

# DIGITAL 2T-CCMHA-CB Central Office Memory Channel Hub

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## Installation/Service Guide

Part Number: EK-MCHCO-IN. A01

**December 1998**

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**December 1998**

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# Preface

## Overview

This guide provides the information necessary to install the 2T-CCMHA-CB central office Memory Channel hub in a 48.26-cm (19-in.) NEBS 2000/ETSI-compliant cabinet with an EIA rail-hole pattern. It also provides information on removing and replacing the top cover and the power supply.

## Intended Audience

This guide is intended for Compaq service personnel or qualified Self-maintenance customers who are familiar with installing computer systems, and for system managers and others who perform system management tasks.

## How to Use This Guide

Read this guide *before* installing the 2T-CCMHA-CB central office Memory Channel hub.

Before installation review the warranty. The terms of the warranty agreement with Compaq may require that a qualified Compaq Customer Services representative install the system. Contact your local Compaq representative if you have any questions.

## Organization

This guide is organized as follows:

**Chapter 1, Introduction** – Provides an overview of the 2T-CCMHA-CB central office Memory Channel hub and a description of the basic components and controls.

**Chapter 2, Installation** – Provides site preparation, unpacking, and system installation information.

**Chapter 3, Removal and Replacement** – Provides the removal and replacement procedures for the top cover and power supply.

## Related Documents

Other documents related to the 2T-CCMHA-CB central office Memory Channel hub include the following:

- *Memory Channel User's Guide* (EK-PCIRM-UG)
- *Memory Channel Service Information* (EK-PCIRM-SV)

## Conventions

This guide uses the following conventions:

Convention	Meaning
<b>Note</b>	A note calls the reader's attention to any item of information that may be of special importance.
<b>Caution</b>	A caution contains information essential to avoid damage to the equipment.
<b>Warning</b>	A warning contains information essential to the safety of personnel.
<b>❶</b>	Circled numbers provide a link between figures or examples and text.
<i>Italic type</i>	Italic type emphasizes important information, indicates variables, and indicates complete titles of manuals.

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# Introduction

## 1.1 Overview

The 2T-CCMHA-CB central office Memory Channel hub is used to share and route data between two AlphaServer 4100 central office systems.

## 1.2 Components and Controls

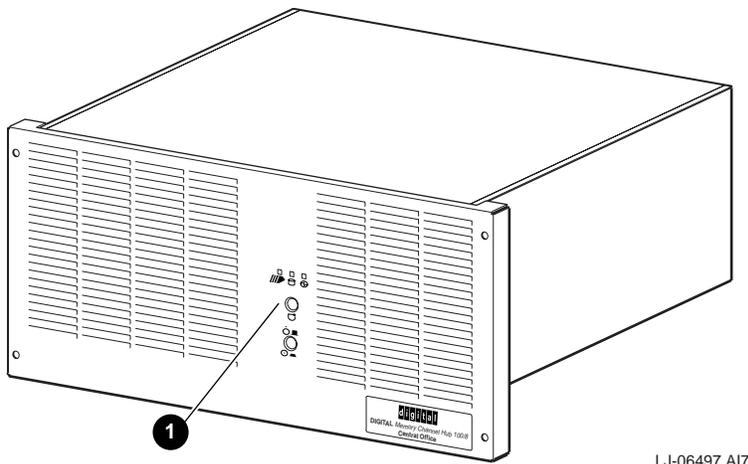
System components and controls are located at the front, internally, and at the rear of the Memory Channel hub chassis.

### 1.2.1 Front Components

Figure 1-1 shows the components located on the front of the Memory Channel hub chassis.

## Introduction

**Figure 1-1 Front Components**



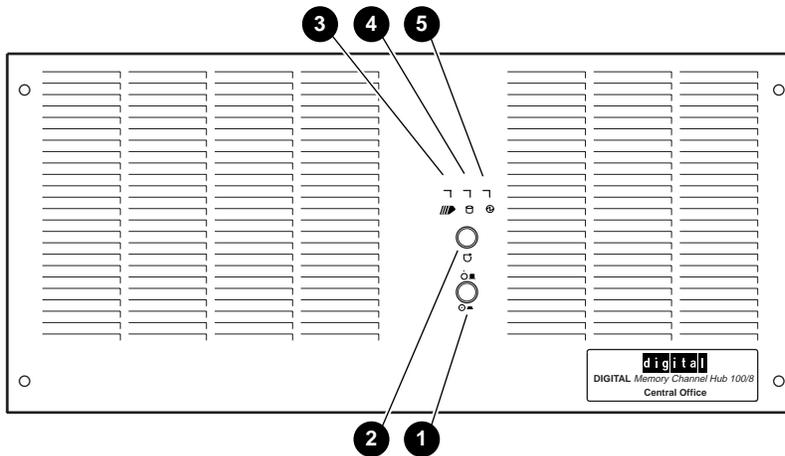
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- ❶ Operator control panel

## 1.2.2 Operator Control Panel

The operator control panel (OCP), shown in Figure 1-2, is located on the front of the Memory Channel hub chassis and consists of an On/Off switch, a Reset button, and three LEDs.

**Figure 1-2 Operator Control Panel**



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- ❶ **On/Off switch** — Powers the system secondary dc power on or off.
- ❷ **Reset button** — Initializes the system.
- ❸ **Turbo LED** — Lit when computer runs at rated microprocessor speed. Not lit when in non-turbo mode.
- ❹ **Disk LED** — Indicates disk drive activity.
- ❺ **Power LED** — Lit when power switch is On.

