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COMPAQ

Keyboard/Monitor/Mouse Switch Box
User Guide

Part Number 242757-001

NOTICE

Compaq Keyboard/Monitor/Mouse Switch Box User Guide

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Chapter 1
Introduction

The Compaq Keyboard/Monitor/Mouse Switch Box is a device that switches a single keyboard, mouse, and monitor between multiple Compaq computers. The Keyboard/Monitor/Mouse Switch Box is a space-efficient 1 U height (1.75-inch) device and is available in four- and eight-port models. This chapter provides an overview of the product features, functionality, and sample configurations.

Compaq Keyboard/Monitor/Mouse Switch Box Features

The Keyboard/Monitor/Mouse Switch Box products provide Compaq users with a complete Compaq solution for their server computing needs. You can use the Keyboard/Monitor/Mouse Switch Box in various configurations to connect from 2 to 64 servers.

The features of the Keyboard/Monitor/Mouse Switch Box include:

■ **Console Configuration Reporting (CCR)** - Console Configuration Reporting displays system-related information on the monitor, such as power-up test data and configuration menus.

■ **Programmable Scanning** - You can evaluate system performance by sequentially scanning any or all of the computers in the system. Programmable scanning allows you to determine which computers to include as well as the duration of the connection.

■ **Configuration NVRAM** - NVRAM (non-volatile RAM) makes it easy to set configuration information using commands entered from the keyboard. The NVRAM stores the resulting configuration until you decide to change the information, even if the unit loses power.

■ **Hardware Reset Switch** - If the keyboard or mouse communication is disrupted, you can press this switch to reset the unit.

■ **External Keypad Jack** - The Keyboard/Monitor/Mouse Switch Box has an external keypad jack to support rack-mounted Compaq products. In this configuration, the switch is mounted behind a door in a cabinet and the optional keypad is mounted outside the cabinet for easy access.

■ **Password Protection** - For protection against unauthorized users, the Compaq Keyboard/Monitor/Mouse Switch Box provides a password option for security purposes.

Configurations

There are many ways to configure your Compaq Keyboard/Monitor/Mouse Switch Box in order to meet your specific organizational needs. Additional information on configuring multiple Keyboard/Monitor/Mouse Switch Boxes can be found in Chapter 4.

■ A single Keyboard/Monitor/Mouse Switch Box is used to connect four or eight servers. In this configuration, the keyboard, monitor, and mouse are connected directly to the unit by their respective cables. You can connect the Keyboard/Monitor/Mouse Switch Box to servers located in the same or adjoining racks. See Figure 1-1.
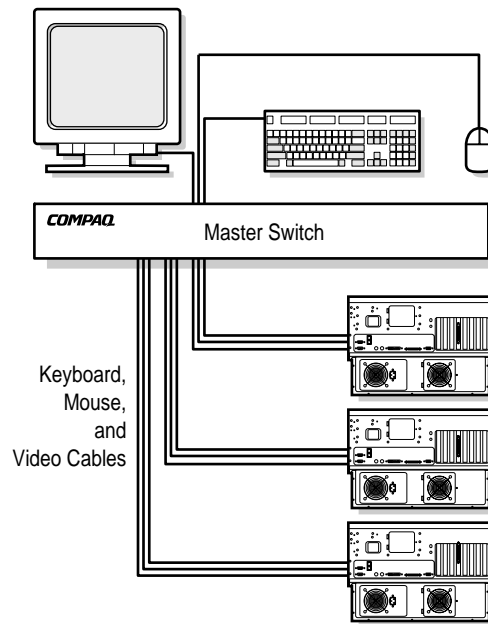
Figure 1-1. Single Keyboard/Monitor/Mouse Switch Box

■ You can pair two Keyboard/Monitor/Mouse Switch Box units to connect up to 16 computers. In this configuration, two eight-port switches are placed one on top of another with a cable connecting them. This requires only 2U (3.5 inches) of vertical space. For additional information, see Chapter 4, "Paired Switch Configurations."

■ You can tier multiple Keyboard/Monitor/Mouse Switch Box units to connect up to 64 servers. This configuration is often referred to as a "master/slave" system. It is illustrated in the example below, with the slave unit's device port connected to one of the computer ports on the original or master unit. Multiple Keyboard/Monitor/Mouse Switch Box units can be tiered from the master unit. See Figure 1-2.
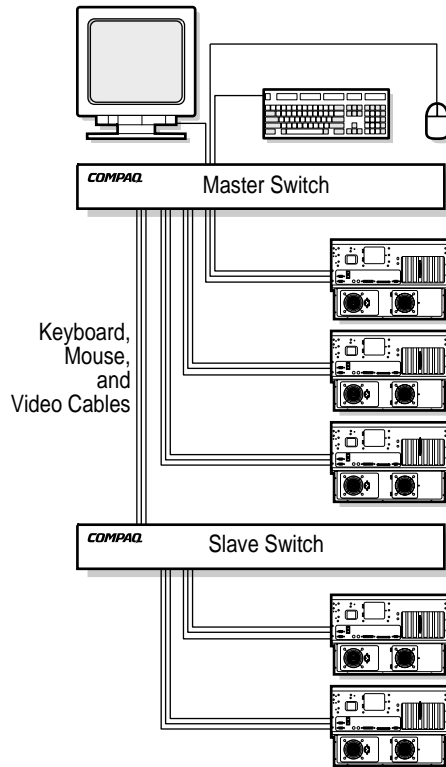
Figure 1-2. Tiered Configuration

Chapter 2
Installation

This chapter provides installation information for the Compaq
Keyboard/Monitor/Mouse Switch Box.

