

Integrated Storage Platform and DECraid+ Storage Systems Installation/Owner's Guide

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Safety



Any warning or caution that appears in this manual is defined as follows:

Warning Contains information to prevent personal injury.

Caution Contains information to prevent damage to equipment.

Vorsicht Enthält Informationen, die beachtet werden müssen, um den Benutzer vor Schaden zu bewahren.

Achtung Enthält Informationen, die beachtet werden müssen, um die Geräte vor Schaden zu bewahren.

Danger Signale les informations destinées à prévenir les accidents corporels.

Attention Signale les informations destinées à prévenir la détérioration du matériel.

Aviso Contiene información para evitar daños personales.

Precaución Contiene información para evitar daños al equipo.

The warnings and cautions that must be observed for the hardware described in this manual are listed below in English, German, French, and Spanish. The pages on which these safety messages appear are also listed.



- WARNING** When installing DECraid+ systems in a computer room with raised floors, DO NOT use vented tiles under any of the system casters. The tiles will crease and may eventually collapse. This could cause personal injury or equipment damage. [2-1, 5-1, B-1]
- VORSICHT** Wenn Sie DECraid+ in einem Computerraum mit Zwischenboden installieren, achten Sie darauf, daß Sie die Rollen NICHT auf ein Ventilationsgitter stellen. Solche Gitter geben nach und können einbrechen, was zu Verletzungen und Beschädigungen führen kann.
- AVERTISSEMENT** Lorsque vous installez DECraid+ dans une salle d'ordinateurs dont le plancher est surélevé, NE PLACEZ PAS les roulettes du système sur les grilles d'accès au faux plancher. Celles-ci risquent de se plier et, éventuellement, de s'effondrer, ce qui peut blesser les utilisateurs ou endommager le matériel.
- PRECAUCION** Al instalar sistemas DECraid+ en una sala de ordenadores con falso suelo, NO se deben usar placas con rejillas de ventilación debajo de las ruedas de arrastre del sistema, puesto que se doblarán y finalmente pueden romperse, con el consiguiente riesgo de daños personales o al equipo.
-

**WARNING**

To prevent personal injury and damage to the enclosure:

Do not move the enclosure unless there are two people available to hold and stabilize the enclosure.

Do not attempt to roll the enclosure off the shipping pallet with the anti-tip legs extended.

Make sure all the equipment mounted in the enclosure is locked down to prevent the equipment from sliding out when moving the enclosure. [3-4]

VORSICHT

Um Personenschäden und Beschädigungen des Gehäuses zu vermeiden:

Versuchen Sie nicht, das Gehäuse zu bewegen, ohne daß zwei weitere Personen anwesend sind, um das Gehäuse zu halten und zu stabilisieren.

Versuchen Sie nicht, das Gehäuse von der Transportpalette herunterzurollen, wenn die Fußstützen ausgefahren sind.

Vergewissern Sie sich, daß die gesamte Ausrüstung, die im Gehäuse montiert ist, fest fixiert ist, wenn Sie das Gehäuse bewegen, um ein Herausgleiten der Ausrüstung zu verhindern.

AVERTISSEMENT

Pour éviter de tels problèmes :

Faites toujours déplacer le coffret d'habillage par deux personnes pour qu'il reste stable pendant son transport.

Evitez de le descendre du transpalette alors que le dispositif 'anti-renversement' est déployé.

Vérifiez que le contenu du coffret d'habillage est bien calé afin d'éviter que celui-ci ne glisse pendant le transport.

PRECAUCION

Para evitar daños personales y a la carcasa del equipo:

No se debe mover la carcasa a menos que lo hagan dos personas para mantener y estabilizar la misma.

No se debe hacer rodar la carcasa fuera de la tarima de transporte con los apoyos de fijación extendidos.

Compruébese que todo el equipo montado en la carcasa está bien fijo para evitar que se deslice al mover la carcasa.



CAUTION	The front wheels of the enclosure swivel, but the rear wheels are fixed. [3–6]
ACHTUNG	Die Vorderräder des Gehäuses sind drehbar, während die Hinterräder fixiert sind.
ATTENTION	Les roulettes avant du coffret d'habillage pivotent, alors que celles se trouvant à l'arrière sont fixes.
ATENCION	Las ruedas delanteras de la carcasa giran, pero las traseras son fijas.



WARNING	Do not leave the enclosure unattended without lowering the feet. The enclosure may roll because the casters do not lock. Tipping the enclosure more than 15 degrees may cause an unstable situation. [3–7]
VORSICHT	Lassen Sie das Gehäuse nie ohne Aufsicht, ohne die Fußstützen auszufahren. Es ist möglich, daß das Gehäuse wegrollt, denn die Rollen sind nicht fixierbar. Vermeiden Sie es, das Gehäuse mehr als 15 Grad zu kippen, es könnten Schäden auftreten.
AVERTISSEMENT	Surveillez le coffret, si vous n'avez pas abaissé le dispositif 'anti-renversement'. Evitez d'incliner le coffret de plus de 15 degrés, car sa stabilité ne serait pas assurée.
PRECAUCION	No se debe desatender la carcasa si los apoyos no están extendidos, pues ésta podría rodar, debido a que sus ruedas no pueden bloquearse. Si se inclina la carcasa más de 15 grados, podría quedar en una posición poco estable.

**WARNING**

When the enclosure is not bolted to the floor, the anti-tip legs must be extended before any individual unit is extended out of the enclosure on its slides for servicing or installation.

Also, do not extend more than one slide assembly at a time. Enclosure instability may result. [4-1, 5-1]

VORSICHT

Wenn das Gehäuse nicht am Boden festgebolt ist, müssen die Fußstützen ausgefahren sein, bevor die einzelnen Elemente auf ihren Gleitschienen zum Service oder zur Installierung herausgezogen werden.

Ziehen Sie auch jeweils nur ein einziges Gleitelement heraus, da es sonst möglich ist, daß das Gehäuse umkippt.

AVERTISSEMENT

Lorsque le coffret n'est pas fixé au sol, utilisez le dispositif 'anti-renversement', lorsque vous désirez retirer un quelconque élément qui se trouve à l'intérieur soit pour son entretien, soit pour son installation.

De même, ne retirez pas plus d'un élément à la fois, car la stabilité du coffret ne serait plus assurée.

PRECAUCION

Cuando la carcasa no esté fijada al suelo, los apoyos de fijación deben estar extendidos antes de extender a lo largo de las guías cualquier unidad individual de la carcasa para su reparación, mantenimiento o instalación.

Asimismo, no se debe extender más de una unidad completa al mismo tiempo, puesto que se provocaría la inestabilidad de la carcasa.

**WARNING**

Before attaching the enclosures, verify that the floor can support the combined weight of 1,170 kilograms (2,600 pounds).

The enclosures must be attached on a smooth level floor.

After the enclosures are attached, they cannot be moved to another location without detaching them. [4-2, 5-2]

VORSICHT

Bevor Sie die Gehäuse befestigen, vergewissern Sie sich, daß der Boden bis zu einem Gesamtgewicht von 1.170 kg belastbar ist.

Das Gehäuse muß auf ebenem und glattem Grund befestigt werden.

Nachdem die Gehäuse befestigt sind, können sie nicht ohne Abmontierung verschoben werden.

AVERTISSEMENT

Avant de fixer le coffret d'habillage, vérifiez que le plancher peut supporter une charge de 1.700 kg.

Fixez le coffret d'habillage sur une surface plane.

Après avoir fixé le coffret d'habillage, ce dernier ne peut être déplacé sans que vous ayez enlevé ses fixations.

PRECAUCION

Antes de unir las carcasas, comprúebese que el suelo puede soportar un peso combinado de 1.170 kilogramos.

Las carcasas deben unirse en un suelo con un nivel uniforme.

Tras unir las carcasas, no se podrán llevar a otro lugar sin antes desunirlas.

**WARNING**

To ensure that the enclosure remains stable when an individual chassis is extended out of the enclosure, extend the anti-tip legs. [4-6]

VORSICHT

Um sicherzugehen, daß das Gehäuse stabil bleibt, wenn einzelne Elemente herausgezogen sind, fahren Sie die Fußstützen aus.

AVERTISSEMENT

Pour s'assurer que le coffret d'habillage reste stable lorsque l'un de ses éléments est retiré, déployez le dispositif 'anti-renversement'.

PRECAUCION

Para asegurarse de que la carcasa se encuentra estable cuando se extiende un chasis individual de la carcasa, se deben extender los apoyos de fijación.



CAUTION	To avoid damaging the CI cables, ensure that they have a minimum bend radius of 6.5 centimeters (2.5 inches). [4-7, 5-11]
ACHTUNG	Um eine Beschädigung der CI-Kabeln zu vermeiden, achten Sie darauf, daß ein Mindest-Biegeradius von 6,5 cm nicht unterschritten wird.
ATTENTION	Pour éviter d'endommager les câbles CI, s'assurer que l'écartement minimum des plis soit de 6,5 cm.
ATENCIÓN	Para evitar daños en los cables CI, hay que asegurarse de no doblarlos a menos de 6,5 cm de radio.



CAUTION	Do not over tighten retaining screws on cable connectors to SABB ports. The screws could be damaged. [5-8, C-14]
ACHTUNG	Achten Sie darauf, daß Sie die Halteschrauben auf den Kabelverbindungen zu den SABB-Buchsen nicht zu fest ziehen - es könnten sonst die Schrauben beschädigt werden.
ATTENTION	Ne serrez pas trop fort le dispositif de fixation des cables de connexion aux ports SABB. Cela pourrait les endommager.
ATENCIÓN	No se deben apretar demasiado los tornillos de retención de los conectores de cables en las puertas SABB, puesto que los tornillos podrían quedar dañados.



WARNING	The floor must be smooth and level, and capable of supporting up to 1,700 kilograms (2,600 pounds). [B-1]
VORSICHT	Der Grund muß eben und glatt sein, und bis zu 1.700 kg belastbar sein.
AVERTISSEMENT	Le plancher doit être parfaitement plat et susceptible de supporter jusqu'à 1.700 kg
PRECAUCION	El suelo debe tener un nivel uniforme, así como soportar hasta 1.700 kilogramos.



WARNING	Before performing the following procedure, disconnect the system ac power cords from the ac power source. [C-4, C-6, C-14, C-16]
VORSICHT	Bevor Sie die folgende Operation durchführen, unterbrechen Sie die Stromzufuhr.
AVERTISSEMENT	Avant de suivre la procédure suivante, débranchez les cables d'alimentation du système AC.
PRECAUCION	Antes de llevar a cabo el procedimiento siguiente, se deben conectar los cables de alimentación AC del sistema de la fuente de alimentación AC.

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Preface

This guide, along with the *Rack-Mountable HSC Installation/Owner's Manual* and the *2T-SA7x Installation Card* provide the information necessary to install the 2T-ISPxx Rack-Mountable Hierarchical Storage Controller (HSC) Integrated Storage System (ISP) and the DECraid+ Storage System. Information concerning individual devices used in the system is contained in other documents as referred to in this guide.

NOTE

For ease of reference in the remainder of this manual, the 2T-ISPxx Rack-Mountable Hierarchical Storage Controller Integrated Storage System and the DECraid+ Storage System will be referred to as the ISP system and the DECraid+ system, respectively.

Intended Audience

The instructions in this guide are for DIGITAL Customer Service or other DIGITAL qualified service personnel installing an ISP or DECraid+ system.

How to Use This Guide

Read all of this guide before installing either an ISP or DECraid+ system. This guide refers to the *Rack-Mountable HSC Installation/Owner's Manual*, and the *2T-SA7x Installation Card* for information necessary to install, operate, and maintain the devices used in the system.

Structure of this Document

This document is organized as follows:

Chapter 1, Introduction — Provides a general description and specifications for the ISP and DECraid+ systems.

Chapter 2, Site Preparation — Provides information concerning site preparation.

Chapter 3, Unpacking — Describes how to unpack and check the shipment.

Chapter 4, ISP System Installation — Describes how to install the ISP system.

Chapter 5, DECraid+ System Installation — Describes how to install the DECraid+ system.

Appendix A, System Options — Provides the part number and description of options available for the ISP and DECraid+ systems.

Appendix B, Tie-Down Installation — Provides guidelines on securing the ISP and DECraid+ systems to the floor.

Appendix C, Maintenance — Describes how to remove and replace recommended Field Replaceable Units (FRUs), provides rules for using requester modules in Rack-Mountable HSC controllers, and provides cabling guidelines in the event any Storage Array Building Block (SABB) or HSC controller in a DECraid+ system needs to be replaced during maintenance.

Related Documents

Site Environmental Preparation Guide (EK-CSEPG-MA)

HSC Controller Installation Manual (EK-HSCMN-IN)

Rack-Mountable HSC Installation/Owner's Manual (FW-HSCH1-A7)

2T-SA7x Enclosure Installation Card (EK-TSA7X-IN)

Star Coupler User's Guide (EK-SC008-UG)

SF200 Storage Array Installation Guide (EK-SF200-IG)

SF72 Storage Enclosure and SF200 Storage Array Owner's Manual (EK-SF72S-OM)

SF72 Storage Enclosure and SF200 Storage Array Cabinet Service Guide (EK-SF72S-SG)

Notes, Cautions and Warnings

Where notes, cautions and warnings are used in this document, specific types of information are highlighted as follows:

NOTE — Calls attention to any item of information that may be of special importance to the reader.

CAUTION — Contains essential information to avoid damage to the equipment.

WARNING — Contains essential information for the safety of the user.

FCC USER STATEMENT
NOTICE:
<p>This equipment generates, uses, and may emit radio frequency. The equipment has been type tested and found to comply with the limits for a Class A digital device pursuant to Part 15, Subpart B of FCC rules, which are designed to provide reasonable protection against such radio frequency interference.</p>
<p>Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.</p>

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im ungünstigsten Fall beim Zusammenschalten mit anderen
EDV-Geräten, Funkstörungen auftreten DIGITAL kann das
im Einzelnen zusätzlich als Use Only
15 Funkentstörungsmaßnahmen durch den Benutzer erfordern.

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Externe Datenkabel:
Sollte ein Austausch der von Digital spezifizierten
Datenkabel nötig werden, muß der Betreiber für eine
einwandfreie Funkentstörung sicherstellen, daß
Austauschkabel im Aufbau und Abschirmqualität dem Digital
Originalkabel entsprechen.

Kennzeichnung: Die Geräte werden bereits in der Fertigung mit der Zulassungsnummer gekennzeichnet und mit einer Anmeldepostkarte versehen. Sollte Kennzeichnung und Anmeldepostkarte übergangsweise nicht mit ausgeliefert werden kontaktieren Sie bitte das nächstgelegene Digital Equipment Kundendienstbüro.

Chapter 1

Introduction

Both the ISP and DECraid+ systems (shown in Figure 1-1) are contained in H9702-MT enclosures; both systems utilize Digital's Rack-Mountable Hierarchical Storage Controller (HSC) subsystems. This chapter provides a general description and specifications of each system.

1.1 ISP System

The ISP systems (2T-ISP65-xx and 2T-ISP95-xx) are Rack-Mountable HSC Integrated Storage Platforms (ISPs), which are available as 120-volt or 240-volt systems. These systems are contained in an unshielded version of the H9702 enclosure (H9702-MT) with 2T-SA7x Storage Array Building Blocks (SABBs).

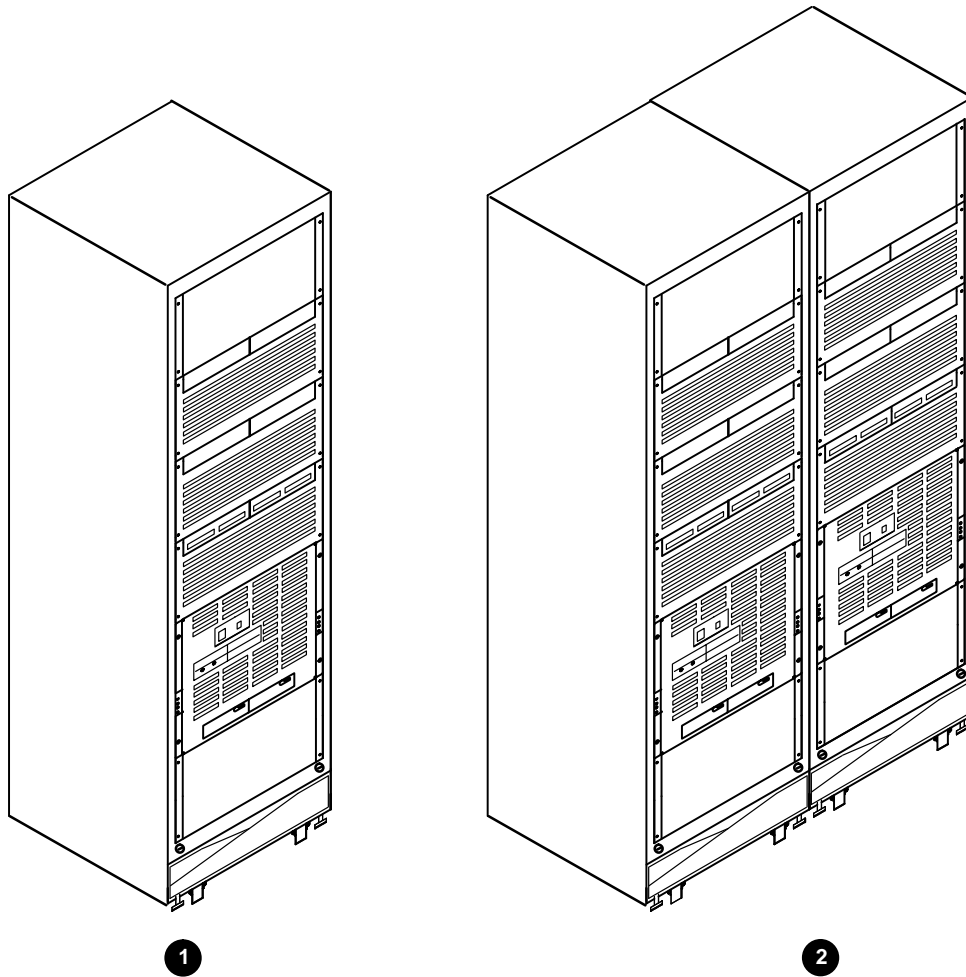
The ISP system can be ordered as one of the standard Digital configurations, or as a base system. The base system contains the enclosure with a Rack-Mountable HSC controller and two power controllers.

The base ISP system serves as the basic building block for a series of custom built ISP systems. The base ISP system has 106.7 centimeters (42 inches) of open rack space at the top of the H9702-MT enclosure for the installation of a rackmount star coupler (2T-SC008-AC) and up to six 2T-SA7x SABBs. Figure 1-2 shows the rack space required by each SABB and identifies the location of the 106.7-centimeter (42-inch) rack space.