## Introduction

### 1.2.3 Internal Components

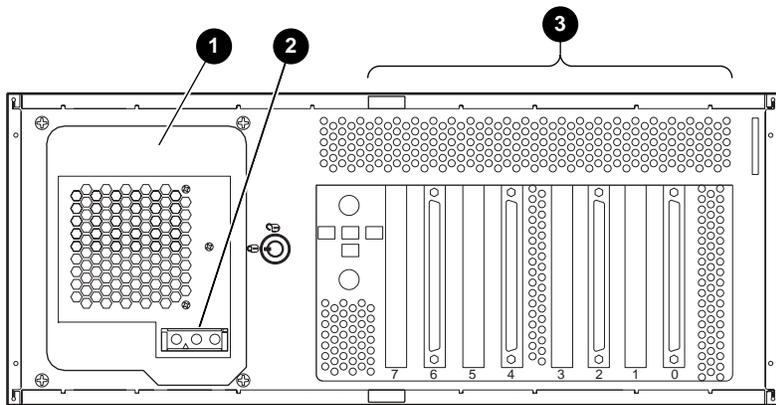
The internal components of the Memory Channel hub chassis consist of the following:

- One motherboard
- Four to eight CCMLA hub linecards
- Cooling fan

### 1.2.4 Rear Components

Figure 1-3 shows the components located on the rear of the Memory Channel hub chassis.

**Figure 1-3 Rear Components**



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- ❶ Power supply
- ❷ -48 Vdc power receptacle
- ❸ CCMLA linecard slots

## 1.3 Specifications

Table 1-1 contains the physical, environmental, and electrical specifications for the 2T-CCMHA-CB central office Memory Channel hub.

**Table 1-1 2T-CCMHA-CB Central Office Memory Channel Hub Specifications**

<b>Physical Characteristics</b>	
Chassis	
Weight	13.6 kg (30 lb.)
Length	40.64 cm (16 in.)
Width	48.26 cm (19.0 in.)
Height	17.78 cm (7.00 in.)
<b>Environmental Requirements</b>	
Temperature range	
Operating	0°C to 40°C (32°F to 104°F)
Non-Operating	-20°C to 95°C (-4°F to 203°F)
Temperature change rate	11°C/hr (20°F/hr) maximum
Wet bulb temperature (maximum)	28°C (82°F)
Dew point temperature (minimum)	2°C (36°F)
Relative humidity	10% to 95% (noncondensing)
Altitude	60 m to 3050 m (-200 ft to 10,000 ft)
<b>Electrical Requirements</b>	
Nominal voltage	-48 Vdc
Operational voltage range	-36 to -72 Vdc
Input current (maximum)	1.25 A at -48 Vdc
Input power	60 W



## 2.1 General

This chapter covers the installation of the 2T-CCMHA-CB central office Memory Channel hub in a 48.26-cm (19-in.) NEBS 2000/ETSI-compliant cabinet with an EIA rail-hole pattern. The major topics covered in this chapter include:

- Site Preparation
- Unpacking the Shipment
- Installing the 2T-CCMHA-CB central office Memory Channel Hub
  - Determining the Installation Area
  - Attaching the Slide Assemblies to the Cabinet Rails
  - Attaching the Inner Races to the Tray
  - Mounting the Chassis and Front Bezel to the Tray
- Installing the Interlock System

For information on configuration and verification, refer to the *Memory Channel User's Guide*.

## 2.2 Site Preparation

The installation instructions that follow assume that:

- All cables that you plan to connect to the 2T-CCMHA-CB central office Memory Channel hub are in place and clearly labeled. These cables are the BC12N cables from the CCMAA adapters installed in the AlphaServer systems.
- The specifications and conditions listed in Section 1.3 have been met.

## Installation

- The system is located in an area that provides sufficient clearance for ventilation and servicing. A clearance of 61 cm (24 in.) at the rear and 129.6 cm (51 in.) at the front of the cabinet is required for service.

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### Caution

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Do not impede airflow by obstructing the front and rear of the cabinet. Exceeding internal thermal limits can affect system reliability.

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### WARNING

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**The 2T-CCMHA-CB central office Memory Channel hub can weigh up to 13.6 kg (30 lb.). To prevent personal injury and equipment damage, ensure that the system is contained in an enclosure that can be stabilized when the system is pulled out on its slides.**

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### ACHTUNG

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**Der 2T-CCMHA-CB Central Office Memory Channel Hub kann bis zu 13,6 kg (30 lb) wiegen. Um Personen- und Geräteschaden zu vermeiden, sollten Sie deshalb sicherstellen, daß sich das System in einem Gehäuse befindet, das stabilisiert werden kann, wenn das System an den Schienen herausgezogen wird.**

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## 2.3 Unpacking the Shipment

The 2T-CCMHA-CB central office Memory Channel hub shipment may include several cartons. Check the packing list to ensure that all items listed have been received.

If the equipment is damaged or if any items are missing, notify the delivery agent and contact the Compaq sales representative.

Save all shipping cartons in case the equipment needs to be moved to a new location, or needs to be returned for repair.

