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ESCALA Power7



REFERENCE  
86 A1 &) :: \$\*



# ESCALA Models Reference

The ESCALA Power7 publications concern the following models:

Bull Escala E1-700 / E3-700	(31E/2B ,8231-E2B)
Bull Escala E1-705	(31E/1C, 8231-E1C)
Bull Escala E1-715	(31E/1D, 8231-E1D)
Bull Escala E3-705	(31E/2C, 8231-E2C)
Bull Escala E3-715	(31E/2D, 8231-E2D)
Bull Escala E2-700 / E2-700T	(02E/4B, 8202-E4B)
Bull Escala E2-705 / E2-705T	(02E/4C, 8202-E4C)
Bull Escala E2-715 / E2-715T	(02E/4D, 8202-E4D)
Bull Escala E4-700 / E4-700T	(05F/6B, 8205-E6B)
Bull Escala E4-705	(05E/6C, 8205-E6C)
Bull Escala E4-715	(05E/6D, 8205-E6D)
Bull Escala E5-700	(33E/8B, 8233-E8B)
Bull Escala E5-715	(08E/8D, 8408-E8D)
Bull Escala M5-715	(09R/MD, 9109-RMD)
Bull Escala M6-700	(17M/MB, 9117-MMB)
Bull Escala M6-705	(17M/MC, 9117-MMC)
Bull Escala M6-715	(17M/MD, 9117-MMD)
Bull Escala M7-700	(79M/HB, 9179-MHB)
Bull Escala M7-705	(79M/HC, 9179-MHC)
Bull Escala M7-715	(79M/HD, 9179-MHD)
Bull Escala H9-700	(19F/HB, 9119-FHB)

References to 8236-E8C models are irrelevant.

## Hardware

February 2013

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FRANCE

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## Safety notices

Safety notices may be printed throughout this guide.

- **DANGER** notices call attention to a situation that is potentially lethal or extremely hazardous to people.
- **CAUTION** notices call attention to a situation that is potentially hazardous to people because of some existing condition.
- **Attention** notices call attention to the possibility of damage to a program, device, system, or data.

### World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, a safety information booklet is included in the publications package shipped with the product. The booklet contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information in the booklet. You should also refer to the booklet any time you do not clearly understand any safety information in the U.S. English publications.

### Laser safety information

The servers can use I/O cards or features that are fiber-optic based and that utilize lasers or LEDs.

#### Laser compliance

The servers may be installed inside or outside of an IT equipment rack.

## DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the provided power cord. Do not use the provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices.

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005a)

## DANGER

Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

#### CAUTION

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- *(For sliding drawers.)* Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

(R001)

**CAUTION:**

Removing components from the upper positions in the rack cabinet improves rack stability during relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building:

- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:
  - Remove all devices in the 32U position and above.
  - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.
  - Ensure that there are no empty U-levels between devices installed in the rack cabinet below the 32U level.
- If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- Inspect the route that you plan to take to eliminate potential hazards.
- Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Verify that all door openings are at least 760 x 230 mm (30 x 80 in.).
- Ensure that all devices, shelves, drawers, doors, and cables are secure.
- Ensure that the four leveling pads are raised to their highest position.
- Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.
- Do not use a ramp inclined at more than 10 degrees.
- When the rack cabinet is in the new location, complete the following steps:
  - Lower the four leveling pads.
  - Install stabilizer brackets on the rack cabinet.
  - If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.
- If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.

(R002)

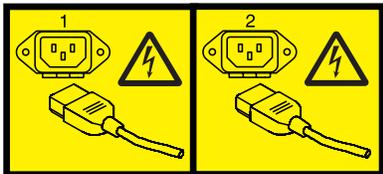
(L001)



(L002)



(L003)



or



All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

**CAUTION:**

This product might contain one or more of the following devices: CD-ROM drive, DVD-ROM drive, DVD-RAM drive, or laser module, which are Class 1 laser products. Note the following information:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

(C026)

**CAUTION:**

Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)

**CAUTION:**

This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

**CAUTION:**

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

**CAUTION:**

The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.

*Do Not:*

- \_\_\_ Throw or immerse into water
- \_\_\_ Heat to more than 100°C (212°F)
- \_\_\_ Repair or disassemble

Exchange only with the approved part. Recycle or discard the battery as instructed by local regulations. (C003a)

## **Power and cabling information for NEBS (Network Equipment-Building System) GR-1089-CORE**

The following comments apply to the servers that have been designated as conforming to NEBS (Network Equipment-Building System) GR-1089-CORE:

The equipment is suitable for installation in the following:

- Network telecommunications facilities
- Locations where the NEC (National Electrical Code) applies

The intrabuilding ports of this equipment are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of this equipment *must not* be metallically connected to the interfaces that connect to the OSP (outside plant) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

**Note:** All Ethernet cables must be shielded and grounded at both ends.

The ac-powered system does not require the use of an external surge protection device (SPD).

The dc-powered system employs an isolated DC return (DC-I) design. The DC battery return terminal *shall not* be connected to the chassis or frame ground.

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## Installing the 57/96 and 14G/30 expansion units

Use this overview as a guide to the tasks required for installing the 57/96 and 14G/30 expansion units (PCI-DDR 12X Expansion Drawer) into a rack and cabling it to a server.

### Procedure

You can use the following table to read about and complete the high-level tasks for installing the 57/96 and 14G/30 expansion units.

Table 1. Tasks to install the expansion unit into a rack

Task	Where to find associated information
Perform inventory. Ensure that you have the rails. Ensure that you have both a Philips-head and flat-head screwdriver.	Locate the inventory list for your expansion unit, and verify that you received all of the parts that you ordered.  Each order contains, at a minimum, the following items: <ul style="list-style-type: none"><li>• Left and right rack-mounting rails</li><li>• Mounting screws</li><li>• Power supply cables</li></ul> If your shipment contains parts that are not required to complete the installation procedure, store those parts until they are required to be used.  You can also obtain order information from your marketing representative or IBM® Business Partner.
Verify that you have a rack.	You must have a rack installed. If you do not have a rack installed, see <i>Installing the rack</i> ( <a href="http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hbf/installrack.htm">http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hbf/installrack.htm</a> ).
Prepare to install the expansion unit.	To ensure that you have taken all preparatory steps to install this expansion unit, see <i>Installing the 5796 in a rack</i> ( <a href="http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7ham_5796_prepare.htm">http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7ham_5796_prepare.htm</a> ).
Power off the system, if required, to install the expansion unit.	For requirements and procedures related to shutting down and powering off the system, see <i>Overview for I/O expansion units</i> ( <a href="http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7hamconcepts.htm">http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7hamconcepts.htm</a> ).
Determine where to install the expansion unit in the rack and mark the location.  <b>Note:</b> Skip this task if you are installing the system unit into an existing shell.	The expansion unit is installed in a shell that is mounted to the rack.  If you have a rack-mounting template for the expansion unit, use it to mark the location.  If you do not have a rack-mounting template, see step 2c on page 3.
Install the rail assembly in the rack.  <b>Note:</b> Skip this task if you are installing the system unit into an existing shell.	To install the mounting hardware in the rack, see step 3 on page 4.

Table 1. Tasks to install the expansion unit into a rack (continued)

Task	Where to find associated information
Install the shell on the rail assembly. <b>Note:</b> Skip this task if you are installing the system unit into an existing shell.	To install the shell on the rail assembly, see step 4 on page 7.
Install the expansion unit into the shell.	To install the expansion unit into the shell, see step 5 on page 8.
Cable the expansion unit to the server.	To connect the expansion unit to the system, see step 6 on page 11.
Verify that the system power control network (SPCN) is functioning correctly.	To verify that the SPCN is functioning correctly, see step 7 on page 16.
Verify that the new expansion unit configuration is functioning correctly.	To verify that your configuration is functioning correctly, see step 8 on page 20.

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## Installing the 57/96 and 14G/30 expansion units: Details

The detailed installation procedure includes information from online references that are specified in the overview. You can use the expanded instructions in this procedure to install your expansion unit into a rack and to cable it to a server.

### Before you begin

- This information is provided in printed form as a list of basic tasks for installing the 57/96 and 14G/30 expansion units. For the most current version, use the online information: Installing the 5796 and 7314-G30 expansion units.
- This procedure assumes that you are installing the 57/96 or 14G/30 expansion unit into an existing rack. If the rack is not yet installed, you must first complete the procedure for Installing the rack.
- Before installing the expansion unit into a rack, read the Rack safety notices.

### About this task

To install the 57/96 or 14G/30 expansion unit, complete the following tasks:

1. Unpack the expansion unit as follows:
  - a. Refer to the kitting list provided with the rack installation kit, and complete a parts inventory.
  - b. Locate the rack-mounting hardware kit and the system rail assemblies that were included with your expansion unit.
2. Determine where to install the expansion unit in the rack. Choose one of the following options:
  - a. If you are installing the system unit into an existing shell, skip this step and continue with step 5 on page 8
  - b. If you have a rack-mounting template, use it to mark the location.
  - c. If you do not have a rack-mounting template, perform the following steps to mark the location:
    - 1) Determine where in the rack to place the expansion unit in relation to other system hardware. As you plan, keep the following steps in mind:
      - a) Organize larger and heavier units into the lower part of the rack.
      - b) Plan to install units into the lower part of the rack first.
      - c) Record the EIA locations in your plan.

**Note:** The expansion unit is four Electronic Industries Alliance (EIA) units high. An EIA unit is 44.50 mm (1.75 in.) in height. The rack contains three mounting holes for each EIA unit of height. This enclosure, therefore, is 177.8 mm (7 in.) high and covers 12 mounting holes in the rack.

The following illustration shows a 1-EIA unit and a 4-EIA unit. Depending on the rack manufacturer, the EIA units might be separated either by color or by a line. The holes along the EIA strip are not evenly spaced. If your rack has no color or line separation between EIAs, assume that each EIA section begins where the hole spacing is closest together.