Cables for the system include the standard BC26V and the newer 2T-BC26V-15. The 2T-BC26V-15 cable is smaller and more flexible than the BC26V cable and can replace the latter to connect the disk drives to the Rack-Mountable HSC controller. Cabling used to connect the SABBs to the Rack-Mountable HSC controller in the basic ISP system can be specified when ordering.

The H9702-MT enclosure can be secured to the floor at the installation site. An optional H9702-KB Bolt-down Kit is available to secure the system to a raised floor.

Figure 1-1: ISP and DECraid+ Systems

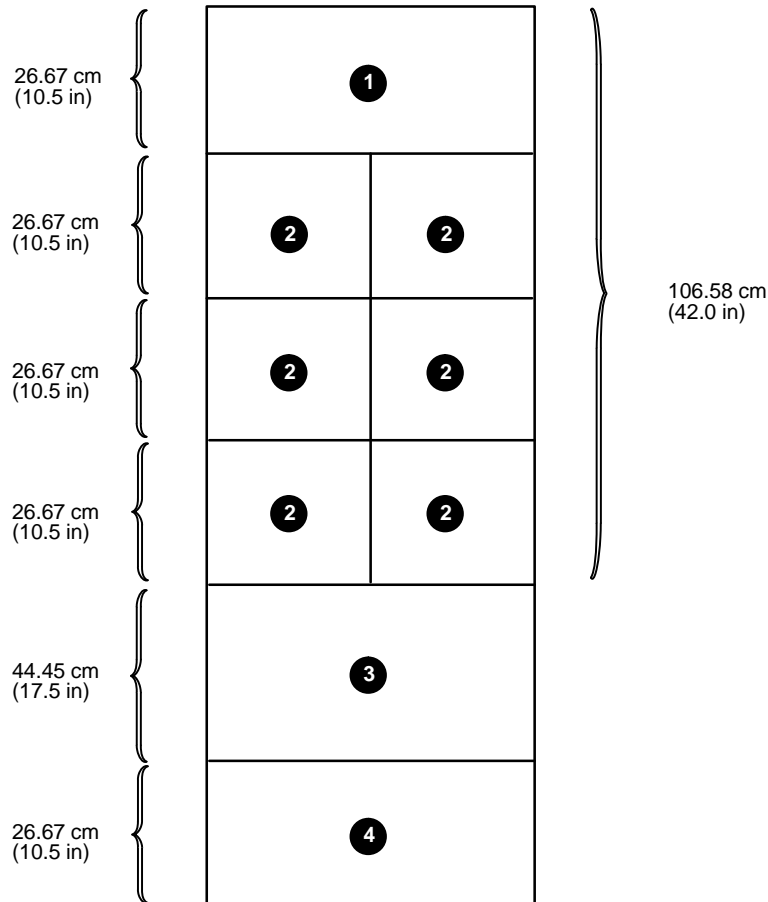


1 ISP System

2 DECraid+ System

CS9078

Figure 1–2: Front Panel Layout for ISP System and DECraid+ System



CS9065

- ❶ Filler panel (space available for star coupler 2T-SC008-AC or other 2T-SA7x SABBs)
- ❷ 2T-SA7x storage arrays
- ❸ 2T-HSC65 or 2T-HSC95 controller with HSC5X-DA and HSC9X-FA data channel modules (DECraid+ systems are configured with 2T-HSC95 controllers)
- ❹ Two 877-DB or 877-E power controllers

As shown in Figure 1–2, the total available rack space for SABBs and star coupler is 106.58 cm (42 in).

The ISP system kit consists of an H9702-MT enclosure with:

- Either a Rack-Mountable HSC65 or Rack-Mountable HSC95 controller.
- Either a 120-volt or 240-volt power controller.
- 42.0 inches available rack space to mount SABBs and/or a rackmount star coupler.
- *H9702 Installation Guide* (EK-H9702-IN).
- *Rack-Mountable HSC Installation/Owner's Manual* (EK-HSCH1-A7).
- *2T-ISPyy-xx Rack-Mountable HSC ISP Installation Guide* (EK-TISPX-IN).
- *SF200 Storage Array Installation Guide* (EK-SF200-IG).
- *SF72 Storage Enclosure and SF200 Storage Array Owner's Manual* (EK-SF72S-OM).
- *SF72 Storage Enclosure and SF200 Storage Array Cabinet Service Guide* (EK-SF72S-SG).

For details concerning the optional items that are available for the ISP system, refer to Appendix A.

1.2 DECraid+ System

The DECraid+ Storage System is used for critical online storage applications that frequently access large databases. A DECraid+ system is housed in two attached H9702-MT enclosures that require less than 12 square feet of floor space. Each DECraid+ system contains two DIGITAL Rack-Mountable HSCxx subsystems. Most DECraid+ systems include Redundant Arrays Of Inexpensive Disks (RAID) software and licenses to optimize input/output performance and duplicate stored data. This prevents the loss of information in case of disk or other component failure.

The Rack-Mountable HSC subsystems provide the same functionality as standard HSC subsystems, but mount in EIA-standard 19-inch wide racks or enclosures, utilizing 42 inches of vertical rack space. Up to six SA7x storage arrays are installed in each of the two H9702-MT enclosures. The top 10.5-inches in the enclosure is left vacant for users who order the optional rackmount star coupler to connect the DECraid+ Storage System to a central network node. This is the same configuration as shown in Figure 1-2.

The HSCxx controller is a high-performance, CI-based, intelligent disk and tape controller that offers full architectural support for up to 48 RA disk drives. Each HSCxx controller contains a 32-Mbyte disk cache. Contact your DIGITAL Sales Representative for availability of additional 32 Mbytes of disk cache. The cache memory module plugs into the HSC backplane and is shared by all selected disk drives connected to the HSCxx controllers.

The RAID concept uses arrays of disks, which work as a single, large-capacity storage device. The computer industry has defined a number of RAID "levels," numbered RAID 0 through RAID 6, with each number representing a particular storage technique.

The RAID levels that are currently available in DECraid+ configurations are:

- RAID 0 (Disk Striping).

Digital's VMS layered striping product optimizes I/O performance. Striping spreads data across multiple disks. Data to be written to storage is broken into "chunks" and distributed over the set of system drives. Each chunk goes to a different drive in a defined way.

- RAID 1 (VMS Volume Shadowing).

Digital's VMS volume shadowing software creates an exact copy of the primary storage disk. If a disk fails, the user's access to the data is not interrupted because the reads and writes are executed by the remaining good disk.

- RAID 0+1.

This is the combination of striping and shadowing, implemented by striping shadow sets. RAID 0+1 provides the best performance of any type of RAID by combining the performance advantages of RAID 0 and RAID 1. It also provides disaster tolerance. Performance is better than RAID 0, and the cost is the same as RAID 1.

- RAID 5 (contact your DIGITAL Sales Representative for availability).

RAID 5 uses large chunk sizes and stripes each request and the parity data across all members of the RAID set. Since chunk size is large, usually only one drive participates in any request. This increases request rate performance, compared with a group of non-RAID drives. If a second drive fails before the first is replaced, access to all data in the RAID set is lost.

The DECraid+ system kit consists of two H9702-MT enclosure with:

- A Rack-Mountable HSC95 controller (in each enclosure).
- Either a 120-volt or 240-volt power controller (in each enclosure).
- 42.0 inches available rack space to mount SABBs and/or a rackmount star coupler (in each enclosure).
- *H9702 Installation Guide* (EK-H9702-IN).
- *Rack-Mountable HSC Installation/Owner's Manual* (EK-HSCH1-A7).
- *2T-ISPyy-xx Rack-Mountable HSC ISP Installation Guide* (EK-TISPX-IN).
- *SF200 Storage Array Installation Guide* (EK-SF200-IG).
- *SF72 Storage Enclosure and SF200 Storage Array Owner's Manual* (EK-SF72S-OM).
- *SF72 Storage Enclosure and SF200 Storage Array Cabinet Service Guide* (EK-SF72S-SG).

For details concerning the optional items that are available for the DECraid+ system, refer to Appendix A.

1.3 ISP and DECraid+ System Specifications

This section describes the mechanical and electrical specifications of the ISP and DECraid+ system.

Mechanical, Each Cabinet:

Height (including the caster base and casters):	205.7 cm	(81.0 in)
Height (including the shipping pallet):	227.3 cm	(89.5 in)
Width:	53.6 cm	(21.1 in)
Depth (including rear door):	94.0 cm	(37.0 in)
Weight (approximate):	493.0 kg	(1086 lbs)
Maximum Pallet Load Capacity:	635.0 kg	(1400 lbs)
Casters, swivel, nonlocking:		
Diameter:	6.99 cm	(2.75 in)
Tread width:	4.45 cm	(1.75 in)
Maximum capacity, each:	204.1 kg	(450 lbs)
Rear casters, fixed, nonlocking:		
Diameter:	6.99 cm	(2.75 in)
Tread width:	4.45 cm	(1.75 in)
Maximum capacity, each:	204.1 kg	(450 lbs)
Horizontal rackmounting dimension:	Standard EIA 19-in cabinet	
Enclosure finish:	Painted DIGITAL standard light gray	

Environmental:

Temperature:	
Operating:	10°C (50°F) to 40°C (104°F)
Nonoperating:	-40°C (-40°F) to 66°C (151°F)
Relative Humidity:	
Operating:	10% to 90%
Nonoperating:	Up to 95%
Maximum wet bulb temperature:	
Operating:	28°C (82°F)
Nonoperating:	32°C (90°F)

Electrical:

Each ISP system can have either two 877-DB or two 877-E power controllers. Each DECraid+ system can have either four 877-DB or four 877-E power controllers.

Item	Two 877-DBs	Two 877-Es
Power requirements (ac input)	120 V	240 V
Voltage range (Vrms)	90 to 132	180 to 264
Power source phasing	single	single
Frequency range (Hz)	47 to 63	50 to 60
System rated current (Amperes) Nominal ¹	22.43	13.30
Power consumption (Watts)	1470	1470
USA Power cord plug (2 Pole, 3 Wire)	NEMA L5-30P	NEMA L6-30P

¹Divided between two power controllers per cabinet. Each cabinet requires 22.43 Amperes (120 V) or 13.30 Amperes (240 V).

Chapter 2

Site Preparation

Site preparation and planning are necessary before installing the ISP or DECraid+ system. Before installing a system, ensure that the installation site conforms to the physical, electrical, and environmental specifications provided in Chapter 1.



WARNING

When installing DECraid+ systems in a computer room with raised floors, DO NOT use vented tiles under any of the system casters. The tiles crease and may eventually collapse. This could cause personal injury or equipment damage.

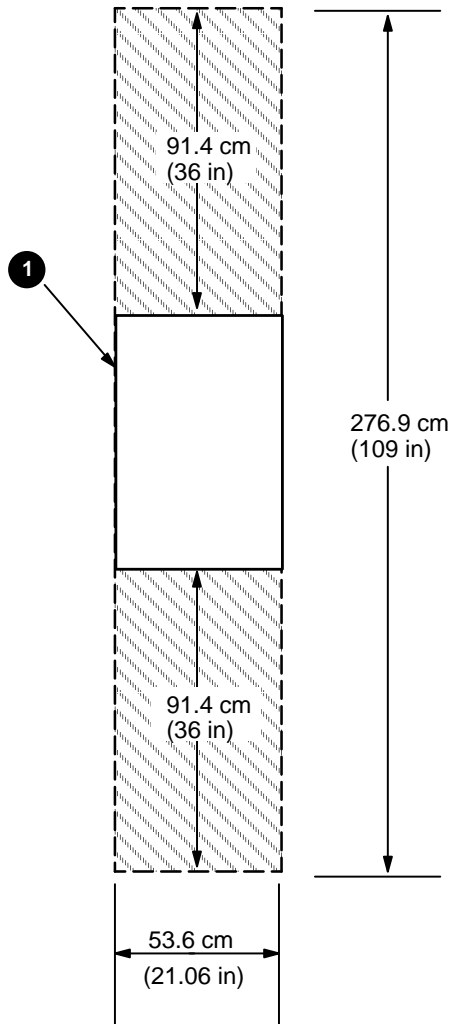
Locate the system in an area that provides sufficient clearance for ventilation and servicing. Figure 2-1 and Figure 2-2 show the clearance required around each system. Ensure that no obstructions (walls, cabinets, boxes, and so forth) are allowed to interfere with the free flow of exhaust air from the system.

For additional information concerning site planning and computer room environments, refer to the *Site Environmental Preparation Guide* (not supplied with the system).

Consider all specifications and conditions listed in Chapter 1 during preinstallation planning.

If the system is going to be secured to the floor, identify that location. Refer to Appendix B for information on types of tie-down installations.

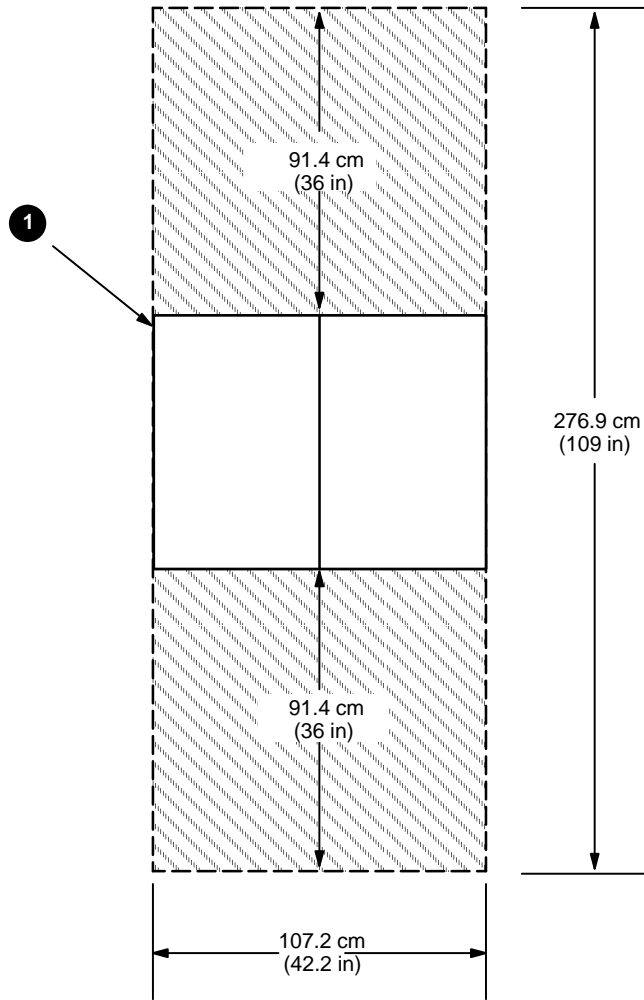
Figure 2-1: ISP System Clearance Requirements



CS-9067

1 Front of ISP System

Figure 2-2: DECraid+ System Clearance Requirements



CS-9068

1 Front of DECraid+ system

Chapter 3

Unpacking the Shipment

This chapter describes how to unpack an ISP or DECraid+ system. The procedure applies to both systems unless noted differently. Both the ISP and DECraid+ systems are shipped with one enclosure to a wooden pallet. Since the DECraid+ system has more than one enclosure, repeat the procedure to unpack the second enclosure. Unpacking involves:

- Removing the packaging material.
- Checking the shipment.
- Removing the system enclosure from the pallet.

3.1 Removing the Packaging Material

To remove the packaging material, refer to Figure 3-1 and proceed as follows:

NOTE

Save all packaging materials in case any item needs to be returned.

1. Position the pallet with the enclosure in a smooth, level area that provides sufficient work space for unpacking. Ensure that there is at least 243.8 cm (8 feet) of space behind the rear of the enclosure to roll the enclosure down the ramps.
2. Cut and remove the plastic wrap ④.
3. Remove the four corner posts ②, the box containing the ramps ⑥, and other boxes in the shipment.
4. Lift the corrugated cap ③ straight up and off the enclosure ⑤.

NOTE

In the following step, take care not to damage the enclosure finish when removing the plastic bag ⑦.

5. Remove the plastic bag ⑦ covering the enclosure ⑤.

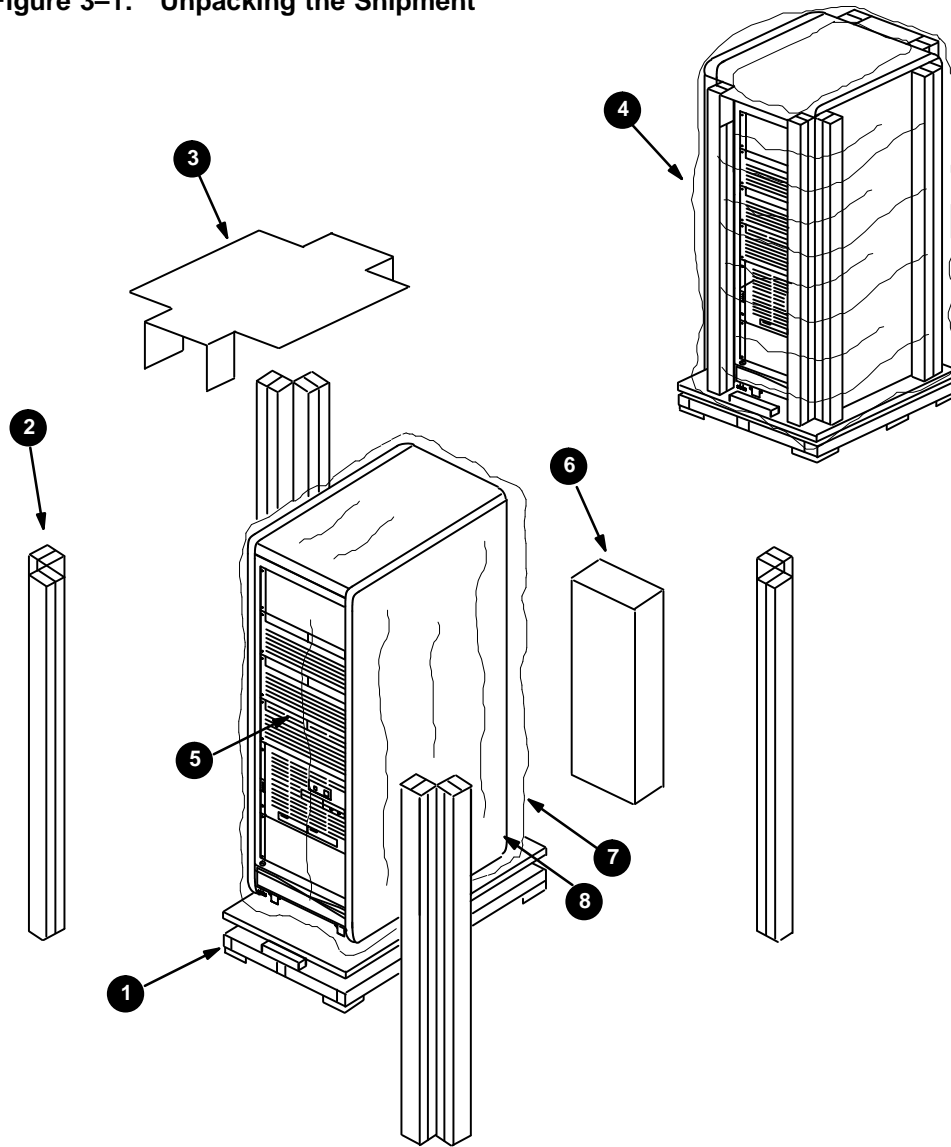
3.2 Checking the Shipment

In addition to the enclosure and its contents, the shipment may include several boxes depending on the system ordered. Check the packing list to ensure that all items listed have been received. If any item is missing or damaged, immediately contact your DIGITAL sales representative and delivery agent. Save all packaging materials in case any item needs to be returned.

