LIC Image
    - Cleanup A Failed Activate of a LIC Image
- LIC Feature Menu
  - This option displays the LIC Feature Menu that provides the functions used for installing LIC features and displaying active LIC features.
    - Activate LIC Feature
    - Display Active LIC Features
- Disk Drive Module (DDM) LIC Menu
  - This option displays the DDM LIC Menu that provides the instructions and functions used for installing and activating DDM LIC:
    - Start/Restart DDM Download NonConcurrently
    - Start/Restart DDM Download Concurrently
    - Halt DDM Download
    - DDM Download Status
    - DDM Download Force Reset

Licensed Internal Code

- Display Current DDM Levels

- Common Platform Interconnect (CPI) Firmware LIC Menu
  - This option displays the Firmware LIC Menu that provides the instructions and functions used for installing and activating firmware updates:
    - Display Current CPI Firmware levels
    - Update CPI Firmware - Concurrent, all Host Bays
    - Update CPI Firmware — Concurrent, single Host Bay
- Host Adapter LIC Menu
  - This option displays the instructions used to install Host Adapter code updates on the boot hard disk drive and activate the updates. This function supports concurrent and non-concurrent code activation.
    - Activate by Host Adapter (Concurrent)
    - Activate by Host Bay (Concurrent)

Activate LIC Feature

Requirements:

Must have the DOS diskette containing the LIC Feature Control Record specifically written for the selected 2105 storage server.

Procedure:

1. Connect the service terminal interface cable to the S2 connector on the front of cluster bay 1.
2. Log the service terminal into cluster 1.

   From the service terminal **Main Service Menu**, select:

   Licensed Internal Code Maintenance Menu

   LIC Feature Menu

   Activate LIC Feature

   a. Follow all of the screen instructions, they will guide you through the diskette insertion and removal steps.

   b. When completed, all LIC features will be enabled per the file record on the diskette.

Machine Test Menu

The following menus and text describe the machine checkout functions available with the service terminal.

```
           Main Service Menu
Repair Menu
Install/Remove Menu
Configuration Options Menu
Licensed Internal Code Maintenance Menu
 Machine_Test_Menu
```

```
       Machine Test Menu
Cluster Bay Menu
Host Bay Planars Menu
Host Interface Cards Menu
External Connections Menu
SSA Devices Temperature Test
SSA Devices Certify Menu
SSA Loops Menu
Rack Power Control (RPC) Cards
CD-ROM Drive
Diskette Drive
Send Test Notification Menu
Show Problem Log
```

- Cluster Bay Menu

  - This option will display what cluster features will be tested and what cluster resources will not be available to the host during the test. If problems are found, repair options are offered. The service terminal must be connected to the current cluster bay.
    - Cluster Bay Health Check
    - Cluster Bay Resource Test
- Host Bay Planars Menu
  - This option displays the 4-slot bays and allows you to select a 4-slot bay planar for testing.
- Host Interface Cards Menu
  - This option allows you to test an ultra SCSI host card or an ESCON host card. It also describes what resources will be unavailable to the host.
    - Ultra SCSI Host Ports Menu
    - ESCON Host Ports Menu
    - Fibre Channel Host Ports Menu
- External Connections Menu
  - This option displays the external connections that can be tested.
    - SSA Loop Test Menu
    - LAN Test
    - Cluster-Cluster Communication Test
    - Initialize Expander/Modem
- SSA Devices Temperature Test
  - This option displays the temperature of the SSA devices.
- SSA Devices Certify Menu
  - This option allows you to select an SSA disk drive module (DDM) by its name (pdisk) or by its location (drawer and DDM),
- SSA Loops Menu
  - This option allows you to select for testing an SSA loop attached to an SSA device card.
    - Select SSA Loop by SSA Device Card
    - Select SSA Loop by Storage Bay Drawer
- Rack Power Control (RPC) Cards
  - Displays the resource name and location of the RPC cards.
- CD-ROM Drive
  - This option displays the CD-ROM drive test option.
- Diskette Drive
  - This option displays the floppy diskette drive test option.
- Send Test Notification Menu
  - This option displays the notification that can be tested.
    - Customer Notification (via E-mail)
    - Customer Notification (via SNMP)
    - Service Notification (via modem)
    - Service Notification (vis Pager)
- Show Problem Log
  - Displays a list of problems to view with the following information:
    - Problem ID, ESC, and SRN
    - Date Problem occurred
    - Problem Status
    - Problem description

Utility Menu

The following menus and text describe the utility functions available with the service terminal.

Utility Menu

```
           Main Service Menu
Repair Menu
Install/Remove Menu
Configuration Options Menu
Licensed Internal Code Maintenance Menu
Machine Test Menu
 Utility_Menu
```

```
     Utility Menu
Trace/State Save Menu
Problem Log Menu
Resource Management Menu
Machine Test Menu
Re-Initialize a Logical Subsystem
Cluster Power Off/On
Host Bay Power Off/On
Show Storage Facility Resources Menu
Make Customization Diskette
Show WEB Status
Battery Menu
Show Call Home Event History for Problem Records
Display Physical and Logical Configuration
Pinned Data Menu
Show Status of DDM Format/Certify Process
Fixed Block Format Menu
```

- Trace / State Save Menu
  - Displays the following trace/state save activities:
    - Display Statesave Status and Parameters
    - Set Statesave Parameters
    - Suspend Statesave Parameters
    - Force a Statesave
    - AIX System Trace Menu
    - Change/Show Memory Address Location
    - Discard/Show - Statesave/Dump Files
    - Off-load - Statesave/Trace/Dump Files to Diskette
    - Build PE Package and Off-load to Diskettes
    - Build PELite Package and Off-Load to Diskettes
- Problem Log Menu
  - Displays the following problem log options:
    - List Problems
    - Change a Problem State
    - Suspend Problem Reporting
    - Select Logs to Off-Load
    - Cancel All Problems by Selecting Cluster
    - Cancel Problems by Selecting Problem IDs
- Resource Management Menu
  - Displays the following subsystem resource options:
    - Quiesce a Resource
    - Resume a Resource
    - Show Quiesced Resources
    - Set Service Mode for a Resource
    - Reset Service Mode for a Resource
    - Show Fenced Resources
    - Reset Fence for a Resource
- Machine Test Menu
  - Displays the following machine checkout options:
    - Cluster Bay Menu

    - Host Bay Planars Menu
    - Host Interface Cards Menu
    - External Connections Menu
    - SSA Device Temperature Test
    - SSA Devices Certify Menu
    - SSA Loops Menu
    - Rack Power Control (RPC) Cards
    - CD-ROM Drive
    - Diskette Drive
    - Send Test Notification Menu
    - Show Problem Log
- Re-Initialize a Logical Subsystem
- Cluster Power Off/On
  – Power Off a Cluster Bay
  – Power On a Cluster Bay
- Host Bay Power Off/On
  – Power Off an Host Bay
  – Power On an Host Bay
- Show Storage Facility Resources Menu
  – This option displays the following Show / List functions:
    - Show Storage Facility Resources
    - List Installed Host Cards
    - List Installed SSA Device Cards
    - List SSA Loops
    - List Installed SSA Device Drawers
    - List Device Drawers on an SSA Loop
    - List DDMs on an SSA Loop
    - List Installed SSA Device Drawer Cables
    - List Installed Racks
- Make Customization Diskette
  – Prompts the user through the process of making a customization diskette. Customization diskettes are required when it is necessary to reinstall all of the code on the SCSI hard drive.
- Show WEB Status
- Battery Menu
- Show Battery Status
  – Update Battery Initialization Date
  – Show Call Home Event History for Problem Records
- Display Physical and Logical Configuration
  – List all Logical Subsystems
  – List all Ranks
  – List Physical Disks in a Rank
  – List Logical Volumes in a Rank
  – List DDMs in a DDM Bay/Drawer
  – Display Physical and Logical Configuration MAP
  – Display DDMs Physical and Logical Information
- Pinned Data Menu
  – This option displays the following pinned data support functions:
    - Display Pinned Data
    - Discard Pinned Data
    - Pinned Data NVS Repair

Utility Menu

- Show Status of DDM Format/Certify Process
  - This option displays the following status options:
    - Show Status of Completed DDM Format/Certify Process
    - Show Status of DDM Format/Certify Process in Progress
  - Show Fixed Block Format Status
    - This option displays a list of logical subsystems (LSS). Selection of a Fixed Block (FB) LSS will display the Fixed Block Format status as a percent complete (0% to 100%), and LAN Status (Ready/Failed).

FRU Replacement Using the Service Terminal

Occasionally the you may need to replace a FRU that is not failing and has not generated a problem. The following menus and text describe the service terminal functions available to replace a FRU with no problem.

```
          Main Service Menu
 Repair_Menu
```

```
         Repair Menu
Show/Repair Problems Needing Repair
 Replace_a_FRU
```

```
         Replace a FRU
Cluster Bay FRUs
Host Bay FRUs
DDM Bay or 7133 Drawer FRUs
Rack Power Cooling FRUs
Device Power Cooling FRUs
Electronic Cage Power Cooling FRUs
```

1. Select the FRU type and then select a FRU and press enter.
2. Follow the service terminal instructions.

Chapter 9: Error Messages, Diagnostic Codes, and Service Reports

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Codes

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Error and Progress Code List

This chapter contains the various codes and descriptions that can be generated by the 2105. Select the code topic from the list below and go to the indicated page:

Table 5. Codes Entry Table

Code Example	Go To	Where Displayed
2xxxxxxx, 4xxxxxxx	“Firmware/POST Error Codes” on page 73	On cluster bay operator panel during power on.
651-730, 9CC-xxx	“Bus SRN to FRU Reference Table” on page 99	In problem log details.
E0xx, OK, READY, STBY	“SP Checkpoints” on page 100	On cluster bay operator panel during service processor power on.
E1xx, E2xx, E3xx, E6xx	“Firmware Checkpoints” on page 105	On cluster bay operator panel during power on.
Example, R1-T2-P2-K2	“Physical Location Codes” on page 111	FRU location code displayed in problem log details.
05xx to 09xx	“Configuration Program Progress Indicators” on page 136	On cluster bay operator panel during power on.
Cxx to Fxx	“Diagnostic Load Progress Indicators” on page 138	On cluster bay operator panel during power on.
0000 or 00Cx	“Dump Status Codes” on page 139	On cluster bay operator panel anytime.
XXX	“Other Three Digit Status Codes” on page 139	On cluster bay operator panel anytime.
Init CPIx, SDxxxxxx, SL111-xxx, SRxxx-xxxx, READY	“9 and 10 Character Progress Codes” on page 139	On cluster bay operator panel near end of power on code load.
6 digit SRN 1xx-xxx, 6xx-xxx, 7xx-xxx, 8xx-xxx, 9xx-xxx	“Service Request Number List” on page 114	Service reference number displayed in problem log details, when ESC=5xxx.
1xx to Dxx	“Failing Function Code Table” on page 132	In Service Reference Number List.
xx	“2105 Primary Power Supply Digital Status Display” on page 140	On PPS status display.
1xxx, 2xxx, 3xxx, 4xxx, 5xxx, 8xxx, 9xxx, Cxxx, Dxxx, Exxx,	“2105 Exception Symptom Codes” on page 141	In problem log details.
5 digit SRN 2xxxx, 3xxxx, 4xxxx, 5xxxx, 6xxxx, 7xxxx, 8xxxx, Dxxxx	“Service Request Numbers (SRN)” on page 173	In problem log details.

Error Code to FRU Index

The Error Code to FRU Index lists error symptoms and possible causes. The most likely cause is listed first. Use this index to help you decide which FRUs to replace when repairing the cluster bay.

Notes:

1. If the codes in the following tables indicate a FRU which is present more than once in the cluster bay, a location code is needed to specify which FRU generated the error. To display the System

Management Services error log and obtain a location code, go to“Appendix B. System Management Service Operation Connection” on page 233. Location code descriptions can be found under “Location Codes” on page 111.

2. Some FRUs have LIC firmware levels that need to be manually checked. To replace any cluster bay FRUs, use ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

If you replace FRUs and the problem is still not corrected, go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*, unless otherwise indicated in the tables.

Firmware/POST Error Codes

If you replace FRUs and the problem is still not corrected, go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*, unless otherwise indicated in the tables.

If the code is not found in this table, call the next level of support. This table only includes the most likely of the hundreds of possible codes for the RS/6000. Reference the *Installation and Service Guide*, SA38–0541 for 2105 Model E10/E20 or SA38–0547 for 2105 Model F10/F20. The **Action/Possible Failing FRU** listed for the RS/6000 might need modifying for use with the 2105 Model Exx/Fxx product.

Table 6. Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU
20A8xxxx	Cluster bay is attempting to boot from a remote connection instead of from the SCSI hard drive.	See the E174 action in “Firmware Checkpoints” on page 105. Use the SMS Menu options to ensure the default boot list is active, which will attempt to boot from the SCSI hard drive before the network connection. Refer to “Appendix B. System Management Service Operation Connection” on page 233. Call the next level of support.
20D00xxx	Unknown/ Unrecognized device	Go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
20D0000F	Self-test failed on device, no error/location code information available.	For this error code, check the System Management Services error log entry (described in “Appendix B. System Management Service Operation Connection” on page 233. The location code (if present) in the error log entry should identify the location of the failing device.
20D00010	Self-test failed on device, can’t locate package.	Call the next level of support.
20D00011	Cannot determine Machine Model.	Refer to the actions in error code 2BA00050.
20E00xxx	Security	
20E00001	Privilege Password entry error.	Passwords are not used, call the next level of support.
20E00002	Privilege Password Jumper not enabled.	This function is not used. Replace the I/O Planar, call the next level of support. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
20E00003	Power On Password Jumper not enabled.	This function is not used. Replace the I/O Planar, call the next level of support. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
20E00004	I/O Planar battery drained or needs replacement.	1. Replace I/O Planar battery. 2. Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
20E00005	EEPROM locked.	1. The cluster bay needs to be power cycled. Connect the service terminal to the working cluster and then use the Alternate Cluster Repair Menu options to quiesce, power off, power on and resume the failing cluster. 2. If the problem is still present, replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
20E00008	CMOS corrupted, CMOS initialized.	1. If the I/O Planar battery is good (new), you can reset the NVRAM so it will be reloaded on the next power up. To reset, remove the I/O Planar battery and wait 15 minutes for the NVRAM to drain, or use a metal object to short the metal contacts of the battery holder together which drains the NVRAM immediately. Then install the battery and power up the cluster bay. 2. Replace the I/O planar battery to reset CMOS on the next power on. 3. Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
20E0000B	EEPROM write problem	Refer to actions for 20E00005.
20E0000C	EEPROM read problem.	Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
20EE0xxx	Informational	See error code 20EE0003.
20EE0003	IP parameter requires 3 dots ″.″	Enter valid IP parameter. Example: 000.000.000.000
20EE0004	Invalid IP parameter.	Enter valid (numeric) IP parameter. Example: 000.000.000.000
20EE0005	Invalid IP parameter (>255)	Enter valid (numeric) IP parameter in the range of 0 to 255. Example: 255.192.002.000
20EE0006	No SCSI controllers present	The I/O Planar should always have (at least) 2 integrated PCI SCSI controllers; replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
20EE0007	False keyboard not found error.	Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
20EE0008	No configurable adapters found in the system.	This warning occurs when the selected SMS function cannot locate any devices/adapters supported by the function. • Replace I/O planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. • Call the next level of support.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
20EE0009	Unable to communicate with the service processor.	1. Replace the Service Processor Card (E10/E20 only). 2. Replace I/O Planar (E10/E20 and F10/F20). The F10/F20 I/O planar includes the service processor. 3. Replace System Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
20EE000A	Pointer to the operating system found in non-volatile storage.	Values normally found in non-volatile storage that point to the location of the Operating System were not found. This can happen if some event occurred that caused the system to lose non-volatile storage information (drainage or replacement of the I/O Planar Battery). Replace the I/O Planar Battery. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. If the battery is not very old, the NVRAM can be reset by removing the battery and using a metal object to momentarily short the battery socket contacts (+ and –) together. Alternatively, the battery can be left unplugged for 15 to 20 minutes, to let the NVRAM charge drain naturally. Use the SMS utilities to ensure the boot device list is set to the default boot list. See “Appendix B. System Management Service Operation Connection” on page 233.
20EE000B	The system was not able to find the operating system on the cluster bay SCSI Hard Drive.	Go to ″MAP 4020: SCSI Hard Drive Build″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
21A000xxx	SCSI Device Errors	A problem exists with the cluster bay SCSI bus. Go to ″MAP 4020: SCSI Hard Drive Build″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
21A00001	Test Unit Ready Failed - hardware error.	Refer to the actions in error code 21A000xxx.
21A00002	Test Unit Ready Failed - sense data available.	Refer to the actions in error code 21A000xxx.
21A00003	Send Diagnostic Failed.	Refer to the actions in error code 21A000xxx.
21A00004	Send Diagnostic Failed - DevOfl cmd.	Refer to the actions in error code 21A000xxx.
21EE0xxx	Other SCSI device type.	Refer to the actions in error code 21A000xxx.
21F00xxx	SCSI CD-ROM.	Refer to the actions in error code 21A000xxx.
25000000	Memory Controller Failed.	Replace the System Planar. Use the service terminal Repair Menu, Replace a FRU options. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25010xxx	Flash Update Problem	Call next level of support.
25010000	No diskette in drive.	Insert diskette containing firmware image.
25010001	Diskette seek error.	1. Retry function. 2. Replace diskette drive. 3. Replace diskette cable. 4. Replace I/O planar.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
25010002	Diskette in drive does not contain an *.IMG file.	Insert diskette with firmware update file.
25010003	Cannot open OPENPROM package.	Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25010004	Cannot find OPENPROM node.	Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25010006	System id does not match image system id.	Call next level of support.
25010007	Image has bad CRC.	Replace the diskette. Call next level of support.
25010008	Flash is write protected, update cancelled.	1. To retry, power the cluster bay off and on. Connect the service terminal to the working cluster bay and use the Alternate Cluster Repair Menu options to quiesce, power off, power on and resume the failing cluster bay. 2. Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25010009	Flash module is unsupported or not recognized.	Make sure the correct firmware update diskette is being used.
2501000A	Flash write protected.	1. Power off and on the cluster bay. Connect the service terminal to the working cluster bay and use the Alternate Cluster Repair Menu options to quiesce, power off, power on and resume the failing cluster bay. 2. Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25A0xxx0	L2 Cache controller problem.	1. Remove the CPU card in P1–C2 (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 2. Exchange the CPU card in P1–C1 (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the removed CPU card. If not, continue. 3. Return both CPU cards to their original slots. 4. Replace the system planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. See error code 2B2xxx22 for xxx definitions.
25A0xxx1	L2 Cache controller problem.	See 25A0xxx0 action. See error code 2B2xxx22 for xxx definitions.
25A1xxx1 to 25A1xxxB	L2 SRAM failure	1. Remove the CPU card in P1–C2 (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 2. Exchange the CPU card in P1–C1 (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the removed CPU card. If not, continue. 3. Return both CPU cards to their original slots. See error code 2B2xxx22 for xxx definitions.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
25A80xxx	NVRAM problems	NVRAM problem resolution: 1. Errors reported against NVRAM can be caused by low I/O Planar Battery voltage and (more rarely) cluster bay power problems. With the exception of the 25A80000 error, these errors are warnings that the NVRAM data content had to be reestablished and do not require any FRU replacement unless the error is persistent. 2. If the error is persistent, replace the I/O planar battery. 3. If the error is persistent after battery replacement, or the error code is 25A80000, replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25A80000	Initialization failed, device test failed.	Refer to the actions in error code 25A80xxx.
25A80001	Init-NVRAM invoked, ALL of NVRAM initialized.	Refer to the actions in error code 25A80xxx.
25A80002	Init-NVRAM invoked, some data partitions may have been preserved.	Refer to the actions in error code 25A80xxx.
25A80011	Data corruption detected, all of NVRAM initialized.	Refer to the actions in error code 25A80xxx.
25A80012	Data corruption detected, some data partitions may have been preserved.	Refer to the actions in error code 25A80xxx.
25A80100	NVRAM data validation check failed.	1. Power off and on the cluster bay and retry the operation. Connect the service terminal to the working cluster bay and use the Alternate Cluster Repair Menu options to quiesce, power off, power on and resume the failing cluster bay. 2. Replace any FRUs in the actions in error code 25A80xxx. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25A80201	Unable to expand target partition while saving configuration variable.	Refer to the actions in error code 25A80xxx.
25A80202	Unable to expand target partition while writing error log entry.	Refer to Action under error code 25A80xxx.
25A80203	Unable to expand target partition while writing VPD data.	Refer to Action under error code 25A80xxx.
25A80210	Setenv/$Setenv parameter error - name contains a null character.	Refer to Action under error code 25A80xxx.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
25A80211	Setenv/$Setenv parameter error - value contains a null character.	Refer to Action under error code 25A80xxx.
25AA0xxx	EEPROM problems.	Replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25AA0000	Unable to unlock EEPROM.	Refer to Action under error code 25AA0xxx.
25AA0001	Read-Recv error.	Refer to Action under error code 25AA0xxx.
25AA0002	Read-Trans error.	Refer to Action under error code 25AA0xxx.
25AA0003	Write-enable error.	Refer to Action under error code 25AA0xxx.
25AA0004	Write-recv error.	Refer to Action under error code 25AA0xxx.
25AA0005	Write-disable error.	Refer to Action under error code 25AA0xxx.
25AA0006	Write-Trans error.	Refer to Action under error code 25AA0xxx.
25AA0007	Unable to lock EEPROM.	Refer to Action under error code 25AA0xxx.
25B00001	No memory modules detected in either memory card 1 or 2.	1. Reseat any installed memory card(s) and retry. 2. Reseat any installed memory modules on the installed memory cards. 3. Replace Memory Card(s). **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25Cyyxxx	Memory Card problems.	See “Memory PD Bits” on page 98 for definition of ″yy″. Use the location code obtained from the SMS Error Log utility (described in ″MAP 4400: Cluster SMS Error Logs″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*) to identify which memory module (or memory module pair) the error is reported against.
25Cyy001	Incorrect memory module type is present.	One or more memory modules are the wrong type and do not match the remaining memory modules. Remove the incorrect memory modules and replace them with the correct memory module type. There might be two memory module related memory errors reported to indicate a memory module pair. One of the two memory modules could be in good condition. See “Memory PD Bits” on page 98 for definition of ″yy″. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25Cyy002	Memory module fails memory test.	1. Replace memory module. 2. Replace memory card. 3. Replace the System Planar. See “Memory PD Bits” on page 98 for definition of ″yy″. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
25Cyy003	PD bits are miss-matched or missing one memory module.	1. Make sure both memory modules in the pair are the same type. 2. Replace System Planar. See "Memory PD Bits" on page 98 for definition of ″yy″. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25Cyy004	Memory modules are disabled.	Remove the unused memory module. Ensure both cluster bays have the same amount of memory after the repair is complete. Use the service terminal Install Remove Menu, Cluster Memory Menu, List Installed Memory option. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25Cyy005	Memory module failed address test.	1. Replace memory module. 2. Replace memory card. 3. Replace System Planar. 4. Remove the CPU card in P1–C2 (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 5. Exchange the CPU card in P1–C1 (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the removed CPU card. If not, continue. 6. Return both CPU cards to their original slots. See "Memory PD Bits" on page 98 for definition of ″yy″. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25Cyy006	Memory module failed inter-extent test.	1. Replace system planar. 2. Remove the CPU card in P1–C2 (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 3. Exchange the CPU card in P1–C1 (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the removed CPU card. If not, continue. 4. Return both CPU cards to their original slots. See "Memory PD Bits" on page 98 for definition of ″yy″. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25Cyy007	Memory module failed extent access test.	1. Replace system Planar. 2. Replace CPU card. See "Memory PD Bits" on page 98 for definition of ″yy″. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
25Cyy008	Memory module has been deconfigured.	Swap the memory module with the other memory module of the same pair. Look for any new error code. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2602000x	The I/O planar PCI slot cannot recognize the card plugged into the slot.	Either the card is failing/missing or the I/O planar is failing. Replace the card in the slot or the I/O planar until it no longer fails. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
26800Cxx	Machine check occurred.	If the location code shown on the operator panel identifies a card slot, replace the card in the slot or the I/O planar until it no longer fails. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. If the location code shown does not identify a card slot, or if there is no location code, replace the I/O planar.
26800Dxx	Machine check occurred. Unable to isolate to a single device.	Attempt to start up the cluster bay again. If it still fails, see ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. If the location code shown does not identify a card slot, or if there is no location code, replace the I/O planar.
28030xxx	Real Time Clock (RTC) errors	1. Errors reported against the clock can be caused by low battery voltage and (more rarely) cluster bay power problem that occur during normal system usage. These errors are warnings that the clock data content needs to be reestablished and do not require any FRU replacement unless the error is persistent. When one of these errors occurs, the Time and Date information has been lost. 2. If the error is persistent, replace the I/O planar battery. 3. If the error is persistent after I/O planar battery replacement, replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
28030001	Clock initialization required, clock not updating, corrected.	Refer to actions in error code 28030xxx.
28030002	Incorrect time/date values.	Refer to Action under error code 28030xxx.
28030003	Clock initialization required. clock not updating, not corrected.	Replace the I/O planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
28030004	Clock operating parameters (data format) changed.	See error code 28030xxx action.
28030005	Clock battery error.	See error code 28030xxx action.
28030006	Processor frequency measurement error.	Replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
29000002	Key-Planar/Mouse controller failed self-test.	Replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
29A00003	Keyboard not present/detected.	Replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
29A00004	Key-Planar stuck key test failed.	Replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
29B00004	Mouse not present/detected.	Replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2B200402	Unsupported Processor.	1. Remove the CPU card in P1–C2 (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 2. Exchange the CPU card in P1–C1 (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the removed CPU card. If not, continue. 3. Return both CPU cards to their original slots. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2B2xxx22	Processor disabled.	1. Remove the CPU card in P1–C2 (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 2. Exchange the CPU card in P1–C1 (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the removed CPU card. If not, continue. 3. Return both CPU cards to their original slots. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. Where xxx indicates the processor type as follows: **211** Vital Product Data corrupted. Call the next level of support. **261** 166 MHz 2 way CPU card **461** 332 MHz 2 way CPU card **868** 255 MHz 2 way CPU card For Model F10 and F20, see the Retain Tip for this error code or call the next level of support. It may be possible to repair this error without replacing the CPU card. **8A8** 340 MHz 2 way CPU card
2B2xxx31	Processor failed.	See error code 2B2xxx22 for action.
2B2xxx42	Unsupported processor type.	Replace with proper CPU Card. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. See error code 2B2xxx22 for action.
2BA00xxx	Service Processor	Find exact error code in this table.
2BA00000	Service processor POST failure.	1. Power off and on the cluster bay, retry the operation. Connect the service terminal to the working cluster bay and use the Alternate Cluster Repair Menu options to quiesce, power off, power on and resume the failing cluster bay. 2. Replace the Service Processor Card (E10/E20 only). 3. Replace I/O Planar (E10/E20 and F10/F20). The F10/F20 I/O planar includes the service processor. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00012	Service processor reports self-test failure.	Refer to actions in error code 2BA00000.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
2BA00013	Service processor reports bad NVRAM CRC.	1. If problem persists, replace battery. 2. Replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00014	Service processor reports bad service processor firmware.	Attempt to reload the service processor firmware. Use the service terminal Licensed Internal Code Maintenance Menu, Firmware LIC Menu, System Planar / Service Processor Menu options. If the reload fails, replace the service processor card (E10/E20 only) or the I/O planar (F10/F20 only, which contains the SP function). **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00017	Service processor reports bad or low battery.	1. Replace the battery. 2. Replace the Service Processor Card (E10/E20 only). 3. Replace I/O Planar (E10/E20 and F10/F20). The F10/F20 I/O planar includes the service processor. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00018	EPOW test failure.	1. Replace the service processor. 2. Replace the I/O Planar (E10/E20 and F10/F20). The F10/F20 I/O planar includes the service processor. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00019	IRQ13 test failure.	1. Replace the I/O Planar. 2. Replace the Service Processor Card (E10/E20 only). The F10/F20 I/O planar includes the service processor. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00024	Service processor reports bad Power Controller firmware.	Attempt to reload the service processor firmware. Use the service terminal Licensed Internal Code Maintenance Menu, Firmware LIC Menu, System Planar / Service Processor Menu options. If the reload fails, replace the service processor card (E10/E20 only) or the I/O planar (F10/F20 only, which contains the SP function). **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00040	Service processor reports Service Processor EEPROM module not present.	Attempt to reload the service processor firmware. Use the service terminal Licensed Internal Code Maintenance Menu, Firmware LIC Menu, System Planar / Service Processor Menu options. • Replace the Service Processor Card (E10/E20 only). • Replace I/O Planar (F10/F20 only). The F10/F20 I/O planar includes the service processor. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00041	Service processor VPD is corrupted.	Refer to the actions in error code 2BA00040.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
2BA00050	Service processor reports system operator panel EEPROM module not present or not recognizable.	Replace the Cluster Bay Operator Panel. **Notes:** 1. Swap the EEPROM module from the old operator panel control assembly to the new one. 2. Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00051	System operator panel VPD data corrupted.	Refer to the actions in error code 2BA00050.
2BA00060	Service processor reports I/O Planar VPD module not present.	Replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00061	Service processor reports I/O Planar VPD data corrupted.	Replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00062	Service processor reports System Planar VPD module not present.	Replace the System Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00063	Service processor reports System Planar VPD data corrupted.	Replace the System Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00070	Service processor reports CPU card VPD module not present.	1. Remove the CPU card in P1–C2 (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 2. Exchange the CPU card in P1–C1 (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the removed CPU card. If not, continue. 3. Return both CPU cards to their original slots. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00071	VPD data corrupted for CPU in slot P1–C1.	Replace the CPU card in P1-C1 (closest to memory cards). **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00073	VPD data corrupted for CPU in P1-C2.	Replace the CPU card in slot P1–C1 (farthest away from the memory cards). Use the service terminal Repair Menu, Replace a FRU options. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00100	Service processor firmware recovery information could not be written to diskette.	1. Check diskette media write protect tab. 2. Test the diskette drive. Use the service terminal Machine Test Menu, Diskette Drive option. If it fails to write, replace the diskette drive. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00101	Service processor is not installed, update cancelled.	1. Replace the Service Processor Card (E10/E20 only). 2. Replace I/O Planar (E10/E20 and F10/F20). The F10/F20 I/O planar includes the service processor. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
2BA00102	No service processor update diskette in drive.	Insert the diskette.
2BA00103	Service processor firmware update file is corrupted, update cancelled.	1. Obtain a new service processor update diskette, or reload LIC Update code from the CD-ROM to the cluster bay. 2. Retry operation.
2BA00104	Service processor firmware update file is the same level as the service processor firmware, update cancelled.	1. Ensure a new level of service processor firmware was on the LIC Update CD-ROM. 2. Retry operation and then call the next level of support.
2BA00200	Service processor firmware update error occurred, update not completed. Error occurred during service processor flash write operation.	Service processor firmware update error recovery procedure: 1. Power off and on the cluster bay. Connect the service terminal to the working cluster bay and use the Alternate Cluster Repair Menu options to quiesce, power off, power on and resume the failing cluster bay. 2. Retry operation. If problem persists, replace the Service Processor Card (E10/E20 only) or the I/O Planar (F10/F20 only). The F10/F20 I/O planar includes the service processor. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00201	Service processor firmware update error occurred, update not completed. Error occurred while reading service processor CRC.	Refer to the actions in error code 2BA00200.
2BA00202	Service processor firmware update error occurred, update not completed. Error occurred while verifying service processor CRC.	Refer to the actions in error code 2BA00200.
2BA00203	Service processor firmware update error occurred, update not completed. Error occurred while reading new service processor CRC after updating service processor firmware.	Refer to the actions in error code 2BA00200.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
2BA00204	Service processor firmware update error occurred, update not completed. Error occurred while calculate CRC write.	Refer to the actions in error code 2BA00200.
2BA00300	Service Processor reports Slow Fan number 1	The I/O planar connector for this fan is not detecting any simulated fan rotation signals from the RPC cards. **Note:** Go to ″MAP 4740: Fan Check Detected by I/O Planar″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00301	Service Processor reports Slow Fan number 2.	See 2BA00300
2BA00302	Service Processor reports Slow Fan number 3.	See 2BA00300
2BA00303	Service Processor reports Slow Fan number 4.	See 2BA00300
2BA00309	Service Processor reports Generic Cooling Alert.	1. Check for air flow obstructions for the cluster bay. 2. Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00310	Service Processor reports CPU Over Temperature Alert.	1. Check for air flow obstructions for the cluster bay. 2. If the problem persists, replace CPU Card **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00311	Service Processor reports I/O Over Temperature Alert.	1. Check for air flow obstructions for the cluster bay. 2. Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00312	Service Processor reports Memory Over Temperature Alert.	1. Check for cool air flow obstructions to the system. 2. Replace Memory Card. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00313	Service Processor reports Generic Power Alert.	1. Use the service terminal to display and repair any related power problems. Use the Show / Repair Problems Needing Repair option. 2. Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00314	Service Processor reports 5V Over Voltage Alert.	1. Replace Electronics Cage Power Supply. 2. Replace I/O Planar. One of the three electronics cage power supplies might be failing. Use the service terminal to display problems needing repair and repair any related problems. If none are found, replace the FRUs listed above until it is repaired. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
2BA00315	Service Processor reports 5V Under Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00316	Service Processor reports 3.3V Over Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00317	Service Processor reports 3.3V Under Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00318	Service Processor reports 2.5V Over Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00319	Service Processor reports 2.5V Under Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00320	Service Processor reports +12V Over Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00321	Service Processor reports +12V Under Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00322	Service Processor reports -12V Over Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00323	Service Processor reports -12V Under Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00324	Service Processor reports 5V Standby Over Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00325	Service Processor reports 5V Standby Under Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00326	Service Processor reports PCI Expansion Card 5V Over Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00327	Service Processor reports PCI Expansion Card 5V Under Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00328	Service Processor reports PCI Expansion Card 3.3V Over Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00329	Service Processor reports PCI Expansion Card 3.3V Under Voltage Alert.	Refer to the Action under error code 2BA00314.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
2BA00330	Service Processor reports PCI Expansion Card +12V Over Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00331	Service Processor reports PCI Expansion Card +12V Under Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00332	Service Processor reports PCI Expansion Card -12V Over Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00333	Service Processor reports PCI Expansion Card -12V Under Voltage Alert.	Refer to the Action under error code 2BA00314.
2BA00334	Service Processor reports Generic Slow Shutdown request.	Refer to the Action under error code 2BA00314.
2BA00335	Service Processor reports CPU Critical Over Temperature Slow Shutdown request.	1. Check for air flow obstructions for the cluster bay. 2. Check electronics cage fans for obstructions that prevent them from normal operation. 3. Use the service terminal to show and repair any related problem logs. 4. If problem persists, replace CPU Card. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00336	Service Processor reports I/O Critical Over Temperature Slow Shutdown request.	1. Check for air flow obstructions for the cluster bay. 2. Check electronics cage fans for obstructions that prevent them from normal operation. 3. Use the service terminal to show and repair any related problem logs. 4. If problem persists, replace I/O Planar. (See notes on 72.) **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00337	Service Processor reports Memory Critical Over Temperature Slow Shutdown request.	1. Check for air flow obstructions for the cluster bay. 2. Check electronics cage fans for obstructions that prevent them from normal operation. 3. Use the service terminal to show and repair any related problem logs. 4. If problem persists, replace Memory Card. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00338	Service Processor reports Generic Fast Shutdown request.	1. Use the service terminal to display and repair any related power problems. Use the Show / Repair Problems Needing Repair option. 2. Replace I/O Planar. (See notes on 72.) **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00340	Service Processor reports Locked fan - Fast Shutdown request fan number 1.	Refer to the actions in error code 2BA00300.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
2BA00341	Service Processor reports Locked fan - Fast Shutdown request fan number 2.	Refer to the actions in error code 2BA00300.
2BA00342	Service Processor reports Locked fan - Fast Shutdown request fan number 3.	Refer to the actions in error code 2BA00300.
2BA00343	Service Processor reports Locked fan - Fast Shutdown request fan number 4.	Refer to the actions in error code 2BA00300.
2BA00350	Service Processor reports Generic Immediate Shutdown request.	1. Use the service terminal to display and repair any related power problems. Use the Show / Repair Problems Needing Repair option. 2. Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00351	Service Processor reports Generic AC power loss EPOW.	1. Use the service terminal to display and repair any related power problems. Use the Show / Repair Problems Needing Repair option. 2. Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00352	Service Processor reports Loss of power.	Use the service terminal to display and repair any related power problems. Use the Show / Repair Problems Needing Repair option. 1. Check electronics cage fans for obstructions that prevent them from normal operation. 2. Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00353	Service Processor reports Loss of power.	1. Use the service terminal to display and repair any related power problems. Connect the service terminal to the other cluster. Use the Show / Repair Problems Needing Repair option. 2. Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00360 to 2BA00376	Service Processor false power or cooling error.	1. Use the service terminal to display and repair any related power problems. Connect the service terminal to the other cluster. Use the Show / Repair Problems Needing Repair option. 2. Replace I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
2BA00399	Service Processor reports Unsupported value in EPOW.	Replace the I/O Planar
40100005	A loss of cluster bay power detected.	Use the service terminal to display and repair any related power problems. Connect the service terminal to the other cluster. Use the Show / Repair Problems Needing Repair option.
40100007	Immediate shutdown.	See error code 40100005.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
40110000	Redundant power supply failure.	See error code 40110001.
40110001 (E10/E20)	Cluster Bay Power Failure.	This information is for Model (E10/E20). See the next table entry for the Model (F10/F20) information. 1. Ensure the electronics cage power supplies (above the cluster bay) are switched on. 2. Use the service terminal to display and repair any related power problems. Connect the service terminal to the working cluster bay and use the Repair Menu, Show / Repair Problems Needing Repair option. 3. Check power cable connections to the P2 connector on the I/O Planar. 4. Replace I/O Planar. 5. Service processor card. 6. A card plugged into the I/O Planar that is drawing too much current can cause this error. One or more cards can be removed to see if the failure goes away. See ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
40110001 (F10/F20)	Cluster Bay Power Failure.	This information is for Model (F10/F20). See the previous table entry for the Model (E10/E20) information. 1. Ensure the electronics cage power supplies (above the cluster bay) are switched on (at the rear of the power supply). 2. Use the service terminal to display and repair any related power problems. Connect the service terminal to the working cluster bay and use the Repair Menu, Show / Repair Problems Needing Repair option. 3. Replace I/O Planar. 4. A card plugged into the I/O Planar that is drawing too much current can cause this error. One or more cards can be removed to see if the failure goes away. See MAP 4540: Cluster Minimum Configuration in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
40110002	Voltage not detected on both CPU Cards.	1. Use the service terminal to display and repair any related power problems. Connect the service terminal to the working cluster bay and use the Repair Menu, Show / Repair Problems Needing Repair option. 2. Check the power bus is connected to the top of each CPU card (E10/E20 only). 3. Ensure all cluster bay power cables are properly plugged into the power distribution planar, system planar.
40110003	Voltage not detected on one CPU card.	Use the service terminal to display problem needing repair and then replace the failing CPU Card. Connect the service terminal to the working cluster bay and use the Repair Menu, Display / Repair Problems Needing Repair option. If the cluster bay is not active, display the SP Problem log on the failing cluster and fix any related problems. See “Appendix A. Service Processor Operation Connection” on page 209. Replace the failing CPU card. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
40111002	An unknown power problem detected.	1. Ensure the electronics cage power supplies (above the cluster bay) are switched on. 2. Use the service terminal to display and repair any related power problems. Connect the service terminal to the working cluster bay and use the Repair Menu, Show / Repair Problems Needing Repair option. 3. Check power cable connections to the I/O Planar. 4. Replace the I/O Planar. (See notes on 72.)
40111003 (F10/F20)	Voltage is present, but not detected on one CPU card.	This is an error that should only occur when this I/O planar is installed in an RS/6000 Model H70. See error code 40111002.
40111004 to 4011100F (F10/F20)	Various power errors detected.	Power errors that would only occur when the I/O planar is installed in an RS/6000 Model H70. These errors will be found occurring in the Model H70 power supply main enclosure. See error code 40111002.
40111022	A high 5.0 voltage reading detected by a CPU card.	1. Ensure the electronics cage power supplies (above the cluster bay) are switched on. 2. Use the service terminal to display and repair any related power problems. Connect the service terminal to the working cluster bay and use the Repair Menu, Show / Repair Problems Needing Repair option. 3. Remove CPU card in the C2 slot (farthest from the memory cards). See if the problem is resolved. If problem is resolved, replace the failing CPU card. If not, continue. 4. Exchange the CPU in the C1 slot (closest to the memory cards) with the CPU card removed in the prior step and see if the problem is resolved. If the problem is resolved replace the failing CPU card. 5. If it still fails, remove one electronics cage power supplies at a time and retest. This will determine if one power supply is causing an overvoltage condition. If it still fails, call the next level of support. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
40111032	A high 3.3 voltage reading detected.	Refer to the actions in error code 40111022.
40111042	A high 2.5 voltage reading detected.	Refer to the actions in error code 40111022.
40111052	A high +12 voltage reading detected.	1. Ensure the electronics cage power supplies (above the cluster bay) are switched on. 2. Use the service terminal to display and repair any related power problems. Connect the service terminal to the working cluster bay and use the Repair Menu, Show / Repair Problems Needing Repair option. 3. Check the power cable connections to the I/O planar. 4. Replace I/O Planar. (See notes on 72.) **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
40111062	A high –12 voltage reading detected.	Refer to the actions in error code 40111052.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
40111072	A high +5 standby voltage reading detected.	1. Remove the CPU card in P1–C2 (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 2. Exchange the CPU card in P1–C1 (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the removed CPU card. If not, continue. 3. Return both CPU cards to their original slots. 4. Use the service terminal to display and repair any related power problems. Connect the service terminal to the working cluster bay and use the Repair Menu, Shoe / Repair Problems Needing Repair option. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
40111082	A low 5.0 voltage reading detected.	Refer to the actions in error code 40111022.
40111092	A low 3.3 voltage reading detected.	Refer to the actions in error code 40111022.
401110A2	A low +5 standby voltage reading detected.	Refer to the actions in error code 40111022.
401110B2	A low +12 voltage reading detected.	Refer to the actions in error code 40111052.
401110C2	A low –12 voltage reading detected.	Refer to the actions in error code 40111052.
401110D2	A low +5 voltage reading detected.	Refer to the actions in error code 40111072.
40111101	Power good signal low on either CPU Card 1 or CPU Card 2.	If the cluster bay is active, use the service terminal to display problems needing repair and then replace the failing CPU Card. If the cluster bay is not active, display the SP problem logs and then replace the failing CPU card. See “Appendix A. Service Processor Operation Connection” on page 209. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
40111102	Wrong CPU cards plugged into the system.	1. Remove cards 2. Verify part numbers 3. Install valid cards **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
40200001	An unknown cooling problem is detected.	Check cooling fans and air flow through cluster bay. If both cluster bays are failing, check customer air temperature. If only one cluster bay is failing, compare its air flow with the working cluster bay. Use the service terminal to display and repair any related power problems. Connect the service terminal to the working cluster bay and use the Repair Menu, Shoe / Repair Problems Needing Repair option. Call your next level of support.
40200021	A CPU temperature warning detected.	Over temperature on CPU card. Refer to the actions in error code 40200001.
40200023	A critical CPU temperature condition detected.	Critical temperature on CPU card. Refer to the actions in error code 40200001.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
40200031	An I/O Planar temperature warning detected.	Over temperature on I/O Planar. Refer to the actions in error code 40200001.
40200033	A critical I/O Planar temperature condition detected.	Critical temperature on I/O Planar. Refer to the actions in error code 40200001.
40200041	A memory temperature warning detected.	Over temperature on the Memory Card. Refer to the actions in error code 40200001.
40200043	A critical memory temperature condition detected.	Critical temperature on the Memory Card. Refer to the actions in error code 40200001.
40210011	A slow fan detected.	Refer to the actions in error code 2BA00300.
40210014	A stopped fan detected.	Refer to the actions in error code 2BA00300.
40210024	Loss of a redundant fan and a subsequent slow fan.	Refer to the actions in error code 2BA00300.
40210091	Loss of a redundant fan.	Refer to the actions in error code 2BA00300.
40211804	Failure to communicate with fan motor controller. This code should not occur in a 2105 Model Exx/Fxx. This error should only occur when the I/O planar is installed in an RS/6000 Model H70.	Refer to the actions in error code 2BA00300. **Note:** This RS/6000 Model H70 firmware error should not occur when the I/O planar is installed in a 2105 Exx/Fxx. This error will occur during the MES conversion from Exx to Fxx clusters.
40A00000 E10/E20)	System firmware IPL failure.	1. Call the next level of support. Service processor surveillance mode is set and should not be set. Use “Appendix A. Service Processor Operation Connection” on page 209. 2. Remove the CPU card in the C2 slot (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 3. Exchange the CPU card in the C1 slot (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the failing CPU card. 4. System Planar (model F10/F20 only). 5. Replace I/O Planar. 6. Replace the Service Processor Card (E10/E20 only). The F10/F20 I/O planar includes the service processor. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
40A00000 (F10/F20)	System firmware IPL failure.	1. Remove the CPU card in the C2 slot (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 2. Exchange the CPU card in the C1 slot (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the failing CPU card. 3. System Planar (model F10/F20 only). 4. Replace I/O Planar. 5. Replace the Service Processor Card (E10/E20 only). The F10/F20 I/O planar includes the service processor. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
40B00000	The operating system surveillance interval exceeded.	See 40A00000
40B00100	Surveillance time-out on CPU 1.	Replace the CPU card in slot P1–C1 (closest to memory cards). **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
40B00101	Surveillance time-out on CPU 2.	Refer to the actions in error code 40B00100.
40B00102	Surveillance time-out on CPU 3.	Replace the CPU card in slot P1-C2 (farthest away from the memory cards). **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
40B00103	Surveillance time-out on CPU 4.	Refer to the actions in error code 40B00102.
40D00003	An unknown slow shutdown commanded.	1. Critical cooling problem. Check to ensure the customer air temperature is in the proper range. 2. Use the service terminal to display and repair any related power problems. Connect the service terminal to the working cluster bay and use the Repair Menu, Shoe / Repair Problems Needing Repair option.
40D00004	An unknown fast shutdown commanded.	Locked fan failure detected. See the action for error code 2BA00300.
40D00101	BIST on I/O Planar failed.	Replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
40D00102	BIST on System Planar failed.	Replace the System Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
45800000	Memory controller check-stop.	Replace the System Planar. If the problem is not resolved, go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
45B00001	A non-compatible memory card is detected.	Replace the memory card, as indicated by the physical location code. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
45C00000	Memory check-stop. (Uncorrectable memory error)	One of the memory cards, one of the memory DIMMs, or the system planar is failing. If the cluster bay comes ready, display and repair the related problem log. Connect the service terminal to the working cluster bay and use the Repair Menu Show / Repair Problems Needing Repair option. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. If the cluster bay hangs, go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
48800909	System VPD error.	1. Check the cable to the cluster operator panel. 2. Replace cluster operator panel. Remember to move EEPROM from old panel to new panel, unless the EEPROM itself is bad. 3. Replace the I/O Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4880090A	Generic VPD error.	If the cluster bay hangs, go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4880090B	Error identifying system type using VPD.	The VPD is read through the I2C bus on the following FRUs: • Cluster Operator Panel • I/O planar • Service Processor Card (model E10/E20 only; the model F10/F20 service processor is on the I/O planar). • System planar • CPU cards • Memory cards and DIMMs (model F10/F20 only) **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4880090C	Jtag unable to confirm system type using system VPD.	Verify that all cards installed in the cluster bay are valid cards. If it still fails, call the next level of support.
4B2xxx00	Check-stop	1. Use the service processor General User menu, Read Progress indicators from the Last System Boot option to display the last posted code. If the code is ″E105″ or ″0xxx″, continue at the next step. If the code is not ″E105″ or ″0xxx″, look up the code and action in “Chapter 9: Error Messages, Diagnostic Codes, and Service Reports” on page 71. 2. Remove the CPU card in P1–C2 (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 3. Exchange the CPU card in P1–C1 (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the removed CPU card. If not, continue. 4. Return both CPU cards to their original slots. 5. Go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4B2xxx01	Check-stop - Slot P1-C1 failure	1. CPU card in P1-C1 (closest to the memory cards). 2. System planar. 3. I/O planar (model F10/F20 only).