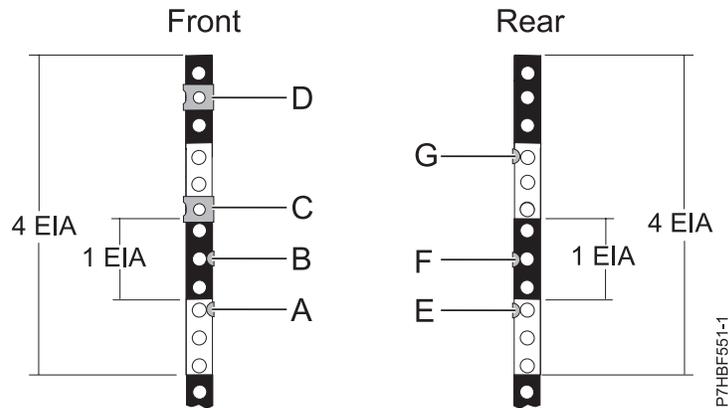


Figure 1. EIA units with expandable rails for the 5796 expansion unit

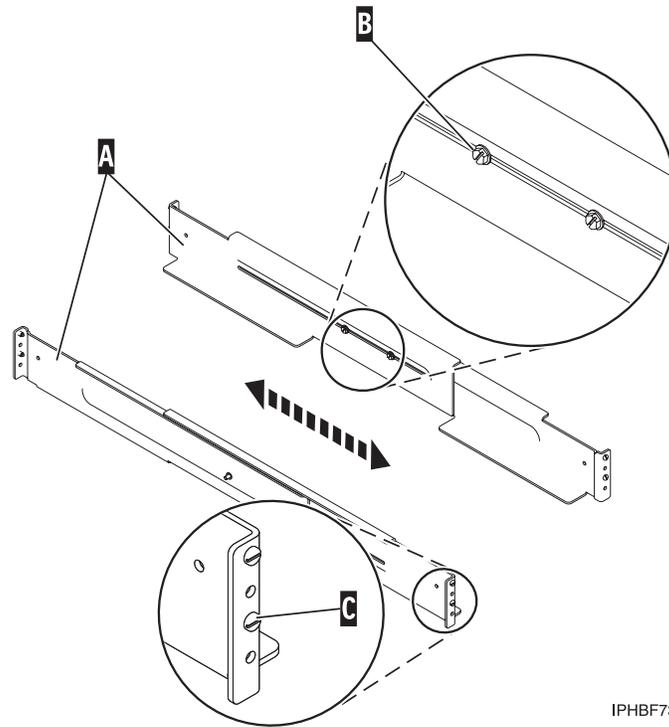
- 2) Face the front of the rack and working from the left side. Make a note of the lowest EIA unit to be used for the expansion unit. Use tape, a marker, or a pencil to mark the top mounting hole (A) of the lowest EIA unit. Count up two holes and place another mark beside that mounting hole (B). Mark the rack so that these marks can also be seen from the rear of the rack
  - 3) Begin with the hole identified by your mark for B. Count up two holes and place a nut clip (C) in that mounting hole. Count up four holes and place a nut clip (D) in that mounting hole.
  - 4) Repeat the last two steps to place two marks and place two nut clips on the corresponding mounting holes on the front-right side of the rack.
  - 5) Go to the back of the rack. On the left side, find the EIA unit that corresponds to the lowest EIA unit marked on the front of the rack.
  - 6) Mark the top mounting hole (E) of this EIA unit. Count up two holes and place another mark beside that mounting hole (F). Count up four holes and place another mark beside that mounting hole (G).
  - 7) Repeat the last step to place three marks on the corresponding mounting holes on the rear-right side of the rack.
3. Install the rail assembly into the rack as follows:

**Important:** To complete this procedure, it is suggested that you use two people to attach the rail assembly to the rack. Position one person in front of the rack and one person at the rear of the rack.

**CAUTION:**

**Installing the rails in the rack is a complex procedure. To install the rails correctly, you must perform each task in the following order. Failure to do so might cause rail failure and potential danger to yourself and the system unit.**

- a. Loosen the two screws (B) in the middle of both rails (A) to allow each rail to extend.

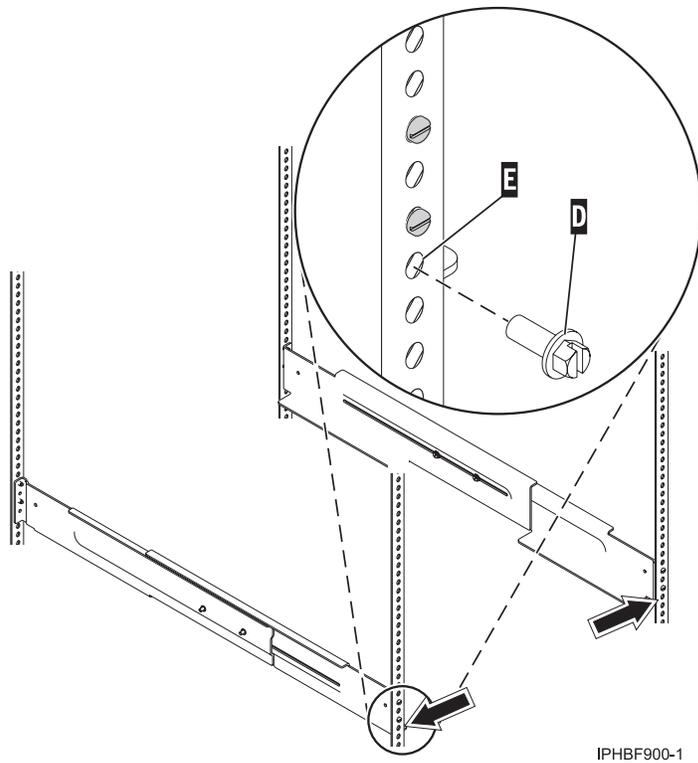


IPHBF731-0

Figure 2. Extending the rails

- b. Starting at the rear of the rack, extend the left rail. Insert the rail pins (C) into the marked locations on the rack so that it is facing upward (L shape).
- c. From the rear of the rack, extend the right rail and insert the rail pins (C) into the marked locations.
- d. Move to the front of the rack, extend the left rail and insert the rail pins (C) into the marked locations.
- e. Extend the right rail and insert the rail pins (C) into the marked locations.
- f. Using one M5 screw (D), secure the left rail to the front of the rack into the lower location (E).

**Important:** Do not install a screw in the top location at this time. It will secure the shell to the assembly.



IPHBF900-1

Figure 3. Attaching the rails to the front of the rack

- g. Using one M5 screw (D), secure the right rail to the front of the rack into the lower location (E).
- h. Move to the rear of the rack and locate the marks that were previously made on the back-left rail. Using two M5 screws (G), secure the rail arm to the rack at the location of the two lowest marks.

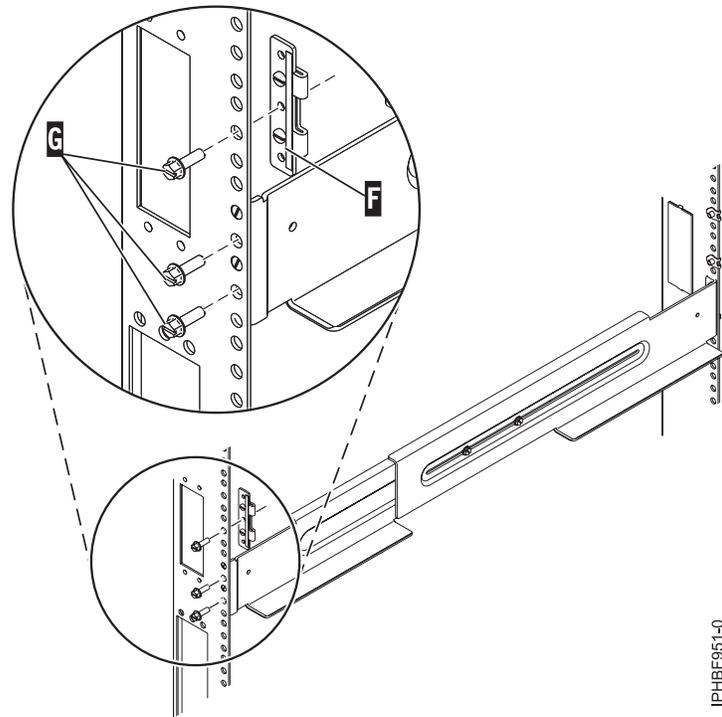
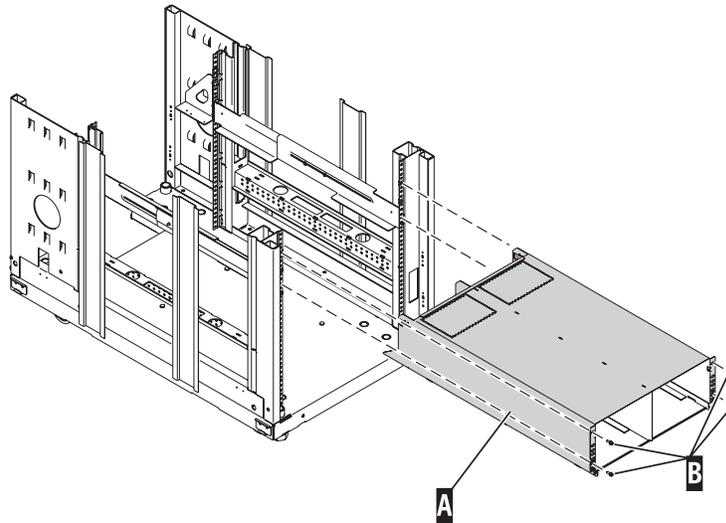


Figure 4. Attaching the rails to the back of the rack

- i. Align the top alignment pin of the bracket (**F**) with the highest mark, and use one M5 screw (**G**) to secure the bracket to the rack at this location.
- Note:** The bracket will face inward.
- j. Locate the marks that were previously made on the back-right rail of the rack. Using two M5 screws (**G**), secure the rail arm to the rack at the location of the two lowest marks.
  - k. Align the top alignment pin of the bracket (**F**) with the highest mark, and use one M5 screw (**G**) to secure the bracket to the rack at this location.
  - l. Tighten the two screws (**B**) in the middle of the left rail and the two screws (**B**) in the middle of the right rail. See Figure 2 on page 5.
4. Install the shell as follows:
    - a. From the front of the rack, place the shell (**A**) on the rails and slide it into the rack.