SPECIAL NOTE

If the DECraid+ unit includes striping part numbers QA-YELAA-H5/HM /GZ, call the DIGITAL Customer Support Center (800-525-6570) and obtain CSCPAT_1048 (patch identification number) in order to incorporate needed patches into the Disk Striping Driver for OpenVMS.

Figure 3-1: Unpacking the Shipment



cs-9069

- ❶ Shipping pallet
- ❷ Corner posts, four
- ❸ Corrugated cap
- ❹ Plastic wrap
- ❺ System enclosure
- ❻ Box with ramps
- ❼ Plastic bag
- ❽ Rear mounting bracket (Behind unit)

3.3 Removing the System Enclosure from the Pallet

To remove the system enclosure from the pallet, refer to Figure 3-1 and proceed as follows:

1. Unscrew and remove the two 3/8-16 hex head bolts holding the rear mounting bracket ③ to the shipping pallet.
2. Loosen the bolts holding the rear mounting bracket ③ to the enclosure ⑤.
3. Move the bracket ③ upward as far as it will go away from the shipping pallet ① and then tighten the bolts.

NOTE

Do not remove the mounting bracket ③; it is used when installing the enclosure ⑤ in a tie-down configuration as described later in Appendix B.

4. Refer to Figure 3-2 and unfold the two anti-tip legs ① in the front bracket ⑤.
5. Remove the two 1/4-20 hex head bolts ④ holding the front bracket ⑤ to the shipping pallet.
6. Adjust the leveling feet ③ upwards as far as they will go to prevent them from contacting the floor while the enclosure is rolling on its casters.



WARNING

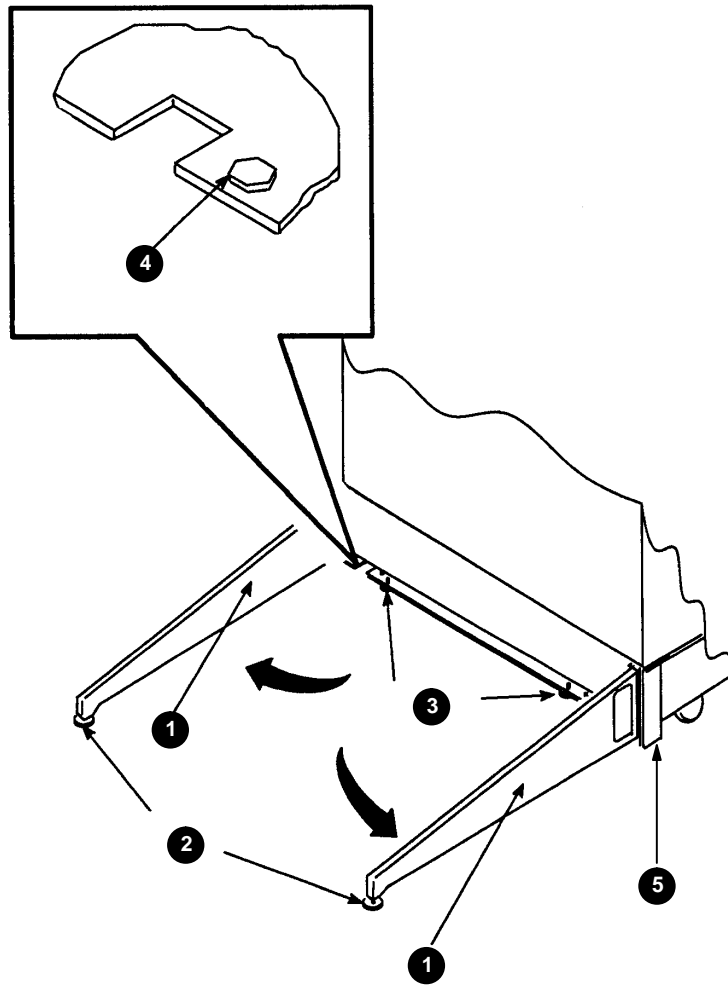
**To prevent personal injury and damage to the enclosure:
Do not move the enclosure unless there are two people available to hold and stabilize the enclosure.**

Do not attempt to roll the enclosure off the shipping pallet with the anti-tip legs extended.

Make sure all the equipment mounted in the enclosure is locked down to prevent the equipment from sliding out when moving the enclosure.

7. Refer to Figure 3-3 and attach the unloading ramps ③ ⑥ to the shipping pallet ⑤ by fitting the grooved end ④ of each ramp over the metal mating strips ① ② on the rear of the shipping pallet ⑤.

Figure 3-2: Anti-Tip Legs

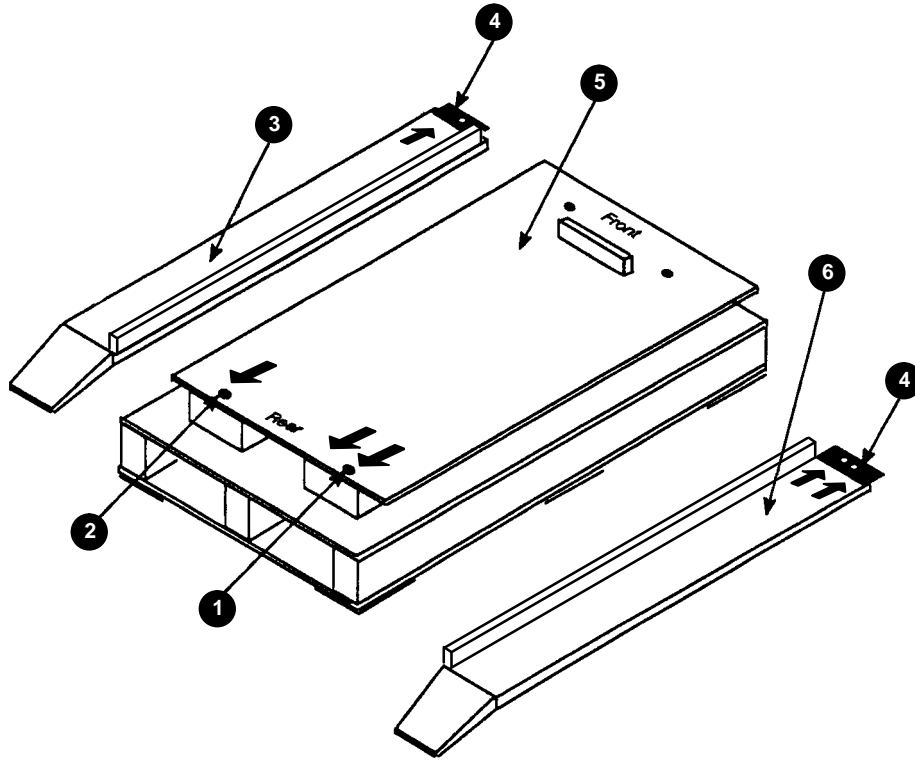


CS-8960

- ❶ Anti-tip leg
- ❷ Adjustable feet
- ❸ Leveling feet

- ❹ 1/4-20 hex head bolts, two
- ❺ Front bracket

Figure 3-3: Installing Unloading Ramps on Shipping Pallet



CS-9073



CAUTION

The front wheels of the enclosure swivel, but the rear wheels are fixed.

- ❶ Right ramp attaches here
- ❷ Left ramp attaches here
- ❸ Left unloading ramp
- ❹ Grooved end

- ❺ Shipping pallet (Shown without enclosure to show pallet more clearly.)
- ❻ Right unloading ramp

8. With at least two people to guide the enclosure, carefully roll the enclosure toward the edge of the shipping pallet where the ramps are in place. Then slowly roll the enclosure down the ramp and off the shipping pallet (see Figure 3-4).



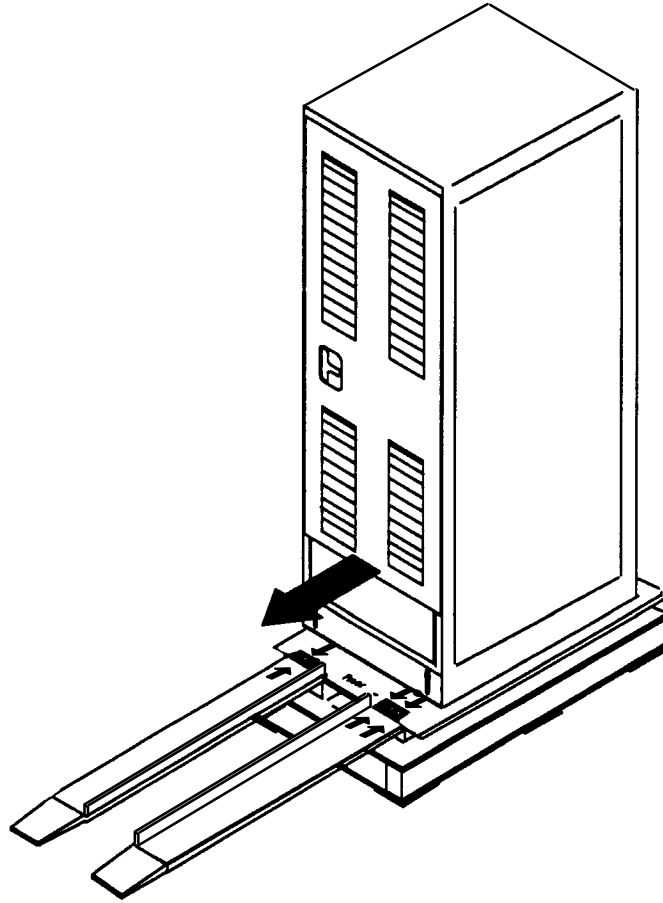
WARNING

Do not leave the enclosure unattended without lowering the feet. The enclosure may roll because the casters do not lock.

Tipping the enclosure more than 15 degrees may cause an unstable situation.

9. The system is now ready to move to the installation site.

Figure 3–4: Moving the Enclosure off of the Pallet



CS-8974

Chapter 4

Installing the ISP System

After verifying that the system installation site is suitable, move the system to that location.



WARNING

When the enclosure is not bolted to the floor, the anti-tip legs must be extended before any individual unit is extended out of the enclosure on its slides.

Also, do not extend more than one slide assembly at a time. Enclosure instability may result.

Installing the system consists of the following:

- Attaching the Enclosures (if applicable)
- Securing the Enclosures
- Connecting the CI (BNCIA) Cables
- Connecting the SDI/STI (BC26V) Cables (if applicable)
- Connecting Power
- Starting the System

4.1 Attaching the Enclosures

The ISP system is delivered in one enclosure. However, you can attach two systems side-by-side using the H9702-JK joiner kit (P/N 70-30534-01). Before attaching the enclosures, note the following:



WARNING

Before attaching the enclosures, verify that the floor can support the combined weight of 1,170 kilograms (2,600 pounds).

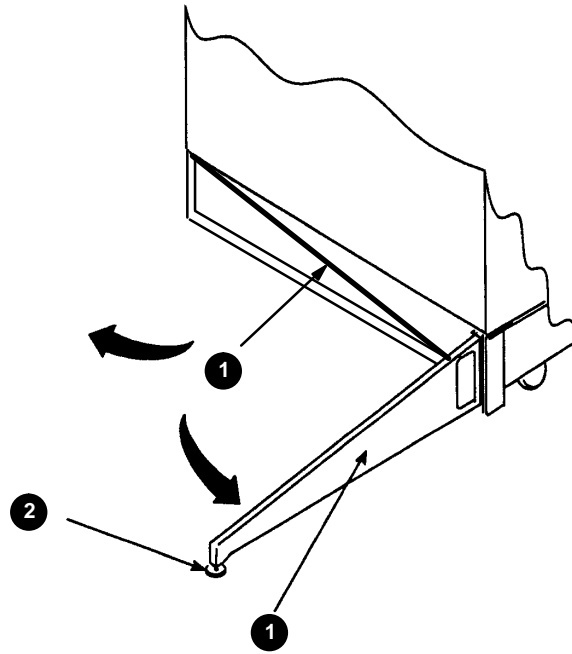
The enclosures must be attached on a smooth level floor.

After the enclosures are attached they cannot be moved to another location without detaching them.

To attach the enclosures, proceed as follows:

1. Position the enclosures in their final location with the front of each enclosure facing in the same direction and the open sides facing each other. Position the open sides as close together as possible.
2. To ensure that the enclosures remain stable, unfold the anti-tip legs ❶ as shown in Figure 4-1. Adjust the foot ❷ at the end of each anti-tip leg until it touches the floor.

Figure 4–1: Opening and Adjusting Anti-Tip Leg Assembly



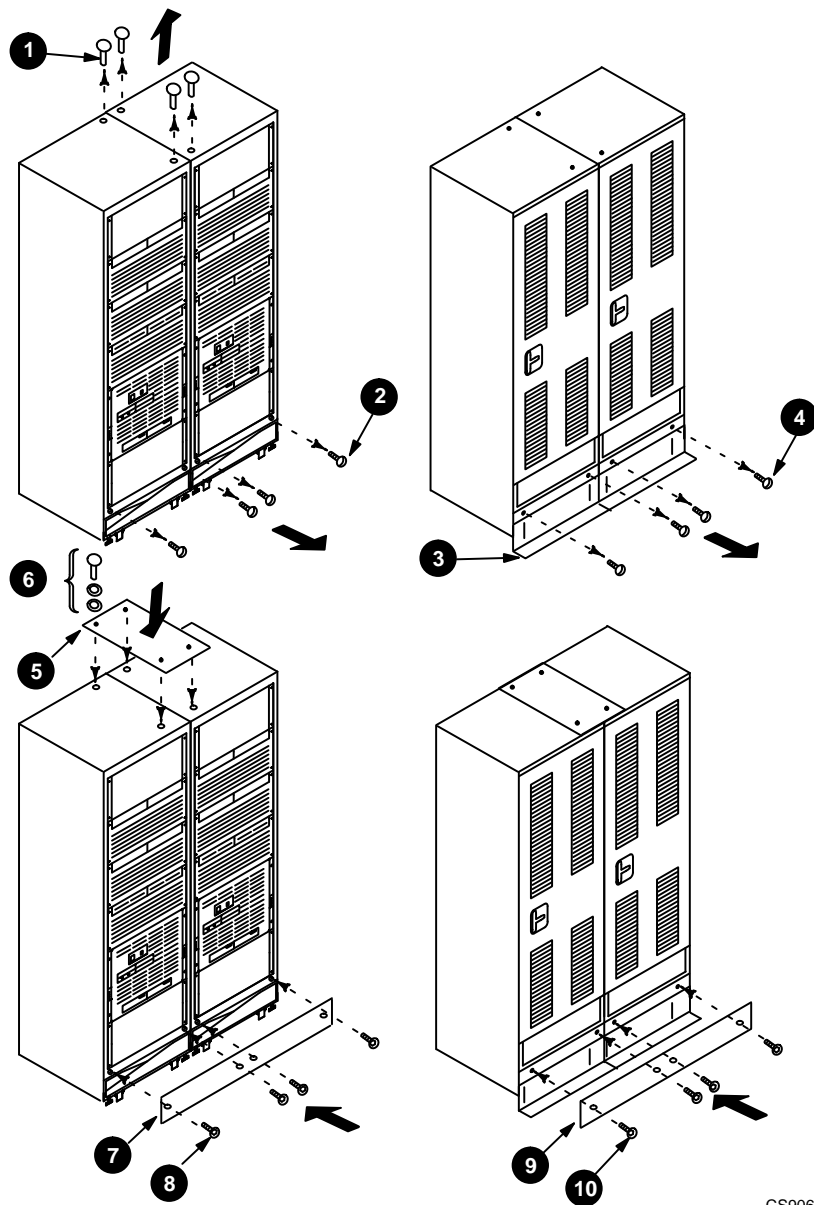
CS-9072

1 Anti-tip legs

2 Adjustable foot

3. Refer to Figure 4–2 and remove the four protective plastic plugs ❶.
4. Remove the two 3/8-16 slotted, truss-head screws ❷ from the bottom front of each enclosure. Discard the screws.
5. Loosen the attaching hardware of the rear mounting bracket ❸ of each enclosure and lower the bracket ❸ to the floor.
6. Remove the 3/8-16 slotted, truss-head screws ❹ from the bottom rear of each enclosure. Discard the screws.
7. Attach the top plate ❺, using four sets of hardware ❻ consisting of one 1/2-13 hex-head machine screw, lockwasher, and flat washer. Do not tighten screws at this time.
8. Attach one bottom plate ❼ across the bottom front of the two enclosures using four Allen, socket head screws ❽. Do not tighten the screws.
9. Attach another bottom plate ❾ across the bottom rear of the two enclosures using four Allen, socket head screws ❿. Do not tighten the screws.
10. Tighten the hardware ❻ installed in step 8.
11. Tighten the screws ❽ and ❿ installed in steps 9 and 10.

Figure 4-2: Attaching the Enclosures



CS9064

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> ❶ Plastic plugs ❷ 3/8-16 slotted, truss-head screws, four ❸ Rear mounting bracket, two ❹ 3/8-16 slotted, truss-head screws, four | <ul style="list-style-type: none"> ❺ Top plate (P/N 74-46334-01) ❻ Set of hardware, consisting of one 1/2-13 hex-head machine screw, lockwasher, and flat washer, four sets. | <ul style="list-style-type: none"> ❼ Front bottom plate (P/N 74-46332-01) ❽ Allen, socket-head screw, four ❾ Rear bottom plate (P/N 74-46332-01) ❿ Allen, socket-head screw, four |
|---|--|---|

4.1.1 Securing the Enclosures

If the ISP system is going to be secured to the floor, refer to Appendix B for details.



