

# StorageWorks™ Solutions

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## SW500 and SW800 Cabinet Metric Shelf Bracket Kit Installation Guide

Order Number: EK-35XRD-IG. C01

This document contains instructions for installing the StorageWorks SW500 and SW800 cabinet metric shelf bracket kit. It also provides general shelf bracket information useful in cabinet reconfiguration.

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**June 1994**

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# Contents

1	Introduction . . . . .	1
2	General Description . . . . .	1
3	Shelf Bracket Types . . . . .	1
3.1	Screw-Mounted Shelf Brackets . . . . .	1
3.2	Tab-Mounted Shelf Brackets . . . . .	1
3.3	Horizontal Cabinet Brackets on the Vertical Slots . . . . .	2
4	Shelf Bracket Kit Configurations . . . . .	2
5	Cabinet Preparation and Shutdown . . . . .	3
6	Accessing the Cabinet Rack Space . . . . .	3
6.1	Removing the Exterior Cabinet Panels . . . . .	4
7	Horizontal Shelf Installation . . . . .	5
7.1	Installing Horizontal Shelf Brackets with Screw Mounts . . . . .	5
7.2	Installing Horizontal Shelves with Tab Mounts . . . . .	9
8	Vertical Shelf Installation . . . . .	13
8.1	Horizontal Cabinet Bracket Types . . . . .	13
8.2	Determining Cabinet Configurations . . . . .	14
8.3	Cabinet Modification . . . . .	14
8.4	Installing Vertical Shelves with Screw Mounts . . . . .	15
8.5	Installing Vertical Shelves with Tab Mounts . . . . .	19
9	Installing Exterior Cabinet Panels . . . . .	23

## Figures

1	Exterior Cabinet Panel Removal and Installation . . . . .	4
2	Front Horizontal Shelf Bracket Installation . . . . .	7
3	Rear Horizontal Shelf Bracket Installation . . . . .	8
4	Front Horizontal Shelf Bracket Installation . . . . .	11
5	Rear Horizontal Shelf Bracket Installation . . . . .	12
6	A Two-Piece Horizontal Cabinet Bracket . . . . .	13
7	A One-Piece Horizontal Cabinet Bracket . . . . .	14
8	Front Vertical Shelf Bracket Installation . . . . .	17
9	Rear Vertical Shelf Bracket Installation . . . . .	18
10	Front Vertical Shelf Bracket Installation . . . . .	21
11	Rear Vertical Shelf Bracket Installation . . . . .	22

## Tables

1	SW500 and SW800 Metric Shelf Screw-Mounted Bracket Kit Parts List .....	2
2	SW500 and SW800 Metric Shelf Tab-Mounted Bracket Kit Parts List .....	3
3	Horizontal Shelf Stop Bracket Positions .....	6
4	Horizontal Shelf Locking Bracket Part Numbers .....	6
5	Horizontal Shelf Stop Bracket Positions .....	9
6	Horizontal Shelf Locking Bracket Part Numbers .....	10
7	Determining Cabinet Configurations .....	14
8	Vertical Shelf Stop Bracket Positions .....	16
9	Vertical Shelf Locking Bracket Part Numbers .....	16
10	Vertical Shelf Stop Bracket Positions .....	19
11	Vertical Shelf Locking Bracket Part Numbers .....	20

# 1 Introduction

This document describes the installation of the StorageWorks™ SW500 and SW800 cabinet metric shelf bracket kit. Procedures for horizontal and vertical front and rear shelf bracket installation are presented. There are two types of shelf brackets: shelf brackets with screw mounts and shelf brackets with tab mounts.

## 2 General Description

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### Note

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In the following descriptions and procedures, the terms *front* and *rear* are references to locations in the cabinet. The terms *inner* and *outer* are references to positions on the shelf brackets.

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Each metric bracket set consists of a pair of shelf brackets, stop brackets, and locking brackets. See Figure 2 for examples of these components.

There are two types of shelf brackets: shelf brackets with screw mounts and shelf brackets with tab mounts.

The stop brackets are attached to the inner portion of the shelf brackets to position the shelf within the brackets. The locking brackets fix the shelf in place. Various combinations of stop positions and locking bracket sizes are necessary to situate a particular shelf for proper clearance from the cabinet doors.

The shelf bracket and stop bracket parts are used to mount all types of StorageWorks shelves in all locations. The bracket set for shelves mounted in various positions in the cabinet differs only in that the locking brackets are unique parts sized for specific cabinet positions.

## 3 Shelf Bracket Types

SW500 and SW800 cabinets can come preconfigured with screw-mounted or tab-mounted shelf brackets. Cabinets that have been field modified can contain both types of shelf brackets. See the following descriptions to determine your cabinet configuration.

### 3.1 Screw-Mounted Shelf Brackets

A typical screw-mounted bracket set is shown in Figures 2 and 8. The shelf bracket used in this set can be identified by the two screw holes between the front of the bracket and the stop bracket screw holes.

In the horizontal position, the screw-mounted brackets are attached to the vertical cabinet rails with six screws. In the vertical position, the screw-mounted brackets are attached to the horizontal cabinet bracket with six screws.

### 3.2 Tab-Mounted Shelf Brackets

A typical tab-mounted bracket set is shown in Figures 4 and 10. The shelf bracket used in this set can be identified by the formed metal slot with four mounting tabs between the front of the bracket and the stop bracket screw holes.

In the horizontal position, the tab-mounted brackets are attached to the vertical cabinet rails with four M5 KEP nuts and four mounting tabs. In the vertical position, the tab-mounted brackets are attached to the horizontal cabinet bracket with four M5 KEP nuts and four mounting tabs.

### 3.3 Horizontal Cabinet Brackets on the Vertical Slots

Before installing a shelf bracket kit in the vertical position in a SW800 cabinet, determine the type of horizontal cabinet bracket. The type of horizontal cabinet bracket determines which type of shelf bracket kit is compatible.

There are two types of horizontal cabinet brackets; a set of two narrow brackets or a one-piece bracket:

- Type 1: Two narrow brackets, one attached to the front vertical cabinet rails and the other attached to the interior vertical rails. The rear bracket has two holes with captive floating nuts. Type 1 horizontal cabinet brackets accept only screw-mounted shelf brackets. To install tab-mounted shelf brackets in a cabinet with type 1 horizontal cabinet brackets, see Section 8.2 for cabinet configuration differences and Section 8.3 for cabinet modification procedures.
- Type 2: A one-piece bracket that attaches to the vertical cabinet rails and has four holes at the rear where the shelf bracket's mounting tabs are inserted. The type 2 horizontal cabinet bracket accepts either the screw-mounted or tab-mounted brackets.

## 4 Shelf Bracket Kit Configurations

Before mounting the metric shelf bracket kit, check the contents of the bracket kit against the parts list. See Table 1 for the SW500 and SW800 Metric Shelf Screw-Mounted Bracket Kit Parts List. See Table 2 for the SW500 and SW800 Metric Shelf Tab-Mounted Bracket Kit Parts List.

