Power Systems

7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard

IBM

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IBM

> **Note**
>
> Before using this information and the product it supports, read the information in "Safety notices" on page v, "Notices" on page 51, the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125–5823.

Contents

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, safety information documentation is included in the publications package (such as in printed documentation, on DVD, or as part of the product) shipped with the product. The documentation 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 documentation. You should also refer to the safety information documentation any time you do not clearly understand any safety information in the U.S. English publications.

Replacement or additional copies of safety information documentation can be obtained by calling the IBM Hotline at 1-800-300-8751.

German safety information

Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

Laser safety information

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

Laser compliance

IBM 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:
- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- 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.
- Do not continue with the inspection if any unsafe conditions are present.
- 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.

  Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching.

  (D005)

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 (compliance ID RACK-001 or 22U (compliance ID RR001) and above.
  - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.
  - Ensure that there are little-to-no empty U-levels between devices installed in the rack cabinet below the 32U (compliance ID RACK-001 or 22U (compliance ID RR001) level, unless the received configuration specifically allowed it.
- If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- If the rack cabinet you are relocating was supplied with removable outriggers they must be reinstalled before the cabinet is relocated.
- 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)

DANGER: Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label. (L001)

(L002)

DANGER: Rack-mounted devices are not to be used as shelves or work spaces. (L002)

(L003)
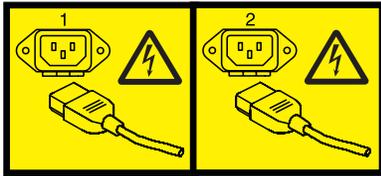
or

or

or

DANGER: Multiple power cords. The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. (L003)

(L007)

CAUTION: A hot surface nearby. (L007)

(L008)

CAUTION: Hazardous moving parts nearby. (L008)

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. Although shining light into one end and looking into the other end of a disconnected optical fiber to verify the continuity of optic fibers many not injure the eye, this procedure is potentially dangerous. Therefore, verifying the continuity of optical fibers by shining light into one end and looking at the other end is not recommended. To verify continuity of a fiber optic cable, use an optical light source and power meter. (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 IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (C003)

(C048)

CAUTION regarding IBM provided VENDOR LIFT TOOL:

- Operation of LIFT TOOL by authorized personnel only.

- LIFT TOOL intended for use to assist, lift, install, remove units (load) up into rack elevations. It is not to be used loaded transporting over major ramps nor as a replacement for such designated tools like pallet jacks, walkies, fork trucks and such related relocation practices. When this is not practicable, specially trained persons or services must be used (for instance, riggers or movers).

- Read and completely understand the contents of LIFT TOOL operator's manual before using. Failure to read, understand, obey safety rules, and follow instructions may result in property damage and/or personal injury. If there are questions, contact the vendor's service and support. Local paper manual must remain with machine in provided storage sleeve area. Latest revision manual available on vendor's web site.

- Test verify stabilizer brake function before each use. Do not over-force moving or rolling the LIFT TOOL with stabilizer brake engaged.

- Do not move LIFT TOOL while platform is raised, except for minor positioning.

- Do not exceed rated load capacity. See LOAD CAPACITY CHART regarding maximum loads at center versus edge of extended platform.
- Only raise load if properly centered on platform. Do not place more than 200 lb (91 kg) on edge of sliding platform shelf also considering the load's center of mass/gravity (CoG).
- Do not corner load the platform tilt riser accessory option. Secure platform riser tilt option to main shelf in all four (4x) locations with provided hardware only, prior to use. Load objects are designed to slide on/off smooth platforms without appreciable force, so take care not to push or lean. Keep riser tilt option flat at all times except for final minor adjustment when needed.
- Do not stand under overhanging load.
- Do not use on uneven surface, incline or decline (major ramps).
- Do not stack loads.
- Do not operate while under the influence of drugs or alcohol.
- Do not support ladder against LIFT TOOL.
- Tipping hazard. Do not push or lean against load with raised platform.
- Do not use as a personnel lifting platform or step. No riders.
- Do not stand on any part of lift. Not a step.
- Do not climb on mast.
- Do not operate a damaged or malfunctioning LIFT TOOL machine.
- Crush and pinch point hazard below platform. Only lower load in areas clear of personnel and obstructions. Keep hands and feet clear during operation.
- No Forks. Never lift or move bare LIFT TOOL MACHINE with pallet truck, jack or fork lift.
- Mast extends higher than platform. Be aware of ceiling height, cable trays, sprinklers, lights, and other overhead objects.
- Do not leave LIFT TOOL machine unattended with an elevated load.
- Watch and keep hands, fingers, and clothing clear when equipment is in motion.
- Turn Winch with hand power only. If winch handle cannot be cranked easily with one hand, it is probably over-loaded. Do not continue to turn winch past top or bottom of platform travel. Excessive unwinding will detach handle and damage cable. Always hold handle when lowering, unwinding. Always assure self that winch is holding load before releasing winch handle.
- A winch accident could cause serious injury. Not for moving humans. Make certain clicking sound is heard as the equipment is being raised. Be sure winch is locked in position before releasing handle. Read instruction page before operating this winch. Never allow winch to unwind freely. Freewheeling will cause uneven cable wrapping around winch drum, damage cable, and may cause serious injury. (C048)

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

The following comments apply to the IBM 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.

The dc-powered system is intended to be installed in a common bonding network (CBN) as described in GR-1089-CORE.

Installing the 7316-TF4 18.5-Inch Flat Panel Rack-Mounted monitor and keyboard

Learn how to install the 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard.

What's new in Installing the 7316-TF4 18.5-Inch Flat Panel Rack-Mounted monitor and keyboard

Read about new or significantly changed information in installing the 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard since the previous update of this topic collection.

June 2015
- Added voltage specifications.

June 2014
- Added information for IBM Power Systems™ servers that contain the POWER8® processor.

PDF file for Installing the 7316-TF4 17-Inch Flat Panel Rack-Mounted monitor and keyboard

You can view and print a PDF file of this information.

Installing the 7316-TF4 17-Inch Flat Panel Rack-Mounted Monitor and Keyboard

This document helps you to install the 7316-TF4 17-Inch Flat Panel Rack-Mounted Monitor and Keyboard in the rack.

The latest version of this document is maintained online, see 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard (http://www.ibm.com/support/knowledgecenter/POWER8/p8egg/p8egg_840_kickoff.htm).

Saving PDF files

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4. Click **Save**.

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Overview of 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard

This topic collection provides the overview of the 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard.

The IBM 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard is a flat-panel display and keyboard tray in one unit. The console unit occupies 1U[1] of space in a rack. You can install an optional console switch behind the standard console in the rack to attach more than one server to the flat-panel display and keyboard. If firmware and documentation updates are available, you can download them from the IBM website.

Note: The 1 EIA unit in racks are measured in vertical increments of 1.75 inches each. Each 1.75-inch increment is called an "EIA." In some countries, the same increment may be referred to as a "U."

Console features

Learn about the 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard console features.

The standard console has the following features:
- Mounts on slide-rails in the rack to enable easy movement and storage of the monitor
- Toolless rack installation in the 1U space of IBM rack configurations
- 18.5-inch, 16:9 ratio LCD panel with a VGA connection to the server or KVM switch
- Support for widescreen and previous (through scaling) resolutions
- Compatible with worldwide power and regulatory requirements
- Cable-management arm comes preinstalled on the rear of the console
- Can be shipped installed in an IBM rack

Check Your Inventory

Find information about the parts shipped along with the 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard console.

**Note:** The illustrations in this topic might differ slightly from your hardware.

The console kit contains the following items:
- One console unit with built-in flat-panel display and cable-management arm (A 1 m power cord is routed along the cable-management arm and is secured with cable straps.)
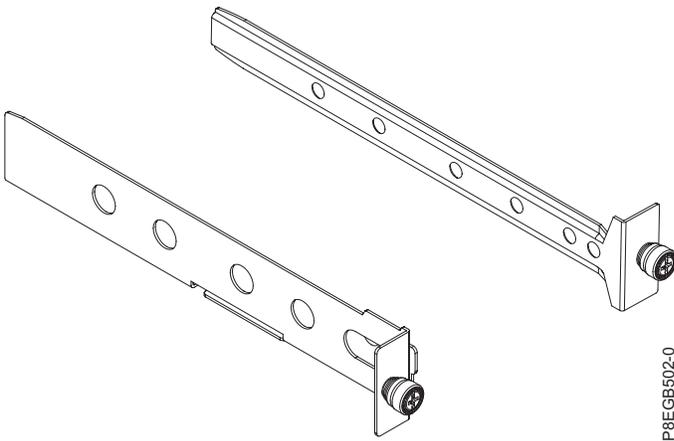
P8EGB500-0
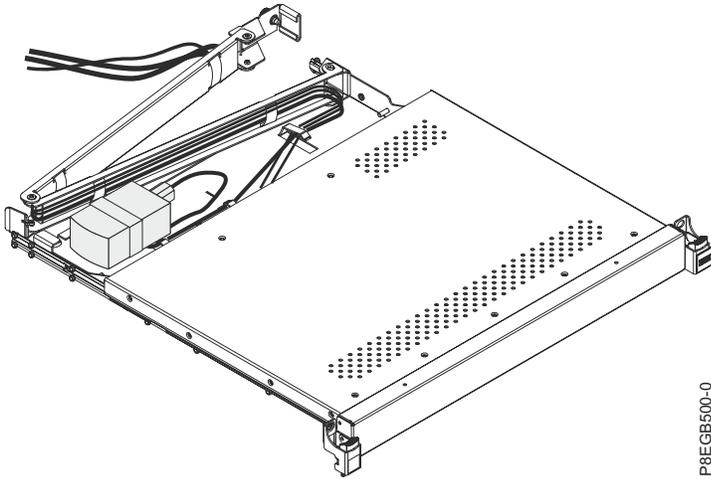
Important: The ac adapter that is connected to the flat-panel display is not intended for use with other products. Do not disassemble the flat-panel display or remove the ac adapter.
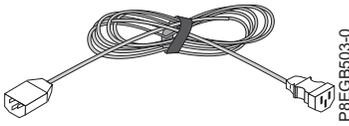
- Two outer rails

P8EGB501-0
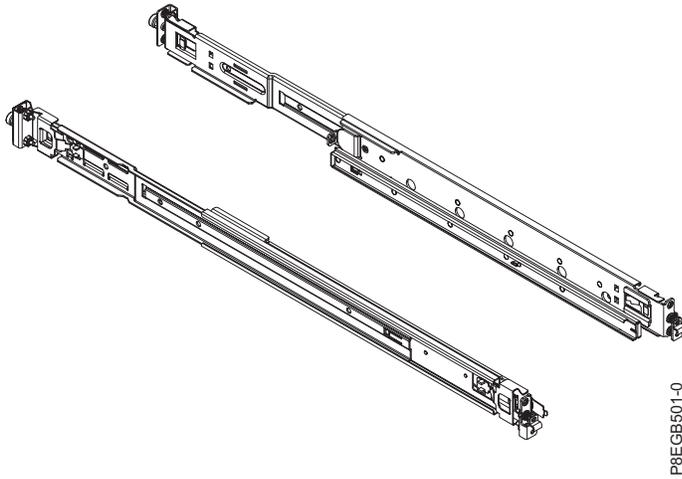
- Two console-switch mounting brackets, one with a channel (for routing the power, video, and keyboard-and-mouse cables) and six screws.

P8EGB502-0

- One 2.8-m (9-ft) IEC connector power cable

- Bag with M5 clip nuts, M5 stability screws, and M5 shipping screws
- IBM Documentation CD

You need the following tools to replace customer replaceable units (CRU):
- One #1 Phillips screwdriver (to install or remove the inner slide-rails)
- One #2 Phillips screwdriver (to unscrew the shipping screws from the rack if you move the rack to another location; to replace the cable-management arm)

See the documentation that comes with your rack or console switch for more information about those products.

The IBM Documentation CD

Learn about the IBM Documentation CD shipped along with the 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard console.

The IBM Documentation CD contains documentation for the console unit in Portable Document Format (PDF) and includes the IBM Documentation Browser to help you find information quickly.

Hardware and software requirements

Learn about the hardware and software requirements to run the IBM Documentation CD.

The IBM Documentation CD requires the following minimum hardware and software:
- Microsoft Windows XP, Windows 2000, or Red Hat Linux
- 100 MHz microprocessor
- 32 MB of RAM
- Adobe Acrobat Reader 3.0 (or later) or xpdf, which comes with Linux operating systems

Using the documentation browser

Learn about how to use the documentation browser.

Use the Documentation Browser to browse the contents of the CD, read brief descriptions of the documents, and view documents, using Adobe Acrobat Reader or xpdf. The Documentation Browser automatically detects the regional settings in use in your server and displays the documents in the language for that region (if available). If a document is not available in the language for that region, the English-language version is displayed.

Use one of the following procedures to start the Documentation Browser:
- If Autostart is enabled, insert the CD into the CD or DVD drive. The Documentation Browser starts automatically.
- If Autostart is disabled or is not enabled for all users, use one of the following procedures:
  - If you are using a Windows operating system, insert the CD into the CD or DVD drive and click **Start --> Run**. In the Open field, type **e:\win32.bat**.

    where *e* is the drive letter of the CD or DVD drive, and click **OK**.
  - If you are using Red Hat Linux, insert the CD into the CD or DVD drive; then, run the following command from the /mnt/cdrom directory: **sh runlinux.sh**

Select the console unit from the **Product** menu. The **Available Topics** list displays all the documents for the console unit. Some documents might be in folders. A plus sign (+) indicates each folder or document that has additional documents under it. Click the plus sign to display the additional documents.

When you select a document, a description of the document is displayed under **Topic Description**. To select more than one document, press and hold the Ctrl key while you select the documents. Click **View Book** to view the selected document or documents in Acrobat Reader or xpdf. If you selected more than one document, all the selected documents are opened in Acrobat Reader or xpdf.

To search all the documents, type a word or word string in the **Search** field and click **Search**. The documents in which the word or word string appears are listed in order of the most occurrences. Click a document to view it, and press Crtl+F to use the Acrobat search function, or press Alt+F to use the xpdf search function within the document. Click **Help** for detailed information about using the Documentation Browser.

Notices and statements in this document

This topic provides the information on the notices and statements used in this document.

The caution and danger statements in this document are also in the multilingual Safety Information document. Each statement is numbered for reference to the corresponding statement in the Safety Information document.

The following notices and statements are used in this document:

Note: These notices provide important tips, guidance, or advice.

Important: These notices provide information or advice that might help you avoid inconvenient or problem situations.

Attention: These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage might occur.

CAUTION:
These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.

DANGER

> **These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.**

Console unit specifications

This topic collection provides the information about the specifications of the console unit.

The following sections provide the console unit specifications.

Rail-to-rail depth measurements

This topic provides the information about the rail-to-rail depth measurement to install the 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard.

The console unit fits in a rack with the front to rear rail dimensions as shown in the following table. The console unit dimensions are measured outside-to-outside and are for IBM and non-IBM racks with unthreaded and threaded holes.

Table 1. Console unit rack post distances

Rack configuration	Rack post distances
No console switch	613 - 909 mm (24.1 - 35.8 in.]
Provision for a console switch	706 - 909 mm (27.9 - 35.8 in.]

Dimensions and weight

This topic provides the information about the dimensions and weight of the console unit.

The following table describes the console unit dimensions and weight.