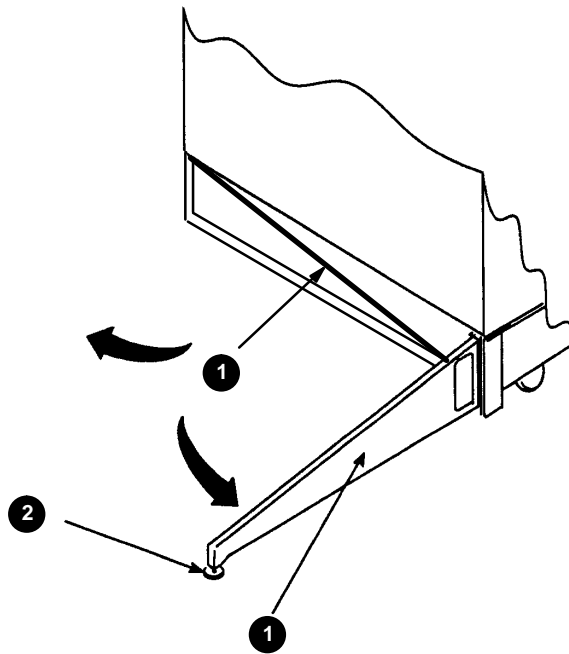
WARNING

To ensure that the enclosure remains stable when an individual chassis is extended out of the enclosure for operation or servicing, extend the anti-tip legs.

As shown in Figure 4-3, unfold the anti-tip legs ❶ from the bottom front of the enclosure. Adjust the foot ❷ at the end of each anti-tip leg until it touches the floor.

The enclosure is designed to hold several system configurations. Therefore, the results differ as to how much force it will take to tip or make this enclosure unstable.

Figure 4-3: Opening and Adjusting Anti-Tip Legs



CS-9072

❶ Anti-tip leg

❷ Adjustable foot

4.2 Connecting the CI (BNCIA) Cables

The Rack-Mountable HSC controller connects to the host system (either directly or through a star coupler (P/N 2T-SC008-xx) by way of blue CI cables (P/N BNCIA-xx).

The following information provides cable routing guidelines using a typical ISP system configuration as an example.



CAUTION

To avoid damaging the CI cables, ensure that they have a minimum bend radius of 6.5 centimeters (2.5 inches).

If there is no star coupler configured into the ISP system, perform the following procedure:

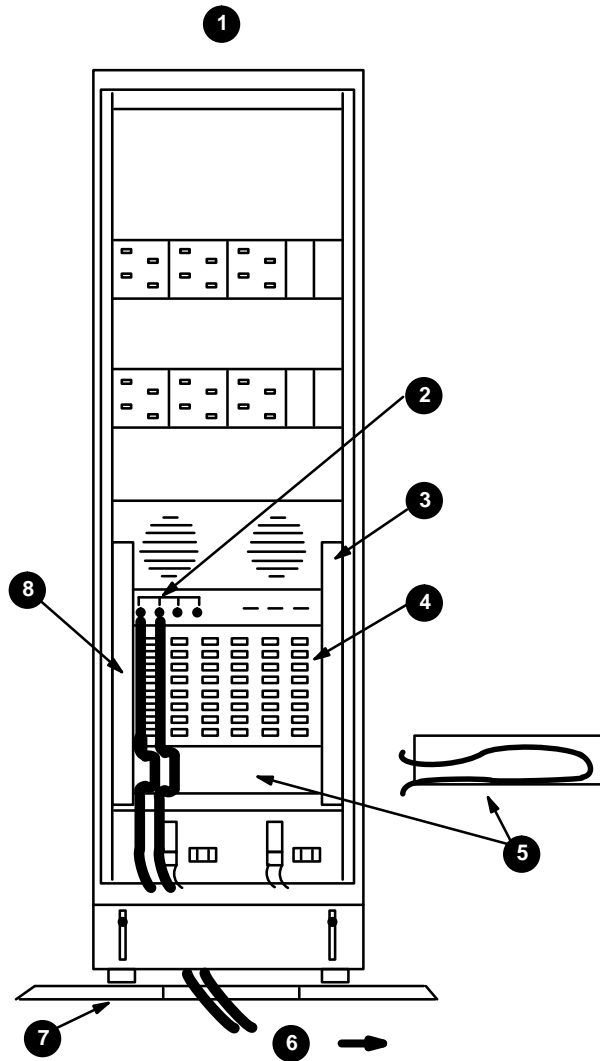
1. Refer to Figure 4–4 and locate the CI cables (blue cables) ❸ that are connected to the CI cable connector ports ❷ at the rear of the Rack-Mountable HSC controller and routed through the cable tray ❹ located under the Rack-Mountable HSC controller.
2. Route the CI cables ❸ down through the opening in the bottom of the enclosure and, if applicable, under the raised flooring ❺ in the computer room.
3. Route the cables ❸ to the host system ❹ and connect them as described in the host system documentation.

If there is a star coupler in the system configuration, it is typically rack mounted in the top of the enclosure as shown in Figure 4–5. Perform the following procedure:

1. Refer to Figure 4–5 and route the first pair of CI cables ❶ from the Rack-Mountable HSC controller up through the nearest cable trough ❷ and then connect them to the star coupler ❸ as described in the *Star Coupler User's Guide*.
2. Connect a second set of CI cables ❹ to the star coupler ❸ and route them down through the cable trough ❷, through the openings in the bottom of the enclosure and, if applicable, under the raised flooring ❺ in the computer room.
3. Route the cables to the host system ❹ and connect them as described in the host system documentation.

Refer to the *Rack-Mountable HSC Installation/Owner's Manual* for more details on routing and connecting the CI cables to the Rack-Mountable HSC controller.

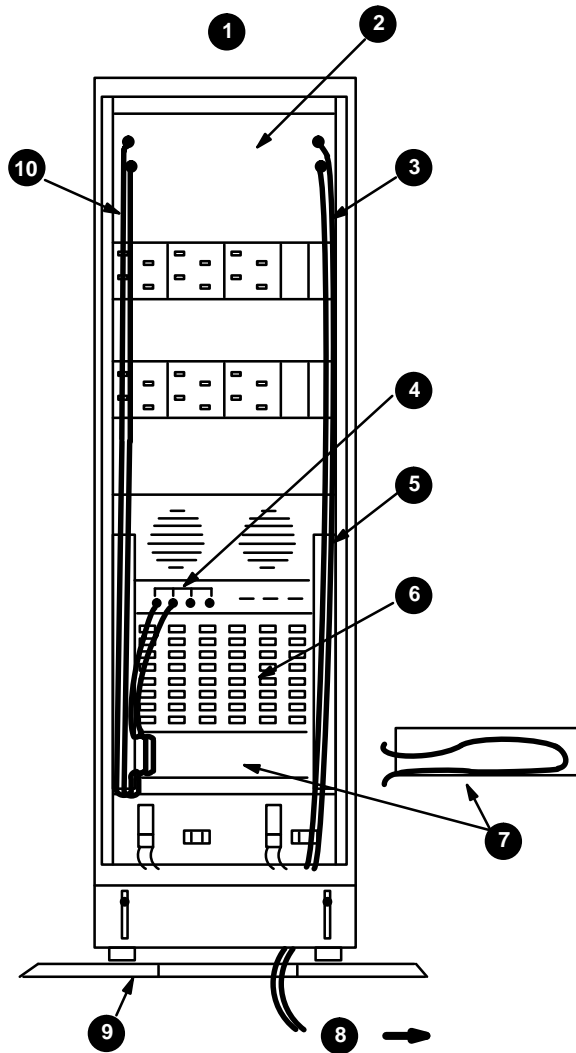
Figure 4-4: CI Cable (BNCIA) Routing Without the Star Coupler



CS-9075

- | | |
|--------------------------------|--|
| ❶ ISP system (rear view) | ❺ Cable tray, side view showing folded cable |
| ❷ CI cable connector ports | ❻ To host system |
| ❸ Cable trough (one each side) | ❼ Raised floor |
| ❹ HSC controller I/O bulkhead | ❽ CI (BNCIA) cables |

Figure 4-5: CI Cable (BNCIA) Routing with a Star Coupler



CS-9074

- | | | |
|----------------------------|--|-----------------------------|
| ❶ ISP system (rear view) | ❺ Cable trough (one each side) | ❸ To host system |
| ❷ Star coupler | ❻ HSC controller I/O bulkhead | ❹ Raised floor |
| ❸ CI cables to host system | ❼ Cable tray, side view showing folded cable | ❿ CI cables to star coupler |
| ❹ CI cable connector ports | | |

4.3 Connecting the SDI/STI (BC26V) Cables

Refer to Appendix C for information on connecting SDI/STI cables from SABBs to an external HSCxx controller.

4.4 Connecting Power

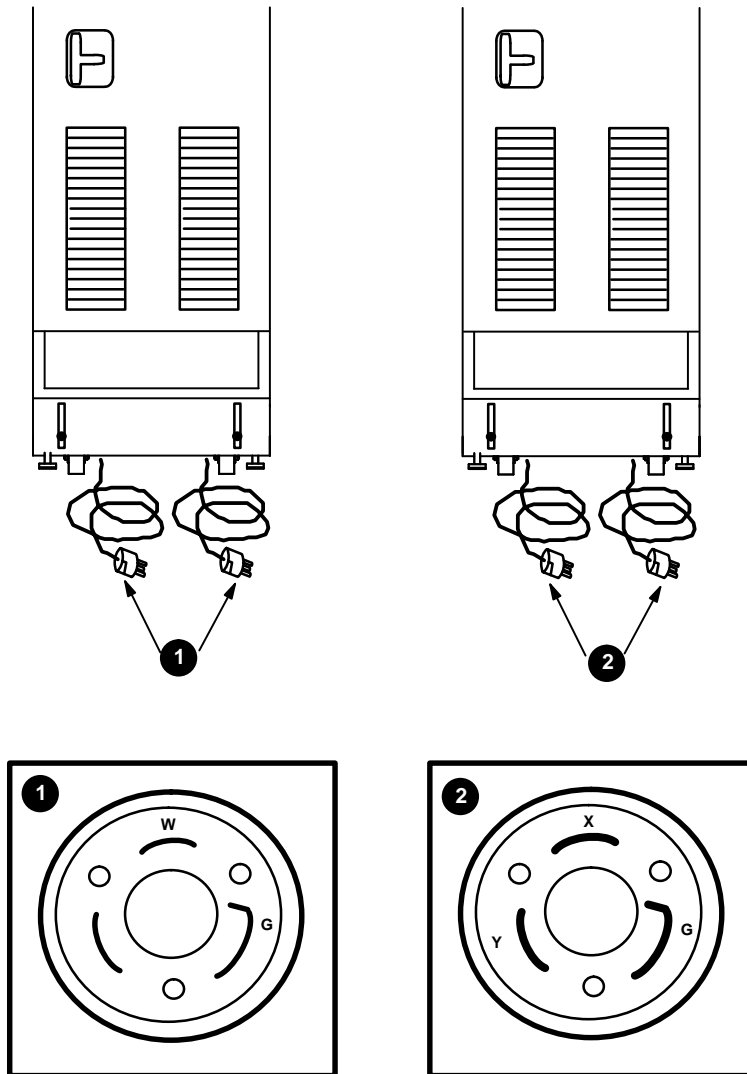
The enclosure provides two power cords. The actual power connections depend on the power controllers installed in the enclosure.

For 120 V ac (90-132 V ac) operation, 877-DB power controllers are installed. The power cord connector (NEMA L5-30P) mates with a NEMA L5-30R wall receptacle. Each power cord must be plugged into a power source capable of delivering 22.43 Amperes (see Section 1.3).

For 240 V ac (180-264 V ac) operation, 877-E power controllers are installed. The power cord connector (NEMA L6-30P) mates with a NEMA L6-30R wall receptacle. Each power cord must be plugged into a power source capable of delivering 13.30 Amperes (see Section 1.3).

Figure 4–6 shows the difference between the NEMA L5-30P ❶ and the NEMA L6-30P ❷ power connectors.

Figure 4-6: Power Connectors



CS9066

❶ End view of a NEMA L5-30P power connector

❷ End view of a NEMA L6-30P power connector

4.5 Starting the ISP System

To start the system, proceed as follows:

NOTE

Before starting the system, make sure the CI cables are properly installed. Otherwise, the system generates a fault condition (the HSC FAULT indicator lights).

1. Set power switches of power controllers to ON.
2. Set power switches of storage devices according to the startup procedure provided in their installation manual.
3. Ensure that the main breaker located at the rear of the HSC controller is in the ON position.
4. Ensure that the power switch on the operator console is set to ON.
5. Start up the Rack-Mountable HSC controller using the procedures in the *HSC Installation Manual*.

Chapter 5

Installing the DECraid+ System

After verifying that the system installation site is suitable, move the system to that location.



WARNING

When installing DECraid+ systems in a computer room with raised floors, DO NOT use vented tiles under any of the system casters. The tiles will crease and may eventually collapse. This could cause personal injury or equipment damage.

WARNING

When the enclosure is not bolted to the floor, the anti-tip legs must be extended before any individual system is extended out of the enclosure on its slides.

Also, do not extend more than one slide assembly at a time. Enclosure instability may result.

Installing the system consists of the following:

- Attaching the Enclosures
- Securing the Enclosures
- Connecting the SDI/STI (2T-BC26V) Cables
- Connecting the CI (BNCIA) Cables
- Connecting Power
- Starting the System

5.1 Attaching the Enclosures

The DECraid+ system is delivered in two enclosures that must be attached using the H9702-JK joiner kit (P/N 70-30534-01). Before attaching the enclosures, note the following:



WARNING

Before attaching the enclosures, verify that the floor can support the combined weight of 1,170 kilograms (2,600 pounds).

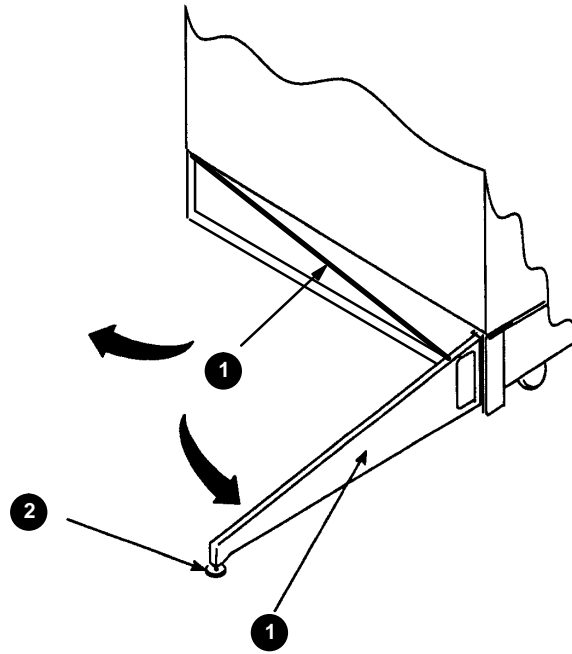
The enclosures must be attached on a smooth level floor.

After the enclosures are attached they cannot be moved to another location without detaching them.

To attach the enclosures, proceed as follows:

1. Position the enclosures in their final location with the front of each enclosure facing in the same direction and the open sides facing each other. Position the open sides as close together as possible.
2. To ensure that the enclosures remain stable, unfold the anti-tip legs ❶ as shown in Figure 5-1. Adjust the foot ❷ at the end of each anti-tip leg until it touches the floor.

Figure 5–1: Opening and Adjusting Anti-Tip Legs



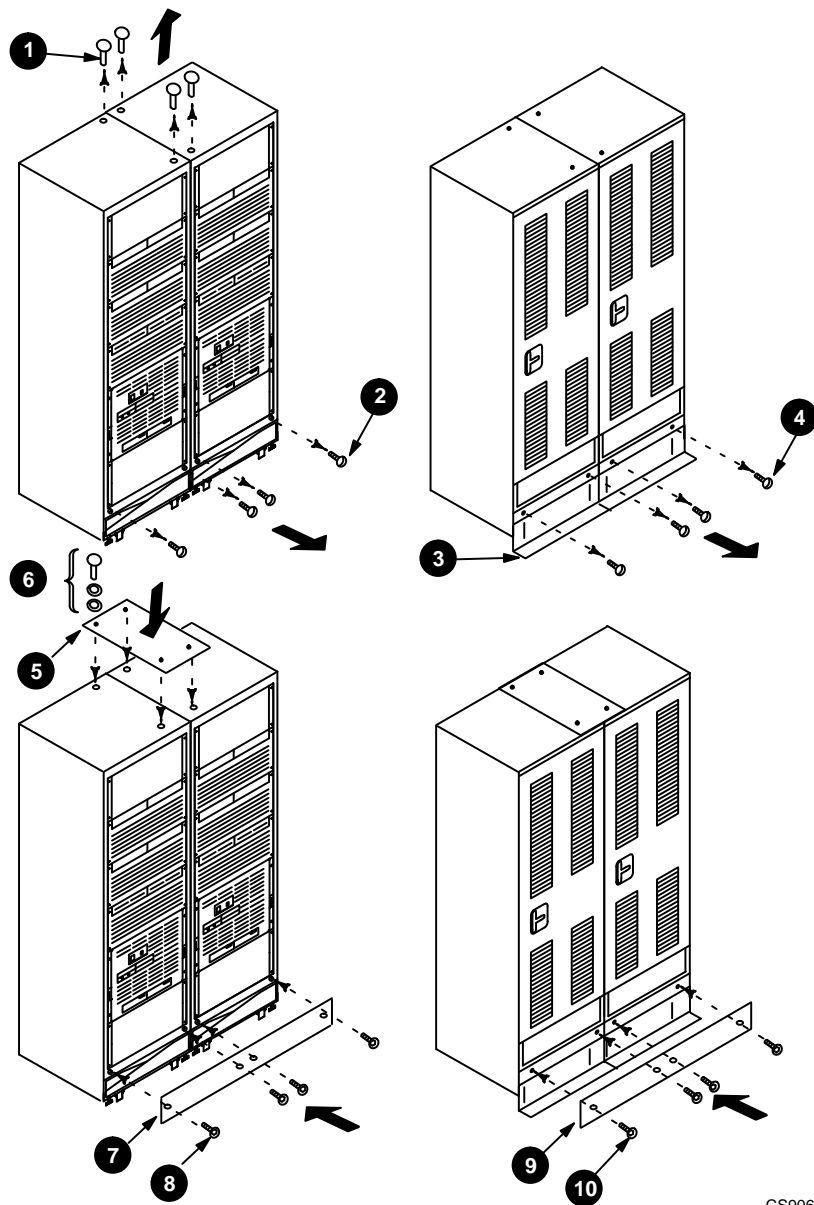
CS-9072

1 Anti-tip legs

2 Adjustable foot

3. Refer to Figure 5-2 and remove the four protective plastic plugs ❶.
4. Remove the two 3/8-16 slotted, truss-head screws ❷ from the bottom front of each enclosure. Discard the screws.
5. Loosen the attaching hardware of the rear mounting bracket ❸ of each enclosure and lower the bracket ❸ to the floor.
6. Remove the 3/8-16 slotted, truss-head screws ❹ from the bottom rear of each enclosure. Discard the screws.
7. Attach the top plate ❺, using four sets of hardware ❻ consisting of one 1/2-13 hex-head machine screw, lockwasher, and flat washer. Do not tighten screws at this time.
8. Attach one bottom plate ❼ across the bottom front of the two enclosures using four Allen, socket head screws ❸. Do not tighten the screws.
9. Attach another bottom plate ❹ across the bottom front of the two enclosures using four Allen, socket head screws ❿. Do not tighten the screws.
10. Tighten the hardware ❻ installed in step 8.
11. Tighten the screws ❸ and ❿ installed in steps 9 and 10.
12. Proceed to Section 5.2 for cabling procedure.