**WARNING**

**The 2T-CCMHA-CB central office Memory Channel hub can weigh up to 13.6 kg (30 lb.). Use sufficient personnel or the proper lifting equipment when lifting or moving the system.**

**ACHTUNG**

**Der 2T-CCMHA-CB Central Office Memory Channel Hub kann bis zu 13,6 kg (30 lb) wiegen. Beim Hochheben oder Transport des Systems sollten deshalb genügend Hilfskräfte vorhanden sein oder die richtigen Hebewerkzeuge benutzt werden.**

Table 2-1 lists the mounting hardware and components included with the 2T-CCMHA-CB central office Memory Channel hub shipment for installation in a 48.26-cm (19-in.) NEBS 2000/ETSI-compliant cabinet with an EIA rail-hole pattern.

**Table 2-1 Mounting Hardware and Component List**

<b>Description</b>	<b>Part Number</b>	<b>Quantity</b>
Chassis slide assembly	12-46387-01	1 pair
Tray	74- 53806-01	1
Front bezel (gray) or	74-53812-02	1
Front bezel (blue)	74-53812-01	1
Interlock actuator bracket	74-53819-01	1
Stabilizer bracket	74-53822-02	1
Actuator latch	74-48997-03	1
Screw, 10-32 truss-head	90-00063-37	2
Set screw, 6-32	90-06291-10	2
Screw, 8-32 pan-head	90-09545-00	6
Screw, 10-32 truss-head	90-00063-39	23
Standoff, 10-32	90-11510-01	4
Kepnut, 8-32	90-06563-00	6
Flat washer, 8-32	90-06661-00	5
Tie-wraps	90-07031-01	10
<i>DIGITAL 2T-CCMHA-CB Central Office Memory Channel Hub Installation/Service Guide</i>	EK-MCHCO-IN	1

## Installation

### 2.4 Installing the 2T-CCMHA-CB Central Office Memory Channel Hub

The following sections contain the procedure for installing the 2T-CCMHA-CB central office Memory Channel hub in a 48.26-cm (19-in.) NEBS 2000/ETSI-compliant cabinet with an EIA rail-hole pattern.

#### Tools Required

- Phillips-head screwdriver
- Flat-blade screwdriver
- Adjustable wrench

#### 2.4.1 Determining the Installation Area

The 2T-CCMHA-CB central office Memory Channel hub requires 22.23 cm (8.75 in.) of vertical space or 15 contiguous holes in a 48.26-cm (19-in.) NEBS 2000/ETSI-compliant cabinet with an EIA rail-hole pattern.

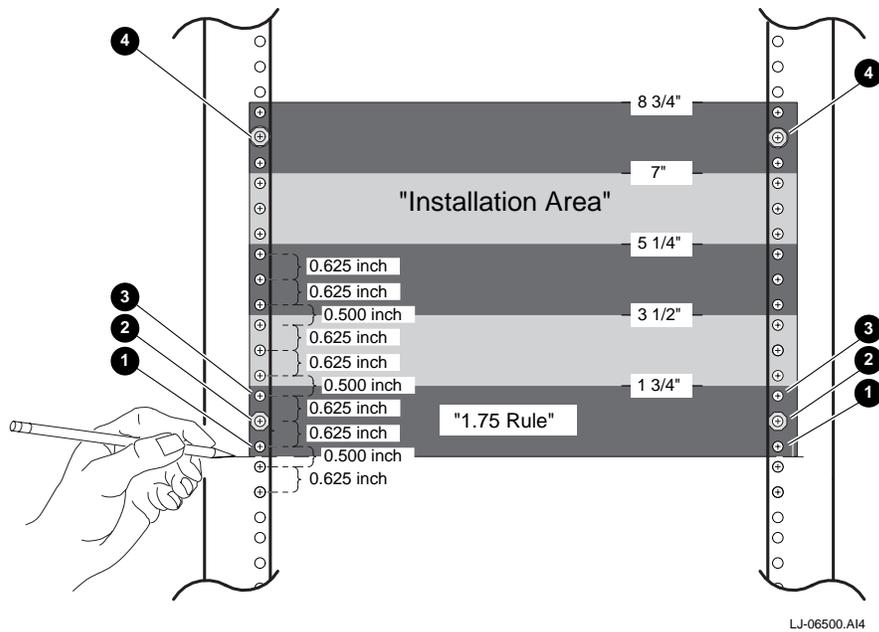
The holes in the EIA rail-hole pattern cabinet rails follow a pattern of 1.27 cm (0.50 in.), 1.59 cm (0.625 in.), and 1.59 cm (0.625 in.). This pattern is called a *set* and is repeated for the length of the cabinet rails.

To determine the installation area, perform the following steps at the front and the rear cabinet rails (refer to Figure 2-1).

1. Select a section of the cabinet rail where there is a 1.27 cm (0.05 in.) space between two holes and make a mark between these two holes. This is the *starting point* of the installation area.
2. Count up or down 15 holes from the starting point and make a mark above or below the 15th hole. The area between these two marks is the *installation area*. The bottom hole of the installation area is identified as hole 1 of the installation area.
3. Repeat steps 1 and 2 for the same holes on the front of both front rails and the rear of both rear rails.

The total installation area for the 2T-CCMHA-CB central office Memory Channel hub is or 22.23 cm (8.75 in.) of vertical space.

**Figure 2-1 Installation Area and Rail-Hole Pattern (EIA Rail-Hole Pattern)**



- ❶ Hole 1 for attaching left and right slide brackets.
- ❷ Hole 2 for installing standoffs on left and right front rails.
- ❸ Hole 3 for attaching left and right slide brackets.
- ❹ Hole 14 for installing standoffs and nuts on left and right front rails.