Table 2. Console unit dimensions and weight

Height	44 mm (1.75 in.) (display in stored position)
Width	434 mm (17 in.) (main chassis only, slide-rails not included, faceplate not included)
Depth	434 mm (17 in.) (chassis behind EIA mounting flange, bezel in front of EIA flange not included, cable-management arm not included)
Bezel depth	35 mm (1.4 in.) (including latches and IBM Logo)
Bezel width	482 mm (19 in.) (includes latches)
Maximum forward extension	650 mm (25.6 in.)
Weight	10.4 kg (23 lb)

Installing the 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard

This topic collection provides the information to install the 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard console.

The console unit occupies 1U of mounting space in a rack. To install the console unit in the rack, complete the steps in the following sections. Removing the rack doors and side panels, and removing the rack devices that are above and below where you want to install the console unit, might make installation easier.

See the documentation that comes with your rack for additional information.

Guidelines for rack mounting the console unit:
- Elevated operating ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment might be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- Reduced air flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Mechanical loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

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

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:
- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- 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.
- Do not continue with the inspection if any unsafe conditions are present.
- 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.

   Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching.

   (D005)

CAUTION:
This product is equipped with a 3-wire (two conductors and ground) power cable and plug. Use this power cable with a properly grounded electrical outlet to avoid electrical shock. C018

Installing the keyboard in the console unit

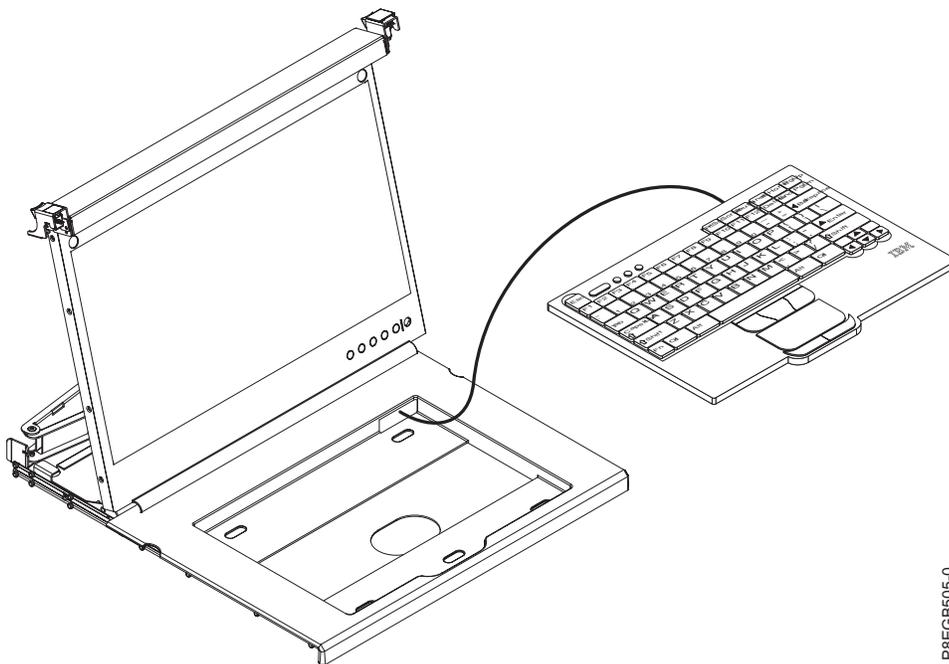Learn how to install the keyboard in the console unit.

To install the keyboard in the console unit, complete the following steps:

1. Place the console unit on a table or other flat surface and make sure that the right side of the unit extends approximately 76 mm (3 in.) over the edge of the surface. This will help you route the keyboard-and-mouse cable more easily later in the procedure.
2. Carefully lift the front of the flat-panel display to the full upright position.
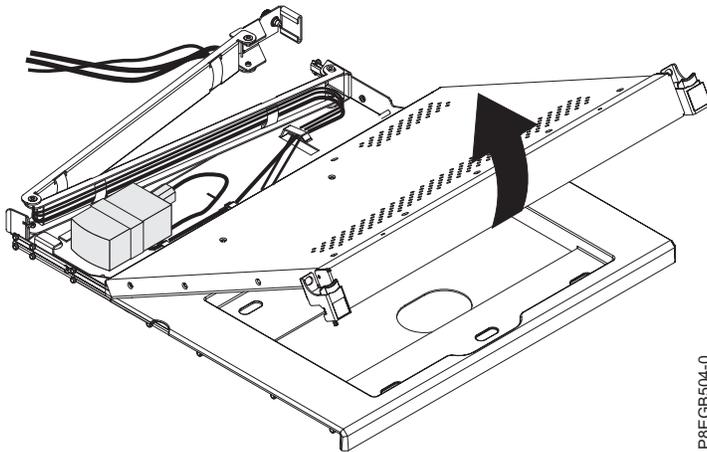
Attention: Do not extend the keyboard feet. The flat-panel display screen might be damaged if the feet are extended when the display is closed.

3. Hold the keyboard near the keyboard tray and carefully route the keyboard-and-mouse cable down through the keyboard tray cutout and up through the cutout that is behind the flat-panel display. (See the illustration.) Carefully pull the cable through the cutouts.

4. Peel the backing of the double-sided foam tape that is preinstalled on the front of the console tray.

5. Place the keyboard in the tray and exert a small amount of pressure on the keyboard to secure it to the double-sided tape.
6. Close the flat-panel display.

   Attention:
   - When you route the keyboard-and-mouse cable, make sure that the cable does not hang below the underside of the keyboard where it might be damaged if it interferes with the devices in the rack space below the console unit.
   - Make sure that you route all cables through the cable-routing features on the console frame behind the display and along the cable-management arm.
7. Route the cable along the cable-management arm, securing the cables with the hook-and-loop fastener strips.

Installing the console unit in the rack

Learn how to install the console unit in the rack.

Review the documentation that comes with your rack for safety and cabling information. When you install your system in a rack, observe the following guidelines:
- Make sure that the room air temperature is below 35°C (95°F).
- Do not block any air vents; usually 15 cm (6 in.) of air space provides proper airflow.
- Plan the device installation starting from the bottom of the rack.
- Install the heaviest device in the bottom of the rack.
- Do not extend more than one device out of the rack at the same time.
- Connect all power cords to properly wired and grounded electrical outlets.
- Do not overload the power outlet when you install multiple devices in the rack.
- You can install the outer slide-rails in a square-hole rack, round-hole rack, or threaded-hole rack and no tools are required.

To install the console unit in the rack, complete the following steps:
1. Place the console unit on a stable, flat surface.

   Attention: The video cable is connected to the flat-panel display. As you install the console unit in the rack, be careful that you do not pinch or cut the video cable.
2. Select a 1U location in the rack for the console unit.
3. Remove the shipping screw from each outer slide-rail.

Slide-rail rear

Shipping screw

Slide-rail front

Shipping screw

P8EGB506-0
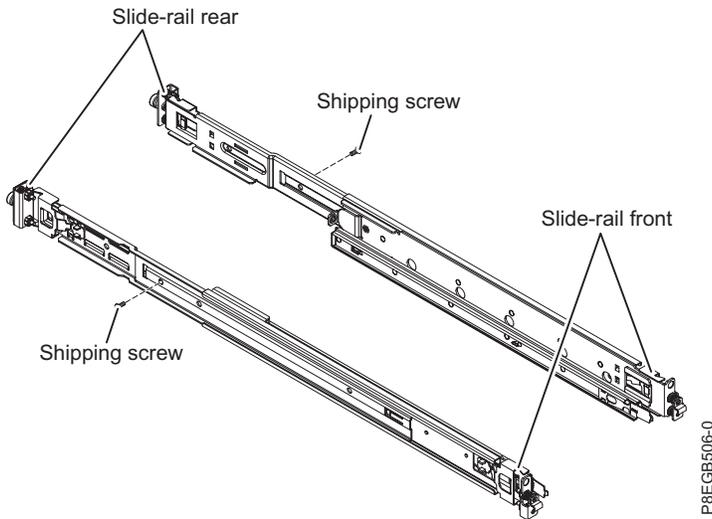
4. **(For non-threaded hole racks)** Install an M5 clip nut in the front of the rack in the top hole of the 1 U-space position that you select. The clip nuts are in the bag of screws that come with the console unit.


M5 clip nut

M5 clip nut

P8EGB507-0
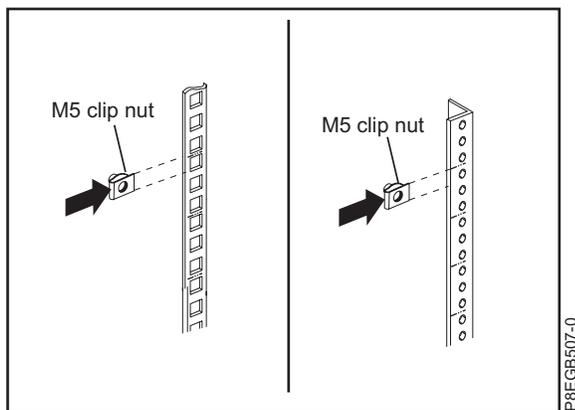
5. To attach the outer slide-rail to the rack, complete the following steps.

   Note: Install the rear slide-rail bracket on the rear of the rack first; then, install the front slide-rail bracket on the front of the rack.

   a. Holding the slide-rail horizontally, align the rear slide-rail bracket so that the bracket is on the outside of the rack mounting flanges.

   b. Press the rear slide-rail bracket towards the rack flange and then pull it towards the front of the rack until the locking bracket clicks into place behind the rack flange.

Slide-rail rear

P8EGB508-0

c. Extend the slide-rail and press the front slide-rail bracket towards the rack flange and then push it towards the rear of the rack until the locking bracket clicks into place behind the rack flange.

Slide-rail front

P8EGB509-0
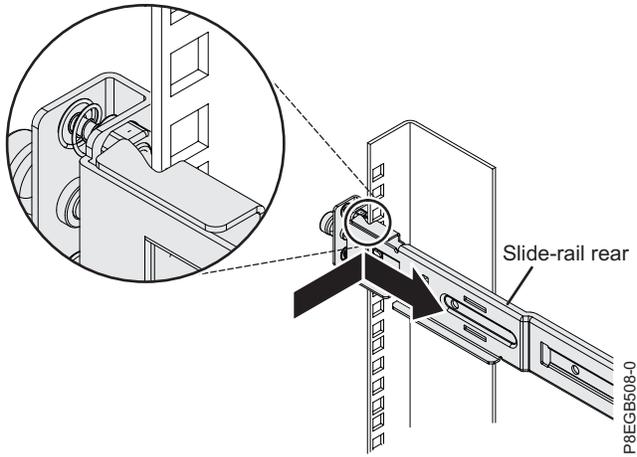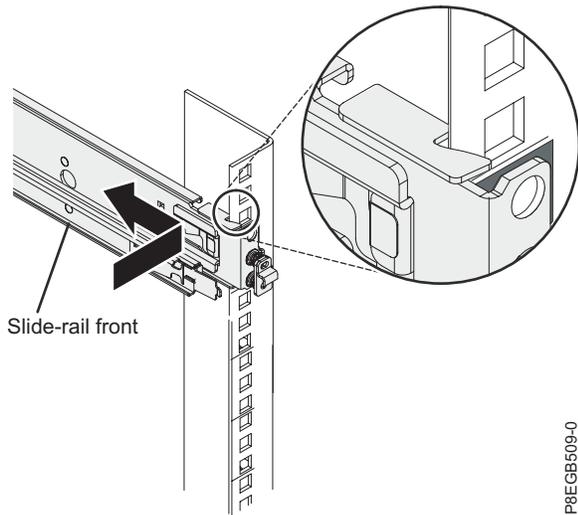
d. Repeat steps 5a to 5c to attach the other outer slide-rail.

Note: Make sure that the two pins in the slide-rail brackets are pressed completely into the rack holes and that the bracket is flush with the rack flange. You might have to move the slide-rail up and down several times, and press on the end of the bracket to release the pins so that they are correctly in the holes in the rack flange.

P8EGB510-0
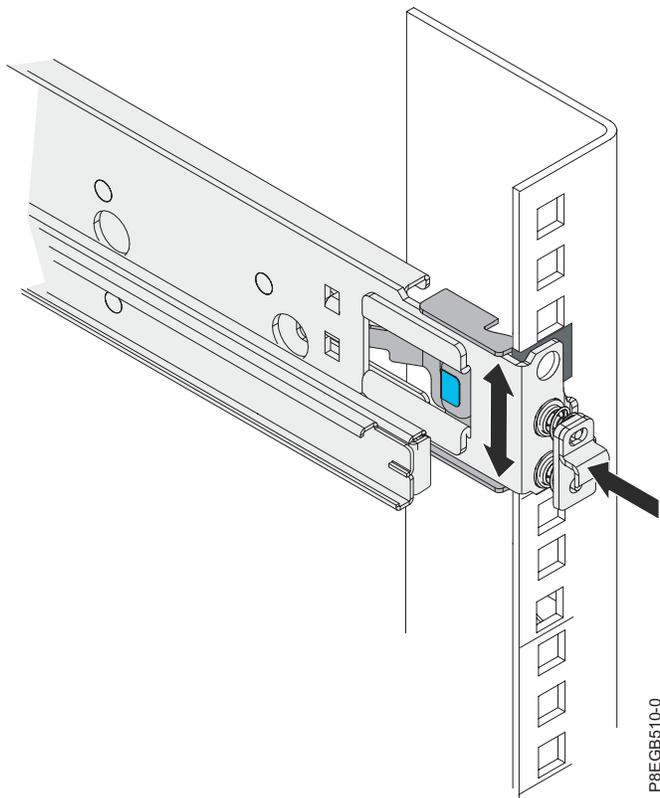
6. Remove the rollers from the rail and fasten them to the display using three screws on each rail.