Figure 5-2: Attaching the Enclosures



CS9064

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> ❶ Plastic plugs ❷ 3/8-16 slotted, truss-head screws, four ❸ Rear mounting bracket, two ❹ 3/8-16 slotted, truss-head screws, four | <ul style="list-style-type: none"> ❺ Top plate (P/N 74-46334-01) ❻ Set of hardware, consisting of one 1/2-13 hex-head machine screw, lockwasher, and flat washer, four sets. | <ul style="list-style-type: none"> ❼ Front bottom plate (P/N 74-46332-01) ❽ Allen, socket-head screw, four ❾ Rear bottom plate (P/N 74-46332-01) ❿ Allen, socket-head screw, four |
|---|--|---|

5.2 Connecting the SDI/STI (2T-BC26V) Cables

Each DECraid+ system enclosure is shipped with up to six 2T-BC26V-15 SDI/STI cables connected only to the rackmounted HSC I/O ports and coiled up in the rear of the enclosure. These cables need to be connected to the B ports of the SABBs in the attached cabinet. The actual number of cables that need to be connected in the system depends on the system ordered. Appendix C describes the procedure to connect SDI/STI (BC26V) cables from SABBs to an external HSCxx.

Each cable has four connectors on one end that are connected to the HSC I/O ports. In enclosure 2 (this is the enclosure on the left when facing the rear of the system), these connectors are labeled starting with 2-Dx, 2-Ex, 2-Fx, 2-Lx, 2-Mx, and 2-Nx. In enclosure 1, these connectors are labeled starting with 1-Dx, 1-Ex, 1-Fx, 1-Lx, 1-Mx, and 1-Nx. Table 5-1 lists the cables and where they are connected.

The other end of each cable has one large connector that must be connected to the appropriate SABB B port in the attached enclosure according to Table 5-1. Figure 5-3 shows the location of the HSC I/O ports and SABB ports.

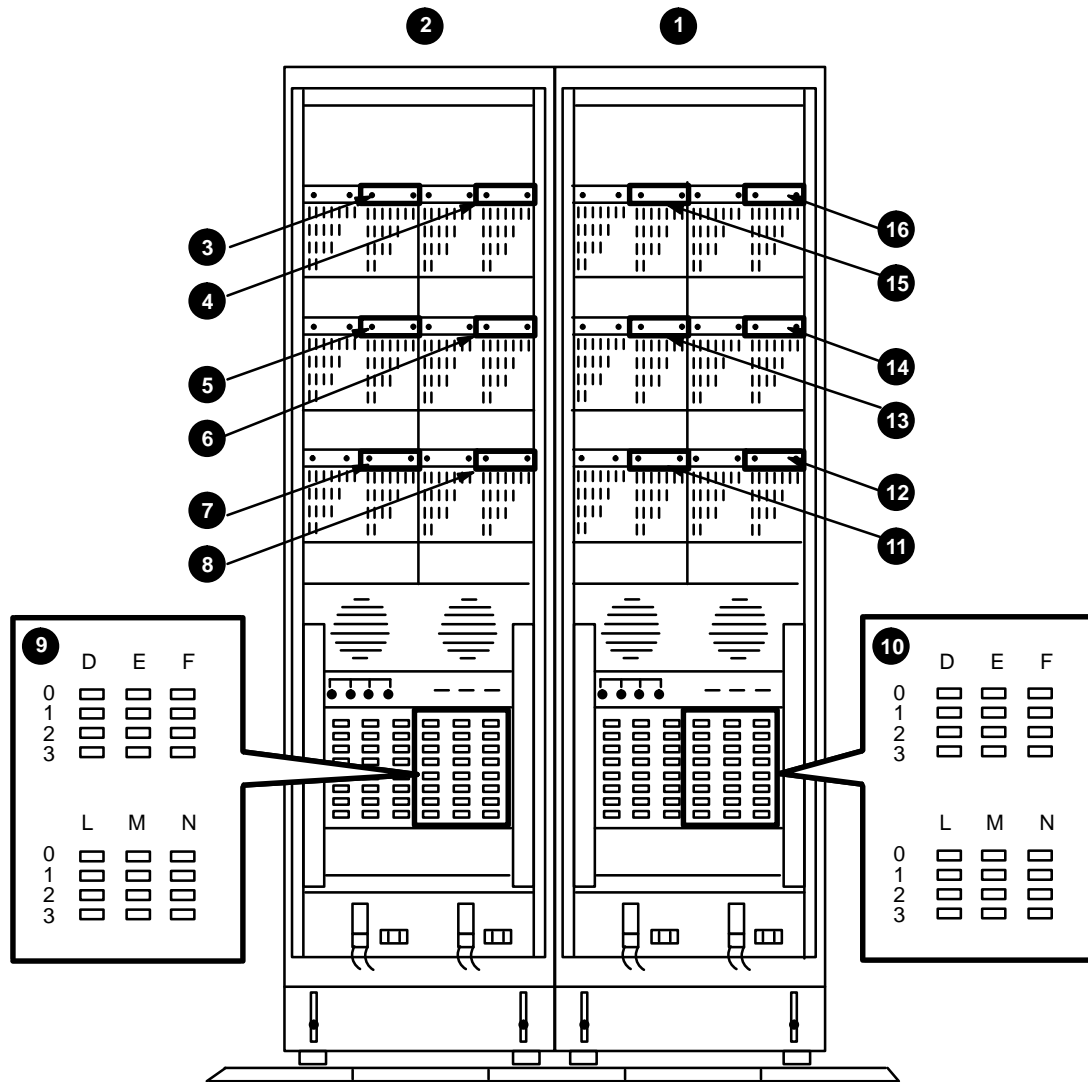
NOTE

Table 5-1 lists the cables in the order that they should be connected. Following this order facilitates connection of the cables from the HSC I/O Port to the SABB Port.

Table 5-1: Cable Identification and Connections

From Enclosure 2 HCS I/O Port	To Enclosure 1 SABB Port	From Enclosure 1 HCS I/O Port	To Enclosure 2 SABB Port
2-E0, 2-E1, 2-E2, 2-E3	1-6B	1-E0, 1-E1, 1-E2, 1-E3	2-6B
2-N0, 2-N1, 2-N2, 2-N3	1-5B	1-N0, 1-N1, 1-N2, 1-N3	2-5B
2-L0, 2-L1, 2-L2, 2-L3	1-4B	1-L0, 1-L1, 1-L2, 1-L3	2-4B
2-F0, 2-F1, 2-F2, 2-B3	1-3B	1-F0, 1-F1, 1-F2, 1-F3	2-3B
2-D0, 2-D1, 2-D2, 2-D3	1-2B	1-D0, 1-D1, 1-D2, 1-D3	2-2B
2-M0, 2-M1, 2-M2, 2-M3	1-1B	1-M0, 1-M1, 1-M2, 1-M3	2-1B

Figure 5-3: HSC I/O Ports and SABB Ports



CS-9077

- | | | | |
|---------------|--------|------------------------------|--------|
| ① Enclosure 1 | ⑤ 2-4B | ⑨ Enclosure 2- HSC I/O ports | ⑬ 1-4B |
| ② Enclosure 2 | ⑥ 2-3B | ⑩ Enclosure 1- HSC I/O ports | ⑭ 1-3B |
| ③ 2-2B | ⑦ 2-6B | ⑪ 1-6B | ⑮ 1-2B |
| ④ 2-1B | ⑧ 2-5B | ⑫ 1-5B | ⑯ 1-1B |

Figure 5–4 provides a simplified drawing showing how the SDI/STI cable ⑤ connected to HSC I/O ports D0, D1, D2, D3 ⑥ in enclosure ② is routed and connected to SABB Port 2B ⑩ in enclosure ①.

The following instructions describe how to install the SDI/STI cable ⑤ shown in Figure 5–4 as an example. The other cables listed in Table 5–1 are installed in a similar manner.

To install the SDI/STI ⑤ cable, refer to Figure 5–4 and proceed as follows:

1. Locate the coiled up SDI/STI cable ⑤ in enclosure ② that is connected to HSC I/O ports D0, D1, D2, D3 ⑥.



CAUTION

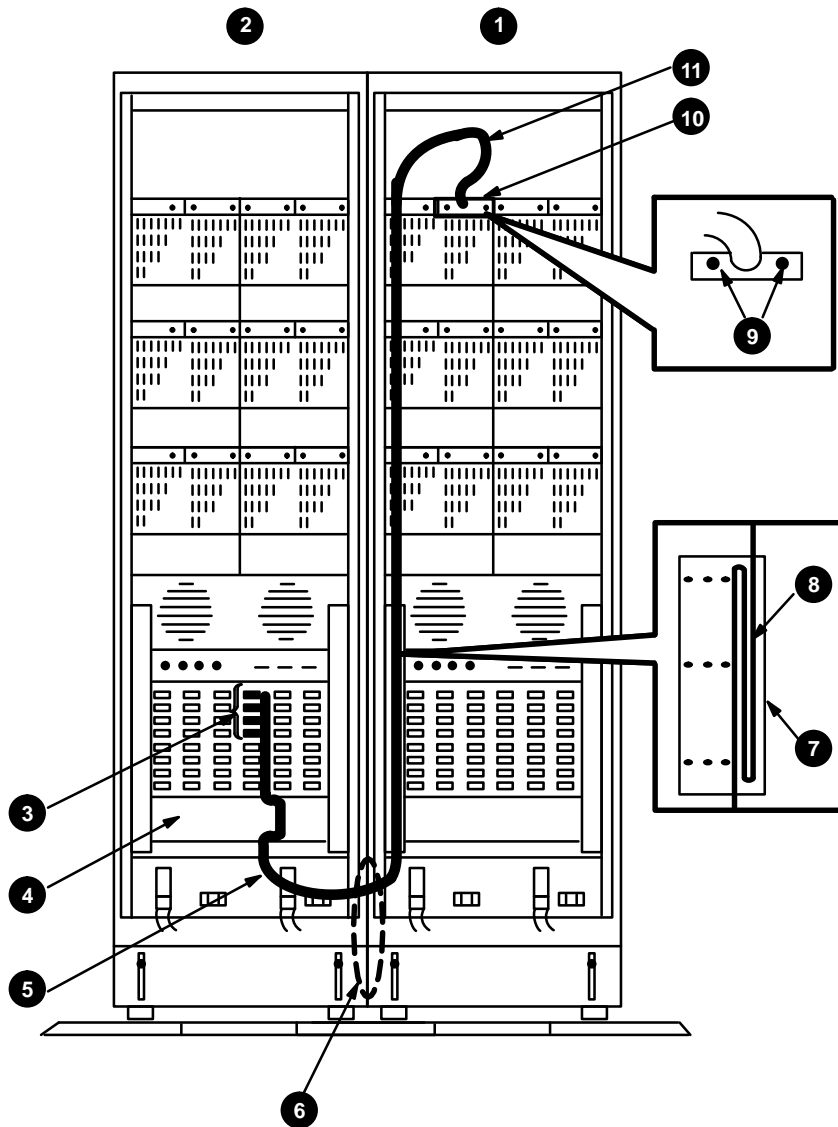
**Do not over tighten retaining screws on cable connectors to SABB ports.
The screws could be damaged.**

2. Route the SDI/STI cable ⑤ through the opening ⑥ in the lower side frame, up the cable trough ⑦, and connect it to the 2B SABB port ⑩. Tighten the retaining screws ⑨. (**Do not** over tighten the screws.)
3. Ensure that a minimum 50.8-cm (20-inch) service loop ⑪ is left at the storage device. Then tie the cable off to the nearest rail. The service loop ensures that there will be enough slack in the cable to pull the SABB halfway out for servicing.
4. Fold the excess cable ③ into the cable trough ⑦ and secure it with the three pins in the cable trough ⑦. The pins (not shown in Figure 5–4) slide through holes in the sides of the cable trough ⑦ to hold the folded cable ③ in place.
5. Connect the other cables in a similar manner to the appropriate SABB ports according to Table 5–1.

NOTE

**An equal number of cables should be routed through each cable trough.
Any extra length of cable should be neatly folded in a cable trough.**

Figure 5-4: Example of Cabling Between Enclosures



CS-9076

- | | | |
|--|---|--------------------------------|
| ❶ Enclosure 1 | ❺ SDI/STI cable (2T-BC26V-15) | ❹ Retaining screws |
| ❷ Enclosure 2 | ❻ Opening in lower side frame to route cables through | ❿ 2B SABB port |
| ❸ Cable connection to HSC I/O ports D0, D1, D2, and D3 | ❼ Cable trough | ⓫ 50.8-cm (20-in) service loop |
| ❹ Cable tray | ❽ Folded excess cable | |

5.2.1 Securing the Enclosures

If the system is going to be bolted to the floor, refer to Appendix B for details.

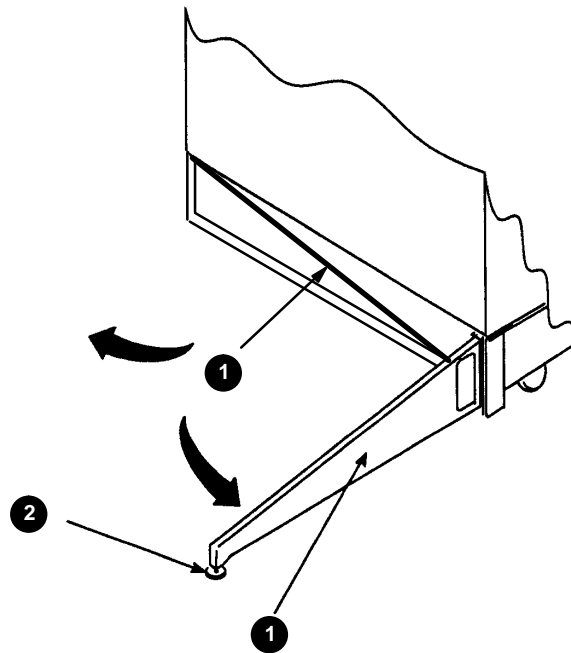
To ensure that the enclosure remains stable when an individual chassis is extended out of the enclosure, extend the anti-tip legs.

NOTE

As shown in Figure 5-5, fold the anti-tip legs ❶ out from the bottom front of the enclosure. Adjust the foot ❷ at the end of each anti-tip leg until it touches the floor.

The enclosure is designed to hold several system configurations. Therefore, the results differ as to how much force it will take to tip or make this enclosure unstable.

Figure 5-5: Opening and Adjusting Anti-Tip Legs



CS-9072

❶ Anti-tip leg

❷ Adjustable foot

5.3 Connecting the CI (BNCIA) Cables

The Rack-Mountable HSC connects to the host system (either directly or through a star coupler (P/N SC008-xx) via blue CI cables (P/N BNCIA-xx). The following information provides the cable routing guidelines using a typical DECraid+ Storage System. For clarity, the figures only show the routing of a few cables.



CAUTION

To avoid damaging the CI cables, ensure that they have a minimum bend radius of 6.5 centimeters (2.5 inches).

If there is no star coupler configured into the ISP system, perform the following procedure:

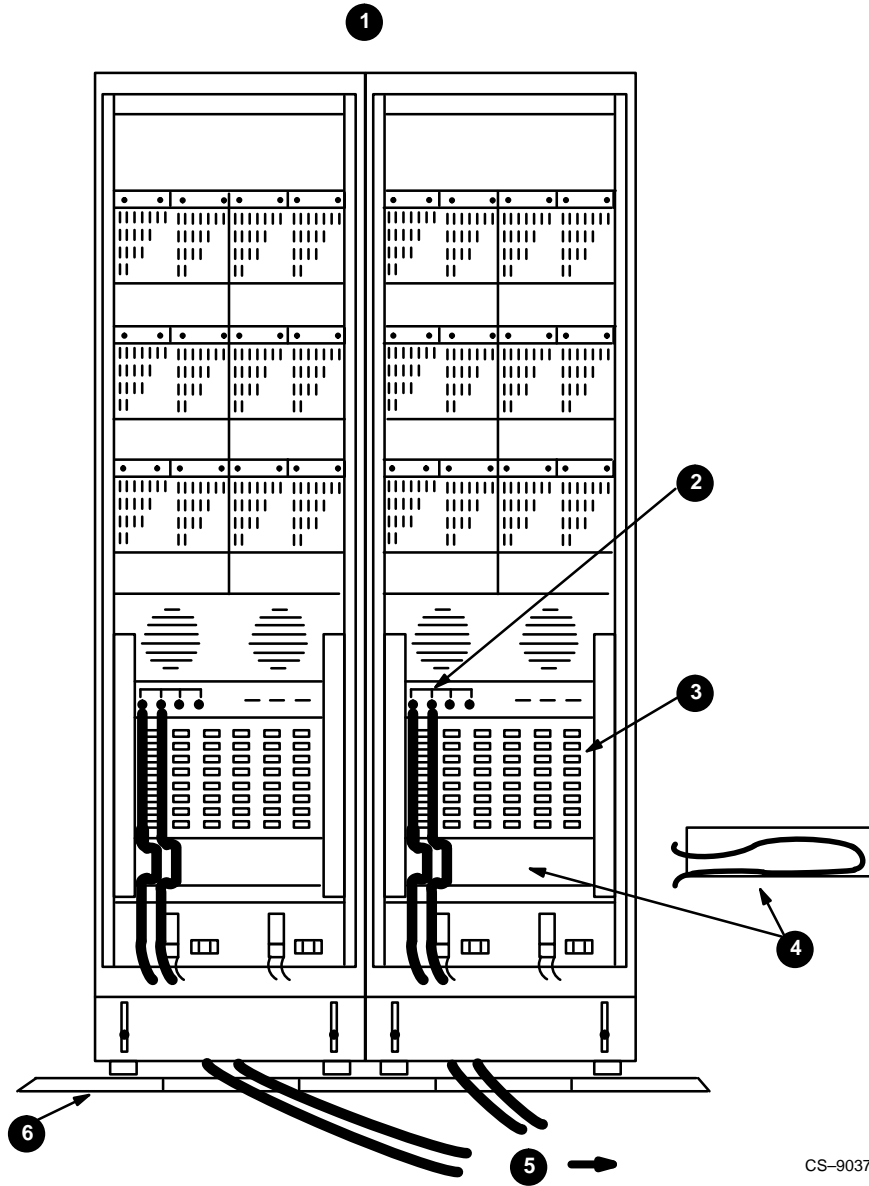
1. As shown in Figure 5–6, connect the CI cables (blue cables) to the CI cable connector ports ② at the rear of the Rack-Mountable HSC controller. Route the cables through the cable tray ④ located under the Rack-Mountable HSC controller.
2. Route the CI cables down through the opening in the bottom of the enclosure and, if applicable, under the raised flooring ⑥ in the computer room.
3. Route the cables to the host system ⑤ and connect them as described in the host system documentation.