**Table 1 SW500 and SW800 Metric Shelf Screw-Mounted Bracket Kit Parts List**

Kit Part Number 70-30092-05		
Digital Part Number	Description	Quantity
74-46442-01	Shelf mounting bracket	2
74-46441-01	Front shelf locking bracket	2
74-46441-02	Front shelf locking bracket	2
74-46441-03	Front shelf locking bracket (not used)	2
74-46439-01	Rear shelf locking bracket	2
74-46439-02	Rear shelf locking bracket	2
74-46440-01	Stop bracket	2
90-00063-39	Screw, THRL 10-32 TRS .500 ARCS	14
90-07786-00	U-nuts, 10-32	4

**Table 2 SW500 and SW800 Metric Shelf Tab-Mounted Bracket Kit Parts List**

Kit Part Number 70-30092-01		
Digital Part Number	Description	Quantity
74-47506-01	Shelf mounting bracket	2
74-46441-01	Front shelf locking bracket	2
74-46441-02	Front shelf locking bracket	2
74-46441-03	Front shelf locking bracket (not used)	2
74-46439-01	Rear shelf locking bracket	2
74-46439-02	Rear shelf locking bracket	2
74-46440-01	Stop bracket	2
90-00063-39	Screw, THRL 10-32 TRS .500 ARCS	2
90-40148-02	Nut, KEP, M5, 8 MMAF, CSZ	8

## 5 Cabinet Preparation and Shutdown

Before mounting the metric shelf bracket kit, perform the following actions:

**WARNING**

While working in the cabinet interior, ac power must be removed from cabinet components. Failure to do so can result in personnel injury as a result of electric shock.

1. If the cabinet is installed and operating, spin down all disk drives and halt all tape drives in the cabinet.
2. Remove ac power from cabinet components by switching the circuit breaker on the front panel of the cabinet's power controllers or cable distribution units to the OFF or  $\bigcirc$  position.

After you have made sure that all the parts are present and that ac power has been removed from the cabinet components, you may begin shelf installation.

## 6 Accessing the Cabinet Rack Space

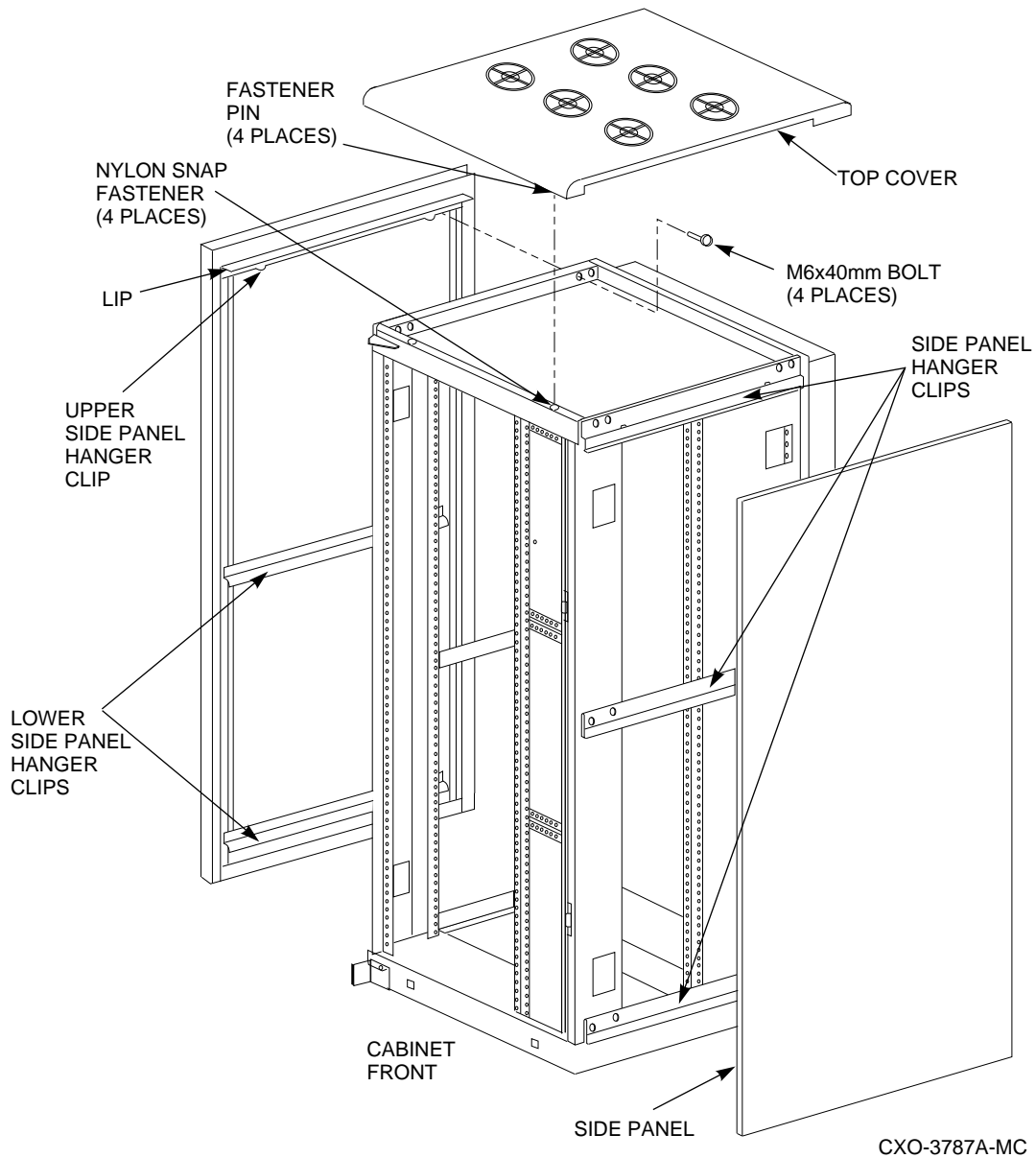
In maximum configurations when access to the interior of the cabinet is limited, external cabinet panels might need to be removed before shelves can be installed or reconfigured. Section 6.1 presents procedures for removing exterior cabinet panels.

The front and rear cabinet doors are held closed by door locks mounted on the smooth vertical panel of each door. The locks are released by turning counterclockwise with a 5/32-inch hex wrench.

## 6.1 Removing the Exterior Cabinet Panels

As shown in Figure 1, there are three side panel hanger clips on each side of the cabinet. A matching set of hanger clips are attached to each side panel. Remove the side panels as follows:

Figure 1 Exterior Cabinet Panel Removal and Installation





1. Move the cabinet away from adjacent enclosures as necessary.
2. Loosen the top cover by pushing up on its front and rear edges until it snaps free of its fasteners.

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**WARNING**

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The top cover is heavy and awkward to lift. Removing it requires two people. Failure to use sufficient personnel can result in personnel injury or equipment damage.

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3. Using two people, lift the top cover from the cabinet and set it aside.
4. Remove the bolts attaching the side panels to the top side rails of the cabinet.
5. Grasp a panel along its front and rear edges and lift up until the hanger clips disengage. Lift the panel away from the cabinet.
6. Repeat the previous step to remove the other panel.
7. Install the horizontal or vertical shelf brackets using the following procedures.

## 7 Horizontal Shelf Installation

There are two types of horizontal shelf bracket installations: those using shelf brackets with screw mounts, and those using shelf brackets with tab mounts. See Section 7.1 for installations using shelf brackets with screw mounts. See Section 7.2 for installations using shelf brackets with tab mounts and mounting studs. Either the screw-mounted bracket set or tab-mounted bracket set can be used in horizontal shelf installations in any SW500 and SW800 cabinet.

### 7.1 Installing Horizontal Shelf Brackets with Screw Mounts

Shelf bracket installations for front and rear horizontal shelves using screw mounts are shown in Figures 2 and 3. Using the illustrations as a guide, install horizontal shelf brackets as follows:

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**WARNING**

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Cabinet rail edges can be sharp and can slice or abrade skin or cable insulation.

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**Note**

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Two small ESD grounding posts are provided with the cabinet. One is located on a front vertical cabinet rail, and one on a rear vertical cabinet rail. Should an ESD grounding post interfere with the installation of a shelf, move the post out of the way to any free hole on the cabinet.