Rear

Front

P8EGB530-0
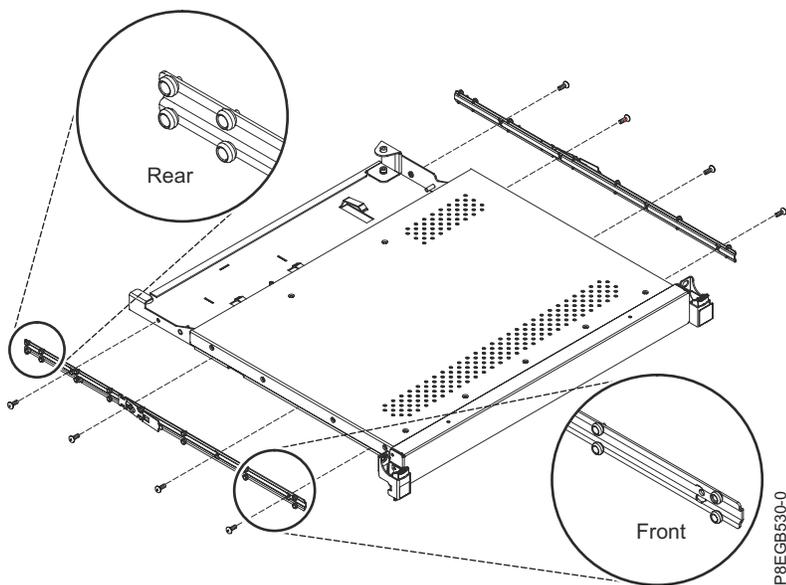
Carefully slide the console unit into the ball-bearing assemblies in the rails. Carefully slide the rollers on the console unit into the notch in the slide-rails as shown in the illustration.
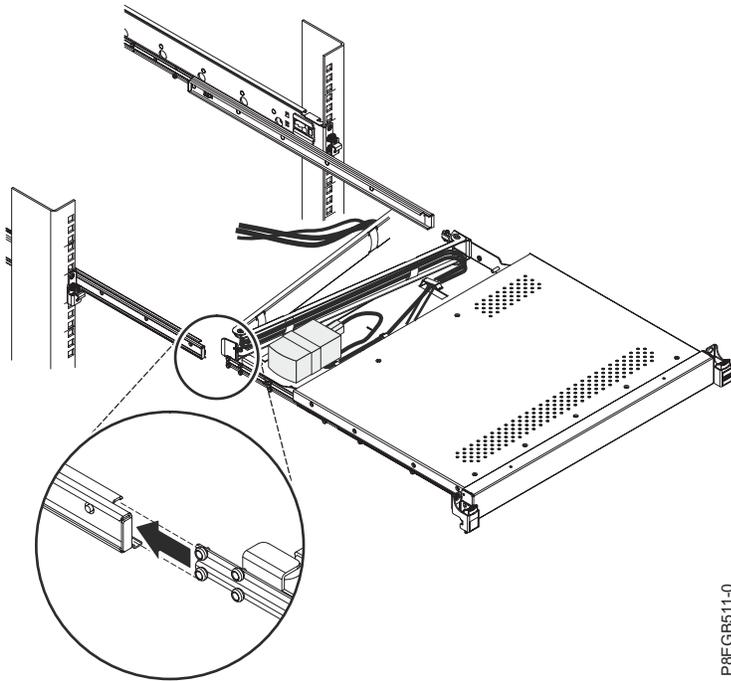
7. Press in both release latches 1; then, grasp both sides of the console unit and push it completely into the rack 2. There will be resistance initially as the inner and outer rails are aligned. Pull the console unit out halfway, and then push it back in to seat the console unit in the rails. Do this a few times until the console unit moves smoothly in the rails.

Release latch

Release latch
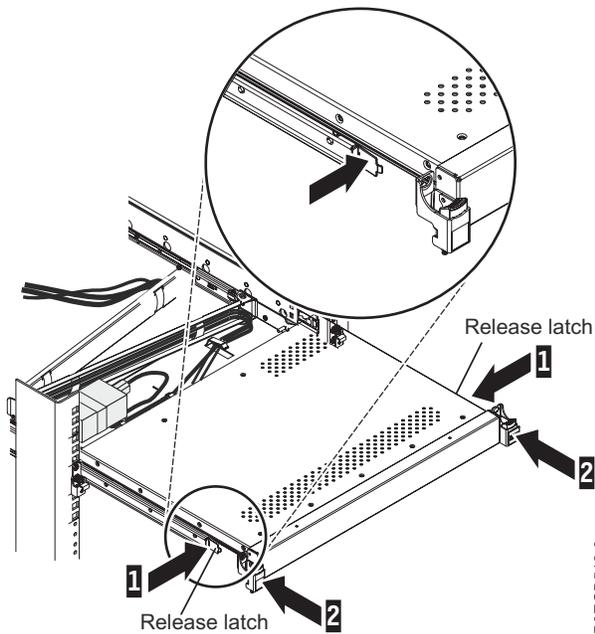
8. On the right rail, align the C-channel on the end of the cable-management arm with the bracket on the console unit. Slide the C-channel onto the bracket until the cable-management arm thumbscrew aligns with the hole in the bracket. Tighten the thumbscrew.

Thumbscrew

Cable-management arm

P8EGB513-0
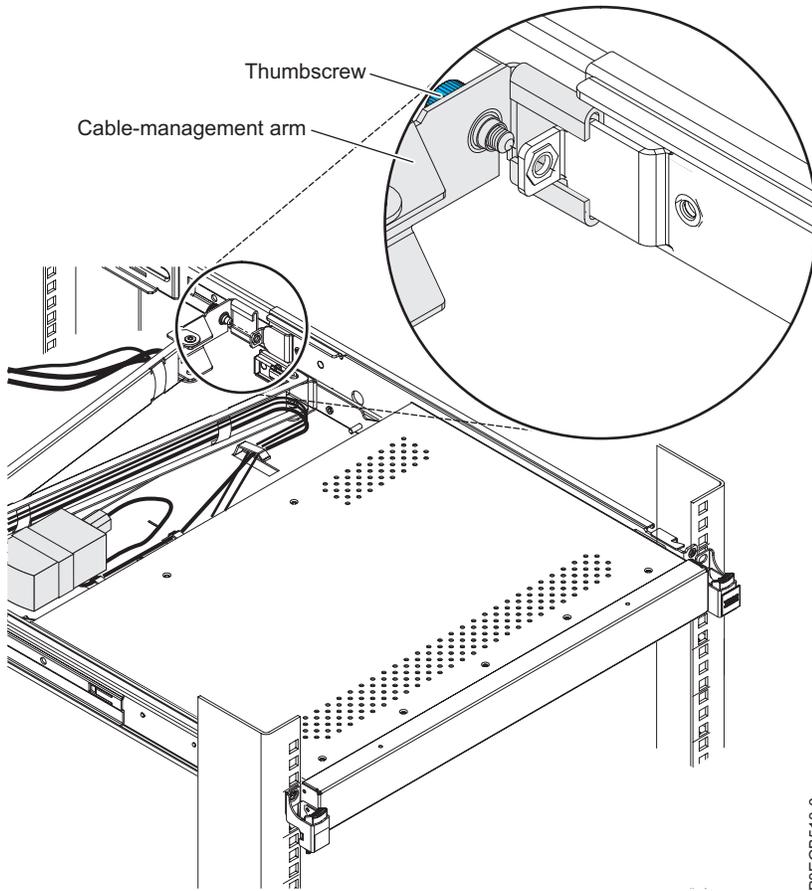
9. Connect all cables to either a server or a console switch in the rack. Connect the power cord to the short jumper cord on the cable-management arm, and then connect the power cord to a properly grounded electrical outlet or power distribution unit (PDU). For information about installing a console switch behind the console unit in the rack, see Installing the Optional Console Switch.

10. Fully extend the console unit from the front of the rack, and then neatly route the cables within the rack and secure them with cable straps along the way.

   Important: If you have excess video cable, do not coil it as shown in the following illustration.

P8EGB514-0

To minimize the electrical interference if you have excess video cable, arrange the cable in figure-eight loops, as shown in the following illustration. Secure the cable in the middle with a cable tie or strap.

Cable tie

P8EGB515-0
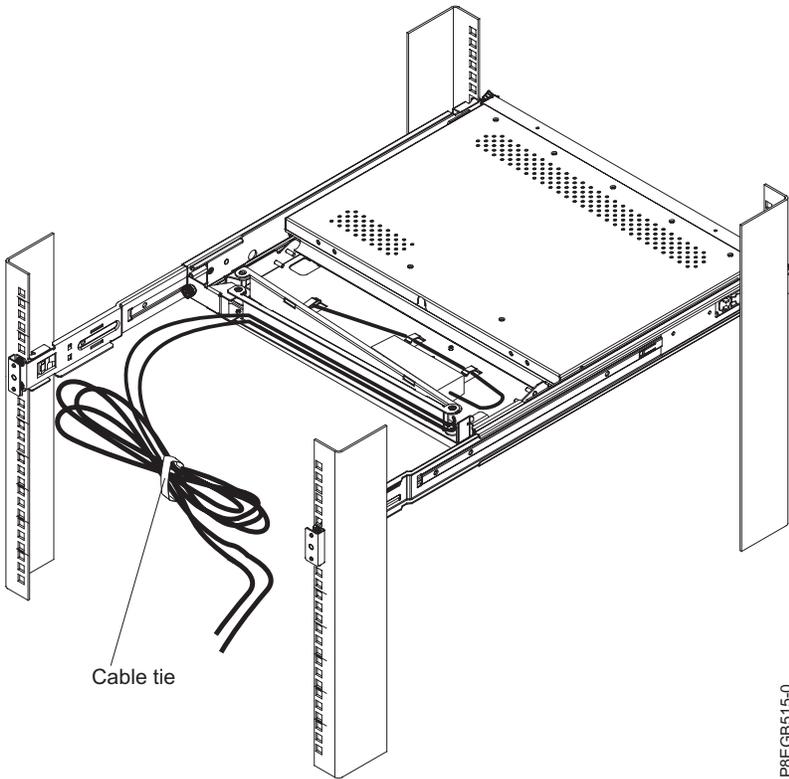
(Optional for all racks) To secure the slide-rails to the rack after installation, install an M5 flat-head stabilizer screw in the top hole on the front of each slide-rail.

Stabilizer
screw

Stabilizer
screw

P8EGB516-0
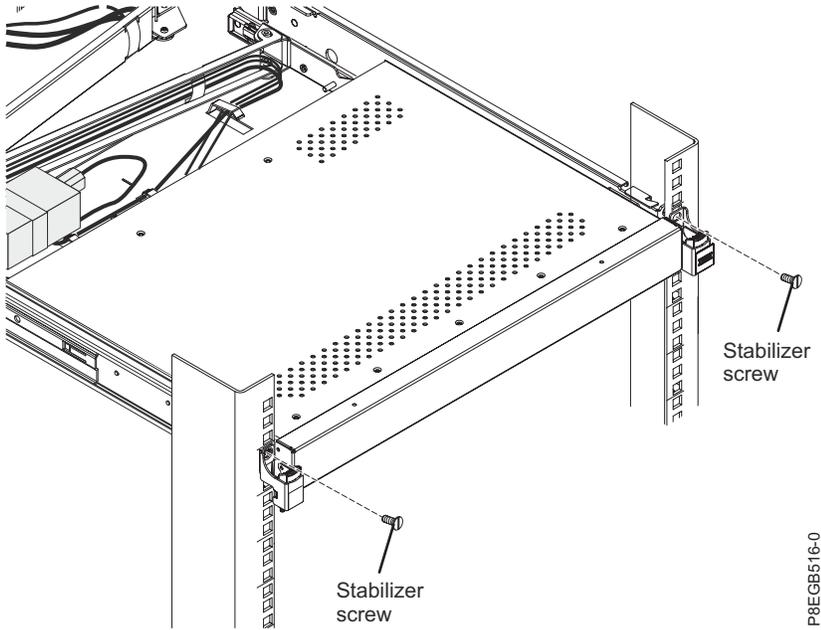
Before you move a rack with a console unit to another location, secure the front of the console unit to the rack with two M5 shipping screws that come in the bag of screws (see the illustration).

Shipping
screw

Shipping
screw

P8EGB517-0
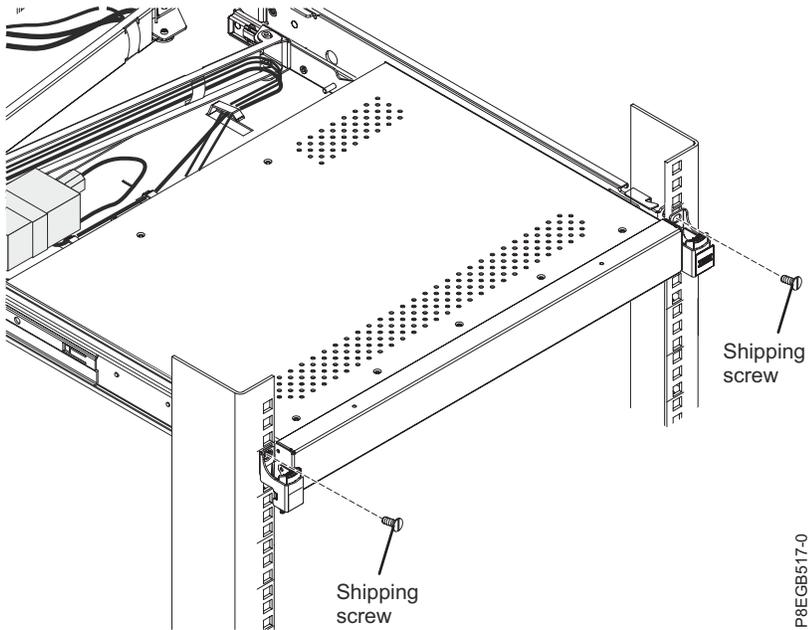
11. See Using the TFT-LCD display for information about operating the display. See the keyboard documentation for information about operating the keyboard.

Installing the optional console switch

Learn how to install the optional console switch.

You can use a console switch to attach more than one server to a single display and keyboard. The optional console switch is available separately.

Depending on the depth of the console switch and the depth of the rack, you might be able to mount a console switch behind the console unit in the same 1U space. To mount the console switch behind the console unit, use the custom mounting brackets that come with the console unit.

Important: The console switch extends beyond the rear rack-cabinet mounting flanges when you install the switch behind the console unit.

Note:
- In this procedure, left and right refer to orientations as you are facing the rear of the rack.
- The console switch mounting brackets are supplied in the miscellaneous hardware kit.
- The mounting brackets have several pre-drilled holes and can support most console switch designs.

To install a console switch behind the tray, complete the following steps:
1. Attach the left-side bracket to the left side of the console switch using two 8-32 screws. Then, attach the right-side bracket to the right side of the console switch.

   Note: The left-side bracket has a channel for you to route the power, video, and keyboard-and-mouse cables. Make sure that you attach the brackets to the console switch so that the channel on the left-side bracket faces upward.
2. Install the console switch behind the flat-panel monitor and keyboard tray using four (two on each side) of the Phillips screws supplied in your miscellaneous hardware kit.
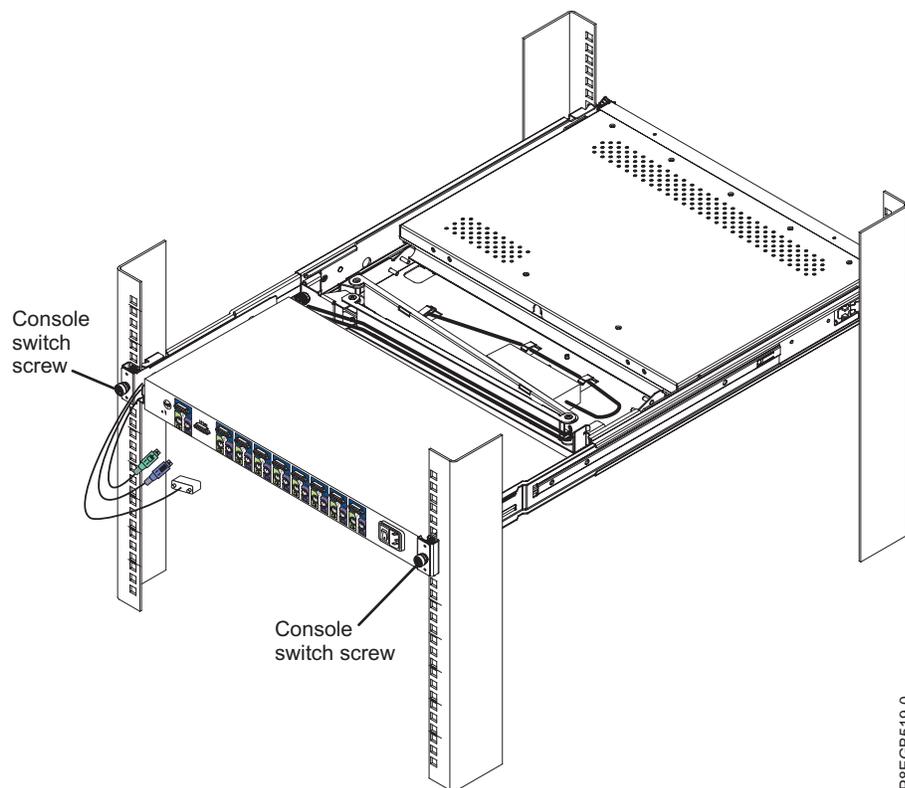
3. Route the power, video, and keyboard-and-mouse cables through the channel in the left-side bracket on the console switch. Then, connect the video, keyboard, and mouse connectors to the console switch.
4. For information about connecting the flat-panel monitor, thin keyboard, and servers to the console switch, see the documentation provided with the console switch.