IPHBF903-2

Figure 5. Installing the shell into the rack on the expandable rails

- A** Shell
- B** Retaining screws (four)

- b. Secure the shell (**A**) to the rack by installing and tightening retaining screws (**B**) into the top and bottom holes on each side of the front of the shell.
5. Install the expansion unit into the shell as follows:
  - a. Remove the front and back shipping covers of the 57/96 or 14G/30. These shipping covers are secured by four thumb screws each. Two screws are located on the top of the cover and two are located on the sides of the cover.
  - b. If you are installing an expansion unit (**H**) into an existing shell (**G**) that has a filler plate (**F**), remove the filler plate by pressing down on the top tabs and pulling it out.

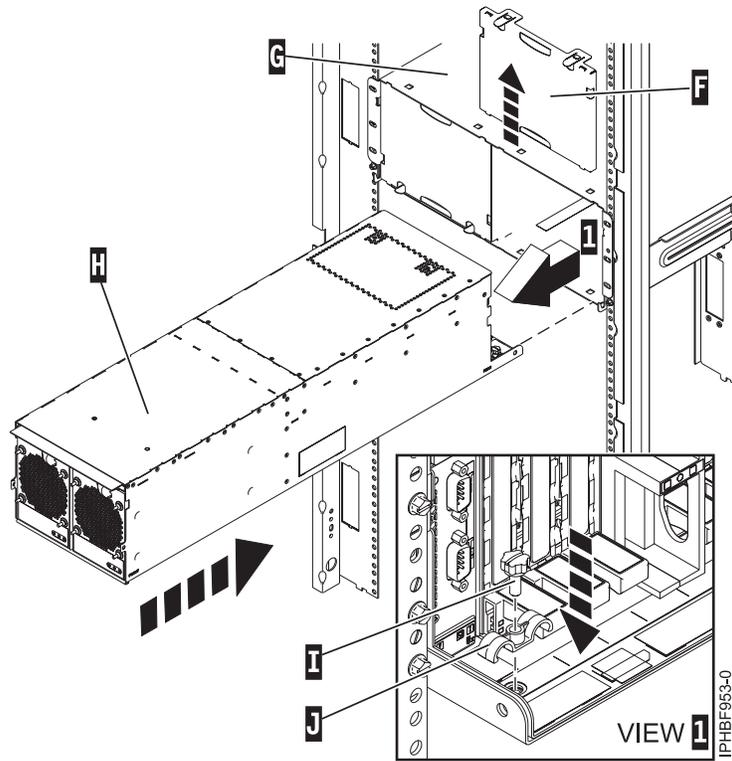


Figure 6. Removing the filler plate

- F** Filler plate
- G** Shell
- H** Drawer
- I** Thumb screw
- J** Cable retention bracket

Figure 7. Removing the filler plate

- c. Slide the expansion unit (**H**) into the shell.
- d. Use a thumb screw (**I**) to install the cable retention bracket (**J**).
- e. If you have two expansion units to install, repeat the last four steps to install the second expansion unit.
- f. If only one expansion unit is installed in the shell, install the filler plate (**N**) in the blank slot in the shell by sliding the filler plate up under the top tab of the shell. Gently press the filler plate into place.

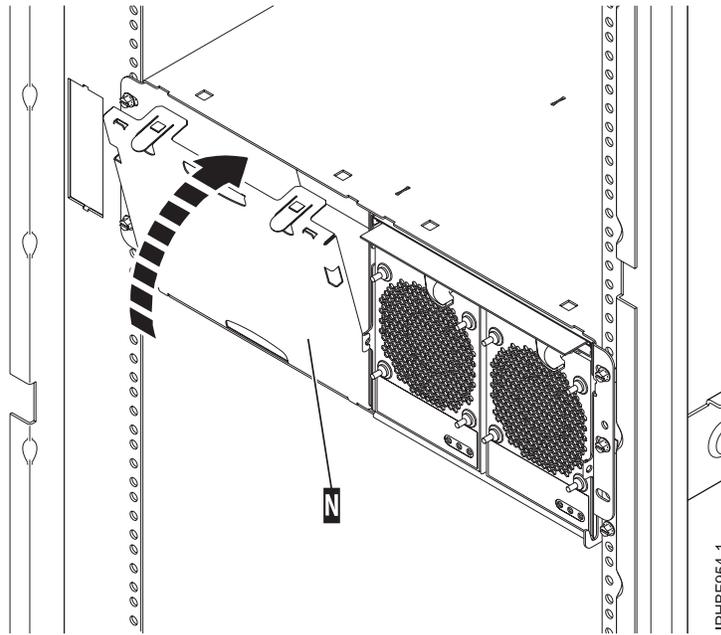


Figure 8. Installing the filler plate

**N** Filler plate

- g. Insert the posts on the bottom of the cover (A) into the hooks on the chassis of the enclosure.
- h. Press in on the two latches (C) on the right and left of the front cover.

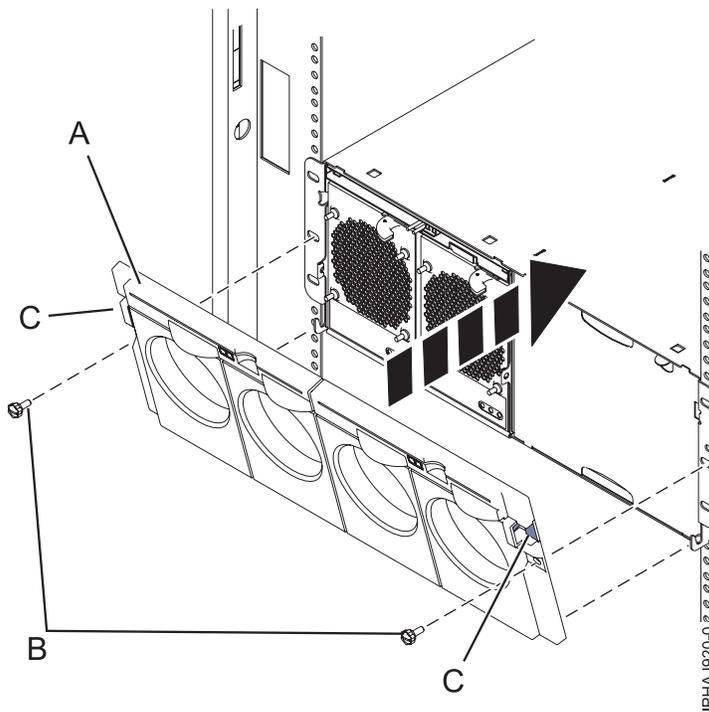


Figure 9. Front cover on a model 14G/30

- i. Press the cover onto the chassis and release the latches. The cover securely snaps into place.

- j. Replace the two thumbscrews **(B)** into the slots on the left and right of the front cover.
6. Cable the expansion unit to the server as follows:
- Attention:** Consult your server documentation to determine if the server must be powered off before connecting the expansion unit. If you cannot determine the requirement for your server, power off the server before connecting the cables.

**Notes:**

- This unit uses system power control network (SPCN) cables to connect to the server.
  - If you are adding a new expansion unit or migrating expansion units from another IBM POWER® server, you might not be able to allocate the expansion unit resources to logical partitions on the new server until an SPCN firmware update is completed for the expansion units.
- a. Review connector information for the hardware in your configuration as follows:
- 1) Review the following connector locations figure for the 57/96 or 14G/30.

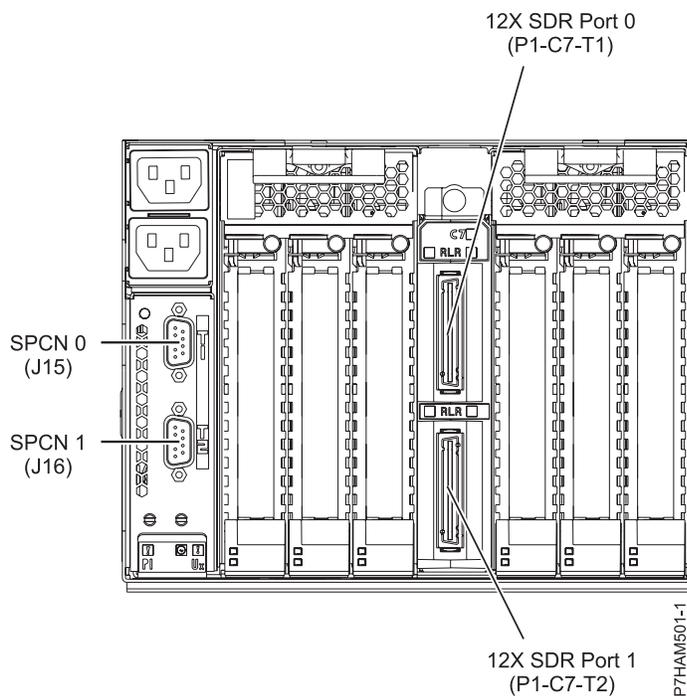


Figure 10. Model 57/96 or 14G/30 connector locations

- 2) Review connector information for the system. For details on systems connector locations, see "Server connectors" on page 23.
- b. Cable the expansion unit as follows:
- 1) Based on your system configuration and power requirements, choose one of the following options for installing your expansion unit:

**Important:** For more information about the system power requirements for your configuration, see Overview for I/O expansion units (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hamconcepts.htm>).