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
4B2xxx02	Check-stop - Slot P1-C2 failure	1. CPU card in P1-C2 (farthest away from the memory cards). 2. System planar. 3. I/O planar (model F10/F20 only).
4B2xxx10	Machine Check-0	1. Remove the CPU card in P1-C2 (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 2. Exchange the CPU card in P1-C1 (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the removed CPU card. If not, continue. 3. Return both CPU cards to their original slots. 4. Go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4B2xxx11	Machine Check-1 (stuck active)	1. Remove the CPU card in P1–C2 (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 2. Exchange the CPU card in P1–C1 (closest to the memory cards) with the CPU card removed in step one. If the problem is resolved, replace the removed CPU card. If not, continue. 3. Return both CPU cards to their original slots. 4. Replace the system planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4B2xxx41	ABIST fail	1. CPU card in slot C1 (closest to the memory cards). 2. I/O planar. 3. Electronics cage sense card.
4B2xxx42	ABIST fail	1. CPU card in slot C2 (farthest away from the memory cards). 2. I/O planar.
4B2xxx43	Service Processor reports JTAG fail	For Models E10/E20: 1. The FRUs for this error are the I/O planar, system planar, CPU card in P1-C1, CPU card in P1-C2, and the SP card. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. 2. You can use ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1* to isolate one of the above failing FRUs. For Models F10/F20: 1. Remove the CPU card in P1-C2 slot. If the problem is resolved, replace the failing CPU card. If not, continue. 2. Remove the CPU card in P1-C1 slot and install the CPU card removed from the P1-C2 slot. If the problem is resolved, replace the failing CPU card. If not, continue. 3. Return both CPU cards to their original slots. 4. Replace the system planar. 5. Replace the I/O planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
4B2xxx51	LBIST fail	1. CPU card in slot P1-C1 (closest to the memory cards). 2. I/O planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4B2xxx52	LBIST fail	1. CPU card in slot P1-C2 (farthest away from the memory cards). 2. I/O planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4B200054	The CPU cards are not compatible with each other.	1. Remove cards 2. Verify part numbers 3. Install valid cards **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4B200055	No CPU card in first slot.	1. A CPU card must always be in slot P1-C1 (closest to the memory cards). 2. Replace the card in slot C1. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4B200056	No CPU card in first slot.	See error code 4B200055 action.
4B200057	The CPU cards are not compatible with each other.	Verify the CPU card part number. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4B200058	Compatibility test on CPU card in slot P1-C1 (closest to memory cards) failed.	Verify the CPU card part number. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4B200059	Compatibility test on CPU card in slot P1-C2 (farthest away from the memory cards) failed.	Verify the CPU card part number. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4B20000A	No configured CPU found.	For Model F10 and F20, see the Retain Tip for this error code or call the next level of support. It may be possible to repair this error without replacing the CPU card. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
4B201000	Check-stop	1. Display the SP error logs. Replace FRUs for those that have a recent timestamp. See “Appendix A. Service Processor Operation Connection” on page 209. 2. Remove CPU card in the C2 slot (farthest from the memory cards). See if the problem is resolved. If problem is resolved replace the failing CPU card. If not, continue. 3. Exchange the CPU in the C1 slot (closest to the memory cards) with the CPU card removed in the prior step and see if the problem is resolved. If the problem is resolved replace the failing CPU card 4. Go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. (See notes on 72.) **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4B201020	TEA Error	Refer to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA00000	The system support controller detects the Service Processor, but cannot establish communication. The system halts.	1. Replace the Service Processor Card (E10/E20 only). 2. Replace I/O Planar (E10/E20 and F10/F20). The F10/F20 I/O planar includes the service processor. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA00001	The system support controller cannot detect the service processor.	1. Replace the Service Processor Card (E10/E20 only). 2. Replace I/O Planar (E10/E20 and F10/F20). The F10/F20 I/O planar includes the service processor. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA00800	Unknown error.	Ensure that the latest level of firmware software is installed. If the problem persists, call the next level of support. **Note:** Use the service terminal LIC internal code maintenance menu, firmware LIC menu, system planar/service processor menu option.
4BA00826	Service processor cannot call home.	Replace the I/O planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA00827	Flash update floppy diskette failure.	Try another diskette, or replace the diskette drive. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA00828	Flash update (crc) checksum failure.	Reload the system firmware and service processor firmware. **Note:** Use the service terminal LIC internal code maintenance menu, firmware LIC menu, system planar/service processor menu option.
4BA00829	Bad system firmware.	Replace the I/O planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA00830	Boot failure.	**Note:** Go to ″MAP 4020: SCSI Hard Drive Build″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA00831	Bad service processor image.	Reload the service processor firmware. **Note:** Use the service terminal LIC internal code maintenance menu, firmware LIC menu, system planar/service processor menu option.

Table 6. Firmware Error Codes. (continued)

Error Code	Description	Action/ Possible Failing FRU
4BA00832	Error during flash update.	1. Reload the service processor and I/O planar firmware. **Note:** Use the service terminal LIC internal code maintenance menu, firmware LIC menu, system planar/service processor menu option. 2. If failure persists, replace the I/O planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA10001	SSC sram fail	Refer to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA10002	SSC sram fail	Refer to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA10003	Service Processor Fail.	1. Replace the Service Processor Card (E10/E20 only). 2. Replace I/O Planar (F10/F20). The F10/F20 I/O planar includes the service processor. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA10004	Service Processor Firmware Fail.	1. If the cluster bay is working, restore or update the Service Processor Flash EPROM. **Note:** Use the Service Terminal Firmware LIC Menu, System Planar / Service Processor Menu options. 2. If the cluster bay is hung, Replace the Service Processor Card (E10/E20 only), or Replace I/O Planar (F10/F20). The F10/F20 I/O planar includes the service processor.
4BA10005	I²C Path Fail.	1. I/O Planar. (See notes on 72.) 2. Remove the CPU card in P1–C2 (farthest away from the memory cards). If the problem is resolved, replace the removed CPU card. If not, continue. 3. Exchange the CPU card in P1–C1 (closest to the memory cards) with the CPU card removed from P1–C2 in step 1.If the problem is resolved, replace the removed CPU card. If not, continue. 4. Return both CPU cards to their original slots. 5. System Planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA80013	NVRAM	Refer to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
4BA80014	NVRAM (crc) checksum failure.	Recoverable temporary condition, unless succeeded by 4BA80015.
4BA80015	NVRAM reinitialization failure.	I/O planar. **Note:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Memory PD Bits

The following table expands the firmware error code **25Cyyxxx** on page 78, where **yy** is the PD values in the table below. Use these values to identify the type of memory that generated the error.

If you replace FRUs and the problem is still not corrected, go to MAP 0030 in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems* unless otherwise indicated in the tables.

Table 7. Memory DIMM PD bits

PD value	Size	Clock Cycle (nsecs)	Parity/ECC
38	128 MB	10	ECC
68	256 MB	10	ECC

Note: Memory modules must be installed in pairs.

Bus SRN to FRU Reference Table

These tables are used to locate defective FRUs within the I/O Planar PCI and ISA buses. These tables indicate which devices should be tested for each SRN. For this procedure, if possible, diagnostics are run on the I/O Planar bus devices with all adapters removed from the failing bus. If a failure is detected on this system with all adapters removed from the failing bus, the I/O Planar is the isolated FRU. If a failure is not detected, the adapters are added back one at a time, to their original slot location, and the configuration is tested until a failure is detected. The failure is then isolated to the failing FRU.

If a failure has not been detected and all the FRUs have been tested call your technical service support person for assistance.

Go to the correct table for your product:

- 2105 Model E10/E20, go to Table 8.
- 2105 Model F10/F20, go to Table 9 on page 100.

*Table 8. Bus SRN to FRU Reference Table (***Models E10/E20 Only***)*

SRN	Bus Identification	Possible Failing Device and AIX Location Code	Associated FRU
9CC-100	PCI Bus 00	Internal SCSI port 1 (10-60)	I/O Planar. (See notes on 72)
		Internal Ethernet port (10-80)	I/O Planar. (See notes on 72)
		Device installed in I/O Slot K3 (10-68 to 10-6F)	SSA Device Card
		Device installed in I/O Slot I4 (10-70 to 10-77)	I/O Attachment Card
		Device installed in I/O Slot I5 (10–78 to 10–7F)	NVS Card
9CC-101	PCI Bus 01	Device installed in I/O Slot K1 (20-58 to 20-5F)	SSA Device Card
		Device installed in I/O Slot K2 (20-60 to 20-67)	SSA Device Card
9CC-102	PCI Bus 02	Internal/External SCSI port 2 (30-58)	I/O Planar (See notes on 72)
		Device installed in I/O Slot I6 (30-60 to 30-67)	NVS Card
		Device installed in I/O Slot I7 (30-68 to 30-6F)	I/O Attachment Card
		Device installed in I/O Slot 8P (30-70 to 30-77)	I/O Planar
		Device installed in I/O Slot K9 (30-78 to 30-7F)	SSA Device Card
651-730	ISA Bus	Diskette Drive port/device (01-D1-00-00)	I/O Planar
		Parallel port/device (01-R1)	I/O Planar
		Serial ports (1-3)/device (01-S1 to 01-S3)	I/O Planar
		Mouse port/device (01-K1-01-00)	I/O Planar
		Key-Planar port/device (01-K1-00-00)	I/O Planar
		Device installed in I/O Slot 8I (01-01 or 01-02)	I/O Planar
		Device installed in I/O Slot 9I (01-01 or 01-02)	I/O Planar

*Table 9. Bus SRN to FRU Reference Table (***Models F10/F20 Only***)*

SRN	Bus Identification	Possible Failing Device and AIX Location Code	Associated FRU
9CC-100	PCI Bus 00	Internal SCSI port 1 (10-60)	I/O Planar (See notes on 72)
		Internal Ethernet port (10-80)	I/O Planar (See notes on 72)
		Device installed in I/O Slot K3 (10-68 to 10-6F)	SSA Device Card
		Device installed in I/O Slot K4 (10-70 to 10-77)	SSA Device Card
9CC-101	PCI Bus 01	Device installed in I/O Slot K1 (20-58 to 20-5F)	SSA Device Card
		Device installed in I/O Slot K2 (20-60 to 20-67)	SSA Device Card
9CC-102	PCI Bus 02	Internal/External SCSI port 2 (30-58)	I/O Planar. (See notes on 72)
		Device installed in I/O Slot I7 (30-68 to 30-6F)	NVS Card
		Device installed in I/O Slot I8 (30-70 to 30-77)	I/O Attachment Card
9CC-103	PCI Bus 03	Device installed in I/O Slot I5 (40-58 to 40-5F)	I/O Attachment Card
		Device installed in I/O Slot I6 (40-60 to 40-67)	NVS Card
651-730	ISA Bus	Diskette Drive port/device (01-D1-00-00)	I/O Planar
		Parallel port/device (01-R1)	I/O Planar
		Serial ports (1-3)/device (01-S1 to 01-S3)	I/O Planar
		Mouse port/device (01-K1-01-00)	I/O Planar
		Key-Planar port/device (01-K1-00-00)	I/O Planar
		Device installed in I/O Slot 8I (01-01 or 01-02)	I/O Planar
		Device installed in I/O Slot 9I (01-01 or 01-02)	I/O Planar

Checkpoints

Checkpoints are intended to let users and service support representative know what the server is doing, with some detail, as it initializes. These checkpoints are not intended to be error indicators, but in some cases a server could hang at one of the checkpoints without displaying an 8-character error code. It is for these hang conditions, only, that any action should be taken with respect to checkpoints. The most appropriate action is included with each checkpoint.

Before taking actions listed with a checkpoint, it is a good idea to look for better symptoms in the Service Processor error log. See “Appendix A. Service Processor Operation Connection” on page 209.

SP Checkpoints

Service Processor checkpoints are in the range E010 to E0FF. The message **OK** indicates successful service processor testing and initialization. Firmware checkpoints are listed in “Firmware Checkpoints” on page 105.

To replace listed FRUs, connect the service terminal to the working cluster and then use the Repair Menu, Replace A FRU options.

Notes:

1. If no FRUs are listed or you have replaced the listed FRUs and the problem is still not corrected, go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Attention: If this failure first occurred after replacing the I/O Planar (Model Exx/Fxx) or Service Processor Card (Model Exx only), the firmware level may be incompatible. Call the next level of support.

2. Call the next level of support for any of the following conditions:
   - A four-digit code in the range of E001 through EFFF displays on the operator panel but is not listed in the checkpoint table.
   - A four-digit code displays in the checkpoint table, but does not contain a repair action or FRU listing.
   - All of the FRUs listed in the repair action have been replaced and the problem has not been corrected.

Table 10. SP Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E000	System Support Controller begins operation. This is an informational checkpoint.	See note1 on page 100
E010	Starting SP self-tests	1. Service Processor (E10/E20 only) 2. I/O Planar(F10/F20 only, see notes on 72)
E011	SP self-tests completed successfully	None
E012	Begin to set up Service Processor helps	1. Service Processor (E10/E20 only) 2. I/O Planar(F10/F20 only, see notes on 72)
E01F	Bad self-test, cannot continue	Call next level of support
E020	Configuring CMOS	1. I/O Planar (See notes on 72) 2. Service Processor (E10/E20 only)
E021	Configuring NVRAM	1. I/O Planar (See notes on 72) 2. Service Processor (E10/E20 only)
E022	Accessing System Backplane VPD	System Planar
E023	Accessing Memory Card 1 VPD	Memory Card 1 (P1-M1)
E024	Accessing Memory Card 2 VPV	Memory Card 2 (P1-M2)
E025	Problem accessing VPD on memory card 1	I/O Planar(F10/F20 only, see notes on 72)
E026	Problem accessing VPD on memory card 2	I/O Planar(F10/F20 only, see notes on 72)
E02E	False ″Hot Swap″ fans and power supply condition	1. I/O Planar (Call next level if it still fails)
E030	Beginning to build I2C resources	1. Service Processor (E10/E20 only) 2. CPU Card 3. I/O Planar (See notes on 72)
E031	Finished building I2C resources	1. Service Processor (E10/E20 only) 2. CPU Card 3. I/O Planar (See notes on 72)
E032	JTAG Self-Test	I/O Planar
E040	Starting serial port tests	1. Service Processor (E10/E20 only) 2. I/O Planar (See notes on 72) 3. CPU Card
E042	Configuring serial port 1	1. Service Processor (E10/E20 only) 2. I/O Planar (See notes on 72) 3. CPU Card

Table 10. SP Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E043	Configuring serial port 2	1. Service Processor (E10/E20 only) 2. I/O Planar (See notes on 72) 3. CPU Card
E044	Preparing to set serial port line speed	1. Service Processor (E10/E20 only) 2. I/O Planar (See notes on 72) 3. CPU Card
E045	Preparing to initialize serial port	1. Service Processor (E10/E20 only) 2. I/O Planar (See notes on 72) 3. CPU Card
E050	Reading system VPD	Cluster Operator Panel
E051	Reading processor VPD	Processor Card, see 1 on page 100
E052	Reading memory card and DIMM VPD	Memory Card or Cards and/or DIMMs, see 1 on page 100
E053	Reading system planar VPD	System Planar
E054	Reading I/O planar VPD	I/O Planar
E055	Reading power supply VPD	False error for the 2105.I/O Planar
E060	Preparing to auto power-on (AC restored)	1. Service Processor (E10/E20 only) 2. I/O Planar (See notes on 72) 3. CPU Card
E061	Preparing to auto power-on (Timer)	1. Service Processor (E10/E20 only) 2. I/O Planar (See notes on 72) 3. CPU Card
E070	Configuring modem	1. Modem 2. Service Processor (E10/E20 only) 3. I/O Planar (See notes on 72) 4. CPU Card
E072	Preparing to call home	1. Modem 2. Service Processor (E10/E20 only) 3. I/O Planar (See notes on 72) 4. CPU Card
E075	Entering SP menus	Normal if service terminal is connected and displaying the SP menu. 1. Service Processor (E10/E20 only) 2. I/O Planar (See notes on 72) 3. CPU Card
E076	Leaving SP menus; attempting to disconnect modems	1. Service Processor (E10/E20 only) 2. I/O Planar (See notes on 72) 3. CPU Card

Table 10. SP Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E080	Entering Service Processor emergency firmware flash recovery process.	Call the next level of support before doing the following: 1. I/O Planar, OR 2. Insert a new DOS formatted diskette containing the service processor firmware into the diskette drive. The image file name must be **spflash.img**. **Note:** ONLY insert the diskette after the operator panel displays E080 code. 3. Power the cluster off then on and rerun the flash recovery.
E081	Flash update completed - system reboot in progress	1. Power the cluster off then on and rerun the flash recovery. 2. Retry a service processor emergency flash update (if possible) as documented in the checkpoint code E080. 3. I/O Planar, see 1 on page 100 4. 5.
E0A0	Beginning Bring-Up Phase	1. Service Processor (E10/E20 only) 2. CPU Card 3. I/O Planar (See notes on 72)
E0B0	Starting CPU BIST	1. CPU Card 2. I/O Planar (See notes on 72) 3. Service Processor (E10/E20 only)
E0C0	Starting X5 BIST	1. CPU Card 2. I/O Planar (See notes on 72) 3. Service Processor (E10/E20 only)
E0D0	Creating scan log is slow, wait for completion	None
E0E0	Pulling CPU out of reset	1. CPU Card 2. I/O Planar (See notes on 72) 3. Service Processor (E10/E20 only)
E0E1	Pull CPU out of reset: **OK**	1. CPU Card 2. I/O Planar 3. System Planar (See notes on 72) 4. Service Processor (E10/E20 only)
E164	Create PCI graphics node (P9)	See 1 on page 100
E168	Create PCI graphics node (S3)	See 1 on page 100
E16C	GTX100P Subsystem Open request	See 1 on page 100
E16D	GTX100P planar not detected or failed diagnostics	See 1 on page 100
E16E	GTX100P subsystem open successful	See 1 on page 100
E16F	GTX100P	See 1 on page 100
E240	Setup Winbond ISA bridge	I/O Planar, see 1 on page 100

Table 10. SP Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E241	Reset PCI bus	I/O Planar, see 1 on page 100
E242	Initialize ISA DMA channel	I/O Planar, see 1 on page 100
E243	Setup grackle configuration registers	I/O Planar, see 1 on page 100
E244	Enable system speaker and send a beep!	I/O Planar, see 1 on page 100
E246	System firmware corrupted, take recover path	I/O Planar, see 1 on page 100
E247	Capture DIMM SPDs into NVRAM	I/O Planar, see 1 on page 100
E249	Enter recover paths main code	I/O Planar, see 1 on page 100
E24C	L2 cache array test fails, system hangs	I/O Planar, see 1 on page 100
E24D	L2 cache array test fails, system hangs	I/O Planar, see 1 on page 100
E297	Start firmware softload path execution	See 1 on page 100
E298	Start firmware recovery path execution	See 1 on page 100
E299	Start C code execution	See 1 on page 100
E600	SSA PCI adapter open firmware has run successfully	SSA card, identify the adapter by using ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1* to isolate the failing SSA card
E601	SSA PCI adapter BIST has been started but failed to complete after four seconds	See Action/Possible Failing FRU with Checkpoint E600
E602	SSA PCI adapter open firmware has started	See Action/Possible Failing FRU with Checkpoint E600
E603	SSA PCI adapter BIST has completed with an error	See Action/Possible Failing FRU with Checkpoint E600
E604	SSA PCI adapter BIST and following POSTs have completed successfully	See Action/Possible Failing FRU with Checkpoint E600
E605	SSA PCI adapter BIST has completed successfully, the following POSTs have failed	See Action/Possible Failing FRU with Checkpoint E600
E60E	SSA PCI adapter open firmware about to exit (no stack corruption)	See Action/Possible Failing FRU with Checkpoint E600
E60F	SSA PCI adapter open firmware has run unsuccessfully	See Action/Possible Failing FRU with Checkpoint E600
E6FF	SSA PCI adapter open firmware about to exit (with stack corruption)	See Action/Possible Failing FRU with Checkpoint E600
F0FF	Service processor firmware fail	See “Firmware/POST Error Codes” on page 73 for 4BA10004
OK	SP Ready Waiting for Power-On	None, Normal operation
READY	SP Cluster Bay may be powered off if CD-ROM tray does not open when the eject button is pressed	None, Normal operation
STBY	SP Ready, system was shutdown by the operating system and is still powered on	This condition can be requested by a privileged system user with no faults. See SP error log for possible operating system fault indications.

Table 10. SP Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
DIAG STBY	SP Ready. The system unit was shutdown in service mode by the operating system; however, the system unit is still powered on.	This condition can be requested by a privileged system user with no faults. See service processor error log for possible operating system fault indications.

Firmware Checkpoints

Firmware uses progress codes (checkpoints) in the range of E1xx to EFFF. These checkpoints occur during system startup and maybe be useful in diagnosing certain problems. Service Processor checkpoints are listed in “SP Checkpoints” on page 100.

To replace listed FRUs, connect the service terminal to the working cluster and then use the Repair Menu, Replace A FRU options.

If you replace FRUs and the problem is still not corrected, go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*, unless otherwise indicated in the tables.

Table 11. Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E100	Reserved	See note 1 on page 100.
E101	Video enabled, extended memory test	See note 1 on page 100.
E102	Firmware restart	See note 1 on page 100.
E103	Set memory refresh (composite img)	See note 1 on page 100.
E104	Set memory refresh (recovery block)	See note 1 on page 100.
E105	Transfer control to Operating System (normal boot).	See ″MAP 4320: E1xx SCSI Hard Drive Code Boot″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. **Note:** This can also be caused by a failure of a CPU card.
E108	Run recovery block base memory (test 2K), set stack	See note 1 on page 100.
E109	Copy CRC verification code to RAM	See note 1 on page 100.
E10A	Turn on cache	See note 1 on page 100.
E10B	Flush cache	See note 1 on page 100.
E10C	Jump to CRC verification code in RAM	See note 1 on page 100.
E10D	Compute composite image CRC	See note 1 on page 100.
E10E	Jump back to ROM	See note 1 on page 100.
E10F	Transfer control to Open Firmware	See note 1 on page 100.
E110	Turn off cache, Check if composite image CRC is valid	See note 1 on page 100.
E111	GOOD CRC - jump to composite image	See note 1 on page 100.
E112	BAD CRC - initialize base memory, stack	See note 1 on page 100.
E113	BAD CRC - copy uncompressed recovery block code to RAM	See note 1 on page 100.
E114	BAD CRC - jump to code in RAM	See note 1 on page 100.
E115	BAD CRC - turn on cache	See note 1 on page 100.

Table 11. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E116	BAD CRC - copy recovery block data section to RAM	See note 1 on page 100.
E117	BAD CRC - Invalidate and flush cache, set TOC	See note 1 on page 100.
E118	BAD CRC - branch to high level recovery control routine.	See note 1 on page 100.
E119	Initialize base memory, stack	See note 1 on page 100.
E11A	Copy uncompressed recovery block code to RAM	See note 1 on page 100.
E11B	Jump to code in RAM	See note 1 on page 100.
E11C	Turn on cache	See note 1 on page 100.
E11D	Copy recovery block data section to RAM	See note 1 on page 100.
E11E	Invalidate and flush cache, set TOC	See note 1 on page 100.
E11F	Branch to high level control routine.	See note 1 on page 100.
E120	Initialize I/O and early memory block	See note 1 on page 100.
E121	Initialize S.P.	See note 1 on page 100.
E122	No memory detected (system lockup)	1. Memory Modules 2. Memory Card 3. System Planar 4. See note 1 on page 100.
E123	No memory module found in socket.	See note 1 on page 100.
E124	Disable defective memory bank	See note 1 on page 100.
E125	Clear PCI devices command reg, go forth	See note 1 on page 100.
E126	Check valid image - start	See note 1 on page 100.
E127	Check valid image - successful	See note 1 on page 100.
E128	Disable interrupts, set int vectors for O.F.	See note 1 on page 100.
E129	Validate target RAM address	See note 1 on page 100.
E12A	Copy ROM to RAM, flush cache	See note 1 on page 100.
E12B	Set MP operational parameters	See note 1 on page 100.
E12C	Set MP cpu node characteristics	See note 1 on page 100.
E12D	Park secondary processors in parking lot	See note 1 on page 100.
E12E	Primary processor sync	See note 1 on page 100.
E12F	Unexpected return from Open Firmware (system lockup)	See note 1 on page 100.
E130	Build device tree	See note 1 on page 100.
E131	Create ROOT node	See note 1 on page 100.
E132	Create CPUs node	See note 1 on page 100.
E133	Create L2 Cache node	See note 1 on page 100.
E134	Create memory node	See note 1 on page 100.
E135	Create memory module node	See note 1 on page 100.
E136	Test memory	See note 1 on page 100.
E137	Create openprom node	See note 1 on page 100.
E138	Create options node	See note 1 on page 100.
E139	Create aliases node and system aliases	See note 1 on page 100.

Table 11. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E13A	Create packages node	See note 1 on page 100.
E140	PReP style load	See note 1 on page 100.
E149	Create boot mgr node	See note 1 on page 100.
E14C	Create terminal-emulator node	See note 1 on page 100.
E14D	Load boot image	See ″MAP 4320: E1xx SCSI Hard Drive Code Boot″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
E14E	Create client interface node/directory	See note 1 on page 100.
E14F	NVRAM validation, config variable token generation	See note 1 on page 100.
E150	Create host (primary) PCI controller node	See note 1 on page 100.
E151	Probing primary PCI bus	1. I/O Attachment Cards. 2. SSA Cards. 3. NVS Cards. 4. I/O Planar. See note 1 on page 100.
E152	Probe for adapter FCODE, evaluate if present	1. I/O Attachment Cards 2. SSA Cards. 3. NVS Cards. 4. I/O Planar Go to ″MAP 4770: E152 Cluster Hang″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
E153	End adapter FCODE, probe/evaluation	See note 1 on page 100.
E154	Create PCI bridge node	See note 1 on page 100.
E155	Probe PCI bridge secondary bus	1. I/O Attachment Cards. 2. SSA Cards. 3. NVS Cards. 4. I/O Planar. See note 1 on page 100.
E156	Create PCI ethernet node	See note 1 on page 100.
E15A	Create 64 bit host (primary) PCI controller node	See note 1 on page 100.
E15B	Transferring control to Operating System (service mode boot)	See ″MAP 4320: E1xx SCSI Hard Drive Code Boot″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
E15C	Probe primary 64 bit PCI bus	See note 1 on page 100.
E15D	Create host PCI controller node	See note 1 on page 100.
E15E	Create MPIC node	See note 1 on page 100.
E15F	Adapter VPD probe	See note 1 on page 100.
E160	CPU node VPD creation	See note 1 on page 100.
E161	Root node VPD creation	See note 1 on page 100.
E162	SP node VPD creation	See note 1 on page 100.
E170	Start of PCI Bus Probe	See note 1 on page 100.

Table 11. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E171	Executing PCI-Delay function	See note 1 on page 100.
E174	Establish host connection	Refer to ″MAP 4320: E1xx SCSI Hard Drive Code Boot″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*, for general considerations. The cluster bay is not able to boot from the SCSI hard drive and is instead trying to boot from the ethernet connection. Call the next level of support. Use the SMS Menu options to ensure the default boot list is active which will attempt to boot from the SCSI hard drive before the network connection. Reference “Appendix B. System Management Service Operation Connection” on page 233. Call the next level of support.
E175	BootP request	See Checkpoint E174.
E176	TFTP file transfer	See note 1 on page 100.
E177	Transfer failure due to TFTP error condition	See note 1 on page 100.
E178	Create PCI token ring node	See note 1 on page 100.
E17B	Processor frequency measurement	1. I/O Planar Battery 2. I/O Planar
E180	SP Command setup	See note 1 on page 100.
E183	SP Post	See note 1 on page 100.
E190	Create ISA node	See note 1 on page 100.
E193	Initialize Super I/O.	See note 1 on page 100.
E196	Probe ISA bus.	See note 1 on page 100.
E19B	Create Service Processor node.	See note 1 on page 100.
E19C	Create tablet node.	See note 1 on page 100.
E19D	Create NVRAM node.	See note 1 on page 100.
E19E	Real time clock (clock) creation and initialization.	Refer to error code 28030xxx in “Firmware/POST Error Codes” on page 73.
E19F	Create eeprom node.	See note 1 on page 100.
E1AD	See description of checkpoint E1DE.	See note 1 on page 100.
E1B0	Create lpt node.	See note 1 on page 100.
E1B1	Create serial node.	See note 1 on page 100.
E1B2	Create audio node.	See note 1 on page 100.
E1B3	Create 8042 node.	See note 1 on page 100.
E1B6	Probe for (ISA) Key-Planar.	See note 1 on page 100.
E1BA	Enable L2 cache.	See note 1 on page 100.
E1BB	Set cache parms for burst.	See note 1 on page 100.
E1BC	Set cache parms for 512KB.	See note 1 on page 100.
E1BD	Probe for (ISA) mouse.	See note 1 on page 100.

Table 11. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E1BE	Create op-panel node.	See note 1 on page 100.
E1BF	Create pwr-mgmt node.	See note 1 on page 100.
E1C0	Create ISA ethernet node.	See note 1 on page 100.
E1C5	Create ISA interrupt controller (pic) node.	See note 1 on page 100.
E1C6	Create dma node.	See note 1 on page 100.
E1D0	Create PCI SCSI node.	See note 1 on page 100.
E1D3	Create (* wildcard *) SCSI block device node (SD).	See note 1 on page 100.
E1D4	Create (* wildcard *) SCSI byte device node (ST).	See note 1 on page 100.
E1DB	Create floppy controller (FDC) node.	See note 1 on page 100.
E1DC	Dynamic console selection.	The S1 port is defined as the system console port even though no system console is ever attached to the cluster bay. Simulate replacing the I/O planar battery, go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. Do the included procedure to define the S1 port. If the cluster bay still hangs with E1DC, replace the I/O planar using the same MAP.
E1DD	Early processor exception	I/O Planar (See notes on 72.) See note 1 on page 100.
E1DE	Alternating pattern of E1DE and E1AD is used to indicate a Default Catch condition before the firmware ″checkpoint″ word is available.	1. I/O Planar (See notes on 72.) See note 1 on page 100.
E1DF	Create diskette drive (disk) node	See note 1 on page 100.
E1E0	Program flash	See note 1 on page 100.
E1E1	Flash update complete	See note 1 on page 100.
E1E2	Initialize System I/O	See note 1 on page 100.
E1E3	PReP boot image initialization.	See note 1 on page 100.
E1E4	Initialize Super I/O with default values.	See note 1 on page 100.
E1E5	XCOFF boot image initialization.	See note 1 on page 100.
E1E6	Set up early memory allocation heap.	See note 1 on page 100.
E1E7	PE boot image initialization.	See note 1 on page 100.
E1E8	Initialize primary diskette drive (polled mode).	See note 1 on page 100.
E1E9	ELF boot image initialization.	See note 1 on page 100.
E1EA	Firmware flash corrupted.	Call the next level of support. (In a standard RS/6000 a flash recovery diskette would be used for recovery.) Replace the I/O planar.
E1EB	Verify flash EPROM recovery image in LIC library on SCSI hard drive.	Call the next level of support. (In a standard RS/6000 a flash recovery diskette would be used for recovery.) See note 1 on page 100.

Table 11. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E1EC	Get recovery image entry point	See note 1 on page 100.
E1ED	Invalidate instruction cache	See note 1 on page 100.
E1EE	Jump to composite image	See note 1 on page 100.
E1EF	Erase flash	See note 1 on page 100.
E1F0	Start O.B.E.	See note 1 on page 100.
E1F1	Begin self-test sequence on boot device(s)	See note 1 on page 100.
E1F2	Power on password prompt	A power on password should not be set. Call the next level of support. The SP menus options may need to be used to disable the password.
E1F3	Privileged access password prompt	A privileged access password should not be set. Call the next level of support. The SP menus options may need to be used to disable the password.
E1F5	Build boot device list.	See note 1 on page 100.
E1F6	Determine boot device sequence.	See note 1 on page 100.
E1F7	No boot image located.	See note 1 on page 100.
E1FB	Scan SCSI bus for attached devices.	See note 1 on page 100.
E1FD	Default Catch	The operator panel will alternate between the code E1FD and another Exxx code, where Exxx is the point at which the error occurred. If the Exxx is not listed in this table, go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
E201	Setup PHB BARC addresses.	I/O Planar See note 1 on page 100.
E202	Initialize PHB registers and PHB's PCI configuration registers.	I/O Planar See note 1 on page 100.
E203	Look for PCI to ISA bridge.	I/O Planar See note 1 on page 100.
E204	Setup ISA bridge. PCI config. registers and initialize	I/O Planar See note 1 on page 100.
E206	Check for 50 MHz device on PCI Bus in Slots 1P or 2P.	1. I/O Planar 2. SSA cards in I/O planar slots 1P or 2P. 3. See note 1 on page 100.
E207	Setup Data gather mode and 64/32-bit mode on PCG.	I/O Planar See note 1 on page 100.
E208	Assign bus number on PCG.	I/O Planar See note 1 on page 100.
E209	Assign PCI I/O addresses on PCI.	I/O Planar See note 1 on page 100.
E20A	Assign PCI I/O addresses on PCG	I/O Planar. See note 1 on page 100.
E20B	Check MCERs stuck at fault.	1. System Planar. See note 1 on page 100. 2. If the problem persists, go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
E20C	Testing L2 cache.	CPU card See note 1 on page 100.
E211	IPL ROS CRC checking.	I/O Planar. See note 1 on page 100.

Table 11. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E212	Processor POST.	CPU card. See note 1 on page 100.
E213	Initial memory configuration.	1. Memory card. 2. System Planar. See note 1 on page 100.
E214	Memory test.	Memory card. See note 1 on page 100.
E216	Copy ROS into RAM. Setup Translation and C environment.	Memory card. See note 1 on page 100.
E218	Memory test.	Memory card. See note 1 on page 100.
E220	Final memory configuration.	Go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
E3xx	Memory test.	Memory card. See note 1 on page 100.
E440	Validate NVRAM, initialize partitions as needed.	1. Call the next level of support. 2. Verify that the system and SP firmware levels are at the current release levels, update as necessary. 3. Replace the memory card. See notes on 72 and on 1 on page 100.
E441	Generate /options node NVRAM configuration variable properties.	1. Call the next level of support. 2. Verify that the system and SP firmware levels are at the current release levels, update as necessary. 3. Memory card. See notes on 72 and on 1 on page 100.
E442	Validate NVRAM partitions.	1. Call the next level of support. 2. Verify that the system and SP firmware levels are at the current release levels, update as necessary. 3. Replace the memory card. See notes on 72 and on 1 on page 100.
E443	Generate NVRAM configuration variable dictionary words.	Suspect a system firmware problem if this problem persists. Verify that the system firmware is at the current release level, update as necessary. See note 1 on page 100. Replace the I/O planar

Location Codes

This system unit uses Physical Location Codes in conjunction with AIX Location Codes to provide mapping of the failing field replaceable units. The location codes are produced by the system unit's firmware and AIX.

Physical Location Codes

Physical location codes provide a mapping of logical functions in a platform (or expansion sites for logical functions, such as connectors or ports) to their specific locations within the physical structure of the platform. Refer to"Location Codes" on page 2.

Location Code Format

The format for the location code is an alphanumeric string of variable length, consisting of a series of location identifiers, separated by the standard dash (-) or slash (/) character. The series is hierarchical; that is, each location identifier in the string is a physical child of the one preceding it.

- The - (dash) separator character represents a normal structural relationship where the child is a separate physical package and it plugs into (or is connected to) the parent. For example, P1-C1 is a CPU card (C1) plugged into a Planar (P1), or P1-M1 is a memory card (M1) plugged into a Planar (P1).
- The / (slash) separator character separates the base location code of a function from any extended location information. A group of logical devices can have the same base location code because they are all on the same physical package, but may require extended location information to describe the connectors they support. For example, P2/S1 describes the location of the serial port 1 controller and its connector (S1), which is located on Planar P2 (its base location code), but the / indicates that further devices can be connected to it at the external S1 serial connector. The Key-Planar controller and its connector likewise have location code P2/K1, which means they have the same base location code (P2) as serial port 1, but a different external connector. In contrast, the location code P2-K1 actually points to the device connected to connector K1; that is, the Key-Planar. The location code P2/Z1 indicates an integrated SCSI controller which drives connector Z1, while location codes of P2-Z1-... point to the actual SCSI bus and devices.

Each location identifier consists of one alpha prefix character that identifies a location type, and a decimal integer number (typically one or two digits) that identifies a specific instance of this location type. Certain location types may also support secondary sub-locations, which are indicated by appending a period (″.″) character and a sub-location instance number.

Specifically, the format of a location code is defined as follows:

pn[.n][- or /]pn[.n][- or /]...

Where p is a defined alpha location type prefix, n is a location instance number, and [.n] is a sub-location instance number (where applicable). Sub-location notation is used only for location types which have clearly defined and limited expansion sites; for example, memory SIMMs slots on a memory card. Primarily, the [.n] sub-location notation is intended for use as an abbreviation of the location code in cases where:

1. Based on the device structure, the abbreviated sub-location code conveys the same information in a more concise form than an additional level of location identifier -- for example:
   - P1-M1.4 (pluggable DIMM 4 on Memory Card 1 on Planar 1), rather than P1-M1-M4
   - P1-C1.1 (pluggable CPU 1 on CPU Card 1 on Planar 1), rather than P1-C1-C1
   - P2-Z1-A3.1 (LUN 1 at SCSI ID 3 on integrated SCSI bus 1 from Planar 2), rather than P2-Z1-A3-A1
2. The sub-location is either a basic physical extension or sub-enclosure of the base location, but does not represent additional function or connectivity; for example, a drawer in a rack (U1.2) or a riser card on an I/O Planar (P2.1).

Description of the Service Request Number List

The service request number (SRN) list is in numerical sequence by the SRN. The columns in the table are used as follows:

Service Request Number

Usually a six-digit number representing a specific failure of a specific function.

Source of SRN (SRN Src.)

SRN source codes identify the program or procedure that produced the SRN:

A The SRN is from a steady number in the operator panel display.

B The SRN is from a MAP callout.

C The SRN was due to a missing resource at configuration time.

D The SRN is from a diagnostic test after complete isolation testing.

E The SRN is from a POST failure.

F The SRN is from a diagnostic test after partial isolation testing.

G The SRN is from the Problem Log.

H The SRN is from a diagnostic message after a flashing 888

J The SRN is from built-in ROM diagnostics.

K The SRN is from off-line diagnostics.

Failing Function Codes
These numbers represent functional areas of the cluster bay. The “Failing Function Codes” on page 131 identifies the FRU that contains this function for each specific cluster bay.

Description and Action
This column lists a brief description of the failure this SRN represents. It also may contain instructions as to what to do to continue the problem analysis.

How to Use the Service Request Number List

Note: If there are any other problem logs for this cluster bay that need repair, see ″MAP 1200: Prioritizing Visual Symptoms and Problem Logs for Repair″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*

The service request number list is in numerical sequence by the SRN.

1. Find your SRN in the table.
2. Record the failing function codes in the order listed.
3. See the “Failing Function Codes” on page 131 to convert the FFC to a FRU. Return here and continue.
4. Read the SRN description and action (if listed). If no action is listed, then replace the FRU(s) in the order listed by the FFCs. To replace the cluster bay FRUs, go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

   Notes:

   a. x in an SRN represents any digit or character.

   b. If your SRN is not listed, check to see if xxx has been used. The -xxx should always be the last SRN identified within a specific prefix. An example would be 950-xxx. The xxx is the last digit within the 950 prefix.

   c. If the code is not found in this table, call the next level of support.

      This table only includes the most likely of the hundreds of possible codes for the RS/6000. For a complete listing, refer to the *RS/6000 Diagnostic Information for Multiple Bus Systems* book, SA38-0509. The **Action/Possible Failing FRU** listed fir the RS/6000 may need to be modified for use with the 2105 Model Exx/Fxx product.

Service Request Number List

Table 12. Service Request Numbers

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
101-000	A		**Description:** The cluster bay hung while attempting to configure a device. **Action:** Go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
101-185	A		**Description:** A Check-stop occurred. **Action:** Go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
101-517	A		**Description:** The cluster bay failed to IPL. **Action:** Go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
101-518	A		**Description:** CD-ROM read problems after boot. **Note:** The boot record was read from the CD-ROM disk. However, errors occurred when trying to mount the CD-ROM file system. **Action:** Test the CD-ROM Drive. Boot from the SCSI Hard Drive (normal cluster bay power on). Connect the service terminal, use Main Service Menu, then Machine Test Menu, then CD-ROM Drive option.
101-521 to 101-538	A		**Description:** The configuration manager detected an error. **Action:** Call the next level of support. (This information is for the next level of support.) If you are running the diagnostics from the SCSI Hard Drive, try running the diagnostics from a CD-ROM. If the diagnostics run correctly from CD-ROM, the problem may be damaged data on the disk. Go to ″MAP 4020: SCSI Hard Drive Build″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. If a different problem occurs when you run the diagnostics from CD ROM, correct that problem. If you were running from a CD ROM at first, or have the same problem on CD ROM that you had when running diagnostics from disk then go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
101-544	A		**Description:** Disk read problems occurred after booting. **Note:** The boot record was read from the disk. However, errors occurred when trying to open the disk drive. This problem can be caused by SCSI device addressing, SCSI terminator, open PTC, SCSI cable, etc. **Action:** Go to ″MAP 4020: SCSI Hard Drive Build″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
101-551 to 101-557	A		**Description:** The cluster bay hung while loading the software. This can be caused by a hardware or software problem. **Action:** Test the cluster bay. Connect the service terminal, use Main Service Menu, then Machine Test Menu, then cluster bay. If no problem is found, then go to ″MAP 4020: SCSI Hard Drive Build″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
101-558	A		**Description:** There is not enough memory to execute diagnostics. **Action:** There must be a minimum of 16 MB of installed memory. The memory card can be replaced now, or the minimum configuration map can be used to remove some of the memory to isolate the problem. Go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
101-559 to 101-599	A		**Description:** The cluster bay halted while software was loading. This problem may be attributed to either hardware or software. **Action:** Test the cluster bay. Boot from the SCSI Hard Drive (normal cluster bay power on). Connect the service terminal, use Main Service Menu, then Machine Test Menu, then cluster bay. If no problem is found, then go to ″MAP 4020: SCSI Hard Drive Build″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
101-711 to 101-726	A		**Description:** The cluster bay hung while trying to configure an unknown resource. **Action:** Test the cluster bay. Connect the service terminal, use Main Service Menu, then Machine Test Menu, then cluster bay. If no problem is found, then go to ″MAP 4020: SCSI Hard Drive Build″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
101-727	A	212	**Description:** The cluster bay hung while trying to configure an asynchronous adapter.
101–80C	A	7C1	**Description:** A potential problem with an SSA device exists. Use the service terminal Repair Menu, Show / Repair Problem Needing Repair option for any related problems.
101–840	A	169	**Description:** An unexpected system interrupt. Suspect the integrated SCSI adapter on the I/O planar. **Action:** Go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
101-888	A	227 E10	**Description:** The cluster bay does not IPL.
101-c33	D		**Description:** The cluster bay hung while indicating that a service terminal is the system console. **Action:** Go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*: Changing cluster FRUs and do the procedure for replacing the I/O planar battery which will reset the NVRAM values. You will need to remove the battery and ground the battery socket contacts. You do not need to install a new battery unless you suspect the battery has lost its charge.
101–c70	A		**Description:** The cluster bay hung while indicating that a service terminal is the system console.
101-xxx	A	xxx 227	**Description:** A problem was encountered mounting the CD-ROM. **Action:** Try another CD-ROM and then call the next level of support.
103-151	D	151	**Description:** The time-of-day battery on the I/O planar failed.
103-202 to 103-210	H		**Description:** Unexpected interrupt. **Action:** Go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Codes

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
109-200	B		**Description:** The cluster bay crashed while running. **Action:** Test the cluster bay. Connect the service terminal, use Main Service Menu, then Machine Test Menu, then cluster bay. If no problem is found, then call your next level of support.
110-101	C		**Description:** The diagnostics did not detect an installed resource. **Action:** Call next level of support. For next level of support, run diag -a command to list missing resource and then replace it.
110–908	D		**Description:** The diagnostics did not detect an installed resource. **Action:** Call next level of support. For next level of support, run diag -a command to list missing resource and then replace it.
110-921 to 110-926	D	xxx 812	**Description:** The cluster bay halted while diagnostics were executing. **Note:** xxx corresponds to the last three digits of the SRN.
110-935	D	935 812	**Description:** The cluster bay halted while diagnostics were executing.
110-946	D	946 221	**Description:** The cluster bay halted while diagnostics were executing.
110-xxx	D	xxx 221	**Description:** The cluster bay halted while diagnostics were executing. **Note:** xxx corresponds to the last three digits of the SRN. If your 110 SRN is not listed below, use the 110-xxx procedure.
111-259	B		**Description:** Cannot display readable information on the terminal. **Action:** Use ″MAP 4020: SCSI Hard Drive Build″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
111-999	D	210	**Description:** Cluster Bay does not perform a soft reset.
651-140	D	165 221	**Description:** Operator panel display test failed
651-150	D	2E0	**Description:** I/O planar fan sensor indicates a fan has failed. **Note:** Go to ″MAP 4740: Fan Check Detected by I/O Planar″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
651-151	D	152 2E2	**Description:** Sensor indicates a voltage is outside the normal range. **Note:** The **FRUs and Notes** for Failing Function Code 152 will have you display and repair any other related problem logs, see “Failing Function Codes” on page 131.
651-152	D	2E1	**Description:** Sensor indicates an abnormally high internal temperature. **Action:** Verify that: 1. The room ambient temperature is within the cluster bay operating environment. 2. There is unrestricted air flow around the cluster bay. 3. There are no fan failures. Use the service terminal to show and repair any related problems. If none of these problems exist, replace the FRU.
651-153	D	152 2279	**Description:** Sensor indicates a power supply has failed.
651-159	D		**Description:** Sensor indicates a FRU has failed. **Action:** Instead of using a failing function code, use the physical location code or codes to replace the FRU or FRUs that are identified on the problem report screen.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
651-160	D	2E0	**Description:** I/O planar sensor indicates a fan is turning too slowly. **Note:** Go to ″MAP 4740: Fan Check Detected by I/O Planar″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
651-161	D	152 2E2	**Description:** Sensor indicates a voltage is outside the normal range.
651-162			**Description:** See SRN 651-152
651-170	D		**Description:** Sensor status not available. **Action:** Contact your next level of support.
651-171	D		**Description:** Sensor status not available **Action:** Contact your next level of support.
651-600	G		**Description:** Uncorrectable memory or unsupported memory. **Action:** Examine the memory modules and determine if they are supported types. If the modules are supported, then replace the appropriate memory module(s).
651-601	G		**Description:** Missing or bad memory **Action:** If the installed memory matches the reported memory size, then replace the memory: otherwise, add the missing memory.
651-603	G	2C6 2C7	**Description:** Bad or missing memory
651-605	G	2C6	**Description:** Failed memory module **Action:** The most probable failure is the memory module paired with the memory module identified by the location code.
651-608	G	D01	**Description:** Bad L2 Cache
651-609	G	D01	**Description:** Missing L2 Cache
651-610	G	210	**Description:** CPU internal error
651-611	G	210	**Description:** CPU internal cache error
651-612	G	D01	**Description:** L2 Cache parity or multi-bit ECC error
651-613	G	D01	**Description:** L2 cache ECC single-bit error
651-614	G	214	**Description:** Time-out error waiting for memory controller
651-615	G	292	**Description:** Time-out error waiting for I/O
651-619	G		**Description:** Problem log analysis indicates an error detected by the CPU. The error log indicates the following physical FRU location(s) as the probable cause(s). **Action:** Use the physical location codes to replace the FRUs that are identified on the problem detail screen.
651-621 and 651-623	G	2C6	**Description:** Correctable error threshold exceeded
651-624	G	214	**Description:** Memory controller internal error
651-625	G	214	**Description:** Memory Address (Bad address going to memory)
651-626	G	214	**Description:** Memory Data error (Bad data going to memory)
651-627	G	214	**Description:** Memory time-out error
651-628	G	210	**Description:** Processor time-out error

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
651-629	G		**Description:** Problem log analysis indicates an error detected by the memory controller. The error log indicates the following physical FRU location(s) as the probable cause(s). **Action:** Use the physical location codes to replace the FRUs that are identified on the problem detail screen.
651-639	G		**Description:** Problem log analysis indicates an error detected by the I/O. The error log indicates the following physical FRU location(s) as the probable cause(s). **Action:** Use the physical location codes to replace the FRUs that are identified on the problem detail screen.
651-640	G	2D5	**Description:** I/O general bus error.
651-641	G	2D6	**Description:** Secondary I/O general bus error
651-642	G	2D3	**Description:** Internal Service Processor memory error
651-643	G	2D3	**Description:** Internal Service Processor firmware error
651-644	G	2D3	**Description:** Other internal Service Processor hardware error
651-710	G	214 2C4	**Description:** Address/Data parity error on Processor bus
651-711	G	214 210 2C4	**Description:** Address/Data parity error on Processor bus
651-712	G	214 210 2C4	**Description:** Address/Data parity error on Processor bus
651-713	G	214 2C4	**Description:** Transfer error on Processor bus
651-714	G	214 210 2C4	**Description:** Transfer error on Processor bus
651-715	G	214 210 2C4	**Description:** Transfer error on Processor bus
651-721	G	2C6 2C7 214	**Description:** Uncorrectable Memory Error
651-722	G	210 2C4 214	**Description:** Processor bus parity error
651-723	G	210 2C4 214	**Description:** Processor bus parity error
651-724	G	292 2C8 214 763	**Description:** I/O Host Bridge time-out error
651-725	G	292 2C8 214 763	**Description:** I/O Host Bridge address/data parity error
651-730	G		**Description:** I/O error on the ISA bus. **Action:** See “Bus SRN to FRU Reference Table” on page 99.
651-731	G	2C8 292 763	**Description:** Intermediate or Cluster Bay Bus Address Parity Error.
651-732	G	2C8 292 763	**Description:** Intermediate or Cluster Bay Bus Data Parity Error.
651-733	G	214 2C8 292	**Description:** Intermediate or Cluster Bay Bus Address Parity Error.
651-734	G	214 2C8 292	**Description:** Intermediate or Cluster Bay Bus Data Parity Error.
651-735	G	2D2 292	**Description:** Intermediate or Cluster Bay Bus Time-out Error.
651-736	G	2D2 292 214	**Description:** Intermediate or Cluster Bay Bus Time-out Error.
651-740	G	2D3 2D4	**Description:** Time-out on communication response from Service Processor
651-741	G	2D3 2D4	**Description:** Service Processor error accessing special registers
651-742	G	2D3 2D4	**Description:** Service Processor reports unknown communication error