⚠ **WARNING:**   To reduce the risk of personal injury or damage
to the equipment be sure that; the leveling feet are extended to
the floor and supporting the full weight of the rack. Each rack
should be level and stable. Racks that are not coupled together
require the installation of stabilizing feet. This must be
accomplished before performing any work on the rack.

⚠ **WARNING:**   Risk of personal injury. The rack may become
unstable if more than one component is extended for any
reason. Always ensure that the rack is adequately stabilized
before extending a component outside the rack. Extend only
one component at a time.

Attaching the Slide Rail
Brackets

The figure below shows how to attach the slide rail brackets to the
Keyboard/Monitor/Mouse Switch Box. Make sure that the front end of the
rack-mount brackets angle out away from the unit.
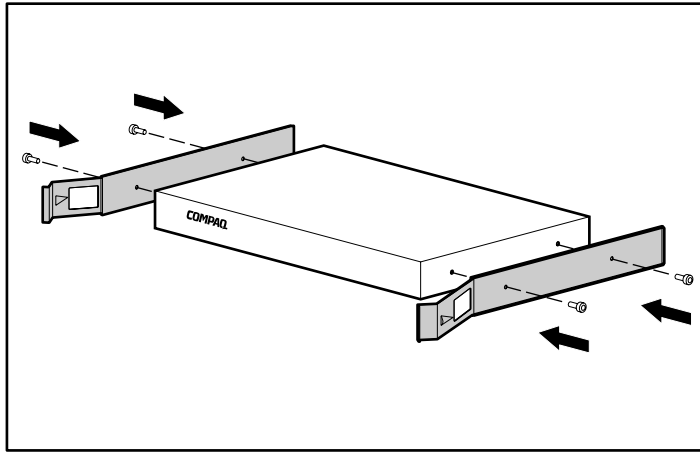
Figure 2-1. Attaching slide rail brackets

Preparing the Rack-Mount Brackets

Prepare the rack-mount brackets for cable management in the rack by attaching the plastic cable ties. The cable ties snap into place, with the tie on the **outside** of the bracket. See Figure 2-2. After the cable ties are in place, install the rack-mount brackets in the rack by sliding the two back tabs in the back mounting rail. Secure the rack-mount brackets in the front mounting rail with two 6mm screws each, making sure to use only the top and bottom holes. The middle will be used for attaching the front cover panel after the unit is fully installed. Also install the cable rod in the back of the unit in the two keyhole-shaped holes. Push the rod down to lock it in place.
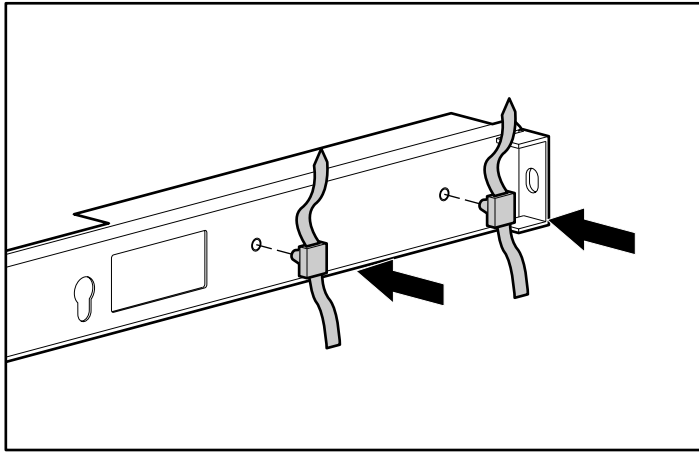
Figure 2-2. Snapping cable ties into place

Rack-mount Installation

Slide the Keyboard/Monitor/Mouse Switch Box into the rack-mount brackets until it snaps into place, as shown in Figure 2-3.
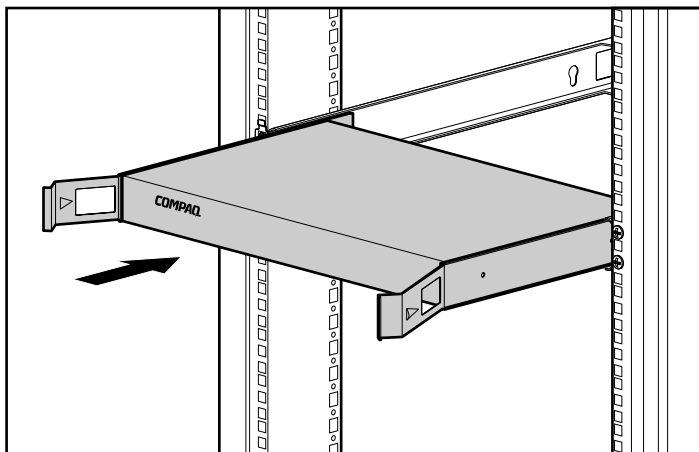
Figure 2-3. Sliding the Keyboard/Monitor/Mouse Switch Box into rack-mount brackets

Cover Panel Installation

After the unit is fully installed, secure the front cover panel using the middle hole, as shown below.
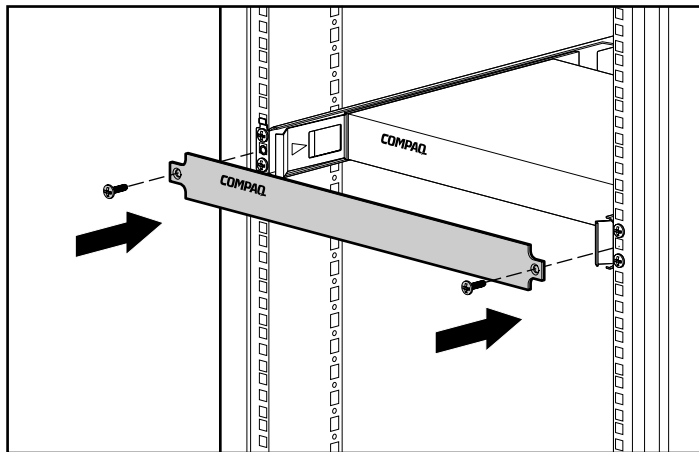
Figure 2-4. Securing the front cover panel

Compaq Keyboard/Monitor/Mouse Switch Box System Installation

Use the following procedure for system installation:

> ⚠ **WARNING:** To reduce the risk of electric shock or damage to your equipment, make sure the power cord is disconnected from the Switch Box.