- If you are connecting your expansion units to an existing system that can remain powered on, continue with step 6b2 on page 12.
- If you are connecting your expansion units to an existing system that must be powered off, perform the following steps:

- a) Remove power from the system. For details, see Stopping a system or logical partition (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7haj/crustopsys.htm>).
  - b) Go to step 6b5 on page 13.
- If you are connecting your expansion units to a new system being installed, continue with step 6b5 on page 13.
- 2) Verify the existing 12X configuration. If problems with the 12X loops are discovered in this step, they must be corrected before continuing with this procedure. Follow the appropriate step to determine if there are problems with the 12X configuration.
    - If your system is managed by a Hardware Management Console (HMC) or Systems Director Management Console (SDMC), see Verifying the 12X loops with an HMC or SDMC ([http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/ipham\\_verifyriohsloopwhmc.htm](http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/ipham_verifyriohsloopwhmc.htm)). One of the steps in that task is to verify the status of the links in the 12X loops. When you are instructed to use the **View Hardware Topology** task on the HMC, you can use the **Save** button to save the current hardware topology. This action allows you to compare the topology that existed before the expansion units were added with the topology that was created by adding the expansion units.
    - If your system is not managed by an HMC or SDMC, see Verifying the 12X loops without an HMC or SDMC ([http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/ipham\\_verifyriohsloopwohmc.htm](http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/ipham_verifyriohsloopwohmc.htm)).
  - 3) Verify the existing system power control network (SPCN). For details, see Verifying the system power control network (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/verifyspcn.htm>). If you discover a problem with the SPCN, you must correct the problem before continuing.
  - 4) Set the SPCN Firmware Update Policy to prevent firmware updates over the serial SPCN interface.

The SPCN Firmware Update Policy controls when and how SPCN firmware on expansion units is updated. The default setting for the SPCN Firmware Update Policy is Enabled. This setting allows for firmware updates to be completed over the 12X interface whenever an update is required and does not allow updates over the slower serial SPCN interface.

- a) Access the Advanced System Management Interface (ASMI) using an authority level of administrator or authorized service provider. For details on using the ASMI, see Managing the Advanced System Management Interface (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hby/asmi.htm>).
- b) In the ASMI navigation area, expand **System Configuration** and select **Configure I/O Enclosures**.
  - If the SPCN Firmware Update Policy shows Expanded, record the current setting so you can restore it later. Then change the setting to Enabled.
  - If the SPCN Firmware Update Policy shows Enabled or Disabled, continue without changing the setting.
- c) Verify that no SPCN firmware updates are in progress by checking the Power Control Network Firmware Update Status column. This column shows In Progress and a percent complete if an SPCN firmware update is in progress.
 

If an SPCN firmware update is in progress, check the Power Control Network Firmware Update Status column to determine the type of update. Then choose one of the following actions:

  - If the SPCN firmware update is an High Speed Link (HSL) update, wait for the update to complete before continuing. An HSL update of the SPCN firmware completes quickly.
  - If the SPCN firmware update is a serial update, either wait for the update to complete or stop the update. A serial update of the SPCN firmware can take 20 minutes or more depending on how many expansion units are in the configuration.

To determine when the update is completed, select **Configure I/O Enclosures** every 15 - 30 seconds until Not Required is displayed in the Power Control Network Firmware Update Status column. Do not use the **Back** or **Refresh** buttons on the browser to monitor the status.

If you choose to stop the update, the update will be restarted from the beginning after you have completed the procedure. To stop the update, perform the following steps:

- i. Click **Stop SPCN Firmware Update** in the Configure I/O Enclosures window.
- ii. Click **Configure I/O Enclosures** every 15 - 30 seconds until Pending is displayed in the Power Control Network Firmware Update Status column. Do not use the **Back** or **Refresh** buttons on the browser to monitor the status.

- 5) Remove or open the back cover of the system unit.
- 6) To connect the expansion units with 12X cables, see Connecting expansion units with 12X cables (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/direct.htm>).

**Note:** If you are installing expansion units in an existing 12X loop with the system powered on, serviceable events and informational logs might be generated when you disconnect and reconnect cables. This action is normal and will be covered later in the procedure.

- 7) To connect the expansion units with SPCN cables, see Connecting expansion units with SPCN cables (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/spcndirect.htm>).

**Note:** If you are installing expansion units in an existing SPCN loop with the system powered on, serviceable events and informational logs might be generated when you disconnect and reconnect cables. This action is normal and will be covered later in the procedure.

- 8) Connect the power cables for the expansion units that you are installing to the power source. Then connect them to the power supplies on the expansion units. If you installed the expansion units with the system's power off, continue with step 6b10. If not, continue with the next step.

**Note:** Plug the power cable into the power source before connecting it into the power supply of the expansion unit.

- 9) The expansion units power on automatically. After the expansion units that you have installed are powered on and you have waited 10 minutes for the hardware initialization to complete, continue with step 6b11.

**Tip:** For each expansion unit, wait for the green power indicator to light solid on the control panel of the expansion unit that just powered on. This action might take 1 - 10 minutes. During this time, a yellow attention indicator might be lit on the control panel of the expansion unit that just powered on. After the green power indicators are lit on the control panels of all the expansion units that were just powered on, wait 10 additional minutes for hardware initialization to complete before proceeding to step 6b11.

- 10) To start the system or logical partition, see Starting the system or logical partition (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7haj/crustartsys.htm>).
- 11) Verify the SPCN configuration. After reading the following note, see Verifying the system power control network (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/verifyspcn.htm>).

**Note:** While concurrently adding an expansion unit, it is normal for error logs and event logs to be created with the following SPCN-related reference codes. The number and combination of these logs is dependent on the configuration. The logs can be ignored during this

verification step if their timestamps indicate that they occurred during the add procedure and if the resources that they refer to were involved in the procedure.

- 10009133: The 12X loop was disrupted. This reference code appears in an informational log.
  - 10009135: The SPCN loop was opened. This reference code might appear in a serviceable event or an informational log.
  - 10009136: An SPCN firmware update was stopped. This reference code appears in an informational log.
  - 10009137: The 12X loop was disrupted. This reference code appears in an informational log.
  - 10009139: The SPCN loop was closed. This reference code appears in an informational log.
  - 1000913B: An SPCN firmware update was required, but not automatically started. This reference code appears in a serviceable event. This condition is corrected in step 6b15 on page 16.
  - 1000910A: An SPCN firmware update was initiated. This reference code appears in an informational log.
  - 100091DE: An SPCN firmware update completed. This reference code appears in an informational log.
- 12) Verify that the Power Control Network Identifier value is set correctly for the expansion units you are adding by completing the following steps:
- a) Access the ASMI by using an authority level of administrator or authorized service provider. For details about using the ASMI, see *Managing the Advanced System Management Interface* (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hby/asmi.htm>).
  - b) In the ASMI navigation area, expand **System Configuration** and select **Configure I/O Enclosures**.
  - c) Review the Enclosure Configuration table to locate the expansion units that you added.
  - d) Use the following information to verify that each expansion unit that you added has the correct Power Control Network Identifier:
    - Identifier 0x8D is for 57/96 and 14G/30 expansion units.
    - Identifier 0x8E is for 58/02 and 58/77 expansion units.
  - e) If an incorrect Power Control Network Identifier is specified for an expansion unit that you have added, contact your service provider for assistance before continuing with this procedure.
- 13) Verify the 12X configuration. After reading the following note, perform one of the following actions:
- If your system is managed by an HMC or SDMC, see *Verifying the 12X loops with an HMC or SDMC* ([http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/iphm\\_verifyriohsllloopwhmc.htm](http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/iphm_verifyriohsllloopwhmc.htm)). If you saved the original hardware topology before adding expansion units in step 6b2 on page 12, the saved topology now appears in Last Valid Hardware Topology section of the **View Hardware Topology** output. This operation enables you to compare the topology that was created by adding the expansion units to the topology that existed before the expansion units were added.
  - If your system is not managed by an HMC or SDMC, see *Verifying the 12X loops without an HMC or SDMC* ([http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/iphm\\_verifyriohsllloopwohmc.htm](http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/iphm_verifyriohsllloopwohmc.htm)).

**Note:** While concurrently adding an expansion unit, it is normal for error logs and event logs to be created with the following 12X-related reference codes. The number and combination of these logs is dependent on the configuration. The logs can be ignored during this verification step if their timestamps indicate that they occurred during the add procedure and if the resources that they refer to were involved in the procedure.

- B7006907: An expansion unit was added that was previously configured on a different system. This reference code appears in an informational log.
  - B7006982: A 12X connection failure was experienced. This reference code appears in an informational log.
  - B7006984: A12X loop was opened. This reference code appears in an informational log.
  - B7006985: A 12X loop was closed. This reference code appears in an informational log.
  - B70069E6: A 12X link was lost. This reference code appears in an informational log.
  - B70069E7: A 12X link was restored. This reference code appears in an informational log.
- 14) Check for and handle new serviceable events that were generated during the procedure by performing the following steps:
- a) Choose one the following options:

**Important:** Multiple options might apply to your configuration. Choose only the first option that applies.

- If your system is managed by an HMC, perform the following steps:
    - i. In the navigation area, select **Serviceability > Manage Serviceable Events**.
    - ii. Continue with step 6b14b.
  - If your system is managed by an SDMC, perform the following steps:
    - i. On the Welcome page, click the **Manage** tab.
    - ii. Click **Service and Support Manager > Serviceable Problems**.
    - iii. Continue with step 6b14b.
  - If your system is not managed by an HMC or SDMC and has a partition running the Virtual I/O Server (VIOS) operating system, perform the following steps:
    - i. Log in as the padmin user. If you need assistance, contact the system administrator.
    - ii. Type `diagmenu -d sysplanar0 -E xx` and press Enter, where xx is a number 1 - 60 that specifies a number of days. This command returns results for the most recent number of days specified. The suggested range is 30 days.
    - iii. On the DIAGNOSTIC MODE SELECTION display, highlight the **Problem Determination** option, and press Enter.
    - iv. Continue with step 6b14b.
  - If your system is not managed by an HMC or SDMC and has a partition running the AIX® operating system, perform the following steps:
    - i. Log in as the root user, or use the CE login. If you need assistance, contact the system administrator.
    - ii. Type `diag -d sysplanar0 -E xx` and press Enter, where xx is a number 1 - 60 that specifies a number of days. This command returns results for the most recent number of days specified. The suggested range is 30 days.
    - iii. On the DIAGNOSTIC MODE SELECTION display, highlight the **Problem Determination** option, and press Enter.
    - iv. Continue with step 6b14b.
  - If your system is not managed by an HMC or SDMC and has a partition running the Linux operating system, perform the following steps:
    - i. Log in as the root user. If you need assistance, contact the system administrator.
    - ii. Type `servicelog -query='serviceable=1 AND closed=0 AND time_event>="yyyy-mm-dd"'` (where *yyyy-mm-dd* is the day on which the procedure occurred). Press Enter.
    - iii. Continue with step 6b14b.
- b) Specify event criteria that includes events that were generated during the procedure.