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
651-743	G	2D7 2D5	**Description:** Service Processor error accessing Vital Product Data EEPROM
651-744	G	165 2D5 2D3	**Description:** Service Processor error accessing Operator Panel
651-745	G	2D9 2D5	**Description:** Service Processor error accessing Power Controller
651-746	G	2E0 2D5	**Description:** Service Processor error accessing Fan Sensor
651-747	G	2E1 2D5	**Description:** Service Processor error accessing Thermal Sensor
651-748	G	2E2 2D5	**Description:** Service Processor error accessing Voltage Sensor
651-749	G	2E3 2D4	**Description:** Service Processor error accessing Serial Port
651-750	G	814 2D4	**Description:** Service Processor error accessing NVRAM
651-751	G	817 2D4	**Description:** Service Processor error accessing Real-Time Clock/Time-of-Day Clock
651-752	G	2E4 2D4	**Description:** Service Processor error accessing JTAG/COP controller/hardware
651-753	G	151 2D4	**Description:** Service Processor detects loss of voltage from the Time-of-Day Clock backup battery
651-754	G		**Description:** A failure has occurred in the power distribution network. **Action:** If a location code is present, check the cable connections at that location. If there is no location code, check all the power distribution cable connections starting at the processor drawer then through each I/O drawer.
651-760	G		**Description:** Service Processor caused a reboot of the system due to a surveillance time-out. **Action:** A surveillance time-out is caused by lack of response from the operating system. The most likely cause is a software failure. The reboot may have corrected the problem.
651-801	G		**Description:** Fan stop was detected. **Note:** Go to ″MAP 4740: Fan Check Detected by I/O Planar″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
651-810	G	152 2E2	**Description:** Over voltage condition was detected
651-811	G	152 2E2	**Description:** Under voltage condition was detected
651-812	G	152	**Description:** Cluster Bay shutdown due to: 1. Loss of 2105 Model Exx/Fxx power and batteries were not available. 2. Loss of power to the cluster bay. **Action:** Display problems needing repair and repair any power, battery or cluster bay related problems.
651-813	G		**Description:** Cluster Bay shutdown due to loss of 2105 Model E10/E20 input power.
651–818	G		**Description:** Power fault due to manual activation of power off request. Call next level of support.
651-819	G		**Description:** Power fault due to internal power supply failure.
651-820	G	2E1	**Description:** An over temperature condition was detected **Action:** See SRN, 651-652

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
651-821	G	2E1	**Description:** Cluster Bay shutdown due to an over maximum temperature condition being reached. **Action:** See SRN, 651-152
651-831	G	152 2E2	**Description:** Sensor detected a voltage outside of the normal range.
651-832	G	2E1	**Description:** Sensor detected an abnormally high internal temperature. **Action:** See SRN, 651-152
651-839	G		**Description:** Sensor detected a FRU that has failed. **Action:** Use the physical location code(s) to replace the FRU(s) that are identified on the problem detail screen.
651-841	G	152 2E2	**Description:** Sensor detected a voltage outside of the normal range.
651-842	G	2E1	**Description:** Sensor detected an abnormally high internal temperature. **Action:** See SRN, 651-152
651-843	G	152 E19	**Description:** Sensor detected a power supply failure.
651-849	G		**Description:** Sensor detected a FRU that has failed. **Action:** Use the physical location code(s) to replace the FRU(s) that are identified on the problem detail screen.
652-600	G		**Description:** A non-critical error has been detected and corrected: Uncorrectable memory or unsupported memory. **Action:** Examine the memory modules and determine if they are supported types. If the modules are supported, then replace the appropriate memory module(s).
652-610	G	210	**Description:** A non-critical error has been detected and corrected: CPU internal error.
652-611	G	210	**Description:** A non-critical error has been detected and corrected: CPU internal cache error.
652-612	G	D01	**Description:** A non-critical error has been detected and corrected: L2 cache parity or multi-bit ECC error.
652-613	G	D01	**Description:** A non-critical error has been detected and corrected: L2 cache ECC single-bit error.
652-623	G	2C6	**Description:** A non-critical error has been detected and corrected: Correctable error threshold exceeded.
652-731	G	2C8 292	**Description:** A non-critical error has been detected and corrected: Intermediate or Cluster Bay Bus Address Parity Error.
652-732	G	2C8 292	**Description:** A non-critical error has been detected and corrected: Intermediate or Cluster Bay Bus Data Parity Error.
652-733	G	214 2C8 292	**Description:** A non-critical error has been detected and corrected: Intermediate or Cluster Bay Bus Address Parity Error.
652-734	G	214 2C8 292	**Description:** A non-critical error has been detected and corrected: Intermediate or Cluster Bay Bus Data Parity Error.
652-735	G	2D2 292	**Description:** A non-critical error has been detected and corrected: Intermediate or Cluster Bay Bus Time-out Error.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
652-736	G	2D2 292 214	**Description:** A non-critical error has been detected and corrected: Intermediate or Cluster Bay Bus Time-out Error.
652-773	G	227	**Description:** A non-critical error has been detected and corrected. Intermediate or Cluster Bay Bus Data Parity Error.
652-810	G	152	**Description:** Non-critical power problem.
652-819	G		**Description:** Power fault.
652-839	G		**Description:** Sensor detected a redundant FRU failure. **Action:** Use the physical location code(s) to replace the FRU(s) that are identified on the problem detail screen.
670-21x	D	670	**Description:** Diagnostic detected ultra SCSI host card failure. Probable cause is the ultra SCSI host card.
670-22x	D	670	**Description:** Diagnostic detected ultra SCSI host card failure. Probable cause is the ultra SCSI host card.
670-23x	D	670	**Description:** Diagnostic detected ultra SCSI host card external SCSI bus failure. Probable cause is the SCSI cable, terminator, or host system. The ultra SCSI host card could be failing.
670-240	D	670	**Description:** Diagnostic detected ultra SCSI host card external SCSI bus failure. Probable cause is the SCSI cable, terminator, or host system. The ultra SCSI host card could be failing.
670-301	D	670	**Description:** Diagnostic detected ultra SCSI host card external SCSI bus failure. Probable cause is the SCSI cable, terminator, or host system. The ultra SCSI host card could be failing.
670-700	G	670	**Description:** Problem log analysis indicates a possible ultra SCSI host card failure. Probable cause is the ultra SCSI host card.
670-80x	G	670	**Description:** Problem log analysis indicates a possible ultra SCSI host card SCSI bus failure. Probable cause is the SCSI cable, terminator, or host system. The ultra SCSI host card could be failing.
689-098	J	689 B88	**Description:** The SCSI Hard Drive indicates an error.
689-099	J	689 B88	**Description:** The SCSI Hard Drive not found.
689-102	D	689	**Description:** An unrecoverable media error occurred.
689-104	D	689	**Description:** The SCSI Hard Drive motor failed to restart.
689-105	D	689	**Description:** The SCSI Hard Drive did not become ready.
689-106	D	689	**Description:** The SCSI Hard Drive electronics card test failed.
689-108	D	689	**Description:** The SCSI Hard Drive bus test failed.
689-110	D	689	**Description:** The SCSI Hard Drive media format is corrupted.
689-112	D	689	**Description:** The SCSI Hard Drive diagnostic test failed.
689-114	D	689	**Description:** The SCSI Hard Drive has unrecoverable hardware error.
689-116	D		**Description:** A protocol error. **Action:** Call you next level of support.
689-117	D	689	**Description:** A SCSI Hard Drive write protect error occurred.
689-118	D	689 B88	**Description:** A SCSI Hard Drive command time-out occurred.
689-120	D	689	**Description:** A SCSI Hard Drive busy or command error.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
689-122	D	689	**Description:** A SCSI Hard Drive reservation conflict error.
689-124	D	689	**Description:** A SCSI check condition error occurred.
689-126	D	689 B88	**Description:** A software error was caused by a SCSI Hard Drive failure.
689-128	G	689	**Description:** The error log analysis indicates a SCSI Hard Drive failure.
689-129	G	D50 689 B88 software	**Description:** Problem log analysis indicates a SCSI bus problem.
689-130	G	689	**Description:** Problem log analysis indicates a problem reported by the SCSI Hard Drive's self monitoring function.
689-132	D	689	**Description:** A SCSI Hard Drive hardware error occurred.
689-134	D	B88 software	**Description:** The adapter failed to configure.
689-135	D	689 B88 software	**Description:** The SCSI Hard Drive failed to configure.
689-136	D	689	**Description:** The certify operation failed.
689-137	D	689 B88 D50	**Description:** Unit attention condition has occurred on the **Send Diagnostic** command.
7C1-101	D	7C1 software	**Description:** Audio support failed (not used)
7C1-102	D	7C1	**Description:** CS4232 failed
7C1-103	D	7C1	**Description:** Clock control failed
7C1-107	D	7C1	**Description:** SoundBlaster support interface failed (not used)
7C1-108	D	7C1	**Description:** Loop back failed
7C1-109	D	7C1	**Description:** CODEC ID invalid
7C1-117	D	D97	**Description:** Internal speaker support failed (not used)
802-78C	C		**Description:** A system bus problem exists. **Action:** System bus problem isolation
802-xxx	C	xxx	**Description:** The diagnostics did not detect an installed resource. **Note:** To obtain the FFC substitute the last three digits of the SRN for xxx. Display problems needing repair, there should be a related problem. If not, call the next level of support.
803-xxx (See note in Action column.)	D	Use the xxx number	**Description:** Diagnostics detected an error. **Action:** Replace the FRU identified by the failing function code. If it still fails, then go to ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
804-111	D	804 B88	**Description:** Unable to reserve device.
804-112	D	804 B88	**Description:** Unable to do configuration.
804-113	D	804 B88	**Description:** Unable to open the device driver.
804-121	D	804	**Description:** The CD-ROM drive indicates an error.
804-122	D	804	**Description:** The CD-ROM drive indicates an error.
804-123	D	804	**Description:** The CD-ROM drive indicates an error.
804-125	D	804 B88	**Description:** The CD-ROM drive indicates an error.
804-126	D	804	**Description:** The CD-ROM drive indicates an error.
804-127	D	804	**Description:** The CD-ROM drive indicates an error.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
804-128	D	804	**Description:** The CD-ROM drive indicates an error.
804-129	D	804	**Description:** The CD-ROM drive indicates an error.
804-150	D	Media 804	**Description:** A media error was detected.
804-151	D	804 B88	**Description:** A command time-out was detected.
804-152	D	804	**Description:** A command reservation conflict was detected.
804-162	D	804	**Description:** The CD-ROM drive indicates an error.
804-171	D	804	**Description:** Unable to reserve device.
804-172	D	804	**Description:** Unable to do configuration.
804-173	D	804	**Description:** Unable to open device driver.
804-175	D	804	**Description:** The CD-ROM drive indicates an error.
804-198	D	804 B88	**Description:** Undefined error detected.
804-199	D	804	**Description:** Undefined error detected.
804-211	D	804	**Description:** The LED test failed.
804-281	D	804	**Description:** No tone during audio test.
804-301	G	804	**Description:** Errors found during ELA.
804-302	G	804 B88	**Description:** Errors found during ELA.
804-xxx	H	Use the xxx number	**Description:** An unexpected halt occurred while running the diagnostics. **Note:** If your 804-xxx SRN is listed in this section, use the procedure for that SRN instead of this one. **Action:** Call next level of support.
805-600	G		**Description:** Problem log analysis indicates a machine check due to uncorrectable memory error or unsupported memory. **Action:** Examine the memory modules and determine if they are supported types. If the modules are supported, then replace the appropriate memory module(s).
805-601	G	210	**Description:** Problem log analysis indicates a machine check due to CPU internal cache error.
805-602	G	214 D01	**Description:** Problem log analysis indicates a machine check due to CPU address/data bus parity error.
805-603	G	210 214 D01	**Description:** Problem log analysis indicates a machine check due to CPU bus transfer error.
805-604	G	210 D01	**Description:** Problem log analysis indicates a machine check due to CPU address/data bus parity error.
805-605	G	210	**Description:** Problem log analysis indicates a machine check due to CPU bus transfer error.
805-606	G	214	**Description:** Problem log analysis indicates a machine check due to memory controller internal error.
805-607	G	210 214	**Description:** Problem log analysis indicates a machine check due to memory address error.
805-608	G	214 217	**Description:** Problem log analysis indicates a machine check due to a Flash ROM error.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
805-609	G	D01	**Description:** Problem log analysis indicates a machine check due to a L2 parity error.
805-610	G	227	**Description:** Problem log analysis indicates a machine check due to ISA device error, but the device could not be identified.
805-611	G	227	**Description:** Problem log analysis indicates a machine check due to EISA/ISA bus time out error, but the device could not be identified.
805-612	G	214	**Description:** Problem log analysis indicates a machine check due to an Illegal L2 copy-back operation.
805-616	G	software	**Description:** Problem log analysis indicates a machine check due to software.
805-617	G		**Description:** Problem log analysis indicates a machine check of unknown origin. **Action:** If the problem is persistent, use ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
805-618	G		**Description:** Problem log analysis indicates multiple instances of machine check of unknown origin. **Action:** If the problem is persistent, use ″MAP 4540: Cluster Minimum Configuration″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
805-619	G	221	**Description:** Problem log analysis indicates a machine check due to an unidentified source on the I/O subsystem.
805-621	G	292	**Description:** Problem log analysis indicates a machine check due to Integrated PCI device does not respond.
805-622	G	293	**Description:** Problem log analysis indicates a machine check due to Integrated PCI device does not respond.
805-623	G	294	**Description:** Problem log analysis indicates a machine check due to Integrated PCI device does not respond.
805-624	G	295	**Description:** Problem log analysis indicates a machine check due to Integrated PCI device does not respond.
805-625	G	868	**Description:** Problem log analysis indicates a machine check due to Integrated PCI device does not respond.
805-631	G	292	**Description:** Problem log analysis indicates a machine check due to Internal error from PCI device.
805-632	G	293	**Description:** Problem log analysis indicates a machine check due to Internal error from PCI device.
805-633	G	294	**Description:** Problem log analysis indicates a machine check due to Internal error from PCI device.
805-634	G	295	**Description:** Problem log analysis indicates a machine check due to Internal error from PCI device.
805-635	G	868	**Description:** Problem log analysis indicates a machine check due to Internal error from PCI device.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
805-649	G	software	**Description:** Problem log analysis indicates a machine check due to a disabled I/O address space. **Action:** Call the next level of support. For RS/6000 repairs, stand-alone diagnostics are run by the service representative on all devices. Use any SRN reported. If no other SRN is reported, suspect a software problem
805-802	G	152 210	**Description:** Over/Under voltage condition. **Action:** Check AC line voltage per the Power MAP in your service guide. If the AC line voltage is correct replace the listed FRUs.
805-805	G	152	**Description:** Cluster Bay shutdown due to loss of AC power. **Action:** Refer to ″MAP 1320: Visual Symptoms″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
805-812	D	152 210	**Description:** Over/Under voltage condition. **Action:** Check the AC line voltage per the Power MAP in your service guide. If the AC line voltage is correct replace the listed FRUs.
805-813	D	2E1 210	**Description:** Cluster Bay shutdown due to non-critical over temperature condition. **Action:** 1. Check for obstructions to cooling air flow. 2. Check for accumulated dust on the CPU and Planar. If reasons 1 and 2 can be ruled out, then replace the listed FRUs.
806-619	G	221	**Description:** Problem log analysis indicates a machine check due to an unidentified source on the I/O subsystem.
814-112	D	814	**Description:** The NVRAM test failed.
814-113	D	221	**Description:** The VPD test failed.
814-114	D	814	**Description:** I/O Card NVRAM test failed.
815-100	D	815	**Description:** The floating-point processor test failed.
815-101	D	815	**Description:** Floating point processor failed.
815-102	D	815	**Description:** Floating point processor failed.
815-200	D	815 7C1	**Description:** Floating point processor failed.
815–201	D	815	**Description:** The CPU card processor has a status of failed. CPU card processors with a failed status are deconfigured and cannot be tested or used by the system.
816-140	D	165 816	**Description:** The four-digit display test failed.
817-123	D	817	**Description:** The I/O Planar time-of-day clock test failed.
817-124	D	817	**Description:** Time of day RAM test failed.
817-210	D	817	**Description:** The time-of-day clock is at POR.
817-211	D	817 169	**Description:** Time of day POR test failed.
817-212	D	151 816	**Description:** The battery is low.
817-213	D	817	**Description:** The real-time clock is not running.
817-215	D	817	**Description:** Time of day clock not running test failed.
817-217	D	817 169	**Description:** Time of day clock not running.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
821-221	D	821	**Description:** The Key-Planar adapter test failed.
821-230	D	221	**Description:** Software error caused by hardware failure.
821-240	G	821	**Description:** The error log analysis indicates hardware failure.
821-241	G	221	**Description:** The error log analysis indicates hardware failure.
821-310 to 821-331	D	821	**Description:** Standard Key-Planar Adapter failed.
821-332	D	821 software	**Description:** Cannot open device.
821-333 to 821-334	D	821	**Description:** Key-Planar/tablet adapter failed.
823-121 to 823-122	D	823	**Description:** Built-In mouse adapter problems.
823-130	D	221	**Description:** Software error caused by hardware failure.
823-132 to 823-133	D	823	**Description:** Built-In mouse adapter problem.
823-134	D	823 software	**Description:** Cannot open device.
823-140	G	823	**Description:** The error log analysis indicates hardware failure.
823-142	D	823	**Description:** Unable to place mouse adapter in block mode.
824-331	D	824 227	**Description:** An unexpected error occurred.
824-332	D	824 227	**Description:** The enable/disable device test failed. **Note:** Ensure that the wrap plug was not attached when the test was run. If the wrap plug was attached, remove it, and rerun the test.
824-333	D	824	**Description:** The internal wrap test failed.
824-441	D	824	**Description:** An unexpected error occurred.
824-442	D	824	**Description:** The wrap test failed.
824-450	D	227	**Description:** Software error caused by hardware failure.
824-461	G	227	**Description:** The error log analysis indicates a hardware failure.
824-511	D	824	**Description:** An unexpected error occurred.
824-512	D	824	**Description:** Tablet adapter reset test failed.
824-523	D	824	**Description:** Device cannot be configured.
824-524	D	824 software	**Description:** Cannot open device.
826-111	D	221	**Description:** Cannot run the test because the device driver detected a hardware error.
826-112	D	221	**Description:** Unable to determine the type of adapter from the VPD.
826-113	D	826	**Description:** The VPD verification test failed.
826-114	D	826	**Description:** The register verification test failed.
826-121	D	221	**Description:** Cannot run the test because the device driver detected a hardware error.
826-122	D	221	**Description:** The data-wrap communications test failed.
826-123	D	221	**Description:** The modem control line test failed.
826-131	D	221	**Description:** Cannot run the test because the device driver detected a hardware error.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
826-132	D	221	**Description:** The data wrap communications test failed.
826-133	D	221	**Description:** The modem control line test failed.
826-321	D	826	**Description:** Cannot run the test because the device driver detected a hardware error.
826-322	D	826	**Description:** The data wrap communications test failed.
826-323	D	826	**Description:** The modem control line test failed.
826-331	D	826	**Description:** Cannot run the test because the device driver detected a hardware error.
826-332	D	826	**Description:** The data wrap communications test failed.
826-333	D	826	**Description:** The modem control line test failed.
826-371	D	826	**Description:** Cannot run the test because the device driver detected a hardware error.
826-372	D	826	**Description:** The data wrap communications test failed.
826-373	D	826	**Description:** The modem control line test failed.
826-381	D	826	**Description:** Could not do the test because the device driver detected a hardware error.
826-382	D	826	**Description:** The data wrap communication test failed.
826-383	D	826	**Description:** The modem control line test failed.
826-481	D	D56	**Description:** Could not do the test because the device driver detected a hardware error.
826-482	D	D56	**Description:** The data wrap communication test failed.
826-483	D	D56	**Description:** The modem control line test failed.
826-581	D	826 D56	**Description:** Could not do the test because the device driver detected a hardware error.
826-582	D	826 D56	**Description:** The data wrap communication test failed.
826-583	D	826 D56	**Description:** The modem control line test failed.
826-901 to 826-920	D	software 826	**Description:** An unexpected error occurred that can be attributed to software or hardware. Call your next level of support.
826-921	D	826	**Description:** The adapter failed to configure
826-922 to 826-924	D	software 826	**Description:** An unexpected error occurred that can be attributed to software or hardware. Call your next level of support.
826-925	D	826	**Description:** The adapter failed to configure
826-926 to 826-943	D	software 826	**Description:** An unexpected error occurred that can be attributed to software or hardware. **Action:** Call your next level of support.
827-112	D	221	**Description:** The parallel port data register write/read test failed.
827-121	D	827	**Description:** Cannot run the test because the device driver detected a hardware error.
827-122	D	827	**Description:** The parallel port data register write/read test failed.
827-123	D	827	**Description:** The parallel port control register write/read test failed.
827-124	D	827	**Description:** The parallel port data register read test failed.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
827-125	D	827	**Description:** The parallel port control register read test failed.
827-126	D	827	**Description:** The parallel port control register read test failed.
827-131	D	827	**Description:** Cannot run the test because the device driver detected a hardware error.
827-132	D	827	**Description:** The control port register direction bit (write) test with BIDI enabled failed.
827-133	D	827	**Description:** The control port register direction bit (read) test with BIDI enabled failed.
827-141	D	827	**Description:** Cannot run the test because the device driver detected a hardware error.
827-142	D	827	**Description:** The parallel port control register write/read test with BIDI enabled failed.
827-151	D	221	**Description:** Cannot run the test because the device driver detected a hardware error.
827-152	D	827	**Description:** The parallel port status register read test failed.
827-161	D	827	**Description:** Cannot run the test because the device driver detected a hardware error.
827-162	D	221	**Description:** The parallel port interrupt test failed.
827-163	D	221	**Description:** The parallel port interrupt test failed.
827-201	D	827	**Description:** The extend control register of the parallel port failed a read/write test.
827-202	D	827	**Description:** Input/output to the FIFO (without interrupts) failed.
827-203	D	827	**Description:** Input/output to the FIFO (with interrupts) failed.
827-204	D	827	**Description:** Direct memory access to the FIFO failed.
828-501	D	828	**Description:** The diskette adapter test failed.
831-111	D	221	**Description:** Cannot run the test because the device driver detected a hardware error.
831-112	D	221	**Description:** Unable to determine the type of adapter from the VPD.
831-113	D	831	**Description:** The VPD verification test failed.
831-114	D	831	**Description:** The register verification test failed.
831-121	D	221	**Description:** Cannot run the test because the device driver detected a hardware error.
831-122	D	221	**Description:** The data wrap communications test failed.
831-123	D	221	**Description:** The modem control line test failed.
831-131	D	221	**Description:** Cannot run the test because the device driver detected a hardware error.
831-132	D	221	**Description:** The data wrap communications test failed.
831-133	D	221	**Description:** The modem control line test failed.
831-161	D	252	**Description:** Cannot run the test because the device driver detected a hardware error.
831-162	D	252	**Description:** The data wrap communications test failed.
831-163	D	252	**Description:** The modem control line test failed.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
831-164	D	221 252	**Description:** Cannot run the test because the device driver detected a hardware error.
831-165	D	221 252	**Description:** The data wrap communications test failed.
831-166	D	221 252	**Description:** The modem control line test failed.
831-171	D	259	**Description:** Cannot run the test because the device driver detected a hardware error.
831-172	D	259	**Description:** The data wrap communications test failed.
831-173	D	259	**Description:** The modem control line test failed.
831-181	D	261	**Description:** Cannot run the test because the device driver detected a hardware error.
831-182	D	261	**Description:** The data wrap communications test failed.
831-183	D	261	**Description:** The modem control line test failed.
831-271	D	831 259	**Description:** Cannot run the test because the device driver detected a hardware error.
831-272	D	831 259	**Description:** The data wrap communication test failed.
831-273	D	831 259	**Description:** The modem control line test failed.
831-281	D	831 259	**Description:** Cannot run the test because the device driver detected a hardware error.
831-282	D	831 259	**Description:** The data wrap communications test failed.
831-283	D	831 259	**Description:** The modem control line test failed.
831-321	D	831	**Description:** Cannot run the test because the device driver detected a hardware error.
831-322	D	831	**Description:** The data wrap communications test failed.
831-323	D	831	**Description:** The modem control line test failed.
831-331	D	831	**Description:** Cannot run the test because the device driver detected a hardware error.
831-332	D	831	**Description:** The data wrap communications test failed.
831-333	D	831	**Description:** The modem control line test failed.
831-371	D	831	**Description:** Cannot run the test because the device driver detected a hardware error.
831-372	D	831	**Description:** The data wrap communications test failed.
831-373	D	831	**Description:** The modem control line test failed.
831-381	D	831	**Description:** Cannot run the test because the device driver detected a hardware error.
831-382	D	831	**Description:** The data wrap communications test failed.
831-383	D	831	**Description:** The modem control line test failed.
831-481	D	D56	**Description:** Could not do the test because the device driver detected a hardware error.
831-482	D	D56	**Description:** The data wrap communication test failed.
831-483	D	D56	**Description:** The modem control line test failed.
831-581	D	831 D56	**Description:** Could not do the test because the device driver detected a hardware error.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
831-582	D	831 D56	**Description:** The data wrap communication test failed.
831-583	D	831 D56	**Description:** The modem control line test failed.
831-901 to 831-920	D	software 831	**Description:** An unexpected error occurred that can be attributed to software or hardware. **Action:** Call your next level of support.
831-921	D	831 software	**Description:** The adapter failed to configure
831-922 to 831-924	D	software 831	**Description:** An unexpected error occurred that can be attributed to software or hardware. **Action:** Call your next level of support.
831-925	D	831 software	**Description:** The adapter failed to configure
831-926 to 831-943	D	software 831	**Description:** An unexpected error occurred that can be attributed to software or hardware. **Action:** Call your next level of support.
832-xxx	G	xxx	I/O Device Internal Error **Note:** xxx represents the last 3 digits of the SRN.
833-xxx	G	xxx 296 2C9	**Description:** PCI device address parity error, PCI device data parity error, or PCI device abort error. The diagnostics screen indicates the actual error. **Note:** xxx represents the last 3 digits of the SRN.
887-101	D	887	**Description:** POS register test failed.
887-102	D	887	**Description:** I/O register test failed.
887-103	D	887	**Description:** Local RAM test failed.
887-104	D	887	**Description:** Vital Product Data (VPD) failed.
887-105	D	887	**Description:** LAN coprocessor internal tests failed.
887-106	D	887	**Description:** Internal loopback test failed.
887-107	D	887	**Description:** External loopback test failed.
887-108	D	887	**Description:** External loopback test failed.
887-109	D	887	**Description:** External loopback parity tests failed.
887-110	D	887	**Description:** External loopback fairness test failed.
887-111	D	887	**Description:** External loopback fairness and parity tests failed.
887-112	D	887	**Description:** External loopback (twisted pair) test failed.
887-113	D	887	**Description:** External loopback (twisted pair) parity test failed.
887-114	D	887	**Description:** Ethernet loopback (twisted pair) fairness test failed.
887-115	D	887	**Description:** External loopback (twisted pair) fairness and parity tests failed.
887-116	D	887	**Description:** Twisted pair wrap data failed).
887-117	D	887 software	**Description:** Device configuration fails.
887-118	D	887	**Description:** Device driver indicates a hardware problem.
887-120	D	887	**Description:** Device driver indicates a hardware problem.
887-123	D	887	**Description:** Internal loopback test failed.
887-124	G	887 software	**Description:** Error log indicates a hardware problem.

Table 12. Service Request Numbers (continued)

Service Request Number	SRN Src.	Failing Function Codes	Description and Action
887-125	G	887	**Description:** Fuse test failed.
887-202	D	887	**Description:** Vital product data test failed.
887-203	D	887	**Description:** Vital product data test failed.
887-209	D	887	**Description:** RJ-45 converter test failed.
887-304	D	887	**Description:** Coprocessor internal test failed.
887-305	D	887	**Description:** Internal loopback test failed.
887-306	D	887	**Description:** Internal loopback test failed.
887-307	D	887	**Description:** External loopback test failed.
887-319	D	887 software	**Description:** Device driver indicates a hardware failure.
887-400	D	887	**Description:** Fuse test failed.
887-401	D	887	**Description:** Circuit breaker for Ethernet test failed.
887-402	D	B09 887	**Description:** Ethernet 10 Base-2 transceiver test failed.
887-403	D	B08 887	**Description:** Ethernet 10 Base-T transceiver test failed.
887-404	D	C29 887	**Description:** RJ-45 converter test failed.
887-405	F	Ethernet network 887	**Description:** Rerun diagnostics in advanced mode for accurate problem determination.
935-101 to 935-102	D	935 828	**Description:** The diskette-drive select or deselect test failed.
935-103 to 935-107	D	935 828	**Description:** The diskette failed.
935-108	D	935	**Description:** The diskette read test failed.
935-109 to 935-110	D	935 828	**Description:** The read/write on the diskette drive failed.
935-111 to 935-114	D	935	**Description:** A diskette drive test failed.
935-115 to 935-121	D	935 828	**Description:** The diskette drive test failed.
935-122	G	935 828	**Description:** The error log analysis indicates a hardware failure.
935-123	G	935	**Description:** The error log analysis indicates a hardware failure.
935-124	D	935 software	**Description:** Unable to configure the device.
9CC-1XX	G		**Description:** I/O error on PCI bus. **Action:** See “Bus SRN to FRU Reference Table” on page 99. **Note:** XX represents the last two digits of the SRN.
9CC-XXX	G	xxx 2C9	**Description:** I/O bus data, address parity error, or time-out error. **Note:** XX represents the last three digits of the SRN.

Failing Function Codes

Failing function codes represent functions within a cluster.

Description of the Failing Function Code Table

The failing function codes are listed in numerical sequence.

The columns in the failing function code table are as follows:

Failing Function Code, The failing function code number from the SRN.

FRU and Notes, This column contains the description of the FRU and any usage notes.

Failing Function Code Table

Lookup the Failing Function Code in the following table to determine the FRU.

For all cluster FRU replacement, go to ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Table 13. Failing Function Code Table

Failing Function Code	FRU and Notes
131	Unidentified memory error. Check all Memory Modules to be present and properly installed. Check all Memory Modules to be the same. If no discrepancy is found then replace the memory module in the location called out by the blinking 888 cluster operator panel codes, reference go to ″MAP 4240: 888 Blinking on Cluster″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*. If the memory error is still present, go to ″MAP 4240: 888 Blinking on Cluster″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
151	I/O Planar Battery **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
152	Electronics cage power system problem detected by the cluster bay. **Note:** ″MAP 2540: Power Problem Detected by Cluster Bay″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
165	Cluster Operator Panel, Cluster Operator Panel Cable **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
169	I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
181	Diskette Drive Signal Cable **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
190	SCSI Signal Cable **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
210	CPU Card **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
212	I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
214 & 217	CPU Card **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*

Table 13. Failing Function Code Table (continued)

Failing Function Code	FRU and Notes
221, 226, 227	I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
241	Ethernet network problem **Note:** ″MAP 4390: Isolating a Cluster to Cluster Ethernet Problem″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
277	SCSI Signal Cable **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
292	CPU Card **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
293	PCI - PCI Bridge Problem I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
294	MPCI Interrupt Controller Problem I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
295	PCI - ISA Bridge Problem I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
296	PCI Device or Adapter Problem The FRU can only be identified by it's location code reported by diagnostics that gave this SRN and FFC. **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2C4	System Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2C6	128 MB DIMM **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2C7	Base Memory Card **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2C8	System Planar, I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2C9, 2D2	I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2D3	Service Processor Card (2105 Model E10/E20 only) **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*

Failing Function Codes

Table 13. Failing Function Code Table (continued)

Failing Function Code	FRU and Notes
2D4	I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2D5	I/O Planar, Service Processor Card (2105 Model E10/E20 only) **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2D7	VPD module problem Cluster Operator Panel. **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2D9	Power controller problem I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2E0	Fan sensor problem I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2E1	Thermal sensor problem I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2E2	Voltage sensor problem I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2E3	Serial port controller problem I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
2E4	JTAG/COP controller problem I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
742	PCI ethernet adapter problem I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
792	SCSI Hard Drive **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
7C1	System Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*

Table 13. Failing Function Code Table (continued)

Failing Function Code	FRU and Notes
804	CD-ROM Drive **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
80C	SSA device card problem. Display problems needing repair or call next level of support.
811	Processor complex being identified. Call next level of support.
812, 814	I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
815	CPU Card **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
816, 817, 821, 823, 824, 826, 827, 828, 831,868,	I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
887	I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
935	Diskette Drive **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
946	I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
B88	I/O Planar **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
D01	CPU Card **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
D50	SCSI Signal Cable, SCSI termination on SCSI Hard Drive **Note:** ″MAP 4700: Cluster Bay FRU Replacement″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*

Diagnostic Numbers and Codes

Operator Panel Display Numbers

This section contains a list of the various numbers and characters that may be displayed on the cluster bay operator panel display. The numbers and characters are divided into two categories:

1. Information about the configuration program status, see “Configuration Program Progress Indicators” on page 136
2. Information messages that follow a blinking *888*, see “Diagnostic Load Progress Indicators” on page 138

Note: A code displayed on the cluster display panel during cluster power on can be considered hung after five minutes. Do the following steps as appropriate:

Failing Function Codes

- Use the progress code/indicator description to identify the failing FRU(s)
- Some progress codes will include a physical location code on the second line of the cluster display panel. That may be the failing FRU.
- Call the next level of support.

Configuration Program Progress Indicators

Find the code and description below then read note 135.

0005 IML retry threshold count reached
0500 Querying Standard I/O slot.
0501 Querying card in Slot 1.
0502 Querying card in Slot 2.
0503 Querying card in Slot 3.
0504 Querying card in Slot 4.
0505 Querying card in Slot 5.
0506 Querying card in Slot 6.
0507 Querying card in Slot 7.
0508 Querying card in Slot 8.
0510 Starting device configuration.
0511 Device configuration completed.
0512 Restoring device configuration files from media.
0513 Restoring basic operating system installation files from media.
0517 The /root and /usr file systems are being mounted.
0520 Bus configuration running.
0521 **/etc/init** invoked **cfgmgr** with invalid options; **/etc/init**has been corrupted or incorrectly modified (irrecoverable error).
0522 The configuration manager has been invoked with conflicting options (irrecoverable error).
0523 The configuration manager is unable to access the ODM database (irrecoverable error).
0524 The configuration manager is unable to access the config.rules object in the ODM database (irrecoverable error).
0525 The configuration manager is unable to get data from a customized device object in the ODM database (irrecoverable error).
0526 The configuration manager is unable to get data from a customized device driver object in the ODM database (irrecoverable error).
0527 The configuration manager was invoked with the phase 1 flag; running phase 1 at this point is not permitted (irrecoverable error).
0528 The configuration manager cannot find sequence rule, or no program name was specified in the ODM database (irrecoverable error).
0529 The configuration manager is unable to update ODM data (irrecoverable error).
0530 The program **savebase** returned an error.
0531 The configuration manager is unable to access the **PdAt** object class (irrecoverable error).
0532 There is not enough memory to continue (malloc failure); irrecoverable error.
0533 The configuration manager could not find a configure method for a device.
0534 The configuration manager is unable to acquire database lock (irrecoverable error).
0535 HIPPI diagnostics interface driver being configured.
0536 The configuration manager encountered more than one sequence rule specified in the same phase (irrecoverable error).
0537 The configuration manager encountered an error when invoking the program in the sequence rule.
0538 The configuration manager is going to invoke a configuration method. See 135.
0539 The configuration method has terminated, and control has returned to the configuration manager.
0551 IPL vary-on is running.
0552 IPL vary-on failed.
0553 IPL phase 1 is complete.
0554 The boot device could not be opened or read, or unable to define NFS swap device during network boot. If this hangs, go to ″MAP 4020: SCSI Hard Drive Build″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

0555 An ODM error occurred when trying to vary-on the rootvg, or unable to create an NFS swap device during network boot.
0556 Logical Volume Manager encountered error during IPL vary-on.
0557 The root filesystem does not mount.
0558 There is not enough memory to continue the system IPL.
0559 Less than 2 M bytes of good memory are available to load the AIX kernel.
0576 Generic async device driver being configured.
0577 Generic SCSI device driver being configured.
0578 Generic common device driver being configured.
0581 Configuring TCP/IP.
0583 Configuring an Ethernet data link control.
0584 Configuring an IEEE Ethernet data link control.
0587 Configuring a NETBIOS.
0589 SCSI target mode device being configured.
0594 Asynchronous I/O being defined or configured.
0603 **/usr/lib/methods/defsys, /usr/lib/methods/cfgsys,** or **/usr/lib/methods/cfgbus** failed.
0607 **/usr/sbin/ifconfig** failed.
0614 Configuring local paging devices.
0615 Configuration of a local paging device failed.
0620 Updating special device files and ODM in permanent filesystem with data from boot RAM filesystem.
0622 Boot process configuring for operating system installation.
0662 Integrated Ultra2 SCSI Controller being identified or configured.
0667 Configuring NVS hardware.
0668 Configuring CPSS code.
0669 Configuring CPI hardware.
0680 Configuring CPSS LSS.
0681 Configuring CPSS rank.
0682 Configuring CD-ROM drive.
0688 Configuring CPSS.
0706 A 4.5 GB 16-bit SCSI disk drive is being identified or configured.
0707 A 4.5 GB 16-bit differential SCSI disk drive is being identified or configured.
0708 Configuring L2 cache.
0727 An asynchronous device is being identified or configured.
0772 4.5GB SCSI F/W Disk Drive
0777 A 10/100 Mbps PCI Ethernet device driver is being identified or configured.
078c PCI bus configuration executing
0790 Multi-bus Integrated Ethernet Adapter being identified or configured. PCI bus configuration executing.
079c ISA bus configuration executing
0804 8x Speed SCSI-2 CD-ROM Drive being configured
080c SSA device card being identified or configured.
0811 Processor complex being identified or configured.
0812 Memory being identified or configured.
0813 Battery for time-of-day, NVRAM, and so on being identified or configured, or system I/O control logic being identified or configured.
0814 NVRAM being identified or configured.
0815 Floating-point processor test
0816 Operator panel logic being identified or configured.
0817 Time-of-day logic being identified or configured.
0821 Standard keyboard adapter being identified or configured.
0823 Standard mouse adapter being identified or configured.
0825 Standard speaker adapter being identified or configured.
0826 Serial Port 1 adapter being identified or configured.
0827 Parallel port adapter being identified or configured.
0828 Standard diskette adapter being identified or configured.

Configuration Program Progress Indicators

0840 A PCI Ultra/Wide SCSI adapter is being configured.
0935 3.5-inch diskette drive being identified or configured.

Diagnostic Load Progress Indicators

Note: The following progress indicators are not all used when AIX is installed on the 2105 Model E10/E20 If the cluster bay hangs with a code displayed, call the next level of support. The *AIX Messages Guide and Reference* book, SC23-2641 has detailed recovery procedures for use by the next level of support.

c00 AIX Install/Maintenance loaded successfully.
c01 Insert the first diagnostic diskette.
c02 Diskettes inserted out of sequence.
c03 The wrong diskette is in diskette drive.
c04 The loading stopped with a hardware failure.
c05 A diskette error occurred.
c06 The **rc.boot** configuration shell script is unable to determine type of boot.
c07 Insert the next diagnostic diskette.
c08 RAM file system started incorrectly.
c09 The diskette drive is reading or writing a diskette.
c10 Platform-specific **bootinfo** command not on boot image.
c20 An unexpected halt occurred, and the system is configured to enter the kernel debug program instead of entering a system dump.
c21 The **.ifconfig** command was unable to configure the network for the client network host.
c25 Client did not mount remote miniroot during network install.
c26 Client did not mount the **./usr**file system during the network boot.
c29 The system was unable to configure the network device.
c31 The cluster bay is waiting for the system console port to be defined. This is defined during the FRU replacement procedure for the I/O planar or I/O planar battery. Repeat the procedure.

Note: This can also occur if the bootable CD is left in the CD-ROM drive.

c32 Progress indicator. The console is a high-function terminal.
c33 A tty terminal attached to serial ports S1 or S2 was selected.
c34 A file was selected. The console messages store in a file.
c40 Configuration files are being restored.
c41 Could not determine the boot type or device.
c42 Extracting data files from diskette.
c43 Could not access the boot or installation tape.
c44 Initializing installation database with target disk information.
c45 Cannot configure the console.
c46 Normal installation processing.
c47 Could not create a physical volume identifier (PVID) on disk.
c48 Prompting you for input.
c49 Could not create or form the JFS log.
c50 Creating root volume group on target disks.
c51 No paging devices were found.
c52 Changing from RAM environment to disk environment.
c53 Not enough space in the **/tmp** directory to do a preservation installation.
c54 Installing either BOS or additional packages.
c55 Could not remove the specified logical volume in a preservation installation.
c56 Running user-defined customization.
c57 Failure to restore BOS.
c58 Displaying message to turn the key.
c59 Could not copy either device special files, device ODM, or volume group information from RAM to disk.
c61 Failed to create the boot image.

c62 Loading platform dependent debug files
c63 Loading platform dependent data files
c64 Failed to load platform dependent data files
c70 Problem Mounting diagnostic CD-ROM disc
c99 Diagnostics have completed. This code is only used when there is no console.
Fxx (xx is any number) Call next level of support.

Dump Status Codes

A software error has caused a software dump to occur. One or more of the following progress codes may display. When the dump is complete, a problem log will be created and should be used for repair. If a code is displayed for more than 10 minutes, call the next level of support.

00c0 The dump completed successfully.
00c1 The dump failed due to an I/O error.
00c2 A dump, requested by the user, is started.
00c3 The dump is inhibited.
00c4 The dump device is not large enough.
00c5 The dump did not start, or the dump crashed.
00c6 Dumping to a secondary dump device.
00c7 Reserved.
00c8 The dump function is disabled.
00c9 A dump is in progress.
00cc Unknown dump failure

Other Three Digit Status Codes

If a cluster bay three digit status code is displayed for more than 10 minutes, call the next level of support. The meaning of these codes can be found in the *AIX Messages Guide and Reference* book, SC23-2641. Only PE or engineering will be able to access the AIX command line to carry out the actions needed for each code. The actions listed in this book may need to be modified for use on the 2105.

Note: Codes 000 to 0cx are defined in “Dump Status Codes”. Codes Cxx to Fxx are defined in .

9 and 10 Character Progress Codes

The following table defines the 9 and 10 digit progress codes displayed during the last half of the cluster bay power on code load.

Table 14. 10 Character Progress Code Table

9 and 10 Character Progress Codes	Description
Init CPIx	Functional code is configuring the CPI interface where x is the interface number (4,5,6,7). If the cluster bay stops with this displayed, call the next level of support.
CU000–1060	NVS Lattice Code Update (P2–I6 slot)
CU000–1070	NVS Lattice Code Update (P2–I7 slot)
CU000–3010	RPC Code Update (R1–G1)
CU000–3020	RPC Code Update (R1–G2)
CU000–404B	CPI-4 Lattice Code Update (P2–I4/JB,I/O Attachment Card)
CU000–407B	CPI-5 Lattice Code Update (P2–I7/JB,I/O Attachment Card)
CU000–404A	CPI-6 Lattice Code Update (P2–I4/JA,I/O Attachment Card)
CU000–407A	CPI-7 Lattice Code Update (P2–I7/JA,I/O Attachment Card)
CU000–504B	CPI-4 Flash Code Update (P2–I4/JB,I/O Attachment Card)

9 and 10 Character Progress Codes

Table 14. 10 Character Progress Code Table (continued)

9 and 10 Character Progress Codes	Description
CU000–507B	CPI-5 Flash Code Update (P2–I7/JB,I/O Attachment Card)
CU000–504A	CPI-6 Flash Code Update (P2–I4/JA,I/O Attachment Card)
CU000–507A	CPI-7 Flash Code Update (P2–I7/JA,I/O Attachment Card)
CU000–6014	CPI-4 Lattice Code Update (R1–B1, Host Bay Planar)
CU000–6025	CPI-5 Lattice Code Update (R1–B2, Host Bay Planar)
CU000–6036	CPI-6 Lattice Code Update (R1–B3, Host Bay Planar)
CU000–6047	CPI-7 Lattice Code Update (R1–B4, Host Bay Planar)
CU000–7014	CPI-4 Flash Code Update (R1–B1, Host Bay Planar)
CU000–7025	CPI-5 Flash Code Update (R1–B2, Host Bay Planar)
CU000–7036	CPI-6 Flash Code Update (R1–B3, Host Bay Planar)
CU000–7047	CPI-7 Flash Code Update (R1–B4, Host Bay Planar)
SDxxxxxxx	CPI Interface Diagnostics progress codes where x is a hexadecimal character. Each CPI interface is tested as the ″Init CPIX″ 9 character progress codes are displayed. Normally, if a CPI error is detected, the cluster bay code load will complete, the CPI interface will be fenced and a problem will be created. If the cluster bay stops with this displayed, go to “MAP 4030: Isolating CPI Diagnostic Progress Code Stop” on page 239.
SL111-00xx	Loading DDM LIC code, xx=minutes load has been in progress.
SL111-0E00	Load of DDM LIC code stopped with an error, go to ″MAP 4710: DDM LIC Update″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
SL111-0F00	Load of DDM LIC code timed out, go to ″MAP 4710: DDM LIC Update″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
SR000-0100	RAS IML Process Starting
SR000-0200	Initializing RAS Runtime Objects
SR000-0300	Starting the AIX Call Home program
SR000-0400	Initializing the Modem
SR000-0500	Running Error Log Analysis
SR000-0600	Running Cluster Bay Configuration Check
SR000-0630	Running Cluster Bay Health Check
SR000-0660	Running Configuration Error Check
SR000-0700	Calling the Trace Re-start Function
SR000-0800	Starting the WEB Server
READY	RAS IML Complete, slow-blinking Message LEDs have been reset

2105 Primary Power Supply Digital Status Display

The primary power supply (PPS) status display is normally off. If a power system fault is detected, a two digit fault code will be displayed.

The primary power supply two digit status codes are explained, repaired, and defined in:

- ″MAP 2350: PPS Status Indicator Codes″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*
- ″PPS Status Indicator Codes″ table in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*

2105 Exception Symptom Codes

An Exception Symptom Codes (ESC) is a two byte code that indicates what functional area of the 2105 has failed. The ESC is generated by the internal error handling code of the 2105.

Platform Exception Symptom Codes

The following Platform ESC code values are set during analysis. The allocated ESC range for detected errors is ’1000’x to ’1FFF’x.

Table 15. 2105 Platform Exception Symptom Codes (ESC)

ESC	Description of ESC
1000	Error attempting to access ODM
1001	Reached threshold on IML attempts
1002	Failure issuing **ioctl** to **cpssdd**
1003	Failure in running configuration manager
1004	**cpss0** is not available
1005	Error configuring **cpssdd** into kernel
1006	Hidden memory not mapped, possible code load problem
1007	Licensed Internal Code feature file did not decrypt or validate

Automatic Diagnostic Exception Symptom Codes

The following Automatic Diagnostic ESC code values are set during analysis. The allocated ESC range for detected errors is ’1100’x to ’13FF’x.

Many times the 1xxx ESC and SRN have the same meaning, sometimes they do not. When the value of the SRN and ESC are the same, the definition of both is found below. For additional information, see “Service Request Numbers (SRN)” on page 173.

Table 16. 2105 Exception Symptom Codes (ESC)

ESC	Description of ESC
1100	Cross Platform Interconnect (CPI) failure
1201	Resource missing or failing
1201	(SRN=60000) SSA device card unable to configure
1202	Unexpected resource
1203	Resource in wrong location
1204	SSA link failure
1205	SSA bypass card failure
1206	FRU failure
1207	One DDM detected redundant power loss
1208	Wrong number of DDMs in drawer
1209	Unexpected result
120A	SSA device card failure
120B	Modem communication failure
120C	DDM capacity incompatibility and/or array offline
120D	Multiple failure analysis needed
120E	SSA device drawers not cabled correctly

2105 Exception Symptom Codes

Table 16. 2105 Exception Symptom Codes (ESC) (continued)

ESC	Description of ESC
120F	Array repair needed
1210	Drawer type mismatch
1211	Rack power fault
1213	Mismatched drawer type
1215	Unable to verify loop on other cluster bay
1220	Modem to modem expander hardware problem
1221	Call home configuration problem
1230	Some cluster bay memory loss
1231	Functional code not ready
1232	Cluster Bay to cluster bay communications fault
1233	Corrupted file or function fault
1234	Licensed internal code problem
1240	Fix other cluster bay fence problem first
1244	High speed link running at low speed
1245	Block LRC failed between DDM and SSA device card
1246	Retry operation unrelated interference
1247	Retry Web process unrelated interruption
1250	Bypass card missing/failed/wrong location
1252	Passthrough card missing/failed/wrong location
1254	Bypass card jumper in inline position
1256	Bypass card has low speed cables attached
1257	DDM characteristics mismatch
1301	Licensed internal code conflicts
1302	IML retry count exceeded
1310	DDM drawer type mismatch or controller card failed
1311	Storage cage fan/power sense card failed, one DDM bay reported
1312	Storage cage fan/power sense card failed, > one DDM bay reported
1313	Storage cage fan/power sense card failed, one DDM bay reported
1314	Storage cage fan failed
1315	Storage cage power supply failed
1316	Controller card communication failure
1317	Cable unplugged from sense card, rack 2 bottom
1318	Rack 2 sense card cable/plug problem
1319	Rack 1 sense card reports plug missing
1320	Rack 1 sense card reports plug failing
1321	Rack 2 sense card reports cable open
1322	Rack # incorrect
1323	Storage cage # incorrect
1324	DDM bay # incorrect
1325	Slot # incorrect

Table 16. 2105 Exception Symptom Codes (ESC) (continued)

ESC	Description of ESC
1326	ESCON/Fiber bit error rate test failed
1327	ESCON/Fiber wrap test failed
1328	ESCON/Fiber bit error rate test or wrap test failed

Platform Microcode Detected Error Exception Symptom Codes

The following ESC code values are set for microcode detected errors. The allocated ESC range for detected errors is ’2600’x to ’26FF’x.