---

1. Turn the cabinet power off as described in Section 5.
2. Determine the correct shelf mounting locations and corresponding cabinet rail mounting holes for the shelf bracket.
3. Position the shelf bracket at the correct mounting holes just behind the outer flange of the vertical cabinet rail.

4. Using the shelf bracket as a template, mark the two U-nut mounting holes on the inner flange of the cabinet rail.
5. Remove the shelf bracket and install two U-nuts along the inner flange of the cabinet rail at the holes marked in step 4.
6. Position and fasten the shelf bracket to the outer flange of the cabinet rail with two screws.
7. Fasten the bracket to the U-nuts with two screws.
8. Using Table 3, determine the correct stop bracket position for the shelf type being installed.

**Table 3 Horizontal Shelf Stop Bracket Positions**

<b>StorageWorks Shelf Type</b>	<b>Front Shelf Stop Bracket Position</b>	<b>Rear Shelf Stop Bracket Position</b>
BA350-Sx	4	1
BA350-Mx	5	2
BA350-Ex	3	1

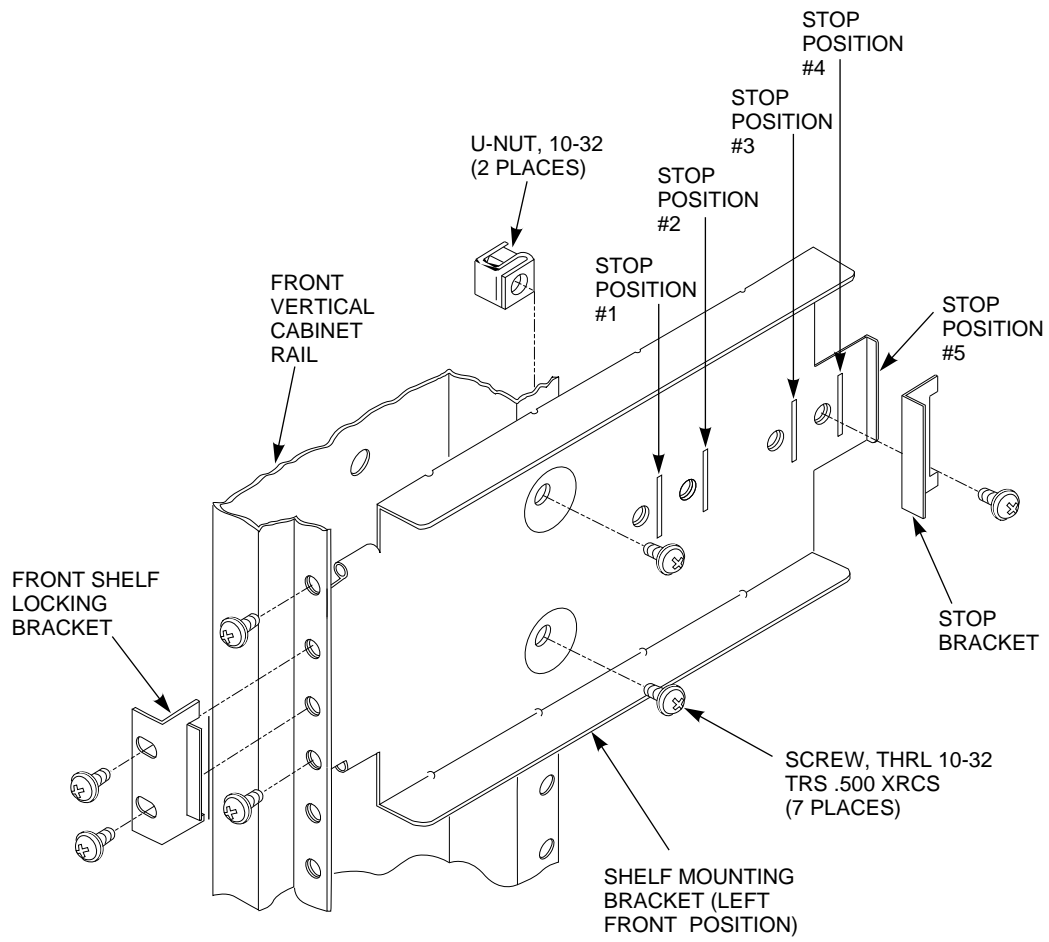
9. Insert the tab on the stop bracket into the slot at the correct stop position on the shelf bracket. Fasten the stop bracket to the shelf bracket.
10. Repeat steps 2 through 9 to mount the companion shelf bracket on the opposite cabinet rail. To be sure of proper alignment of the brackets, use care to mount the bracket to the correct rail mounting holes.
11. With the power supply end of the shelf to the left and the blowers facing the cabinet, slide the shelf into the shelf brackets until it contacts the inner stop brackets. The shelf should slide smoothly into the brackets. If it binds, remove it and check the alignment of the shelf brackets. The shelf bracket mounting screws might need to be loosened slightly to allow the brackets to align with the shelf. Tighten the screws when the shelf brackets are properly aligned.
12. Using Table 4, verify that you have the correct locking bracket part number for the shelf type and position (front or rear) being installed.

**Table 4 Horizontal Shelf Locking Bracket Part Numbers**

<b>StorageWorks Shelf Type</b>	<b>Front Shelf Locking Bracket Part No.</b>	<b>Rear Shelf Locking Bracket Part No.</b>
BA350-Sx	74-46441-01	74-46439-01
BA350-Mx	74-46441-02	74-46439-02
BA350-Ex	74-46441-03	74-46439-01

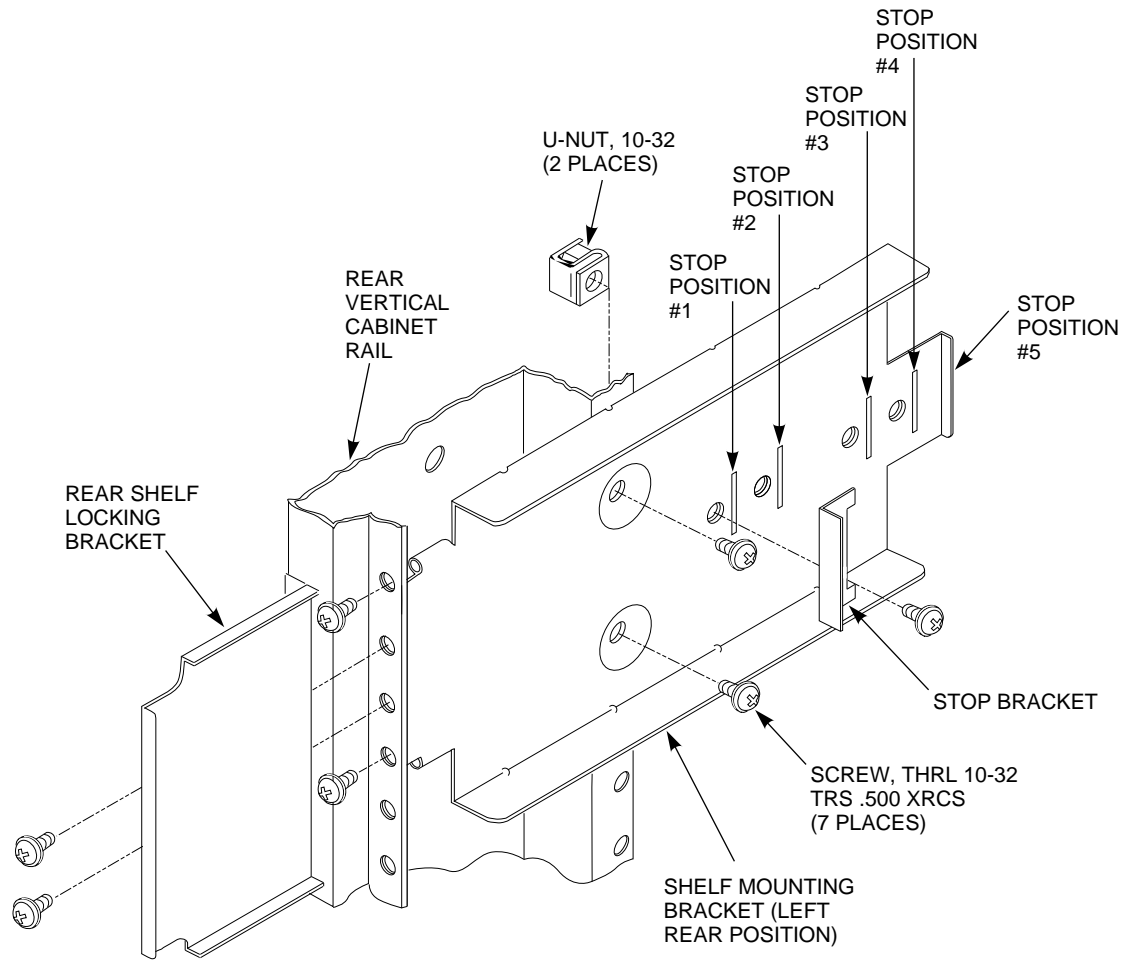
13. Once the shelf is positioned within the shelf brackets, install the shelf's locking brackets to both shelf brackets with screws. Push the locking bracket against the shelf to seat it before tightening the screws.