- c) Close any serviceable events generated during the procedure that include one of the reference codes listed in step 6b11 on page 13 or step 6b13 on page 14.
  - d) Perform problem analysis on any remaining open serviceable events.
- 15) Start necessary SPCN firmware updates.
- If reference code 1000913B was found in step 6b11 on page 13, an SPCN firmware update is needed. However, due to the current SPCN Firmware Update Policy, the update could not be initiated automatically. Therefore, the SPCN firmware update must be initiated manually. To complete this task, see Updating the SPCN firmware ([http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/ipham\\_updatespcn.htm](http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/ipham_updatespcn.htm)).
- Wait for the SPCN firmware updates to complete before continuing to the next step. This update could take 20 minutes to several hours, depending on the number of expansion units on the SPCN loop and the current level of the SPCN firmware in the expansion units that were added.
- 16) If you changed the SPCN Firmware Update Policy in step 6b4 on page 12, change the policy back to the original setting now:
- a) Access the ASMI by using an authority level of administrator or authorized service provider. For details, see Managing the Advanced System Management Interface (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hby/asmi.htm>).
  - b) In the ASMI navigation area, expand **System Configuration** and select **Configure I/O Enclosures**.
  - c) Change the **SPCN Firmware Update Policy** setting to the setting recorded in step 6b4 on page 12. Use the default setting, which is **Enabled**.
- 17) Verify the new configuration. For details, see Verifying that the new configuration is functioning (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/verify.htm>).
- 18) If the system has logical partitions, you can now assign I/O slots in the expansion units that were added to logical partitions.

You have completed the addition of your expansion unit.

7. Verify that the SPCN is functioning as follows:
- a. Choose one the following options to verify the SPCN:
    - If your system is not managed by a Hardware Management Console (HMC) or Systems Director Management Console (SDMC), continue with step 7b.
    - If your system is managed by an HMC, continue with step 7c.
    - If your system is managed by an SDMC, continue with step 7d on page 17.
  - b. Choose one the following options:
 

**Important:** Multiple options might apply to your configuration. Choose only the first option that applies.

    - If your system is running the Virtual I/O Server (VIOS) operating system, continue with step 7e on page 17.
    - If your system is running the AIX operating system, continue with step 7f on page 17.
    - If your system is running the Linux operating system, continue with step 7g on page 18.
  - c. Use the HMC to verify that no serviceable events include 10009xxx reference codes (where x is any character 0 - 9 or A - F) by completing the following steps:
    - 1) In the navigation area, select **Service Management**.
    - 2) In the content area, select **Manage Serviceable Events**.
    - 3) In the Manage Serviceable Events window, perform the following steps:
      - a) Click **Open** for the **Serviceable Event Status** field.

- b) Select the machine type, model, and serial number (MTMS) of the server you are working with for the **Reporting MTMS** field.
- c) Click **ALL** for all other fields and click **OK**.
- 4) Scan for any serviceable events that include 10009xxx reference codes, and perform one of the following actions:
  - If there are no serviceable events with 10009xxx reference codes, click **Cancel** twice to exit Manage Serviceable Events.
  - If there are serviceable events with 10009xxx reference codes, there might be problems with the SPCN loop. Perform problem analysis on the serviceable events to correct the problems before continuing. If you need assistance, contact your service provider.
- 5) Go to step 7h on page 18.
- d. Use the SDMC to verify that no serviceable events include 10009xxx reference codes (where x is any character 0 - 9 or A - F) by completing the following steps:
  - 1) On the Welcome page, click the **Resources** tab.
  - 2) Expand **Hosts**.
  - 3) Right-click the host and click **Service and Support > Reference Code History**.
  - 4) Scan for any serviceable events that include 10009xxx reference codes, and perform one of the following actions:
    - If there are no serviceable events that include 10009xxx reference codes, close the Reference Code History window.
    - If serviceable events include 10009xxx reference codes, there might be problems with the SPCN loop. Perform problem analysis on the serviceable events to correct the problems before continuing. If you need assistance, contact your service provider.
  - 5) Go to step 7h on page 18.
- e. Use the VIOS error log to verify that there are no 10009xxx errors (where x is any character 0 - 9 or A - F) by completing the following steps.
  - 1) Log in as the padmin user. If you need assistance, contact the system administrator.
  - 2) Type `diagmenu -d sysplanar0 -E xx` and press Enter, where xx is any number 1 - 60 that specifies a number of days. This command returns all 10009xxx error log entries for the most recent number of days specified. The suggested range is 30 days.
  - 3) Highlight the **Problem Determination** option in the DIAGNOSTIC MODE SELECTION display. Press Enter.
  - 4) Search the results that are displayed to identify problems with 10009xxx reference codes. You might need to scroll down in the display to see all of the results.

**Note:** If the Problem Determination results contain serviceable events that have already been reported, the PREVIOUS DIAGNOSTICS RESULTS display is shown. Respond to the **Do you want to review these previously reported errors?** prompt by highlighting the YES response, and then press Enter.

  - 5) Based on the results of your search, perform one of the following options:
    - If there are no problems with 10009xxx reference codes, press Enter to return to the command line.
    - If there are problems with 10009xxx reference codes, there might be problems with the SPCN loop. Perform problem analysis on the problems to correct them before continuing. If you need assistance, contact your service provider.
  - 6) Go to step 7h on page 18.
- f. Use the AIX error log to verify that there are no 10009xxx errors (where x is any character 0 - 9 or A - F) by completing the following steps.
  - 1) Log in as the root user, or use the CE login. If you need assistance, contact the system administrator.

- 2) Type `diag -d sysplanar0 -E xx` and press Enter, where `xx` is any number 1 - 60 that specifies a number of days. This command returns all 10009xxx error log entries for the most recent number of days specified. The suggested range is 30 days.
- 3) Highlight the **Problem Determination** option in the DIAGNOSTIC MODE SELECTION display. Press Enter.
- 4) Search the results that are displayed to identify problems with 10009xxx reference codes. You might need to scroll down in the display to see all of the results.

**Note:** If the Problem Determination results contain serviceable events that have already been reported, the PREVIOUS DIAGNOSTICS RESULTS display is shown. Respond to the **Do you want to review these previously reported errors?** prompt by highlighting the YES response, and then press Enter.

- 5) Based on the results of your search, perform one of the following options:
  - If there are no problems with 10009xxx reference codes, press Enter to return to the command line.
  - If there are problems with 10009xxx reference codes, there might be problems with the SPCN loop. Perform problem analysis on the problems to correct them before continuing. If you need assistance, contact your service provider.
- 6) Go to step 7h.
- g. Use the Linux error log to verify that there are no 10009xxx errors (where `x` is any character 0 - 9 or A - F) by completing the following steps.
  - 1) Log in as the root user. If you need assistance, contact the system administrator.
  - 2) Type `servicelog --query='refcode like "10009%" AND serviceable=1 AND closed=0'` and press Enter
  - 3) Search the results that are displayed for problems with 10009xxx reference codes and statuses that are open. If there are problems with 10009xxx reference codes, there might be problems with the SPCN loop. Perform problem analysis on the problems to correct them before continuing. If you need assistance, contact your service provider.

**Note:** You might need to scroll down in the display to see all of the results.

- 4) Go to step 7h.
- h. Verify that no inactive expansion units are in the SPCN by performing the following steps:
  - 1) Access the ASMI by using an authority level of administrator or authorized service provider. For details about using the ASMI, see *Managing the Advanced System Management Interface* (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hby/asmi.htm>).
  - 2) In the ASMI navigation area, expand **System Configuration** and click **Configure I/O Enclosures**.
  - 3) Scan for inactive expansion units by looking for rows that show *Inactive* in the Status column. If inactive expansion units exist, perform the following steps:
 

**Important:** If you are here because the procedure to concurrently add expansion units instructed you to perform this task following steps to connect the power cables and power on the expansion units, do not perform the following steps to clear the inactive enclosures. Contact your service provider for assistance.

    - a) Click **Clear inactive enclosures**.
    - b) Wait for the completion indication, and repeat steps 7h2 and 7h3. If inactive expansion units remain, do not continue. Contact your service provider for assistance.
- i. Check for temporary machine type, model, and serial number (MTMS) values assigned to the expansion units connected to the system by completing the following steps:

- 1) Access the ASMI by using an authority level of administrator or authorized service provider. For details about using the ASMI, see *Managing the Advanced System Management Interface* (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hby/asm.htm>).
  - 2) In the ASMI navigation area, expand **System Configuration** and click **Configure I/O Enclosures**.
  - 3) Review the display to determine if there are any expansion units that require correction. If you find one or more rows that contain a Location code value of UTMPx.xxx.xxxxxx, where x is any character 0 - 9 or A - Z, continue to step 7j to provide the necessary corrections. If there are no rows with Location codes that require correction, continue to step 7k on page 20.
- j. For each expansion unit found in your review, complete the following steps to correct the machine type, model, and serial number (MTMS) values. After you have completed the corrections required for all expansion units identified in your review, continue to step 7k on page 20.