## Installation

### 2.4.2 Attaching the Slide Assemblies to the Cabinet Rails

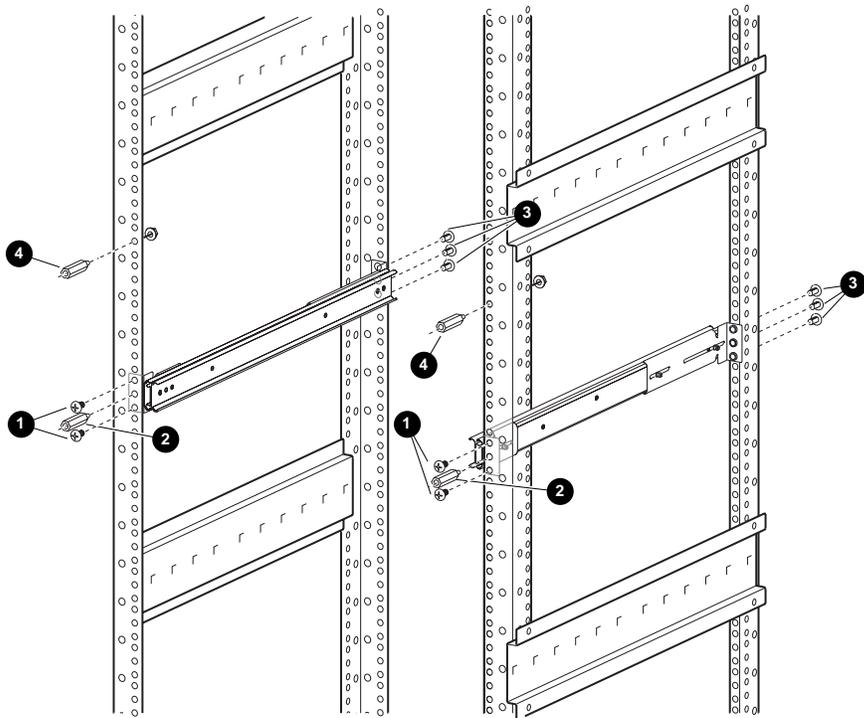
The following sections contain the procedures for attaching the right and left slide assemblies to the cabinet rails.

#### 2.4.2.1 Attaching the Right Slide Assembly to the Cabinet Rails

To attach the right slide assembly to the cabinet rails, refer to Figure 2-2 and proceed as follows:

1. Determine the proper mounting holes for the right slide brackets. The proper mounting holes are the 1st, 2nd, and 3rd holes of the installation area (see Figure 2-1).
2. Locate the right slide assembly.
3. Place the right front slide bracket on the inside of the right front rail and align the three slide bracket holes and with the 1st, 2nd, and 3rd holes of the installation area on the right front rail.
4. Install two 10-32 truss-head screws ❶ in the 1st and 3rd holes of the installation area to secure the right front slide bracket to the right front rail, but *do not* tighten.
5. Install a 10-32 standoff ❷ in the 2nd hole of the installation area on the right front rail. Tighten this standoff.
6. Place the right rear slide bracket on the inside of the right rear rail and align the three slide bracket holes and with the 1st, 2nd, and 3rd holes of the installation area on the right rear rail.
7. Install three 10-32 truss-head screws ❸ in the 1st, 2nd, and 3rd, holes of the installation area to secure the right rear slide bracket to the right rear rail, but *do not* tighten.
8. Tighten the two 8-32 screws and nuts that secure the right rear slide bracket to the right slide assembly.
9. Securely tighten all five 10-32 truss-head screws that secure the right slide assembly to the right front and rear cabinet rails.
10. Install a 10-32 standoff ❹ in 14th hole of the installation area on the right front rail and secure it in place with a 10-32 nut.

**Figure 2-2 Attaching the Slide Assemblies to the Cabinet Rails**



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#### 2.4.2.2 Attaching the Left Slide Assembly to the Cabinet Rails

To attach the left slide assembly to the cabinet rails, refer to Figure 2-2 and proceed as follows:

1. Determine the proper mounting holes for the left slide brackets. The proper mounting holes are the 1st, 2nd, and 3rd holes of the installation area (see Figure 2-1).
2. Locate the left slide assembly.
3. Place the left front slide bracket on the inside of the left front rail and align the three slide bracket holes and with the 1st, 2nd, and 3rd holes of the installation area on the left front rail.
4. Install two 10-32 truss-head screws **1** in the 1st and 3rd holes of the installation area to secure the left front slide bracket to the left front rail, but *do not* tighten.

## Installation

5. Install a 10-32 standoff ② in the 2nd hole of the installation area on the left front rail. Tighten this standoff.
6. Place the left rear slide bracket on the inside of the left rear rail and align the three slide bracket holes and with the 1st, 2nd, and 3rd holes of the installation area on the left rear rail.
7. Install three 10-32 truss-head screws ③ in the 1st, 2nd, and 3rd, holes of the installation area to secure the left rear slide bracket to the left rear rail, but *do not* tighten.
8. Tighten the two 8-32 screws and nuts that secure the left rear slide bracket to the left slide assembly.
9. Securely tighten all five 10-32 truss-head screws that secure the left slide assembly to the left front and rear cabinet rails.
10. Install a 10-32 standoff ④ in 14th hole of the installation area on the left front rail and secure it in place with a 10-32 nut.