ESC	Description of ESC
2620	LRC Check in the Record Header information or the Key Field
2621	PA Miscompare in the Record Header information
2630	Track pinned in Cache is retryable
2631	Track pinned in Cache is non-retryable
2632	Track pinned retryable threshold exceeded
2633	Track pinned non-retryable threshold exceeded
2640	Invalid record sector detected
2650	Remote Support Access word cannot be obtained from the other Service Processor
26E7	No chaining indicated when CCR status is presented

Common Platform Interconnect Exception Symptom Codes

The following CPI ESC code values are set during analysis. The allocated ESC range for detected errors is ’2700’x to ’28FF’x.

ESC	Description of ESC
271D	Unknown adapter in CPI IOM bay
271E	Adapter hardware failure during adapter discovery
2800	IOM error from empty adapter bay slot
2801	Forced error is active in CPI
2802	Fence network or DMA island
2803	Pseudo ESC, see sense bytes 9 and 10 for actual ESC
2804	IOM SERR on adapter bus
2805	Adapter SERR on adapter bus
2806	IOM check sum without supporting check
2807	Adapter SERR can not be isolated
2809	IOM detected adapter check
280A	IOM PERR on adapter bus
280B	IOM master abort on adapter bus
280C	IOM target abort on adapter bus
280D	IOM adapter bus error without supporting check
280E	IOM adapter bus error counter overflowed
2810	PLX detected SERR on adapter bus

2105 Exception Symptom Codes

ESC	Description of ESC
2811	PLX detected PERR on adapter bus
2812	Adapter detected Master Abort on adapter bus
2813	Adapter detected Target Abort on adapter bus
2814	CPI detected LRC error on data transfer
2815	CPI detected adapter Bus Hang
2816	CPI cluster bay 2 internal errors
2817	CPI cluster bay 1 internal errors
2818	CPI internal errors, both sides
2819	Invalid CPI address
281A	CPI detected adapter arbiter hang
281B	Invalid byte enables on CPI adapter bus
281C	Adapter PERR on adapter bus
281D	PA detected master abort
281E	PA detected target abort
281F	Unknown adapter bus failure
2820	CPI Heartbeat Path Failure
2821	CPI Heatbeat Path Failure, Local Cluster Bay not Available
2822	CPI Heartbeat Path Failure, Remote Cluster Bay not Available
2823	IOCTL Requested Fence of CPI
2824	Forced CPI shared error
2825	CPI failed to enter source/sink mode for forced error
2826	CPI heartbeat path failure, CPI in service
2827	CPI adapter time out
2828	CPI adapter invalid response
2829	CPI adapter failure response
2841	CPI error Interrupt receiver-1 error
2842	CPI error Interrupt receiver-2 error
2843	CPI error Interrupt receivers error
2849	NVS error Interrupt receiver-1 error
284A	NVS error Interrupt receiver-2 error
284B	NVS error Interrupt receivers error
284F	CPI Configuration Failure
2850	CPI master abort error during configuration
2851	CPI target abort error during configuration
2852	CPI system bus address error during configuration
2853	CPI system bus data error during configuration
2854	CPI IOA internal error during configuration
2855	CPI IOM internal error during configuration
2857	CPI adapter bus error during configuration
2858	CPI data mismatch during configuration
2859	CPI CPI configuration error with no supporting sense

ESC	Description of ESC
285A	CPI IOA private bus error during configuration
285B	CPI IOM private bus error during configuration
2870	IOM PLX Master abort
2871	IOM PLX Target abort
2872	IOM PLX Received Target abort
2873	IOM PA check error on cluster bay 1
2874	IOM PA check error on cluster bay 2
287F	PCI target abort detected by IC
2880	IOA invalid local bus byte enables
2881	IOA internal error
2882	CPI bay power sense failure
2883	IOM detected IOA/IOM interface error
2884	IOM internal error
2885	IOM SDRAM error
2886	IOA check summary without supporting check
2887	System bus error counter overflowed
2888	Address error on system PCI bus
2889	BLRC from dual port
288A	Data error on system PCI bus
288B	IOM PA check error
288C	Master abort error on system PCI bus
288D	IOM PA Check Registers Disagree
288E	Target abort error on system PCI bus
288F	CPI read hang failure
2890	NVS-VY address error on system PCI bus
2891	NVS-XC address error on system PCI bus
2892	IOA address error on system PCI bus
2894	IOA/IOM private bus error counter overflowed
2895	NVS-VY System Bus Error Counter overflowed
2896	NVS-XC System Bus Error Counter overflowed
2897	Single CPI path in post sink source
2898	Both CPI paths in post sink source
289A	CPI caused CPI pre-post sink source error
289B	CPI error without supporting check
289C	CPI fault not Isolated
289D	CPI remote failure not isolated
289E	CPI IOA flash error detected
289F	CPI IOM flash error detected
28A0	Forced CPI shared error
28A1	CPI failed to enter source/sink mode for forced error
28A2	Reset Failure, Fence Host Bay 1, Host Bay 2 and Cluster Bay 2

2105 Exception Symptom Codes

ESC	Description of ESC
28A3	Reset Failure, Fence Host Bay 1 and Cluster Bay 2
28A4	Reset Failure, Fence Host Bay 2, Host Bay 4 and Cluster Bay 2
28A5	Reset Failure, Fence Host Bay 2 and Cluster Bay 2
28A6	Reset Failure, Fence Host Bay 2 and Cluster Bay 2
28A7	Reset Failure, Fence Cluster Bay 2
28A8	Reset Failure, Fence Host Bay 1, Host Bay 4 and Cluster Bay 1
28A9	Reset Failure, Fence Host Bay 1, Host Bay 2 and Cluster Bay 1
28AA	Reset Failure, Fence Host Bay 1 and Cluster Bay 1
28AB	Reset Failure, Fence Host Bay 2, Host Bay 4 and Cluster Bay 1
28AC	Reset Failure, Fence Host Bay 4 and Cluster Bay 1
28AD	Reset Failure, Fence Host Bay 2 and Cluster Bay 1
28AE	Reset Failure, Fence Cluster Bay 1
28B0	LRC on cross cluster bay transfer
28B1	No CPI paths for cross cluster bay transfer
28B2	Error reprocess
28B3	Time-out on cross cluster bay transfer
28B4	Reset Failure, Fence Host Bay 1, Host Bay 3, and Cluster Bay 1
28B5	Reset Failure, Fence Host Bay 3, Host Bay 4, and Cluster Bay 1
28B6	Reset Failure, Fence Host Bay 3 and Cluster Bay 1
28B7	Reset Failure, Fence Host Bay 1 and Host Bay 4
28B8	Reset Failure, Fence Host Bay 1,Host Bay 2 and Host Bay 3
28B9	Reset Failure, Fence Host Bay 2, Host Bay 3 and Cluster Bay 2
28BA	Reset Failure, Fence Host Bay 2, Host Bay 3 and Cluster Bay 1
28BB	Reset Failure, Fence Host Bay 1 and Host Bay 2
28BC	Reset Failure, Fence Host Bay 1
28BD	Reset Failure, Fence Host Bay 2,Host Bay 3 and Host Bay 4
28BE	Reset Failure, Fence Host Bay 2 and Host Bay 4
28BF	Reset Failure, Fence Host Bay 3 and Host Bay 4
28C0	Reset Failure, Fence Host Bay 4
28C1	Reset Failure, Fence Host Bay 2 and Host Bay 3
28C2	Reset Failure, Fence Host Bay 2
28C3	Reset Failure, Fence Host Bay 3
28C4	Reset Failure, Reboot Cluster Bay 1
28C5	Reset Failure, Reboot Cluster Bay 2
28C6	Reset Failure, Fence Host Bay 1 and Host Bay 3
28C7	Reset Failure, Fence Host Bay 1, Host Bay 2 and Host Bay 4
28C8	Reset Failure, Fence Host Bay 1, Host Bay 4 and Cluster Bay 2
28C9	Reset Failure, Fence Host Bay 1, Host Bay 3 and Host Bay 4
28CA	Reset Failure, Fence Host Bay 1, Host Bay 3 and Cluster Bay 2
28CB	Reset Failure, Fence Host Bay 3, Host Bay 4 and Cluster Bay 2
28CC	Reset Failure, Fence Host Bay 3 and Cluster Bay 2

ESC	Description of ESC
28D0	Cluster Bay 1 Host Bay 1 in post sinksource
28D1	Cluster Bay 1 Host Bay 4 in post sinksource
28D2	Cluster Bay 1 Host Bay 2 in post sinksource
28D3	Cluster Bay 1 Host Bay 3 in post sinksource
28D4	Cluster Bay 2 Host Bay 1 in post sinksource
28D5	Cluster Bay 2 Host Bay 4 in post sinksource
28D6	Cluster Bay 2 Host Bay 2 in post sinksource
28D7	Cluster Bay 2 Host Bay 3 in post sinksource
28D8	Host Bay 1 in post sinksource
28D9	Host Bay 4 in post sinksource
28DA	Host Bay 2 in post sinksource
28DB	Host Bay 3 in post sinksource
28FF	Battery end of life

SCSI Exception Symptom Codes

The following SCSI_ESC code values are set during analysis of failures reported by the SCSI microcode. The low order ESC character is reserved for isolation information that may be appended by Problem Manager. The allocated ESC range for SCSI detected errors is ’2900’x to ’29FF’x.

ESC	Description of ESC
2900	SCSI heartbeat failure for adapter in service
2901	SCSI adapter heartbeat failure
2902	SCSI adapter time out
2903	SCSI adapter invalid response
2904	SCSI adapter failure response
2905	IOCTL requested fence of SCSI adapter
2908	SCSI flash not ready
2909	SCSI new flash burning failed
290A	SCSI Error Reading Handshake Register
290B	SCSI Error Initializing Port Zero
290C	SCSI Error Initializing Port One
290D	SCSI adapter configuration timeout
2910	SCSI adapter Port Panic
2911	SCSI adapter Panic
2912	SCSI adapter random errors
2915	SCSI adapter No Data
2916	SCSI adapter Invalid Data
2917	SCSI adapter Random Errors
291A	SCSI Protocol Error General
291B	SCSI Protocol Error unknown
291D	SCSI Protocol ATN Negation Error

2105 Exception Symptom Codes

ESC	Description of ESC
291E	SCSI Protocol Message Phase Error
291F	SCSI Protocol Conflicting Identify Msg Received
2920	SCSI Protocol Unexpected Message
2922	SCSI adapter Random Errors
2925	SCSI internal bus reset
2926	SCSI Bus Reset
2927	SCSI FB MLE
2929	SCSI Abort Task
292A	SCSI Abort Task Set
292B	SCSI Clear Task Set
292C	SCSI LUN Reset
292D	SCSI Target Reset
292E	SCSI Transport Undocumented Error
292F	SCSI Transport Host Detected Parity Error
2930	SCSI Transport error
2931	SCSI Transport Bus Parity Error
2932	SCSI Transport Reselection Time-out
2933	SCSI Transport Req/Ack Offset Error
2934	SCSI Transport Bus Reselection Phase Error
2935	SCSI adapter Random Failures
2937	SCSI Transport Bus Reset With No I/O Between
2938	SCSI Transport Polling Warhead Time-out
2939	SCSI Transport Warhead Task Time-out
293A	SCSI Sequence Number Error Seen By adapter Only
293B	SCSI Sequence Number Error Detected CPI Threshold
293C	SCSI Sequence Number Error Cache LRC Limit On Alt. Cluster
293D	SCSI Sequence Number Error Cache LRC On Alt. Cluster Bay
293E	SCSI Sequence Number Error On Alt. Cluster Bay
2940	SCSI Data LRC Error Seen By adapter Only
2941	SCSI Data LRC Error Detected CPI Threshold
2942	SCSI Data LRC Error Cache LRC Limit On Alt. Cluster Bay
2943	SCSI Data LRC Error Cache LRC On Alt. Cluster Bay
2945	SCSI Cache Recovery Seen By adapter Only
2946	SCSI Cache Recovery Detected CPI Threshold
2948	SCSI transport permanent bus parity error
2949	SCSI transport permanent relocation time-out
294A	SCSI transport permanent req/ack offset error
294B	SCSI transport permanent bus reselect phase error
294C	SCSI transport permanent undocumented error
294D	SCSI transport permanent error
2950	SCSI Data Storage Exception

ESC	Description of ESC
2951	SCSI Instruction Storage Exception
2952	SCSI Alignment Exception
2953	SCSI Program Exception
2954	SCSI System Call Exception
2955	SCSI Programmable Interval Timer Exception
2956	SCSI Fixed Interval Timer Exception
2957	SCSI Watchdog Timer Exception
2958	SCSI Data TLB Miss Exception
2959	SCSI Instruction TLB Miss Exception
295A	SCSI Debug Exception
295B	SCSI Unknown/Invalid Exception
2960	SCSI PCI Master Abort X
2961	SCSI PCI Master Abort Y
2962	SCSI PCI Master Abort
2963	SCSI PCI Target Abort X
2964	SCSI PCI Target Abort Y
2965	SCSI Target Abort
2966	SCSI PCI Parity Error X
2967	SCSI PCI Parity Error Y
2968	SCSI PCI Parity Error
2969	SCSI PCI Internal Parity Error X
296A	SCSI PCI Internal Parity Error Y
296B	SCSI PCI Internal Parity Error
296C	SCSI PCI MMIO Time-out X
296D	SCSI PCI MMIO Time-out Y
296E	SCSI PCI MMIO Time-out
296F	SCSI NVRAM ECC Error
2970	SCSI NVRAM Write While Protected
2971	SCSI 403 Bus Parity Error On Write
2972	SCSI 403 Dead Man Timer Expired
2973	SCSI MMIO Read Parity
2974	SCSI Cache ECC
2975	SCSI 403 Reg Write Not Four Bytes
2976	SCSI Watch Dog Timer 2nd Tick
2977	SCSI NVRAM Range Error
2978	SCSI Cache Control Parity Error
2979	SCSI Data Store Dead Memory - DRAM
297A	SCSI Data Store Parity Error On Write - DRAM
297B	SCSI Data Store Range Error
297C	SCSI Data Store ECC Error
297D	SCSI Internal RAM Access w/o Diag Bit

2105 Exception Symptom Codes

ESC	Description of ESC
297E	SCSI Data Store Error On Cache Read
297F	SCSI SCACHE Freeze Bit On
2980	SCSI 403 Write To IOARRIN Queue When Full
2981	SCSI Parity Error Filling Cache
2982	SCSI Non Four Byte Word
2983	SCSI Write While Protected To L2 Cache Area
2984	SCSI Critical Interrupt bits 0-5
2985	SCSI No Supporting Interrupt For Exception 100
298A	SCSI Adapt Instr Machine Check Time-out
298B	SCSI Adapt Instr Machine Check Bus Error
298C	SCSI Adapt Instr Machine Check Non-configured
298D	SCSI Adapt Instr Machine Check Protection
298E	SCSI Adapt Data Machine Check Protection Violation
298F	SCSI Adapt Data Machine Check Parity Error
2990	SCSI Adapt Data Machine Check Access To Non-configured Bank
2991	SCSI Adapt Data Machine Check Bus Error
2992	SCSI Adapt Data Machine Check Bus Time-out
2993	SCSI Adapt Unknown Data Machine Check
2994	SCSI Adapt Unknown Machine Check
2995	SCSI host check condition
2996	SCSI host aborted task
2997	SCSI host task timeout
2998	SCSI host logging enabled
2999	SCSI host logging disabled
299A	SCSI External Interrupt 4 - Low Priority
299B	SCSI External Interrupt 2
299D	SCSI Warhead Port0 SERR
299E	SCSI Warhead Port1 SERR
299F	SCSI SERR
29A0	SCSI DRAM Memory Error On Queue Access
29A1	SCSI DRAM Parity Error
29A2	SCSI DRAM Address Out Of Range
29A3	SCSI DRAM Multi-bit ECC Error
29A4	SCSI Operation Status Queue Full
29A5	SCSI ADE Received On Inactive Path
29A6	SCSI AOE Sent But Command Block Not Updated
29A7	SCSI CAM Multi-hit
29A8	SCSI Sequencer Cache Read FIFO Parity Check
29A9	SCSI DRAM Memory Not Configured
29AA	SCSI Sequencer Cache Write FIFO Parity Check
29AB	SCSI DRAM Memory Address Out Of Range

ESC	Description of ESC
29AC	SCSI DRAM Multi-bit ECC Error
29AD	SCSI Unknown/Invalid Sequencer Check
29B0	SCSI DRAM Page Overflow Error
29B1	SCSI Uncorrectable DRAM Error
29B2	SCSI DRAM Single Bit Error
29B3	SCSI DRAM Range Error
29B4	SCSI Data To DRAM Parity Check
29B5	SCSI Unknown/Invalid DRAM Interrupt
29B6	SCSI DRAM Interrupt Without Further Detail
29BA	SCSI Posted Write Error
29BB	SCSI MIRV Interrupt
29BC	SCSI PCI System Parity Error
29BD	SCSI PCI Data Parity Error
29BE	SCSI Signalled Target Abort
29BF	SCSI Received Target Abort
29C0	SCSI Received Master Abort
29C1	SCSI Selected w/ No Paths Available
29C2	SCSI ZMBA Error
29C3	SCSI ZMBA Interrupt Active
29C4	SCSI Timer Interrupt Active
29C5	SCSI Path Register RAM Parity Error
29C6	SCSI MMIO RAM Parity Error
29C7	SCSI PCB Load Error
29C8	SCSI DDS Error
29C9	SCSI Initiator Link Cmd Complete
29CA	SCSI Invalid Phase Change Detected
29CB	SCSI Self Selected
29CC	SCSI Logically Bad Header Hit
29CD	SCSI Non Zero Status
29CE	SCSI Restore w/o Previous Save Ptr
29CF	SCSI Selection Time-out
29D0	SCSI Command Phase Error
29D1	SCSI Bus Free Phase Error
29D2	SCSI Overlength Error Suppress
29D3	SCSI Invalid LUN Error
29D4	SCSI Invalid Queued Tag
29D5	SCSI Raise Overlength Error
29D6	SCSI LRC Error
29D7	SCSI Byte Count Not Zero
29D8	SCSI PCI Error On Warhead
29D9	SCSI FIFO Parity Error

2105 Exception Symptom Codes

ESC	Description of ESC
29DA	SCSI Device Interrupt - Other
29DB	SCSI Device Interrupt Without Further Detail
29DC	SCSI Unknown/Invalid Local PCI X Interrupt
29DD	SCSI Local X Interrupt w/o Further Detail
29DE	SCSI local PCI bus DMA error
29DF	SCSI host DMA error
29E1	SCSI Copy Error To IOARRIN Queue Interrupt
29E2	SCSI Copy Error To Send Port Interrupt
29E3	SCSI Copy Error To Receive Queue Interrupt
29E4	SCSI IOARCB Fetch Interrupt
29E5	SCSI warhead detected data parity error
29E6	SCSI warhead detected parity error
29E7	SCSI warhead asserted SERR
29E8	SCSI warhead received master abort
29E9	SCSI warhead received target abort
29EA	SCSI warhead sent target abort
29EB	SCSI Accel Interrupt
29EC	SCSI XOR Interrupt
29EE	SCSI Int0 Interrupt Without Further Detail
29EF	SCSI operation status queue shows error
29F0	SCSI Other External Interrupt
29F5	SCSI Unknown/Invalid Local PCI X/Y Interrupt
29FA	SCSI Other External Interrupt

NVS Exception Symptom Codes

The following NVS ESC code values are set during analysis. The allocated ESC range for NVS errors is ’2A00’x to ’2AFF’x.

ESC	Description of ESC
2A00	NVS Primary Path Heartbeat Failure
2A01	NVS Alternate Path Heartbeat Failure
2A02	IOCTL Requested fence of NVS adapter
2A03	NVS Message/Control Data LRC
2A04	NVS adapter Panic
2A05	NVS error, no error data received from adapter
2A06	NVS error, invalid data received from adapter
2A07	NVS adapter, Time-out
2A08	NVS adapter, Failure Response
2A09	NVS adapter, Invalid Response
2A10	NVRAM Error
2A11	Bus Parity Error

ESC	Description of ESC
2A12	Dead Man Timer
2A13	MMIO Read Parity
2A14	PCI Master Abort
2A15	PCI Target Abort
2A16	PCI Parity
2A17	PCI Internal Parity
2A18	PCI MMIO Time-out
2A19	Cache ECC
2A1A	Watchdog timer 2nd click
2A1B	Cache Control RAM parity
2A1C	Data Store dead memory
2A1D	Data Store parity error
2A1E	Data store ECC Error
2A1F	Data store error on cache read
2A20	SCache freeze bit on
2A21	403 write to IOARRIN Queue when full
2A22	Parity error DS filing cache
2A23	403 Reg write less than 4 bytes
2A24	NVRAM range error
2A25	Data Store range error
2A26	Internal RAM Access without Diag bit
2A27	Non 4 byte write to cache
2A28	Write while protected to L2 cache area
2A29	BIU bank protection error
2A2A	BIU Bank Non configured error
2A2B	BIU Bus error
2A2C	BIU Time-out
2A2D	Parity error
2A2E	Access to non configured bank
2A2F	Bus error
2A30	Bus time-out
2A31	Data Storage Exception
2A32	Instruction Storage Exception
2A33	Unexpected Timer Interrupt
2A34	Unexpected INT 3
2A35	Unexpected DMA Complete interrupt
2A36	Unknown Critical Interrupt
2A37	Unexpected Generic software interrupt
2A38	Sequencer Error
2A39	Bad RAM parity on write detected
2A3A	Out of Range/protected memory access

2105 Exception Symptom Codes

ESC	Description of ESC
2A3B	Single bit error
2A3C	Uncorrectable error
2A3D	Page overflow error
2A3E	Received PCI Master Abort
2A3F	Received PCI Target Abort
2A40	Signalled PCI Target Abort
2A41	Data parity error
2A42	System parity error
2A43	Parity error device id
2A44	PCI error during PCB fetch
2A45	PCI error during index fetch
2A46	PCI error during skip mask fetch
2A47	PCI error during DDS fetch
2A48	PCI error during DMA
2A49	PCI error during AOE transfer
2A4A	Internal Parity Error
2A4B	Correctable RAM Error
2A4C	Uncorrectable RAM error
2A4D	Non Free Page during write
2A4E	Time stamp / drive /LBA filed mismatch error
2A4F	DDS Length error
2A50	DDS syntax error
2A51	Skip Mask length error
2A52	Page fault
2A53	PCB syntax error
2A54	Invalid Index Offset
2A55	Invalid PCI MMIO access error
2A56	RAM Diag check
2A57	PCI MMIO NV address error
2A58	PCI MMIO NV Control data error
2A59	PCI MMIO Diagnostic parity error to external RAM
2A5A	PCI MMIO parity error to internal RAM
2A5B	Low Battery power detected
2A5C	Low System Voltage Detected
2A5D	Battery Power disabled detected
2A5E	Charge transition signal state
2A5F	Command Queue Error, Entry lost
2A60	Invalid Start sequence
2A61	Invalid Clear sequence
2A62	Self Refresh detected
2A63	Fully Charged Battery Sense

ESC	Description of ESC
2A64	Low system voltage sense
2A65	Unexpected MITRV Interrupt
2A66	Posted Write Error
2A67	PLXV Detected Parity Error
2A68	PLXV Signaled System Error - SERR # made active
2A69	PLXV Received Master Abort
2A6A	PLXV Received Target Abort
2A6B	PLXV Signaled Target Abort
2A6C	PLXV Master Data Parity Error - PERR # detected or made active
2A6D	Copy Error to IOARRIN Queue
2A6E	Copy error to send port
2A6F	Copy error to receive port
2A70	IOARCB Fetch Error
2A71	Interval Timer Interrupt
2A72	Timer Count Interrupt
2A73	Timer Compare Interrupt
2A74	Operation Queue Interrupt
2A75	Free Queue is empty
2A76	Receive Queue valid
2A77	Accel Interrupt
2A78	XOR Interrupt
2A79	NVS memory card Host Bus SERR/PERR
2A7A	NVS memory card Local Bus X PERR/SERR
2A7B	NVS memory card Local Bus Y SERR/PERR
2A7C	PLXV/P LSERR
2A7D	PLXP PCHK
2A7E	Lattice PCHK
2A7F	Host Bay IOM Error
2A80	Device Bay IOM Error
2A81	Power Bay IOM Error
2A82	Unknown NVS Error
2A83	Unknown NVS memory card cache module INTA
2A84	Unknown PLXP/V Error
2A85	Alternate VHB INTA
2A86	Unknown NVS memory card Host Bus Error
2A87	Unknown NVS memory card INTA
2A88	Alignment exception
2A89	Program exception
2A8A	System Call
2A8B	Programmable Interval Timer
2A8C	Fixed Interval Timer

2105 Exception Symptom Codes

ESC	Description of ESC
2A8D	Watchdog Timer
2A8E	Data TLB Miss
2A8F	Instruction TLB Miss
2A90	Debug Exception
2A91	Protection Error
2A92	Voy/403 exception 200
2A93	Illegal instruction
2A94	Privileged instruction
2A95	Trap compare
2A9A	Invalid NVS track ID list
2AA0	Hardware Initialization Failure
2AA1	NVS memory card BIST Failure
2AA2	NVS memory card DRAM BIST Failure
2AA3	NVS Boot failure
2AA4	No ADS for NVS adapter
2AA5	Code mismatch between NVS adapter and SMP
2AA6	AIX open firmware configuration failure
2AA7	Previous fire hose dump failure
2AA8	NVS flash burn failed
2AA9	NVS config with no cluster power cycle
2AAA	NVS memory card cache module 0 failure
2AAB	NVS memory card cache module 1 failure
2AAC	NVS memory card cache module 2 failure
2AAD	No NVS memory card cache module Found
2AF0	NVS Failure

Support Level Exception Codes

The allocated ESC range for support level errors is ’30xx’ to ’30FF’.

ESC	Description of ESC
3000	Support level error, LOG
3001	Support level error, REBOOT
3002	Support level error, WARMSTART
3003	Support level error, FAILOVER
3004	Support level error, FORCED STATESAVE

Notification Events Exception Symptom Codes

The following ESC code values are set during Notification Event analysis. The allocated ESC range for Notification Events is ’3100’x to ’31FF’x

ESC	Description of ESC
3110	CE request to power on cluster bay

ESC	Description of ESC
3111	CE request to power off cluster bay
3112	CE request to reset service mode for cluster bay
3113	Cluster Bay failover
3114	Cluster Bay fenced due to excessive failover/failback
3115	Cluster Bay failback
3116	Cluster Bay failback from cluster bay failover
3117	Cluster Bay failover Without failback

Fibre Channel Exception Symptom Codes

The following Fibre Channel code values are set during analysis. The allocated ESC range for Fibre Channel errors is '3200'x to '32FF'x.

ESC	Description of ESC
3200	Fibre Channel heartbeat failure for adapter in service
3201	Fibre Channel adapter heartbeat failure
3202	Fibre Channel adapter time-out
3203	Fibre Channel adapter invalid response
3204	Fibre Channel adapter failure response
3205	IOCTL requested fence of Fibre Channel adapter
3206	Fibre Channel adapter not available
3207	Fibre Channel adapter Error: no data while in service mode
3208	Fibre Channel adapter Error: no data - temporary
3209	Fibre Channel adapter Error: no data - permanent
3210	Fibre Channel adapter Error: invalid data while in service mode
3211	Fibre Channel adapter Error: invalid data - temporary
3212	Fibre Channel adapter Error: invalid data - permanent
3221	Fibre Channel adapter Error: configuration failure - temporary
3222	Fibre Channel adapter Error: configuration failure - permanent
3225	Fibre Channel adapter Error: panic - temporary
3226	Fibre Channel adapter Error: panic - permanent
3227	Fibre Channel adapter Error: 603 hardware check - temporary
3228	Fibre Channel adapter Error: 603 hardware check - permanent
3265	Fibre Channel adapter Error: fence logical path - temporary
3269	Fibre Channel adapter Error: link incident - temporary
326A	Fibre Channel adapter Error: link incident, bit error rate exceeded - permanent
326B	Fibre Channel adapter Error: link incident - informational message
3270	Fibre Channel adapter Error: configuration single flash failure - temporary
3271	Fibre Channel adapter Error: configuration single flash failure - permanent
3272	Fibre Channel adapter Error: configuration both flash failure - temporary
3273	Fibre Channel adapter Error: configuration both flash failure - permanent
3274	Fibre Channel adapter Error: configuration checksum failure - temporary

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ESC	Description of ESC
3275	Fibre Channel adapter Error: configuration checksum failure - permanent
3280	Fibre Channel: SCSI abort task
3281	Fibre Channel: SCSI abort task set
3282	Fibre Channel: SCSI clear task set
3283	Fibre Channel: SCSI LUN reset
3284	Fibre Channel: SCSI target reset
3288	Emulex IOCB response hardware failure
3289	Emulex mailbox response hardware failure
328A	Fibre Channel microcode detected hardware failure
328B	Fibre Channel SMP microcode detected hardware failure
3291	Fibre Channel PPC machine reset
3292	Fibre Channel PPC data storage interrupt
3293	Fibre Channel PPC instruction storage interrupt
3294	Fibre Channel PPC alignment exception
3295	Fibre Channel PPC program exception
3296	Fibre Channel PPC floating point unavailable
3297	Fibre Channel PPC hang timer decrement
3298	Fibre Channel PPC system call exception
3299	Fibre Channel PPC trace exception
329A	Fibre Channel PPC performance exception
329B	Fibre Channel PPC translation miss
329C	Fibre Channel PPC instruction address breakpoint
329D	Fibre Channel PPC system management interrupt
329E	Fibre Channel PPC thermal management interrupt
329F	Fibre Channel PPC unrecognized exception
32A0	Fibre Channel PPC data not available
32A1	Fibre Channel PPC machine check interrupt
32A2	Fibre Channel PPC data bus parity error
32A3	Fibre Channel PPC address bus parity error
32A4	Fibre Channel mpc106 data not available
32A5	Fibre Channel mpc106 SERR - daughter card
32A6	Fibre Channel mpc106 SERR - Fibre Channel card
32A7	Fibre Channel mpc106 PCI target PERR
32A8	Fibre Channel mpc106 memory read parity error
32A9	Fibre Channel mpc106 flash ROM write error
32AA	Fibre Channel mpc106 illegal L2 copy-back error
32AB	Fibre Channel mpc106 unknown TEA check
32AC	Fibre Channel unknown 200 exception
32B0	Fibre Channel icc data not available
32B1	Fibre Channel icc PLX3 LSERR
32B2	Fibre Channel icc hang time overflow

ESC	Description of ESC
32B3	Fibre Channel emulex data not available
32B4	Fibre Channel emulex EBus pck
32B5	Fibre Channel emulex BBus pck
32B6	Fibre Channel emulex internal error 1
32B7	Fibre Channel emulex internal error 2
32B8	Fibre Channel emulex host bus internal error
32B9	Fibre Channel emulex Fibre channel link internal error
32BA	Fibre Channel emulex control memory error
32BB	Fibre Channel emulex buffer memory error
32BC	Fibre Channel emulex no error found in status register
32BD	Fibre Channel emulex host attach error
32BE	Fibre Channel emulex no error found
32C0	Fibre Channel icc error
32C1	Fibre Channel PCI arbiter error
32C2	Fibre Channel PLX1 LSERR
32C3	Fibre Channel PLX4 LSERR
32C4	Fibre Channel PLX2 LSERR
32C5	PLX4 address error
32C6	PLX1-2 address error
32C7	PLX1 PCHK
32C8	PLX2 PCHK
32C9	DRAM write protect error
32CA	FPGA error
32CB	SBM hardware error
32CC	SBM data check
32CD	PLX3 PCHK
32CE	PLX4 PCHK
32CF	No intStat check recognized
32D0	Fibre Channel host check condition
32D1	Fibre Channel host aborted task
32D2	Fibre Channel host task timeout
32D3	Fibre Channel host logging enabled
32D4	Fibre Channel host logging disabled

Data Path Exception Symptom Codes

The following Data Path code values are set during analysis. The allocated ESC range for data path errors is ’3300’x to ’34FF’x and ’4900’ to ’49FF’.

ESC	Description of ESC
3311	DA Stage DA LRC
3312	DA Stage LRC Data Bad

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ESC	Description of ESC
3313	DA RBC LRC Data Bad
3314	DA Stage LRC Not Isolated
3315	DA stage media error
3316	DA block LRC error
3317	DA Part of Previous Error
3318	DA Destage Cache LRC
3319	DA Destage DA LRC
331A	DA Destage LRC Not Isolated
331B	DA decompression error
3320	DA destage Cache SN
3321	DA destage DA SN
3322	DA destage SN not isolated
3324	DA destage Cache PA
3325	DA destage DA PA
3326	DA destage PA not isolated
333E	ESCON cache recovery seen by adapter only
333F	ESCON cache recovery detected CPI threshold
3340	ESCON Header LRC Check while in Service Mode
3341	ESCON Header LRC Check - temporary
3342	ESCON Header LRC Check - permanent
3344	ESCON Header PA Check while in Service Mode
3345	ESCON Header PA Check bad CRC - temporary
3346	ESCON Header PA Check bad CRC - permanent
3348	ESCON Data CRC Check while in Service Mode
3349	ESCON Data CRC Check - temporary
334A	ESCON Data CRC Check - permanent
334B	ESCON header PA check good CRC first event
334C	ESCON header PA check good CRC repeat event
334E	ESCON failed writing cache, recovered
334F	ESCON failed writing cache, not recovered
3350	Fibre Channel data failure while in service mode
3351	Fibre Channel header LRC check - temporary
3352	Fibre Channel header LRC check - permanent
3353	Fibre Channel CKD cache recovery seen by adapter only
3354	Fibre Channel CKD cache recovery detected CPI threshold
3355	Fibre Channel header PA check bad CRC - temporary
3356	Fibre Channel header PA check bad CRC - permanent
3357	Fibre Channel data CRC check - temporary
3358	Fibre Channel data CRC check - permanent
3359	Fibre Channel header PA check first event
335A	Fibre Channel header PA check repeat event

ESC	Description of ESC
335E	Fibre Channel CKD failed writing cache, recovered
335F	Fibre Channel CKD failed writing cache, not recovered
3360	Fibre Channel SCSI read LRC
3361	Fibre Channel SCSI read cache LRC
3362	Fibre Channel SCSI sequence number error and cache LRC
3363	Fibre Channel SCSI sequence number error first event
3364	Fibre Channel SCSI sequence number error repeat event
3366	Fibre Channel SCSI failed writing cache, recovered
3367	Fibre Channel SCSI failed writing cache, not recovered
3369	Fibre Channel SCSI cache recovery seen by adapter only
336A	Fibre Channel SCSI cache recovery detected CPI threshold
3410	SCSI Read LRC
3480	SCSI Read Cache LRC
3490	SCSI Sequence Number Error and Cache LRC
34A0	SCSI Sequence Number Error
34AF	SCSI Repeated Sequence Number Error
34B0	SCSI Diagnostic Data Mismatch
34C0	SCSI failed writing cache, recovered
34C2	SCSI failed writing cache, not recovered
4910	Data check one sector medium error
4920	Data check multiple sectors medium error
4930	Data check one sector LRC
4940	Data check multiple sectors LRC
4960	Second occurrence of customer data sequence number error
4970	Second occurrence of customer physical address error
4980	Metadata check one sector medium error
4990	Metadata check multiple sectors medium error
49A0	Metadata check one sector LRC
49B0	Metadata check multiple sectors LRC
49C0	Multi-Track Data Loss, Customer Approved
49D0	Multi-Track Data Loss
49E0	Data loss handling complete

ESCON Exception Symptom Codes

The following ESCON code values are set during analysis. The allocated ESC range for fibre channel errors is ’3500’x to ’35FF’x and ’4900’ to ’49FF’.

ESC	Description of ESC
3501	ESCON adapter not available
3503	ESCON adapter Heartbeat Failure
3504	ESCON adapter Time-out

2105 Exception Symptom Codes

ESC	Description of ESC
3505	ESCON adapter Invalid Response
3506	ESCON adapter Failure Response
3507	IOCTL Requested fence of ESCON adapter
3510	ESCON adapter Error: No Data while in Service Mode
3511	ESCON adapter Error: No Data - temporary
3512	ESCON adapter Error: No Data - permanent
3514	ESCON adapter Error: Invalid Data while in Service Mode
3515	ESCON adapter Error: Invalid Data - temporary
3516	ESCON adapter Error: Invalid Data - permanent
3518	ESCON adapter Error: Machine Check while in Service Mode
3519	ESCON adapter Error: Machine Check - temporary
351A	ESCON adapter Error: Machine Check - permanent
351C	ESCON adapter Error: Other Exception while in Service Mode
351D	ESCON adapter Error: Other Exception - temporary
351E	ESCON adapter Error: Other Exception - permanent
351F	ESCON adapter error: SMP microcode detected hardware failure
3521	ESCON adapter Error: Configuration Failure - temporary
3522	ESCON adapter Error: Configuration Failure - permanent
3524	ESCON adapter Error: Panic while in Service Mode
3525	ESCON adapter Error: Panic - temporary
3526	ESCON adapter Error: Panic - permanent
3527	ESCON adapter Error: 603 hardware check - temporary
3528	ESCON adapter Error: 603 hardware check - permanent
3550	ESCON adapter Error: Message LRC Check while in Service Mode
3551	ESCON adapter Error: Message LRC Check - temporary
3552	ESCON adapter Error: Message LRC Check - permanent
3564	ESCON adapter Error: Fence Logical Path while in Service Mode
3565	ESCON adapter Error: Fence Logical Path - temporary
3569	ESCON adapter Error: Link Incident - temporary
356A	ESCON adapter Error: Link Incident, bit error rate exceeded, permanent
356B	ESCON adapter Error: Link Incident, informational message
3570	ESCON adapter Error: Configuration Single Flash Failure - temporary
3571	ESCON adapter Error: Configuration Single Flash Failure - permanent
3572	ESCON adapter Error: Configuration Both Flash Failure - temporary
3573	ESCON adapter Error: Configuration Both Flash Failure - permanent
3574	ESCON adapter Error: Configuration Checksum Failure - temporary
3575	ESCON adapter Error: Configuration Checksum Failure - permanent
3580	ESCON adapter Error: ppc data valid false
3581	ESCON adapter Error: ppc msr (19) is reset
3582	ESCON adapter Error: ppc srr1 (mpc) active
3583	ESCON adapter Error: ppc srr1 (dpe) active

ESC	Description of ESC
3584	ESCON adapter Error: ppc srr1 (ape) active
3585	ESCON adapter Error: ppc srr1 (tea) active
358C	ESCON adapter Error: flash ROM write error
358D	ESCON adapter Error: memory read parity error
358E	ESCON adapter Error: PCI error
358F	ESCON adapter Error: illegal L2 copy-back error
3590	Message LRC error - temporary
3591	Message LRC error - fence CPI
3592	Message LRC error - fence cluster bay
3593	Message LRC error - fence adapter

Microcode Detected Error Exception Symptom Codes

The following ESC code values set during MDE error analysis. The allocated ESC range for MDE errors is '3200'x to '32FF'x and '3800'x to '38FF'x.

ESC	Description of ESC
3800	Cluster Heartbeat failure for cluster bay in service
3801	Cluster Bay 1 Heartbeat Fail
3802	Cluster Bay 2 Heartbeat Fail
3805	IOCTL Requested fence of Cluster Bay 1
3806	IOCTL Requested fence of Cluster Bay 2
3807	IOCTL Requested fence of RPC-1
3808	IOCTL Requested fence of RPC-2
380A	Adapter BUS PCI reset failure
3810	RPC-1 heartbeat failure
3811	RPC-2 heartbeat failure
3812	RPC-1 fenced, permanent error logging was deferred
3813	RPC-2 fenced, permanent error logging was deferred
3814	RTAS failure communicating with RPC-1
3815	RTAS failure communicating with RPC-2
3816	RTAS failure communicating with RPC-1 during IML
3817	RTAS failure communicating with RPC-2 during IML
3818	RTAS failure communicating with RPC-1 w/cluster bay in service
3819	RTAS failure communicating with RPC-2 w/cluster bay in service
381A	RTAS failure communicating with RPC-1 with it in service
381B	RTAS failure communicating with RPC-2 with it in service
381C	RPC missing interrupt RPC-1 verification testing
381D	RPC missing interrupt RPC-2 verification testing
381E	RPC missing interrupt RPC-1 IML verification testing
381F	RPC missing interrupt RPC-2 IML verification testing
3820	RPC lock failure during RPC-1 verification testing

2105 Exception Symptom Codes

ESC	Description of ESC
3821	RPC GPR data mismatch during RPC-1 verification testing
3822	RPC GPR address failure during RPC-1 verification testing
3823	RPC fence mode failure during RPC-1 verification testing
3824	RPC lock failure during RPC-2 verification testing
3825	RPC GPR data mismatch during RPC-2 verification testing
3826	RPC GPR address failure during RPC-2 verification testing
3827	RPC fence mode failure during RPC-2 verification testing
3828	RPC lock failure during RPC-1 IML verification testing
3829	RPC GPR data mismatch during RPC-1 IML verification testing
382A	RPC GPR address failure during RPC-1 IML verification testing
382B	RPC fence mode failure during RPC-1 IML verification testing
382C	RPC lock failure during RPC-2 IML verification testing
382D	RPC GPR data mismatch during RPC-2 IML verification testing
382E	RPC GPR address failure during RPC-2 IML verification testing
382F	RPC fence mode failure during RPC-2 IML verification testing
3830	RPC-1 communication time-out with alternate cluster bay indicating fenced
3831	RPC-2 communication time-out with alternate cluster bay indicating fenced
3832	RPC-1 and RPC-2 communication time-out with alternate cluster indicating fenced
3833	RPC-1 communication time-out with alternate cluster bay in service
3834	RPC-2 communication time-out with alternate cluster bay in service
3835	RPC-1 and RPC-2 communication time-out with alternate cluster in service
3836	RPC-1 communication time-out with alternate cluster bay indicating installed
3837	RPC-2 communication time-out with alternate cluster bay indicating installed
3838	RPC-1 and RPC-2 communication time-out with alternate cluster indicating installed
3839	RPC-1 communication time-out
383A	RPC-2 communication time-out
383B	RPC-1 and RPC-2 communication time-out
383C	RPC-1 communication time-out with local cluster bay in service
383D	RPC-2 communication time-out with local cluster bay in service
383E	RPC-1 and RPC-2 communication time-out w/local cluster bay in service
3840	Cluster Bay 1 failover/failback failure
3841	Cluster Bay 2 failover/failback failure
3848	LSS Warning, LSS ODM objects created or deleted to many times
3849	LSS Failure, LSS ODM objects out of sync on each cluster bay
384B	License failure, license out of sync on each cluster bay
384C	License failure, PAV disabled
384D	License failure, XRC disabled
384E	License failure, PPRC disabled
384F	License failure, Flash Copy disabled
3850	Active parallel port interrupt, temporary
3851	Active parallel port interrupt, permanent

ESC	Description of ESC
3858	Cluster message/control data LRC
3860	CPI experiencing random errors
3861	Active CPI interrupt with no source, temporary
3867	Cross cluster bay CPI LRC check on data transfer
386B	CPI empty bay slot interrupt, temporary
386C	CPI Empty bay slot interrupt, permanent
3870	Fenced adapter interrupt, temporary
3871	Fenced adapter interrupt, permanent
3872	Adapter interrupt with no indication of source, temporary
3873	Adapter interrupt with no indication of source, permanent
3878	Dual cluster bay IML, both cluster bays have the same adapter ID
3879	IML back cluster bay has same adapter ID as operating cluster bay
3880	No interrupt handler in ADS for adapter
3881	No interrupt handler in ADS for adapter
3887	Peer to peer copy path status change
3888	Flash Copy device partner off line
3889	Flash Copy device partner on line
388A	Flash Copy relationship established
388B	Flash Copy relationship terminated
388C	PPRC device state changed to simplex
388D	PPRC device state changed to duplex pending
388E	PPRC device state changed to full duplex
388F	PPRC device state changed to suspended
3890	Message LRC check on RPC-1
3891	Message LRC check on RPC-2
3892	Message LRC check on RPC-1 during IML
3893	Message LRC check on RPC-2 during IML
3898	Global status location changed during failback
38A0	Local time-out detected
38A1	Local CMS time-out detected
38A8	Loss of access to rank
38A9	Request warmstart
38AA	Data trapped in local NVS
38AB	LSS not ready data trapped
38B0	XC communication timeout
38B8	Pseudo shutdown
38BA	New adapter installed, not the same as old adapter
38BB	Unknown adapter type installed during repair action
38C0	Cluster Bay 1 IML failure
38C1	Cluster Bay 2 IML failure
38CA	SCSI diagnostic failure

2105 Exception Symptom Codes

ESC	Description of ESC
38CB	CPI diagnostic failure
38D0	Sequence number failure with LRC failure, temporary
38D1	Sequence number failure with LRC failure, permanent
38DA	CPI IOA reset failure
38DB	CPI host top/host bottom reset failure
38E0	Adapter configuration mismatch failure
38E7	Pinned data detected during shutdown
38F0	CPSSDD IML threshold reached
4xxx	See “Data Path Exception Symptom Codes” on page 159

SRN Exception Symptom Codes

- The code value in the SRN field is used to determine if this error is a firmware error or an SRN error. Firmware errors post either an eight digit Firmware/POST error code or a six digit SRN error code.
- Is the SRN field an eight digit field?
  - **Yes**, this is a firmware error code, go to “Firmware/POST Error Codes” on page 73.
  - **No**, this is an SRN error code. Analyze the error using the following information.

ESC code values (xxx) indicate that the repair should be done using the SRN value. The allocated ESC range for SRN errors is ’5000’x to ’5FFF’x. The three low order ESC character are the first three digits in the SRN. may be appended by Problem Manager.

ESC	Description of ESC
5xxx	The xxx in the ESC is the first three digits in the SRN for this problem. Repair the problem using the SRN with this ESC.

RPC Exception Symptom Codes

ESC code values are set during RPC error analysis. The allocated ESC range for RPC errors is ’8100’x to ’83FF’x. The low order ESC character is reserved for isolation information that may be appended by Problem Manager.