Using the TFT-LCD display

This topic collection provides the information about using the TFT-LCD display.

This chapter contains information about using the TFT-LCD display. For most applications, the factory default settings on the display do not require adjustment.
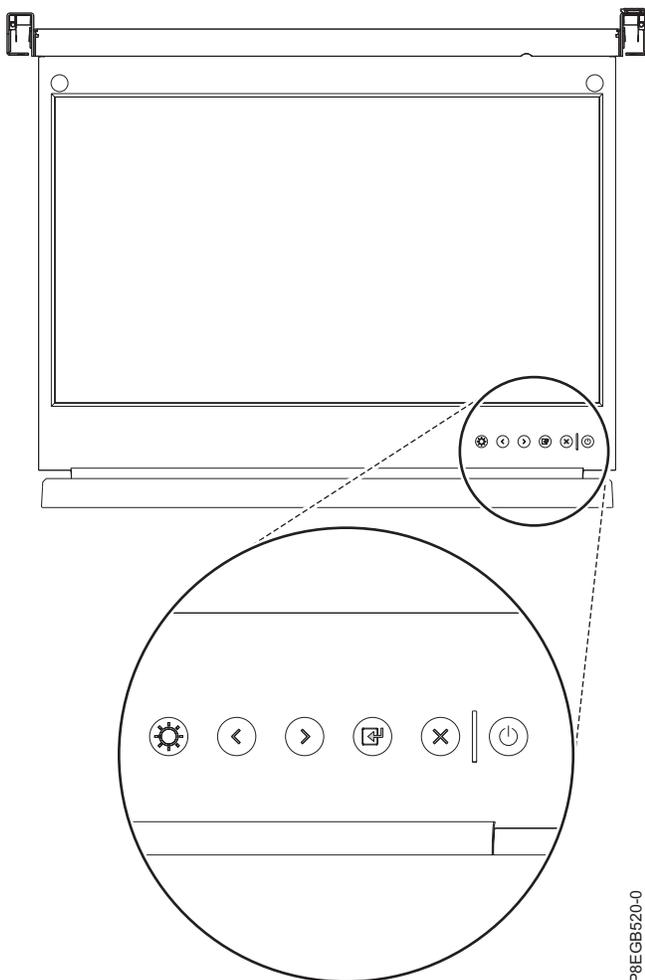
Using the on-screen display (OSD) menu

Learn how to use the OSD menu to adjust the characteristics of the image that is being displayed.

Using the control buttons

Learn how to use the control buttons on the TFT - LCD display.

The control buttons on the lower right of the LCD display are shown in the following illustration.

- **Brightness/Contrast**: Press this button to access the controls.
- **Left arrow and right arrow buttons**:
  - Press the right arrow button to select the function that is to be adjusted.
  - Press the left arrow or right arrow button to decrease or increase the value of the selected adjustment or to select the correct setting.
- **Exit button**: Press this button to exit the menu or return 1 level in the menu.
- **Select/Menu button**: Press this button to access, select, or confirm a menu option.

- **Power button**: Press this button to turn on and turn off the display power. This indicator shows the status of the display operation:
  - Green: Normal operation
  - Flashing green: Standby power
  - Black: Power is off

Using the display menu

Learn how to use the display menu on the TFT - LCD display.

To activate the display menu, press the Select/Menu button. The Main menu is displayed.
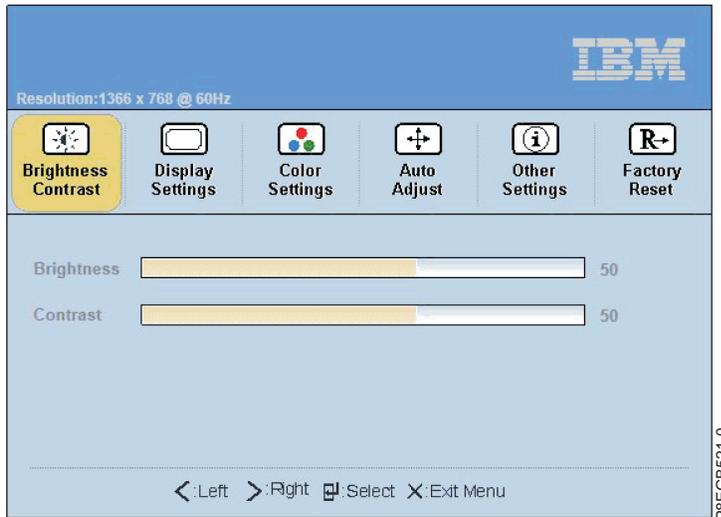
The menu choices are described in the following list:

- **Brightness/Contrast**
  - **Brightness** - Brightness Slider Default 50, incremental adjustment by 0 from 1 - 100
  - **Contrast** - Contrast Slider Default 50, incremental adjustment by 0 from 1 - 100
- **Display Settings**
  - **Wide Mode**
    - 1:1 - Uses exact pixel count from video controller
    - Aspect - Uses pixel ratio but scales to largest available picture
    - Fill - Default. Scales incoming image to utilize full screen
  - **Horizontal Position** - Screen picture adjustment - Default at 50 Center of the Screen, incremental adjustment by 1 pixel from 0 - 100
  - **Vertical Position** - Screen picture adjustment - Default at 50 Center of the Screen, incremental adjustment by 1 pixel from 0 - 100
  - **Sharpness** - Visual reference to light and dark - Default 50, incremental adjustment by 10 from 0 - 100
  - **Pixel Clock** - Analog input control - Default Panel Dependent
  - **Phase** - Analog input control - Default Panel Dependent
  - **Display Info** - Display Resolution and Refresh Rate
  - **Reset Display settings** - Reset Display Settings to Factory Default - confirmation required
- **Color Settings**
  - **Standard**
  - **Warm**

- **Cool**
- **Custom Color** - If selected, the following RGB default values are displayed:
  - **Red** - Default 50, incremental adjustment by 1, from 0 - 100
  - **Blue** - Default 50, incremental adjustment by 1, from 0 - 100
  - **Green** - Default 50, incremental adjustment by 1, from 0 - 100
- **Reset Color Settings** - Resets color to factory default - confirmation required
- **Auto Adjust** - Auto adjustment - confirmation required
- **Other Settings**
  - **Language**
    - **English** - Converts OSD UI into local language chosen by user (default language)
    - **Spanish** - Converts OSD UI into local language chosen by user
    - **French** - Converts OSD UI into local language chosen by user
    - **German** - Converts OSD UI into local language chosen by user
    - **Japanese** - Converts OSD UI into local language chosen by user
    - **Korean** - Converts OSD UI into local language chosen by user
    - **Simple Chinese** - Converts OSD UI into local language chosen by user
  - **Menu Timer** Sliding scale by 5 second increments, from 5 to 100 - default is 20
  - **DDC/CI** On/Off - default is On
  - **LCD Conditioning** On/Off - default is Off
  - **Reset** Reset Other settings to Factory Default - confirmation required
- **Factory Reset** - Reset all settings to default

Maintaining the TFT-LCD display

Learn how to maintain the TFT-LCD display.

Statement 8:

CAUTION: Never remove the cover on a power supply or any part that has the following label attached.

Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Before you perform any maintenance on the display, turn off the power. Observe the following guidelines when you clean the display:
- Gently wipe the device covers and the screen with a soft cloth.

- Remove finger marks and grease with a damp cloth and mild detergent; do not use solvents or abrasives.
- Never use flammable cleaning material to clean an IBM display or any other electronic device.

Technical specifications

This topic provides the detailed technical specifications of the TFT-LCD display unit.

The technical specifications for the console unit are described in the following list.

LCD Panel

Size	18.5-inch diagonal
Display area (horizontal x vertical)	376.32 x 301.056 mm
Type	TFT active matrix
Pixel pitch (horizontal x vertical)	0.294 x 0.294 mm

Characteristics

Brightness	250 cd /m2 (Typ.)
Contrast ratio	1000:1 (Typ.)
Display color	16.7 M colors
Viewing Angle	Horizontal - 170°
	Vertical - 160°
Aspect Ratio	16:9 (Native)
Scaling	1:1, Aspect and Fill

Display resolution

Optimum mode	1280 x 1024 at 60 Hz
Maximum mode	1280 x 1024 at 70 Hz

Note: For the supported display resolutions, see, Supported resolution timing charts.

Connector	VGA

Power Supply	ac 100 - 240 V, 60 - 50 Hz
	dc 12 V/ 5.0 A

Power Consumption

Standard usage	17 watts
Maximum	22 watts
Power supply maximum	40 Watts
Power Saving	Less than 1 Watts

Environmental conditions

Operating temperature	0°C to 50°C
Operating humidity	10% to 80%
Operating altitude maximum	3000 meters
Storage temperature	-20°C to +60°C

| Storage humidity | 5% to 95% |
| Storage altitude maximum | 3000 meters |

Supported resolution timing charts

This topic provides the detailed supported resolution timing charts for the TFT-LCD display unit.

The following tables are the supported resolution timing charts. Although additional resolutions might work, these are the supported signals.

Table 3. 640 x 480 timing chart

Type	Standard			
Timing name	640 x 480 @ 60 Hz		640 x 480 @ 75 Hz	
Horizontal frequency and polarity	31.469 kHz	Negative	37.5 kHz	Negative
Vertical frequency and polarity	59.94 Hz	Negative	75 Hz	Negative
Pixel clock	25.175 MHz		31.5 MHz	
Scan type	Noninterlaced		Noninterlaced	
Horizontal				
Period	31.778 µs	800 pixels	26.667 µs	840 pixels
Display	25.422 µs	640 pixels	20.317 µs	640 pixels
Blanking	6.356 µs	160 pixels	6.349 µs	200 pixels
Sync	3.813 µs	96 pixels	2.032 µs	64 pixels
Back porch	1.907 µs	48 pixels	3.810 µs	120 pixels
Front porch	0.636 µs	16 pixels	0.508 µs	16 pixels
Vertical				
Total	16.683 ms	525 lines	13.333 ms	500 lines
Display	15.253 ms	480 lines	12.800 ms	480 lines
Blanking	1.430 ms	45 lines	0.533 ms	20 lines
Sync	0.064 ms	2 lines	0.080 ms	3 lines
Back porch	1.049 ms	33 lines	0.427 ms	16 lines
Front porch	0.318 ms	10 lines	0.027 ms	1 line

Table 4. 800 x 600 timing chart

Type	Standard			
Timing name	800 x 600 @ 60 Hz		800 x 600 @ 75 Hz	
Horizontal frequency and polarity	37.879 kHz	Positive	46.875 kHz	Positive
Vertical frequency and polarity	60.317 Hz	Positive	75 Hz	Positive
Pixel clock	40 MHz		49.5 MHz	
Scan type	Noninterlaced		Noninterlaced	
Horizontal				
Period	26.400 µs	1056 pixels	21.333 µs	1056 pixels

Table 4. 800 x 600 timing chart (continued)

Type	Standard			
Display	20.000 µs	800 pixels	16.162 µs	800 pixels
Blanking	6.400 µs	256 pixels	5.172 µs	256 pixels
Sync	3.200 µs	128 pixels	1.616 µs	80 pixels
Back porch	2.200 µs	88 pixels	3.232 µs	160 pixels
Front porch	1.000 µs	40 pixels	0.323 µs	16 pixels
Vertical				
Total	16.579 ms	628 lines	13.333 ms	625 lines
Display	15.840 ms	600 lines	12.800 ms	600 lines
Blanking	0.739 ms	28 lines	0.533 ms	25 lines
Sync	0.106 ms	4 lines	0.064 ms	3 lines
Back porch	0.607 ms	23 lines	0.448 ms	21 lines
Front porch	0.026 ms	1 line	0.021 ms	1 line

Table 5. 1024 x 768 timing chart

Type	Standard			
Timing name	800 x 600 @ 60 Hz		800 x 600 @ 75 Hz	
Horizontal frequency and polarity	48.363 kHz	Negative	60.023 kHz	Negative
Vertical frequency and polarity	60.004 Hz	Negative	75.029 Hz	Negative
Pixel clock	65 MHz		78.75 MHz	
Scan type	Noninterlaced		Noninterlaced	
Horizontal				
Period	20.677 µs	1344 pixels	16.660 µs	1312 pixels
Display	15.754 µs	1024 pixels	13.003 µs	1024 pixels
Blanking	4.923 µs	320 pixels	3.657 µs	288 pixels
Sync	2.092 µs	136 pixels	1.219 µs	96 pixels
Back porch	2.462 µs	160 pixels	2.235 µs	176 pixels
Front porch	0.369 µs	24 pixels	0.203 µs	16 pixels
Vertical				
Total	16.666 ms	806 lines	13.328 ms	800 lines
Display	15.880 ms	768 lines	12.795 ms	768 lines
Blanking	0.786 ms	38 lines	0.533 ms	32 lines
Sync	0.124 ms	6 lines	0.050 ms	3 lines
Back porch	0.600 ms	29 lines	0.466 ms	28 lines
Front porch	0.062 ms	3 lines	0.017 ms	1 line

Table 6. 1152 x 864 timing chart

Type	Standard	
Timing name	1152 x 864 @ 60 Hz	1152 x 864 @ 75 Hz

Table 6. 1152 x 864 timing chart (continued)

Type	Standard			
Horizontal frequency and polarity	54.348 kHz	Positive	67.5 kHz	Positive
Vertical frequency and polarity	60.053 Hz	Positive	75 Hz	Positive
Pixel clock	80 MHz		108 MHz	
Scan type	Noninterlaced		Noninterlaced	
Horizontal				
Period	18.400 µs	1472 pixels	14.815 µs	1600 pixels
Display	14.400 µs	1152 pixels	10.667 µs	1152 pixels
Blanking	4.000 µs	320 pixels	4.148 µs	448 pixels
Sync	1.200 µs	96 pixels	1.185 µs	128 pixels
Back porch	2.400 µs	192 pixels	2.370 µs	256 pixels
Front porch	0.400 µs	32 pixels	0.593 µs	64 pixels
Vertical				
Total	16.652 ms	905 lines	13.333 ms	900 lines
Display	15.898 ms	864 lines	12.800 ms	864 lines
Blanking	0.754 ms	41 lines	0.533 ms	36 lines
Sync	0.055 ms	3 lines	0.044 ms	3 lines
Back porch	0.681 ms	37 lines	0.474 ms	32 lines
Front porch	0.018 ms	1 line	0.015 ms	1 line