If there is a star coupler in the system configuration, it is typically rack mounted in the top of the enclosure as shown in Figure 5–7. Perform the following procedure:

1. As shown in Figure 5–7, route the first pair of CI cables from the CI cable connector ports ④ up through the nearest cable trough ⑤ and then connect them to the star coupler ② as described in the *Star Coupler User's Guide*.
2. Connect a second set of CI cables to the star coupler and route them down through the nearest cable trough ④, through the openings in the bottom of the enclosure and, if applicable, under the raised flooring ⑥ in the computer room.
3. Route the cables to the host system ③ and connect them as described in the host system documentation.

Refer to the *Rack-Mountable HSC Installation/Owner's Manual* for more details on routing and connecting the CI cables to the Rack-Mountable HSC.

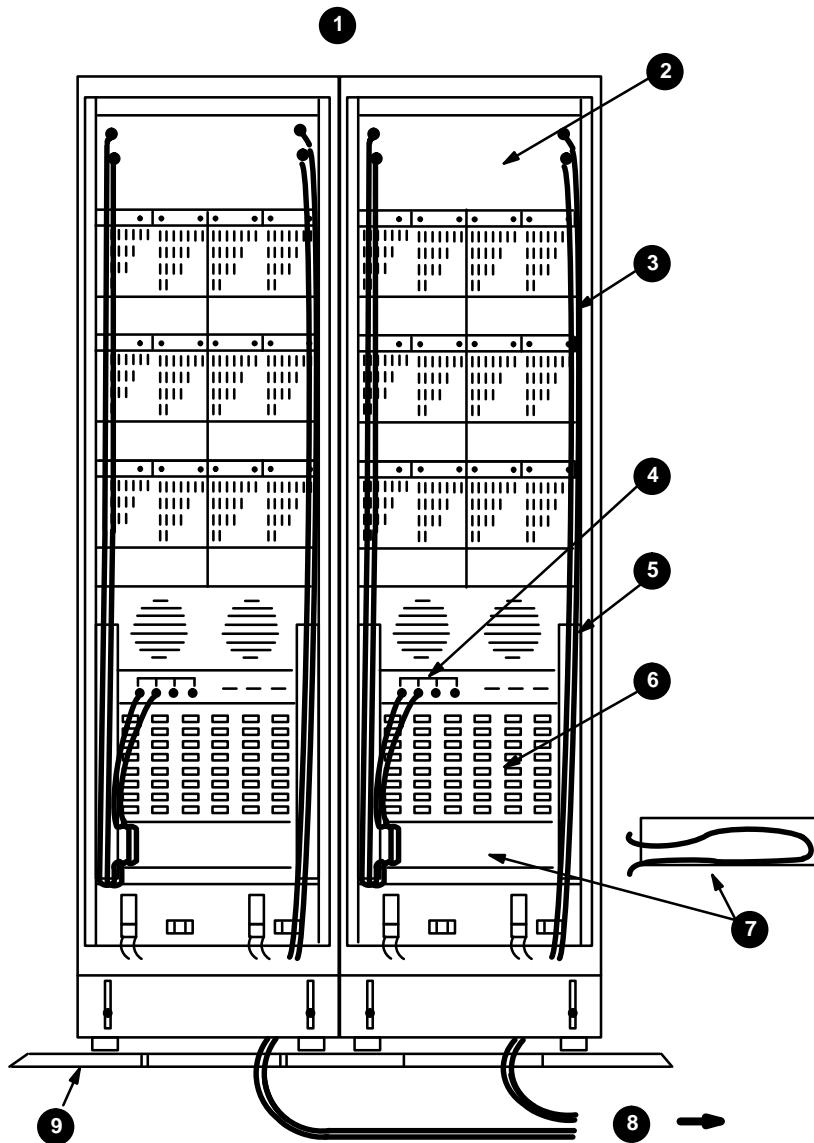
Figure 5-6: CI Cable (BNCIA) Routing Without the Star Coupler



CS-9037

- 1 DECraid+ system (rear view)
- 2 CI cable connector ports
- 3 HSC I/O bulkhead
- 4 Cable tray, side view showing folded cable
- 5 BNCIA cable to host system
- 6 Raised floor

Figure 5-7: CI Cable (BNCIA) Routing With the Star Coupler



CS-9036

- | | |
|---|--|
| <ul style="list-style-type: none"> ❶ DECraid+ system (rear view) ❷ Star Coupler ❸ BNCIA cables ❹ CI cable connector ports ❺ Cable trough (two in each side of enclosure) | <ul style="list-style-type: none"> ❻ HSC I/O bulkhead ❼ Cable tray, side view showing folded cable ❽ BNCIA cable to host system ❾ Raised floor |
|---|--|

5.4 Connecting SDI/STI (BC26V) Cables

Refer to Appendix C for information on connecting SDI/STI cables from SABBs to an external HSCxx controller.

5.5 Connecting Power

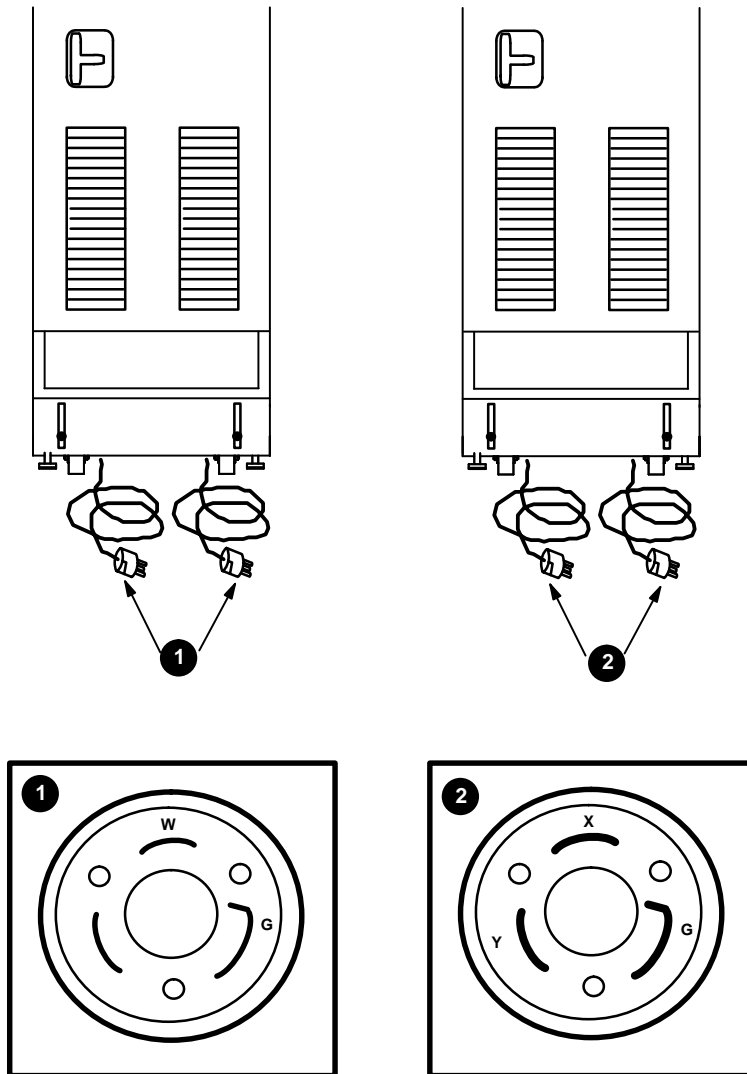
There are four power cords from the enclosure with the actual power connections dependent on the power controllers installed in the enclosure.

For 120 V ac (90-132 V ac) operation, 877-DB power controllers are installed. The power cord connector (NEMA L5-30P) mates with a NEMA L5-30R wall receptacle. Each power cord must be plugged into a power source capable of delivering 22.43 Amperes (see Section 1.3).

For 240 V ac (180-264 V ac) operation, 877-E power controllers are installed. The power cord connector (NEMA L6-30P) mates with a NEMA L6-30R wall receptacle. Each power cord must be plugged into a power source capable of delivering 13.30 Amperes (see Section 1.3).

Figure 5–8 shows the difference between the NEMA L5-30P ❶ and the NEMA L6-30P ❷ power connectors.

Figure 5–8: Power Connectors



CS9066

NOTE

Figure 5–8 shows only one enclosure of a DECRaid+ 120 V ac system and a DECRaid+ 240 V ac system.

❶ End view of a NEMA L5-30P power connector

❷ End view of a NEMA L6-30P power connector

5.6 Starting the DECraid+ System

To start the system, proceed as follows:

NOTE

Before starting the system, make sure the CI cables are properly installed. Otherwise, the system generates a fault condition (the HSC FAULT indicator lights.)

1. Set power switches of power controllers to ON.
2. Set power switches of storage devices according to the startup procedure provided in their installation manual.
3. Ensure that the main breaker located at the rear of the HSC is in the ON position.
4. Ensure that the power switch on your operator console is set to ON.
5. Start up the Rack-Mountable HSC using the procedures in the *HSC Installation Manual*.

Appendix A

Options

Table A–1 provides a list of the options available for the ISP system and the DECraid+ system.

Table A–1: System Options

Part Number	Description
2T-SA71-xx	Storage Array Building Block (SABB), made up of one to four RA71 disk drives, depending upon 2T-SA71 variant. Each SABB requires 10.5 inches of vertical rack space. Up to six of these SABBs can be installed in one enclosure. Each 2T-SA71-xx SABB contains 2.8 Gigabytes of storage.
2T-SA72-xx	Identical to 2T-SA71-xx except that it is made up of one to four RA72 disk drives. Each 2T-SA71-xx SABB contains 4.0 Gigabytes of storage.
2T-SA73-xx	Identical to 2T-SA71-xx except that it is made up of one to four RA73 disk drives. Each 2T-SA71-xx SABB contains 8.0 Gigabytes of storage.
2T-SC008-AC	Rackmount star coupler. This option requires 10.5 inches of vertical rack space at the top of the enclosure.
2T-ISPCK-AA/RA	Bulkhead kits, which enable the connection of 2T-SA7x SABBs to the Rack-Mountable HSC using BC26V cables. Depending on the quantity of 2T-SA7x SABBs being installed in an ISP or DECraid+ system, one 2T-ISPCK-AA or a combination of 2T-ISPCK-AA and 2T-ISPCK-RA kits are required. One 2T-ISPCK-AA bulkhead kit is required for each odd number of 2T-SA7x SABBs installed in an ISP or DECraid+ system. A 2T-ISPCK-RA kit is required for every even number of SABBs installed. For example: For one 2T-SA7x SABB, only one 2T-ISPCK-AA kit is required; for five 2T-SA7x SABBs, three 2T-ISPCK-AAs and two 2T-ISPCK-RA kits are required.

Table A-1 (Cont.): System Options

Part Number	Description
2T-BC26V-15	Special cables to connect 2T-SA72s with Rack-Mountable HSCs in the same enclosure or an attached adjacent enclosure. (The 2T-ISPCK bulkhead kits are not needed with these cables.)
NOTE Two 2T-BC26V-15 cables are needed for each 2T-SA7x SABB installed in the system when it is required to have dual port access to each disk spindle in an SABB.	
H9702-JK	Joiner kit to attach two ISP system or DECraid+ system enclosures (P/N H9702-MT).
H9702-KB	H9702 Bolt-down Kit (for raised floors). To meet local safety requirements, it may be necessary to secure the system enclosure to the floor.
HSC5X-DA	4-port data channel card. See Appendix C for usage.
HSC9X-FA	8-port data channel card. See Appendix C for usage.

NOTE

Most standard HSC upgrade kits can be used with the rackmountable HSC. If migrating from an HSC40 or HSC60, the appropriate upgrade kit plus a 2T-HSCPS-UG kit must be installed. Refer to the *Rack-Mountable HSC Installation/Owner's Manual* for kit installation instructions.

Appendix B

Tie-Down Installation

This appendix provides information for securing an ISP or DECraid+ system enclosure (P/N H9702-MT) to a floor. A Boltdown Kit (P/N H9702-KB) is needed to secure the system to a raised floor.

NOTE

It is the customer's responsibility to bolt the enclosure to the floor if it is required.



WARNING

When installing DECraid+ systems in a computer room with raised floors, DO NOT use vented tiles under any of the system casters. The tiles crease and may eventually collapse. This could cause personal injury or equipment damage.

To fasten a DECraid+ system to the floor, use the following guidelines:

1. Establish the exact floor location where the system will be installed. **Do not** move the system to the installation site before the floor is prepared to receive the system.



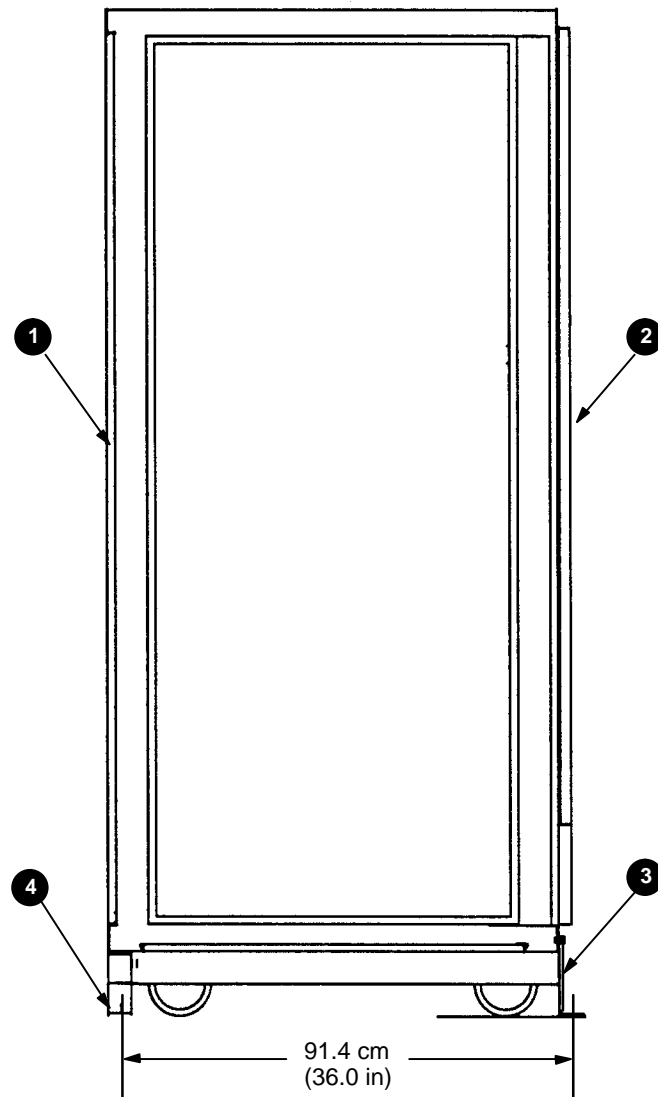
WARNING

The floor must be smooth and level, and capable of supporting up to 1,170 kilograms (2,600 pounds).

2. Prepare the floor with floor mounting hardware. Dimensions for preparing the floor are provided in Figure B-1 and Figure B-2. For an example of how to secure the system to a raised laboratory floor using the Boltdown Kit (P/N H9702-KB), refer to Figure B-3.
3. After the floor is prepared for securing the system, move the system to the installation site. If two attached ISP systems or a DECraid+ system is being installed, attach the enclosures according to Chapter 4 and 5 (respectively) before securing the system enclosures to the floor.
4. To gain access to the mounting holes in the anti-tip leg assembly, unfold the anti-tip legs.
5. Remove the three bolts in the top of the bracket of the anti-tip leg assembly, and loosen the two bolts at the rear of the bracket to adjust the front mounting bracket up and down. After adjusting the bracket to the floor, tighten the two bolts.
6. Loosen the two bolts on the rear mounting bracket, adjust the bracket to the floor and tighten the two bolts.
7. Attach the brackets to the floor.

The enclosure mounting brackets used to mount the enclosure to the shipping pallet are also used to fasten the enclosure to the floor.