Power Control Sequence (Not Error Conditions)

ESC	Description of ESC
8110	RPC non-error interrupt
8111	RPC first occurrence of power event, not analyzed
8120	RPC Set Service Mode, RPC-1
8121	RPC Set Service Mode RPC-2
8122	RPC Reset Service Mode, RPC-1
8123	RPC Reset Service Mode, RPC-2
8130	RPC BPS-0 Battery Charging
8131	RPC BPS-1 Battery Charging
8132	RPC BPS-0 and BPS-1 Battery Charging
8133	RPC BPS-0 Power Good Status
8134	RPC BPS-1 Power Good Status

ESC	Description of ESC
8135	RPC BPS-0 On Battery
8136	RPC BPS-1 On Battery
8137	RPC BPS-0 Battery Charging Complete
8138	RPC BPS-1 Battery Charging Complete
8139	RPC BPS-0 Power On
813A	RPC BPS-1 Power On
813B	RPC Cluster Bay 1 Complex Power On
813C	RPC Cluster Bay 2 Complex Power On
8140	RPC Host adapter Bay Power On
8144	RPC Host adapter Bay 1 Power Off
8145	RPC Host adapter Bay 2 Power Off
8146	RPC Host adapter Bay 3 Power Off
8147	RPC Host adapter Bay 4 Power Off
8149	RPC Cluster Bay Power Off Request
814A	RPC Cluster Bay Power Off
814B	RPC Electronics Cage Power Supply Powered On
814C	RPC Cluster Bay Power On
814D	RPC Rack Power Off Sequence
8150	RPC Begin Line Cord 1 Loss Analysis
8151	RPC Begin Line Cord 2 Loss Analysis
8152	RPC Line Cord 1 Voltage Returned
8153	RPC Line Cord 2 Voltage Returned
8154	RPC A-Rack AC Power Returned
8155	RPC B-Rack AC Power Returned
8156	RPC A-Rack Battery Charging Complete
8157	RPC B-Rack Battery Charging Complete
8158	RPC A-Rack Battery Charging
8159	RPC B-Rack Battery Charging
8160	RPC A-Rack On Battery
8161	RPC B-Rack On Battery
8162	RPC Battery Capacity Low Early Warning
8170	RPC Switch to Remote, Remote Power Feature Disabled
8171	RPC Switch to Remote, Remote Power Feature Enabled
8172	RPC Switch to Local
8173	Thermal sense low
8174	Thermal sense high

Power Control Sequence Errors

ESC	Description of ESC
8180	RPC Cluster Bay power off recovered

2105 Exception Symptom Codes

ESC	Description of ESC
8190	RPC Rack power off cluster bay power status in error
81A0	RPC valid Rack power off, RPC error
81B0	RPC Invalid rack power off request, no cluster bay power off
81C0	RPC invalid two cluster bay power off request
81D0	RPC invalid cluster bay power off request
81E0	RPC excessive recurring power events
81E1	RPC excessive recurring primary power events
81E2	RPC excessive recurring power sub-actions
81E3	RPC card firmware update required
81F0	RPC Service Processor Power Cycle Event

Cluster Bay Controller Hardware Error Conditions

ESC	Description of ESC
8210	RPC Fault
8211	RPC Interrupts Disagree Between RPC-1 And RPC-2
8212	RPC Microcode Interrupt Threshold Exceeded
8213	RPC Both RPCs Detect Other RPC Not Good
8214	RPC-2 Indicates an RPC-1 Failure
8215	RPC-1 Indicates and RPC-2 Failure
8220	RPC RTAS Single Cluster Bay Fault
8221	RPC RTAS Single RPC Fault
8222	RPC RTAS, Cluster Bay and RPC Fault
8223	RPC RTAS Fault, Both Cluster Bays and RPCs
8230	RPC LPT Interrupt Not Reported on Cluster Bay 1
8231	RPC LPT Interrupt Not Reported on Cluster Bay 2
8232	RPC Hot LPT Interrupt From Both Cluster Bays
8233	RPC Hot LPT Interrupt From Only One Cluster Bay
8234	RPC Cluster Bay Views of RPC-1 Disagree
8235	RPC Cluster Bay Views of RPC-2 Disagree
8240	RPC Cluster Bay 1 Fenced From RPC-1
8241	RPC Cluster Bay 1 Fenced From RPC-2
8242	RPC Cluster Bay 2 Fenced From RPC-1
8243	RPC Cluster Bay 2 Fenced From RPC-2
8244	RPC Cluster Bay 1 Fenced From RPC-1 And RPC-2
8245	RPC Cluster Bay 2 Fenced From RPC-1 And RPC-2
8246	RPC Cluster Bay Fenced Status, First Occurrence
8250	RPC Cluster Bay Power State Change Did Not Complete
8251	RPC Cluster Bay Power Fault
8252	RPC Cluster Bay Did Not Power Off, Power Off Forced
8253	RPC Unexpected Host adapter Bay Power Off

ESC	Description of ESC
8254	RPC Local/Remote Switch Settings Disagree
8255	RPC Bay Power State Change Did Not Complete
8260	RPC Hot Fan State Change Interrupt
8261	RPC Cage 1 Fan Failure
8262	RPC Cage 2 Fan Failure
8263	RPC cluster 1 fan failure
8264	RPC cluster 2 fan failure

Rack Power or Cooling Error Conditions

ESC	Description of ESC
8310	RPC primary Power Assembly Power Fault
8311	RPC BPS-0 Battery Charge or BPS Fault
8312	RPC BPS-1 Battery Charge or BPS Fault
8313	RPC BPS-0 to BPS-1 Communication Failure
8314	RPC BPS-0 Power Fault
8315	RPC BPS-1 Power Fault
8316	RPC PPS heartbeat failure
8320	RPC AC Power Fault, Line Cord 1 and 2
8321	RPC AC Power Fault, Line Cord 1
8322	RPC AC Power Fault, Line Cord 2
8323	All primary power is available, allow DDM fault reporting
8324	Primary power is not available from at least one PPS, inhibit DDM fault reporting
8325	Primary power is not available with no other defining fault
832A	RPC AC power fault, line cord 1
832B	RPC AC power fault, line cord 2
8330	RPC Electronics Cage Power Supply Failure
8331	RPC PPS battery failure
8332	RPC PPS battery low early warning
8333	RPC PPS loss of line cord phase
8334	RPC PPS failure
8335	RPC PPS circuit breaker tripped
8336	RPC PPS fan failure
8337	RPC both PPS fans failed
8340	RPC B-Rack Front/Back Rack Model Type Disagree
8341	RPC B-Rack Model Type and Configuration Status Disagree
8342	RPC A-Rack Model Does Not Support Single Phase Power
8343	RPC B-Rack Model Does Not Support Single Phase Power
8344	RPC R2-Rack Front/Rear Battery Installed Status Disagrees
8345	RPC R3-Rack Front/Rear Battery Installed Status Disagrees
8346	RPC Battery is defective or not connected

2105 Exception Symptom Codes

ESC	Description of ESC
8347	RPC PPS to RPC Cable Check
8350	Periodic replacement of rack battery is required
8360	Cluster bay 1 thermal sensor out of range
8361	Cluster bay 2 thermal sensor out of range
8362	Cluster bay 1 and cluster bay 2 thermal sensors out of range

Microcode Logic errors

The following describe the ESC codes that will be used when errors are encountered that require support trained service personnel. The allocated range for support level errors is '9000'x to '9FFF'x.

ESC	Description of ESC
9000-9804	Support level errors

SSA Device Card Exception Symptom Code and Service Request Numbers

The following SSA ESC and SRN code values are set during SSA device card error analysis. The allocated ESC range for detected errors is 'C000'x to 'C5FF'x.

Note: These SRNs may also occur with an ESC of 1xxx. See "Service Request Numbers (SRN)" on page 173

ESC	SRN	Description of ESC and SRN
C001	xxxxx	SRN not on ESC list
C100	40000	SSA device card failed
C110	50000	SSA device card failed to respond
C110	50001	SSA device card data parity error
C110	50002	SSA device card DMA error
C110	50004	SSA device card channel check
C110	50006	SSA device card channel check
C110	50007	SSA device card IOCC detected intermittent error
C110	50008	SSA unable to access POS/PCI cfg space
C110	50013	SSA device card hardware error
C120	D4000	Cannot configure SSA device card
C120	D4100	Cannot open SSA device card
C130	D4300	SSA device card POST failure
C140	D44XX	SSA microcode corrupted, cannot update
C200	40004	DRAM failed (module 0) - 4 MB
C200	40008	DRAM failed (module 0) - 8 MB
C200	40016	DRAM failed (module 0) - 16 MB
C200	40032	DRAM failed (module 0) - 32 MB
C200	40064	DRAM failed (module 0) - 64 MB
C200	40128	DRAM failed (module 0) - 128 MB
C210	41004	DRAM failed (module 1) - 4 MB

ESC	SRN	Description of ESC and SRN
C210	41008	DRAM failed (module 1) - 8 MB
C210	41016	DRAM failed (module 1) - 16 MB
C210	41032	DRAM failed (module 1) - 32 MB
C210	41064	DRAM failed (module 1) - 64 MB
C210	41128	DRAM failed (module 1) - 128 MB
C300	42000	Both DRAMs failed
C510	504xx	SSA device card, microcode hung, hardware?
C520	50012	SSA microcode hung, hardware?

SSA Device Card Exception Symptom Codes

The following ESC code values are set during SSA device card error analysis. The allocated ESC range for SSA device card errors is ’CF00’x to ’CFFF’x.

ESC	Description of ESC
CF01	SSA device card not available
CF02	IOCTL requested fence of SSA device card error
CF10	Microcode detected SSA device card error - temporary
CF20	Microcode detected SSA device card error - permanent
CF21	Microcode detected SSA device card adapter error while in Service
CF30	Hardware detected SSA error - temporary
CF40	Hardware detected SSA error - permanent
CF41	Hardware detected SSA error while in service mode
CF50	SSA device card failed heartbeat, temporary error
CF60	SSA device card failed heartbeat, permanent error
CF61	SSA device card failed heartbeat while in service
CF70	DA requested SSA device card reset
CF80	Unknown detected SSA error - temporary
CF90	Unknown detected SSA card error - permanent
CF91	Unknown detected SSA card error while in service
CFA0	Logical disk failure
CFA1	Rank layout failure
CFA2	Permanent error
CFA3	Permanent error while in service
CFA4	DA non-error log entry

SSA Device Card Link Exception Symptom Code and Service Request Numbers

The following ESC and SRN code values are set during SSA link error analysis. The allocated ESC range for detected errors is ’D100’x to ’D1FF’x.

Note: These SRNs may also occur with an ESC of 1xxx. See “Service Request Numbers (SRN)” on page 173

2105 Exception Symptom Codes

ESC	SRN	Description of ESC and SRN
D100	20XXX	Open SSA link
D110	45XXX	SSA link opened
D120	21XXX	Link threshold, no characters received
D120	22XXX	Link threshold, remote port disabled
D120	23XXX	Link threshold, link reset failed
D120	24XXX	Link threshold, retry limit exceeded
D120	25XXX	Link threshold, hardware error
D120	26XXX	Link threshold, frame reject
D120	27XXX	Link threshold, invalid retry status
D120	28XXX	Link threshold, time-out disable state
D120	29XXX	Link threshold, time-out ready state
D130	33XXX	Excessive link configurations
D140	34000	Controller cannot initialize device

SSA Disk Drive Module Exception Symptom Code and Service Request Numbers

The following ESC and SRN code values are set during DDM error analysis. The allocated ESC range for detected errors is 'E000'x to 'EDFF'x.

Note: These SRNs may also occur with an ESC of 1xxx. See "Service Request Numbers (SRN)" on page 173

Note: **E000** ESCs indicate that error analysis was unable to determine which DDM has failed.

ESC	SRN	Description of ESC and SRN
E000	2A206	DDM SSA link failed POST
E000	50100	Attempt to log error against unavailable pdisk
E000	50411	SSA Node failed or noisy
E000	50425	SSA device prevents configuration
E000	60210	DDM has check light on
E000	60230	Drawer (7133) check light on
E000	60240	DDM cannot be configured
E000	7XXXX	DDM missing from SSA loop
E000	80203	DDM has check light on
E000	80215	Drawer (7133) has check light on
E000	80280	DDM cannot be configured
E000	D0000	DDM cannot be configured
E100	1XXXX	Drive error
E100	44XXX	DDM failed
E110	4BXXX	Unable to configure disk drive
E140	D0300	DDM failed diagnostic
E200	46000	> 1 member of array not available

ESC	SRN	Description of ESC and SRN
E250	48900	> 1 array member failed
E255	48950	Array rebuild failed, DDM caused
E260	49000	Array degraded, no available spare
E270	49100	Array exposed, no available spare
E290	49500	No spare available for array
E291	49501	Spares + Members do not meet expectation
E292	49502	Configuration time-out, multiple SSA errors
E500	2A106	Drawer power loss or controller card interrupt
E500	301C0	Drawer power loss or controller card interrupt
E500	60200	Drawer will not power on
E500	60220	Drawer power assembly check light on
E500	80200	Drawer will not power on
E501	8022X	7133 power supply in position X has failed
E601	8023X	7133 fan assembly in position X has failed
E700	1022F	Drive over temperature
E800	49503	Power sense or controller card code load fail
EB00	31000	PRT detected DDM impending failure (member or spare)
ED01	80210	Controller card has failed
ED01	D8300	Diagnostic detected controller failure
ED03	D8000	Diagnostics cannot access controller

Service Request Numbers (SRN)

The following SRNs are sometimes found without an 1xxx ESC.

These SRNs may also occur with an 1xxx ESC.

Table 17. 2105 Service Request Number (SRN) Descriptions

SRN	Description of SRN
20XXX	Open SSA link
21XXX	Link threshold, no characters received
22XXX	Link threshold, remote port disabled
23XXX	Link threshold, link reset failed
24XXX	Link threshold, retry limit exceeded
25XXX	Link threshold, hardware error
26XXX	Link threshold, frame reject
27XXX	Link threshold, invalid retry status
28XXX	Link threshold, time-out disable state
29XXX	Link threshold, time-out ready state
2A106	Multiple DDMs detected redundant power loss
2A206	DDM SSA link failed POST
301C0	Multiple DDMs detected redundant power loss or controller interrupt
31000	PRT detected DDM impending failure or reset threshold exceeded

2105 Exception Symptom Codes

Table 17. 2105 Service Request Number (SRN) Descriptions (continued)

SRN	Description of SRN
33XXX	Excessive link configurations
40000	SSA device card failed
40004	DRAM failed (module 0) - 4 MB
40008	DRAM failed (module 0) - 8 MB
40016	DRAM failed (module 0) - 16 MB
40032	DRAM failed (module 0) - 32 MB
40064	DRAM failed (module 0) - 64 MB
40128	DRAM failed (module 0) - 128 MB
41004	DRAM failed (module 1) - 4 MB
41008	DRAM failed (module 1) - 8 MB
41016	DRAM failed (module 1) - 16 MB
41032	DRAM failed (module 1) - 32 MB
41064	DRAM failed (module 1) - 64 MB
41128	DRAM failed (module 1) - 128 MB
42000	Both DRAMs failed
43XXX	Device preventing SSA configuration
44XXX	DDM failed
45XXX	SSA link opened
46000	> 1 member of array not available
48900	> 1 array member failed
48950	Array rebuild failed, DDM caused
49000	Array degraded, no available spare
49100	Array exposed, no available spare
49500	No spare available for array
49501	Spares + Members not= 8 x n
49502	Configuration time-out, multiple SSA errors
49503	Power sense of controller card code load fail
49700	Incomplete parity on array
4BXXX	Unable to configure disk drive
50000	SSA device card failed to respond
50001	SSA device card data parity error
50002	SSA device card DMA error
50004	SSA device card channel check
50006	SSA device card channel check
50007	SSA device card IOCC detected intermittent error
50008	SSA unable to access POS/PCI cfg space
50012	SSA microcode hung, hardware?
50013	SSA device card error
50100	Attempt to log error against unavailable pdisk
504xx	SSA device card, microcode hung, hardware?

Table 17. 2105 Service Request Number (SRN) Descriptions (continued)

SRN	Description of SRN
50411	SSA node failed or noisy
50425	SSA device prevents configuration
60000	SSA device card unable to configure
60200	Drawer will not power on
60210	DDM has check light on
60220	Drawer power assembly check light on
60230	Drawer (7133) check light on
60240	DDM cannot be configured
7XXXX	DDM missing from SSA loop
80200	Drawer will not power on
80203	DDM has check light on
80210	7133 controller card has failed
80215	Drawer (7133) has check light on
8022X	7133 power supply in position X has failed
8023X	7133 fan assembly in position X has failed
80280	DDM cannot be configured
D0000	DDM cannot be configured
D0300	DDM failed diagnostic
D4000	Cannot configure SSA device card
D4100	Cannot open SSA device card
D4300	SSA device card POST failure
D44XX	SSA microcode corrupted, cannot update
D6XXX	High speed link running at low speed
D8000	Diagnostics cannot access controller
D8300	Diagnostic detected controller failure

Chapter 10: Power Distribution Diagrams

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2105 Expansion Enclosure System Power Overview 178
2105 Model Exx/Fxx Electronics Cage Power Diagram 179
2105 Earth Ground Diagram 180

2105 Model Exx/Fxx System Power Overview

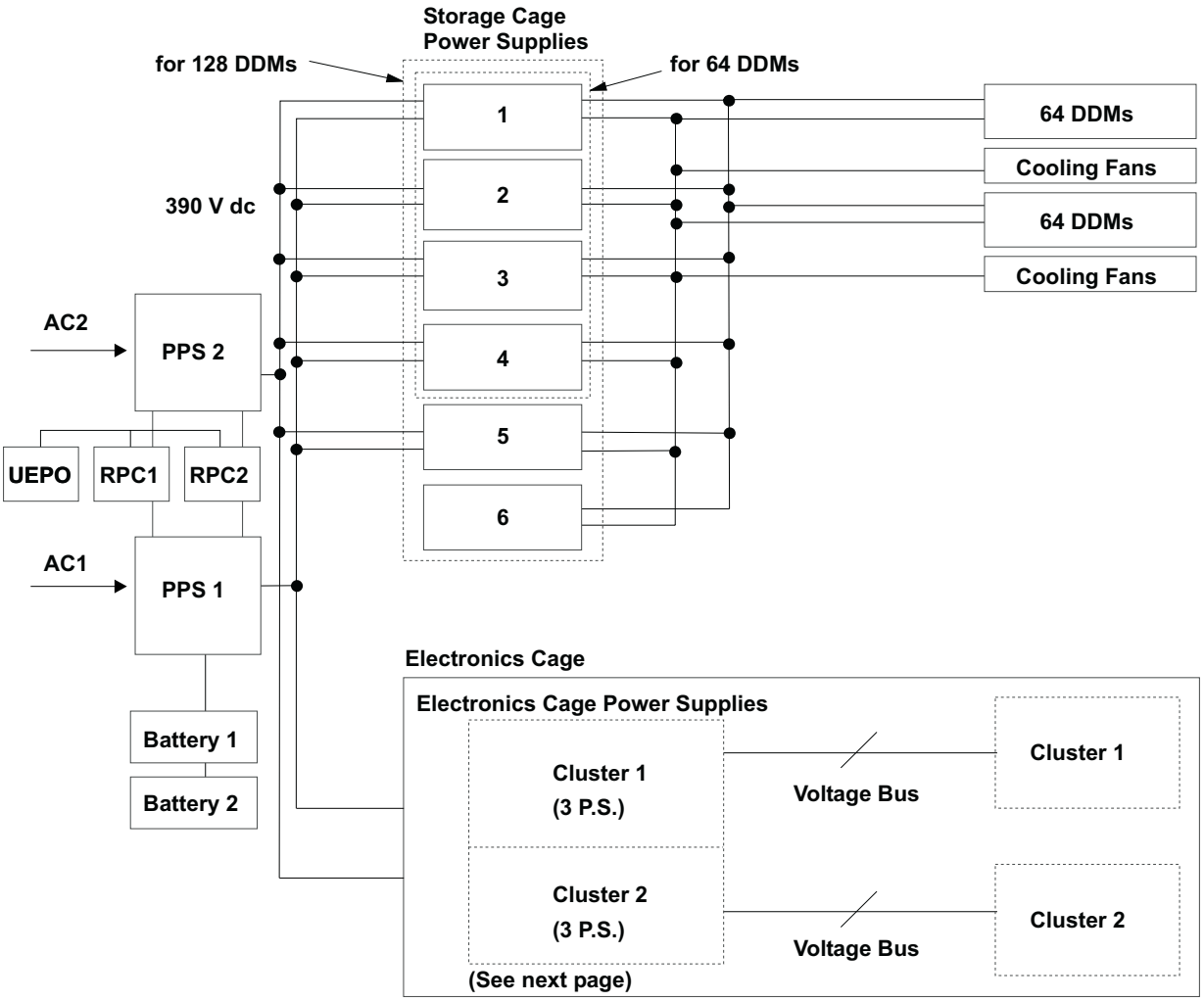

Figure 65. 2105 Model Exx/Fxx System Power Overview (S008130q)

2105 Expansion Enclosure System Power Overview

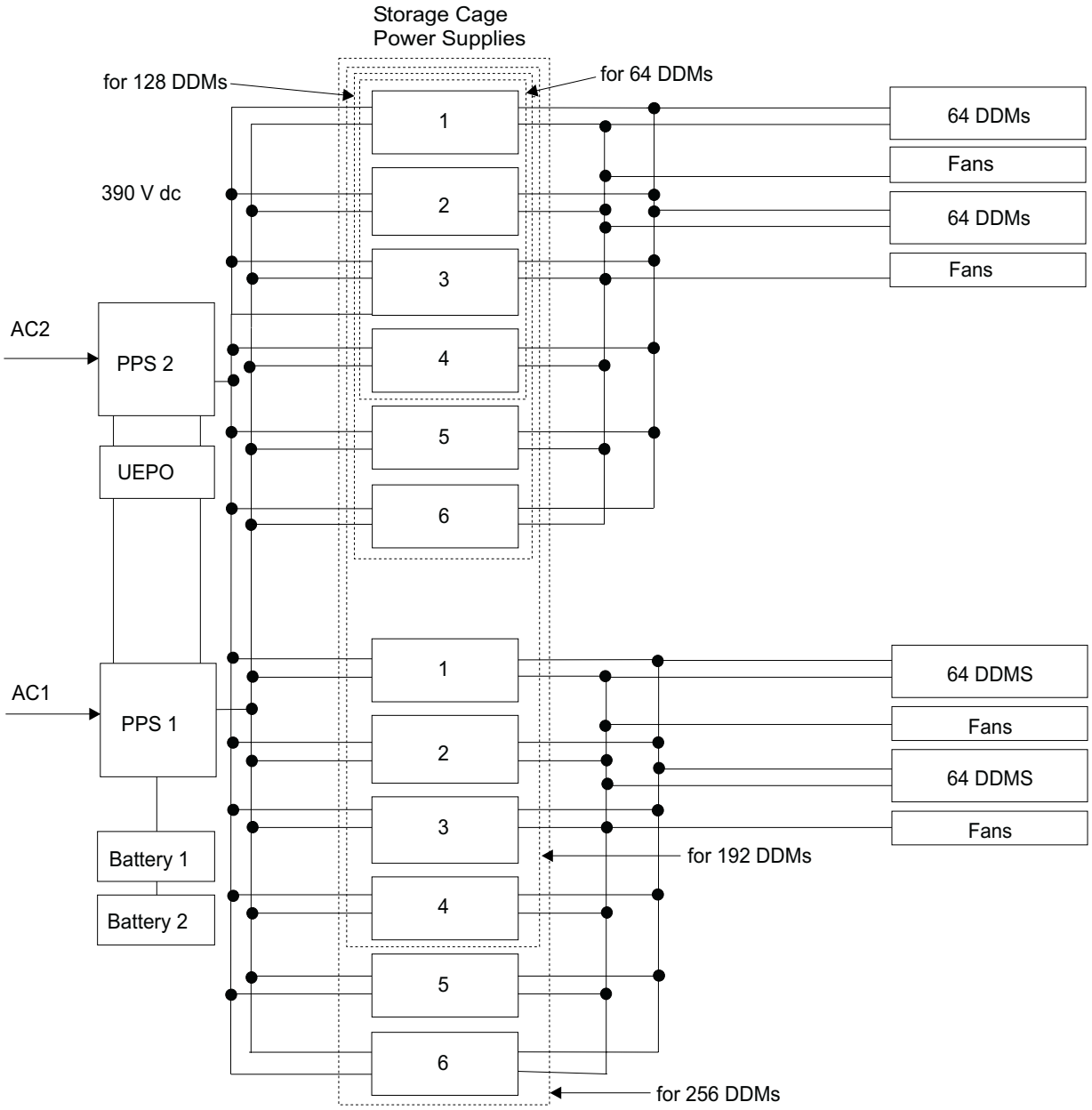

Figure 66. 2105 Expansion Enclosure System Power Overview (S008131r)

2105 Model Exx/Fxx Electronics Cage Power Diagram

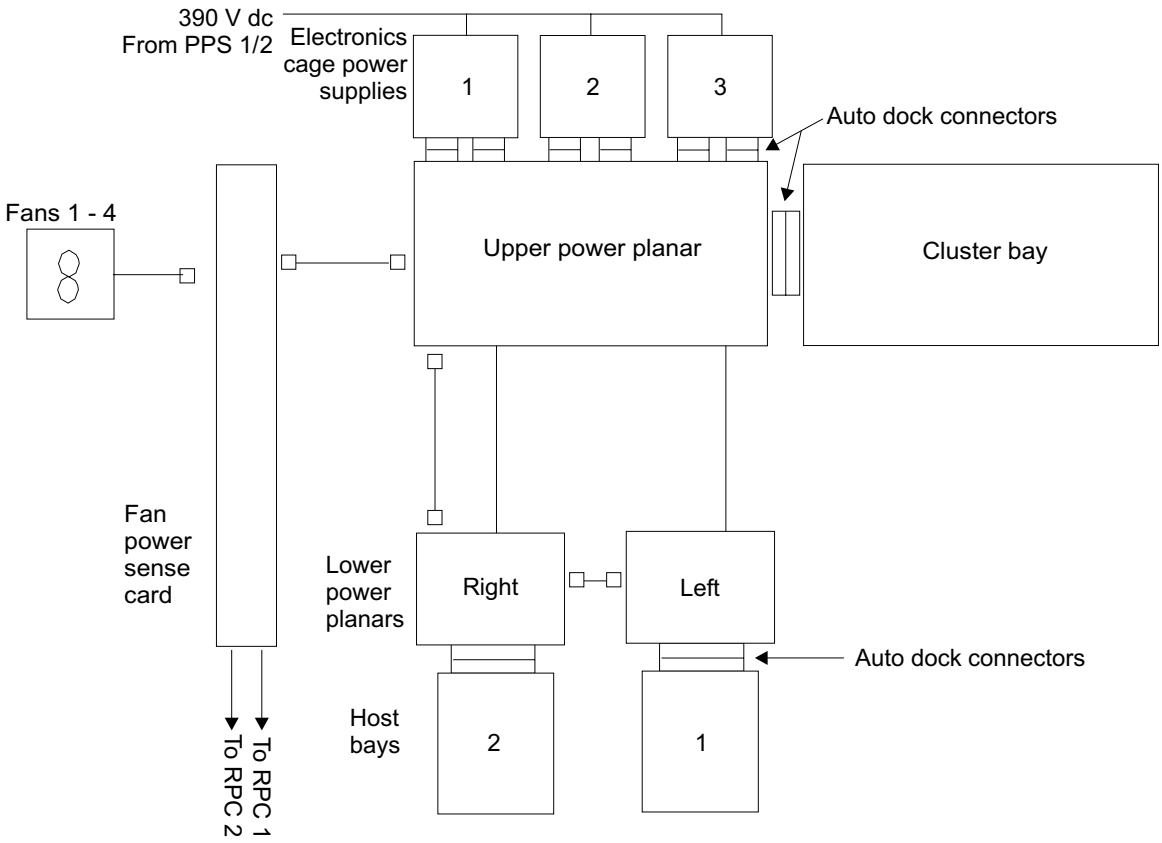

Figure 67. 2105 Model Exx/Fxx Electronics Cage Power Overview (S008132p)

2105 Earth Ground Diagram

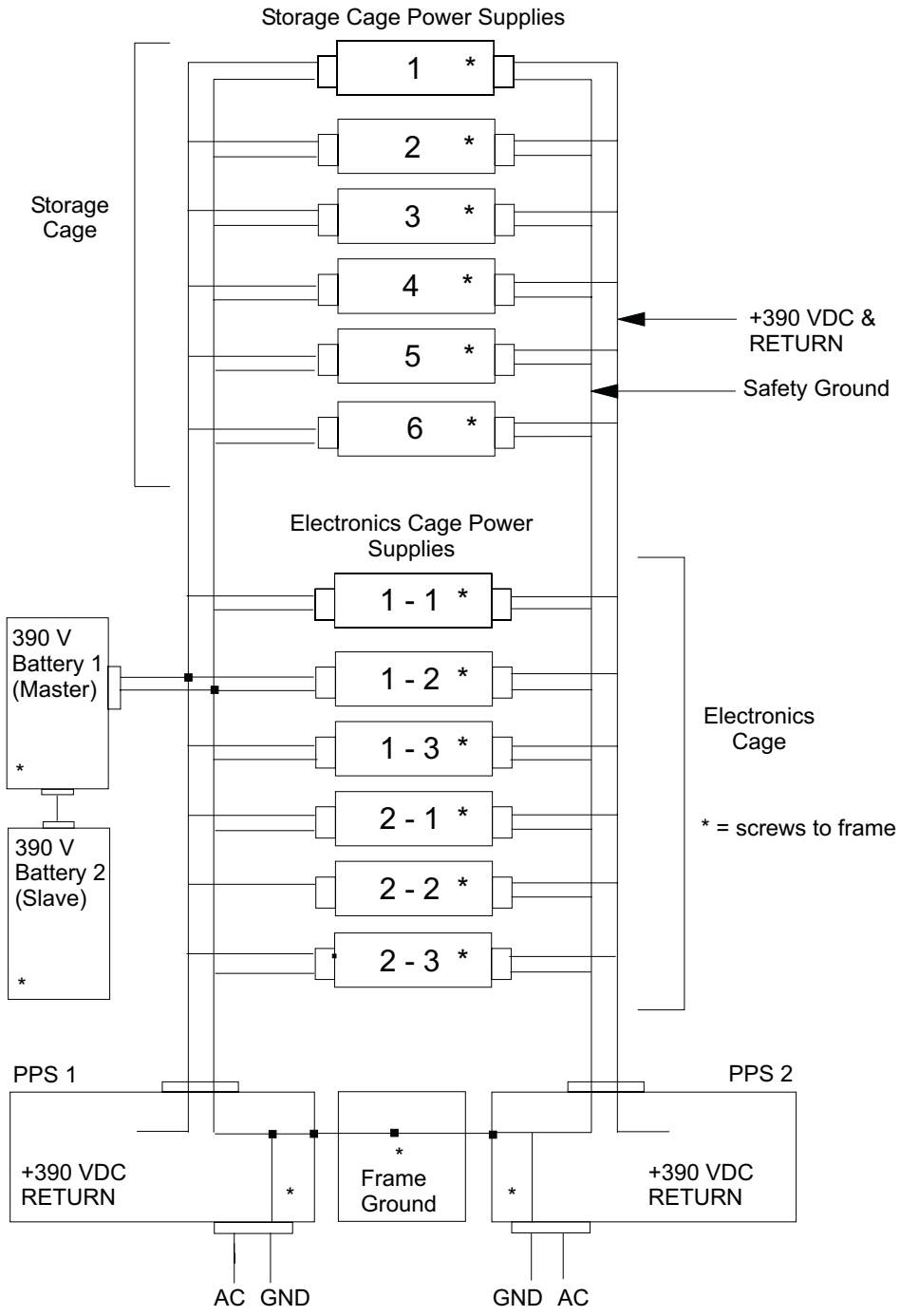

Figure 68. 2105 Earth Ground Diagram (S008105s)

Chapter 11: Translation of Cautions and Danger Notices

- *IBM Storage Solution Safety Notices* book, GC26-7229.
- *Enterprise Storage Server Models Exx and Fxx Service Documents* CD-ROM, SK2T-8771.

Examples of Caution and Danger Notices

DANGER

Danger notices warn you of conditions or procedures that can result in death or severe injury if you do not take precautions, or if you do not perform procedures exactly as stated.

CAUTION:
Caution notices warn you of conditions or procedures that can cause injury that is neither lethal nor extremely hazardous, if you do not take precautions, or if you do not perform procedures exactly as stated.

1001

Translation

Chapter 12: Safety Check

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Introduction

Attention: This chapter has been translated for use in Germany and Taiwan. These translations are available in the *IBM Storage Solution Safety Notices* book, GC26-7229. They are also available for viewing or printing on the web at **http://www.ibm.com/storage/ess**.

This safety inspection helps you verify the safe condition of a 2105 Model Exx/Fxx or 2105 Expansion Enclosure rack and its DDM bay and SSA DASD drawers. Do not service a 2105 rack, DDM bay, or SSA DASD drawer with unsafe conditions.

Perform a safety inspection:

- When IBM receives a request for a service agreement for a 2105 rack, DDM bay or SSA DASD drawer.

  Note: Adding previously used 7133 device drawers must be checked for compatibility. Use the ″7133 Model 020 and D40 Requirements for 2105 Installations″ instruction list service offering in the *IBM Enterprise Storage Server Introduction and Planning Guide* book, form number GC26-7294. Adding a previously used 7133 SSA DASD drawer is a *billable service*.
- As part of an alteration-and-attachments review on any 2105 rack, DDM bay or SSA DASD drawer. that is on lease, under a service agreement, or on a per-call service.
- On a relocated 2105 rack, DDM bay or SSA DASD drawer.

Preparation

Read the complete safety inspection before you perform any of the steps.

Safety

Record any problems in Table 18.

Table 18. Safety Inspection Problems

Date	Problem Found	Date Corrected

Ensure you complete the *Electrical Safety Training Course for IBM Service Support Representatives*, number 77170.

Unsafe Conditions

When first assembled, each 2105 rack, DDM bay and SSA DASD drawer has safety equipment installed to protect the operators and service support representative from injury. This inspection checklist ensures that all safety equipment and safety labels are installed on the 2105 rack, DDM bay and SSA DASD drawer.

Listed below are some safety conditions and hazards that can be present on the 2105.

- A frame that is not grounded. This can cause a serious or lethal electrical shock.
- Missing safety covers or safety shields. This can be a hazard to the customer and maintenance personnel.

CAUTION:

Do not continue with the inspection if any unsafe conditions are present. (1052)

Note: This notice is translated into selected languages. See “Chapter 11: Translation of Cautions and Danger Notices” on page 181.

Reference Items

The following items are supplied with the 2105 Model Exx/Fxx or 2105 Expansion Enclosure:

- A machine history. If the history is not available, obtain a copy and continue with the inspection.
- The *IBM Enterprise Storage Server Service Guide, 2105 Models E10 and E20* book

The following information is not supplied with the 2105:

- *Electrical Safety for IBM Customer Engineers* book
- *IBM Input/Output Equipment Installation Manual–Physical Planning* book
- The 2105 engineering change announcements (ECAs)

Special Tools

Always perform any power safety checks with a recommended analog meter. Do not use a digital meter when you perform power checks. A digital meter is sensitive to external electrical currents on the low-range scale.

You can also use a ground impedance tester, P/N 6339716 or P/N 6339695, to perform the ground check. Instructions for the tester are in the operating manual.

Continue with the safety inspection procedure:

- For **2105 Model Exx/Fxx**, go to "2105 Model Exx/Fxx Safety Inspection"
- For **2105 Expansion Enclosure**, go to "2105 Expansion Enclosure Safety Inspection" on page 197

2105 Model Exx/Fxx Safety Inspection

Safety inspect the2105 Model Exx/Fxx by doing the following procedures:

1. "Remove ac Power"
2. "External Machine Check"
3. "Internal Machine Check" on page 186
4. "Safety Label Check" on page 186

Remove ac Power

The 2105 Model Exx/Fxx operates with two mainline power cables. Disconnect both mainline power cables from the 2105 Model Exx/Fxx before continuing.

Refer to ″Rack, Subsystem Power, 2105 Model Exx/Fxx and Expansion Enclosure″ and ″Mainline Power Cable, 2105 Model Exx/Fxx and Expansion Enclosure″ in chapter 4 of the *Enterprise Storage Server Service Guide, Volume 2*.

Follow these steps to remove ac power:

1. Power the 2105 off.
2. Instruct the customer to switch off the mainline circuit breakers that are used to supply mainline ac voltage to the 2105 Model Exx/Fxx.
3. Attach a "Do Not Operate" tag (S229-0237) and a safety lockout padlock to each of the customer's mainline circuit breakers. Refer to the *Electrical Safety for IBM Customer Engineers* book.
4. Disconnect the customer end of both mainline ac power cables.

   For mainline power cables (plug in): Disconnect both mainline ac power cables from the customer's ac mainline power receptacles.

   For mainline power cables (wired): If the mainline power cables were recently rewired or have never been used, disconnect both mainline ac power cables before you continue the safety inspection.

   Instruct the customer to call a licensed electrician to disconnect the mainline ac power cables from the customers mainline ac power.
5. Disconnect both mainline power cables from their line cord brackets on the front of the 2105.

External Machine Check

Perform the external machine check.

1. Verify that all external covers are present and undamaged.
2. Ensure all latches and hinges are in correct operating condition.
3. Check the 2105 Model Exx/Fxx for loose, broken, or binding casters.
4. Correct any problems that you find.

Internal Machine Check

Perform the internal machine check.

1. Check for any non-IBM changes that may have been made to the machine. If any are present, obtain the “Non-IBM Alteration Attachment Survey” form, number R009, from the IBM branch office. Complete the form and return it to the branch office.
2. Check the condition of the inside of the machine for any metal or other contaminants, or any indications of water, other fluid, fire, or smoke damage.
3. Check for any obvious mechanical problems, such as loose components.
4. Check any exposed cables and connectors for wear, cracks, or pinching.

Safety Label Check

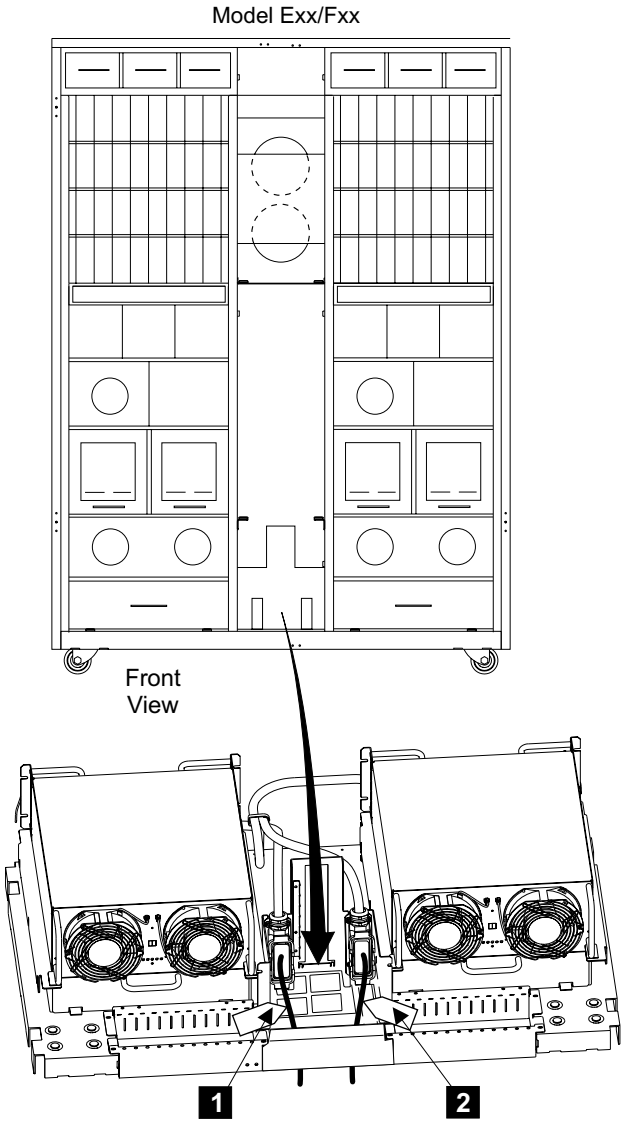
1. Verify that all safety labels shown in the following steps are installed on the machine. If any safety labels are missing, order and install them.
2. Ensure that both of the greater than 200 VAC safety labels are installed on the 2105 Model Exx/Fxx end of each of the mainline power cables **1** and **2**.

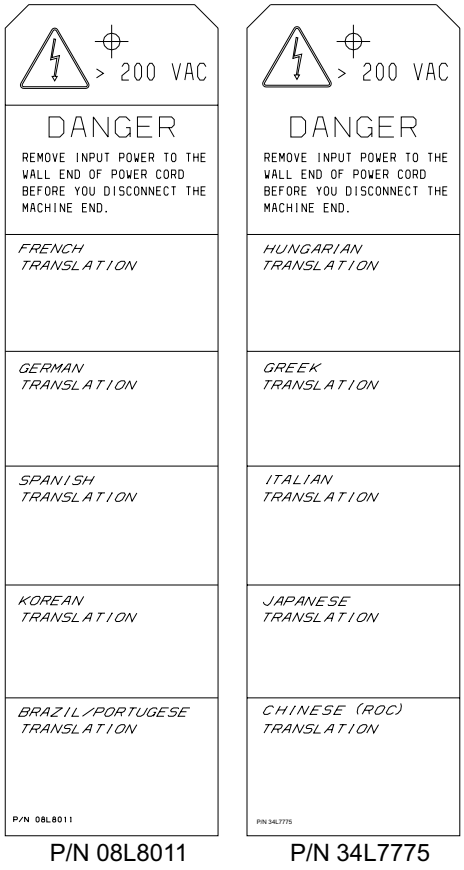
   P/N 08L8011

   Universal language, English, French, German, Spanish, Korean, and Brazilian/Portuguese

   P/N 34L7775

   Universal language, Hungarian, Greek, Italian, Japanese, and Chinese/ROC





P/N 08L8011 P/N 34L7775

Figure 69. 2105 Model Exx/Fxx, Mainline Power Cable Safety Labels (S008818q)

3. Ensure that the dual mainline power cable safety labels are installed on the front tailgate areas of the 2105 Model Exx/Fxx. See Figure 70 on page 188.

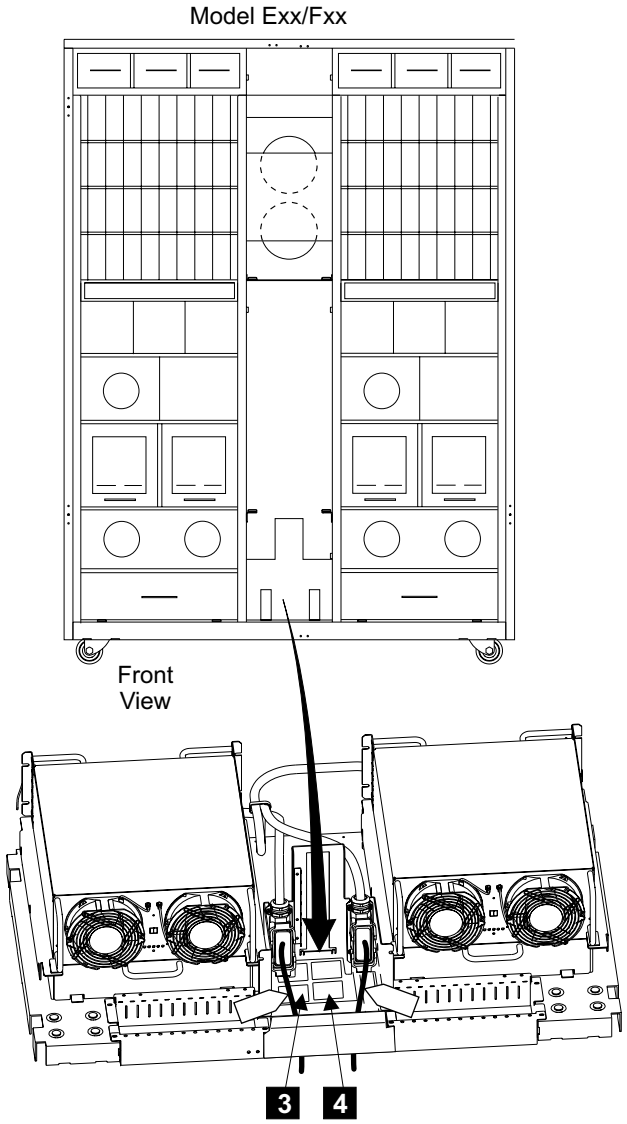
   English dual mainline power cable labels (shown) **3**

   English P/N 09G4108

   Translated dual mainline power cable labels (not shown) **4**

   Brazilian/Portuguese P/N 05J7398
   French P/N 09G5517
   German P/N 09G5511
   Korean P/N 09G5525
   Spanish P/N 09G5509
   Portuguese P/N 09G5513
   French/Canadian P/N 09G5515
   French/Dutch P/N 09G5519
   Italian P/N 09G5521
   Japanese P/N 09G5523
   Norwegian P/N 09G5527

Swedish	P/N 09G5529
Danish	P/N 05J7394
Slovak	P/N 05J8839
Russian	P/N 05J8841
Chinese-PRC	P/N 05J8843
Czech	P/N 05J8845
Croatian	P/N 05J8847
Finnish	P/N 05J7396



P/N 09G4108

Figure 70. 2105 Model Exx/Fxx, Dual Mainline Power Cable Safety Labels (S008819q)

4. Ensure that the danger leakage current safety labels are installed on the front tailgate areas of the 2105 Model Exx/Fxx. See Figure 71 on page 189.

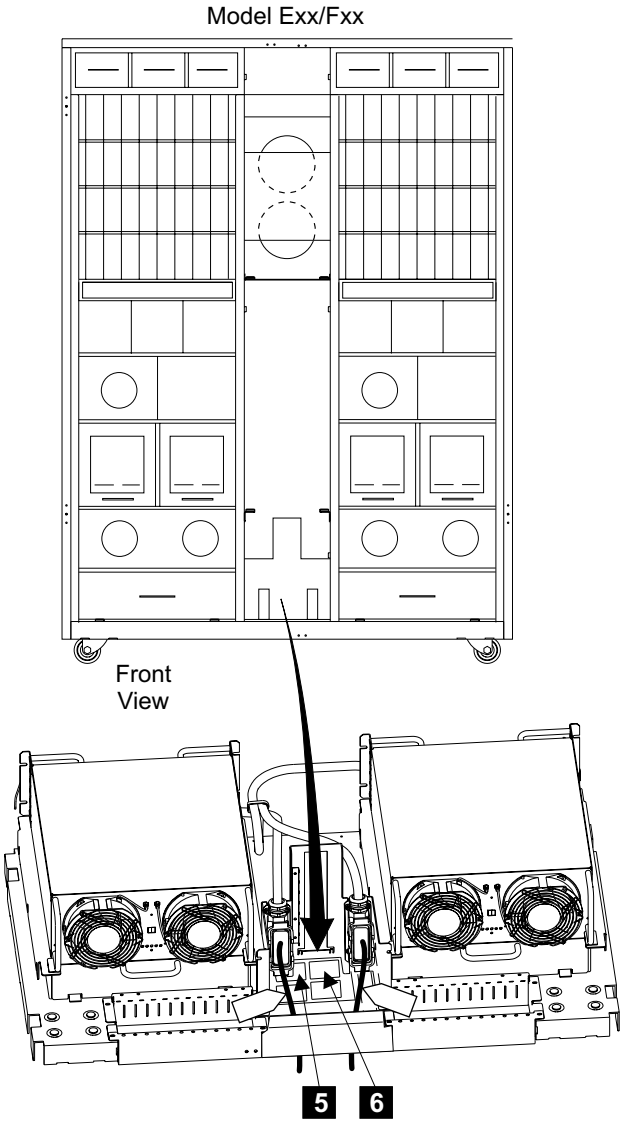
   English danger leakage current labels (shown) **5**

English	P/N 05J8627

   Translated danger leakage current labels (not shown) **6**

French	P/N 05J9071

German	P/N 05J9065
Korean	P/N 05J9079
Spanish	P/N 05J9063
Portuguese	P/N 05J9067
French/Dutch	P/N 05J9073
Italian	P/N 05J9075
Japanese	P/N 05J9077
Norwegian	P/N 05J9081
Danish	P/N 05J9085
Finnish	P/N 05J9087
Brazilian/Portuguese	P/N 05J9089
Slovakian	P/N 05J9091
Russian	P/N 05J9093
Chinese/PRC	P/N 05J9095
Czech	P/N 05J9097
Croatian	P/N 05J9099



P/N 05J8627

Figure 71. 2105 Model Exx/Fxx, Danger Leakage Current Safety Labels (S008820q)

2105 Model Exx/FxxSafety Inspection

5. If any of the languages below apply, ensure that the Unit Emergency switch portion of the translated operator panel **7** is installed on the 2105 Model Exx/Fxx.

Belgian/Dutch	P/N 34L2419
Brazilian/Portuguese	P/N 34L2418
Chinese/ROC	P/N 34L2415
Chinese/ROC	P/N 34L2415
English	P/N 34L2408
French	P/N 34L2409
German	P/N 34L2203
Italian	P/N 34L2414
Japanese	P/N 34L2411
Korean	P/N 34L2412
Spanish	P/N 34L2413

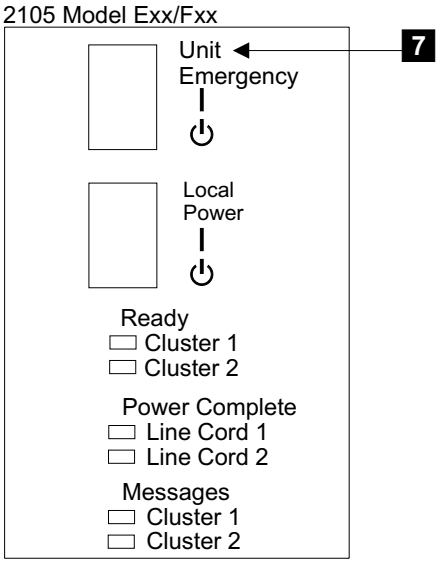


Figure 72. 2105 Model Exx/Fxx, Operator Panel Label (S008821m)

6. Ensure that the weight safety label **8** is installed on the inside of the front right cover of the 2105 Model Exx/Fxx.

Universal language	P/N 5423461

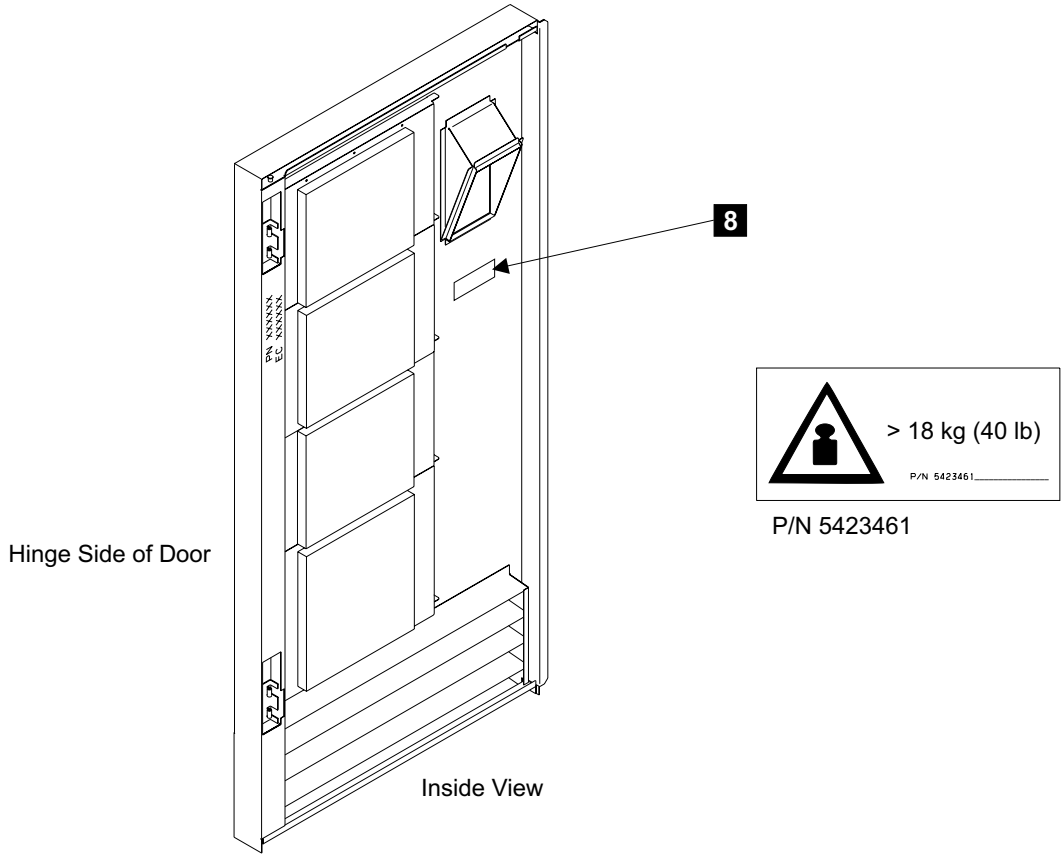


Figure 73. 2105 Model Exx/Fxx Cover Weight Safety Label (S008382p)

7. Ensure that the Trained Service Personnel Only labels are installed on the inside of the front and rear frames of the 2105 Model Exx/Fxx.