Table 7. 1366 x 768 timing chart

Type	Standard			
Timing name	1366 x 768 @ 60 Hz		1366 x 768 @ 75 Hz	
Horizontal frequency and polarity	47.712 kHz	Positive	60.15 kHz	Positive
Vertical frequency and polarity	60.053 Hz	Positive	75 Hz	Positive
Pixel clock	85.5 MHz		110.195 MHz	
Scan type	Noninterlaced		Noninterlaced	
Horizontal				
Period	20.959 µs	1792 pixels	16.625 µs	1832 pixels
Display	15.976 µs	1366 pixels	12.396 µs	1366 pixels
Blanking	4.983 µs	426 pixels	4.231 µs	466 pixels
Sync	1.310 µs	112 pixels	1.307 µs	144 pixels
Back porch	2.929 µs	250 pixels	2.120 µs	234 pixels
Front porch	0.749 µs	64 pixels	0.799 µs	88 pixels
Vertical				
Total	16.662 ms	795 lines	13.333 ms	802 lines
Display	16.097 ms	768 lines	12.768 ms	768 lines
Blanking	0.566 ms	27 lines	0.565 ms	34 lines

Table 7. 1366 x 768 timing chart (continued)

Type	Standard			
Sync	0.126 ms	6 lines	0.049 ms	3 lines
Back porch	0.377 ms	18 lines	0.498 ms	30 lines
Front porch	0.063 ms	3 lines	0.015 ms	1 line

Table 8. 1280 x 800 timing chart

Type	Standard			
Timing name	1280 x 800 @ 60 Hz		1280 x 800 @ 75 Hz	
Horizontal frequency and polarity	49.702 kHz	Negative	62.795 kHz	Negative
Vertical frequency and polarity	59.81 Hz	Positive	74.934 Hz	Positive
Pixel clock	83.5 MHz		106.5 MHz	
Scan type	Noninterlaced		Noninterlaced	
Horizontal				
Period	20.120 µs	1680 pixels	15.925 µs	1696 pixels
Display	15.329 µs	1280 pixels	12.019 µs	1280 pixels
Blanking	4.790 µs	400 pixels	3.906 µs	416 pixels
Sync	1.533 µs	128 pixels	1.202 µs	128 pixels
Back porch	2.395 µs	200 pixels	1.935 µs	206 pixels
Front porch	0.862 µs	72 pixels	0.751 µs	80 pixels
Vertical				
Total	16.720 ms	831 lines	13.345 ms	838 lines
Display	16.096 ms	800 lines	12.740 ms	800 lines
Blanking	0.624 ms	31 lines	0.605 ms	38 lines
Sync	0.121 ms	6 lines	0.096 ms	6 lines
Back porch	0.443 ms	22 lines	0.462 ms	29 lines
Front porch	0.060 ms	3 lines	0.048 ms	3 lines

Table 9. 1280 x 1024 timing chart

Type	Standard			
Timing name	1280 x 1024 @ 60 Hz		1280 x 1024 @ 75 Hz	
Horizontal frequency and polarity	63.981 kHz	Positive	79.976 kHz	Positive
Vertical frequency and polarity	60.02 Hz	Positive	75.025 Hz	Positive
Pixel clock	108 MHz		135 MHz	
Scan type	Noninterlaced		Noninterlaced	
Horizontal				
Period	15.630 µs	1688 pixels	12.504 µs	1688 pixels
Display	11.852 µs	1280 pixels	9.481 µs	1280 pixels
Blanking	3.778 µs	408 pixels	3.022 µs	408 pixels

Table 9. 1280 x 1024 timing chart (continued)

Type	Standard			
Sync	1.037 µs	112 pixels	1.067 µs	144 pixels
Back porch	2.296 µs	248 pixels	1.837 µs	248 pixels
Front porch	0.444 µs	48 pixels	0.119 µs	16 pixels
Vertical				
Total	16.661 ms	1066 lines	13.329 ms	1066 lines
Display	16.005 ms	1024 lines	12.804 ms	1024 lines
Blanking	0.656 ms	42 lines	0.525 ms	42 lines
Sync	0.047 ms	3 lines	0.038 ms	3 lines
Back porch	0.594 ms	38 lines	0.475 ms	38 lines
Front porch	0.016 ms	1 line	0.013 ms	1 line

Table 10. 1440 x 900 timing chart

Type	Standard			
Timing name	1440 x 900 @ 60 Hz		1440 x 900 @ 75 Hz	
Horizontal frequency and polarity	55.935 kHz	Negative	70.635 kHz	Negative
Vertical frequency and polarity	59.887 Hz	Positive	74.984 Hz	Positive
Pixel clock	106.5 MHz		136.75 MHz	
Scan type	Noninterlaced		Noninterlaced	
Horizontal				
Period	17.878 µs	1904 pixels	14.157 µs	1936 pixels
Display	13.521 µs	1440 pixels	10.530 µs	1440 pixels
Blanking	4.357 µs	464 pixels	3.627 µs	496 pixels
Sync	1.427 µs	152 pixels	1.112 µs	152 pixels
Back porch	2.178 µs	232 pixels	1.814 µs	248 pixels
Front porch	0.751 µs	80 pixels	0.702 µs	96 pixels
Vertical				
Total	16.698 ms	934 lines	13.336 ms	942 lines
Display	16.090 ms	900 lines	12.741 ms	900 lines
Blanking	0.608 ms	34 lines	0.595 ms	42 lines
Sync	0.107 ms	6 lines	0.085 ms	6 lines
Back porch	0.447 ms	25 lines	0.467 ms	33 lines
Front porch	0.054 ms	3 lines	0.042 ms	3 lines

Table 11. 1600 x 1200 timing chart

Type	Standard			
Timing name	1600 x 1200 @ 60 Hz		1600 x 1200 @ 75 Hz	
Horizontal frequency and polarity	75 kHz	Positive	65.29 kHz	Negative

Table 11. 1600 x 1200 timing chart (continued)

Type	Standard			
Vertical frequency and polarity	60 Hz	Positive	59.954 Hz	Positive
Pixel clock	162 MHz		146.25 MHz	
Scan type	Noninterlaced		Noninterlaced	
Horizontal				
Period	13.333 μs	2160 pixels	15.316 μs	2240 pixels
Display	9.877 μs	1600 pixels	11.487 μs	1680 pixels
Blanking	3.457 μs	560 pixels	3.829 μs	560 pixels
Sync	1.185 μs	192 pixels	1.203 μs	176 pixels
Back porch	1.877 μs	304 pixels	1.915 μs	280 pixels
Front porch	0.395 μs	64 pixels	0.711 μs	104 pixels
Vertical				
Total	16.667 ms	1250 lines	16.679 ms	1084 lines
Display	16.000 ms	1200 lines	16.082 ms	1050 lines
Blanking	0.667 ms	50 lines	0.597 ms	39 lines
Sync	0.040 ms	3 lines	0.092 ms	6 lines
Back porch	0.613 ms	46 lines	0.459 ms	30 lines
Front porch	0.013 ms	1 line	0.046 ms	3 lines

Hardware maintenance information

This topic collection provides the information about the IBM Customer-replaceable units (CRUs) for the console unit and instructions for the replacement parts.

Replaceable components

This topic provides the information about the replaceable components of the 7316-TF4 18.5-Inch Flat Panel Rack-Mounted Monitor and Keyboard console.

Field replaceable units (FRUs) must be replaced only by a trained service technician, unless they are classified as customer replaceable units (CRUs).

Tier 1 CRU: Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request without a service contract, you will be charged for the installation.

Tier 2 CRU: You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your product.

For more information about the terms of the warranty and getting service and assistance, see the *Warranty Information* document that comes with the optional device.

IBM CRU part numbers are subject to change without notice. This section contains a listing of the CRU part numbers that are available as of the date of this document was written.

1U standard console

Right rail

Left rail

P8EGB524-0
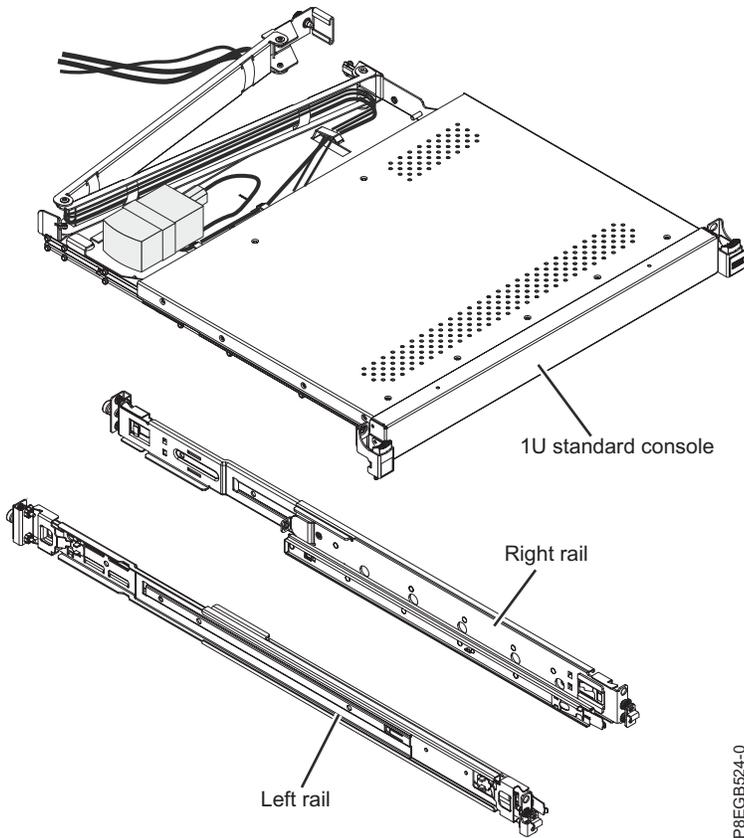
Table 12. Field replaceable units for the IBM 1U 18.5-inch Standard Console

Description	CRU part number (Tier 1)
IBM 1U 18.5-inch Standard Console, without keyboard	47C2521
Standard slide-rail kit (inner and outer rails)	44X3116
Cable-management arm	44X3114
Miscellaneous parts kit (includes shipping screws, console switch mounting brackets and mounting screws)	44X3120
Power cord that connects the power supply to a power distribution unit (PDU)	39M5377

You need the following tools to replace customer replaceable units:

- One #1 Phillips screwdriver (to install or remove the inner slide-rails)
- One #2 Phillips screwdriver (to replace the cable-management arm)

Power cords

This topic provides the information about the power cords and the part number of the power cords for different countries across the world.

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country or region are usually available only in that country or region.

Table 13. Power cord part numbers and associated regions

IBM power cord part number	Used in these countries and regions
39M5206	China
39M5102	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea
39M5123	Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Azerbaijan, Belarus, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Democratic Republic of), Congo (Republic of), Cote D'Ivoire (Ivory Coast), Croatia (Republic of), Czech Republic, Dahomey, Djibouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, French Guyana, French Polynesia, Germany, Greece, Guadeloupe, Guinea, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Kazakhstan, Kyrgyzstan, Laos (People's Democratic Republic of), Latvia, Lebanon, Lithuania, Luxembourg, Macedonia (former Yugoslav Republic of), Madagascar, Mali, Martinique, Mauritania, Mauritius, Mayotte, Moldova (Republic of), Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Reunion, Romania, Russian Federation, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia (Republic of), Somalia, Spain, Suriname, Sweden, Syrian Arab Republic, Tajikistan, Tahiti, Togo, Tunisia, Turkey, Turkmenistan, Ukraine, Upper Volta, Uzbekistan, Vanuatu, Vietnam, Wallis and Futuna, Yugoslavia (Federal Republic of), Zaire
39M5130	Denmark
39M5144	Bangladesh, Lesotho, Macao, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda

Table 13. Power cord part numbers and associated regions (continued)

IBM power cord part number	Used in these countries and regions
39M5151	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dominica, Gambia, Ghana, Grenada, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Polynesia, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad and Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
39M5158	Liechtenstein, Switzerland
39M5165	Chile, Italy, Libyan Arab Jamahiriya
39M5172	Israel
39M5095	220 - 240 V Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Taiwan, United States of America, Venezuela
39M5081	110 - 120 V Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Taiwan, United States of America, Venezuela
39M5219	Korea (Democratic People's Republic of), Korea (Republic of)
39M5199	Japan
39M5068	Argentina, Paraguay, Uruguay
39M5226	India
39M5233	Brazil

Replacing the keyboard

Learn how to replace the keyboard from the console unit.

Before you replace the keyboard, remove any devices that are directly above the console unit so that you have access to disconnect the cables. See the documentation that comes with the device for removal instructions.

You can also remove the console unit from the rack for easier cable access. See the instructions in Removing the console unit from the rack; then, return to step 5 in this procedure.

To replace a keyboard in the console unit, complete the following steps:
1. Close the flat-panel display.
2. Disconnect the keyboard-and-mouse cable from the server or console switch.

3. Carefully unfasten the hook-and-loop fastener strips from the cable-management arm and remove the keyboard-and-mouse cable.

   L012

   CAUTION: Pinch hazard. (L012)

4. Fully extend the console unit out of the rack.
5. Lift the front of the flat-panel display and raise the display to the full upright position.
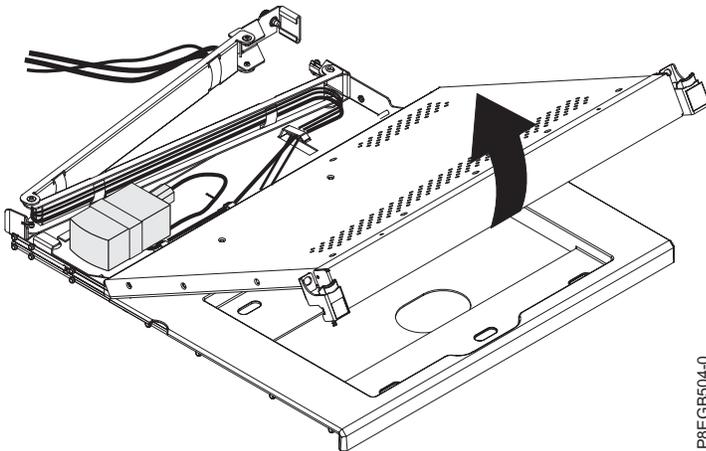
6. Remove the old keyboard from the console unit.
7. Unpack the replacement keyboard.

   Note: Do not extend the keyboard feet. The flat-panel display screen might be damaged if the feet is extended when the display is closed.

8. Hold the new keyboard near the keyboard tray and carefully route the keyboard-and-mouse cable down through the keyboard tray cutout and up through the cutout that is behind the flat-panel display. (See the illustration.) Carefully pull the cable through the cutouts.