1. Connect the keyboard, monitor, and mouse cables to the switch monitor, keyboard, and mouse connectors as shown below. Note that all keyboard and mouse cables are 6-pin mini-DIN PS/2 style, and all the video cables are 15-pin VGA style.

Monitor   Computer 3 Monitor   Power Cord Connector

Keyboard   Mouse   Computer 3 Keyboard   Computer 3 Mouse   Power Switch
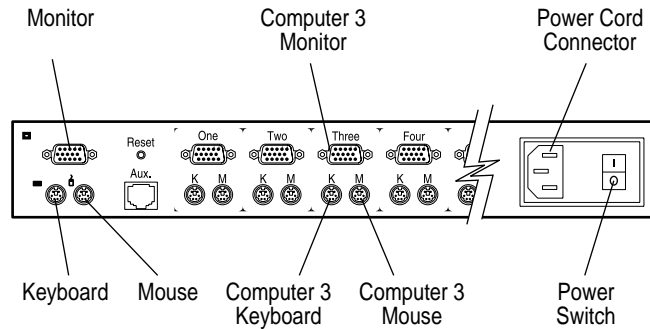
Figure 2-5. Keyboard/Monitor/Mouse Switch Box Connectors

2. Decide which computer is to be connected to port 1. Connect the computer's keyboard and mouse to the jacks marked K and M, respectively, beneath the port labeled One. Connect the computer's monitor to the 15-pin VGA connector. Bundle and label the cables for easy identification.

3. Repeat step 2 for all remaining computers to be connected to the Keyboard/Monitor/Mouse Switch Box. Bundle the cables to the cable rod with Velcro cable ties. Then route the cables out the slot in the rack-mount bracket. Use the plastic cable ties to bundle the cables. See Figure 2-6.

Cable Rod

Velcro Ties

Plastic Cable Ties
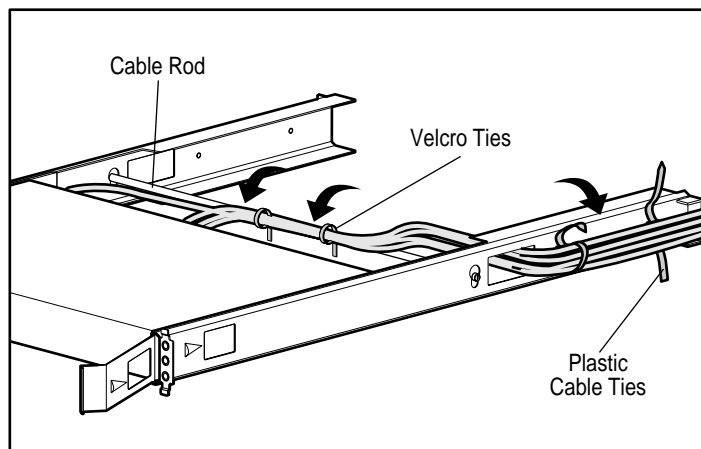
Figure 2-6. Bundling cables with cable ties

> ⚠ **WARNING:** To reduce the risk of electric shock or damage to your equipment, do not disable the power cord grounding feature. This equipment is designed to be connected to a grounded (earthed) power outlet that is easily accessible to the operator. The grounding plug is an important safety feature.

4. Connect the power cord to the Keyboard/Monitor/Mouse Switch Box.

Initial Power-up

It is important that you power up the Keyboard/Monitor/Mouse Switch Box first, then the computers. This is because when the servers boot up, their drivers send device settings to the switch. These settings are then stored in the switch NVRAM. Power-up the system as follows:

1. Power up the switch by pressing the power switch located on the rear panel to the on (1) position.

2. Power up the computers.

Keyboard/Monitor/Mouse Switch Box Startup Behavior

Power up the Keyboard/Monitor/Mouse Switch Box first. During startup, the unit does the following:

■ Identifies the mouse and keyboard and puts them into default states.

■ Switches to port number 1 by default, and displays the number "1" in the status flag displayed on the monitor. If the status flag default setting has been changed to Names mode, the status flag displays the port name instead of the port number. If a status flag is not being shown on the monitor, make sure that it is connected and powered up.

Computer Startup Behavior

During startup the computers send device settings to the Keyboard/Monitor/Mouse Switch Box. The unit then generates standard responses to these commands and allows the computers to boot successfully without actually being physically connected to the devices. Once you have the switch installed you can save these settings to non-volatile RAM (NVRAM). See Chapter 3 for additional information.

Configuring the Keyboard/Monitor/Mouse Switch Box

When you first power up the Keyboard/Monitor/Mouse Switch Box, no configuration is needed for normal switching operation. For tailoring the unit to meet your specific needs, such as assigning unique names for the computers, or displaying the computers by their assigned name or port number, see Chapter 3.