   Universal language P/N 09L2638

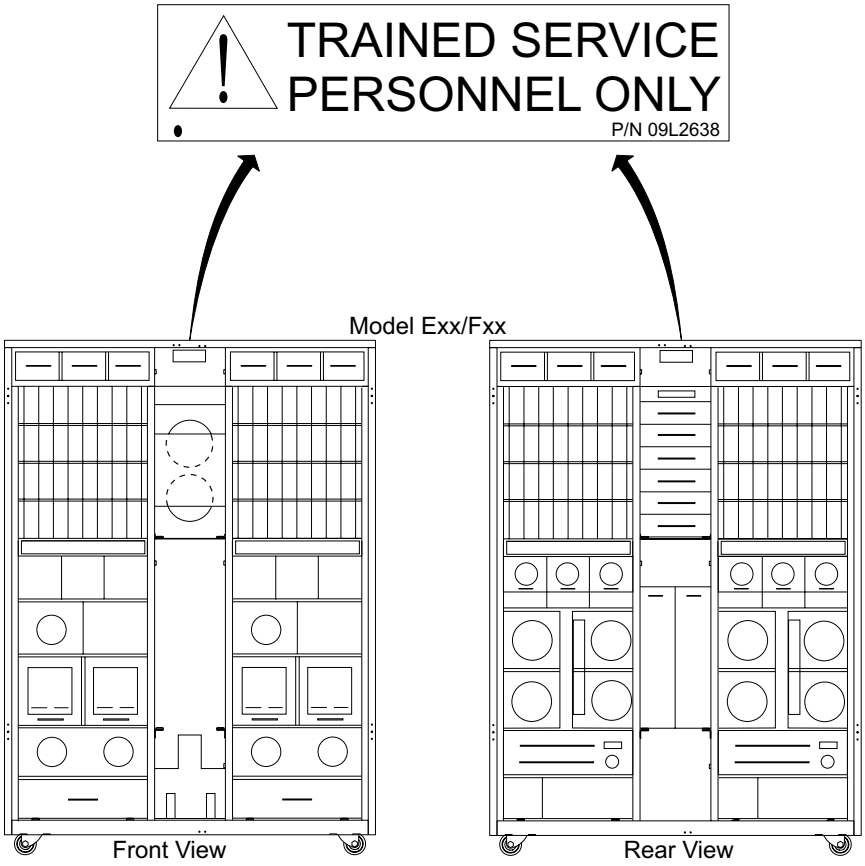


Figure 74. 2105 Model Exx/Fxx Trained Service Personnel Only Labels (S009046)

8. Ensure that the Cluster Fan Warning labels are installed on the front of cluster 1 and cluster 2 inside the front of the 2105 Model Exx/Fxx.

   Universal language P/N 34L9192

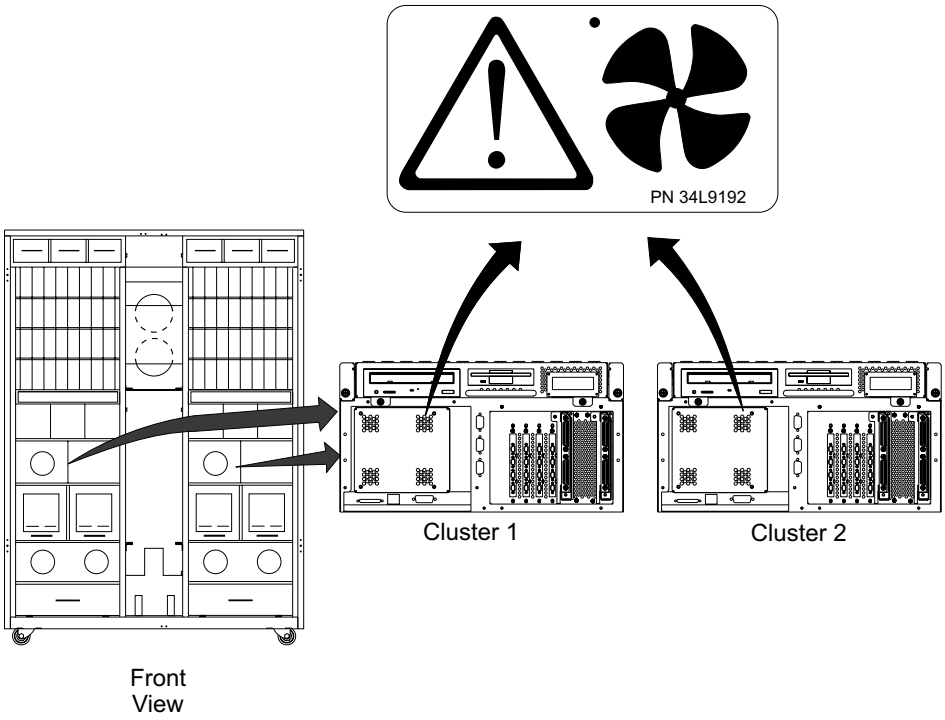


Figure 75. 2105 Model Exx/Fxx Cluster Fan Warning Labels (S009038)

9. Verify that the following safety labels are installed on both primary power supplies:
   - **9** , S1, Micro-Processor switch label
   - **10** , weight warning label
   - **11** , high voltage warning label
   - **12** , high voltage and high energy warning label

   Note: These labels cannot be ordered individually. If a label is missing, the entire primary power supply must be replaced.

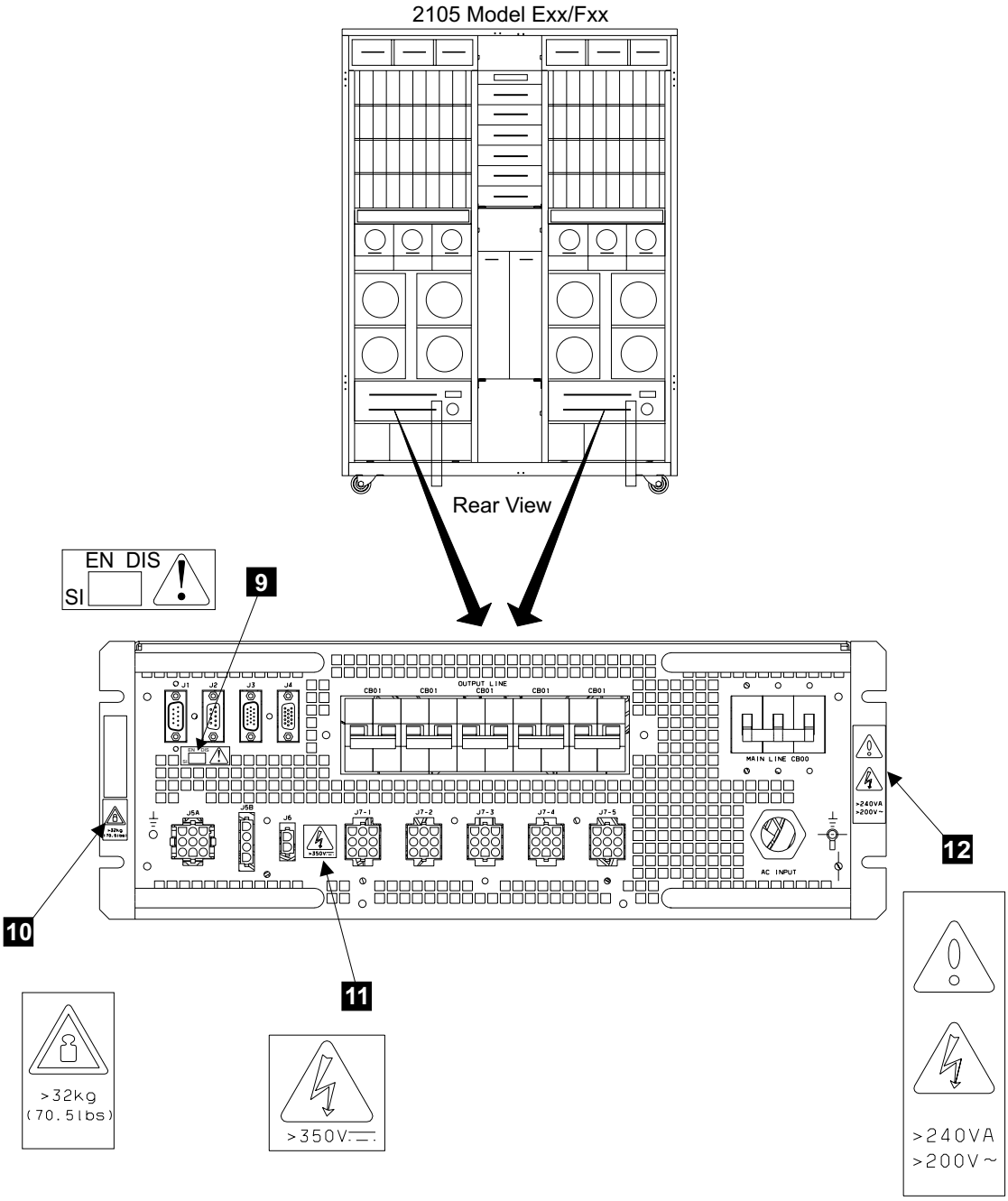


Figure 76. 2105 Model Exx/Fxx Primary Power Supply Safety Labels (S008822r)

10. Verify that the following safety labels are installed on both 390 Volt Batteries:
    - 390 V Battery 1 (master)
      - **14** , weight warning label
      - **15** , high voltage warning label
    - 390 V Battery 2 (slave)
      - **12** , weight warning label
      - **13** , high voltage warning label

Note: These labels cannot be ordered individually. If a label is missing, the 390 V battery set must be replaced.

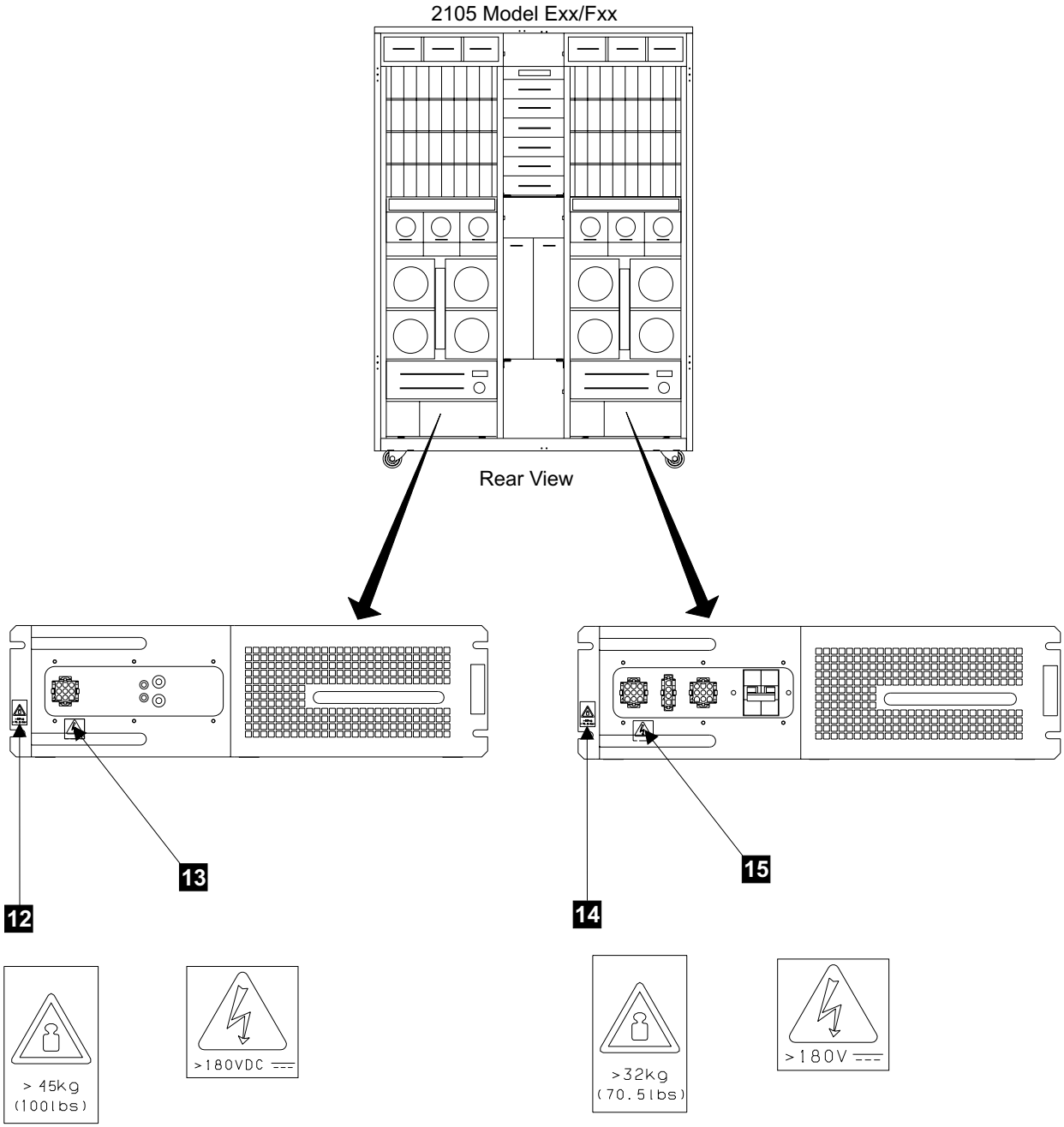


Figure 77. 2105 Model Exx/Fxx 390 V Battery Set Safety Labels (S008823r)

11. Verify that the high voltage safety label is installed on all six electronics cage power supplies.

    Note: These labels cannot be ordered individually. If a label is missing, the entire electronics cage power supply must be replaced.

2105 Model Exx/FxxSafety Inspection

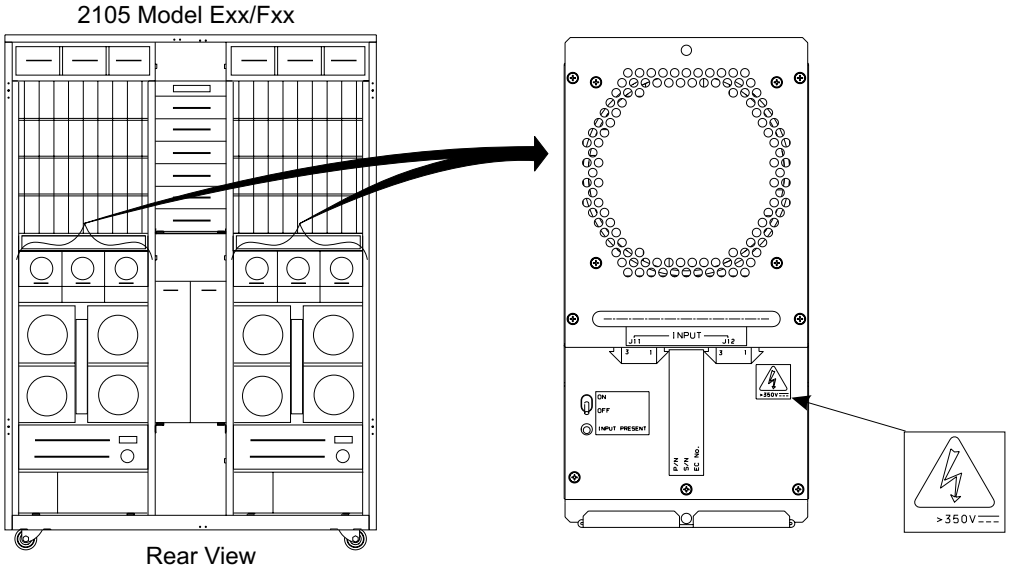


Figure 78. 2105 Model Exx/Fxx Electronics Cage Power Supply Safety Labels (S008824m)

12. Verify that the ground jumpers are installed between each primary power supply (PPS) and the frame:
    - PPS 1, **17**
    - PPS 2, **16**

    Note: There should be a star washer between the ground jumper terminals and the frame and PPS.

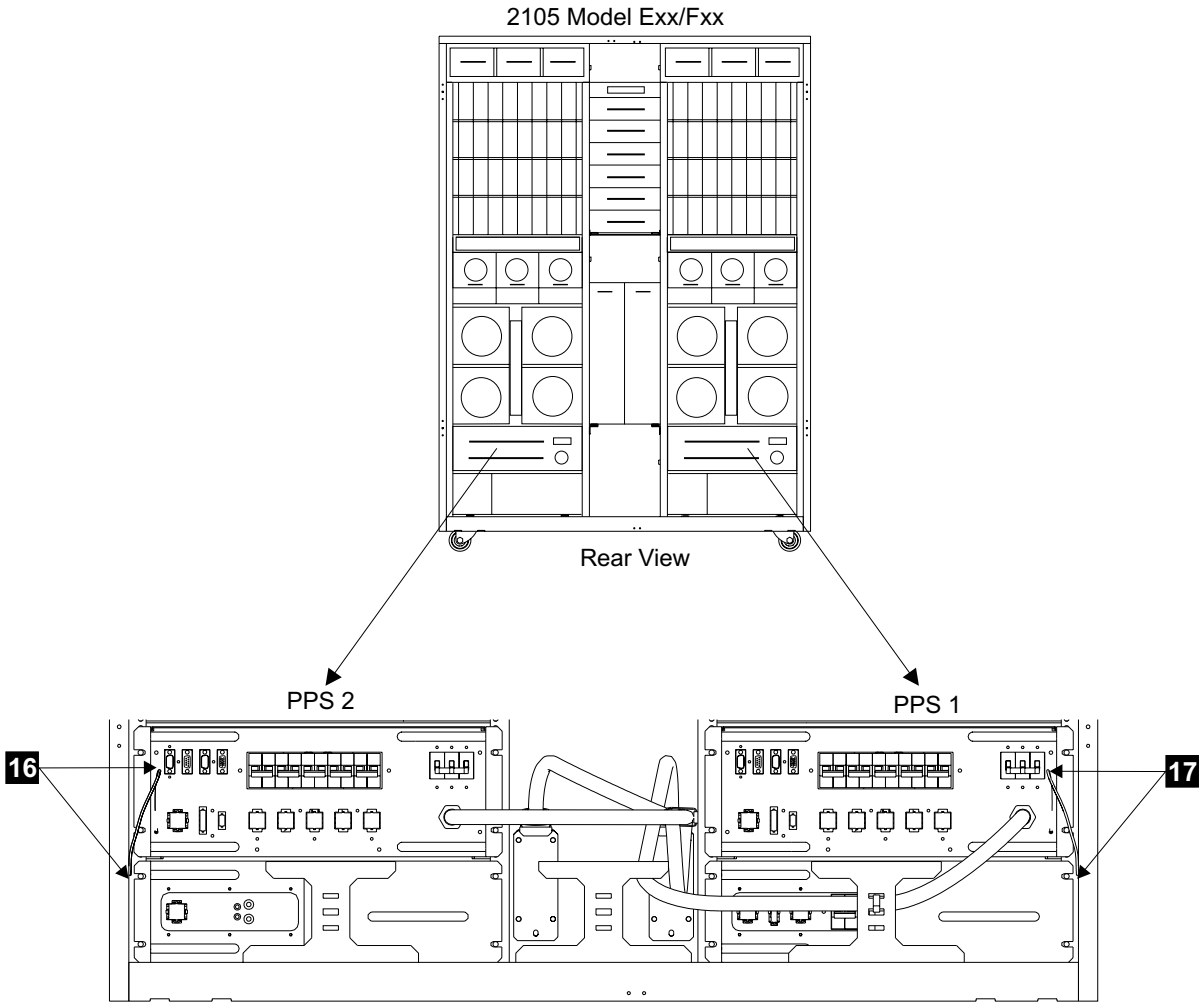


Figure 79. 2105 Model Exx/Fxx, Primary Power Supply Ground Jumpers (S008825q)

13. Complete the safety inspection by going to “Safety Engineering Changes” on page 208.

2105 Expansion Enclosure Safety Inspection

Safety inspect the 2105 Expansion Enclosure by doing the following procedures:

1. “Remove ac Power”
2. “External Machine Check” on page 198
3. “Internal Machine Check” on page 198
4. “Safety Label Check” on page 198

Remove ac Power

The 2105 Expansion Enclosure operates with two mainline power cables. Disconnect both mainline power cables from the 2105 Expansion Enclosure before continuing.

Power off the entire 2105 subsystem, refer to ″Rack, Subsystem Power, 2105 Model Exx/Fxx and Expansion Enclosure″ and ″Mainline Power Cable, 2105 Model Exx/Fxx and Expansion Enclosure″ in chapter 4 of the *Enterprise Storage Server Service Guide, Volume 2*.

Follow these steps to remove ac power:

2105 Expansion Enclosure Safety Inspection

1. Instruct the customer to switch off the mainline circuit breakers that are used to supply mainline ac voltage to the 2105 Expansion Enclosure.
2. Attach a “Do Not Operate” tag and a safety lockout padlock to each of the customer’s mainline circuit breakers. Refer to the *Electrical Safety for IBM Customer Engineers* book.
3. Disconnect the customer end of both mainline ac power cables.

   For mainline power cables (plug in): Disconnect both mainline ac power cables from the customer’s ac mainline power receptacles.

   For mainline power cables (wired): If the mainline power cables were recently rewired or have never been used, disconnect both mainline ac power cables before you continue the safety inspection.

   Instruct the customer to call a licensed electrician to disconnect the mainline ac power cables from the customers mainline ac power.

External Machine Check

Perform the external machine check.

1. Verify that all external covers are present and undamaged.
2. Ensure all latches and hinges are in correct operating condition.
3. Check the 2105 Expansion Enclosure for loose, broken, or binding casters.
4. Correct any problems that you find.

Internal Machine Check

Perform the internal machine check.

1. Check for any non-IBM changes that may have been made to the machine. If any are present, obtain the “Non-IBM Alteration Attachment Survey” form, number R009, from the IBM branch office. Complete the form and return it to the branch office.
2. Check the condition of the inside of the machine for any metal or other contaminants, or any indications of water, other fluid, fire, or smoke damage.
3. Check for any obvious mechanical problems, such as loose components.
4. Check any exposed cables and connectors for wear, cracks, or pinching.

Safety Label Check

1. Verify that all safety labels shown in the following steps are installed on the machine. If any safety labels are missing, order and install them.
2. Ensure that both of the greater than 200 VAC safety labels are installed on the 2105 Expansion Enclosure end of each of the mainline power cables **1** and **2**.

   P/N 08L8011

   Universal language, English, French, German, Spanish, Korean, and Brazilian/Portuguese

   P/N 34L7775

   Universal language, Hungarian, Greek, Italian, Japanese, and Chinese/ROC

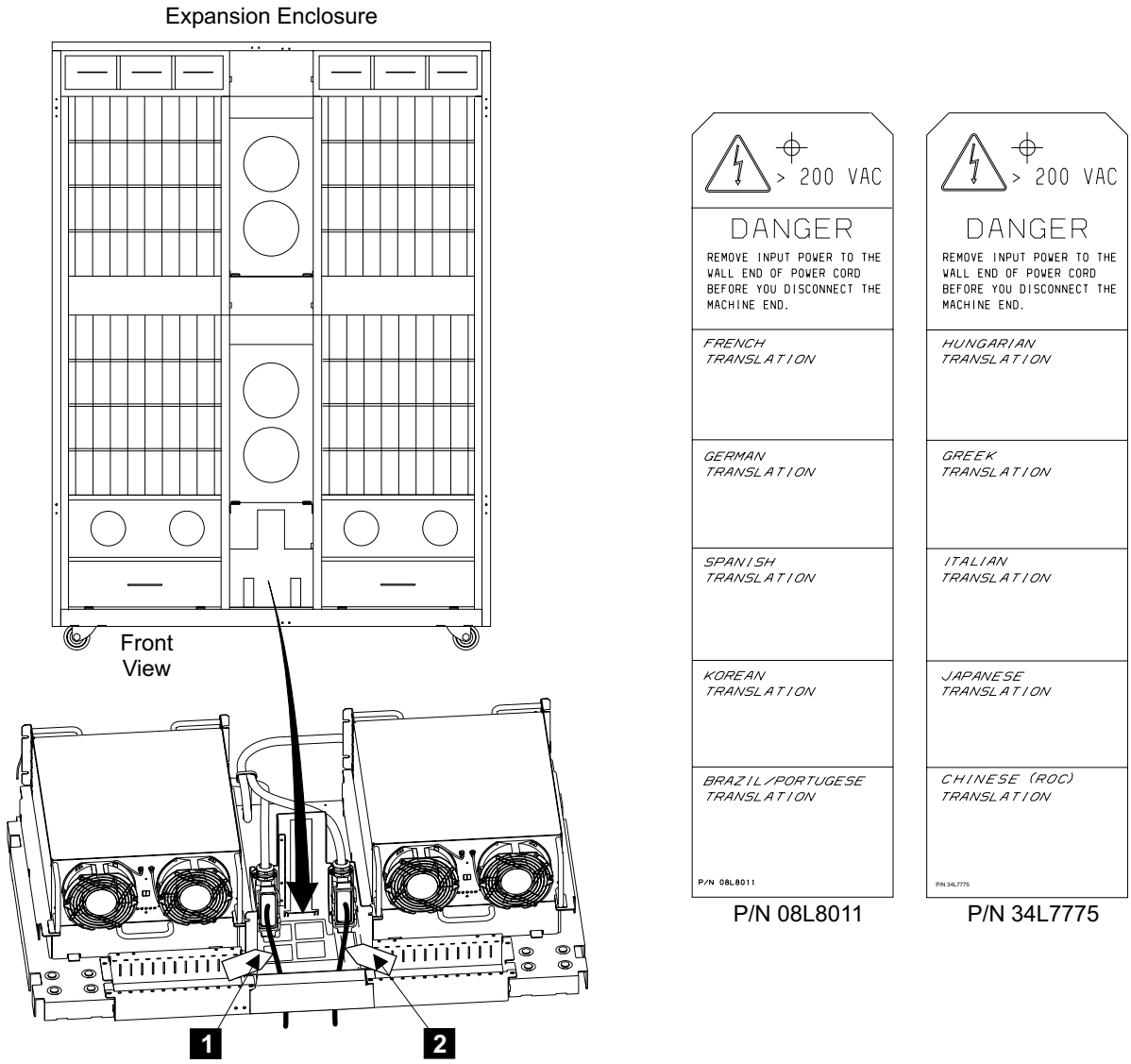


Figure 80. 2105 Expansion Enclosure, Mainline Power Cable Safety Labels (S008368q)

3. Ensure that the dual mainline power cable safety labels are installed on the front tailgate areas of the 2105 Expansion Enclosure. See Figure 81 on page 200.

   English dual mainline power cable labels (shown) **3**

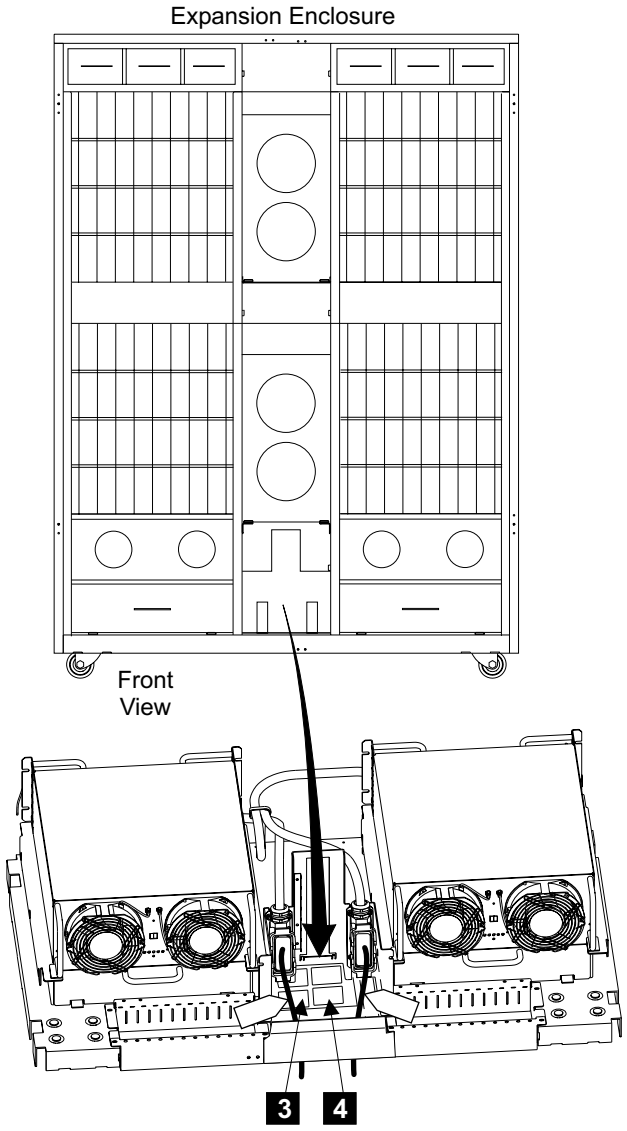
English	P/N 09G4108

   Translated dual mainline power cable labels (not shown) **4**

Brazilian/Portuguese	P/N 05J7398
French	P/N 09G5517
German	P/N 09G5511
Korean	P/N 09G5525
Spanish	P/N 09G5509
Portuguese	P/N 09G5513
French/Canadian	P/N 09G5515
French/Dutch	P/N 09G5519
Italian	P/N 09G5521
Japanese	P/N 09G5523
Norwegian	P/N 09G5527

2105 Expansion Enclosure Safety Inspection

Swedish	P/N 09G5529
Danish	P/N 05J7394
Slovak	P/N 05J8839
Russian	P/N 05J8841
Chinese-PRC	P/N 05J8843
Czech	P/N 05J8845
Croatian	P/N 05J8847
Finnish	P/N 05J7396



P/N 09G4108

Figure 81. 2105 Expansion Enclosure, Dual Mainline Power Cable Safety Labels (S008370q)

4. Ensure that the danger leakage current safety labels are installed on the front tailgate areas of the 2105 Expansion Enclosure. See Figure 82 on page 201.

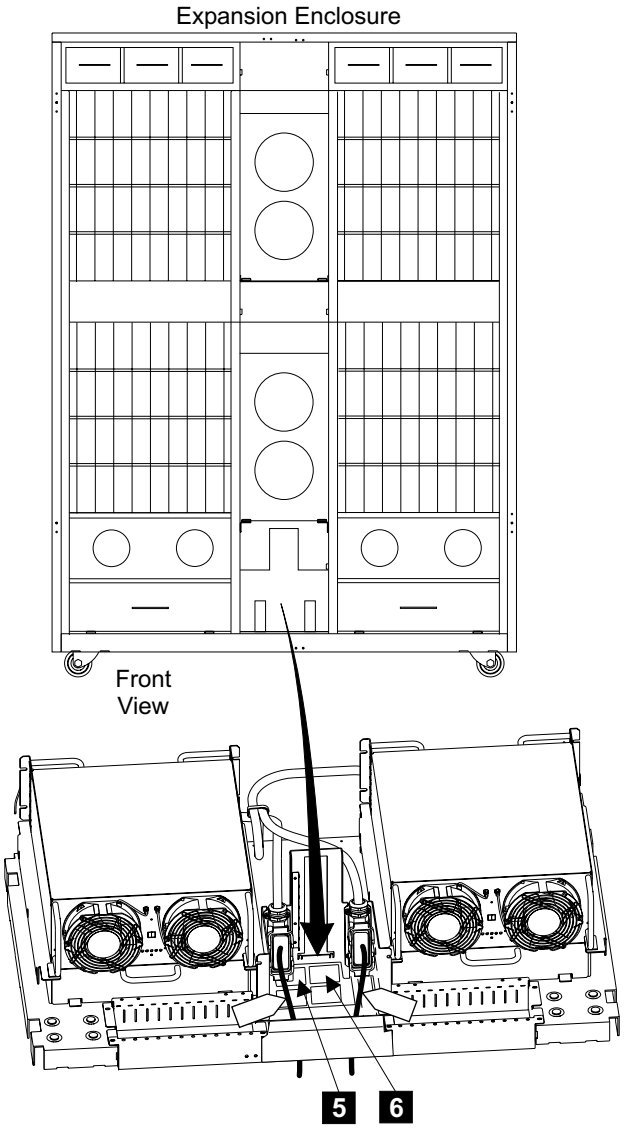
   English danger leakage current labels (shown) **5**

English	P/N 05J8627

   Translated danger leakage current labels (not shown) **6**

French	P/N 05J9071

German	P/N 05J9065
Korean	P/N 05J9079
Spanish	P/N 05J9063
Portuguese	P/N 05J9067
French/Dutch	P/N 05J9073
Italian	P/N 05J9075
Japanese	P/N 05J9077
Norwegian	P/N 05J9081
Danish	P/N 05J9085
Finnish	P/N 05J9087
Brazilian/Portuguese	P/N 05J9089
Slovakian	P/N 05J9091
Russian	P/N 05J9093
Chinese/PRC	P/N 05J9095
Czech	P/N 05J9097
Croatian	P/N 05J9099



P/N 05J8627

Figure 82. 2105 Expansion Enclosure, Danger Leakage Current Safety Labels (S008372q)

2105 Expansion Enclosure Safety Inspection

5. If any of the languages below apply, ensure that the Unit Emergency switch portion of the translated operator panel **7** is installed on the 2105 Expansion Enclosure.

Belgian/Dutch	P/N 34L7071
Brazilian/Portuguese	P/N 34L6760
Chinese/ROC	P/N 34L3294
English	P/N 34L3311
French	P/N 34L3312
German	P/N 34L3313
Italian	P/N 34L3293
Japanese	P/N 34L3314
Korean	P/N 34L3291
Spanish	P/N 34L3292

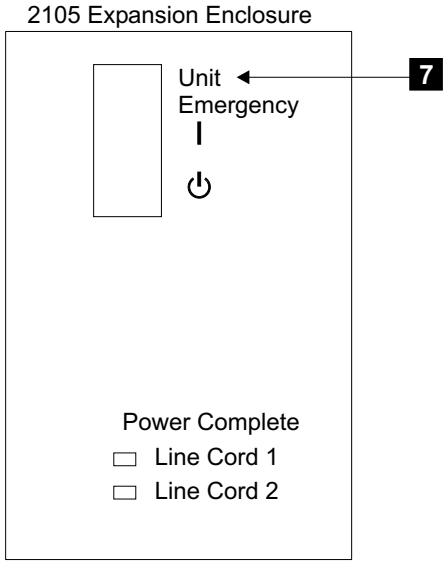


Figure 83. 2105 Expansion Enclosure, Operator Panel Label (S008374m)

6. Ensure that the weight safety label **8** is installed on the inside of the front right cover of the 2105 Expansion Enclosure.

Universal language	P/N 5423461

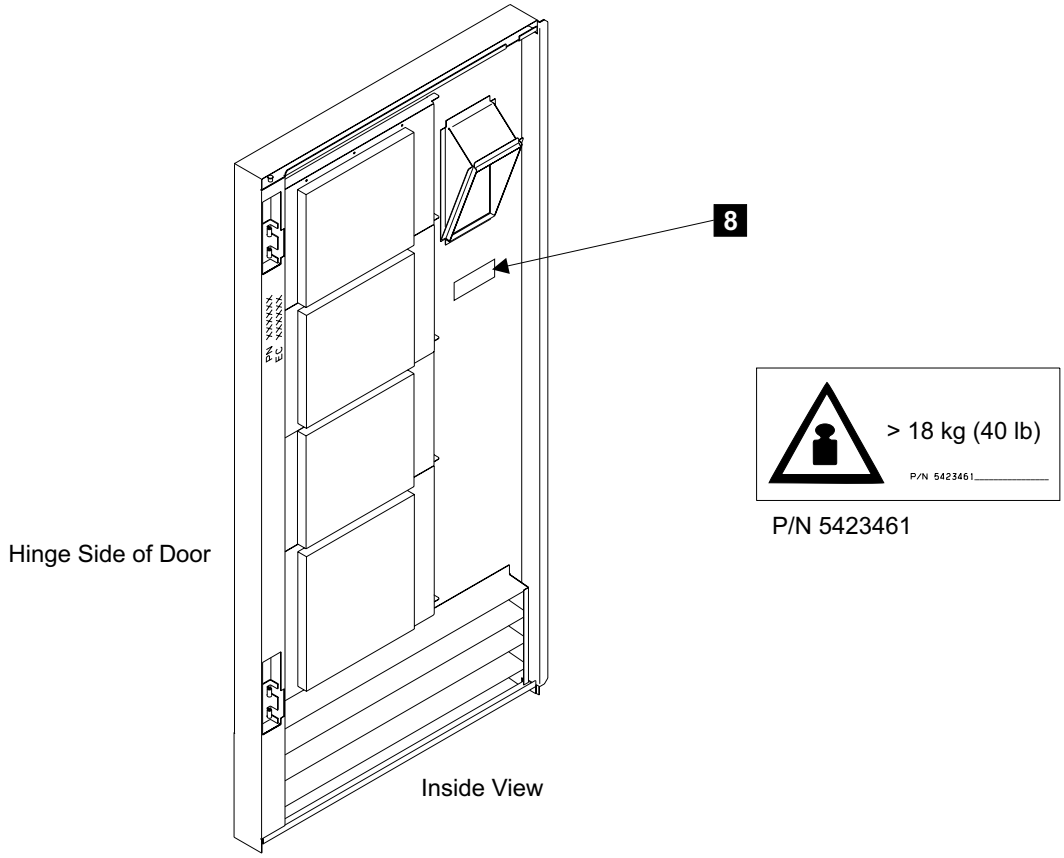


Figure 84. 2105 Expansion Enclosure Cover Weight Safety Label (S008382p)

7. Ensure that the Trained Service Personnel Only labels are installed on the inside of the front and rear frames of the 2105 Expansion Enclosure.

   Universal language P/N 09L2638

2105 Expansion Enclosure Safety Inspection

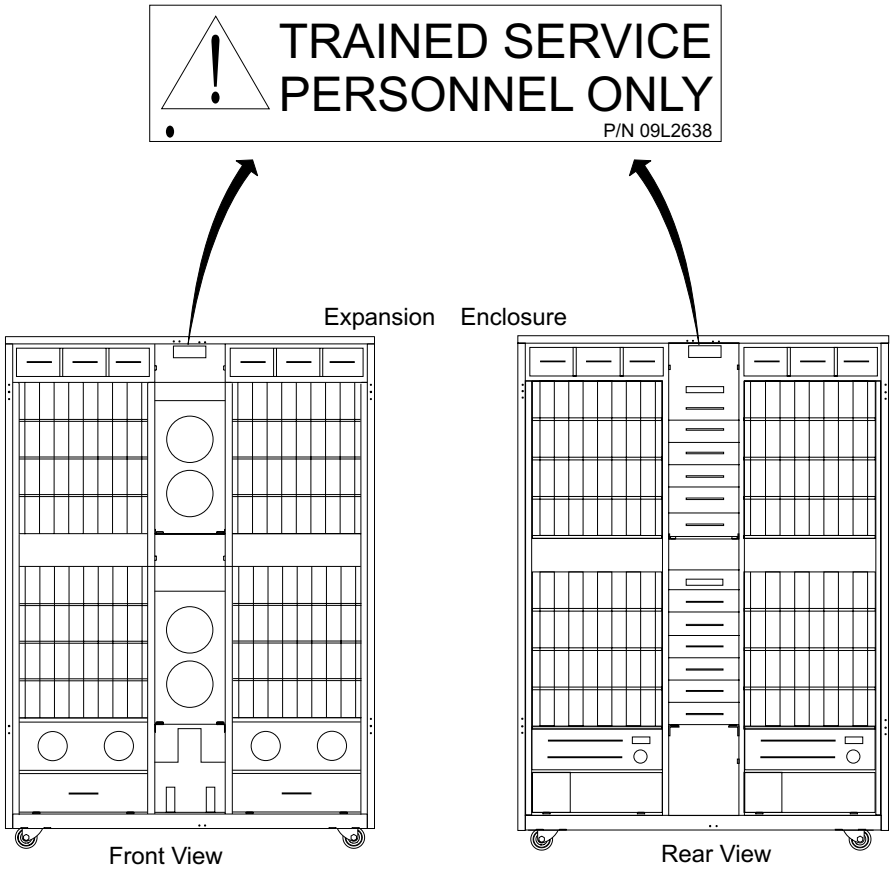


Figure 85. 2105 Expansion Enclosure Trained Service Personnel Only Labels (S009047)

8. Verify that the following safety labels are installed on both primary power supplies:
   - **9** , S1, Micro-Processor switch label
   - **10** , weight warning label
   - **11** , high voltage warning label
   - **12** , high voltage and high energy warning label

   Note: These labels cannot be ordered individually. If a label is missing, the entire primary power supply must be replaced.

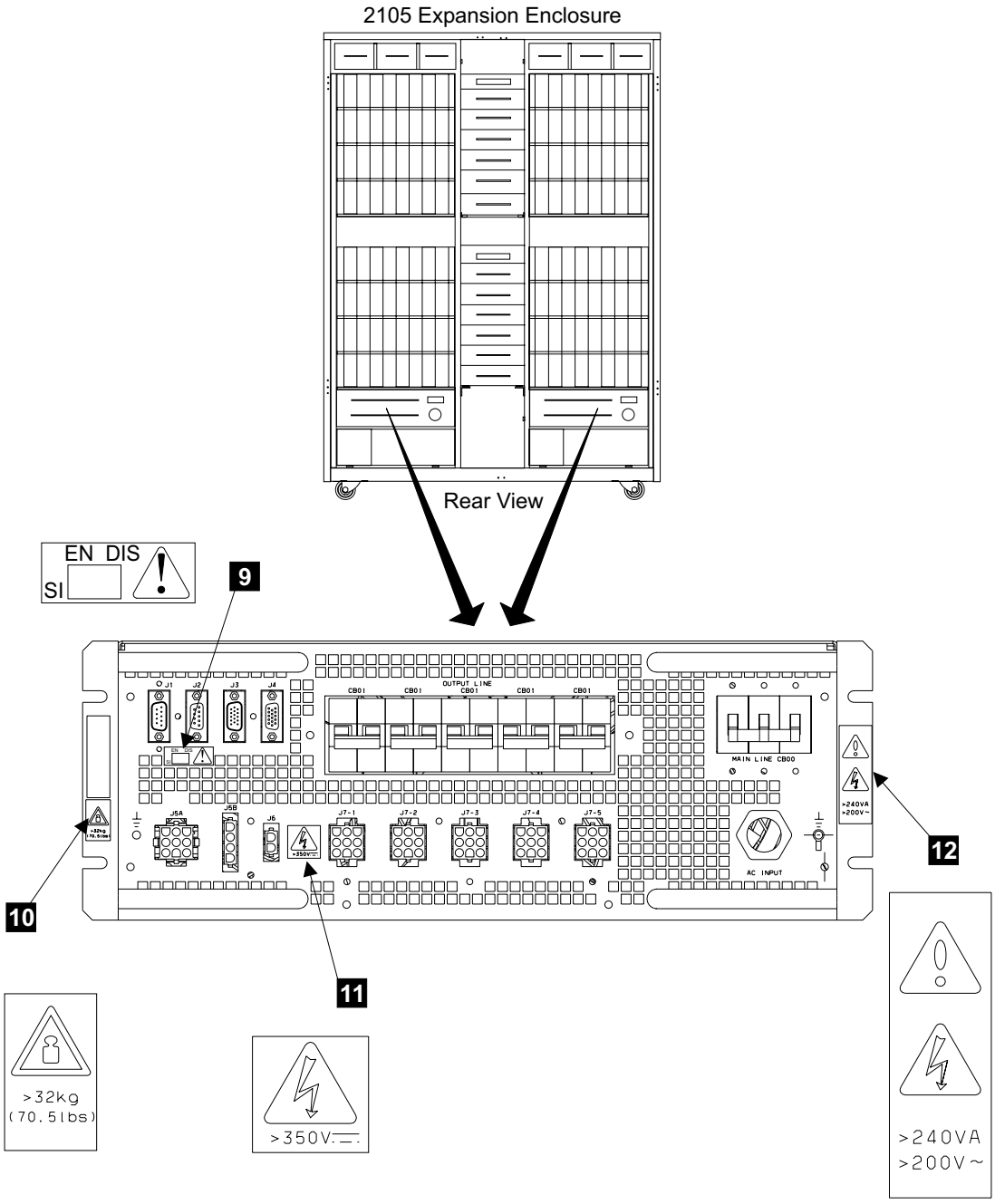


Figure 86. 2105 Expansion Enclosure Primary Power Supply Safety Labels (S008397r)

9. Verify that the following safety labels are installed on both 390 Volt Batteries:
   - 390 V Battery 1 (master)
     - **14** , weight warning label
     - **15** , high voltage warning label
   - 390 V Battery 2 (slave)
     - **12** , weight warning label
     - **13** , high voltage warning label

2105 Expansion Enclosure Safety Inspection

Note: These labels cannot be ordered individually. If a label is missing, the 390 V battery set must be replaced.

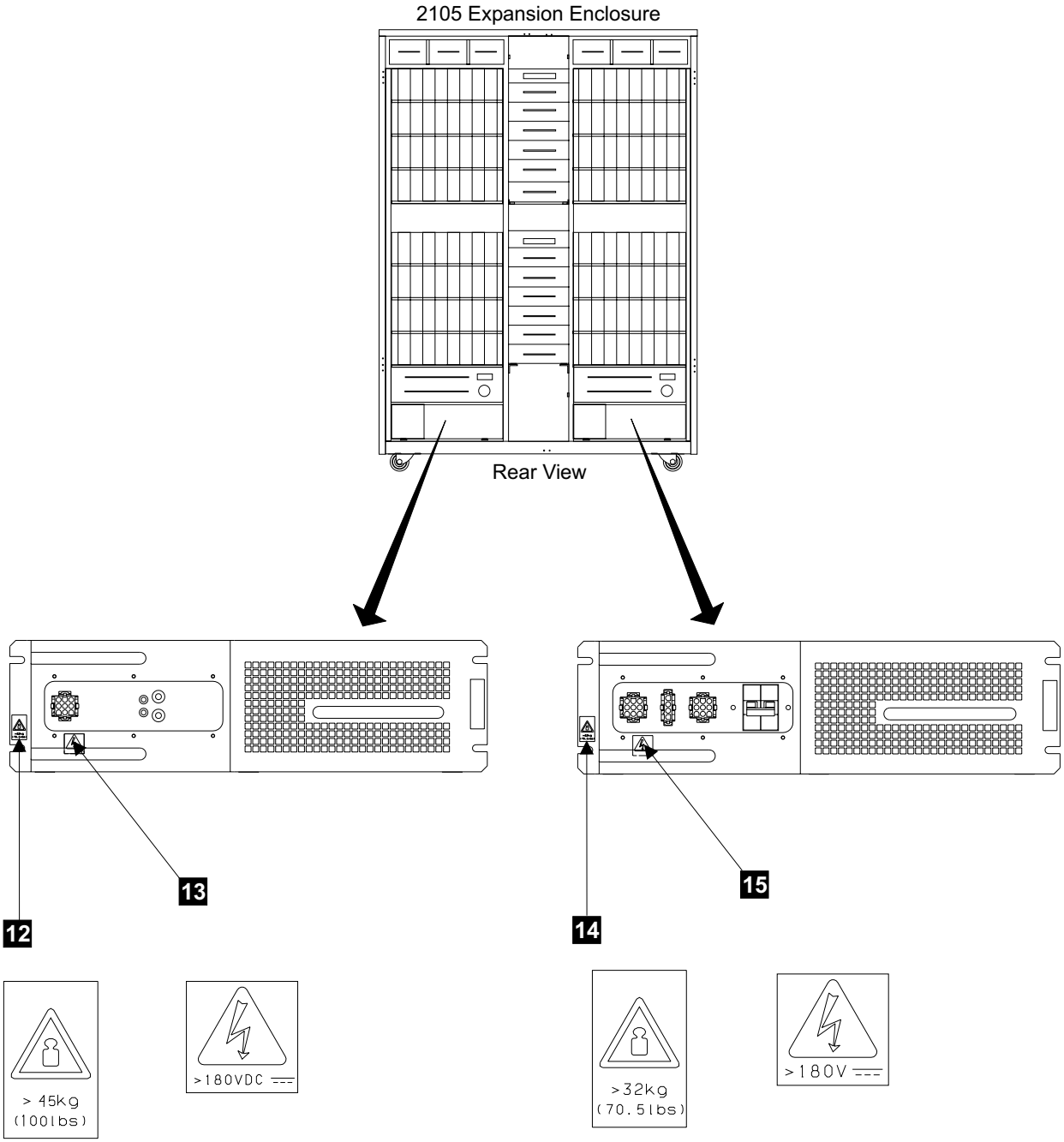


Figure 87. 2105 Expansion Enclosure 390 V Battery Set Safety Labels (S008399r)

10. Verify that the ground jumpers are installed between each primary power supply (PPS) and the frame:
    - PPS 1, **17**
    - PPS 2, **16**

    Note: There should be a star washer between the ground jumper terminals and the frame and PPS.