**Important:** If your expansion unit contains one or more I/O slots that are owned by active partitions running the VIOS, AIX, or Linux operating system, these partitions will not automatically recognize the MTMS value corrections that you are about to make. For these partitions to recognize the new values, you will be required to take additional action that is potentially disruptive. Before proceeding with this step, review step 7j5 to determine whether it is possible to take the required actions at this time. If it is not, continue to step 7k on page 20 without performing this step.

- 1) Access the ASMI by using an authority level of administrator or authorized service provider. For details about using the ASMI, see *Managing the Advanced System Management Interface* (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hby/asm.htm>).
- 2) In the ASMI navigation area, expand **System Configuration** and click **Configure I/O Enclosures**.
- 3) Select the row associated with the expansion unit to be corrected and click **Change settings**. Follow these steps to update the information:
  - a) Enter the correct type and model in the **Type-Model** field.
  - b) Enter the correct serial number in the **Serial number** field.
  - c) Do not update the **Power Control Network Identifier** field.
  - d) Click **Save settings**.
- 4) In the ASMI navigation area, expand **System Configuration** and click **Configure I/O Enclosures** again. Verify that the values you entered are displayed in the information for the expansion unit that you selected in step 7j3. If the values that you entered are not displayed, wait for a few minutes and repeat this step. If the problem persists, contact your service provider for assistance.

**Important:** Do not click **Back** for the purpose of verifying your values.

- 5) If the expansion unit that you corrected contains one or more I/O slots that are owned by active partitions running the AIX, VIOS, or Linux operating system, the corrections will not be recognized by those partitions until you take one of the following actions:
  - Power off and power on the expansion unit. To perform this task, select one of the following options:
    - If the system is managed by an HMC, click **Serviceability > Hardware > Power On/Off Unit** to perform this task.
    - If the system is managed by an SDMC, click **Service and Support > Hardware > Power On/Off Unit** to perform this task.
    - If the system is not managed by an HMC or SDMC, you must choose one of the other options in this list.
  - Power off and power on active partitions that own I/O slots in the expansion unit that you corrected and that are running the AIX, VIOS, or Linux operating system.

- Dynamically remove I/O slots in the expansion unit that you corrected from active partitions that are running the AIX, VIOS, or Linux operating system, and then dynamically add the slots back to those partitions. To perform this task, select one of the following options:
    - If the system is managed by an HMC, click **Dynamic Logical Partitioning > Physical Adapters** to perform this task.
    - If the system is managed by an SDMC, click **Dynamic Logical Partitioning > Manage Virtual Server** to perform this task.
    - If the system is not managed by an HMC or SDMC, you must choose one of the other options in this list.
  - Power off and power on the server.
- k. Return to the procedure that sent you here.
8. Verify that the new expansion unit configuration is functioning. Choose from the following options:
- a. If your system is not managed by an HMC, see Verifying the installed part.
  - b. If your system is managed by an HMC, perform the following steps:
    - 1) To view more information about the managed system, choose a system console option:
      - If your system is managed by an HMC, complete the following steps:
        - a) From the navigation area, expand **Systems Management**.
        - b) Click **Servers**.
        - c) Select the system with which you want to work. Information about the system is shown under the **Tasks** section in the content area.
      - If your system is managed by an SDMC, complete the following steps:
        - a) From the navigation area, expand **Hosts**.
        - b) Click the server with which you want to work. Information about the system is shown under the **Actions** menu.
    - 2) To verify the new expansion units, complete the following steps:
      - a) To view the properties of the managed system, choose a system console option:
        - i. If your system is managed by an HMC, complete the following steps:
          - i) Select the server for which you want to verify the configuration.
          - ii) Click **Tasks > Properties**.
          - iii) Click the **I/O** tab.
        - ii. If your system is managed by an SDMC, complete the following steps:
          - i) On the **Welcome** page, click the **Resources** tab.
          - ii) In the content pane, select the server for which you want to verify the configuration.
          - iii) Click **Actions > Properties**.
          - iv) Click the **Inventory** tab.
  - b) Verify that the new expansion units are displayed in the list. It might take several minutes for the new expansion units to be displayed in the list.

**Tip:** To refresh the list of expansion units, choose a system console option:

- For the HMC option, repeat steps 8b2aiii and 8b2aiiii.
- For the SDMC option, repeat steps 8b2aiiii and 8b2aiiii.

It is not necessary to exit the **Properties** task before repeating these steps, but doing so reduces the number of active tasks.

If the I/O Properties window does not display the new expansion units after 10 minutes, verify the installation by completing the following steps:

- i. Ensure that the expansion units are powered on and that the power cables are connected to the power source and the expansion units.

- ii. Ensure that the 12X cables are connected correctly. For details, see [Connecting expansion units with 12X cables \(http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/direct.htm\)](http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/direct.htm).
- iii. Ensure that the SPCN cables are connected correctly. For details, see [Connecting expansion units with SPCN cables \(http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/spcndirect.htm\)](http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/spcndirect.htm).
- iv. If the expansion units still are not displayed, contact your next level of support for assistance.



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## Reference information

Use the information in this section as needed to complete enclosure installation and configuration tasks.

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### Connector locations

Learn about 12X, system power control network (SPCN), and PCIe connector locations.

### Server connectors

Learn about connector locations for servers.

### Model 02E/4B connector locations

Learn about connector locations on rack-mounted and stand-alone models.

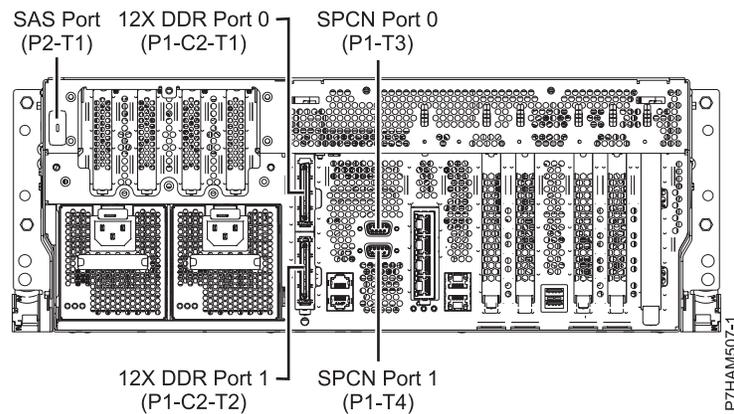


Figure 11. Model 02E/4B connector locations on a rack-mounted model

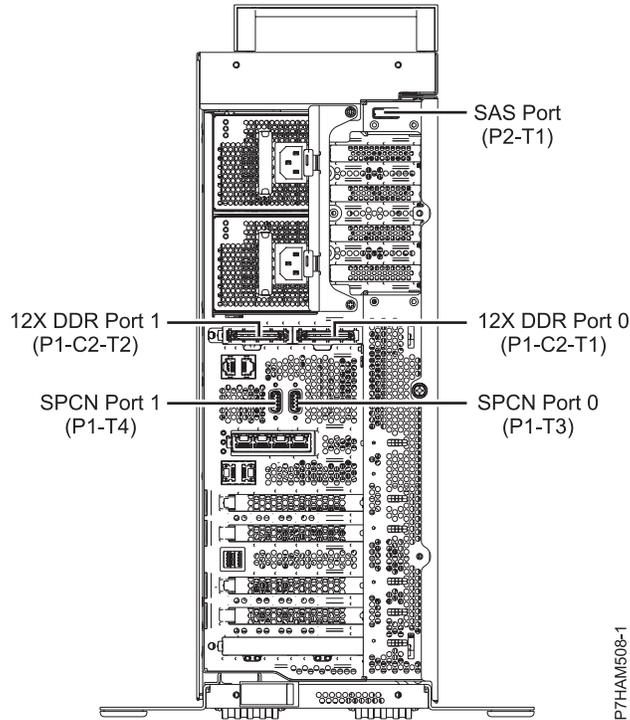


Figure 12. Model 02E/4B connector locations on a stand-alone model

## Model 02E/4C connector locations

Learn about connector locations on rack-mounted models.

The 02E/4C server provides cable connector locations for the following enclosures:

- Support for expansion units, as shown in the following figure, is as follows:
  - The card installed in the C1 slot can contain two 12X double data rate (DDR) cable ports. However, the C1 slot cannot provide both 12X DDR and PCIe cable ports.
  - The server contains a serial-attached SCSI (SAS) port.

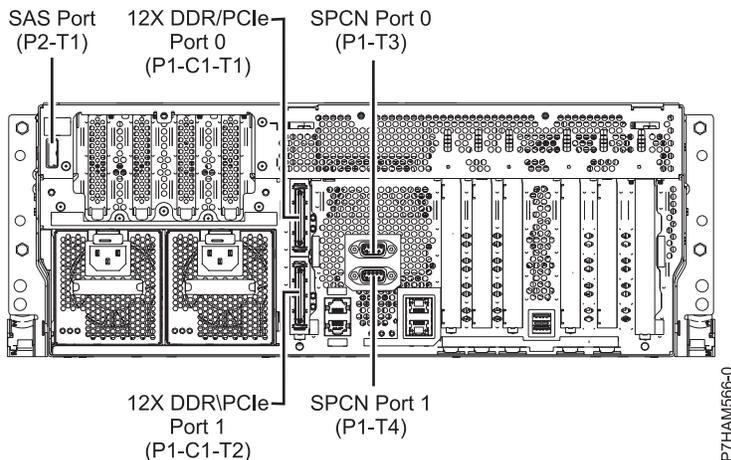


Figure 13. Model 02E/4C connections for expansion units, disk drive enclosures, and PCIe storage enclosures

- Support for disk drive enclosures, as shown in the preceding figure, is as follows:
  - The server contains a SAS port.
- Support for PCIe storage enclosures, as shown in the preceding figure, is as follows:
  - The card installed in the C1 slot can contain two PCIe cable ports. However, the C1 slot cannot provide both PCIe and 12X DDR cable ports.
  - The server contains a SAS port.