Switching Between Computers

Switching from one computer to another is a simple process with the Keyboard/Monitor/Mouse Switch Box. Switching disconnects the keyboard, mouse, and monitor from one computer and connects them to another. The steps are as follows:

1. Press **Print Scrn**.

2. Select the computer you want to switch to by using the Up and Down arrow keys, or by pressing the numeric key that corresponds to the computer's port number.

3. Press **Enter**.

Since the **Print Scrn** key is used to start the switching process, you cannot use it to print a screen in the normal way. To print the screen, simply press **Print Scrn** twice. For more information on switching, see Chapter 3.

Whenever you switch between two computers, the Keyboard/Monitor/Mouse Switch Box reconfigures the keyboard and mouse using the settings stored in its memory. For example, if the current computer selected has Caps Lock turned On, but the user is switching to a second computer that has Caps Lock turned Off, then the unit turns Caps Lock Off to match the setting for the second computer.

Unattended Reboot

After a power outage, each server connected to the Keyboard/Monitor/Mouse Switch Box reboots (if designed to do so), without operator intervention, when power returns. The switch generates responses to ensure that the reboot is successful and that the Keyboard/Monitor/Mouse Switch Box is ready to switch between computers.

Chapter 3
Basic Switch Functions

This chapter provides information on basic switch functions such as resetting the Keyboard/Monitor/Mouse Switch Box, connecting the keyboard and mouse while the system is powered up, and basic and advanced commands.

Unit Operation

Basic operation of the Keyboard/Monitor/Mouse Switch Box is achieved through the keyboard and a series of windows and menus that appear on the monitor. You can switch between computers and check port/computer status by using these menus.

Console Configuration Reporting (CCR) is the interface used to communicate with the Keyboard/Monitor/Mouse Switch Box. CCR is accessed by pressing the **Print Scrn** key. The user then communicates directly with the switch using the system keyboard and monitor. For more information on navigating the menus or lists, refer to "Appendix B, Command Summary."

Switching Computers

To switch the keyboard, monitor, and mouse from one computer in the system and connect it to another, proceed as follows:

1. Press **Print Scrn**. The CCR Selection window appears on the monitor. The computers are listed in order of port or computer name, as determined by the Menu Attribute choice.

2. Select the computer you want to switch to by using the Up and Down arrow keys, or by pressing the numeric key that corresponds to the computer's port number, and press **Enter**.

3. Press **Esc** to exit CCR and remove the CCR Selection window from the monitor. The status flag window returns (if enabled) to the display to indicate the currently connected computer.

Checking Port/Computer Status

You can confirm which ports are currently active and whether each port has a computer or a slave switch connected by the following:

1. Press **Print Scrn**. The CCR Selection window appears on the monitor. The symbols after the Port or Name columns show the status of the port as follows:

Table 3-1
Port/Computer Status

Type of Symbol	Symbol	Meaning
Plus	+	Computer connected and running
Asterisk	*	Slave connected and running

2. Press **Esc** to exit the CCR selection window.

Advanced Switch Operations

Many switch functions are available that allow you to tailor your system to meet your unique needs. Like the basic operation of the unit, system configuration is achieved through the keyboard and the Console Configuration Reporting. Some of the advanced operations include :

■ Scanning the computers connected to the switch

■ Displaying switch firmware version and settings

■ Saving switch settings

■ Resetting the mouse and keyboard

- ■ Setting up a special scan pattern

- ■ Assigning unique names to the computers connected to the switch

- ■ Displaying computers by name or port number in the windows

- ■ Changing the position and color of the operation menus/windows

- ■ Changing the attributes of the status flag

- ■ Assigning a specific monitor type to a certain port/computer

- ■ Assigning a password to protect against unauthorized users

For information on making specific entries and selections in the menus, refer to "Appendix B, Command Summary."

Scanning System Computers

When the unit is in scan mode, it automatically switches from port to port in a sequential manner. You can modify the scan order so that specific computers are included in a certain sequence and for a variable duration. For more information, see "Setting a Scanning Pattern."

To place the unit in scan mode, proceed as follows:

1. Press **Print Scrn**. The CCR Selection window appears.

2. Press **F2** and the Advanced Menu screen appears. The highlight is in the Commands menu.

3. Using the Up and Down arrow keys, move the highlight to **Scan** and press **Enter**. At this point, the switch enters the scan mode and the display returns to the status flag. You can press **Esc** at any time prior to pressing **Enter** to cancel the operation.

4. To cancel the scan mode, press any key or move the mouse. The scan stops at the currently connected computer.

Displaying Version Information and Device Settings

To help when troubleshooting or supporting this system, the switch firmware version number can be displayed along with specific keyboard and mouse information for the currently selected computer. To show this information, proceed as follows:

1. Press **Print Scrn**. The CCR Selection window appears.

2. Press **F2** and the Advanced Menu screen appears. The highlight is in the Commands menu.

3. Using the Up and Down arrow keys, move the highlight to **Version** and press **Enter**. This window appears:

Version	
Firmware	X.XX
Hardware	X X
Port 1	Computer Name
Keyboard	Mouse
ENABLED	ENABLED
Rate 2C	Rate 100
LEDs 2	Res 2
Mode 2	
Type 101	Type Gen

The window contains keyboard information including enabled/disabled, typematic rate, LED settings, port mode and keyboard type. The mouse information includes enabled/disabled, sample rate, resolution, and mouse type.

4.   Press **Esc** to remove the Version window.

Saving the Hardware Configuration

Whenever servers are added or removed from the system, or whenever there is a change in the mouse or monitor, the configuration settings should be saved to non-volatile memory (NVRAM) within the unit. If the settings are not saved, they will be lost whenever the switch loses power or is turned off. To save settings to memory, proceed as follows:

> △ **CAUTION:** If settings are not saved and switch power is lost, it may be necessary to reboot each computer in the system to reestablish keyboard and mouse communications.