**Figure 2 Front Horizontal Shelf Bracket Installation**



CXO-3768A-MC

**Figure 3 Rear Horizontal Shelf Bracket Installation**



CXO-3767A-MC

## 7.2 Installing Horizontal Shelves with Tab Mounts

Shelf bracket installations for front and rear horizontal shelves using tab-mount brackets are shown in Figures 4 and 5. Using the illustrations as a guide, install horizontal shelf brackets as follows:

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### WARNING

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Cabinet rail edges can be sharp and can slice or abrade skin or cable insulation.

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### Note

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Two small ESD grounding posts are provided with the cabinet. One is located on a front vertical cabinet rail, and one on a rear vertical cabinet rail. Should an ESD grounding post interfere with the installation of a shelf, move the post out of the way to any free hole on the cabinet.

---

1. Turn the cabinet power off as described in Section 5.
2. Determine the correct shelf mounting locations and corresponding cabinet rail mounting holes for the shelf brackets.
3. Position the shelf bracket at the correct mounting holes just behind the outer flange of the vertical cabinet rail.
4. Align the bracket mounting studs and mounting tabs with the appropriate holes in the front vertical cabinet rail and seat the studs and tabs in the holes.
5. Fasten the bracket to the cabinet rail by installing KEP nuts on the upper-most and lower-most bracket mounting studs. Do not install KEP nuts on the two middle studs at this time.
6. Using Table 5, determine the correct stop bracket position for the shelf type being installed.

**Table 5 Horizontal Shelf Stop Bracket Positions**

StorageWorks Shelf Type	Front Shelf Stop Bracket Position	Rear Shelf Stop Bracket Position
BA350-Sx	4	1
BA350-Mx	5 (stop bracket not used)	2
BA350-Ex	3	1

7. Insert the tab on the stop bracket into the slot at the correct stop position on the shelf bracket. Fasten the stop bracket to the shelf bracket. Note that for front-mounted BA350-Mx shelves, the inner lip on the shelf mounting bracket serves as the stop bracket.

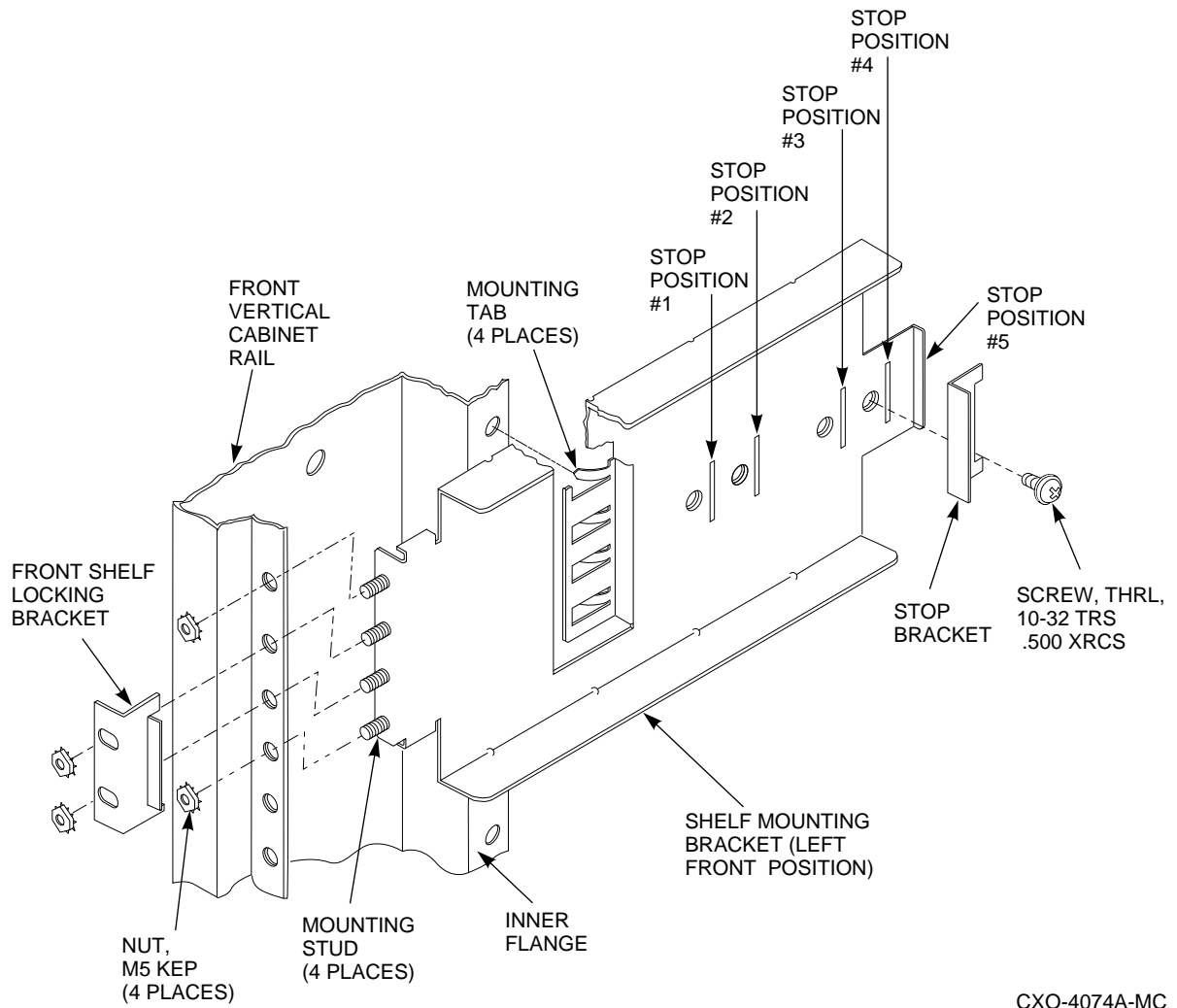
8. Repeat steps 2 through 7 to mount the companion shelf bracket on the opposite cabinet rail. To be sure of proper alignment of the brackets, use care to mount the bracket to the correct rail mounting holes.
9. With the power supply end of the shelf to the left and the blowers facing the cabinet, slide the shelf into the shelf brackets until it contacts the inner stop brackets. The shelf should slide smoothly into the brackets. If it binds, remove it and check the alignment of the shelf brackets. The shelf bracket mounting nuts might need to be loosened slightly to allow the brackets to align with the shelf. Tighten the nuts when the shelf brackets are properly aligned.
10. Using Table 6, verify that you have the correct locking bracket part number for the shelf type and position (front or rear) being installed.