## Model 02E/4D connector locations

Learn about connector locations on rack-mounted models.

The 02E/4D server provides cable connector locations for the following enclosures:

- Support for expansion units, as shown in the following figure, is as follows:
  - The card installed in the C1 slot can contain two 12X double data rate (DDR) cable ports. However, the C1 slot cannot provide both 12X DDR and PCIe cable ports.
  - The server contains a serial-attached SCSI (SAS) port.

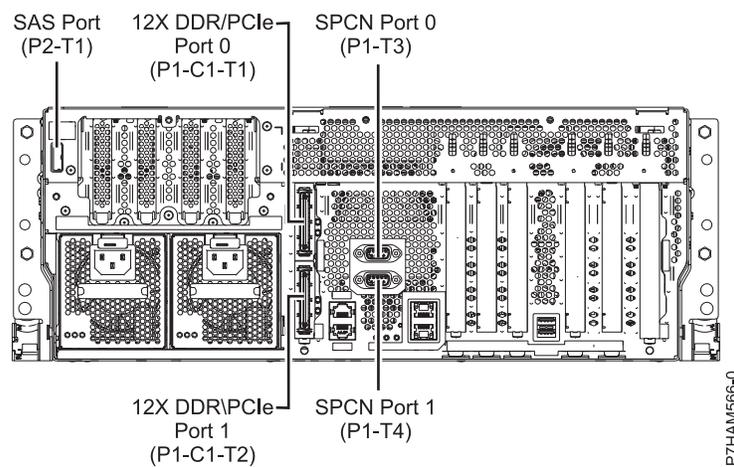


Figure 14. Model 02E/4D connections for expansion units, disk drive enclosures, and PCIe storage enclosures

- Support for disk drive enclosures, as shown in the preceding figure, is as follows:
  - The server contains a SAS port.
- Support for PCIe storage enclosures, as shown in the preceding figure, is as follows:
  - The card installed in the C1 slot can contain two PCIe cable ports. However, the C1 slot cannot provide both PCIe and 12X DDR cable ports.
  - The server contains a SAS port.

## Model 05F/6B connector locations

Learn about connector locations on rack-mounted and stand-alone models.

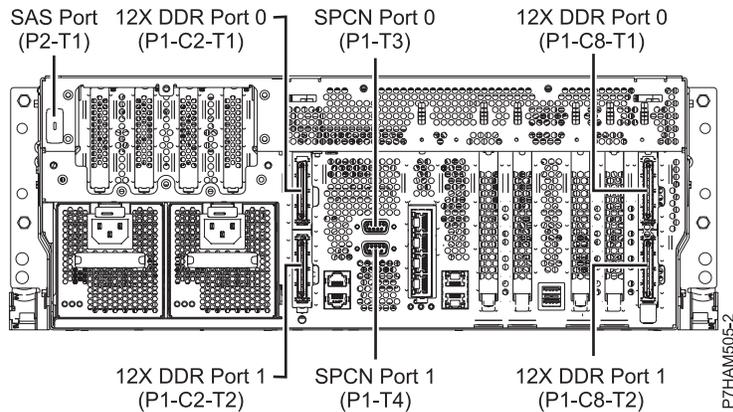


Figure 15. Model 05F/6B connector locations on a rack-mounted model

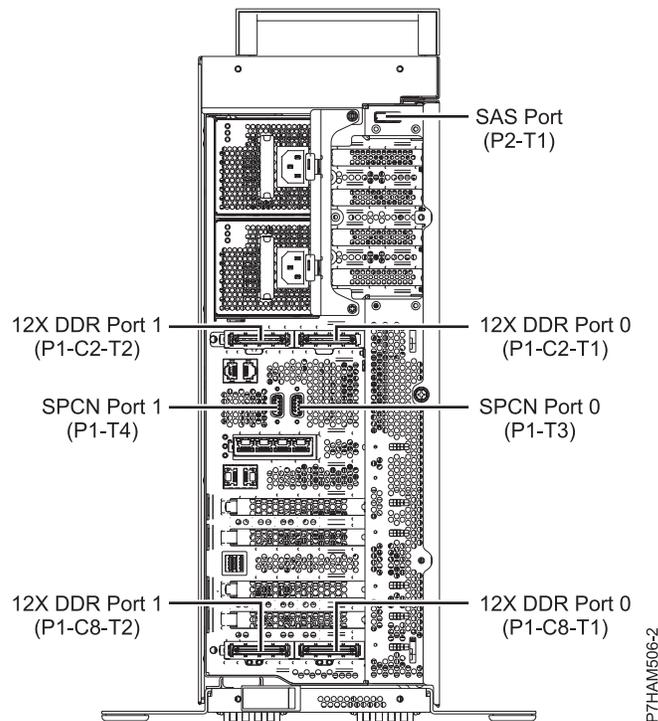


Figure 16. Model 05F/6B connector locations on a stand-alone model

## Model 05E/6C connector locations

Learn about connector locations on rack-mounted models.

The 05E/6C server provides cable connector locations for the following enclosures:

- Support for expansion units, as shown in the following figure, is as follows:
  - The card installed in the C1 slot can contain two 12X double data rate (DDR) cable ports. However, the C1 slot cannot provide both 12X DDR and PCIe cable ports.
  - The card installed in the C8 slot can contain two 12X DDR cable ports. However, the C8 slot cannot provide both 12X DDR and PCIe cable ports.
  - The port card type installed in the C1 slot can differ from the port card type installed in the C8 slot.
  - The server contains a serial-attached SCSI (SAS) port.

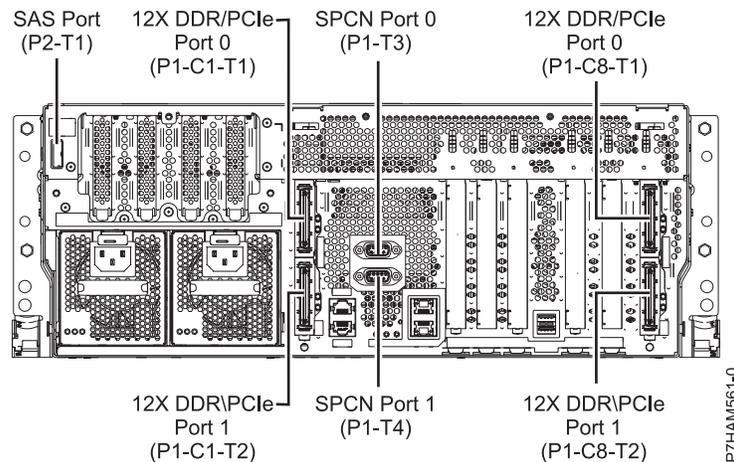


Figure 17. Model 05E/6C connections for expansion units, disk drive enclosures, and PCIe storage enclosures

- Support for disk drive enclosures, as shown in the preceding figure, is as follows:
  - The server contains a SAS port.
- Support for PCIe storage enclosures, as shown in the preceding figure, is as follows:
  - The card installed in the C1 slot can contain two PCIe cable ports. However, the C1 slot cannot provide both PCIe and 12X DDR cable ports.
  - The card installed in the C8 slot can contain two PCIe cable ports. However, the C8 slot cannot provide both PCIe and 12X DDR cable ports.
  - The port card type installed in the C1 slot can differ from the port card type installed in the C8 slot.
  - The server contains a SAS port.

## Model 05E/6D connector locations

Learn about connector locations on rack-mounted models.

The 05E/6D server provides cable connector locations for the following enclosures:

- Support for expansion units, as shown in the following figure, is as follows:
  - The card installed in the C1 slot can contain two 12X double data rate (DDR) cable ports. However, the C1 slot cannot provide both 12X DDR and PCIe cable ports.
  - The card installed in the C8 slot can contain two 12X DDR cable ports. However, the C8 slot cannot provide both 12X DDR and PCIe cable ports.
  - The port card type installed in the C1 slot can differ from the port card type installed in the C8 slot.
  - The server contains a serial-attached SCSI (SAS) port.

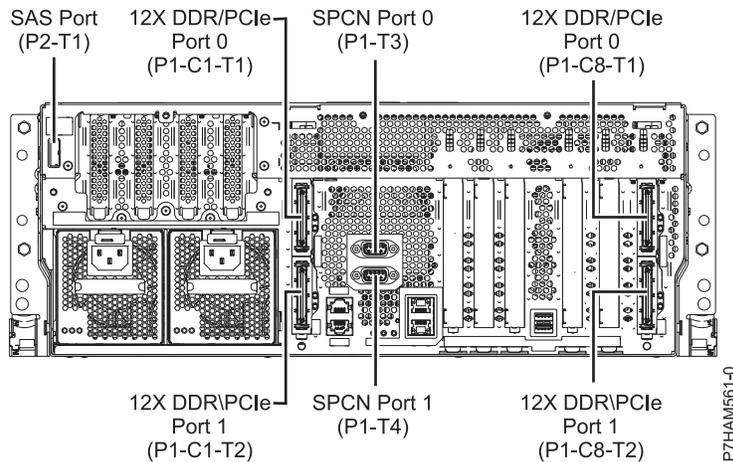


Figure 18. Model 05E/6D connections for expansion units, disk drive enclosures, and PCIe storage enclosures

- Support for disk drive enclosures, as shown in the preceding figure, is as follows:
  - The server contains a SAS port.
- Support for PCIe storage enclosures, as shown in the preceding figure, is as follows:
  - The card installed in the C1 slot can contain two PCIe cable ports. However, the C1 slot cannot provide both PCIe and 12X DDR cable ports.
  - The card installed in the C8 slot can contain two PCIe cable ports. However, the C8 slot cannot provide both PCIe and 12X DDR cable ports.
  - The port card type installed in the C1 slot can differ from the port card type installed in the C8 slot.
  - The server contains a SAS port.