1.   Press **Print Scrn**. The CCR Selection window appears on the monitor.

2.   Press **F2** and the Advanced Menu screen appears. The highlight is in the Commands menu.

3.   Using the Up and Down arrow keys, move the highlight to **Snapshot** and press **Enter**. The hardware settings for all connected ports are now saved to memory.

Resetting the Mouse and Keyboard

To reset the mouse and keyboard settings for the selected computer, perform the following:

1.   Press **Print Scrn**. The CCR Selection window appears on the monitor.

2. Press **F2** and the Advanced Menu screen appears. The highlight is in the Commands menu.

3. Using the Up and Down arrow keys, move the highlight to **Reset** and press **Enter**. The mouse and keyboard are now reset.

Setting a Scanning Pattern

The unit defaults to a standard scan routine that sequentially connects each computer to the monitor, keyboard and mouse. However, you can configure a scan of all or any of the servers in any particular scan pattern. To create a scan pattern, proceed as follows:

1. Press **Print Scrn**. The CCR Selection window appears on the monitor.

2. Press **F2** and the Advanced Menu screen appears. The highlight is in the Commands menu. Press the Right arrow key to move the highlight to the Setup menu.

3. Using the Up and Down arrow keys, move the highlight to **Scan** and press **Enter**. The Scan Pattern Setup window appears with the first port position (or computer name) highlighted.

4. Using the keyboard keys, select the port number of the first computer to be included in the scan.

5. Press the **Tab** or Right Arrow key to move the highlight to the **Sec** column and use the keyboard keys to enter a time value in seconds that you want this computer connected to the monitor/keyboard (before switching to the next computer in the scan).

6. Press the Down Arrow key to move the highlight to the next port in the Port column and repeat step 5. To delete unwanted ports from the bottom of the scan list in the Scan Pattern Setup window, place the highlight on the topmost port to be removed and press the **Delete** key (not DEL on the numeric keypad).

7. When you have finished setting the scan pattern, press **Enter**. You can press **Esc** at any time prior to pressing enter to retain the previous scan pattern. Pressing the **F2** key while in this screen, will return all Port and Sec values to factory defaults.

8. To exit CCR, press **Esc**.

Assigning Names to Switch Ports

In order to easily identify the computers connected to the switch, it is often helpful to assign unique names to each port. In a network environment, the names can be the same as those assigned in the network for each computer. Assign names as follows:

1. Press **Print Scrn**. The CCR Selection window appears on the monitor.

2. Press **F2** and the Advanced Menu screen appears. The highlight is in the Commands menu. Press the Right arrow key to move the highlight to the Setup menu.

3. Using the Up and Down arrow keys, move the highlight to **Names** and press **Enter**. The Port Naming window appears with the first port position (or computer name) highlighted.

4. Move the highlight to the Port entry for which the computer name is to be entered or changed. Type in the name of computer using up to 12 alphanumeric characters. Legal characters are A-Z, 0-9, and the dash character. Lowercase letters are converted to uppercase. Press **Back Space** to delete an incorrect entry.

5. If necessary, repeat step 4 for each of the computers in the system that are to be named. Press **Enter** to save the computer name(s) in NVRAM. You can press **Esc** at any time prior to pressing **Enter** to cancel the operation.

6. To exit CCR, press **Esc**.

Changing the Menu Attributes

You can change the "look" or visual appearance of the Console Configuration Reporting (CCR) system menus to suit your own preferences. Adjustments can be made to the menus so that:

■ The menu is positioned in a convenient location on the display

■ The computers are listed by port or by name, whichever is desired in the appropriate menus

■ The character height is suitable for display

■ The colors are suitable

■ The CCR Selection window appears on the display for a certain period of time

To change menu attributes, proceed as follows:

1. Press **Print Scrn**. The CCR Selection window appears on the monitor.

2. Press **F2** and the Advanced Menu screen appears. The highlight is in the Commands menu. Press the Right arrow key to move the highlight to the Setup menu.

3. Using the Up and Down arrow keys, move the highlight to **CCR** and press **Enter**. The CCR Attributes window appears.

4. Highlight the setting(s) you want to change and use the + and - keys on the numeric keypad to obtain the desired value. As you select different values, the effect of the changes is reflected immediately on the display.

NOTE: Certain changes that you make to CCR menu attributes may distort the menu and windows on the display. The distortion can make the display difficult to read. If this occurs, you can reset the Keyboard/Monitor/Mouse Switch Box to its default CCR settings by pressing **Esc**, **Esc**, **Print Scrn**, **F10**, **Y**, **Enter**.

5. When you've completed all the desired changes, press **Enter** to save the changes to NVRAM. You can press **Esc** at any time prior to pressing **Enter** to cancel the operation and retain the previous settings. The following table describes each of the available menu attributes.

Table 3-2
Menu Attributes

Setting	Effect on Menu/Window Appearance
Resolution	Affects the size of the menu and windows as they appear on the display. Choose from values of 320, 480, and 640. The lower the value, the larger the size.
Height	Affects the size of the text in the menu and windows. The larger the value, the larger the text.
Horizontal/Vertical	Determines the position of the menu or window on the display.
Background	Determines the menu or window background color.
Highlight	Determines the menu or window highlight color.
Text	Determines the menu or window text color.
Delay Time	This is the time in seconds that the CCR Selection window is delayed before appearing on the display after Print Screen is pressed. This delay may be increased so that the window is not a distraction when performing simple port switching operations at the keyboard.
Order	Determines the way the computers are listed; numerically by port number, or alphabetically by assigned name.