**Table 6 Horizontal Shelf Locking Bracket Part Numbers**

<b>StorageWorks Shelf Type</b>	<b>Front Shelf Locking Bracket Part No.</b>	<b>Rear Shelf Locking Bracket Part No.</b>
BA350-Sx	74-46441-01	74-46439-01
BA350-Mx	74-46441-02	74-46439-02
BA350-Ex	74-46441-03	74-46439-01

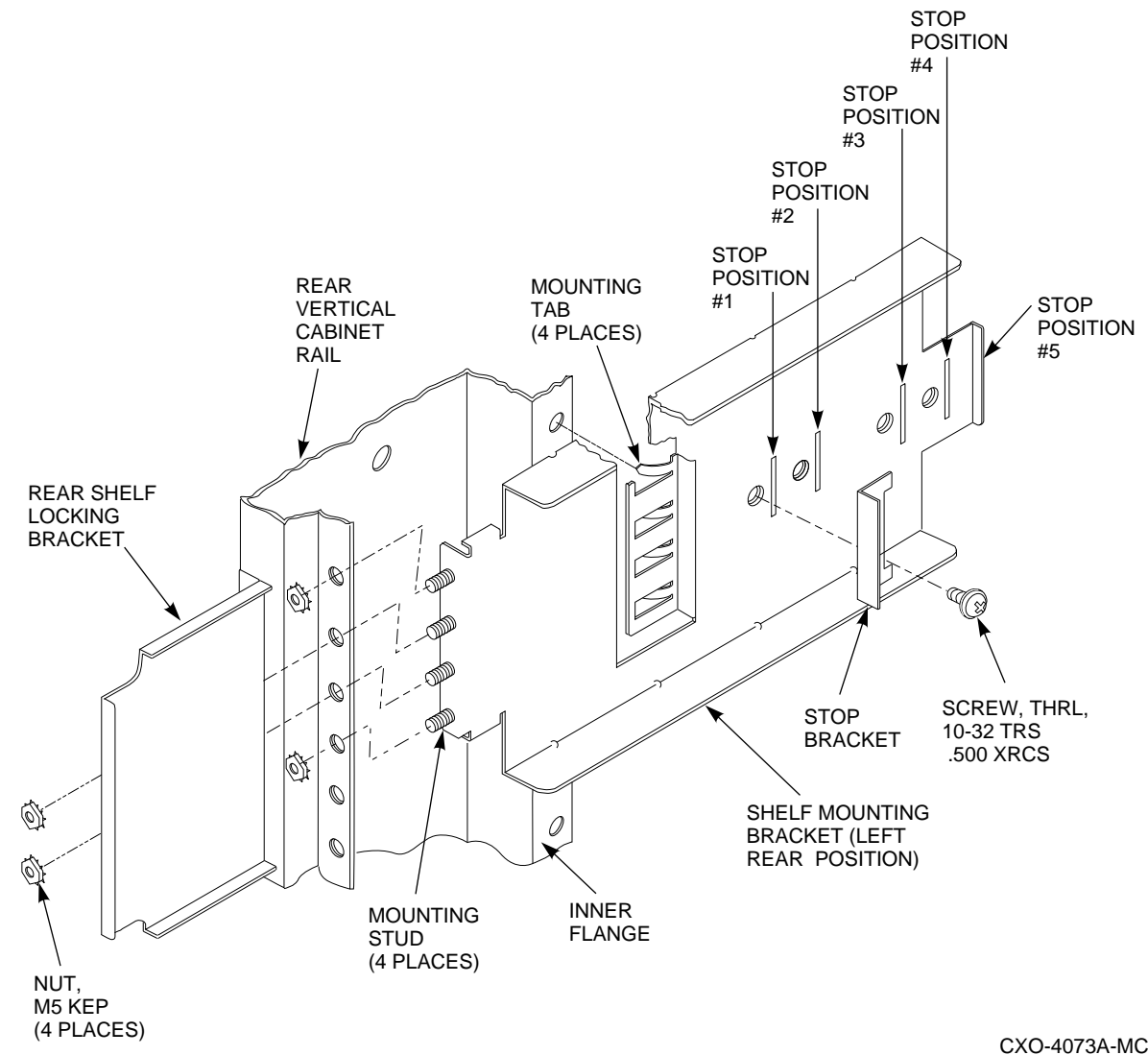
11. Once the shelf is positioned within the shelf brackets, install both shelf locking brackets with KEP nuts on the middle bracket mounting studs, as shown. Push each locking bracket against the shelf to seat it before tightening the nuts.

**Figure 4 Front Horizontal Shelf Bracket Installation**



CXO-4074A-MC

**Figure 5 Rear Horizontal Shelf Bracket Installation**



CXO-4073A-MC



## 8 Vertical Shelf Installation

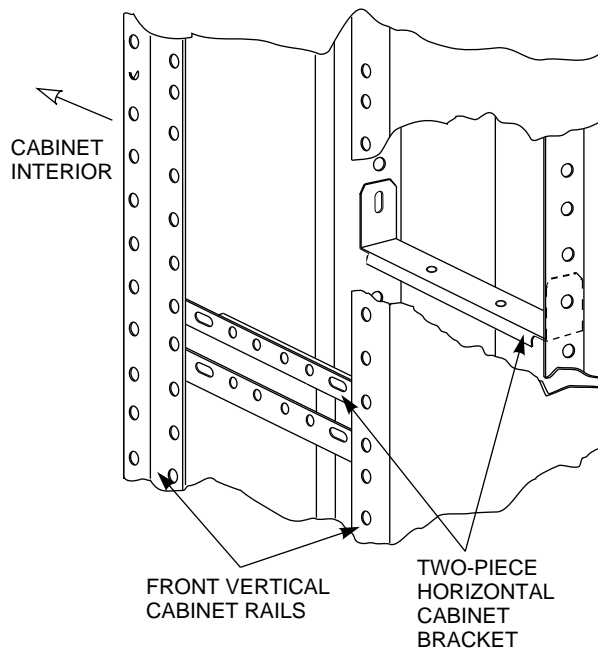
There are two types of vertical shelf bracket installations: those using shelf brackets with screw-mounts, and those using shelf brackets with tab-mounts. When installing shelf brackets in the vertical position the shelf brackets used are determined by the horizontal cabinet bracket that was factory installed.