P8EGB505-0
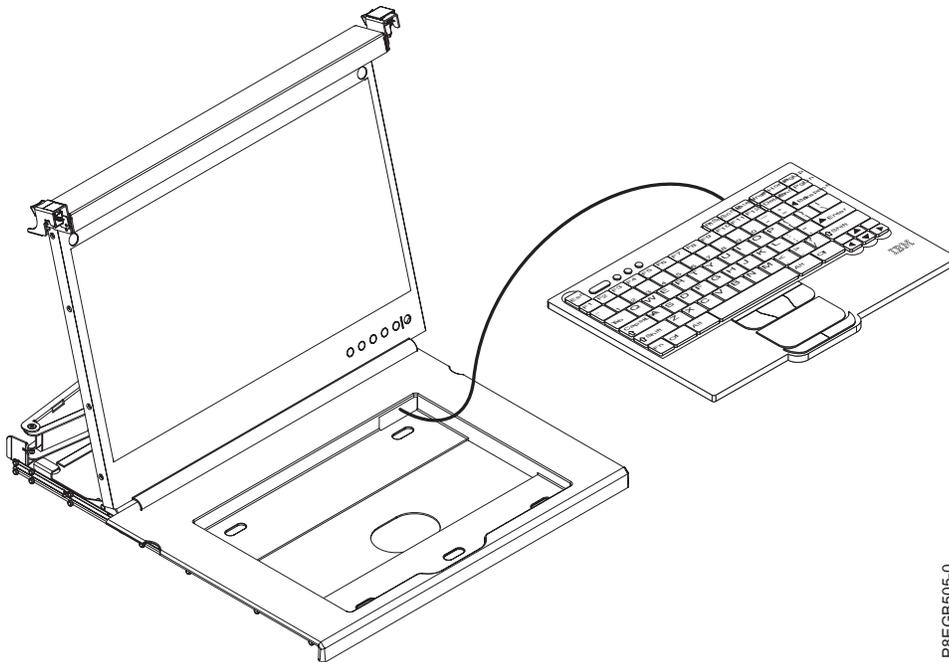
9. Place the keyboard in the tray and exert a small amount of pressure on the keyboard to secure it to the double-sided tape on the front of the console tray.

10. Close the flat-panel display.

11. If you removed the console unit from the rack, go to "Installing the console unit in the rack" to complete the procedure.

    Note: When you route the keyboard-and-mouse cable, make sure that the cable does not hang below the underside of the keyboard where it might be damaged if it interferes with the devices in the rack space below the console unit.

12. Route the keyboard-and-mouse cable along the cable-management arm, securing the cable with the hook-and-loop fastener strips.

13. Reconnect the keyboard-and-mouse cable.

Replacing the cable-management arm

Learn how to replace the cable-management arm from the console unit.

Before you replace the cable-management arm, remove any devices that are directly above and below the console unit so that you can disconnect the cables and detach the cable-management arm. See the documentation that comes with the device for removal instructions.

You can also remove the console unit from the rack for easier access. See the instructions in Removing the console unit from the rack; then, return to step 5 in this procedure.

To replace the cable-management arm, complete the following steps:

1. If a console switch is installed behind the console unit, remove the console switch from the rack.

2. Turn off the display and disconnect the power cord from the short jumper cord on the cable-management arm from the electrical outlet or power distribution unit (PDU). Disconnect from the server or console switch any cables that are connected to the console unit (keyboard-and-mouse, video, and power cables).

3. Close the flat-panel display.

4. Temporarily remove all cables from the cable-management arm.

5. Remove the screw that attaches the front cable-management arm bracket to the console unit and then, remove the cable-management arm.
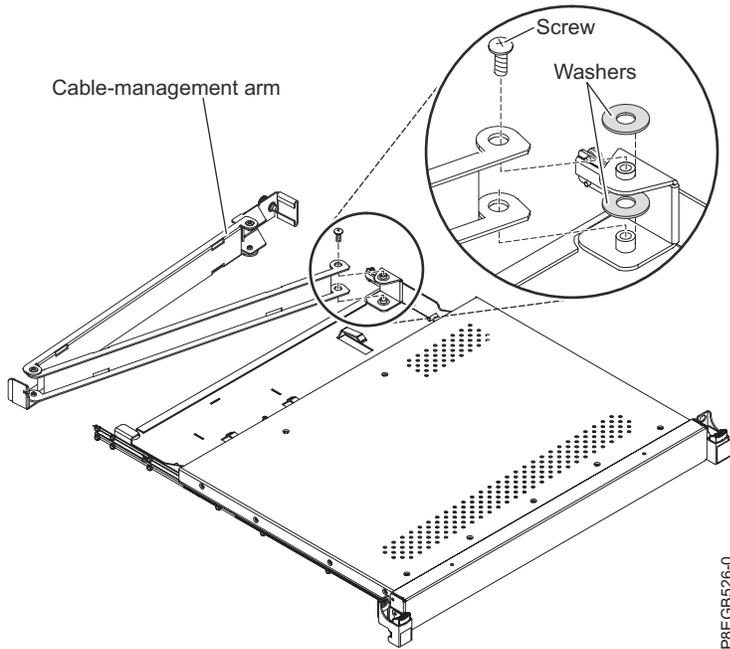
6. Unpack the replacement cable-management arm.
7. Remove the two washers on the cable-management arm bracket and replace them with the new washers that come with the replacement cable-management arm.
8. Align the screw holes in the new cable-management arm with the bracket and secure it with the screw that you removed in step 5.
9. If you removed the console unit from the rack, go to Installing the console unit in the rack to complete the procedure.
10. Route the cables that you removed in step 2 along the new cable-management arm and secure them along the way with the hook-and-loop fastener strips.
11. Align the C-channel on the end of the cable-management arm with the bracket on the console unit. Slide the C-channel onto the bracket until the cable-management arm thumbscrew aligns with the hole in the bracket. Tighten the thumbscrew.

Thumbscrew

Cable-management arm

P8EGB513-0
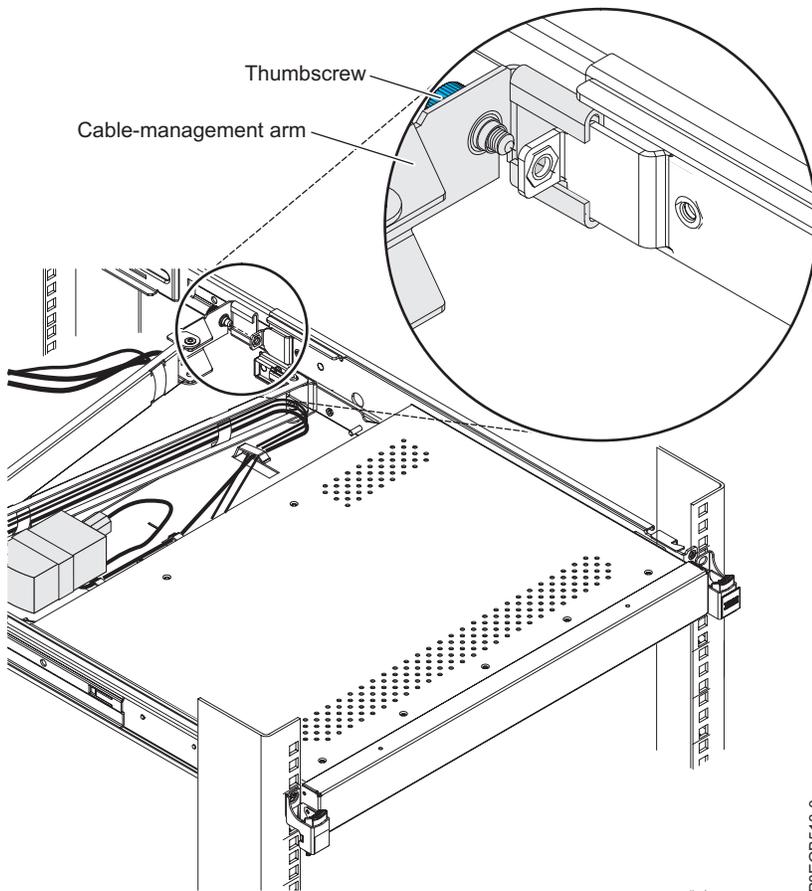
12. If you removed a console switch from behind the console unit, reinstall it now.

13. Reconnect to the server or console switch all cables that you removed in step 2.

14. Connect power to the display.

Replacing the slide-rail assemblies

Learn how to replace the slide-rail assemblies.

Note: To make sure that the slide-rail assemblies fit correctly, replace both the outer and inner slide-rails at the same time.

To replace the outer and inner slide-rails for the console unit, complete the following steps:

1. If a console switch is installed behind the console unit, remove the console switch from the rack.

2. Turn off the display and disconnect the power cord from the short jumper cord on the cable-management arm from the electrical outlet or power distribution unit (PDU). Disconnect from the server or console switch any cables that are connected to the console unit (keyboard-and-mouse, video, and power cables).

3. Close the flat-panel display.

4. If you installed the optional flat-head stabilizer screws in the top hole on the front of each slide-rail, remove them and set them aside.
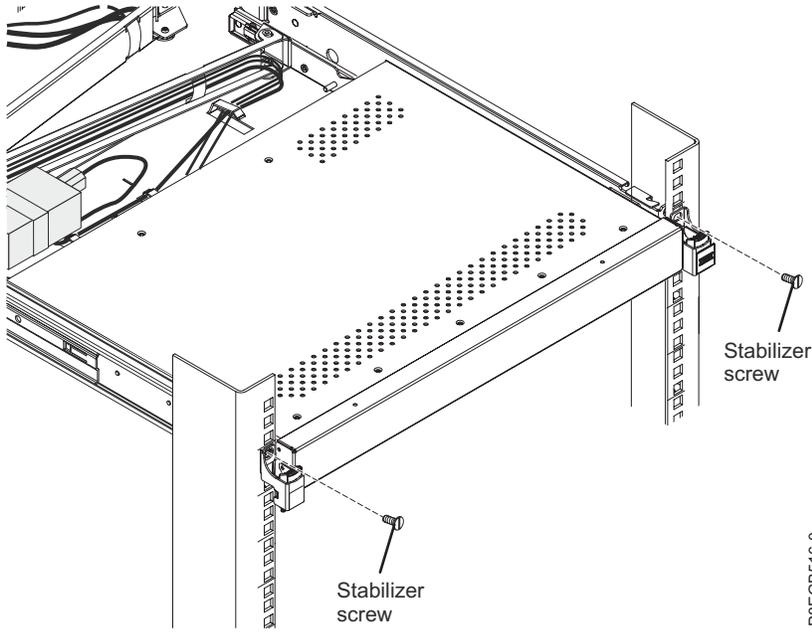
Stabilizer screw

Stabilizer screw

P8EGB516-0

5. Remove the console unit from the rack:

   a. Remove the thumbscrew that attaches the cable-management arm to the outer slide-rail bracket. Slide the C-channel on the cable-management arm completely away from the bracket on the console unit.

Thumbscrew

Cable-management arm

P8EGB513-0
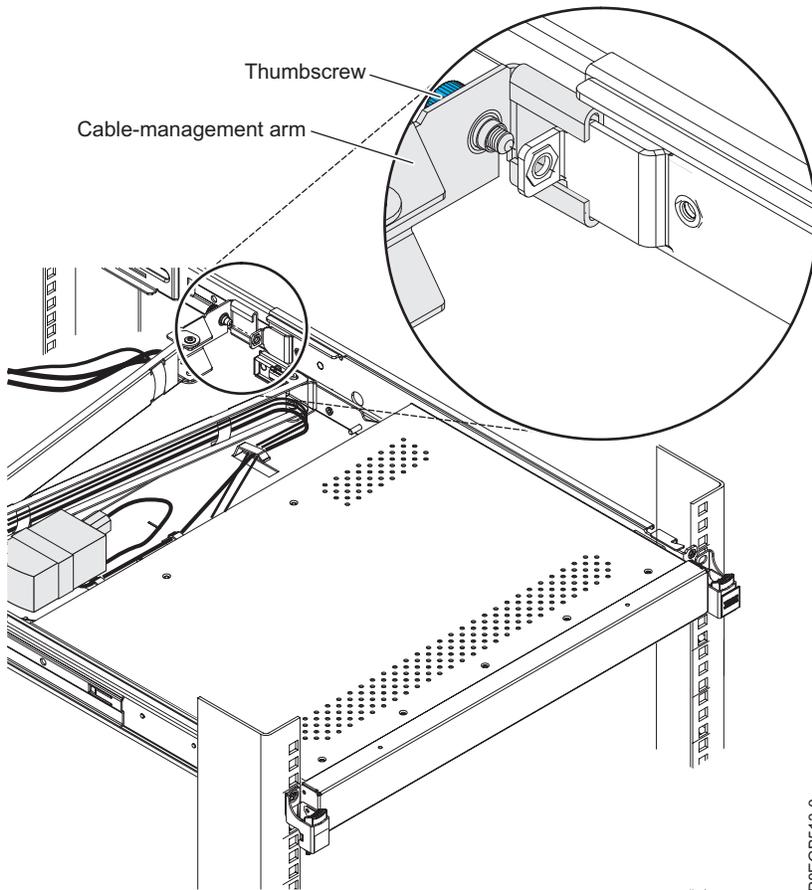
L012

CAUTION: Pinch hazard. (L012)

b. Fully extend the console unit out of the rack.

c. Press in both release latches 1.

Release latch

d. Grasp both sides of the console unit and pull it completely out of the rack 2.

e. Place the console unit on a table or other flat surface.

6. To close the extended rails, press up on the release latch 1 and push the extended rail towards the rack so that it is fully closed 2.

P8EGB527-0
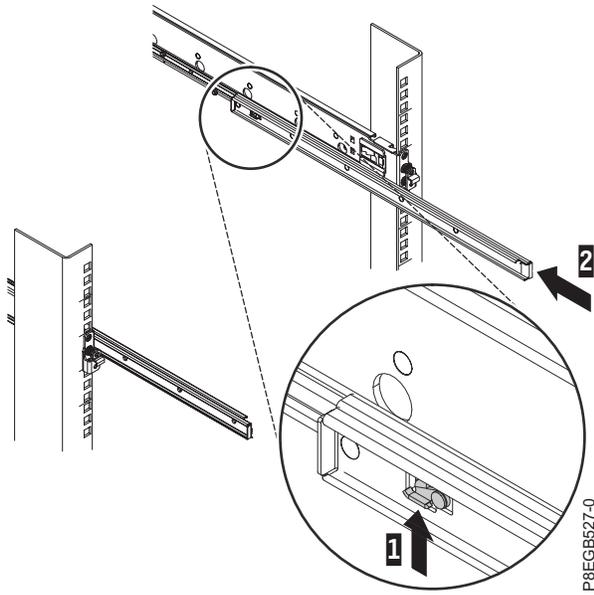
7. Remove the rear bracket of the outer slide-rail from the rack by pulling the blue tab out 1 while you move the end of the slide-rail away from the rack flange and toward the center of the rack 2.

P8EGB528-0
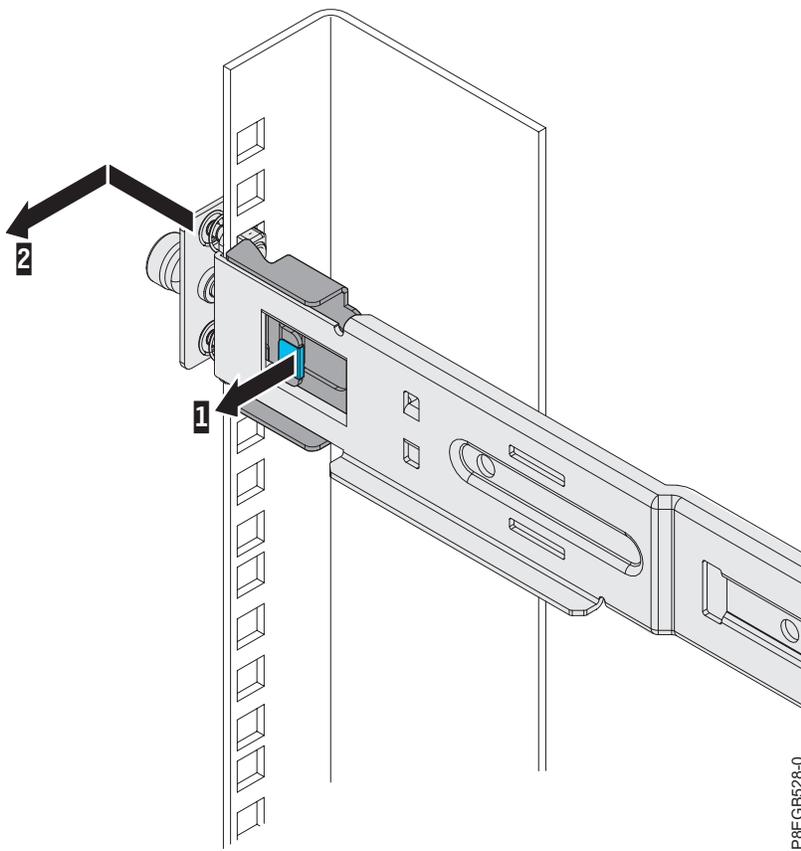
8. Remove the front bracket of the outer slide-rail from the rack by pulling the blue tab out 1 while you pull the end of the slide-rail away from the rack flange and toward the center of the rack 2.