Changing the Status Flag Attributes

The status flag indicates the currently connected computer and can be set to appear on the screen whenever the system is operating. You can change how and where the flag appears on the screen by changing one or more of the following attributes:

■ Appearance on the screen: none, timed or constant

■ Position on the screen

■ Color and opaqueness

To change the status flag attributes, proceed as follows:

1. Press **Print Scrn**. The CCR Selection window appears on the monitor.

2. Press **F2** and the Advanced Menu screen appears. The highlight is in the Commands menu. Press the Right arrow key to move the highlight to the Setup menu.

3. Using the Up and Down arrow keys, move the highlight to **Flag** and press **Enter**. The Flag Attributes window appears.

4. Highlight the setting(s) you want to change and use the + and - keys to adjust the values. The following table describes each of the available menu attributes.

**Table 3-3
Flag Attributes**

Setting	Values and Effect on Flag Appearance

Enabled	FLAG OFF = Flag does not appear
	PORTS ON = Flag indicates the connected port number
	NAMES ON = Flag indicates the connected computer by name
	PORTS TIMED = Port number displays for 5 seconds after connection
	NAMES TIMED = Name displays for 5 seconds after connection
Row	Select values in the range of 0 to 14 to position the flag vertically on the screen
Column	Select values in the range of 0 to 25 to position the flag horizontally on the screen
Color	Select values in the range of 0 to 7 for the flag color
Text	Select values in the range of 0 to 7 for the flag text color
Mode	Choose between Opaque and Transparent

5. Press **Enter** to retain the settings. You can press **Esc** at any time prior to pressing **Enter** to cancel the operation and retain the previous settings.

6. Press **Esc** to exit CCR.

Assigning Specific Device Types

In situations where one or more of the computers need a special type of monitor or device, it may be necessary to assign that device type to the port number associated with that computer. When tiering you must make the master switch aware of the slaves through this assignment. Assign a device type as follows:

1. Press **Print Scrn**. The CCR Selection window appears on the display.

2. Press **F2** and the Advanced Menu screen appears. The highlight is in the Commands menu. Press the Right Arrow key to move the highlight to the Setup menu.

3. Using the Up and Down arrow keys, move the highlight to **Devices** and press **Enter**. The Device Setting window appears.

4. To assign a monitor type, highlight the port you want and use the + and **-** keys to obtain the value that corresponds to the particular monitor. To assign a slave switch to a port, highlight the port and use the + and **-** keys to obtain the appropriate 4-port or 8-port values.

5. Press **Enter** to retain the settings. You can press **Esc** at any time prior to pressing **Enter** to cancel the operation.

6. Press **Esc** to remove the Advanced Menu screen from the display.

Changing the Security Password

Advanced server applications should usually be protected against unauthorized users. CCR provides a simple screen and keyboard lock for the unit. The factory default password is "password." To change the password, proceed as follows:

1. Press **Print Scrn**. The CCR Selection window appears on the display.

2. Press **F2** and the Advanced Menu screen appears. The highlight is in the Commands menu. Press the Right Arrow key to move the highlight to the Setup menu.

3. Using the Up and Down arrow keys, move the highlight to **Security** and press **Enter**. The Security Configuration window appears. You must always provide a password to access the fields on this screen. Once the current password is entered, the other fields on the screen are activated.

4. Enter the new password, and then press **Enter**. Passwords can be up to eight characters. This field is case sensitive. Then enter the new password again for confirmation, and press **Enter**. When entered correctly, the password field shows "CHANGED" to indicate that your new password has been accepted.

5. Wait time is the amount of time the system must be idle before the screen and keyboard lock is initiated. To change this setting, highlight the value and use the + and - keys to obtain the desired setting.

6. The **Mode** field should be set to **energy** only when EnergyStar ™ compliant monitors are being used. This allows the monitors to go into low power mode when the wait time has elapsed. Do not use **energy** mode with non-compliant monitors.

7. To test your password settings, highlight **Test** and press **Enter**. The display shows the security screen. Pressing a key or moving the mouse will cause the system to prompt you for your password.

8. Press **Enter** to retain the settings. You can press **Esc** at any time prior to pressing **Enter** to cancel the operation.

9. Press **Esc** to remove the Advanced Menu screen from the display.

Resetting the Unit

If the keyboard or mouse locks up, you can push the **Reset** button on the back panel to reset the switch. Pressing the **Reset** button may allow you to recover the device settings without power cycling the computers.

Making Connections Under Power

You can connect additional computers to the switch while it is running. When you power up the newly connected computers, the switch recognizes them, and you can switch to the new computers without taking any additional steps.

You can also connect the mouse and/or keyboard to the switch while the system is powered up. When you connect a new device, the switch recognizes it, and configures it to the settings of the currently selected computer. This technique allows replacement of failed devices without having to restart the system.

NOTE: When new computers are added to the switch, or when existing connections are changed, the new configurations should be saved in NVRAM. See "Saving the Hardware Configuration."

Chapter 4
Alternate Configurations

There are other ways to configure your system, including paired switch configurations and tiered switch configurations. This chapter provides brief descriptions, installation instructions, and hardware requirements for these alternate configurations.