### 8.1 Horizontal Cabinet Bracket Types

There are two types of horizontal cabinet brackets: a set of two narrow brackets or a one piece bracket:

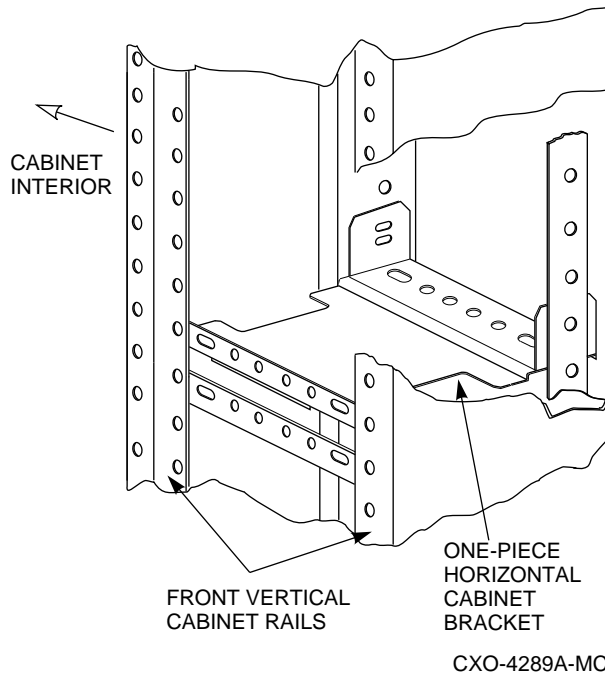
- Type 1: A two-piece bracket, one attached to the front vertical cabinet rails and the other attached to the interior vertical rails (see Figure 6). The rear bracket has two holes with captive floating nuts. Type 1 horizontal cabinet brackets accept only screw-mounted shelf brackets. To install tab-mounted shelf brackets in a cabinet with Type 1 horizontal cabinet brackets see Section 8.2 for cabinet configuration differences and Section 8.3 for cabinet modification procedures.
- Type 2: A one-piece bracket that attaches to the vertical cabinet rails and has four holes at the rear where the shelf bracket's mounting tabs are inserted (see Figure 7). The type 2 horizontal cabinet bracket accepts either the screw-mounted or tab-mounted brackets.

**Figure 6 A Two-Piece Horizontal Cabinet Bracket**



CXO-4288A-MC

**Figure 7 A One-Piece Horizontal Cabinet Bracket**



## 8.2 Determining Cabinet Configurations

To determine the configuration of your cabinet's vertical slot, look at the horizontal cabinet bracket in the vertical slots of the cabinet. Is the horizontal cabinet bracket a type 1 two-piece bracket, or a type 2 one-piece bracket? Use Table 7 as a guide to properly determine your vertical shelf brackets.

**Table 7 Determining Cabinet Configurations**

If the horizontal cabinet bracket is a ...	And you are installing a ...	Then go to ...
Type 1 two-piece	Screw-mounted bracket kit	Section 8.4
Type 1 two-piece	Tab-mounted bracket kit	Section 8.3
Type 2 one-piece	Tab-mounted bracket kit	Section 8.5
Type 2 one-piece	Screw-mounted bracket kit	Section 8.4

## 8.3 Cabinet Modification

This procedure applies to cabinets with the type 1 two-piece horizontal cabinet bracket, and it only applies when installing a tab-mounted vertical shelf bracket. This procedure instructs you to remove a horizontal shelf and shelf brackets, and to exchange the new tab-mounted bracket kit for the horizontal, screw-mounted brackets.

1. Turn the cabinet power off as described in Section 5.
2. Select a horizontal shelf to remove.
3. Disconnect the signal and power cables from the horizontal shelf.
4. Remove the locking brackets from the horizontal shelf.

5. Remove the horizontal shelf.
6. Remove the horizontal, screw-mounted shelf brackets from the cabinet.
7. Remove the two U-nuts from each of the vertical cabinet rails.
8. Refer to Section 7.2 and install the tab-mounted shelf brackets in the horizontal position.
9. Install the shelf in the horizontal position.
10. Install the locking brackets on the horizontal shelf.
11. Connect the signal and power cables.
12. See Section 8.4 and install the screw-mounted shelf brackets in the vertical position.

#### 8.4 Installing Vertical Shelves with Screw Mounts

Shelf bracket installations for front and rear vertical shelves using screw mount brackets are shown in Figures 8 and 9. Using the illustrations as a guide, install the vertical shelf brackets as follows:

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##### **WARNING**

---

Cabinet rail edges can be sharp and can slice or abrade skin or cable insulation.

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##### **Note**

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Two small ESD grounding posts are provided with the cabinet. One is located on a front vertical cabinet rail, and one on a rear vertical cabinet rail. Should an ESD grounding post interfere with the installation of a shelf, move the post out of the way to any free hole on the cabinet.

---

1. Turn the cabinet power off as described in Section 5.
2. Determine the correct vertical shelf location for the shelf bracket.
3. Position the shelf bracket at the correct mounting holes just behind the outer flange of the horizontal cabinet rail.
4. Fasten the shelf bracket to the outer flange of the cabinet rail with two screws.

---

##### **Note**

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If a type 2 one-piece horizontal cabinet bracket is installed, two 10–32 retaining nuts (not provided) are required.

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5. Fasten the shelf bracket to the inner horizontal cabinet bracket with two screws and 10–32 retaining nuts if required.

- Using Table 8, determine the correct stop bracket position for the shelf type being installed.

**Table 8 Vertical Shelf Stop Bracket Positions**

<b>StorageWorks Shelf Type</b>	<b>Front Shelf Stop Bracket Position</b>	<b>Rear Shelf Stop Bracket Position</b>
BA350-Sx	3	1
BA350-Mx	4	1

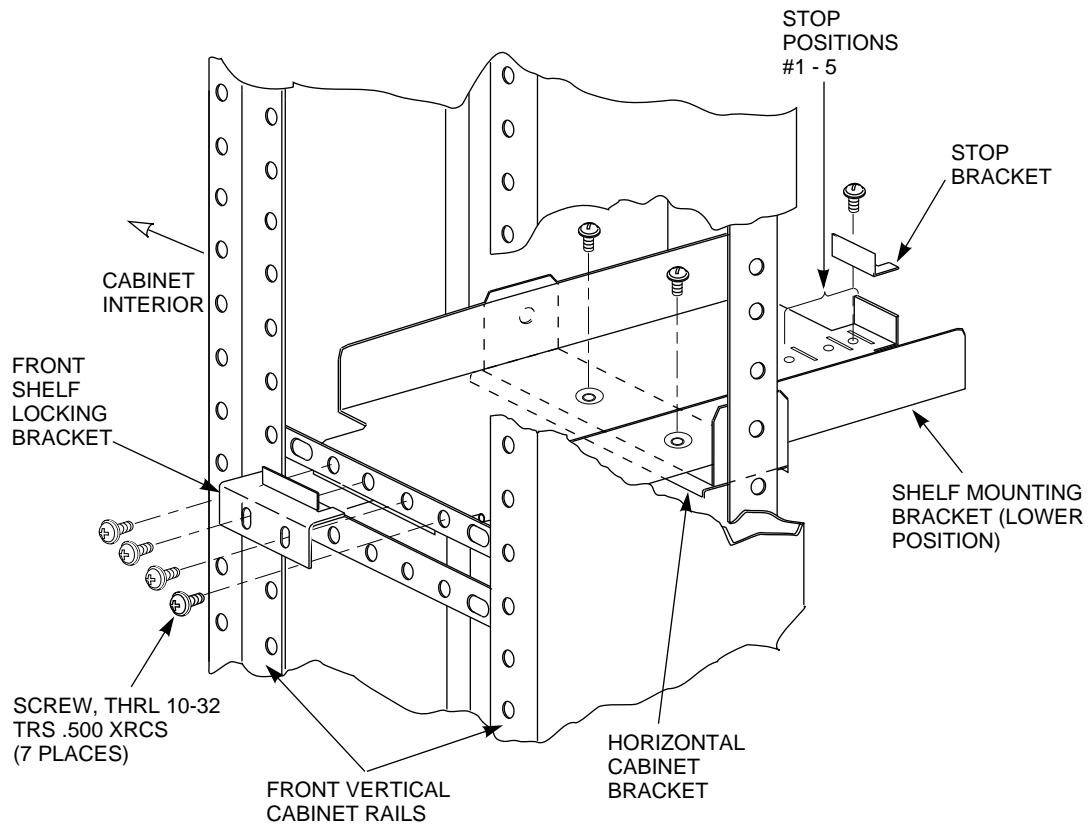
- Insert the tab on the stop bracket into the slot at the correct stop position on the shelf bracket. Fasten the stop bracket to the shelf bracket.
- Repeat steps 2 through 7 to mount the companion shelf bracket on the opposite cabinet rail.
- With the power supply end of the shelf at the top and the blowers facing the cabinet, slide the shelf into the shelf brackets until it contacts the stop brackets. The shelf should slide smoothly into the shelf brackets. If it binds, remove it and check the alignment of the shelf brackets. The bracket mounting screws might need to be loosened slightly to allow the brackets to align with the shelf. Tighten the screws when the brackets are properly aligned.
- Using Table 9, verify that you have the correct locking bracket part number for the shelf type and position (front or rear) being installed.