P8EGB529-0
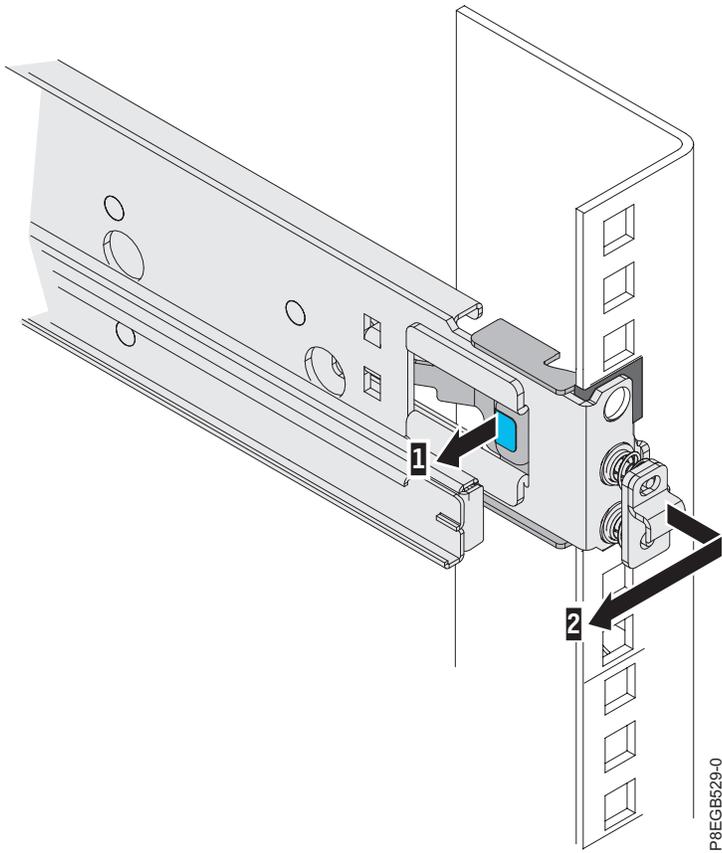
Repeat step 7 and step 8 for the other outer slide-rail.

9. Remove the shipping screw from each new outer slide-rail.

P8EGB506-0

10. To attach the outer slide-rail to the rack, complete the following steps.

   Note: Install the rear slide-rail bracket to the rear of the rack first; then, install the front slide-rail bracket to the front of the rack.

   a. Holding the slide-rail horizontally, align the rear slide-rail bracket so that the bracket is on the outside of the rack mounting flanges.

b. Press the rear slide-rail bracket toward the rack flange and then pull it towards the front of the rack until the locking bracket clicks into place behind the rack flange.

Slide-rail rear

P8EGB508-0

c. Extend the slide-rail and press the front slide-rail bracket toward the rack flange and then push it towards the rear of the rack until the locking bracket clicks into place behind the rack flange.

Slide-rail front

P8EGB509-0

d. Repeat steps 10a to 10c to attach the other outer slide-rail.

11. Use a #1 Phillips screwdriver to remove the four screws that attach each inner slide-rail to the console unit. Then, attach the corresponding new inner slide-rails to the unit, using the same hardware. Make sure that you orient the inner slide rails correctly (see the illustration).

Rear

Front

P8EGB530-0
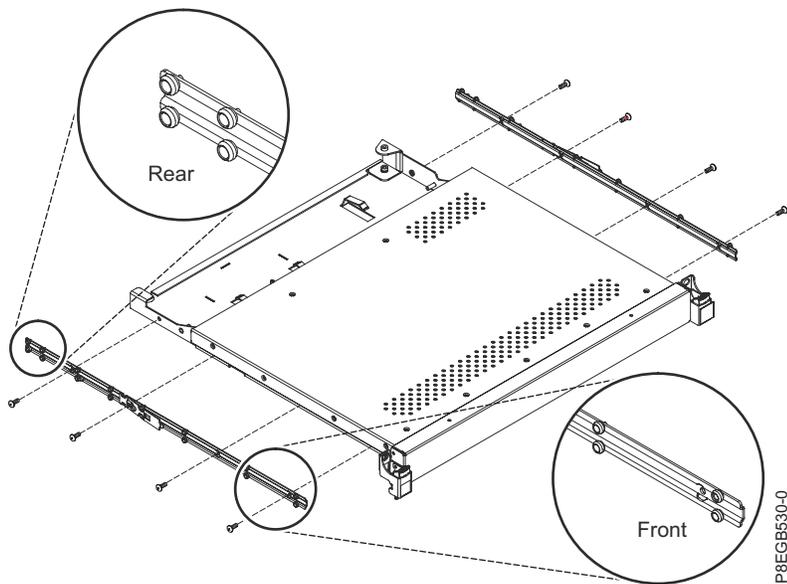
12. Go to Installing the console unit in the rack for instructions for reinstalling the console unit in the rack, and then install any other devices that you removed from the rack.

Replacing the console unit

This topic collection provides the information on how to replace the console unit.

The procedures that are provided in this section to replace the console unit in the rack consist of the following tasks:

1. Removing the existing console unit from the rack
2. Moving the keyboard from the existing console unit to the replacement console unit
3. Removing and replacing the outer slide-rails

   Note: The replacement console unit comes with inner slide-rails attached. To make sure that the slide-rail assemblies fit correctly, replace the existing outer slide-rails with the new rails that come with the replacement console unit.

4. Installing the replacement console unit in the rack.

   Removing the rack doors and side panels might make removal of the existing console unit and installation of the replacement easier. See the documentation that comes with the rack for additional information.

Removing the console unit from the rack

Learn how to remove the console unit from the rack.

To remove the console unit from the rack, complete the following steps:

1. If a console switch is installed behind the console unit, remove the console switch from the rack.
2. Turn off the display and disconnect the power cord from the short jumper cord on the cable-management arm from the electrical outlet or power distribution unit (PDU). Disconnect from the server or console switch any cables that are connected to the console unit (keyboard-and-mouse, video, and power cables).
3. Close the flat-panel display.
4. Remove the console unit from the rack:
   a. Remove the thumbscrew that attaches the cable-management arm to the outer slide-rail bracket. Slide the C-channel on the cable-management arm completely away from the bracket on the
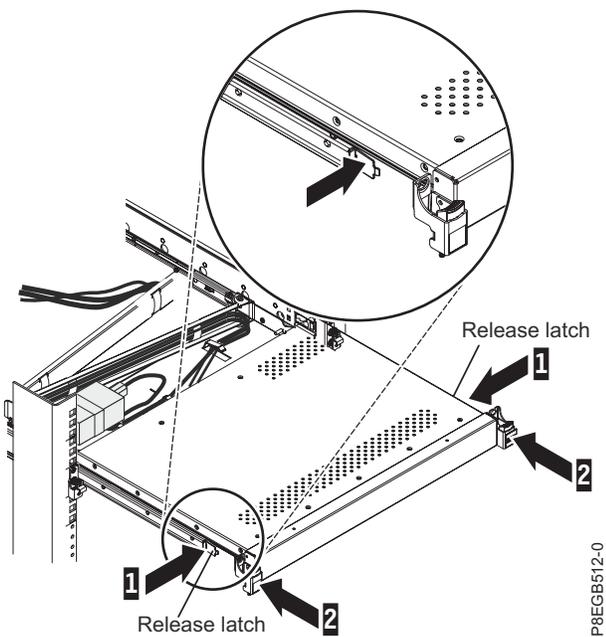
console unit.

Thumbscrew

Cable-management arm

P8EGB513-0

L012

P8EGB525-0

CAUTION: Pinch hazard. (L012)

b. Fully extend the console unit out of the rack.

c. Press in both release latches 1.

Release latch

Release latch

P8EGB512-0
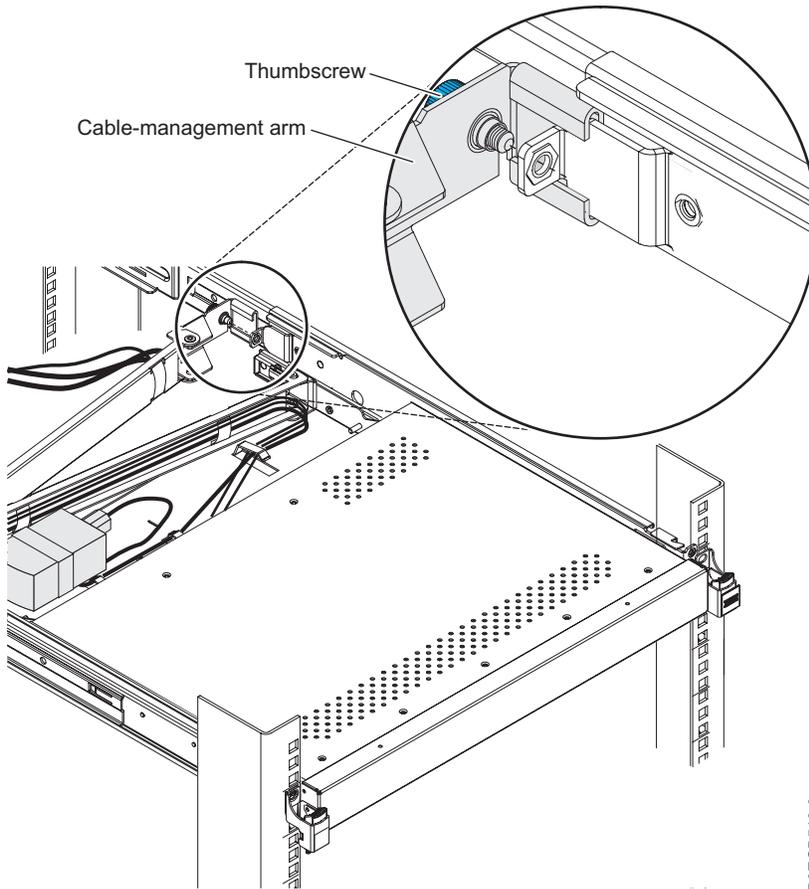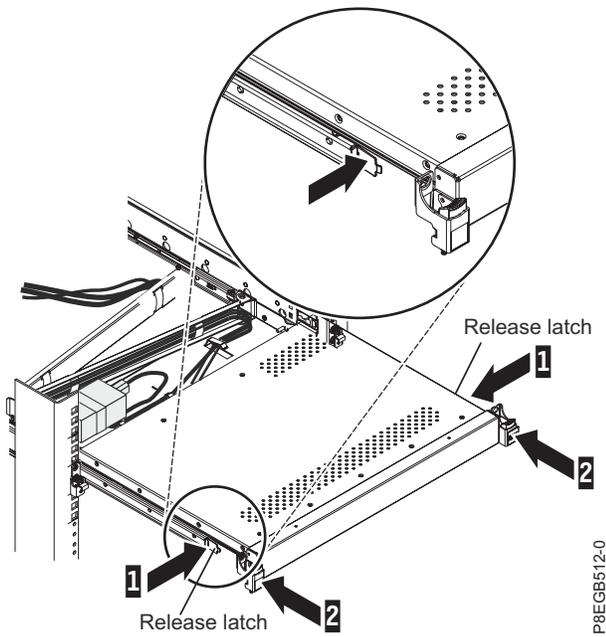
d. Grasp both sides of the console unit and pull it completely out of the rack 2.

e. Place the console unit on a table or other flat surface.

Moving the keyboard

Learn how to move the keyboard from the console unit.

To move the keyboard from the existing console unit to the replacement console unit, complete the following steps:

1. Carefully lift the flat-panel display to the full upright position.

2. Remove the keyboard-and-mouse cable from the keyboard tray, and then remove the keyboard from the console unit and set it aside.

3. Place the replacement console unit on a table or other flat surface and make sure that the right side of the unit extends approximately 76 mm (3 in.) over the edge of the surface. This will help you route the keyboard-and-mouse cable more easily.

4. Hold the keyboard near the keyboard tray and carefully route the keyboard-and-mouse cable down through the keyboard tray cutout and up through the cutout that is behind the flat-panel display. (See the illustration.) Carefully pull the cable through the cutouts.

P8EGB505-0
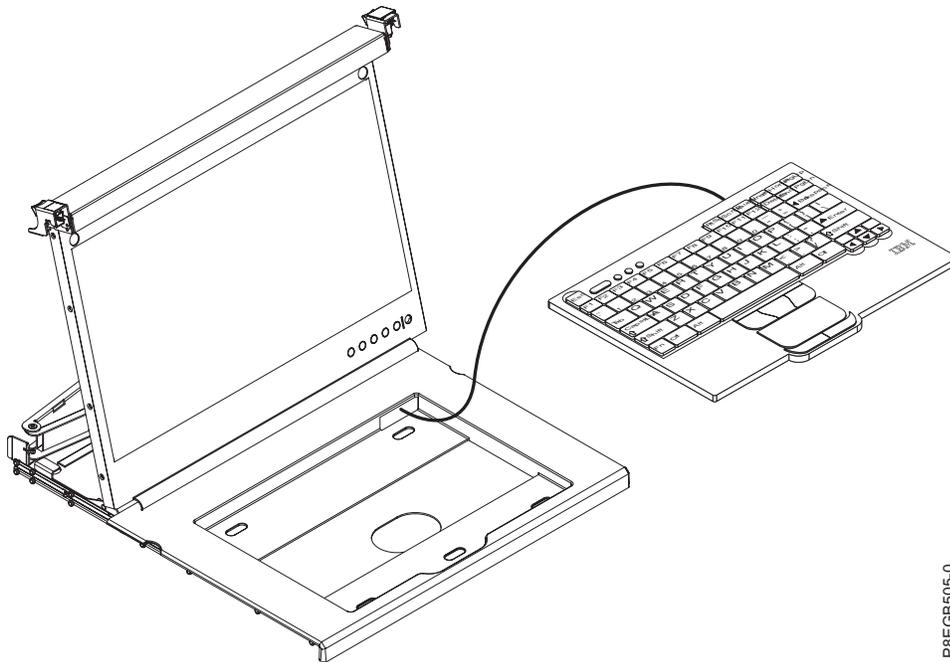
5. Place the keyboard in the tray and exert a small amount of pressure on the keyboard to secure it to the double-sided tape on the front of the console tray.

6. Close the flat-panel display.

   Attention:

   - When you route the keyboard-and-mouse cable, make sure that the cable does not hang below the underside of the keyboard where it might be damaged if it interferes with the devices in the rack space below the console unit.