### 2.4.3 Attaching the Inner Races to the Tray

To attach the inner slide races to the tray, refer to Figure 2-3 and proceed as follows:

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**Caution**

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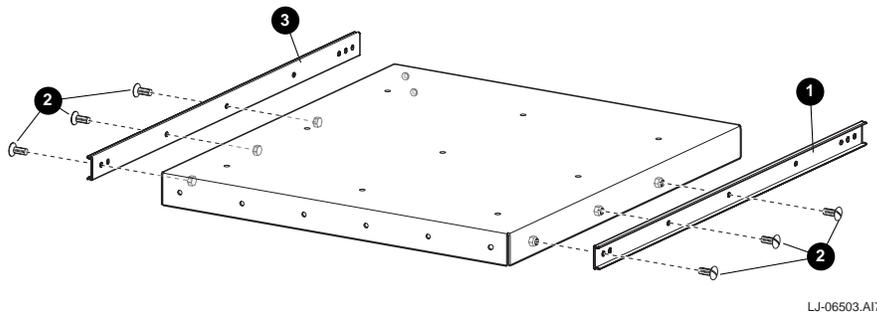
When performing this procedure, ensure that the locking lever is on the outside of the inner slide race. Otherwise, the slide will be damaged when the system is installed on the slide assemblies.

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Remove the inner slide race from the right slide assembly and attach the right inner slide race ① to the right side of the tray (as viewed from the front) using three 8-32 pan-head screws ②.

Remove the inner slide race from the left slide assembly and attach the left inner slide race ③ to the left side of the tray (as viewed from the front) using three 8-32 pan-head screws ②.

**Figure 2-3 Attaching the Inner Slide Races**



## Installation

### 2.4.4 Mounting the Memory Channel Hub, Front Bezel, and Interlock Actuator Bracket on the Tray

To mount the 2T-CCMHA-CB central office Memory Channel hub, front bezel, and interlock actuator bracket on the tray, refer to Figure 2-4 and proceed as follows:

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#### WARNING

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**The 2T-CCMHA-CB central office Memory Channel hub can weigh up to 13.6 kg (30 lb.). Use sufficient personnel or the proper lifting equipment when lifting or moving the system.**

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#### ACHTUNG

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**Der 2T-CCMHA-CB Central Office Memory Channel Hub kann bis zu 13,6 kg (30 lb) wiegen. Beim Hochheben oder Transport des Systems sollten deshalb genügend Hilfskräfte vorhanden sein oder die richtigen Hebewerkzeuge benutzt werden.**

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1. Turn the 2T-CCMHA-CB central office Memory Channel hub upside down on a proper work surface.
2. Turn the tray ❶ (with inner races attached) upside down and place it on bottom cover of the 2T-CCMHA-CB central office Memory Channel hub ❷.
3. Align the nine holes in the bottom cover of the 2T-CCMHA-CB central office Memory Channel hub with the nine holes in the tray.
4. Install nine 10-32 truss-head screws ❸ through the bottom of the tray into the hub chassis to secure the 2T-CCMHA-CB central office Memory Channel hub to the tray.
5. Turn the front bezel ❹ upside down and place flat washers on the five left most studs on the inside of the bezel. A flat washer is not required on the stud behind the indented label area.
6. Align the six studs on the inside of the bezel with the six holes in the front of the tray and push the bezel onto the tray.
7. Secure the front bezel to the tray with six 8-32 kepnuts ❺.
8. Use two 8-32 screws ❻ to secure the interlock actuator bracket ❼ to the rear of the tray.



## Installation

### 2.4.5 Mounting the Chassis and Tray Assembly on the Slides

To mount the chassis and tray assembly on the slides, refer to Figure 2-5 and proceed as follows:

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#### WARNING

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**The 2T-CCMHA-CB central office Memory Channel hub can weigh up to 13.6 kg (30 lb.). Use sufficient personnel or the proper lifting equipment when lifting or moving the system.**

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#### ACHTUNG

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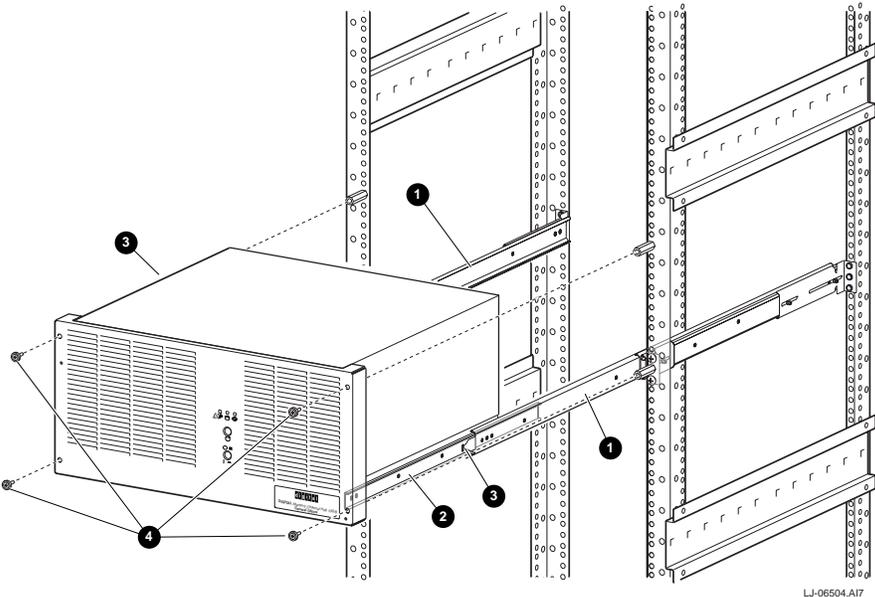
**Der 2T-CCMHA-CB Central Office Memory Channel Hub kann bis zu 13,6 kg (30 lb) wiegen. Beim Hochheben oder Transport des Systems sollten deshalb genügend Hilfskräfte vorhanden sein oder die richtigen Hebewerkzeuge benutzt werden.**

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Stabilize the cabinet before installing the chassis and tray assembly into the cabinet.