**Table 9 Vertical Shelf Locking Bracket Part Numbers**

<b>StorageWorks Shelf Type</b>	<b>Front Shelf Locking Bracket Part No.</b>	<b>Rear Shelf Locking Bracket Part No.</b>
BA350-Sx	74-46441-01	74-46439-01
BA350-Mx	74-46441-02	74-46439-02

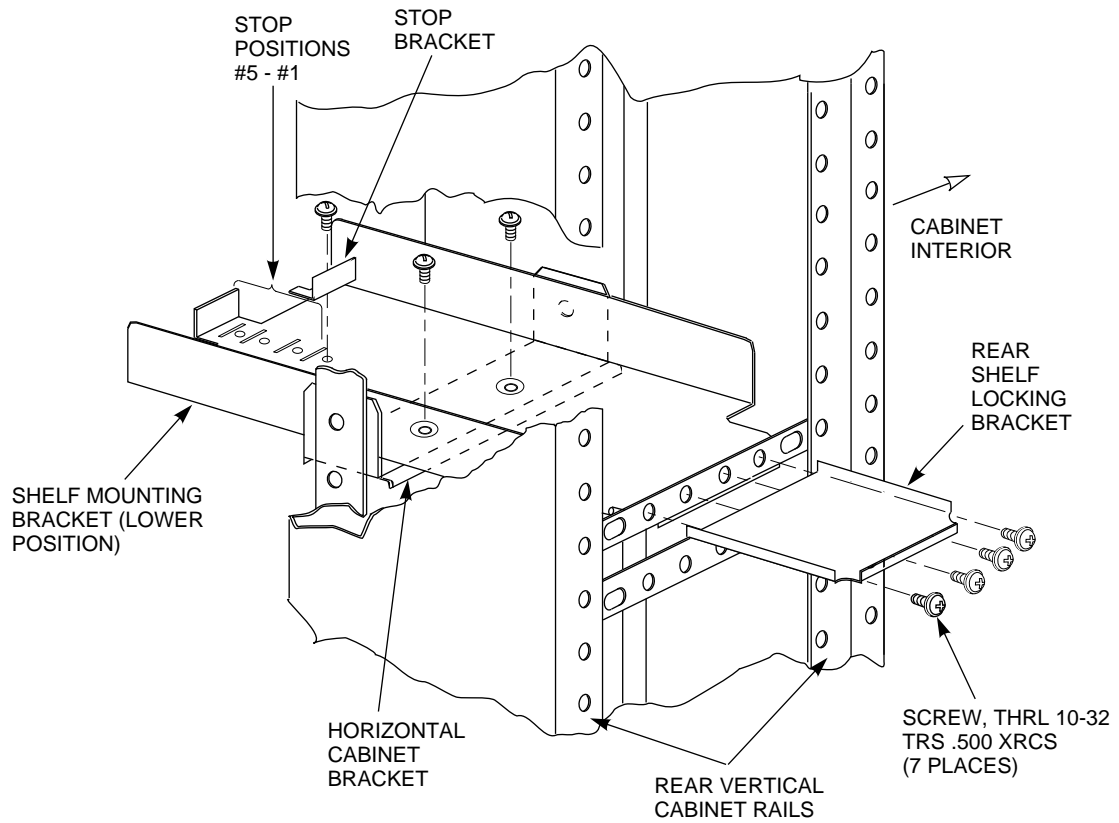
- Once the shelf is positioned within the shelf brackets, install the locking brackets with screws. Push each locking bracket against the shelf to seat it before tightening the screws.

**Figure 8 Front Vertical Shelf Bracket Installation**



CXO-3775A-MC

**Figure 9 Rear Vertical Shelf Bracket Installation**



CXO-3776A-MC

## 8.5 Installing Vertical Shelves with Tab Mounts

Shelf bracket installations for front and rear vertical shelves using tab mount brackets are shown in Figures 10 and 11. Using the illustrations as a guide, install the vertical shelf brackets as follows:

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### WARNING

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Cabinet rail edges can be sharp and can slice or abrade skin or cable insulation.

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### Note

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Two small ESD grounding posts are provided with the cabinet. One is located on a front vertical cabinet rail, and one on a rear vertical cabinet rail. Should an ESD grounding post interfere with the installation of a shelf, move the post out of the way to any free hole on the cabinet.

---

1. Turn the cabinet power off as described in Section 5.
2. Determine the correct vertical shelf location for the shelf bracket.
3. Position the shelf bracket at the correct mounting holes just behind the outer flange of the horizontal cabinet bracket.
4. Align the bracket mounting studs and mounting tabs with the appropriate holes in the horizontal cabinet bracket and seat the studs and tabs in the holes.
5. Fasten the bracket to the horizontal cabinet bracket by installing KEP nuts on the left-most and right-most bracket mounting studs. Do not install nuts on the two middle studs at this time.
6. Using Table 10, determine the correct stop bracket position for the shelf type being installed.

**Table 10 Vertical Shelf Stop Bracket Positions**

StorageWorks Shelf Type	Front Shelf Stop Bracket Position	Rear Shelf Stop Bracket Position
BA350-Sx	3	1
BA350-Mx	4	1

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7. Insert the tab on the stop bracket into the slot at the correct stop position on the shelf bracket. Fasten the stop bracket to the shelf bracket.
8. Repeat steps 2 through 7 to mount the companion shelf bracket on the horizontal cabinet bracket above the one just installed.
9. With the power supply end of the shelf at the top and the blowers facing the cabinet, slide the shelf into the shelf brackets until it contacts the stop brackets. The shelf should slide smoothly into the shelf brackets. If it binds, remove it and check the alignment of the shelf brackets. The bracket mounting nuts might need to be loosened slightly to allow the brackets to align with the shelf. Tighten the nuts when the brackets are properly aligned.

10. Using Table 11, verify that you have the correct locking bracket part number for the shelf type and position (front or rear) being installed.