   - Make sure that you route all cables through the cable-routing features on the console frame behind the display and along the cable-management arm.

7. Close the flat-panel display.

Removing and replacing the outer slide-rails

Learn how to remove and replace the outer slide-rails.

To remove and replace the outer slide-rails, complete the following steps:

1. Remove the rear bracket of the outer slide-rail from the rack by pulling the blue tab out **1** while you move the end of the slide-rail away from the rack flange and toward the center of the rack **2**.

P8EGB528-0
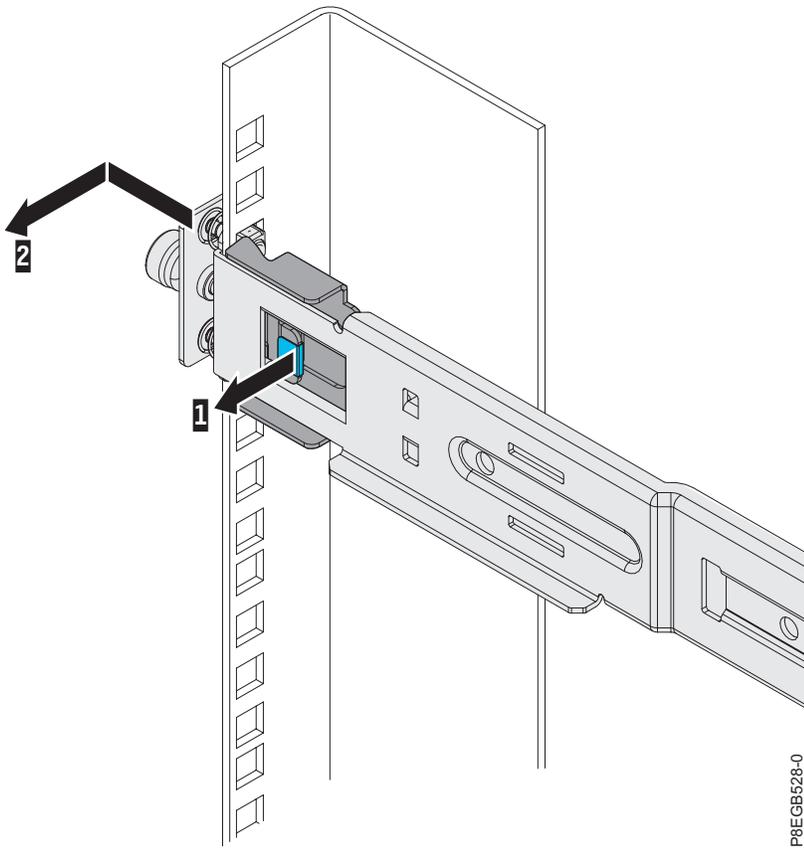
2. Remove the front bracket of the outer slide-rail from the rack by pulling the blue tab out **1** while you pull the end of the slide-rail away from the rack flange and toward the center of the rack **2**. Repeat step 1 and step 2 for the other outer slide-rail.

P8EGB529-0

3. Remove the shipping screw from each new outer slide-rail.

Slide-rail rear

Shipping screw

Slide-rail front

Shipping screw

P8EGB506-0

4. To attach the outer slide-rail to the rack, complete the following steps.

   Note: Install the rear slide-rail bracket to the rear of the rack first; then, install the front slide-rail bracket to the front of the rack.

   a. Holding the slide-rail horizontally, align the rear slide-rail bracket so that the bracket is on the outside of the rack mounting flanges.

b. Press the rear slide-rail bracket towards the rack flange and then pull it towards the front of the rack until the locking bracket clicks into place behind the rack flange.

Slide-rail rear

P8EGB508-0

c. Extend the slide-rail and press the front slide-rail bracket towards the rack flange and then push it towards the rear of the rack until the locking bracket clicks into place behind the rack flange.

Slide-rail front

P8EGB509-0

d. Repeat steps 4a to 4c to attach the other outer slide-rail.

Installing the console unit in the rack

Learn how to install the console unit in the rack.

To install the console unit in the rack, complete the following steps:

1. Extend the inner part of the outer slide-rails and slide them forward to the front of the outer rails. Carefully slide the rollers on the console unit into the notch in the slide-rails as shown in the illustration.
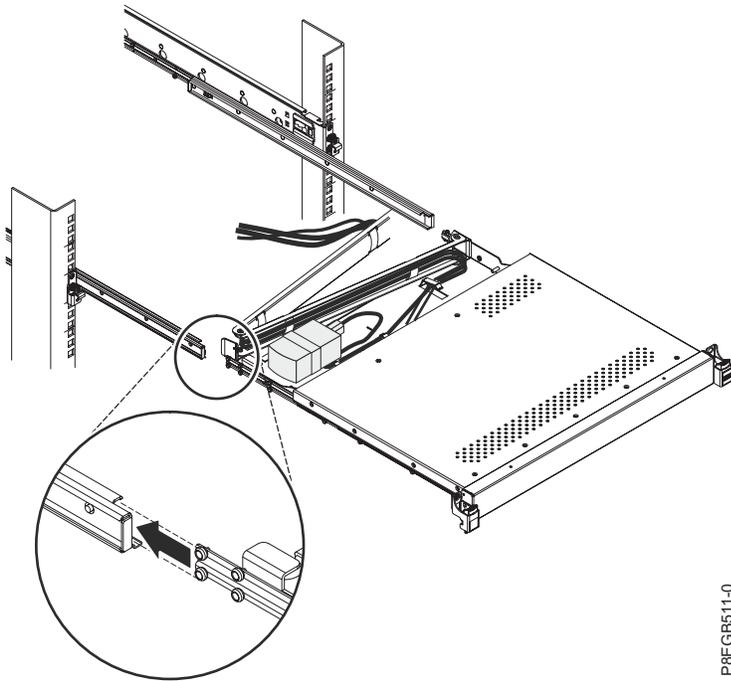
P8EGB511-0

2. Press in both release latches **1**; then, grasp both sides of the console unit and push it completely into the rack **2**. There will be resistance initially as the inner and outer rails are aligned. Pull the console unit out halfway, and then push it back in to seat the console unit in the rails. Do this a few times until the console unit moves smoothly in the rails.

Release latch

1

2

1

Release latch

2
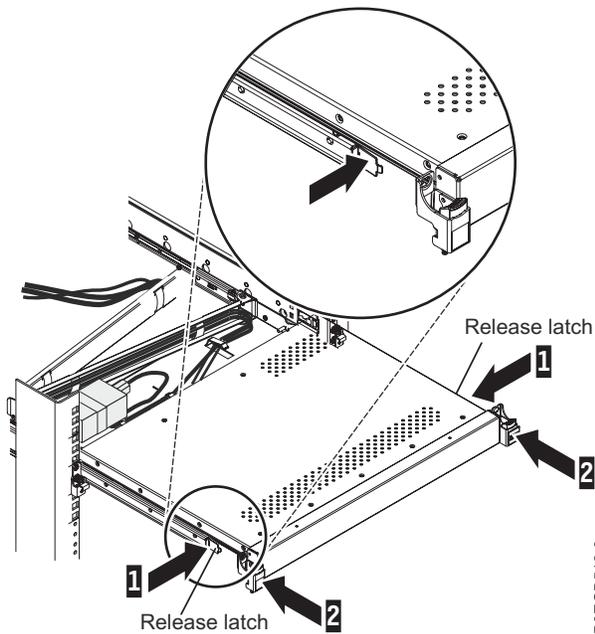
P8EGB512-0

3. Align the C-channel on the end of the cable-management arm with the bracket on the console unit. Slide the C-channel onto the bracket until the cable-management arm thumbscrew aligns with the hole in the bracket. Tighten the thumbscrew.

Thumbscrew

Cable-management arm
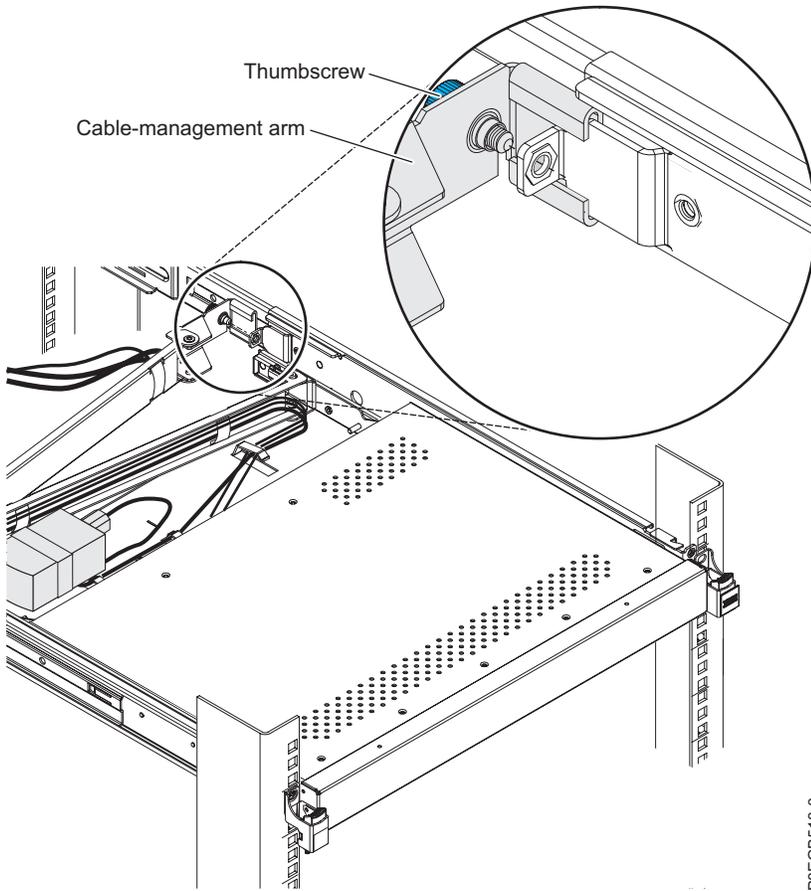
P8EGB513-0

4. Reinstall the stabilizer screws if you have removed them.

Stabilizer screw

Stabilizer screw
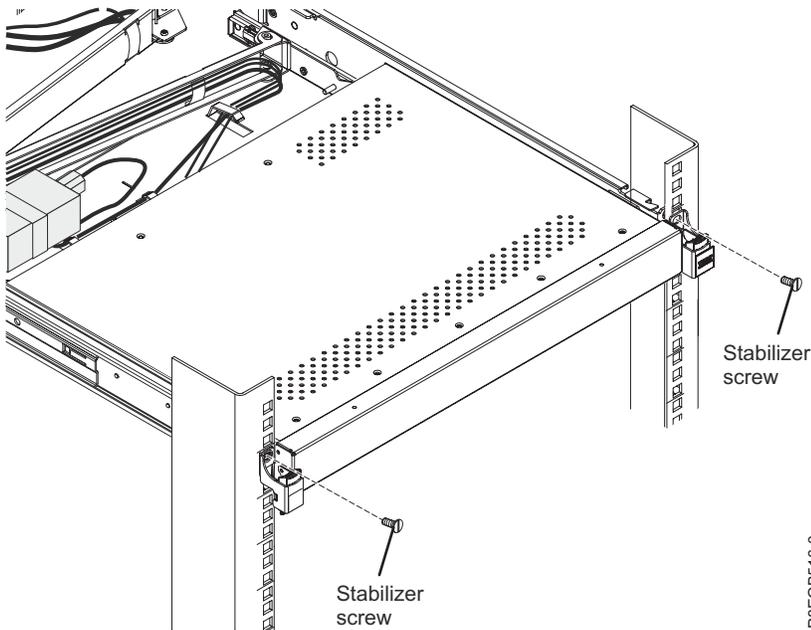
P8EGB516-0

5. If you removed a console switch from behind the console unit, reinstall it now.
6. Reconnect to the server or console switch all cables that you removed.

7. Connect power to the display.
8. Fully extend the console unit from the front of the rack, and then neatly route the cables within the rack and secure them with cable straps along the way.

   Important: If you have excess video cable, do not coil it as shown in the following illustration.

P8EGB514-0

To minimize the electrical interference if you have excess video cable, arrange the cable in figure-eight loops, as shown in the following illustration. Secure the cable in the middle with a cable tie or strap.

Cable tie
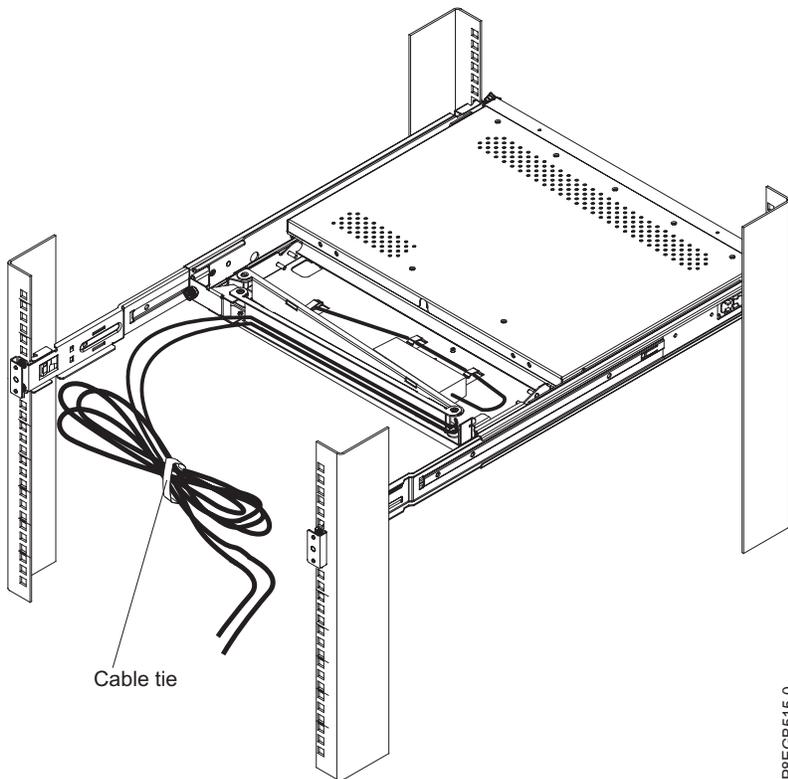
P8EGB515-0

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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 IBM servers that contain the POWER8 processor and its features unless designated as electromagnetic compatibility (EMC) Class B in the feature information.

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.

European Community Compliance Statement

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:
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Technical Regulations, Department M372
IBM-Allee 1, 71139 Ehningen, Germany
Tele: +49 (0) 800 225 5423 or +49 (0) 180 331 3233
email: halloibm@de.ibm.com

Warning: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

VCCI Statement - Japan

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

This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

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

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      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.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

IBM Taiwan Contact Information:

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

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Germany Compliance Statement

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

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"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
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IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 (0) 800 225 5423 or +49 (0) 180 331 3233
email: halloibm@de.ibm.com

Generelle Informationen:

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

Electromagnetic Interference (EMI) Statement - Russia

ВНИМАНИЕ! Настоящее изделие относится к классу А.
В жилых помещениях оно может создавать
радиопомехи, для снижения которых необходимы
дополнительные меры

Class B Notices

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

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

European Community Compliance Statement

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

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高調波ガイドライン準用品

IBM Taiwan Contact Information

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Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse B EU-Richtlinie zur Elektromagnetischen Verträglichkeit

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Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

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Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
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Generelle Informationen:

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