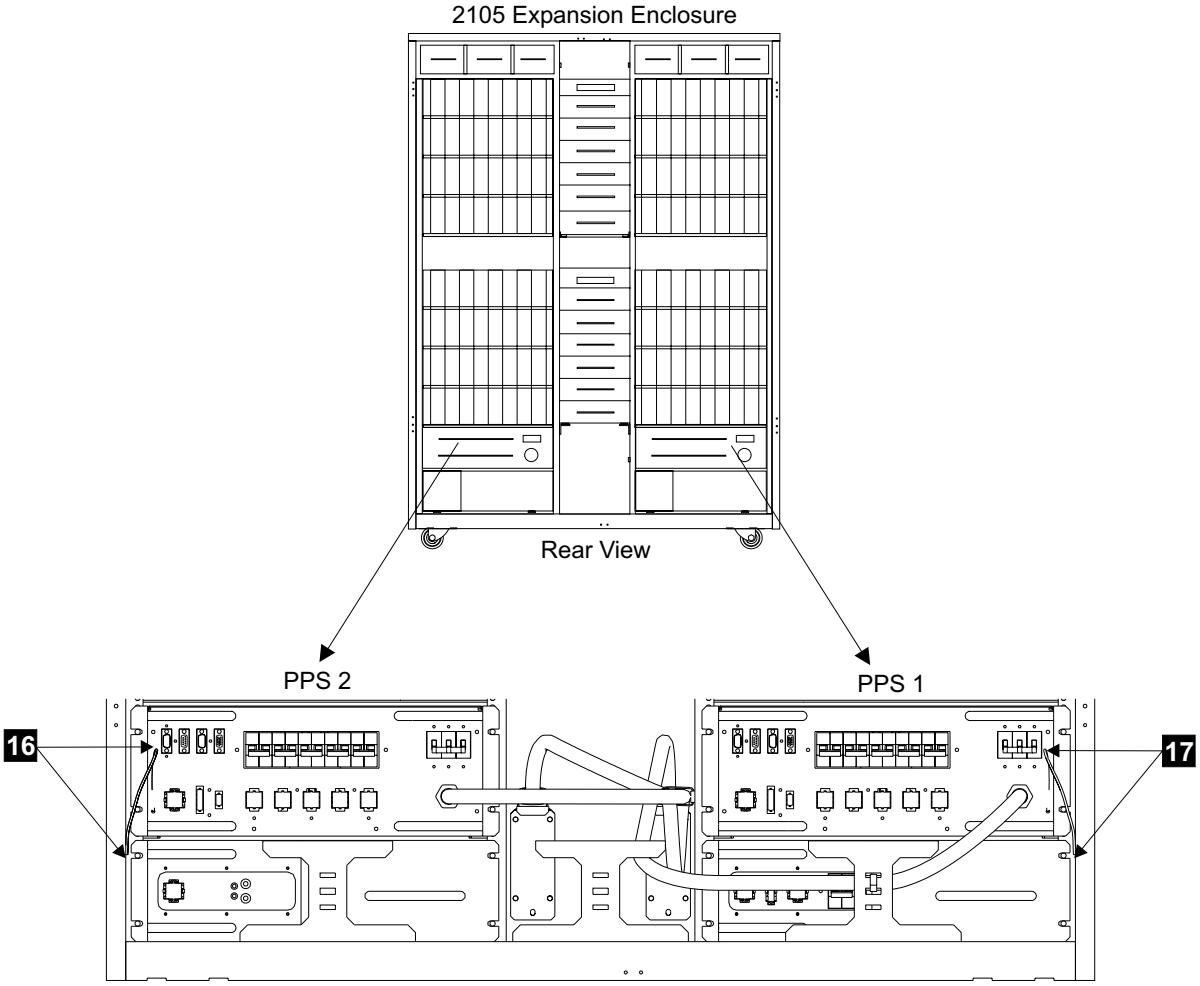


Figure 88. 2105 Expansion Enclosure, Primary Power Supply Ground Jumpers (S008376q)

11. Verify that the ground strap is fastened to the 2105 Expansion Enclosure frame with lock washers between both cable terminals and the frame **18** .

    Note: The ground strap may be fastened to the left side of the 2105 Expansion Enclosure frame in the same position.

2105 Expansion Enclosure Safety Inspection

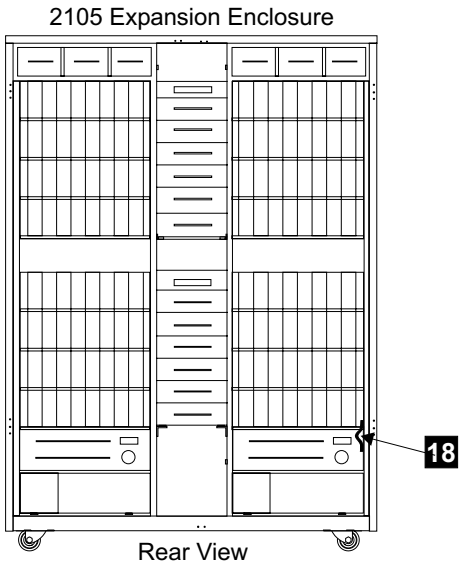


Figure 89. 2105 Expansion Enclosure Ground Strap Location (S008419m)

12. Complete the safety inspection by going to “Safety Engineering Changes”.

Safety Engineering Changes

1. Ensure all safety engineering changes (ECs) are installed.
2. Reinstall all removed covers.
3. This completes the visual and mechanical safety inspection procedures with the power off.

CAUTION:

Do not attempt to switch on power to the machine until all unsafe conditions are corrected. (1050)

Note: This notice is translated into selected languages. See “Chapter 11: Translation of Cautions and Danger Notices” on page 181.

CAUTION:

Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements. (1051)

Note: This notice is translated into selected languages. See “Chapter 11: Translation of Cautions and Danger Notices” on page 181.

Perform one of the following:

- Installation:

  Return to ″Install and Remove″ in chapter 5 of the *Enterprise Storage Server Service Guide, Volume 2*.
- Relocate or discontinue:
  1. Perform the electrical safety checks. See ″Checking the Customer’s Power″ through ″Check the Customer’s Circuit Breaker with the Power On″ in chapter 5 of the *Enterprise Storage Server Service Guide, Volume 2*.

     Return to ″Install and Remove″ in chapter 5 of the *Enterprise Storage Server Service Guide, Volume 2*. Checks are complete.

Appendix A. Service Processor Operation Connection

Attention: The service processor functions should only be used when directed by this maintenance package or the next level of support. Unguided use of the service processor functions can have unexpected results.

Do the following steps to activate Cluster Bay Service Processor Operations:

Attention: The 2105 and cable in this procedure are ESD-sensitive. Always wear an ESD wrist strap during this procedure. Follow the ESD procedures in ″Install and Remove″ in chapter 4 of the *Enterprise Storage Server Service Guide, Volume 2*.

1. Set the service terminal on the 2105 service table and start the appropriate terminal emulator (i.e. EBTERM for OS/2 or NetTerm for Windows).

   Use “Service Terminal Setup and 2105 Configuration Verification” on page 54 to prepare the service terminal for service and to verify that the service terminal has been initialized to service the 2105.
2. Set the terminal emulator to the Direct Connect mode:
   - **OS/2 Operating System**:
     a. At the EBTERM window, select and click on the **Modify** menu option.
     b. At the **Modify** menu, verify that **Direct Connect Mode** has a check mark next to it. Set all other check marks on this menu off.

        Note: Single click to set check marks on or off.
     c. Go to step 3.
   - **Windows Operating System**, at the NetTerm window, single click on **File** and then **Phone Directory**
     – If the **Phone Directory** displays **IBM 2105 VSS/ESS (Direct Connect, IBM3151 emulation)**, the service terminal is setup to run NetTerm as Direct Connect. Go to step 3.
     – If the Phone Directory doesn’t display **IBM 2105 VSS/ESS (Direct Connect, IBM3151 emulation)**, then the service terminal needs to be setup again. Go to “Service Terminal Setup and 2105 Configuration Verification” on page 54 to prepare the service terminal for service and go to step 3. when complete.
3. Verify that the 2105 Model E10/E20 is powered on. The 2105 Model E10/E20 operator panel Power Complete indicator for the cluster bay you are attaching to should be on continuously.
4. Observe the operator panel on the front of the cluster bay being serviced.

   Is **OK** displayed on the cluster bay operator panel?
   - **Yes**, the cluster bay is ready to display the Service Processor (SP) Operation menus, go to step 7 on page 210.
   - **No**: go to step 5.
5. Has the cluster bay you are servicing completed a successful IML? (Operator panel Cluster Bay 1 or 2 Message indicator stops blinking):
   - **Yes**, go to step 6.
   - **No**, IML the cluster bay, wait three minutes for the IML to complete, then go to step 10 on page 211.
6. Prepare the cluster bay being serviced to display the SP menus:

   Note: The cluster bay being serviced must be powered off to display the SP menus, SP power is present with cluster bay power off.

   a. Attach the service terminal interface cable to the cluster bay you are NOT servicing and start the service login operation, see “Service Login Operation Connection, with Cluster IML Complete” on page 57.

b. Quiesce the cluster bay you are servicing by selecting the following options from the **Main Service Menu**, see “Utility Menu” on page 67:
   Utility Menu
   Resource Management Menu
   Quiesce a Resource
   Quiesce the cluster bay you are servicing.

c. Power Off the cluster bay you are servicing by selecting the following options from the **Main Service Menu**:
   Utility Menu
   Cluster Bay Power Off/On
   Select **Power Off Cluster Bay 1** or **2**

d. Wait three minutes for the cluster bay to power off. When **OK** is displayed on the cluster bay operator panel, go to step 7.

7. Connect the service terminal to the cluster bay being serviced:
   a. Connect the service terminal interface cable to the serial port connector (9 pin) on the service terminal.
   b. Connect the other end of the cable to the S2 connector on the cluster bay being serviced, cluster bay 1 or cluster bay 2.

      Note: The service terminal interface cable is stored in the 2105 Model E10/E20 rack or connected to S2 on the front of cluster bay 1 or 2.

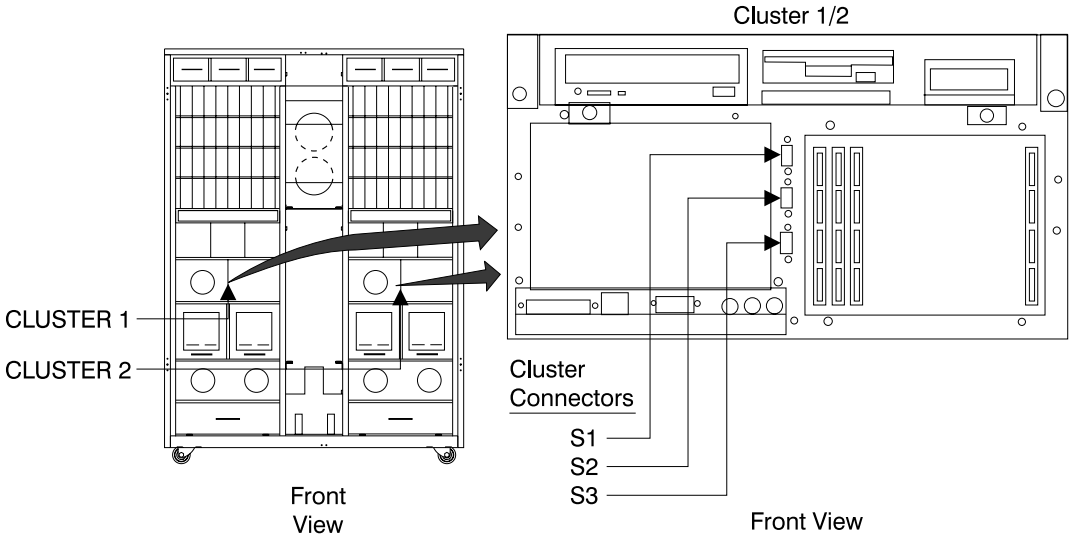


Figure 90. Cluster Bay Connectors for Service Terminal (S008027m)

8. Logically connect the service terminal to the cluster bay:
   - **OS/2 Operating System**:
     a. At the EBTERM window, select and click on the **Connect** menu option.
     b. At the **Connect** dialog box, click on **2105 Direct Connect**.
     c. Go to step 9 on page 211.
   - **Windows Operating System**:
     a. At the NetTerm window, single click on **File** and then **Phone Directory**
     b. At the **Phone Directory**, click on **IBM 2105 VSS/ESS (Direct Connect, IBM3151 emulation)**, and then click on **Connect**.
     c. Go to step 9 on page 211.

9. If the operation is successful, the SP **Main Menu** will be displayed.

   For a listing of all service processor menus, go to “Service Processor Operations”.

10. Verify that the cluster bay being serviced is powered on by pressing the eject button on it’s CD-ROM drive.

    Did the CD-ROM disk tray come out?

    - **Yes**, the cluster bay is powered on go to ″MAP 4360: Cluster Operator Panel Codes″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
    - **No**, the cluster bay is not powered on go to step 11.

11. Attach the service terminal interface cable to the cluster bay you are NOT servicing and start the service login operation, see “Service Login Operation Connection, with Cluster IML Complete” on page 57.

    Power On the cluster bay you are servicing by selecting the following options from the **Main Service Menu**:

    Utility Menu
    Cluster Bay Power Off/On
    Select **Power On Cluster Bay 1** or **2**

12. Wait about 30 seconds, then press the eject button on the CD-ROM drive in the cluster bay being serviced.

    Did the CD-ROM disk tray come out?

    - **Yes**, the cluster bay is powered on. Leave the service terminal attached to the cluster bay you are NOT servicing, go to step 6b on page 210.
    - **No**, the cluster bay is not powered on go to ″MAP 4360: Cluster Operator Panel Codes″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.

Service Processor Operations

The following diagram is an overview of the six options available on the cluster bay service processor main menu and the options that are available with each of them.

For instructions on connecting and activating the service terminal, see “Service Terminal Setup and 2105 Configuration Verification” on page 54.

Service Processor Connection

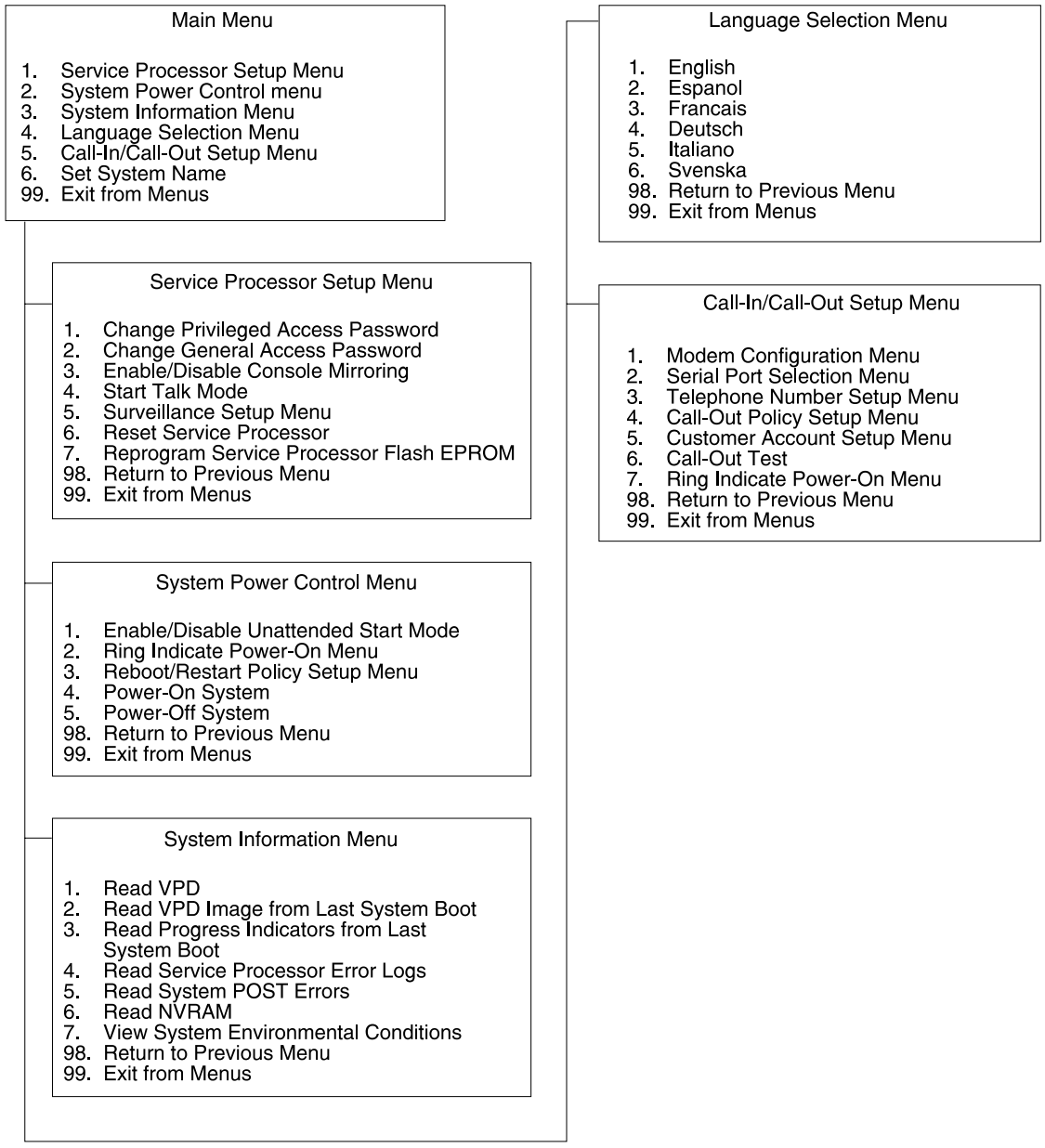


Figure 91. Cluster Bay Service Processor Main Menu Options (s007528r)

Service Processor Menus

Attention: The service processor functions should only be used when directed by this maintenance package or the next level of support. Unguided use of the service processor functions can have unexpected results.

The Service Processor (SP) menus enable you to configure SP options and to enable and disable functions.

SP menus are available using a service terminal when the server is powered off and the SP is operating with standby power. SP menus are also available when server power is on and the SP has detected a server problem (such as loss of surveillance).

During the first power up (i.e. power cord is plugged into the outlet), SP menus are not available for 45 seconds while the SP is running self-tests and initializing the server. If the server powers down, SP menus become available after 15 seconds.

For a summary of the SP functions and the methods for invoking them, see the table on page 213.

SP Functions	SP Menus (ASCII terminals)	SP Service Aids (ASCII or graphics terminals)	SMS (ASCII or graphics terminals)
Read VPD	Yes[3]	Yes[3]	Yes[3]
View System Environmental Conditions	Yes[3]		
Read System POST Errors	Yes[3]		
Read SP Error Logs	Yes[3]		
View Progress Indicators from last Boot	Yes[3]		
Power-on System	Yes[3]		
Power-off System	Yes[2]		
Read NVRAM	Yes[2]		
Reset SP	Yes[2]		
Setup Reboot/Restart Policy	Yes[2]	Yes[3]	
Start Talk Mode	Yes[2]		
Enable/Disable Console Mirroring	Yes[2]	Yes[1]	
Select Modem Line Speed	Yes[2]	Yes[1]	
Enable/Disable Modem	Yes[2]	Yes[1]	
Setup Modem Configuration	Yes[2]	Yes[1]	
Setup Ring Indicate Power-On	Yes[2]	Yes[1]	
Setup Dial-out Phone Numbers	Yes[2]	Yes[1]	
Setup Surveillance	Yes[2]	Yes[1]	
Update SP Flash EPROM	Yes[2]	Yes[1]	Yes[2]
Change General Access Password	Yes[2]		Yes[2]
Change Privileged Access Password	Yes[2]		Yes[2]
Select Language	Yes[2]		Yes[2]
Enable/Disable Unattended Start Mode	Yes[2]	Yes[3]	Yes[2]

[1] Operating system root password [2] Privileged access password [3] General access (power-on) password

SP Menu Groups

Attention: The service processor functions should only be used when directed by this maintenance package or the next level of support. Unguided use of the service processor functions can have unexpected results.

The SP menus are divided into two groups:

- General user menus - the user must know the general access password.
- Privileged user menus - the user must know the privileged access password.

The following section describes these two groups of menus, how to access them, and the functions associated with each option.

Service Processor Connection

When the server is powered down, the SP menus may be accessed locally or remotely.

Attention: The service processor functions should only be used when directed by this maintenance package or the next level of support. Unguided use of the service processor functions can have unexpected results.

Menu Inactivity

To prevent loss of control in unstable power environments, the SP leaves the menu mode after 5 minutes of inactivity. Menus may be resumed by pressing any key on the terminal, local or remote.

How to access SP menus locally

SP menus may be accessed locally by connecting a service terminal to either serial port. Because the presence of the service terminal cannot be confirmed by the SP, you must press a key on the service terminal to confirm its presence. Next the SP prompts you for a password (if set), and when verified, displays the SP menus.

How to access SP menus remotely

SP menus may be accessed remotely by connecting a modem to serial port 1 or serial port 2.

- Power off the server, unplug the power cord, and press the power button to drain capacitance while power is disconnected.
- Connect the modem to the appropriate serial port and turn the modem on.
- Plug in the server.

Note: If your modem has not been configured, go to “CALL-IN/CALL-OUT SETUP MENU” on page 221.

With a terminal or terminal emulator, call the server’s modem. The SP prompts you for a password (if set), and when verified, displays the SP menus.

General User Menus

The menu options presented to the General user are a subset of the options available to the Privileged user. The user must know the General Access Password in order to access these menus.

```
       GENERAL USER MENU

  1. Power-On System

  2. Read VPD

  3. Read Progress Indicators from Last System Boot

  4. Read SP Error Logs

  5. Read System POST Errors

  6. View System Environmental Conditions

 99. Exit from Menus
```

- **Power-On System**

  Allows the user to power-on the system.
- **Read VPD**

  Displays manufacturer vital product data, such as serial numbers, part numbers, etc.
- **Read Progress Indicators from Last System Boot**

  Displays the boot progress indicators (check points), up to a maximum of 100, from the system boot prior to the one in progress now. This historical information may be useful to help diagnose system faults.

The progress indicators are displayed in two sections. Above the dashed line are the progress indicators from the boot that produced the current sessions. Below the dashed line are progress indicators from the boot preceding the one that produced the current sessions.

The progress indication codes are chronological from bottom to top. The dashed line merely represents the point where the latest boot started.

- **Read Service Processor Error Logs**

  Displays the SP error logs.

  The time stamp in this error log is Coordinated Universal Time (CUT), also known as Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time. See 231 for an example of the error log.

- **Read System POST Errors**

  Selecting this item lets you review the results of the POST (Power-On Self Test). Your server may be able to start in the presence of POST errors if there is sufficient working system resources. If POST errors occur during start-up, this error log when used with the diagnostics helps to isolate faults.

- **View System Environmental Conditions**

  On selection of this menu, the SP reads all environmental sensors and reports the results to the user. This option maybe useful when surveillance fails, as it allows the user to determine the environmental conditions that may be related to the failure. See 219 for an example of the System Environmental Conditions screen.

Privileged User Menus

The following menus are available to privileged users only. The user must know the Privileged Access Password in order to access these menus.

MAIN MENU

At the top of the MAIN Menu is a listing containing:

- Your Service Processor's current firmware version
- The firmware copyright notice

You need the firmware version for reference when you either update or repair the functions of your service processor.

Note: The information under the Service Processor Firmware heading in the Main Menu example that follows is example information only.

```
            Service Processor Firmware
            EPROM:  19970915
            FLASH:  19970512
            Copyright 1997, IBM Corporation
                 SYSTEM NAME


       MAIN MENU

  1. Service Processor Setup Menu

  2. System Power Control Menu

  3. System Information Menu

  4. Language Selection Menu

  5. Call-In/Call-Out Setup Menu

  6. Set System Name

 99. Exit from Menus
```

Service Processor Connection

SP SETUP MENU

```
      SP SETUP MENU

 1. Change Privileged Access Password

 2. Change General Access Password

 3. Enable/Disable Console Mirroring:
      Currently Disabled

 4. Start Talk Mode

 5. OS Surveillance Setup Menu

 6. Reset SP

 7. Reprogram SP Flash EPROM

98. Return to Previous Menu

99. Exit from Menus
```

Note: Unless otherwise stated in menu responses settings become effective when a menu is exited using option 98 or 99.

Passwords: Passwords can be any combination of up to 8 alphanumeric characters. You can enter longer passwords, but the entries are truncated to include only the first 8 characters. Passwords can be set from the SP menu or from the SMS menus.

For security purposes, the SP counts the number of attempts to enter correct passwords. The results of not recognizing a correct password within this error threshold are different, depending on whether the attempts are being made locally (at the server) or remotely (via a modem). The error threshold is 3.

If the error threshold is reached by someone entering passwords at the server, the SP exits the menus. This action is taken based on the assumption that the server is in an adequately secure location with only authorized users having access. Such users must still successfully enter a login password to access AIX.

If the error threshold is reached by someone entering passwords remotely, the SP disconnects the modem to prevent potential security attacks on the server by unauthorized remote users.

The following illustrates what you can access with the Privileged Access Password and the General Access Password.

Privileged Access Password	General Access Password	Resulting Menu
None	None	MAIN MENU displayed
None	Set	MAIN MENU displayed
Set	None	User's with password see the MAIN MENU Others users see the GENERAL USER MENU
Set	Set	Users see menus associated with the entered password

- **Change Privileged Access Password**

  Set or change the Privileged Access Password. It provides the user with the capability to access all SP functions. This password is usually used by the system administrator or **root** user.
- **Change General Access Password**

Set or change the General Access Password. It provides limited access to SP menus, and is usually available to all users who are allowed to power-on the server.

- **Enable/Disable Console Mirroring**

  When Console Mirroring is enabled, the SP sends information to both serial ports. This capability may be enabled by local or remote users. This provides local users the capability to monitor remote sessions. Console mirroring may be enabled for the current session only. For more information, see “Console Mirroring” on page 229.

- **Start Talk Mode**

  In a console mirroring session, it is useful for those that are monitoring the session to be able to communicate with each other. Selecting this menu item activates the keyboards and displays for such communications while console mirroring is established. This is a full duplex link, so message interference is possible. Alternating messages between users works best.

- **Surveillance Setup Menu**

  This option may be used to setup operating system surveillance.

```
       OS Surveillance Setup Menu

  1. Surveillance:
       Currently Enabled

  2. Surveillance Time Interval:
       Currently 5

  3. Surveillance Delay:
       Currently 10


 98. Return to Previous Menu
```

  – **Surveillance**

    May be set to Enabled or Disabled.
  – **Surveillance Time Interval:**

    May be set to any number from 2 to 255 minutes.
  – **Surveillance Delay:**

    May be set to any number from 0 to 255 minutes.

  Refer to “SP System Monitoring - Surveillance” on page 228 for more information about surveillance.

- **Reset SP** - Allows the user to reinitialize the SP.
- **Reprogram Service Processor Flash EPROM** - This is an automatic process.

  Your next level of support will instruct you on how to get an update diskette.

  The update files must be downloaded to a DOS-formatted diskette. You should format the diskette just prior to receiving the download, to be sure it is clean. Reformatting is worth the time and effort. When this process is selected, you are prompted to place the diskette into the drive and to indicate to the system that the diskette in available and the automatic process starts. If the system has other needs, you are prompted. See “SP Firmware Updates” on page 230 for additional information and update methods.

SYSTEM POWER CONTROL MENU

```
       SYSTEM POWER CONTROL MENU

 1. Enable/Disable Unattended Start Mode:
      Currently Disabled

 2. Ring Indicate Power-On Menu

 3. Reboot/Restart Policy Setup Menu

 4. Power-On System

 5. Power-Off System

98. Return to Previous Menu

99. Exit from Menus
```

- **Enable/Disable Unattended Start Mode**

  Should stay set to disable.
- **Ring Indicator Power-On Menu**

  Ring Indicate Power-On is an alternate method of dialing in, without establishing a SP session. If the system is powered off, Ring Indicate Power-On is enabled, the server is powered on at the predetermined number of rings, If the server is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the server powered-on. The **Ring Indicator Power-On Menu** and defaults are shown below:

  ```
         Ring Indicator Power-On Menu

    1. Ring Indicate Power-On :
         Currently Disabled
    2. Number of Rings :
         Currently 6

   98. Return to Previous Menu
  ```

  – Ring Indicate Power-On may be set to 'Enabled' or 'Disabled'.
  – Number of Rings may be set to any number from 1 to 255.
- **Reboot/Restart Policy Setup Menu**, see "Reboot/Restart Policy Setup Menu" on page 224
- **Power-on System**

  Lets you power-on the system immediately. For other power-on methods see "System Power-On Methods" on page 226.
- **Power-off System**

  Allows the user to power-off the server following a surveillance failure.

SYSTEM INFORMATION MENU

```
      SYSTEM INFORMATION MENU

 1. Read VPD

 2. Read VPD Image from Last System Boot

 3. Read Progress Indicators from Last System Boot

 4. Read SP Error Logs

 5. Read System POST Errors

 6. Read NVRAM

 7. View System Environmental Conditions

98. Return to Previous Menu

99. Exit from Menus
```

- **Read VPD**

  Displays manufacturers vital product data, such as serial numbers, part numbers, etc.
- **Read VPD Image from Last System Boot**

  Displays the VPD information that was in effect after the last system boot. This information will usually be identical with the results from the menu selection ″Read VPD,″ but in the case of configuration updates or certain faults, this historical comparison can be useful to System Administrators and service personnel.
- **Read Progress Indicators from Last System Boot**

  Displays the boot progress indicators (check points), up to a maximum of 100, from the system boot prior to the one in progress now. This historical information may be useful to help diagnose system faults.

  The progress indicators are displayed in two sections. Above the dashed line are the progress indicators from the boot that produced the current sessions. Below the dashed line are progress indicators from the boot preceding the one that produced the current sessions.

  The progress indication codes are chronological from bottom to top. The dashed line merely represents the point where the latest boot started.
- **Read SP Error Logs**

  Displays error conditions detected by the SP.

  The time stamp in this error log is Coordinated Universal Time (CUT), also known as Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time. See 231 for an example of the error log.
- **Read System POST Errors**

  Selecting this item lets you review the results of the POST (Power-On Self Test). Your server may be able to start in the presence of POST errors if there is sufficient working system resources. If POST errors occur during start-up, this error log when used with the diagnostics helps to isolate faults.
- **Read NVRAM**

  Displays Non-Volatile Random Access Memory (NVRAM) content.
- **View System Environmental Conditions**

  The SP reads all environmental sensors and reports the results to the user. This option is most useful when surveillance fails, as it allows the user to determine the environmental conditions that may be related to the failure.

  The following is an example of system environment conditions:

Service Processor Connection

```
                    System Environmental Conditions
                    (System Power is currently off.)

Fan 0:  A stopped fan detected
Fan 1:  A stopped fan detected
Fan 2:  A stopped fan detected
Fan 3:  A stopped fan detected
MEM Temperature is operating within normal tolerances
I/O Temperature is operating within normal tolerances
CPU Temperature is operating within normal tolerances
5.0 Volts:  A low 5.0 Voltage reading detected
3.3 Volts:  A low 3.3 Voltage reading detected
5.0 Standby Volts:  is operating within normal tolerance
+12.0 Volts:  A low +12.0 voltage reading detected
-12.0 Volts:  A high -12.0 voltage reading detected
           (Press Return to Continue)
```

LANGUAGE SELECTION MENU

```
       LANGUAGE SELECTION MENU

  1. English

  2. Francais

  3. Deutsch

  4. Italiano

  5. Espanol

  6. Svenska

 98. Return to Previous Menu

 99. Exit from Menus
```

Note: Your service terminal must support the ISO-8859 character set in order to properly display languages other than English.

This menu allows selecting languages into which SP and system firmware menus and messages are displayed.

CALL-IN/CALL-OUT SETUP MENU

```
        CALL-IN/CALL-OUT SETUP MENU

   1. Modem Configuration Menu

   2. Serial Port Selection Menu

   3. Serial Port Speed Setup Menu

   4. Telephone Number Setup Menu

   5. Call-Out Policy Setup Menu

   6. Customer Account Setup Menu

   7. Call-Out Test

   8. Ring Indicate Power-On Menu

  98. Return to Previous Menu

  99. Exit from Menus
```

- **Modem Configuration Menu**, see “Modem Configuration Menu”.
- **Serial Port Selection Menu**, see “Serial Port Selection Menu” on page 222.
- **Telephone Number Setup Menu**, see “Telephone Number Setup Menu” on page 222.
- **Call-Out Policy Setup Menu**, see 7 on page 54.
- **Customer Account Setup Menu**, see “Customer Account Setup Menu” on page 224.
- **Ring Indicate Power-On Menu**, see 218.

Modem Configuration Menu: The first two lines of the Modem Configuration Menu are status lines showing the current selections. Selections are made in the two section labeled Modem Ports and Modem Configuration File Name. Select the serial port that you that you want to activate and then select the modem configuration file for the modem on the port. If you wish to set up both serial ports with modems, make your selections one port at a time.

For information on choosing a modem configuration file, see “Sample Modem Configuration Files” on page 232 and “Seamless Transfer of a Modem Session” on page 232.

```
        Modem Configuration Menu

   Port 1 Modem Configuration File Name:
   Port 2 Modem Configuration File Name:

To make changes, First select the port and then the configuration file
name

Modem Ports:
   1. Serial port 1
   2. Serial port 2

Modem Configuration File Name:
   3. modem_f_sp
   4. modem_f0_sp
   5. modem_f1_sp
   6. modem_z_sp
   7. modem_z0_sp
   8. none

   9. Save configuration to NVRAM and Configure modem

  98. Return to Previous Menu
```

Service Processor Connection

Serial Port Selection Menu:

```
       Serial Port Selection Menu

  1. Serial Port 1 Call-Out:
      Currently Disabled

  2. Serial Port 2 Call-Out:
      Currently Disabled

  3. Serial Port 1 Call-In:
      Currently Disabled

  4. Serial Port 2 Call-In:
      Currently Disabled

 98. Return to Previous Menu
```

You may enable and/or disable the call-in and call-out functions of each serial port in any combination.

Serial Port Speed Setup Menu:

```
       Serial Port Speed Setup Menu

  1. Serial Port 1 Speed:
       Currently 9600

  2. Serial Port 2 Speed:
       Currently 9600

 98. Return to Previous Menu
```

Serial port speed can be set for terminal performance or to accommodate modem capabilities. A speed of 9600 baud or higher is recommended. Valid serial port speeds are shown below:

50	600	4800
75	1200	7200
110	1800	9600
134	2000	19200
150	2400	38000
300	3600	57600
		115200

Telephone Number Setup Menu: This menu may be used to set or change the telephone numbers for reporting a system failure. The SP allows setting or changing telephone numbers for:

- Service Center Telephone Number: - The telephone number of the maintenance provider's computer.
- Customer Administration Center Telephone Number: - The telephone number of the local system support provider's computer.
- Digital Pager Telephone Number: The number for a pager carried by someone who will respond to problem calls from your server.
- Customer Voice Telephone Number: - The telephone number service support representative will use to reach the system user.
- Customer System Telephone Number: - The telephone number to which the server's modem is connected.

```
       Telephone Number Setup Menu

  1. Service Center Telephone Number:
      Currently Unassigned

  2. Customer Administration Center Telephone Number:
      Currently Unassigned

  3. Digital Pager Telephone Number:
      Currently Unassigned

  4. Customer Voice Telephone Number:
      Currently Unassigned

  5. Customer System Telephone Number:
      Currently Unassigned

 98. Return to Previous Menu
```

- **Service Center Telephone Number** is the number of the service center computer. The service center usually includes a computer that takes calls from servers with call-out capability. This computer is referred to as ″the catcher.″ The catcher expects messages in a specific format to which SP conforms. For more information about the format and catcher computers, refer to the README file in the AIX `/usr/samples/syscatch` directory. Contact your service provider for the correct telephone number to enter here. Until you have that number, leave this field blank.
- **Customer Administration Center Telephone Number** is the number of the System Administration Center computer (catcher) that receives problem calls from servers. Contact your system administrator for the correct telephone number to enter here. Until you have that number, leave this field blank.
- **Digital Pager Telephone Number** is the number for a pager carried by someone who will respond to problem calls from your server. Contact your administration center representative for the correct telephone number to enter here. For test purposes, enter your telephone number here. You can change it later when testing is complete.

  Note: Some modems, such as IBM 7857-017, are not designed for the paging function. Although they can be used for paging, they will return an error message when they do not get the expected response from another modem. Therefore, even though the paging was successful, the error message will cause the SP to retry, continuing to place pager calls for the number of retries specified in the Call-Out policy Setup Menu. These retries result in redundant pages.

  For digital pagers that require a personal Identification Number (PIN) for access, include the PIN in this field as in the following example:

  `1 800 123 4567,,,,87654`

  where the commas create pauses the voice response system, and the 87654 represents the PIN.

  Note: The length of these pauses is set in modem register S8. The default is usually 1 or 2 seconds each.
- **Customer Voice Telephone Number** is the telephone number of a phone near the server or answered by someone responsible for the server. This is the telephone number left on the pager for callback. For test purposes, enter your telephone number here. You can change it after testing is completed.

  Customer System Telephone Number is the telephone number to which your server's modem is connected. The service or administration center representatives need this number to make direct contact with your server for problem investigation. This is also referred to as the **call-in** phone number.

Call-Out Policy Setup Menu:

```
       CALL-OUT POLICY SETUP MENU

  1. Call-Out policy (First/All):
      Currently First

  2. Remote timeout, (in seconds):
      Currently 120

  3. Remote latency, (in seconds):
      Currently 2

  4. Number of retries:
      Currently 2

 98. Return to Previous Menu
```

- **Call Out policy** may be set to 'first' or 'all'. If call out policy is set to 'first', the SP will stop at the **first successful** call out to one of the following numbers in the order listed:
  1. Service Center
  2. Customer Administration Center
  3. Pager

  If call out policy is set to 'all', the SP will attempt a call out to **all** the following numbers in the order listed:
  1. Service Center
  2. Customer Administration Center
  3. Pager

  Remote timeout and **Remote latency** are functions of your service provider's catcher computer. You should take the defaults or contact your service provider for recommended settings.

  Number of retries is the number of times you want the server to retry calls that resulted in busy signals or other error messages.

Customer Account Setup Menu:

```
       Customer Account Setup Menu

  1. Customer Account Number:
      Currently Unassigned

  2. Customer RETAIN Login UserID:
      Currently Unassigned

  3. Customer RETAIN Login Password:
      Currently Unassigned

 98. Return to Previous Menu
```

- **Customer Account Number** is assigned by your service provider for record keeping and billing. If you have an account number, enter it here. Otherwise, leave this field blank.
- **Customer RETAIN Login UserID** and **Customer RETAIN Login Password** apply to a service function to which your service provider may or may not have access. Leave these fields blank if your service provider does not use RETAIN.

Reboot/Restart Policy Setup Menu: **Reboot** describes bringing the system hardware back up from scratch, for example, from a system reset or power on. The boot process ends when control passes to the operating system process.

Restart describes activating the operating system after the system hardware reinitialized. Restart must follow a successful reboot.

```
       Reboot/Restart Policy Setup Menu

  1. Number of reboot attempts:
       Currently 3

  2. Use OS-Defined restart policy?
       Currently Yes

  3. Enable supplemental restart policy?
       Currently No

  4. Call-Out before restart:
       Currently Disabled

 98. Return to Previous Menu
```

- **Number of reboot attempts** if the server fails to successfully complete the boot process, it attempts to reboot the number of times specified. Entry values equal to or greater than 0 are valid. Only successive failed reboots attempts count, not reboots that occur after a restart attempt. At restart, the counter is set to 0.
- **Use OS-Defined restart policy** lets the SP react or not react the same as the operating system to major system faults, by reading the setting of the operating system parameter **Automatically Restart/Reboot After a System Crash**. This parameter may, or may not be defined depending on the operating system or its version/level. If the operating system automatic restart setting is defined, then it may be set to respond to a major fault by restarting or by not restarting. See your operating system documentation for details on setting up operating systems automatic restarts. The default value is YES.
- **Enable supplemental restart policy** - The default setting is NO. If set to YES, the SP restarts the system when the system loses control as detected by the SP surveillance, and either:
  1. The **Use OS-Defined restart policy** is set to NO OR
  2. The **Use OS-Defined restart policy** is set to YES and the operating system has NO automatic restart policy.

  Refer to “SP Reboot/Restart Recovery” on page 227.
- **Call-Out before restart (Enabled/Disabled)** If a restart is necessary due to a system fault, you can enable the SP to call out and report the event. This item is valuable if the number of these events becomes excessive, signalling a bigger problem.

SP Functions and Features

The following section discusses some of the SP functions and features more fully.

The IBM RS/6000 7025 F50 Series supports the following functions:

Built-in Functions	Initialization and Test	SP Basic Instructions Test (BIST)
		JTAG System Chip Initialization
	Error Data Collection	BIST/POST errors and status
		Checkstop FIR data logout
		Machine check logout
	Configuration	
	CPU Complex validation	VPD Collection
	System Management	Reset and Reboot on System Firmware fail
		Reboot on system failure

Service Processor Connection

Local User Function	User Interface	Local async console
		Text based menus with NLS
		Operator Panel messages
	Power and Miscellaneous	Power On/Off
		Configurable Reboot Policy
	Status and Data Access	VPD
		Error data (SP)
		Error data (system)
		Environmental data
	SP Setup Utilities	Passwords
		Phone numbers
		Language (NLS) selection
		Call In/Call Out enable/disable
		Flash (Gold/Recovery block) Update
		Flash (Composite block) Update
		System Name
		Modem Configuration
Remote User Functions	Call Out (Call Home) Reporting	Boot failure
		OS Termination
		Surveillance failure
		Critical EPOW reporting
		Checkstop
		Machine check
	Identify system by name	Call In
		Power-on via ring-indicate
		Password/security check
		Console mirroring/Quick disconnect
Application Interface Functions	Monitor/Sense	Thermal/Voltage/fan speed
		SP Flash Update(Recovery and Composite)

System Power-On Methods

- Power on switch, see “Starting the System Unit” on page 232.
- SP Menu power-on request

  You can request a power-on via the SP menus from either a local or remote terminal.

  If a remote terminal is to be used, the modem must be connected to serial port 1, and the operating system set up to enable a TTY login session on that port.

  Refer to “Seamless Transfer of a Modem Session” on page 232 for information on transferring modem sessions from SP to the operating system.
- Unattended start mode - refer to **Enable/Disable Unattended Start Mode** on page 218.

  The SP can be enabled to recover from the loss of AC power (see Enable/Disable Unattended Power-On Mode in the SYSTEM POWER CONTROL MENU). When AC power is restored, the system returns to the then current power state at the time AC loss occurred. For example, if the system was

powered-on when AC loss occurred, it reboots/restarts when power is restored. If the system was powered-off when AC loss occurred, it remains off when power is restored.

- Timed power-on - refer to the `shutdown -t` command on servers using AIX.

  Working in conjunction with AIX, the Service Processor in your server can operate a timer, much like the wake-up timer on your clock radio. You can set the timer so that your server powers on at a certain time after shutting down. The timer is battery operated, so power interruptions occurring while the server is off do not affect its accuracy. Refer to the **shutdown -t** command of AIX for details on setting the timer.

  Because of the potential for AC power loss, the Timed Power-On function of AIX can only be assured when Unattended Power-On Mode is enabled. If a Timed Power-On event occurs during an AC power loss, and if Unattended Power-On Mode is enabled, the system starts when AC power is restored.

  If Unattended Start Mode is disabled (the default), the system power state remains off when AC power is restored, regardless of the power state of the system when AC loss occurred.

- Ring Indicate Power-On

  Enabling ring indicate power-on disables remote call-in. If ring indicate power-on is enabled, the server will power on at a predetermined number of rings. If the server is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the server powered on.

- Follow-up to a Failed Boot Attempt

  The SP will initiate a power-on sequence upon detection of a failed boot attempt.

SP Reboot/Restart Recovery

Reboot describes bringing the system hardware back up from scratch, for example, from a system reset or power on. The boot process ends when control passes to the operating system process.

Restart describes activating the operating system after the system hardware reinitialized. Restart must follow a successful reboot.

Failure During Boot Process: During the boot process, either initially after system power-on or upon reboot after a system failure, the Service Processor (SP) monitors the boot progress (via surveillance). If progress stops, the SP can reinitiate the boot process (reboot) if enabled to do so. The SP can re-attempt this process according to an entry on the Reboot/Restart Policy Setup Menu.

Failure During Normal System Operation: When the boot process completes and control transfers to the operating system (OS), the SP can monitor operating system activity (see the SERVICE PROCESSOR SETUP MENU item Set Surveillance Parameters). If OS activity stops, the SP can initiate a reboot/restart process based on the settings in the SP Reboot/Restart Policy Setup Menu and the OS automatic restart settings (see OS documentation).

If the operating system is AIX, the menu item under SMIT for setting the restart policy is Automatically Reboot After Crash (True/False), and the default is False. When the setting is True, and if the SP parameter, Use OS-Defined Restart Policy, is Yes (the default), the SP takes over for AIX to reboot/restart after a Check Stop or Surveillance failure.

Service Processor Reboot/Restart Policy Controls: The operating system's automatic restart policy (see operating system documentation) indicates the OS response to a system crash. The SP can be instructed to refer to that policy, or not, by the Use OS-Defined Restart Policy menu item.

If the operating system has no automatic restart policy, or if it is disabled, then the SP restart policy can be controlled from the SP Menus by using the Enable Supplemental Restart Policy selection.

Use OS-Defined restart policy?: The **Use OS-Defined restart policy** default setting is YES. This causes the SP to refer to the OS Automatic Restart Policy setting and take action, the same action the OS would take if it could have responded to the problem causing the restart.

Service Processor Connection

When this setting is NO, or if the OS did not set a policy, the SP refers to Enable supplemental restart policy for its action.

Enable Supplemental Restart Policy?: The default setting is NO. If set to YES, the SP restarts the system when the system loses control as detected by the SP surveillance, and either:

1. The **Use OS-Defined restart policy** is set to NO OR
2. The **Use OS-Defined restart policy** is set to YES and the operating system has NO automatic restart policy.

Refer to “SP Reboot/Restart Recovery” on page 227.

The following provides a more thorough understanding of the relations among the OS and SP restart controls:

OS Automatic reboot/restart after crash setting	SP to use OS-Defined restart policy?	SP Enable supplemental restart policy?	System response
None	No	No[1]	
None	No	Yes	Restarts
None	Yes[1]	No[1]	
None	Yes[1]	Yes	Restarts
False[2]	No	No[1]	
False[2]	No	Yes	Restarts
False[2]	Yes[1]	No[1]	
False[2]	Yes[1]	Yes	
True	No	No[1]	
True	No	Yes	Restarts
True	Yes[1]	No[1]	Restarts
True	Yes[1]	Yes	Restarts

[1] SP default [2] AIX default

SP System Monitoring - Surveillance

Surveillance is a function in which the SP monitors the system, and the system monitors the SP. This monitoring is accomplished by periodic samplings called heartbeats.

Surveillance is available during two phases:

1. System firmware bringup (automatic) and
2. Operating system runtime (optional).

System Firmware Surveillance: Provides the SP with a means to detect boot failures while the system firmware is running.

System firmware surveillance is automatically enabled during system power-on. It cannot be disabled via a user selectable option.

If the SP detects no heartbeats during system IPL (for 7 minutes), it cycles the system power to attempt a reboot. The maximum number of retries is set from the SP menus. If the fail condition repeats, the SP leaves the machine powered on, logs an error and offers menus to the user. If Call-out is enabled, the SP calls to report the failure and displays the operating system surveillance failure code on the operator panel.

Operating System Surveillance: Provides the SP with a means to detect hang conditions, hardware or software failures while the operating system is running. It also provides the operating system with a means to detect the SP failure by the lack of a return heartbeat.

Operating system surveillance is enabled by default. This is to allow the user to run operating systems that do not support this SP option.

Operating system surveillance can be enabled and disabled via:

- SP Menus
- SP Service Aids

Three parameters must be set for operating system surveillance:

1. Surveillance enable/disable
2. Surveillance interval

   This is the maximum time in minutes the SP should wait for a heartbeat from the operating system before timeout.
3. Surveillance delay

   This is the length of time in minutes for the SP to wait from when the operating system is started to when the first heartbeat is expected.

Surveillance will take effect immediately after setting the parameters from the SP menus.

If operating system surveillance is enabled (and system firmware has passed control to the operating system), and the SP does not detect any heartbeats from the operating system, the SP assumes the system is hung. The machine is left powered on and the SP enters standby phase, displaying the operating system surveillance failure code on the operator panel. If Call-out is enabled, the SP calls to report the failure.