1. Pull both slide assemblies ❶ out fully to their locked positions.
2. Lift the chassis and tray assembly and position it so that the inner slide races ❷ fit into the front end of the slides.
3. Push the chassis and tray assembly into the slides until it stops. Push in on the two locking levers ❸ and then push the system into the cabinet.
4. Secure the chassis to the front cabinet rails using four 10-32 truss-head screws ❹. The screws go through the front bezel and into the four standoffs previously installed in the 2nd and 14th holes of the left and right front cabinet rails.

Figure 2-5 Mounting the Chassis and Tray Assembly on the Slides



## Installation

### 2.5 Installing the Interlock System

The interlock system helps prevent cabinet instability by allowing only one system at a time to be pulled out of the cabinet.

The interlock system consists of a vertical rod on which are mounted actuator latches for each product installed in the cabinet. These actuator latches engage the interlock actuator bracket on the rear of rackmount systems. When a rackmount system is pulled out of the cabinet, the actuator latches rotate to prevent any other rackmount system that has an interlock actuator bracket from being pulled out of the cabinet.

If additional products are installed into the cabinet, actuator latches for those products should be installed. To install actuator latches, refer to Figure 2-6 and proceed as follows:

1. Remove the screws securing the bottom mounting bracket ④ to the cabinet.
2. Slide the mounting bracket off the bottom of the vertical rod ①.
3. Slide the actuator latch ② for the new product onto the bottom of the vertical rod.
4. Slide the stabilizer bracket ⑤ for the new product onto the bottom of the vertical rod.
5. Replace the bottom mounting bracket ④ and install the screws removed in step 1 but *do not* tighten them.
6. Position the stabilizer bracket so that the top surface of the stabilizer bracket ⑤ is aligned just below the interlock actuator bracket on the installed system (see bottom expanded view). This may require the loosening and sliding of other latches and stabilizer brackets to accommodate the new configuration.
7. Install and tighten the two 10-32 truss-head screws provided to secure the stabilizer bracket to the rear rail (see bottom expanded view).
8. Position the new actuator latch ② to properly engage the interlock actuator bracket, and tighten the two 6-32 set screws to secure the latch (see bottom expanded view).
9. Now tighten the screws to secure the bottom mounting bracket ④.

The expanded view (A) shows the position of the actuator latches when all systems are pushed into the cabinet. The expanded view (B) shows the position of all actuator latches after one system has been pulled out.

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**Note**

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The interlock system is compatible with the 2T-CCMHA-CB central office Memory Channel hub. Other systems may not be compatible because the interlock actuator bracket may not engage properly. In these cases, do not install the interlock actuator bracket on those systems.

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**WARNING**

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**If a system is installed without an interlock actuator bracket or the vertical rod in the cabinet does not engage properly with the system interlock actuator bracket, it is the customer's responsibility to provide a stable cabinet.**

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**ACHTUNG**

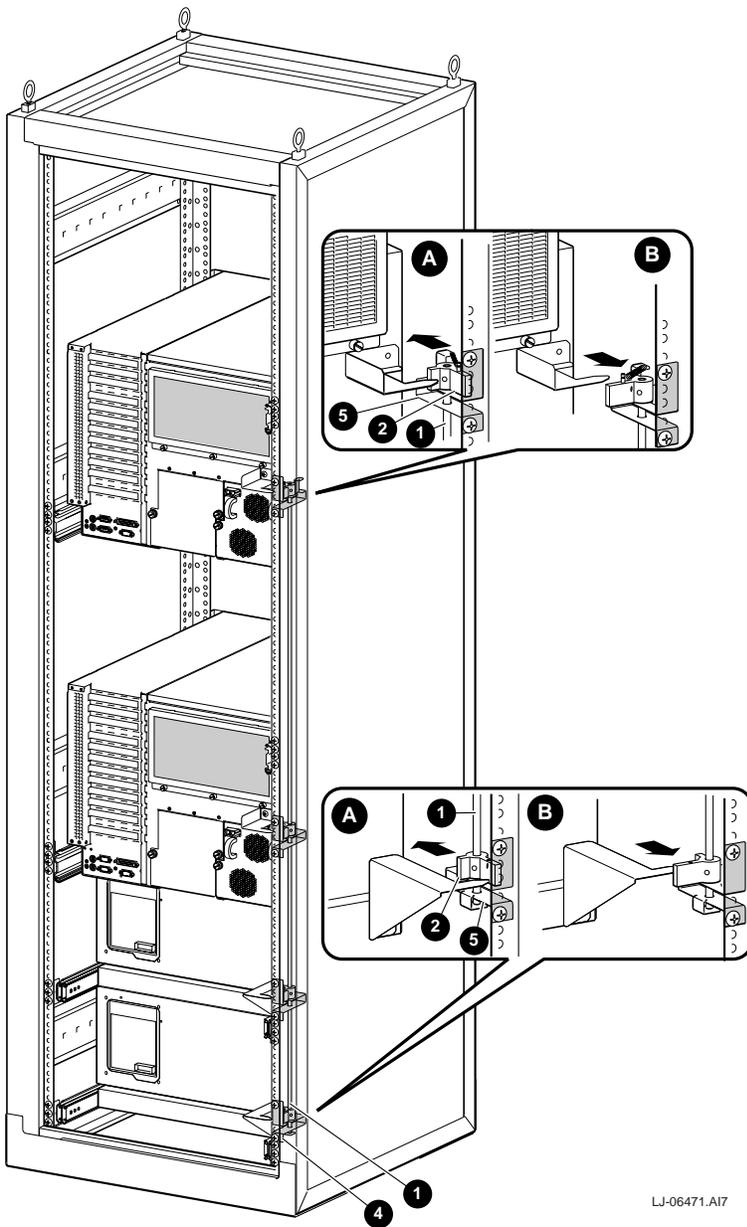
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**Falls ein System ohne Verriegelungsklammer installiert wird oder die vertikale Stange im Gehäuse nicht richtig in der Verriegelungsklammer des Systems einrastet, dann ist der Kunde selbst für die Bereitstellung eines stabilen Gehäuses verantwortlich.**