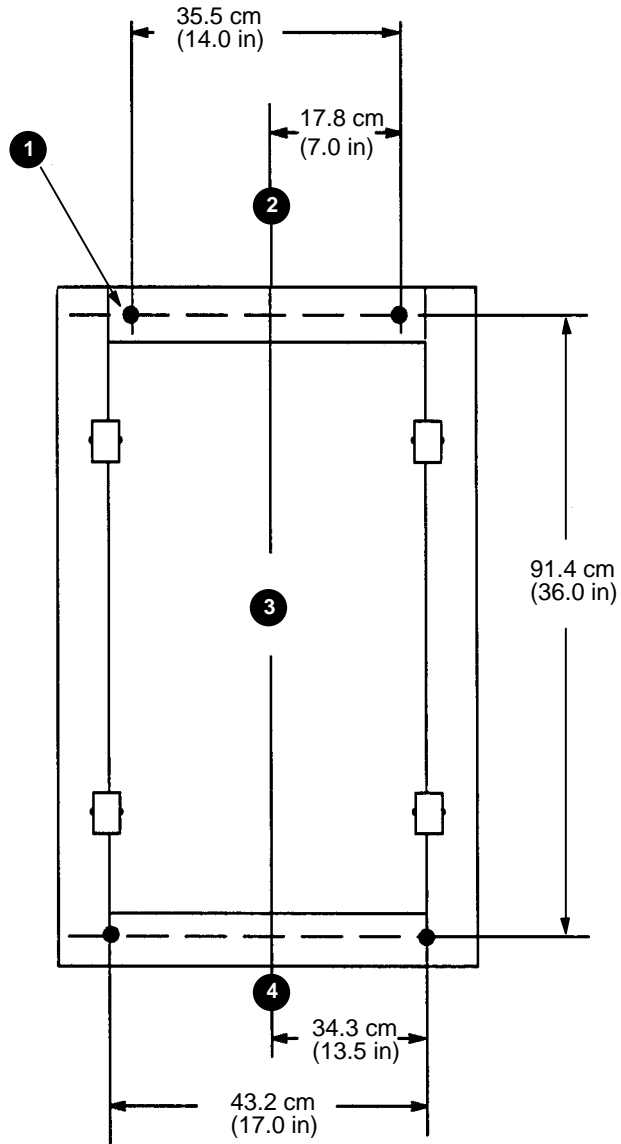
Figure B-1: H9702-MT Enclosure Side View (Dimensions)



CS-9085

- ❶ Front of the enclosure
- ❷ Rear of the enclosure
- ❸ Rear mounting bracket
- ❹ Anti-tip leg assembly (also serves as the front mounting bracket)

Figure B-2: H9702-MT Enclosure Bottom View (Dimensions)

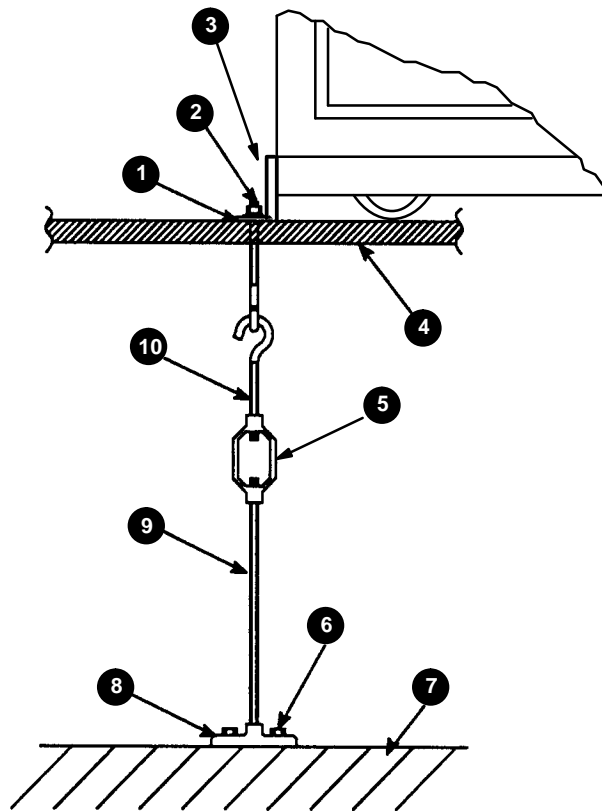


CS-9086

- ❶ 1.4-cm (.53-in) clearance holes for mounting bolts
- ❷ Front of the enclosure
- ❸ Center line to the enclosure
- ❹ Rear of the enclosure

B-4 Tie-Down Installation

Figure B-3: Tie-Down Method on Raised Floor



cs-9084

Reference: Boltdown Kit, P/N H9702-KB (not supplied with system)

- | | | |
|--|------------------------|---|
| ① Washer | ⑤ Turn buckle | ⑨ .95 cm (.375 in) or larger, right-hand threaded rod |
| ② .95 cm (.375 in) or larger hex nut | ⑥ Lag bolt into cement | ⑩ .95 cm (.375 in) or larger, left-hand threaded rod |
| ③ Enclosure mounting bracket (front or rear) | ⑦ Sub floor | |
| ④ Raised laboratory floor | ⑧ Hold down bracket | |

Appendix C

Maintenance

This appendix provides information concerning the following items:

- Recommended Field Replaceable Units (FRUs)
- FRU Removable/Replacement Procedures
- HSC Requester Module Usage
- SDI/STI Cable Connection Guidelines

C.1 Recommended Field Replaceable Units (FRUs)

Table C-1 lists the major FRUs for the H9702-MT enclosure used in the ISP and DECraid+ system.

Table C-1: Recommended Field Replaceable Units (FRUs)

FRU	Part Number
Rear door	34-37528-01
Side panel	34-34643-01
Anti-tip leg assembly	70-28612-01
Bottom cover assembly	70-29036-01

The following units are not FRUs. They are listed for reference only.

Caster base, part number: 34-33655-03

Swivel caster, part number: 12-39346-01

C.2 Removal and Installation Procedures

Section C.2.1 through Section C.2.4 provide the removal and installation procedures for the FRUs listed in Table C-1.

C.2.1 Rear Door

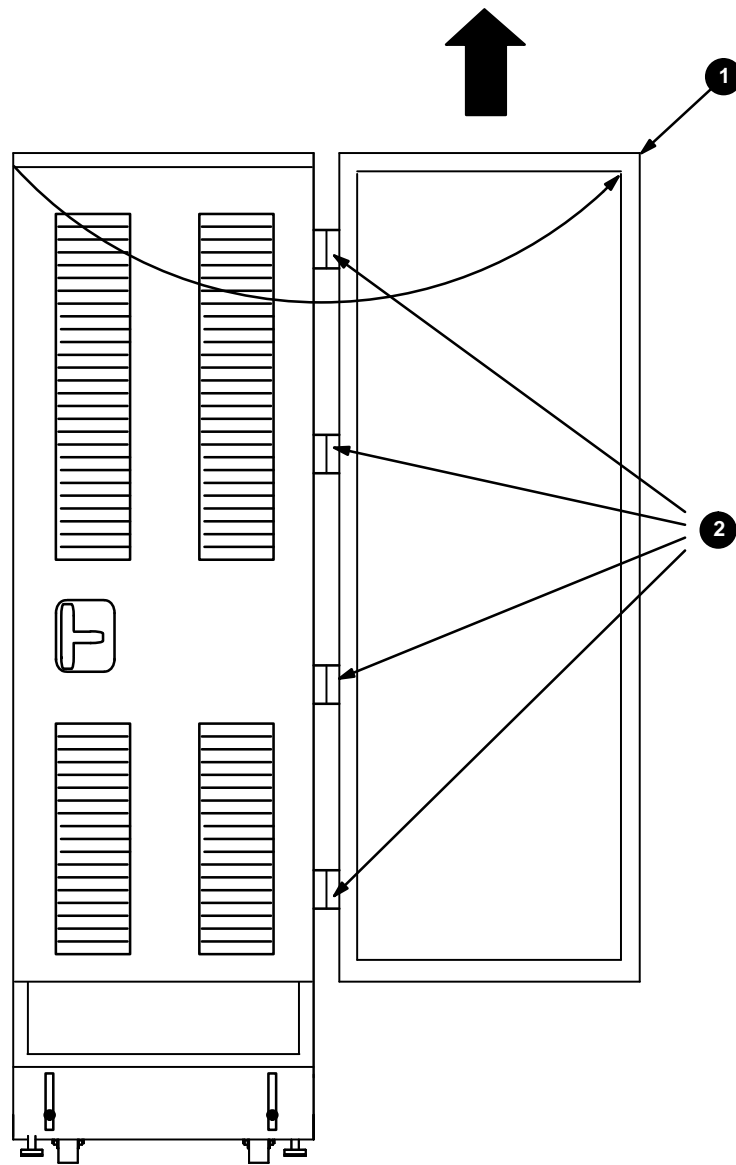
To remove the rear door, refer to Figure C-1 and proceed as follows:

1. Open the rear door ❶ to the fully open position.
2. Facing the inside of the rear door ❶, grasp the door along the left and right edge and lift the door straight up off the hinges ❷.

To install the rear door, proceed as follows:

1. Facing the inside of the rear door ❶, grasp the door along the left and right edge. Then lift the rear door ❶ and align the four door hinges ❷ with the mating hinge pins of the enclosure.
2. Lower the door hinges ❷ onto the enclosure hinge pins.
3. Close the rear door ❶.

Figure C-1: Removing the Rear Door



CS-9082

❶ Rear door

❷ Door hinges

C.2.2 Side Panel

There are forty Phillips head screws inside the enclosure fastening a side panel to the enclosure. Before a side panel can be removed, the enclosure must be prepared to gain access to the forty Phillips head screws.

C.2.2.1 Preparing the Enclosure

To prepare the enclosure for removing or installing a side panel, proceed as follows:



WARNING

Before performing the following procedure, disconnect the system ac power cords from the ac power source.

1. Open the anti-tip legs and adjust the feet to stabilize the system. (Refer to Section 4.1.1 or 5.2.1 for details.)
2. Disconnect the power and signal cables from the SABBs adjacent to the side panel being removed. Then remove the SABBs from the enclosure. (Refer to the SABB documentation for the removal procedures.)

NOTE

Remove only the SABBs adjacent to the side panel being removed.

3. Slide the rack-mountable HSCxx controller to its fully extended position. (Refer to the rack-mountable HSC documentation for the procedure.)

C.2.2.2 Removing the Side Panel

To remove a side panel, refer to Figure C-2 and proceed as follows:

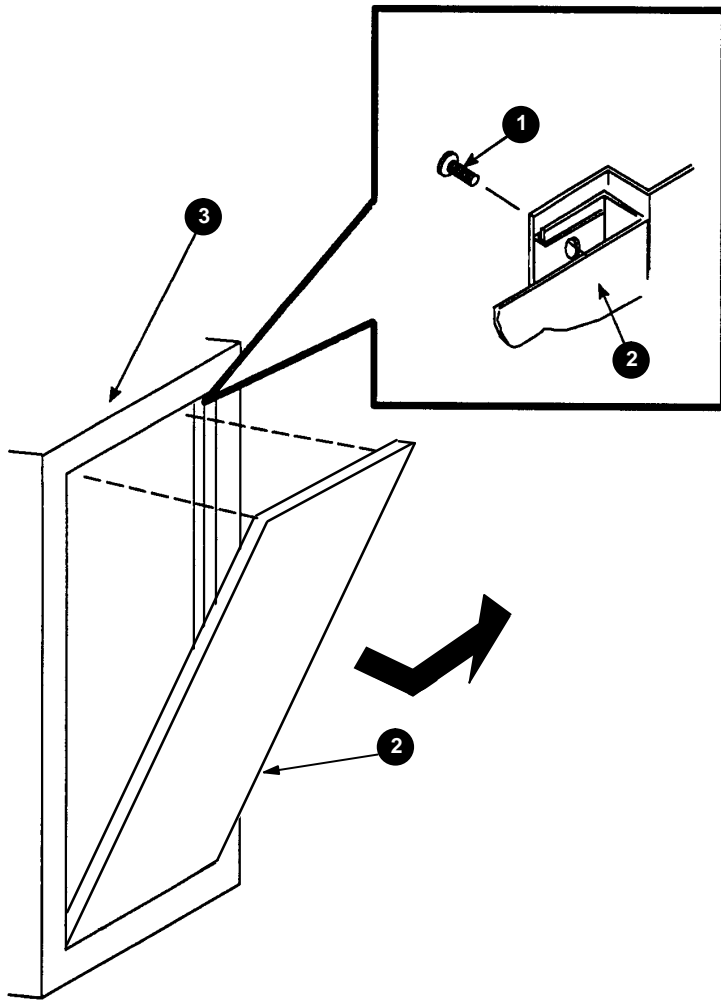


WARNING

Before performing the following procedure, disconnect the system ac power cords from the ac power source.

1. Remove all Phillips head screws ❶, except one at the top center.
2. With one hand holding the side panel ❷ in place, remove the last Phillips head screw ❶.
3. Tilt the side panel ❷ away from the enclosure ❸ and remove it.

Figure C-2: Removing a Side Panel



CS-9087

- ❶ Phillips head screws
- ❷ Side panel

- ❸ Enclosure

C.2.2.3 Installing a Side Panel

To install a side panel, refer to Figure C-2 and proceed as follows:



WARNING

Before performing the following procedure, disconnect the system ac power cords from the ac power source.

1. If the enclosure has not been prepared for installation, perform the procedure described in Section C.2.2.1.
2. Place the bottom edge of the side panel ❷ in the side frame of the enclosure ❸ and push into place.
3. While holding the side panel ❷ in place with one hand, install one Phillips head screw ❶ at top center screw location to hold the side panel in place.
4. Install, but do not tighten the remaining Phillips head screws.
5. Tighten all the Phillips head screws.

C.2.3 Anti-Tip Leg Assembly

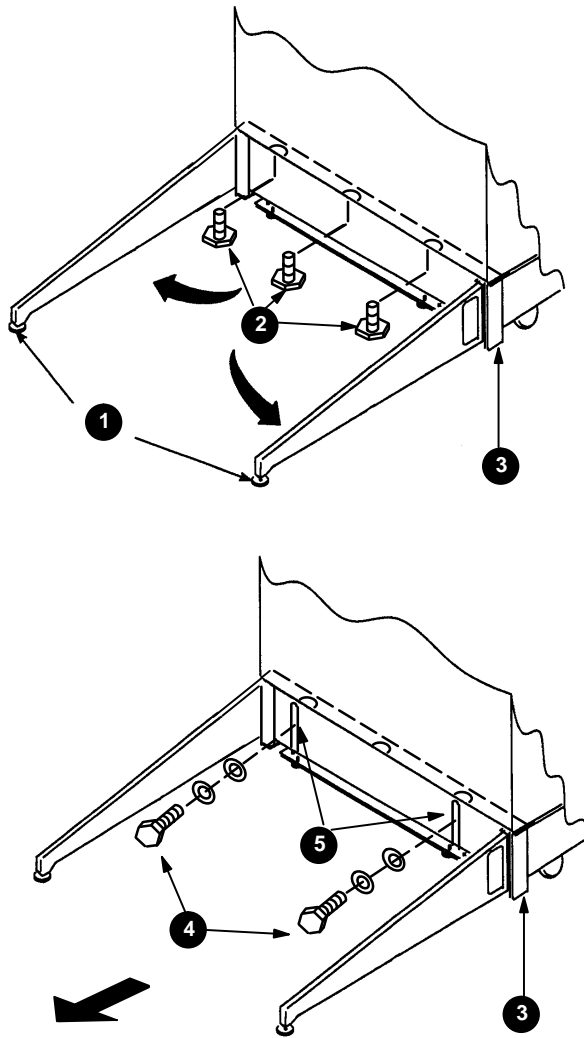
To remove the anti-tip leg assembly, refer to Figure C-3 and proceed as follows:

1. Open the anti-tip legs ❶.
2. Remove the three hex head bolts ❷ fastening the top of the anti-tip leg assembly ❸ to the enclosure frame.
3. Remove the two rear hex head bolts, lock washers, and flat washers ❹.
4. Remove the anti-tip leg assembly ❸.

To install the anti-tip leg assembly, proceed as follows:

1. Align the slotted mounting holes ❺ in the bracket of the anti-tip leg assembly ❸ with those in the front of the enclosure.
2. Install two rear hex head bolts with lock washers and flat washers ❹, but do not tighten.
3. Slide the anti-tip leg assembly ❸ up and install the three hex head bolts ❷ to fasten the top of the anti-tip leg assembly ❸ to the enclosure.
4. Tighten the two rear bolts ❹.
5. Fold the anti-tip legs ❶ into the bracket of the anti-tip leg assembly ❸.

Figure C-3: Removing the Anti-Tip Leg Assembly



CS-9088

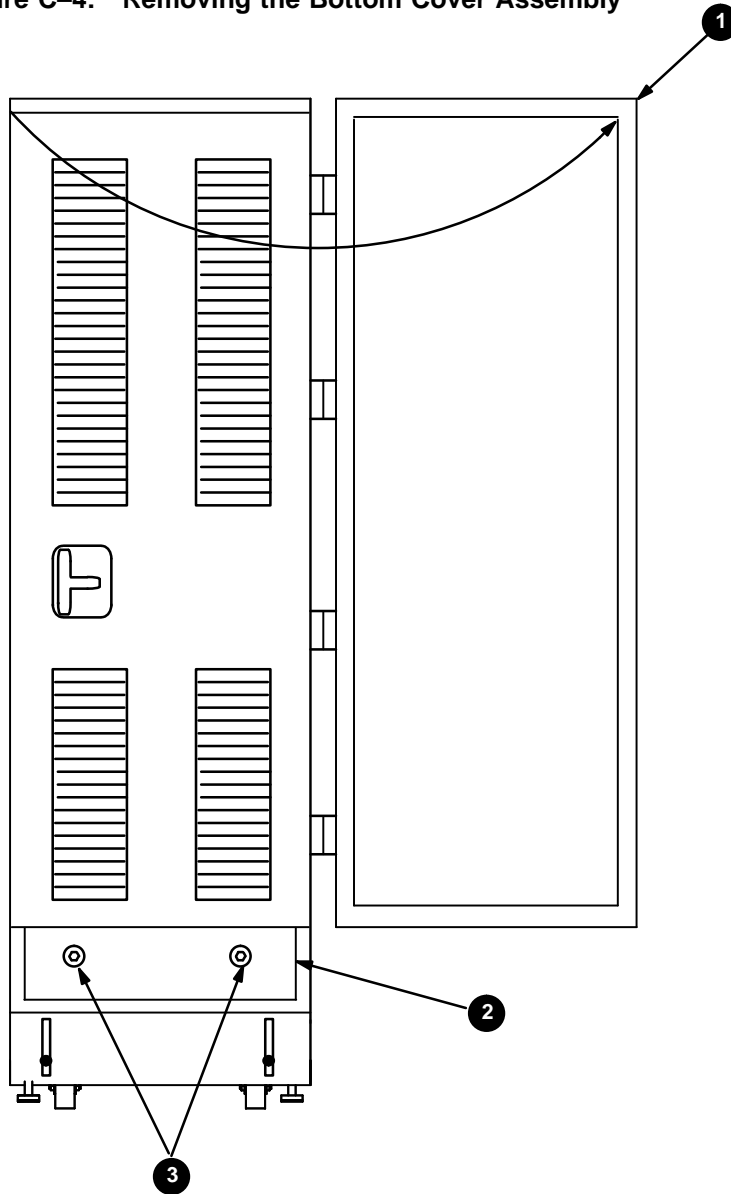
- ❶ Anti-tip legs
- ❷ Hex head bolts (three)
- ❸ Anti-tip leg assembly
- ❹ Hex head bolt, lock washer, and flat washer (two sets)
- ❺ Slotted holes in bracket of anti-tip leg assembly

C.2.4 Bottom Cover Assembly

To remove the bottom cover assembly, refer to Figure C-4 and proceed as follows:

1. Open the rear door ❶.
2. Using a 1/8-inch Allen wrench, turn the two 1/4-turn fasteners ❸ counterclockwise to release the bottom cover assembly ❷ from the enclosure.
3. Remove the bottom cover assembly ❷.
4. To install the bottom cover assembly ❷, reverse the procedure.

Figure C-4: Removing the Bottom Cover Assembly



CS-9083

1 Rear door

2 Bottom cover assembly

3 1/4-turn fastener, 1/8-inch, Allen, socket head

C.3 HSC Requester Module Usage

This section provides the rules for using the Rack-Mountable HSC controller HSC9X-FA, HSC5X-DA, HSC5X-BA and HSC5X-CA requester modules in the ISP and DECraid+ systems.