Paired Switch Configurations

Two eight-port Keyboard/Monitor/Mouse Switch Box units can be connected or paired together to effectively double the capacity of the system. To operate two switch box units in a paired configuration, mount one on top of the other and interconnect them by means of the pairing kit cables. The Interconnect Cable Kit (pairing kit) consists of one RJ45 interconnecting cable and three 'Y' cables as shown below. The pairing kit is required for a paired configuration and is available through your Compaq Authorized Reseller.
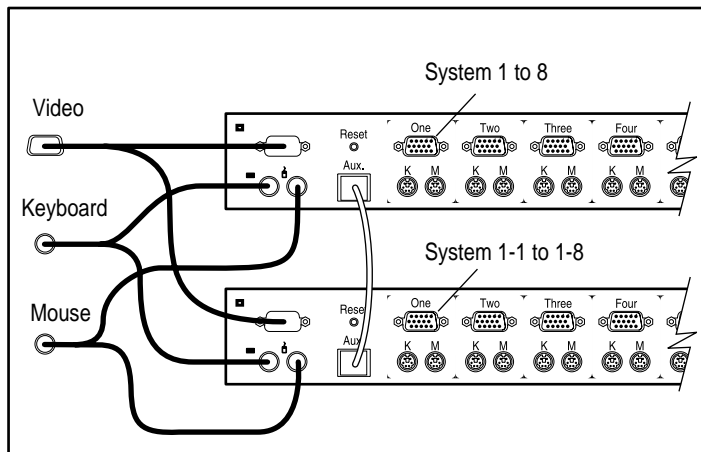
Figure 4-1. Paired switch configuration

Tiered Switch Configurations

In tiered systems, you can connect additional switches to ports on a master unit. That is, switches can be tiered in master/slave configurations to allow one master switch to switch between computers or other switch units. Tiering simply involves linking the slave units' physical keyboard, mouse, and monitor connections to one of the computer ports on the master unit. For example, one eight-port master unit can accommodate eight slave switch units. This system with eight servers connected to each of the eight slave switches would provide a 1x64 concentration. An example of a tiered switch configuration is shown below.
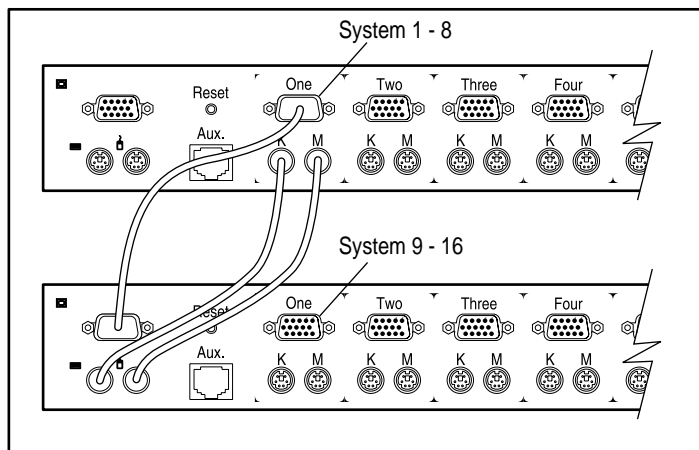
Figure 4-2. Tiered configuration

When connecting a slave unit to one of the ports of the master unit, you need to indicate this connection to the master unit by performing the previously described "Assigning Specific Device Types" procedure, but entering slave unit designation for the associated port number instead of a monitor type. Use the designation **4port** for a four-port slave and **8port** for an eight-port slave.

CCR allows slave ports to be treated much like ports on the master switch. It may be helpful to name each slave unit as previously described under "Assigning Names to Switch Ports."

Connecting Tiers while the System is Powered Up

If necessary, you can connect a master unit to a slave unit while the system is powered on. This technique can be used to isolate any problems with a minimum disruption to the system. When plugging a master Keyboard/Monitor/Mouse Switch Box into a slave unit, you must first connect the mouse and video cables, then connect the keyboard cable. This is because the master unit interprets the keyboard connection as the slave unit's power up. At this point the master unit sends initialization codes to the slave unit, triggering device configuration.

Switching Tiered Systems

To switch the Keyboard/Monitor/Mouse Switch Box to a computer that is connected to the master through a slave unit, proceed as follows:

1. Press **Print Scrn**. The CCR Selection window appears on the monitor.

2. Type the number of the port to which the slave unit is connected followed by a dash and the number of the port (on the slave unit) to which the computer is connected. For example, to switch to the computer connected to port 3 of a slave unit connected to port 1 of the master, press **Print Scrn**, **1**, **-**, **3**.

    If the computer/slaves are listed in the window by name (as described in "Assigning Names to Switch Ports"), then type the assigned name of the computer. If no slave unit is connected to the selected master port, the command is canceled when you enter the slave number.

3. Press **Enter**.

Appendix A
# Compaq Keyboard/Monitor/Mouse Switch Box Specifications

Table A-1
Compaq Keyboard/Monitor/Mouse Switch Box Specifications

Dimensions	
Height (1U = 1.75 inches)	1.75 in (4.5 cm)
Depth	10.80 in (27.7 cm)
Width	17.00 in (68.6 cm)
Weight	9.1 lb (4.1 kg)
Input Power Requirements	
Rated Voltage	100 -240 VAC
Rated Frequency	50 - 60 Hz
Rated Input Current	1.4 - 0.7 A
Temperature Range	
Maximum Ambient Operating Temperature	50° - 122° F (10° - 50° C)
Ambient Storage and Shipping Temperature	-40° - 185° F (-40° - 85° C)
Maximum Internal Rack Temperature for the Switch Box	122° F (50° C)
Relative Humidity (non-condensing)	
Operating	20% - 80%
Nonoperating	5% - 90%

Video Modes Supported	VGA, SVGA, XGA
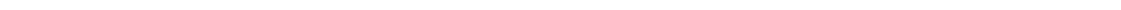
Appendix B
Command Summary