Call Out (Call-Home)

The SP can call out (Call-Home) when it detects one of the following conditions:

- System firmware surveillance failure.
- Operating system surveillance failure (if supported by Operating System).
- Critical environmental failures.
- Restarts

To enable the call out feature, you need to do the following:

- Have a modem connected to serial port 1 or 2.
- Set up the following using the SP Menus or Diagnostic Service Aids:
  - Enable call out for the serial port where the modem is connected.
  - Set up serial port line speed.
  - Enter the modem configuration filename.
  - Set up site specific parameters (i.e. phone numbers for call out, call out policy, etc).
- To call out before restart, set “Call-Out before restart” to ENABLED from the Reboot/Restart Policy Setup menu.

Note: Some modems, such as IBM 7857-017, are not designed for the paging function. Although they can be used for paging, they will return an error message when they do not get the expected response from another modem. Therefore, even though the paging was successful, the error message will cause the SP to retry, continuing to place pager calls for the number of retries specified in the Call-Out policy Setup Menu. These retries result in redundant pages.

Console Mirroring

Console mirroring allows a person on a local service terminal to monitor the SP activities of a remote user. Console mirroring ends when the SP releases control of the serial ports to the system firmware.

Service Processor Connection

System Configuration:

- SP
- Modem connected to one serial port and enabled for incoming calls
- Local service terminal connected to the other serial port. This local service terminal may be connected directly to your server or connected through another modem.

There are two scenarios in which console mirroring can be invoked:

1. Remote session first, then local session added
   a. Remote session already in progress.
   b. Remote user uses the SP menus to enable console mirroring, allowing both consoles to be active.
2. Local session first, then remote session added
   a. Local session is already in progress.
   b. The SP receives a call from the remote user.
   c. The local user selects the option to enable console mirroring. The SP immediately begins mirroring SP menus.

Note: A quick disconnect is accomplished by hitting the key sequence Ctrl+D on either console. Both sessions will exit the SP menus.

SP Firmware Updates

The SP EPROM may need to be updated for two different reasons:

1. The UPDATE (composite) portion of the EPROM has become corrupted.
2. The SP firmware upgrades, without any corruption present.

The use of a Flash EPROM allows updates to occur without physically replacing the memory.

The firmware in your server can be updated using one of four available initiation processes:

1. Service Processor initiation
2. SMS Utilities initiation
3. Service Aids initiation
4. AIX initiation.

Each initiation method is described below. In each case, the process prompts you for your authority and shows the contents of the update media. Verify the file with which to perform the update, and follow any other instructions that may appear. After initiation, the processes are identical and automatic.

There are two areas in each firmware module that may need updating:

1. The gold code or base code or EPROM area
2. The custom or main program or FLASH area

Each update file contains matching gold and custom firmware, so it is not possible to update to a conflicting set.

Before the update process begins, the versions of each of the two areas of the target firmware module are compared to the versions on the update diskette. Only the area(s) that need updating are updated. In most cases, only the custom area is updated.

Your next level of support will instruct you on how to get an update diskette.

The update files must be downloaded to a DOS-formatted diskette. You should format the diskette just prior to receiving the download, to be sure it is clean. Reformatting is worth the time and effort.

Refer to the downloaded update instructions, or to the System Management Services “Display Configuration” on page 232 or “Config” on page 232 or Service Processor menus on page 215, to determine the level of the system unit or service processor flash.

Updating Firmware from the Service Processor Menus: The Service Processor Menus are available while the server is powered off. From the Service Processor Main Menu, select Service Processor Setup to bring up a menu containing the item, Reprogram Service Processor Flash EPROM. Selecting that item starts the update process. The process requests the update diskette(s) as needed. After inserting the first diskette and informing the system, the process continues automatically. If the process requires user assistance, it is requested.

Updating Firmware from the SMS Utilities: From a powered down or reset condition, bring up the SMS Utilities and select the menu item for updating firmware. The process requests the update diskette(s) as needed. After inserting the first diskette and informing the system, the process continues automatically. If the process requires user assistance, it is requested.

Updating Firmware from the Service Aids:

Note: This service aid is only supported for Online Diagnostics.

This service aid allows you to update the system or service processor flash.

Additional update and recovery instructions may be provided; also you need to know the fully qualified path and file name of the flash update image file. If the flash update image file is on a diskette, you need the AIX DOS utilities package to process the diskette. You can use the **dosdir** command to find out the name of the update image file. This service aid uses the **dosread** command to put the file into the **/var** file system.

Using this service aid to update the system or service processor flash will not save the current contents of the flash.

The flash image file will be copied in the **/var** file system. If there is not enough space in the **/var** file system for the flash update image file, an error is reported. If this occurs, exit the service aid, increase the size of the **/var** file system and retry the service aid. After the file is copied, a warning screen will ask for confirmation to continue the flash update. Continuing the flash update will eventually cause the system to reboot and return to the AIX login prompt. After the system unit reboots, the file **/var/update_flash_image** can be removed to conserve space in the **/var** file system.

Updating Firmware from AIX: You must delete the file **/var/update_flash_image** before proceeding.

The flash update image file must have already been placed in the **/var** file system. This could have been done with a file transfer from another server or with the **dosread** command of the AIX DOS Utilities, for example. With the flash update image in place, issuing the following AIX command

```
shutdown -u /var/*filename*.img
```

initiates the update process. Where *filename* is the name of the flash update image. During the process, the server powers down and reboots. You know the process is complete when the login prompt reappears.

SP Logs

SP Error Log: The SP error logs contain error conditions detected by the SP.

Service Processor Connection

```
                          Error Log

19970626223337  0. Loss of Redundant Fan #5
                     40210091



   Press "C" to clear error log, any other key to continue.  >
```

The time stamp in this error log is Coordinated Universal Time (CUT), also known as Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time.

System POST Errors: If POST (Power-On Self Test) errors occur during start-up, this error log help isolate faults when used with the diagnostics.

```
                          Read System POST Errors



Version : 0
Severity : 0
Disposition : 0
Initiator : 0
Event being reported : 0
Extended Error Log Data:
0xC2 0x00 0x84 0x09 0x00 0x00 0x00 0x00
0x20 0x00 0x00 0x00 0x00 0x00 0x72 0x74
0x63 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x28 0x03 0x00 0x05 0x00 0x01
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x49 0x42 0x4D 0x00 0x55 0x30 0x2E 0x31
0x2D 0x50 0x31 0x2D 0x58 0x31 0x00

                     (Press Return to Continue)
```

Sample Modem Configuration Files: Call for technical support.

Seamless Transfer of a Modem Session: Call for technical support.

Starting the System Unit: Call for technical support.

Seamless Transfer of a Modem Session: Call for technical support.

Config: Call for technical support.

Display Configuration: Call for technical support.

Appendix B. System Management Service Operation Connection

Attention: The text-based System Management Services (SMS) should only be used when directed by this maintenance package or the next level of support. Normal maintenance uses the SMIT menu option when logging in with the **SERVICE** login ID. Normally this process is only used if the cluster bay cannot IML the AIX and functional code. (Operator panel Cluster Bay 1 or 2 Message indicator does not stop blinking):

To start the System Management Services:

Note: The 2105 Model E10/E20 should be powered on.

Attention: The 2105 and cable in this procedure are ESD-sensitive. Always wear an ESD wrist strap during this procedure. Follow the ESD procedures in ″Working with ESD-Sensitive Parts″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 2*.

1. Set the service terminal on the 2105 service table and start the appropriate terminal emulator (i.e. EBTERM for OS/2 or NetTerm for Windows).

   Use “Service Terminal Setup and 2105 Configuration Verification” on page 54 to prepare the service terminal for service and to verify that the service terminal has been initialized to service the 2105.
2. Set the terminal emulator to the Direct Connect mode:
   - **OS/2 Operating System**:
     a. At the EBTERM window, select and click on the **Modify** menu option.
     b. At the **Modify** menu, verify that **Direct Connect Mode** has a check mark next to it. Set all other check marks on this menu off.

        Note: Single click to set check marks on or off.
     c. Go to step 3.
   - **Windows Operating System**, at the NetTerm window, single click on **File** and then **Phone Directory**
     – If the **Phone Directory** displays **IBM 2105 VSS/ESS (Direct Connect, IBM3151 emulation)**, the service terminal is setup to run NetTerm as Direct Connect. Go to step 3.
     – If the Phone Directory doesn’t display **IBM 2105 VSS/ESS (Direct Connect, IBM3151 emulation)**, then the service terminal needs to be setup again. Go to “Service Terminal Setup and 2105 Configuration Verification” on page 54 to prepare the service terminal for service and go to step 3. when complete.
3. Verify that the 2105 Model E10/E20 is powered on. The 2105 Model E10/E20 operator panel Power Complete indicator for the cluster bay you are attaching to should be on continuously.
4. Connect the service terminal to the cluster bay being serviced:
   a. Connect the service terminal interface cable to the serial port connector (9 pin) on the service terminal.
   b. Connect the other end of the cable to the S2 connector on the cluster bay being serviced, cluster bay 1 or cluster bay 2.

      Note: The service terminal interface cable is stored in the 2105 Model E10/E20 rack or connected to S2 on the front of cluster bay 1 or 2.

System Management Services Connection

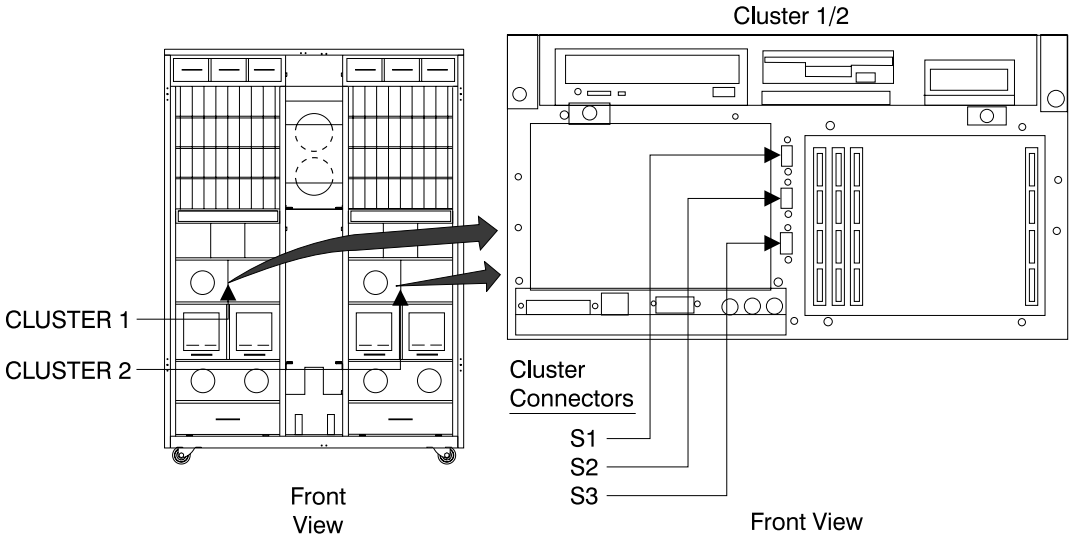


Figure 92. Cluster Bay Connectors for Service Terminal (S008027m)

5. Logically connect the service terminal to the cluster bay:
   - **OS/2 Operating System**:
     a. At the EBTERM window, select and click on the **Connect** menu option.
     b. At the **Connect** dialog box, click on **2105 Direct Connect**.
     c. Go to step 6.
   - **Windows Operating System**,
     a. At the NetTerm window, single click on **File** and then **Phone Directory**
     b. At the **Phone Directory**, click on **IBM 2105 VSS/ESS (Direct Connect, IBM3151 emulation)**, and then click on **Connect**.
     c. Go to step 6.
6. Quiesce the cluster bay being serviced to prevent interruption of customer operation:
   a. Connect the service terminal to the cluster bay NOT being serviced.
   b. Quiesce the cluster bay you will be running the diagnostics on, from the service terminal **Main Service Menu**, select:
      Utility Menu
      Resource Management Menu
      Quiesce a Resource
      Select and quiesce the cluster bay you will be running the diagnostics on.
7. Power Off the cluster bay you are servicing by selecting the following options from the **Main Service Menu**:
   Utility Menu
   Cluster Bay Power Off/On
   Select **Power Off Cluster Bay 1** or **2**
8. Wait three minutes for the cluster bay to power off. When **OK** is displayed on the cluster bay operator panel, power the cluster bay on by selecting the following options from the **Main Service Menu**:
   Utility Menu
   Cluster Bay Power Off/On
   Select **Power On Cluster Bay 1** or **2**

   Go to step 9.
9. Reconnect the service terminal to the cluster bay being serviced.

10. Watch the operator panel display of the cluster bay being serviced. As the cluster bay powers on, the firmware test displays **EXXX** progress codes. Keep logically connecting the service terminal, by repeating step 5 on page 234 on the service terminal, until progress code **E1FB** is displayed. (During the cluster bay power on, the service terminal may be logically disconnected one or more times.) Immediately look at the service terminal for the display shown below.

    As soon as the word **Keyboard** is displayed at the bottom of the screen, *immediately* press the number **1** key on the service terminal. This will initiate loading diagnostics from the CD-ROM drive or from the SCSI Hard Drive.

```
RS/6000 RS/6000 RS/6000 RS/6000 RS/6000 RS/6000 RS/6000 RS/6000 RS/6000
RS/6000 RS/6000 RS/6000 RS/6000 RS/6000 RS/6000 RS/6000 RS/6000 RS/6000
RS/6000 RS/6000 RS/6000 RS/6000 RS/6000 RS/6000 RS/6000 RS/6000 RS/6000

   Memory        Keyboard
 ====>
```

    Note: During firmware boot the service terminal may be logically disconnected one or more times.

11. After the text-based System Management Services starts, the following screen appears.

```
System Management Services


 1.  Display Configuration
 2.  Multiboot
 3.  Utilities
 4.  Select Language


                                                  *------*
                                                  ³X=Exit³
                                                  *------*

 ====>
```

12. Selecting the numbered options provide capabilities described on the following pages.
13. After you have finished using the text-based System Management Services, entering the letter **x** (for exit) boots the cluster bay.

Display Configuration

This option provides information about the setup of the cluster bay being serviced. A screen similar to the following is displayed.

System Management Services Connection

```
  Device

  PowerPC 604e 332MHz
  L2-Cache, 0256K
  PowerPC 604e 332MHz
  L2-Cache, 0256K
  PowerPC 604e 332MHz
  L2-Cache, 0256K
  PowerPC 604e 332MHz
  L2-Cache, 0256K
  Memory
     Memory Card Slot 1, module slot=1 size=128MB
     Memory Card Slot 1, module slot=1 size=128MB
  Service Processor
LPT
     addr=378B
  COM

 *-----------* *-----------*                              *------*
 ³P=prev-page³ ³N=next-page³                              ³X=Exit³
 *-----------* *-----------*                              *------*
```

MultiBoot Menu

```
Multiboot Menu

 1. Select Software
 2. Software Default
 3. Install From
 4. Select Boot Devices
 5. OK Prompt
 6. Mulitboot Startup <OFF> (or <ON>)









                                                      *------*
                                                      ³X=Exit³
                                                      *------*

 ===>
```

The Select Software option shows the name of the operating system installed.

If you receive a message saying that:

```
No Operating System Installed
```

this would mean that information in non-volatile storage could have been lost, as would happen if the I/O planar battery had failed.

The Software Default option, if not used.

The Install From option produces a list of devices, for example the CD-ROM, where the operating system may be installed from.

The Select Boot Device option provides options to display or change the boot device order. The proper order is,

```
1. SCSI CD-ROM id=3 ( Integrated )
2. Diskette
3. SCSI 4512 MB Hard drive id=0 ( Integrated )
4.   None
5.   None
```

The **OK** Prompt option is not used.

The Multiboot Start option is not used.

Select Boot Devices

This option is only used if the displayed boot list is incorrect and the next level of support OKs it.

Utilities

The Utilities screen enables you to select from the following system management tools.

```
Utilities

 1. Set Password and Unattended Start Mode
 2. Test Memory
 3. Display Error Log
 4. Remote Initial Program Load Setup
 5. Change SCSI ID
 6. Update System Firmware
 7. Update Service Processor
 8. Select Console


                                                  *------*
                                                  ³X=Exit³
                                                  *------*
===>
```

Set Password and Unattended Start Mode

This option is not used. the following options.

```
Password Utilities

 1. Set Power On Password
 2. Remove Power On Password
 3. Unattended Start Mode <OFF>
 4. Set Privileged-Access Password
 5. Remove Privileged-Access Password




                                                  *------*
                                                  ³X=Exit³
                                                  *------*
===>
```

Display Error Log

A screen similar to the following is displayed when you select this option. Here, you can view or clear the error log on the cluster bay being serviced.

System Management Services Connection

```
*-------------------------------------------------------*
                     Error Log

           Date       Time       ErrorCode       Location
   Entry 1. 98/04/01   12:13:22   25A80011        00-00
   Entry 2. no error logged
*-------------------------------------------------------*




  *-----------------*                              *------*
  ³C=Clear Error Log³                              ³X=Exit³
  *-----------------*                              *------*
```

Change SCSI ID

This option allows you to view and change the addresses of the SCSI controllers attached to you cluster bay. Use only if directed by next level of support.

Update System Firmware

This option allows you to update the cluster bay firmware. Note that you must insert a diskette containing the firmware update image after you see the following confirmation screen.

```
*-------------------------------------------------------------*
  This selection will update your system firmware. Do you want
  to continue? Press Y(Yes) N(No).
*-------------------------------------------------------------*
```

Update Service Processor Firmware

This option allows you to update the service processor (SP) firmware. Note that you must insert a diskette containing the firmware update image after you see the following confirmation screen.

```
*-----------------------------------------------------------------------*
  This selection will update your Service Processor firmware. . Do you want
  to continue? Press Y(Yes) N(No).
*-----------------------------------------------------------------------*
```

Select Console

This option should not be used, as it will automatically start an IML of the cluster bay AIX and functional code.

Appendix C. Isolating a CPI Diagnostic Progress Code Stop

MAP 4030: Isolating CPI Diagnostic Progress Code Stop

Attention: This is *not* a stand-alone procedure.

Customer disruption may occur if microcode and power boundaries are not in the proper conditions for this service action. Ensure that you start all service activities in Entry MAP for All Service Action in chapter 2 of the *Enterprise Storage Server Service Guide, Volume 1*.

Attention: The FRUs and cables in this procedure are ESD-sensitive. Always wear an ESD wrist strap during this isolation procedure. Follow the ESD procedures in ″Working with ESD-Sensitive Parts″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 2*.

Description

Normally, CPI errors detected by the CPI diagnostics during the cluster bay power on will fence that CPI interface and create a problem requesting service. It is possible for cluster bay to stop with the CPI diagnostics displaying a 10 digit progress code in the cluster bay operator panel. This MAP uses that code to determine the possible failing FRU.

Procedure

1. The cluster bay stopped with a 10 digit CPI diagnostic progress code displayed in the cluster bay operator panel. This code contains information that will be used with the code listing below to determine the failing FRUs.
2. This step contains an example of how to convert the progress code to the probable failing FRU(s) and locations.
   - Assume that cluster bay 1 stopped with SD010000156, the first entry in the table below.
   - The last digit of the progress code ″6″, is the CPI interface that was being tested when the cluster bay stopped.
   - There are four FRUs listed. The first column is the Resource Name of the FRU, while the second column is the FRU Name. The last column is the probability in % that the FRU will fix the problem.
   - At the top of the table, next to ″Cluster Bay with progress code -->″ is a group of columns labeled ″Cluster Bay 1″ and another group labeled ″Cluster Bay 2″. Refer to the ″Cluster Bay 2″ group.
   - Beneath that is ″Last digit of progress code -->″. In this case it is a ″6″.
   - Go directly down and notice that the number in the row for each FRU lists the slot or bay for the FRU.
   - If you choose to replace the IOA Card (70% probability to fix the problem), it is in I/O Planar slot 9 of cluster bay 2.
   - The I/O Planar is in the failing cluster bay.
   - FRU resource name for the I/O Attachment Card is rsioaxy, where x is the cluster bay the IA resides in, and y is the Bay the IA connects to.
   - FRU resource name for Bays are rsiomy, where y is the numeric value representing the Bay in error.
3. To replace the FRUs, ensure the customer is not using the other cluster bay. Power off the 2105 Model E10/E20 and replace the FRU(s). Power on the 2105 Model E10/E20.
   - If both cluster bays display READY, the problem is fixed. Go to ″MAP 1500: End Service Action″ in chapter 3 of the *Enterprise Storage Server Service Guide, Volume 1*.
   - If the cluster bay still stops, replace the remaining FRUs, then call the next level of support.

CPI Diagnostic Progress Code Stop

Cluster with progress code -->	Cluster 0				Cluster 1				FRU
Last digit of progress code -->	4	5	6	7	4	5	6	7	
Progress Code / Resource Name	Description / FRU Name	Slot ID or Bay ID Listed Below				Slot ID or Bay ID List Below				FRU % to Fix
SD1000015y: System Bus Failure on CPI-y SD100001Dy: System Bus Failure on CPI-y										
rsioaxy	IOA Card in I/O Planar slot of failing cluster	4	3	8	9	3	4	9	8	70
SysPlannar	I/O Planar	-	-	-	-	-	-	-	-	10
rsioayx	IOA Card in I/O Planar slot of other cluster	3	4	9	8	4	3	8	9	10
Adapter	Adapter in I/O Planar slot	5	5	6	6	5	5	6	6	10
SD100002Dy: IA System Bus Failure on CPI-y SD1000050y: IA System Bus Failure on CPI-y SD2000015y: IA Internal Failure on CPI-y SD200002Dy: IA Internal Failure on CPI-y										
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	95
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	5
SD300000Dy: IA/HB Interface Failure on CPI-y										
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	50
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	50
SD3000040y: Host Bay Failure on CPI-y										
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	30
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	70
SD4000040y: Host Bay Failure on CPI-y										
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	20
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	80
SD4000060y: Host Bay Failure on CPI-y										
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	10
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	90

SD5000030y: Host Bay Failure on CPI-y											
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	50	
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	50	
SD5000040y: Host Bay Failure on CPI-y SD5000050y: Host Bay Failure on CPI-y											
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	5	
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	95	
SD5000060y: Host Bay Failure on CPI-y											
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	50	
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	50	
SD5000070y: Host Bay Failure on CPI-y SD5000080y: Host Bay Failure on CPI-y											
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	5	
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	95	
SD5000090y: Host Bay Failure on CPI-y											
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	50	
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	50	
SD50000A0y: Host Bay Failure on CPI-y SD50000B0y: SD6000030y: SD6000040y: SD6000080y: SD60000A0y: SD6500040y: SD6500050y:											
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	95	
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	5	
SD7000030y: Host Bay Failure on CPI-y											
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	50	
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	50	

SD7000040y: Host Bay Failure on CPI-y									
SD7000050y: Host Bay Failure on CPI-y									
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	5
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	95
SD7000060y: Host Bay Bus Failure on CPI-y									
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	5
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	15
Adapter	Bay adapter-0*	4	5	6	7	4	5	6	7	20
Adapter	Bay adapter-1*	4	5	6	7	4	5	6	7	20
Adapter	Bay adapter-2*	4	5	6	7	4	5	6	7	20
Adapter	Bay adapter-3*	4	5	6	7	4	5	6	7	20
SD7000070y: Host Bay Failure on CPI-y									
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	5
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	95
SD70000A0y: Host Bay Failure on CPI-y									
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	5
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	95
SDd300010y: Reserved									
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	5
SDd500010y: Reserved									
SDd700010y: Reserved									
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	?
rsiomy	4-Slot Bay Planar	4	5	6	7	4	5	6	7	?
SDdA00010y: Reserved									
SysPlanar	I/O Planar for failing cluster	-	-	-	-	-	-	-	-	100
SDdA00020y: Reserved									
SysPlanar	I/O Planar for failing cluster	-	-	-	-	-	-	-	-	100
rsioaxy	IOA Card in I/O Planar slot	4	3	8	9	3	4	9	8	?

Glossary of Terms and Abbreviations

This glossary defines important terms and abbreviations used in this service guide. If you cannot find the term you are looking for, see the Index or the *IBM Dictionary of Computing*

This glossary includes terms and definitions from:

- The *American National Dictionary for Information Systems,* ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI). Copies may be purchased from the American National Standards Institute, 11 West 42 Street, New York, New York 10036. Definitions are identified by the symbol (A) after the definition.
- The ANSI/EIA Standard—440-A: *Fiber Optic Terminology.* Copies may be purchased from the Electronic Industries Association, 2001 Pennsylvania Avenue, N.W., Washington DC 20006. Definitions are identified by the symbol (E) after the definition.
- The *Information Technology Vocabulary,* developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC1/SC1). Definitions of published parts of this vocabulary are identified by the symbol (I) after the definition; definitions taken from draft international standards, committee drafts, and working papers being developed by ISO/IEC JTC1/SC1 are identified by the symbol (T) after the definition, indicating that final agreement has not yet been reached among the participating National Bodies of SC1.

A

access. (1) To obtain the use of a computer resource. (2) In computer security, a specific type of interaction between a subject and an object that results in flow of information from one to the other.

alert. A message or log that a storage facility generates as the result of error event collection and analysis. An alert indicates that you need to perform some service action.

allegiance. The ESA/390 term for a relationship that is created between a device and one or more channel paths during the processing of certain conditions. Refer to implicit allegiance, contingent allegiance, and reserved allegiance.

ANSI. American National Standards Institute. A standards committee body for the United States.

array. An arrangement of related disk drive modules that you have assigned to a group.

ASCII. American national Standard Code for Information Interchange. A coding scheme defined by ANSI X3.4-1977 which is used to represent various alphabetic, numeric, and special symbols with a seven-bit code.

availability. The degree to which a system or resource is capable of performing its normal function.

B

BIST. Built-In Self-Test.

bit. binary digit. The storage medium required to store a single binary digit.

block. A group of consecutive bytes.

boot. To load an operating system or start the system.

BOS. Base Operating System.

byte. An aggregation of eight bits. The storage medium required to store eight bits.

C

cache (memory). Typically refers to volatile memory used to improve access times on data or instructions accesses. The cache memory is typically smaller and faster than the primary memory or storage medium. On a storage facility, the cache memory is used to improve the performance of accesses to data that ultimately resides on the storage devices in the storage facility.

cache fast write. A form of fast write where the subsystem writes the data directly to cache, where it is available for later destaging.

CCR. Channel Command Retry.

CCW. Channel Command Word. The ESA/390 term for a data structure that is used to specify an I/O operation to the channel subsystem.

CD-ROM. Compact Disc Read-Only Memory.

CEC. Computer Electronic Complex. The set of hardware facilities associated with a host computer.

channel. The ESA/390 term for the part of a channel subsystem that manages a single I/O interface between a channel subsystem and a set of control units.

Channel-Command Retry (CCR). An ESA/390 term for a protocol used between a channel and a control unit which allows the control unit to request that the current command be reissued.

channel path. The ESA/390 term for the interconnection between a channel and its associated control units.

channel subsystem. The ESA/390 term for the part of a host computer that manages I/O communication between the program and any attached control units.

channel-subsystem image. The ESA/390 term for the logical facilities required to perform the function of a channel subsystem. With EMIF, one channel-subsystem image exists in the channel subsystem for each LPAR. Each image appears to be an independent channel subsystem program, but all images share a common set of hardware facilities.

CKD. Count Key Data. An ESA/390 architecture for a DASD logical device that specifies the format of and access mechanisms for the logical data units on the device. The logical data unit is a track which can contain one or more records, each consisting of a count field, a key field (optional), and a data field (optional).

cluster. A partition of a storage controller that is capable of performing all functions of a storage server. Multiple clusters provide redundancy.

concurrent copy. A facility of a storage controller used to assist a program in making a consistent copy of a logical volume while the logical volume remains available for subsequent processing.

concurrent maintenance. The ability to service a unit while it is operating.

concurrent media maintenance. The ability to perform maintenance on a disk drive module (DDM) without loosing access to the data.

configure. To define the logical and physical configuration of the input/output (I/O) subsystem via the user interface provided for this function on the storage facility.

consistent copy. A copy of a data entity (e.g. a logical volume) that contains the contents of the entire data entity from a single instant in time.

contingent allegiance. The ESA/390 term for a relationship that is created in a control unit between a device and a channel path when unit-check status is accepted by the channel. The allegiance causes the control unit to guarantee access (i.e. busy status is not presented) to the device to retrieve the sense data associated with the unit-check status on the channel path associated with the allegiance.

control unit. The ESA/390 term for a storage controller with ESCON or OEMI interfaces.

control-unit image. The ESA/390 term for a logical subsystem accessed via an ESCON I/O Interface. One or more control-unit images exist in each control unit. Each image appears to be an independent control unit, but all images share a common set of hardware facilities.

count field. The first field of a CKD record. The eight-byte field contains a four-byte track address (CCHH) that defines the cylinder and head associated with the track, a one-byte record number (R) that identifies the record on the track, a one-byte key length that specifies the length of the record's key field (0 means no key field), and a two-byte data length that specifies the length of the record's data field (0 means no data field). Only the end-of-file record has a data length of zero.

CPAR. Customer Problem Analysis and Repair.

CPI. Common Platform Interconnect.

CPSS. Common Platform Storage Subsystems. A strategy and family of storage products based on common hardware parts.

CRC. Cyclic Redundancy Check.

CSU. Customer Set Up.

Customer Console. A user interface to a server. Also see Versatile Storage Specialist.

Cyclic Redundancy Check (CRC). A data redundancy check in which a cyclic algorithm generates the check key.

cylinder. A unit of storage on a CKD device consisting of a fixed number of tracks.

D

DA. Device Adapter, the SSA device card.

daisy chain. A method of device interconnection for determining interrupt priority by connecting the interrupt sources serially.

DASD. Direct Access Storage Device.

DASD fast write. A facility of a storage controller that allows caching of active write data without exposure of data loss by journaling of the active write data in NVS.

data availability. The degree to which data is available when needed. For better data availability when you attach multiple hosts that share the same data storage, configure the data paths so the data transfer rates are balanced among the hosts.

data compression. A technique or algorithm used to encode a quantity of data such that the encoded result can generally be stored in less space than the original data and such that the original data can be recovered from the encoded result through a reverse technique or reverse algorithm.

data field. The third (optional) field of a CKD record. The field length is determined by the data length specified in the count field. The data field contains data written by the program.

data record. A data records are stored on a track following the track-descriptor record. The data records are numbered consecutively starting with 1. A maximum of 255 data records can be stored on a track. Each data record consists of a count field, a key field (optional), and a data field (optional).

data sharing. The ability of the similar or different host systems to concurrently utilize information that they store on one or more storage devices. The storage facility allows configured storage to be accessible to any attached host systems, or to all. To use this capability, the host programs need to be designed to support data sharing.

dedicated storage. Storage within a storage facility that is configured so that a single host has exclusive access to the storage.

demote. The action of removing a logical data unit from cache memory. A data unit is demoted in order to make room for other logical data units in the cache or because the logical data unit was invalidated. Logical data units with active write unit must be destaged before being demoted.

destage. (1) The process of reading data from cache. (2) The action of storing a logical data unit in cache memory with active write data to the storage device. As a result, the logical data unit changes from cached active write data to cached read data.

device. The ESA/390 term for a logical device.

Device Adapter (DA). A physical sub-unit of a storage controller, the SSA device card, that provides the facilities to attach to one or more interfaces used to communicate with the associated storage devices.

device address. The ESA/390 term for the field of an ESCON device-level frame that selects a specific device on a control-unit image.

device interface card. A physical sub unit of a storage cluster that provides the communication with the attached DDMs.

device number. The ESA/390 term for a four-hexadecimal-character identifier (e.g. X'13A0') associated with a device to facilitate communication between the program and the host operator. The device number is associated with a subchannel.

device sparing. When a subsystem automatically copies data from a failing DDM to a spare DDM. The subsystem maintains data access during the process

disk drive. The mechanism used to seek, read, and write information on a disk.

disk drive module. The primary nonvolatile storage medium that you use for any host data that is stored within a subsystem. Number and type of storage devices within a storage facility may vary.

drawer. A unit that contains multiple DDMs, and provides power, cooling, and related interconnection logic to make the DDMs accessible to the attached host systems.

E

EBCDIC. Extended Binary-Coded Decimal Interchange Code. A coding scheme developed by IBM which is used to represent various alphabetic, numeric, and special symbols with an 8 bit code.

EC. Engineering Change. A update to a machine, part, or program. Each EC for a given unit is assigned a unique number referred to as an EC level or EC number. The initial release of a unit normally has an associated EC level.

ECC. Error Correction Code.

ECKD. Extended Count Key Data. An extension of the CKD architecture.

electrostatic discharge (ESD). An undesirable discharge of static electricity that can damage equipment and degrade electrical circuitry.

EMIF. ESCON Multiple Image Facility. An ESA/390 facility that allows LPARs to share an ESCON channel path by providing each LPAR with its own channel-subsystem image.

enclosure. See *rack*.

end-of-file record. On a CKD DASD device, end of file is indicated by a record with a data length of zero.

EPOW. Early Power-Off Warning.

EPROM. Erasable Programmable Read-Only Memory.

ERP. Error Recovery Procedure.

Exception Symptom Code (ESC). A two byte error code that describes the exception: class, type, and symptom.

ESA/390. Enterprise Systems Architecture/390. An IBM architecture for mainframe computers and peripherals. Processor systems following this architecture include the ES/9000 family.

ESC. Exception Symptom Code.

ESCON. Enterprise Systems Connection Architecture. An ESA/390 computer peripheral interface. The I/O interface utilizes ESA/390 logical protocols over a serial interface that configures attached units to a communication fabric.

ESCON director. A I/O interface switch that allows the interconnection of multiple ESCON interfaces in a distributed-star topology.

ESD. ElectroStatic Discharge.

extended remote copy. A facility of a storage controller that assists a control program to maintain a consistent copy of a logical volume on another storage facility. All modifications of the primary logical volume by any attached host are presented in order to a single host which in turn makes these modifications on the secondary logical volume.

F

failback. Cluster recovery from failover following repair. Also see *cluster*.

failover. The routing of all transactions to a second controller when the first controller fails. Also see *cluster*.

fast write. A write operation at cache speed that does not require immediate transfer of data to a DDM. The subsystem writes the data directly to cache, to nonvolatile storage, or to both. The data is then available for destaging. Fast write reduces the time an application must wait for the I/O operation to complete.

FBA. Fixed Block Address. An architecture for DASD logical devices that specifies the format of and access mechanisms for the logical data units on the device. The logical data unit is a block. All blocks on the device are the same size (i.e. fixed) and can be accessed independently,

FC-AL. Fibre Channel - Arbitrated Loop. An implementation of the fibre channel standard that uses a ring topology for the communication fabric. Reference ANSI X3T11/93-275.

FCS. Fibre Channel Standard.

Fibre Channel Standard (FCS). An ANSI standard for a computer peripheral interface. The I/O interface defines a protocol for communication over a serial interface that configures attached units to a communication fabric. The protocol is defined in two layers. The IP layer defines basic interconnection protocols. The upper layer supports one or more logical protocols (e.g. FCP for SCSI command protocols, SBCON for ESA/390 command protocols). Reference ANSI X3.230-199x.

FIFO. First-In First-Out.

firmware. An ordered set of microcode instructions and data stored in a hardware EPROM. When microcode software is installed into a hardware EPROM, it becomes firmware. Firmware cannot be modified by the user but can be updated by the service personnel.

First-In First-Out (FIFO). A queuing technique in which the next item to be retrieved is the item that has been in the queue for the longest time.

FRU. Field-Replaceable Unit.

H

HA. Home Address, Host Adapter.

hard drive. A storage medium within a storage server used to maintain information that the storage server requires.

HDA. Head and Disk Assembly. The portion of a HDD associated with the medium and the read/write head.

HDD. Head and Disk Device. A disk drive.

hdisk. An AIX term for storage space.

Home Address (HA). A nine-byte field at the beginning of a track that contains information identifying the physical track and its association with a cylinder.

host. A computer.

host adapter. A physical sub-unit of a storage controller, ultra SCSI host card, that provides the facilities to attach to one or more host I/O interfaces.

host system. A computer.

hot plug. The ability to add or remove a hardware facility, resource, or FRU to a unit while its power is on.

I

ID. IDentifier.

identifier (ID). A unique name or address that identifies such things as programs, devices, or systems.

IML. Initial Microcode Load

implicit allegiance. The ESA/390 term for a relationship that is created in a control unit between a device and a channel path, or path group, when an I/O operation is accepted by the device. The allegiance causes the control unit to guarantee access (i.e. busy status is not presented) to the device for the remainder of the channel program over the set of channel paths associated with the allegiance.

initiator. A SCSI term for the part of a host computer that communicates with its attached targets.

interchange. The sending and receiving of data in such a manner that the content of the data is not altered during transmission.

internet. The worldwide collection of interconnected networks that use the Internet suite of protocols and permit public access.

intranet. A private network that integrates internet standards and applications (such as Web browsers) with an organization's existing computer networking infrastructure.

invalidate. The action of removing a logical data unit from cache memory because it cannot support continued access to the logical data unit on the logical device. The removal may be the result of a failure within the storage controller or a storage device associated with the logical device.

I/O. Input/Output.

I/O device. An addressable read and write unit, such as a disk drive device, magnetic tape device, or printer.

I/O interface. An interface defined to allow input/output operations to be performed between a host and its associated peripheral devices.

IOA. I/O Attachment Card

IOM. 4-Slot Bay Planar

IOCC. Input/Output Channel Controller

IP. Internet Protocol.

IPL. Initial Program Load

J

java. An object oriented programming language for portable interpretive code that supports interaction among remote objects. Java was developed and specified by Sun Microsystems, Incorporated.

JBOD. Just a Bunch Of Disks, a group of hard disks that are not configured according to RAID, a subsystem of disk drives that improve performance and fault tolerance.

K

KB. KiloByte.

key field. The second (optional) field of a CKD record. The field length is determined by the key length specified in the count field. The key field contains data written by the program that can be used to identify or locate a given record.

kilobyte (KB). A kilobyte of storage is 10^3 bytes. A kilobyte of memory is 2^{10} bytes.

KPOH. Kilo (1000) of Power-On Hours. A unit of time used for a measurement of MTBF.

L

LAN. Local Area Network.

Last-In First-Out (LIFO). A queuing technique in which the next item to be retrieved is the item that has been most recently placed in the queue.

LBA. Logical Block Address

Least Recently Used (LRU). The algorithm used to identify and make available the cache space that contains the least-recently used data.

LED. Light-Emitting Diode.

LIC. Licensed Internal Code.

Licensed Internal Code (LIC). Microcode that IBM does not sell as part of a machine but licenses to the customer, as designated in the Supplement to Agreement for Purchase of IBM Machines. See *microcode*.

LIFO. Last-In First-Out.

Light Emitting Diode (LED). A semiconductor chip that gives off visible or infrared light when it is activated.

link address. On an ESCON interface, the portion of a source or destination address in a frame that ESCON uses to route a frame through an ESCON director. ESCON associates the link address with a specific switch port that is on the ESCON director. Equivalently, it associates the link address with the channel-subsystem, or control-unit link-level functions that are attached to the switch port.

link-level facility. An ESCON term for the hardware and logical facilities of a control unit or channel subsystem that allows communication over an ESCON write interface and an ESCON read interface.

Local Area Network (LAN). A computer network located at a user's site within a limited area.

logical address. On an ESCON interface, the portion of a source or destination address in a frame used to select a specific channel-subsystem or control-unit image.

logical data unit. A unit of storage which is accessible on a given logical device.

logical device. The facilities of a logical subsystem that the host communicates with when performing I/O operations to a single addressable-unit over an I/O interface. The same logical device may be accessible over more than one I/O interface.

logical partition mode (LPAR). The ESA/390 term for a set of facilities that create the programming environment defined by the ESA/390 architecture. The term is typically used when there is more than one LPAR established on a CEC. An LPAR is conceptually similar to a virtual machine environment except that the LPAR is a function of the CEC and is not dependent on an operating system to create the virtual machine environment.

logical subsystem. The logical functions of a storage controller that allow one or more host I/O interfaces to access a set of logical devices. The controller aggregates the devices according to the addressing mechanisms of the associated I/O interfaces. One or more logical subsystems exist on a storage controller. In general, a given set of logical devices is associated with one and only one logical subsystem.

logical unit. The SCSI term for a logical device.

Logical Unit Number (LUN). The SCSI term for the field in an Identify message that is used to select a logical unit on a given target.

logical volume. The storage medium associated with a logical disk drive. A logical volume typically resides on one or more storage devices. For the 2105, you define this unit of storage; the logical volume resides on a RAID-5 array, and is spread over 6 + P or 7 + P drives.

LPAR. Logical PARtition mode.

LRU. Least Recently Used.

LUN. Logical Unit Number.

M

Maintenance Analysis Procedure (MAP). Service personnel use these procedures during maintenance on a subsystem.

MAP. Maintenance Analysis Procedure.

MB. MegaByte.

MCA. Micro-Channel Architecture.

medium. For a storage facility, this is the disk surface on which data is stored.

megabyte (MB). A megabyte of storage is 10^6 bytes. A megabyte of memory is 2^{20} bytes.

MIB. Management Information Base.

microcode. Stored microinstructions, not available to users, that perform certain functions. See *firmware*.

mirrored pair. Two units that contain the same data. The system refers to them as one entity.

mirroring. In AS/400 systems, the process of writing the same data to two disk units within the same auxiliary storage pool at the same time.

MLC. Machine-Level Control. A data bases that maintains the EC level and configuration of products in the field.

MTBF. Mean Time Between Failures. A projection of the time that an individual unit will remain functional based on averaging the performance or projected performance of a population of statistically independent units under as set of operating conditions or assumptions.

N

ND. Node Descriptor.

NED. Node-Element Descriptor.

NEQ. Node-Element Qualifier.

nondisruptive. The attribute of an action or activity that does not result in the loss of any existing capability or resource, from the customer's view.

non-removable medium. Recording media that cannot be added to or removed from a storage device.

non-retentive data. Data that the control program can easily recreated in the event it is lost. The control program may cache non-retentive write data in volatile memory.

Non-Volatile Storage (NVS). Typically refers to non-volatile memory on a processor rather than a non-volatile storage device. On a storage facility, non-volatile storage is used to store active write data to avoid data loss in the event of a power loss.

NQ. Node Qualifier.

NVRAM. NonVolatile Random Access Memory

NVS. Non-Volatile Storage.

O

OEMI. Original Equipment Manufacturer's Information. A reference to an IBM standard for a computer peripheral interface. More specifically, a reference to *IBM S/360 and S/370 Channel to Control Unit Original Equipment Manufacture's Information* The interface utilizes ESA/390 logical protocols over an I/O interface that configures attached units in a multi-drop bus topology.

open system. A system whose characteristics comply with standards made available throughout the industry, and therefore can be connected to other systems that comply with the same standards.

P

parity. A data checking scheme used in a computer system to ensure the integrity of the data. The RAID implementation uses parity to recreate data if a disk drive fails.

path group. The ESA/390 term for a set of channel paths that are defined to a controller as being associated with a single LPAR. The channel paths are in a group state and are online to the host.

path-group identifier. The ESA/390 term for the identifier that uniquely identifies a given LPAR. The path-group identifier is used in communication between the LPAR program and a device to associate the path-group identifier with one or more channel paths, thereby defining these paths to the control unit as being associated with the same LPAR.

PCI. Program-Controlled Interrupt, Peripheral-Component Interconnect.

Peer to Peer Remote Copy (PPRC). A function of a storage controller that maintains a consistent copy of a logical volume on the same controller or on another controller. The controllers are accessed over an ESCON I/O interface. All modifications that any attached host performs on the primary logical volume, they also perform on the secondary logical volume. Options exist to request the modifications to be performed synchronously (i.e. before the completion of the modification of the primary copy is are completed).

POST. Power On Self Test.

PPRC. Peer to Peer Remote Copy.

predictable write. A write operation that can cached without knowledge of the existing formatting on the medium. All writes on FBA DASD devices are predictable. On CKD DASD devices, a write is predictable if it does a format write for the first data record on the track.

PPS. Primary Power Supply.

Primary Power Supply (PPS). A primary power supply that attaches customer AC input power, generates and distributes 390 V dc, and controls and monitors associated power functions.

program. A generic term for the software that controls the operation of a host computer. Typically, the program is an operating system that allows sharing of the host resources between multiple tasks.

promote. The action of adding a logical data unit to cache memory.

R

rack. A unit that houses the components of a storage subsystem, such as controllers, disk drives, and power.

RAID. Redundant Array of Independent Disks. See *array*.

RAM. Random Access Memory.

random access. A mode of accessing data on a medium in a manner that requires the storage device to access non-consecutive storage locations on the medium.

reserved allegiance. The ESA/390 term for a relationship that is created in a control unit between a device and a channel path, when a Sense Reserve command is completed by the device. The allegiance causes the control unit to guarantee access (busy status is not presented) to the device. Access is over the set of channel paths that are associated with the allegiance; access is for one or more channel programs, until the allegiance ends.

ROM. Read-Only Memory.

R0. track-descriptor record.

S

SBCON. Single-Byte command code Sets CONnection architecture. An ANSI standard draft for the ESCON I/O interface.

SCSI. Small Computer System Interface. An ANSI standard for a logical interface to computer peripherals and for a computer peripheral interface. The interface utilizes a SCSI logical protocol over an I/O interface that configures attached targets and initiators in a multi-drop bus topology.

SCSI ID. A unique identifier assigned to a SCSI device that is used in protocols on the SCSI interface to identify or select the device. The number of data bits on the SCSI bus determines the number of available SCSI IDs. A wide interface has 16 bits, with 16 possible IDs. A SCSI device is either an initiator or a target.

SDRAM. Static Dynamic Random Access Memory (DRAM with integrated refresh logic)

sequential access. A mode of accessing data on a medium in a manner that requires the storage device to access consecutive storage locations on the medium.

Sequential Stage Group (SSG). The number of tracks that will be prestaged in a sequential operation.

server. A type of host that provides certain services to other hosts that are referred to as clients.

service processor. A dedicated processing unit which is used to service a storage facility.

shared storage. Storage within storage facility that is configured such that multiple similar or different hosts can concurrently access the storage. The storage unit has a uniform appearance to all hosts.

SIM. Service-Information Message.

SIMM. Single In-line Memory Module.

SMIT. System Management Interface Tool.

SNMP. Simple Network Management Protocol.

software transparency. Criteria applied to a processing environment that states that changes do not require modifications to the host software in order to continue to provide an existing function.

spare. A disk drive that is used to receive data from a device that has experienced a failure that requires disruptive service. A spare can be pre-designated to allow automatic dynamic sparing. Any data on a disk drive that you use as a spare is destroyed by the dynamic sparing copy process.

SRN. Service Request Number or System Reference Number.

SSA. Serial Storage Architecture. An IBM standard for a computer peripheral interface. The interface utilizes a SCSI logical protocol over a serial interface that configures attached targets and initiators in a ring topology.

SSG. Sequential Stage Group

SSID. SubSystem IDentifier.

stacked status. An ESA/390 term for status that the control unit is holding for the channel because the channel responded with the stack-status control the last time the control unit attempted to present the status.

stage. The process of reading data into cache from a disk drive module.

Self-Timed Interface (STI). An interface that has of one or more conductors that transmit information serially between two interconnected units without requiring any clock signals to recover the data. The interface performs clock recovery independently on each serial data stream, and uses information in the data stream to determine character boundaries and inter-conductor synchronization.

STI. Self-Timed Interface.

storage complex. Multiple storage facilities.

storage controller. A physical unit which provides an interface between one or more storage devices and a host computer by providing the function of one or more logical subsystems. The storage controller may provide functions that are not provided by the storage device. The storage controller is composed of one or more clusters.

storage device. A physical unit which provides a mechanism to store data on a given medium such that it can be subsequently retrieved. Also see *disk drive module*.

storage facility. (1) A physical unit which consists of a storage controller integrated with one or more storage devices to provide storage capability to a host computer. (2) A storage server and its attached storage devices.

storage server. A that manages attached storage devices and provides access to the storage or storage related functions for one or more attached hosts.

stripe. The set of tracks in a RAID Rank that have the same parity track. Full stripe writes reduce the RAID 5 write penalty.

striping. A technique that distributes data in bit, byte, multibyte, record, or block increments across multiple disk drives.

subchannel. A logical facilities of a channel subsystem associated with the management of a single device.

subsystem identifier (SSID). A number that uniquely identifies a logical subsystem within a computer installation.

synchronous write. A write operation whose completion is indicated after the data has been stored on a storage device.

T

target. The SCSI term for a storage controller.

TCP. Transmission Control Protocol

track. A unit of storage on a CKD device consisting that can be formatted to contain a number of data records. Also see *home address, track-descriptor record,* and *data record.*

track-descriptor record. A special record on a track following the home address that is used by the control program to maintain certain information about the track. The record has a count field with a key length of zero, a data length of 8, and a record number of 0. This record is sometimes referred to as R0.

transparency. See *software transparency*.

TTY. TeleTYpewriter.

U

Ultra SCSI. An enhanced small computer system interface.

unit address. The ESA/390 term for the address associated with a device on a given control unit. On ESCON interfaces, the unit address is the same as the device address. On OEMI interfaces, the unit address specifies a control unit/device pair on the interface.

utility device. The ESA/390 term for the device used with the Extended Remote Copy facility to access information describing the modifications performed on the primary copy.

V

Versatile Storage Specialist. The web-based management interface to the Versatile Storage Server.

Vital Product Data (VPD). Information that uniquely defines the system, hardware, software, and microcode elements of a processing system.

volume. Refers to a *logical* volume.

VPD. Vital Product Data.

VS Specialist. See Versatile Storage Specialist.

W

write hit. A write operation where the data that you requested is in the cache.

write penalty. The term that describes the classical RAID write operation performance impact.

X

XRC. eXtended Remote Copy.

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