C.3.1 Rules for HSC9X-FA and HSC5X-DA Requester Modules

Each HSC9X-FA module supports eight HSC ports; each HSC5X-DA module supports four HSC ports. Table C-2 shows the maximum number of ports per Rack-Mountable HSC server and the maximum HSC9X-FA and/or HSC5X-DA requester modules that can be used in each server. For example, when two HSC9X-FA modules are installed in the Rack-Mountable HSC65 controller, one HSC5X-DA can also be installed.

Table C-2: HSC9X-FA/HSC5X-DA Usage Rules

Rack-Mountable Server	Ports (Maximum)	HSC9X-FA (Maximum)	HSC5X-DA (Maximum)
HSC65 ¹	20	2	1
		1	3
		0	5
HSC95	48	4	4
		3	5
		2	6
		1	7
		0	8

¹Applies only to the ISP system. The HSC65 controller is not used in the DECraid+ system.

C.3.2 Rules for HSC5X-BA and HSC5X-CA Requester Modules

The 120-V ac Rack-Mountable HSC controllers do not support a full compliment of the older HSC5X-BA/CA requester modules. (The 240-V ac Rack-Mountable HSC controllers do not have this restriction.) Table C-3 specifies the maximum number of requester modules that can be installed in a 120-V ac Rack-Mountable HSC controller. For example, when five HSC5X-DA (or HSC5X-CA) modules are installed in a 120-V ac Rack-Mountable HSC controller, up to two HSC5X-BA (or HSC5X-CA) modules can be installed when there is no cache memory. If there is cache memory, only one additional HSC5X-DA (or HSC5X-CA) module can be installed.

Table C-3: Maximum Requester Modules in 120 V ac Rack-Mountable HSC Controllers

HSC5X-DA or HSC9X-FA Modules	HSC5X-BA or HSC5X-CA Modules	
	With Cache	Without Cache
8	0	0
7	1	0
6	1	0
5	2	1
4	2	1
3	3	2
2	3	2
1	4	3
0	4	3

C.4 Cable Connection Guidelines

This section provides supplemental cable connection information for the ISP system and the DECraid+ system. This information is helpful when troubleshooting or replacing components in the systems.

The following information includes:

- SDI/STI (2T-BC26V) Cable Connections
- SDI/STI (BC26V) Cable Connections
- 2T-ISPCK Bulkhead Connections (ISP System)

C.4.1 SDI/STI (2T-BC26V) Cable Connections

The cable connections from the A, B, C, H, J, K ports of the HSC I/O to the SABBs are the same in both the ISP and DECraid+ systems. Each system enclosure is shipped with up to six 2T-BC26V SDI/STI cables connected from the HSC I/O ports to the SABB A ports in the same enclosure.

NOTE

The actual number of cables connected in the system is dependent on the SABBs in the system. The following information is based on a system with the maximum number of SABBs.

Each 2T-BC26V cable has four connectors on one end that are connected to the HSC I/O ports Ax, Bx, Cx, Hx, Jx, and Kx. The other end of each cable has one large connector that connects to an SABB A port in the same enclosure.

The four connectors are labeled LF, LR, RR, and RF (left front, left rear, right rear and right front). These labels refer to the location of the drive (when facing the front of the system) controlled in the SABB to which the other end of the cable (large connector) is connected to. The four connectors must be plugged into the HSC I/O ports as follows:

- LF to HSC I/O port x0
- LR to HSC I/O port x1
- RR to HSC I/O port x2
- RF to HSC I/O port x3

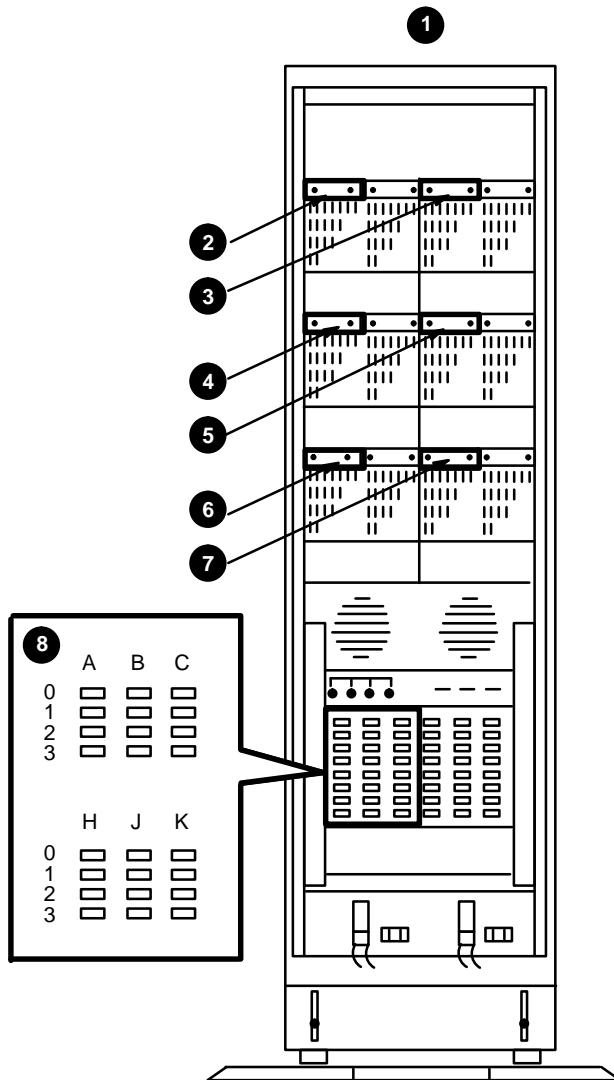
For example: LF would be plugged into A0, LR into A1, RR into A2, and RF into A3.

Table C-4 identifies the connection between HSC I/O ports and the appropriate SABBs. For example, the cable connected to A0, A1, A2 and A3 is connected to SABB port 2A. Figure C-5 shows the location of the HSC I/O ports and the SABB ports.

Table C-4: Cable Identification and Connections

From HSC I/O Port	To SABB Port	From HSC I/O Port	To SABB Port
A0, A1, A2, A3	2A	H0, H1, H2, H3	4A
B0, B1, B2, B3	6A	J0, J1, J2, J3	1A
C0, C1, C2, C3	3A	K0, K1, K2, K3	5A

Figure C-5: HSC I/O Ports and SABB A Ports



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- 1 Enclosure (Rear View) with the maximum number of SABBs.
- 2 2A

- 3 1A
- 4 4A
- 5 3A

- 6 6A
- 7 5A
- 8 HSC I/O ports

SDI/STI (2T-BC26V) Cable Installation

When replacing an HSC controller or SABB, always tag the cables to ensure that the cables are reconnected correctly. To replace a cable or to add new cables that connect the HSC I/O ports Ax, Bx, Cx, Hx, Jx, and Kx to SABBs, use the following instructions.

To simplify the instructions, the following provides a typical installation procedure for installing one cable. Except where noted, additional 2T-BC26V-15 cables are installed in the same manner. To install a 2T-BC26V-15 cable, refer to Figure C-6 and proceed as follows:



WARNING

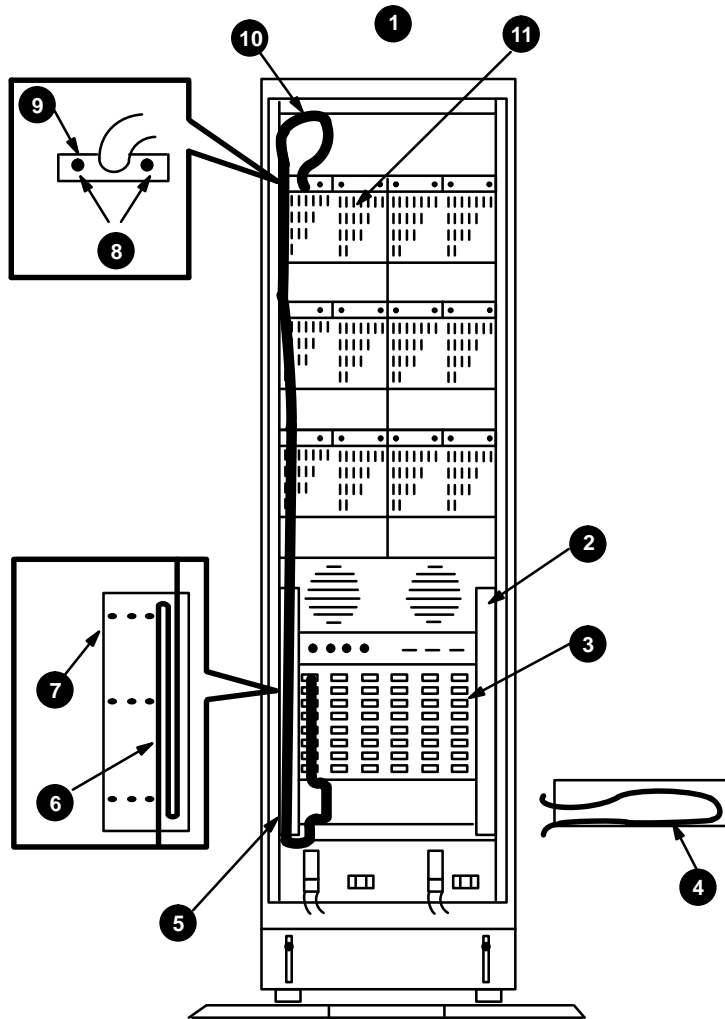
Before performing the following procedure, disconnect the system ac power cords from the ac power source.

CAUTION

Do not over tighten retaining screws on cable connectors to SABB ports. The screws could be damaged.

1. Connect the 2T-BC26V-15 cable ⑤ to the appropriate SABB connector ⑨ (In this example, it is SABB port 2A.) Secure the SABB connector ⑨ with the retaining screws ③, but take care not to over tighten them. Refer to the appropriate storage device documentation for details concerning I/O identification and connection.
2. Connect the other end of the cable ⑤ to the appropriate HSC I/O bulkhead ④ connector. Refer to the *Rack-Mountable HSC Installation/Owner's Manual* for details concerning cable connection and the HSC I/O bulkhead.
3. To ensure that there will be enough slack in the cable for future servicing, pull the Rack-Mountable HSC controller out to the vertical service position (see *Rack-Mountable HSC Installation/Owner's Manual* for the procedure).
4. Ensure that a minimum 50.8-centimeter (20-inch) service loop ⑩ is left at the SABB ⑩, and then tie the cable off to the nearest rail. The service loop ⑩ ensures that there will be enough slack in the cable ⑤ to pull the SABB ⑩ halfway out for servicing.
5. Fold the excess cable ⑤ into the cable trough ⑦ and secure it with the three pins in the cable trough. The pins (not shown in Figure C-6) slide through holes in the sides of the cable trough ⑦ to hold the cable in place.
6. Tie down the cable ⑤ in the cable tray ④. When more than one cable is being installed, tie down the cables after they are all connected. Refer to the *Rack-Mountable HSC Installation/Owner's Manual* for details concerning bundling and tying down SDI/STI cables to the cable tray.
7. Repeat steps 1 through 6 to install additional cables. Make sure the cables are neatly folded in the cable trough.
8. Push the Rack-Mountable HSC controller back into the enclosure.

Figure C-6: HSC Controller Port A Cable Routing



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- | | | | |
|--|---|--|---------------|
| <p>❶ Enclosure (Rear View) with the maximum number of SABBs.</p> | <p>❸ HSC I/O bulkhead
 ❹ Cable tray (side view showing folded cable)
 ❺ 2T-BC26V-15 SDI/STI cable
 ❻ Excess cable</p> | <p>❼ Cable trough (side view)
 ❽ Retaining Screws
 ❾ SABB connector, port 2A
 ⓫ 50.8-cm (20-in) service loop</p> | <p>⓪ SABB</p> |
|--|---|--|---------------|

C.4.2 SDI/STI (BC26V) Cable Connections

In some instances, there may be a need to connect the individual SDI/STI cables (BC26V) from the HSC I/O in an existing system to the B ports of the SABBs in an ISP or DECraid+ system. However, the BC26V cables cannot be connected directly to the SABBs in a DECraid+ system. To make the connection, the installation of 2T-ISPCK-AA/RA bulkhead kits is required. Details concerning these kits are provided in Appendix A.

Figure C-7 provides an example of how the BC26V cables are routed from the HSC I/O ports in another system to the bulkhead ports, which are connected to SABB port 2B. The following procedure assumes that the 2T-ISPCK-AA/RA bulkhead kits are installed. To install a BC26V cable, refer to Figure C-7 and proceed as follows:

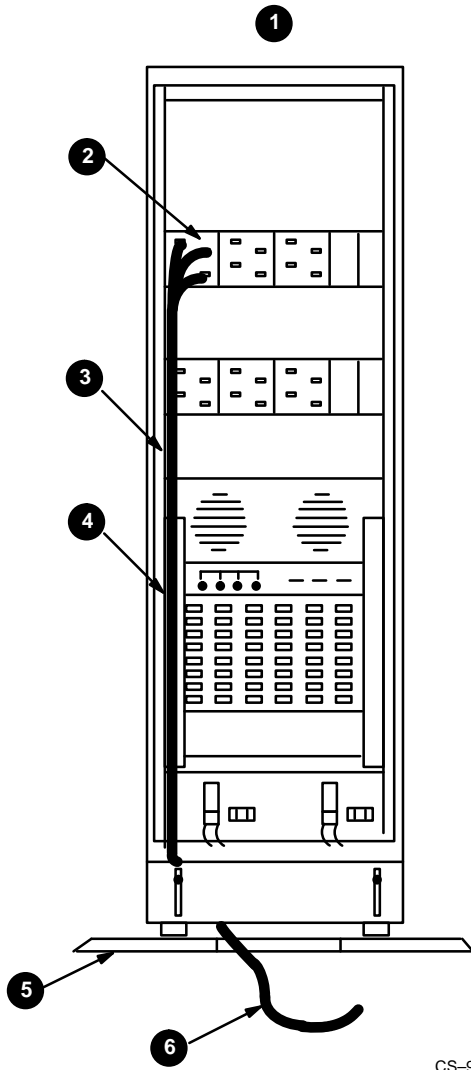


WARNING

Before performing the following procedure, disconnect the system ac power cords from the ac power source.

1. Connect the BC26V cables ⑥ to bulkhead ports ②, which are connected to SABB port 2B.
2. Route the BC26V cables ⑥ straight down along the inside rail ③, straight through the cable trough ④, through the opening in the bottom of the enclosure, through the floor ⑤ (if applicable), and to the proper HSC I/O connectors in another enclosure.
3. Tie down the BC26V cables ⑥ to the nearest side rail ③ at about every 15.34 cm (6 inches).
4. Secure the BC26V cables ⑥ with the three pins in the cable trough ④. The pins (not shown in Figure C-6) slide through holes in the sides of the cable trough ④ to hold the BC26V cables ⑥ in place.
5. Repeat steps 1 through 4 to install additional cables. Make sure the cables are neatly placed in the cable trough.

Figure C-7: Routing SDI/STI (BC26V) Cables



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① Enclosure (rear view)
② Bulkhead ports for SABB
port 2b

③ Side rail
④ Cable trough

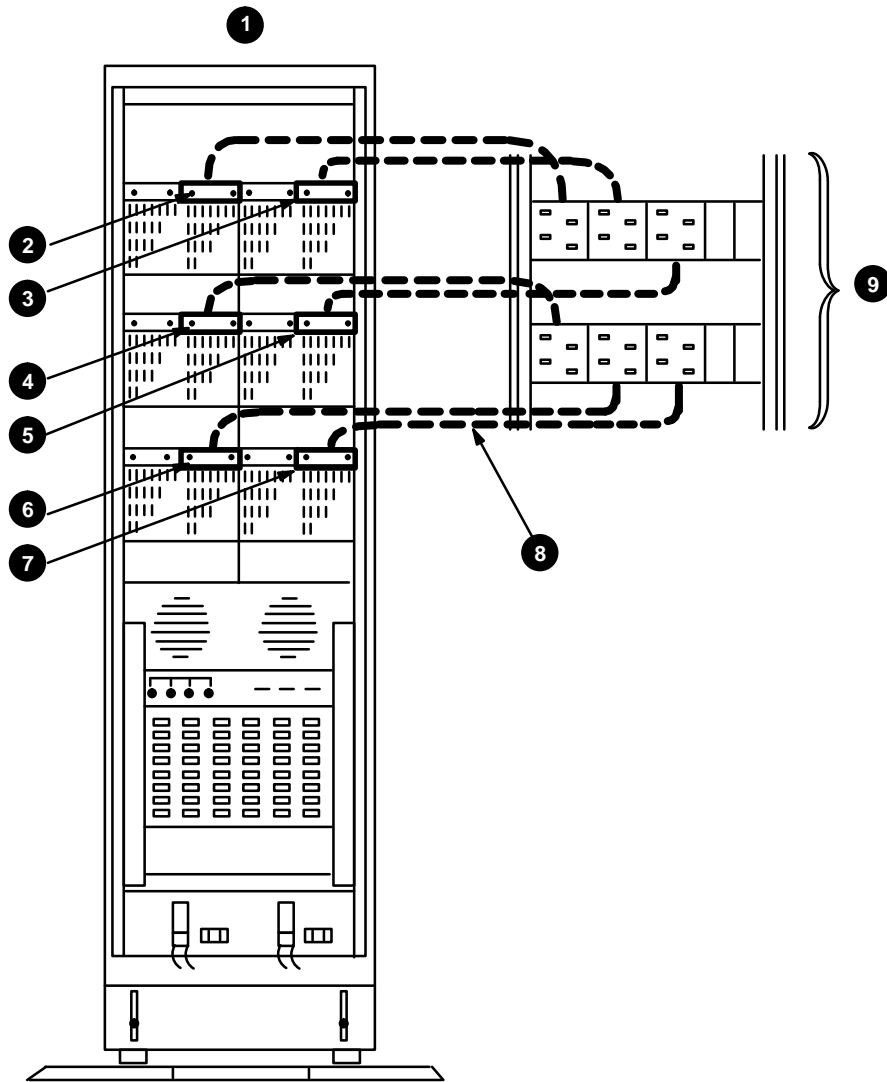
⑤ Raised floor
⑥ BC26V cables from HSC I/O of
other system

C.4.3 2T-ISPCK Bulkhead Connections (ISP System)

Unlike the DECraid+ system, the B ports of the SABBs in the ISP system do not connect directly to the host system. The B ports of the SABBs are connected to 2T-ISPCK bulkheads using cables (P/N 17-01699-xx). The 2T-ISPCK bulkheads provide the I/O connections for the host system.

Figure C-8 shows cables connections from the B ports of the SABBs to the bulkheads.

Figure C-8: 2T-ISPCK Bulkhead Cable Connections



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1 Enclosure (Rear View)
with the maximum number
of SABBs

3 1B

4 4B
5 3B
6 6B

2 2B