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# Installation

## Figure 2-6 The Interlock System



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## Removal and Replacement

### 3.1 Introduction

This chapter contains the procedures for removing and replacing the top cover and power supply of the 2T-CCMHA-CB central office Memory Channel hub:

For troubleshooting information and the procedure for removing the CCMLA linecards, motherboard, hub fan assembly, and hub control panel, refer to the *Memory Channel Service Information* manual.

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#### WARNING

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**Before servicing the 2T-CCMHA-CB central office Memory Channel hub chassis or performing any of the following removal and replacement procedures, ensure that the DC On/Off button on the OCP is in the OFF position and disconnect the power cable from the power supply dc input receptacle on the rear of the chassis.**

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#### ACHTUNG

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**Vor der Wartung des Gehäuses des 2T-CCMHA-CB Central Office Memory Channel Hub bzw. vor der Durchführung der folgenden Verfahren zum Entfernen oder Auswechseln von Komponenten müssen der On/Off-Netzstromschalter auf dem OCP auf OFF eingestellt und das Netzkabel aus der Netzsteckereingangsbuchse an der Rückseite des Gehäuses gezogen werden.**

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## Removal and Replacement

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### **WARNING**

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**Only a qualified service person should remove and replace components in the 2T-CCMHA-CB central office Memory Channel hub. A qualified service person should have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task and the measures that should be taken to minimize the danger to themselves or other persons.**

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### **ACHTUNG**

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**Die Komponenten im 2T-CCMHA-CB Central Office Memory Channel Hub dürfen nur von qualifiziertem Wartungspersonal entfernt bzw. ausgewechselt werden. Qualifiziertes Personal sollte entsprechend technisch geschult sein und über die nötige Erfahrung verfügen, um die möglichen Gefahren zu kennen, denen sie bei der Ausführung der notwendigen Wartungsarbeiten ausgesetzt sein könnten, und um die entsprechenden Schritte zur Minimierung dieser Gefahren für das Wartungspersonal und für andere Personen unternehmen zu können.**

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### **Tools Required**

The following tools are required for servicing the 2T-CCMHA-CB central office Memory Channel hub chassis:

- Phillips-head screwdriver
- Flat-blade screwdriver
- Adjustable wrench

## 3.2 Top Cover

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### Caution

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Use care when removing and replacing the cover to prevent damage to the RFI gaskets that are located around the cover and opening.

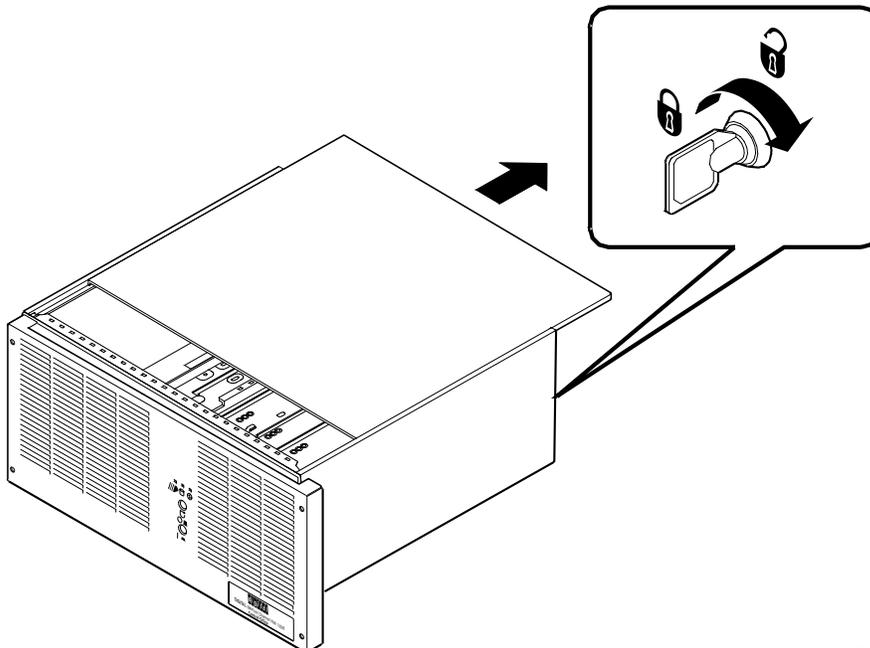
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Perform the following procedure to remove the top cover:

1. Unlock the top cover by turning the key, located on the rear of the chassis, clockwise to the unlock position (see Figure 3-1). The lock is unlocked when the key is in the vertical position.
2. Insert two fingers into the finger grip on the rear edge of the top cover.
3. Slide the top cover toward the rear of the chassis and remove (see Figure 3-1).