Table B-1
Keyboard Sequences for CCR (Console Configuration Reporting)

Keyboard Entry	Results
PRINT SCRN	Pressing once activates CCR.
	Pressing twice sends the print screen command to the selected computer.
ESCAPE (Esc)	Terminates the command or selection without executing
ENTER	Executes the current selection, command, or submenu
Up Arrow	Moves up one field or up one item in the menu
Down Arrow	Moves down one field or down one item in the menu
Right Arrow TAB	Moves one field to the right, wraps downward or highlights adjacent menu
Left Arrow SHIFT + TAB	Moves one field to the left, wraps downward or highlights adjacent menu
+	Increases the current field value
-	Decreases the current field value
Page Up	Displays the previous screenful of a list
Page Down	Displays the next screenful of a list
Home	Displays the top screenful of a list
End	Displays the bottom screenful of a list

Appendix C
Troubleshooting Tips

Table C-1
System Troubleshooting

Symptom	Probable Cause	Recommended Solution
No video on one computer	Loose video connection	Reconnect video cable.
	Defective video cable	Replace video cable.
	Computer powered down	Power up the computer connected to that port.
No video or CCR on any computer	No power to unit	Establish power connection.
	Loose monitor connection	Reconnect monitor.
	No power to unit	Check power switch. Reconnect power cable. Check ac outlet for power.
	CCR colors or setup incompatible	Reset CCR colors to defaults. Press reset button.
No video on switching	Keyboard did not initialize	Reset keyboard (and mouse) with rear panel reset switch.
	Keyboard incompatible	Replace keyboard.
	Computer powered down	Power up the computer connected to that port.

|		
Keyboard error on boot, one computer	Loose keyboard connection	Check that all cables are well seated. Ensure that mouse and keyboard cables are not swapped.
		Replace keyboard cable.
	Defective cable	

Table C-1 *continued*

Symptom	Probable Cause	Recommended Solution
Keyboard error on boot, all computers	Loose keyboard connection	Check that all cables are well seated.
		Replace keyboard.
	Incompatible or defective keyboard	
Keyboard strokes shifted (swaps upper case for lower case)	Computer left keyboard shifter state when last connected	Press both SHIFT keys
Mouse error on boot, one computer	Loose mouse connection	Check that all cables are well seated. Ensure that mouse/keyboard cables are not swapped.
	Defective mouse cable	Replace mouse cable.
	Using serial port on computer	Install PS/2-to-serial protocol converter.
Mouse error on boot, all computers	Loose mouse connection	Check that all cables are well seated. Ensure that mouse/keyboard cables are not swapped.
	Using serial port on computer	Install PS/2-to-serial protocol converter.
	Incompatible or defective mouse	Replace mouse with PS/2 or mouse-port compatible mouse.
Mouse displays ballistic behavior	Computer left mouse in indeterminate state	Reset mouse through CCR or reset switch.
Mouse pointer frozen on display	Mouse not initialized	Reset mouse through CCR or reset switch.
Unit switches from one system to the next at will	Scan mode initiated	Halt scanning by pressing any key or moving mouse.
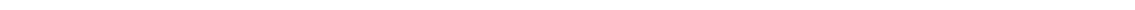
Appendix D
Regulatory Notices

Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (i.e., personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC ID on the label. Class A devices do not have an FCC ID on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class A Equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Canadian Notice

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Avis Canadien

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

■ Reorient or relocate the receiving antenna.

■ Increase the separation between the equipment and receiver.

■ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

■ Consult the dealer or an experienced radio or television technician for help.

Canadian Notice

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Avis Canadien

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Compaq Computer Corporation may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

European Union (EU) Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms:

- EN55022 (CISPR 22) - Electromagnetic Interference

- EN50082-1 (IEC801-2, IEC801-3, IEC801-4) - Electromagnetic Immunity

- EN60950 (IEC950) - Product Safety

Japanese Notice

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Appendix E
Power Cord Set Requirements

The voltage select switch feature of your switch box permits it to operate from any line voltage between 100-120 or 200-240 volts AC.

The power cord set (appliance coupler, flexible cord, and wall plug) you received with your switch box meets the requirements for use in the country where you purchased your equipment.

Power cord sets for use in other countries must meet the requirements of the country where you use the switch box. For more information on power cord set requirements, contact your Authorized Compaq Dealer.

General Requirements

The requirements listed below are applicable to all countries:

■   The length of the power cord must be at least 6.00 feet (1.8 m) and a maximum of 9.75 feet (3.0 m).

■   All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord will be used.

■   The power cord set must have a minimum current capacity of 10A and a nominal voltage rating of 125 or 250 volts AC, as required by each country's power system.

■   The appliance coupler must meet the mechanical configuration of an EN 60320/IEC 329 Standard Sheet C7 connector for mating with the appliance inlet on the switch box.

Country-Specific Requirements

Use the following table to identify the appropriate accredited agency in your country.

Table E-1
Power Cord Set Requirements - By Country

Country	Accredited Agency	Applicable Note Numbers
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	JIS	3
Netherlands	KEMA	1
Norway	NEMKO	1
Sweden	SEMKO	1
Switzerland	SEV	1
United Kingdom	BSI	1
United States	UL	2

Notes:

1. Flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm^2 conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.

2. Flexible cord must be Type SV or equivalent, No. 18 AWG, 3-conductor. Wall plug must be a two-pole grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15) (15A 250V) configuration.

3. Appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. Flexible cord must be Type VCT or VCTF, 3-conductor, o.75 mm^2 conductor size. Wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (15A, 250V) configuration.

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