### Model 33E/8B connector locations

Learn about connector locations on rack-mounted models.

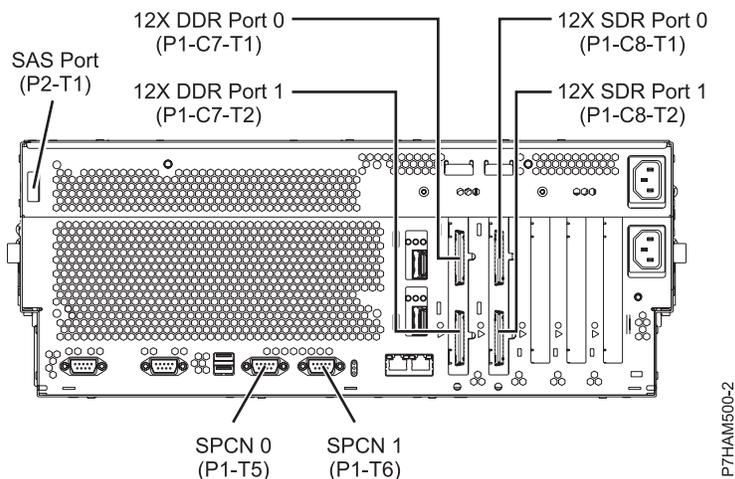


Figure 19. Model 33E/8B connector locations on a rack-mounted model

## Model 17M/MB or 79M/HB connector locations

Learn about connector locations.

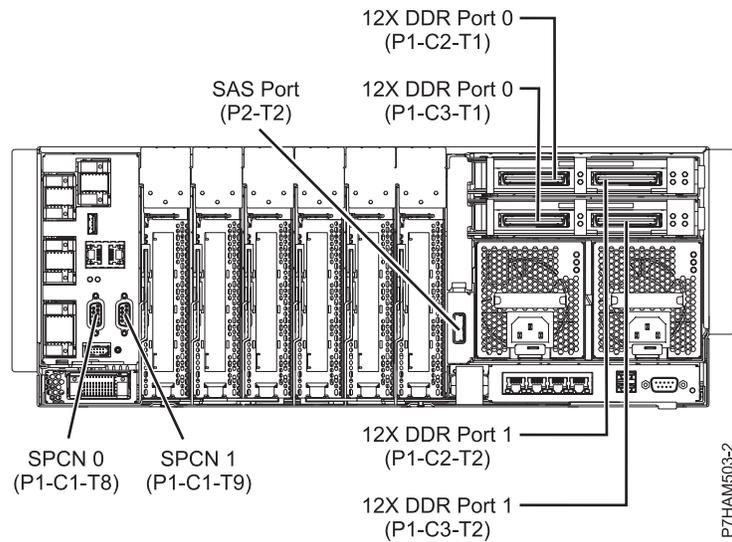


Figure 20. Model 17M/MB or 79M/HB connector locations

## Model 17M/MC or 79M/HC connector locations

Learn about connector locations.

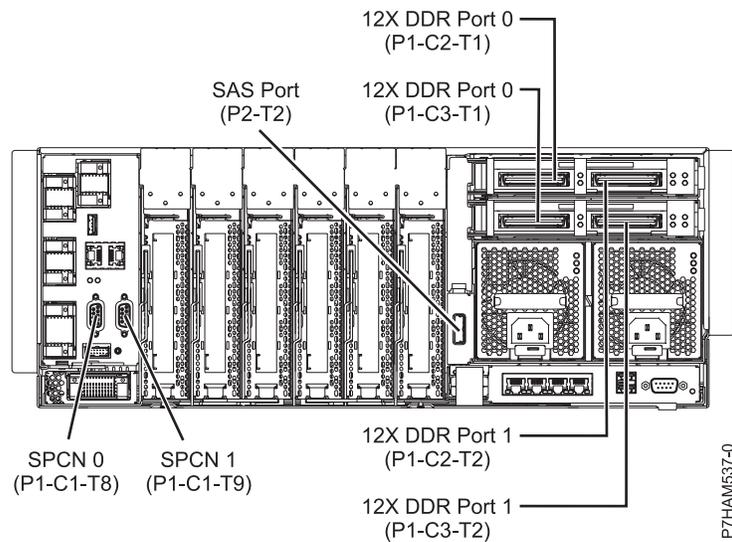


Figure 21. Model 17M/MC or 79M/HC connector locations

## Model 17M/MD or 79M/HD connector locations

Learn about connector locations.

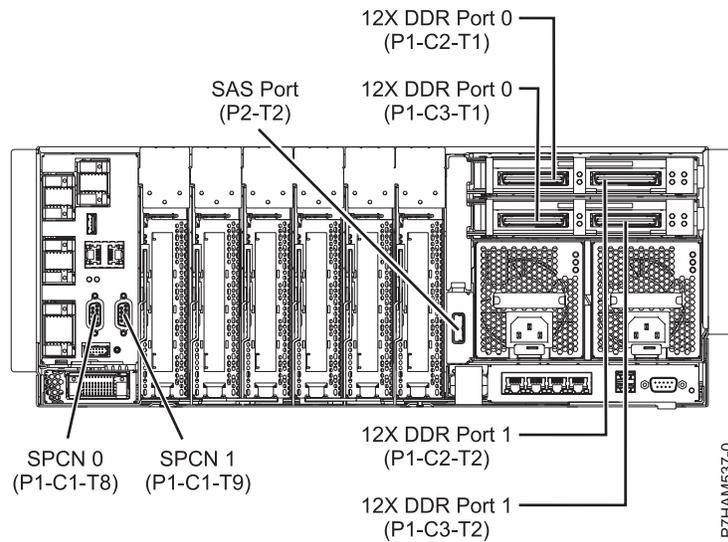


Figure 22. Model 17M/MD or 79M/HD connector locations

## Enclosure connectors

Learn about connector locations for I/O enclosures.

## Model 57/96 or 14G/30 connector locations

Learn about connector locations.

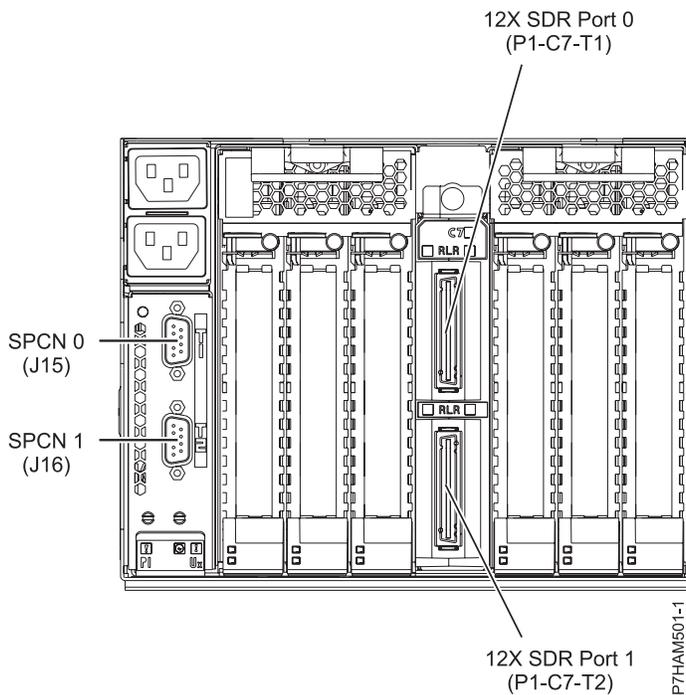


Figure 23. Model 57/96 or 14G/30 connector locations





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## Electronic emission notices

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

## Class A Notices

The following Class A statements apply to the servers.

## 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 conforme à la norme NMB-003 du Canada.

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This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC 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.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

European Community contact:  
IBM Deutschland GmbH  
Technical Regulations, Department M372  
IBM-Allee 1, 71139 Ehningen, Germany  
Tele: +49 7032 15 2941  
email: lugi@de.ibm.com

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VCCI-A

The following is a summary of the VCCI Japanese statement in the box above:

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**Japanese Electronics and Information Technology Industries Association (JEITA)  
Confirmed Harmonics Guideline (products less than or equal to 20 A per phase)**

高調波ガイドライン適合品

**Japanese Electronics and Information Technology Industries Association (JEITA)  
Confirmed Harmonics Guideline with Modifications (products greater than 20 A per phase)**

高調波ガイドライン準用品

**Electromagnetic Interference (EMI) Statement - People's Republic of China**

**声 明**

此为 A 级产品,在生活环境  
中,该产品可能会造成无线电干  
扰。在这种情况下,可能需要用  
户对其干扰采取切实可行的措  
施。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

**Electromagnetic Interference (EMI) Statement - Taiwan**

**警告使用者：**

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

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International Business Machines Corp.

New Orchard Road

Armonk, New York 10504

Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:

IBM Deutschland GmbH

Technical Regulations, Abteilung M372

IBM-Allee 1, 71139 Ehningen, Germany

Tel: +49 7032 15 2941

email: lugi@de.ibm.com

Generelle Informationen:

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The following Class B statements apply to features designated as electromagnetic compatibility (EMC) Class B in the feature installation information.

### **Federal Communications Commission (FCC) statement**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM-authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM-authorized dealers. IBM is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate this 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 B digital apparatus complies with Canadian ICES-003.

## **Avis de conformité à la réglementation d'Industrie Canada**

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高調波ガイドライン適合品

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IBM-Allee 1, 71139 Ehningen, Germany  
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Generelle Informationen:

**Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse B.**

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