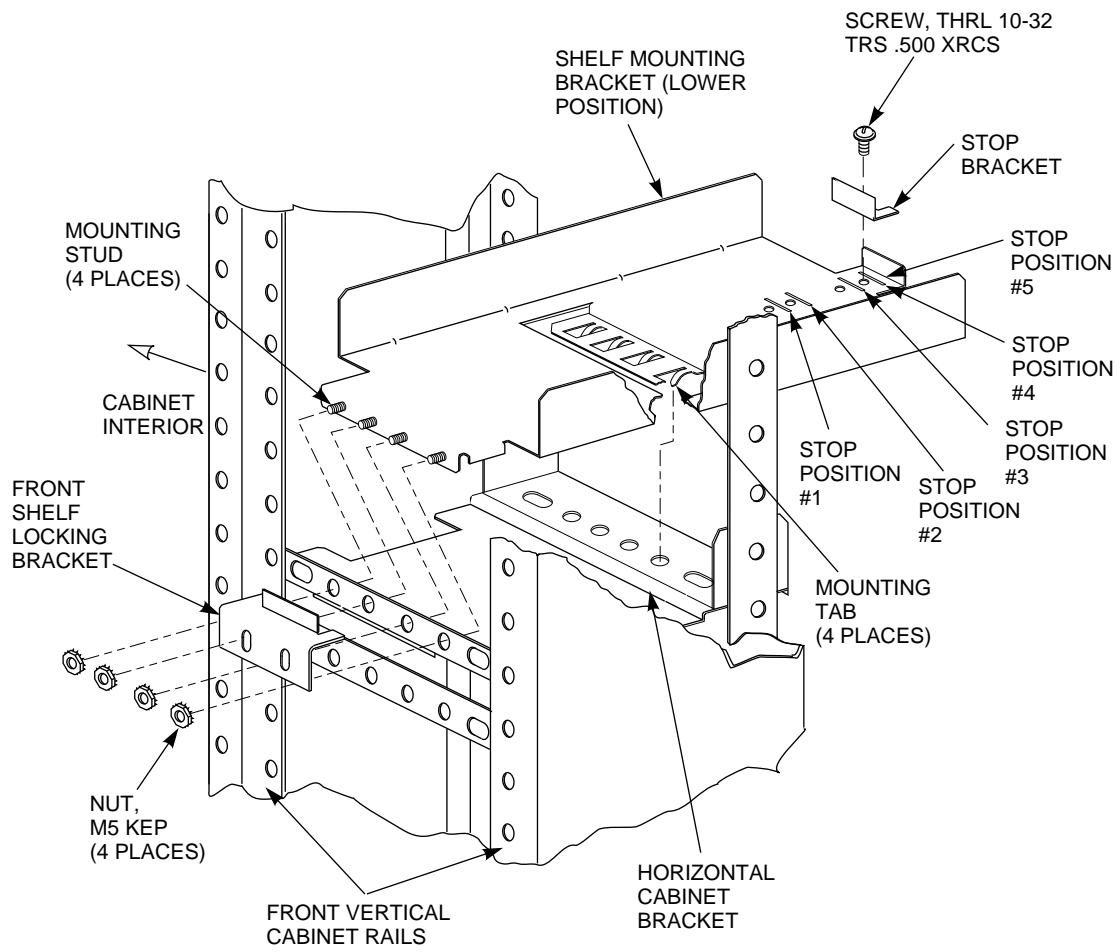
**Table 11 Vertical Shelf Locking Bracket Part Numbers**

<b>StorageWorks Shelf Type</b>	<b>Front Shelf Locking Bracket Part No.</b>	<b>Rear Shelf Locking Bracket Part No.</b>
BA350-Sx	74-46441-01	74-46439-01
BA350-Mx	74-46441-02	74-46439-02

11. Once the shelf is positioned within the shelf brackets, install the locking brackets with KEP nuts on the two middle mounting studs. Push each locking bracket against the shelf to seat it before tightening the nuts.

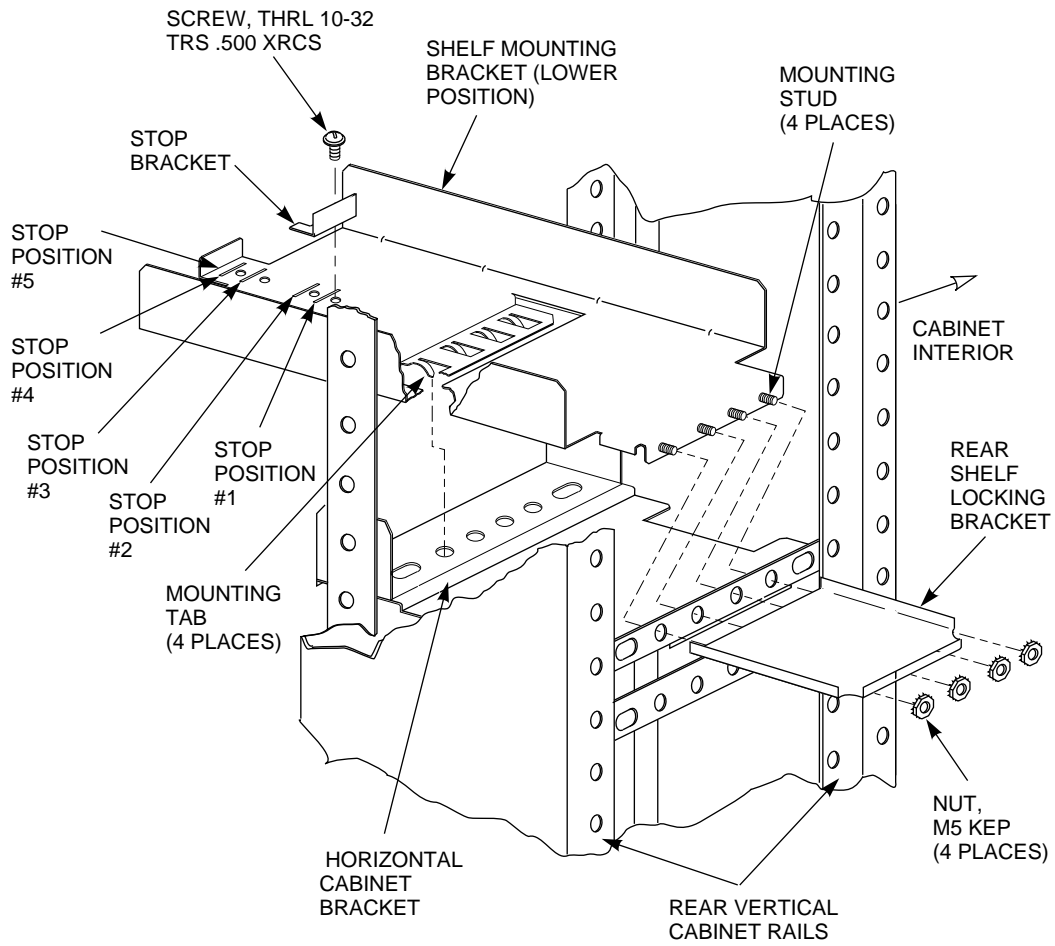


**Figure 10 Front Vertical Shelf Bracket Installation**



CXO-4075A-MC

**Figure 11 Rear Vertical Shelf Bracket Installation**



CXO-4076A-MC

## 9 Installing Exterior Cabinet Panels

Once the cabinet rack space is configured as desired, the exterior cabinet panels may be installed. Refer to Figure 1 and install the exterior cabinet panels as follows:

1. Position a side panel against the cabinet with the lip above the upper hanger clips just over the upper edge of the side of the cabinet.
2. Make sure that the entire surface of the side panel rests firmly against the side of the cabinet.
3. Allow the panel to slide downward, catching the three hanger clips as it moves.
4. Install the side panel bolts into the side panel through the holes in the top side rails of the cabinet.
5. Repeat steps 1 through 4 to install the other side panel.
6. Locate the four inset nylon snap fasteners on the top cabinet rails.

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**WARNING**

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The top cover is heavy and awkward to lift. Installing it requires two people. Failure to use sufficient personnel can result in personnel injury or equipment damage.

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7. Position the top cover over the cabinet. Position the cover as shown in Figure 1 such that the end of the panel with the shorter overhang is oriented toward the front of the cabinet.
8. Align the pins on the underside of the top cover with the inset nylon fasteners on the top cabinet rails.

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**WARNING**

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Be careful not to catch your fingers between the cabinet and the top panel when snapping the panel to the cabinet.

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9. Lower the cover onto the cabinet and press it down, making sure that the pins snap into the top panel fasteners.
10. If the cabinet was moved to access the side panels, place it in its original position.