To replace the top cover, refer to Figure 3-1 and reverse steps 1 through 3 of the removal procedure.

**Figure 3-1 Removing and Replacing the Top Cover**



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## Removal and Replacement

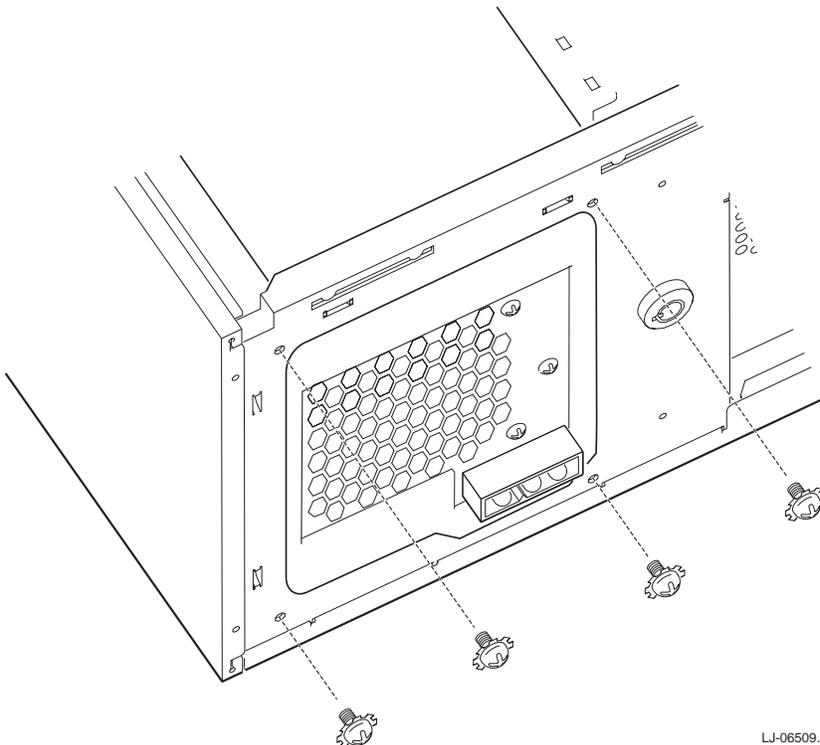
### 3.3 Power Supply

Perform the following procedure to remove the power supply:

1. Remove the top cover (see Section 3.2).
2. Remove the four screws on the rear of the chassis that secure the power supply (see Figure 3-2).
3. Loosen the two screws ❶ and disconnect the power cable connector ❷ from the power supply (see Figure 3-3).
4. Slide the power supply toward the front of the chassis until it is free and then lift the power supply out of the chassis.

To replace the power supply, refer to Figure 3-2 and Figure 3-3 and reverse steps 1 through 4 of the removal procedure.

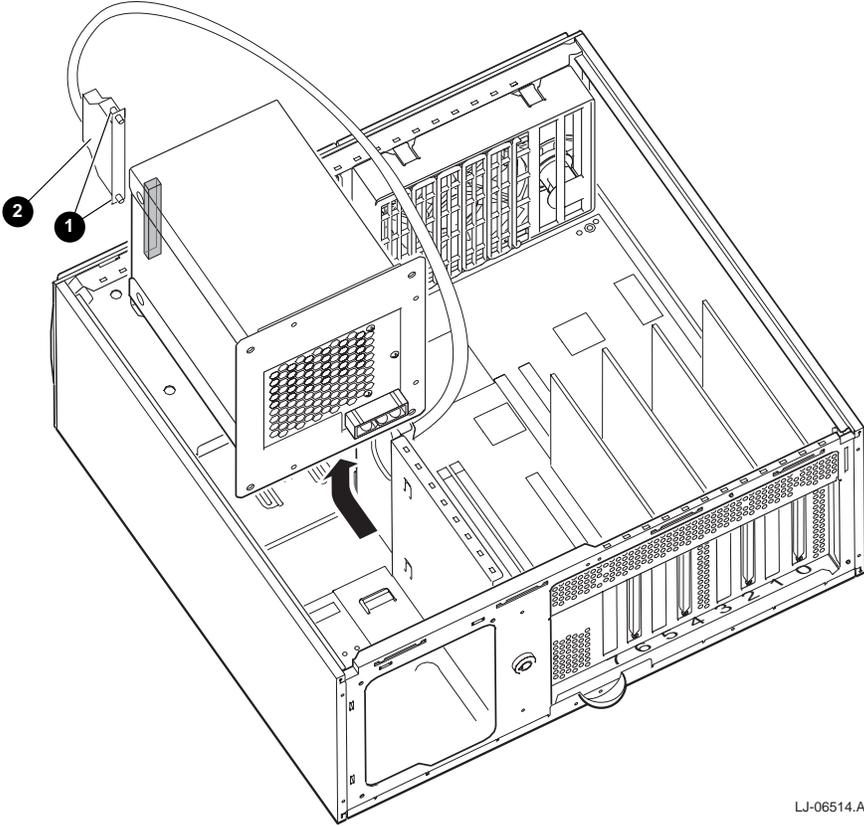
**Figure 3-2 Removing the Power Supply**



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Removal and Replacement

**Figure 3-3 Disconnecting the Power Cable Connector and Removing the Power Supply**



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