IRISconsole™ Multiplexer Installation Guide

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About This Guide

This guide is designed to help users set up, connect, and properly configure the Silicon Graphics® ST-1600 or ST-1616 serial port multiplexer that acts as a key interface for the IRISconsole™ administration station. This document provides information about connecting the multiplexer between CHALLENGE®, Onyx®, POWER CHALLENGE™, POWER Onyx™, Origin200™, Origin2000™, and Onyx2™ systems and these Silicon Graphics workstations:

- Indy®
- O2™

The Indigo® and Indigo2™ workstations do not support the serial port multiplexer.

Note: For ease in reading, CHALLENGE is written as Challenge in the balance of this guide. For purposes of brevity, the term IRISconsole is used regardless of how many multiplexers are used to connect to systems at a site.

This document is organized as follows:

- Chapter 1, “Multiplexer Features and Capabilities,” describes the IRISconsole system administration station in general and the multiplexer and its capabilities in detail.
- Chapter 2, “Multiplexer to Challenge, Onyx, and Origin Installation and Cabling,”describes software options, all of the system hardware components, and the proper process for connecting and starting them.
- Chapter 3, “Technical Specifications,” reviews hardware-specific operating parameters, cable and connector pinouts, and environmental limits.

Start at Chapter 1 to familiarize yourself with the features of the multiplexer and the IRISconsole setup. You can also proceed directly to the information you need using the table of contents as your guide.

Additional Reading

Read the *IRISconsole Administrator's Guide* (P/N 007-2872-*nnn*) for information on using the graphical user interface with the multiplexer and Silicon Graphics workstation to monitor the attached systems.

For information on properly setting up and using your workstation, read the manual for your model:

- *Indy Workstation Owner's Guide* (P/N 007-9804-*nnn*)
- *O2 Workstation Hardware Reference Guide* (P/N 007-3275-*nnn*)

Additional software-specific information is found in the following software guides:

- *Personal System Administration Guide*
- *Desktop User's Guide*

Conventions

The *IRISconsole Multiplexer Installation Guide* uses these conventions:

- Commands that you type at the shell prompt and IRIX filenames are in *italics*. References to other documents are also in *italics*.
- References to other chapters and sections within this guide are in quotation marks.
- Steps to perform tasks are in numbered sentences. When a numbered step needs more explanation, the explanation follows the step.

Chapter 1

Multiplexer Features and Capabilities

This chapter introduces and explains the operational features, functions, and capabilities of the multiplexer system. Topics covered include

- "Site Administration"
- "Functional Checklist"
- "IRISconsole System Administration Components"

Site Administration

The ST-1600 or ST-1616 multiplexer (see Figure 1-1) is a high-performance serial port multiplexer that acts as an integral part of the IRISconsole station (see Figure 1-2). The IRISconsole allows the system administrator or other responsible individual to monitor onsite systems.

Note: Both multiplexers operate similarly. The ST-1616 is required for Europe.

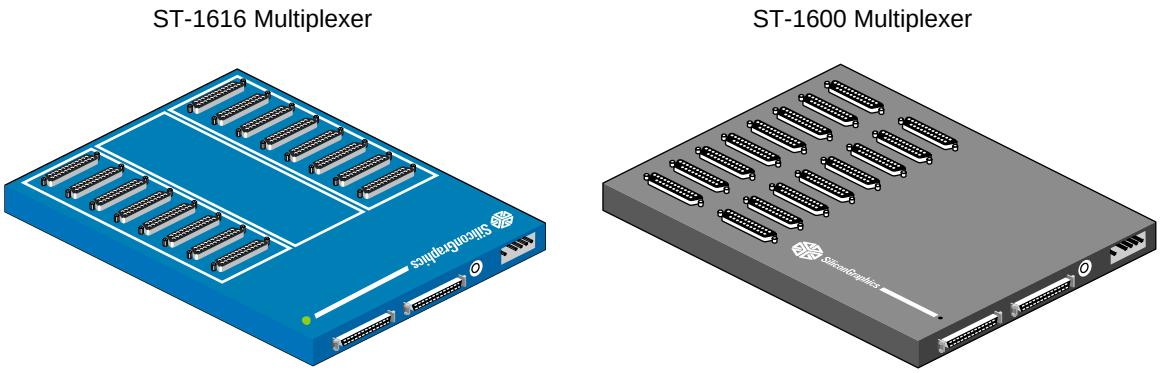

Figure 1-1 ST-1616 and ST-1600 Multiplexers

Note: Although the figures in this guide show a specific model of multiplexer and a specific workstation (Indy), they and the references and descriptions in this guide also apply to the ST-1600 multiplexer and the other workstations supported for IRISconsole.

Using the multiplexer and the IRISconsole graphical user interface (GUI), you can set up and administer Challenge, Onyx, and Origin "sites." A site is a group of Onyx, Onyx2, or POWER Onyx workstations and Challenge, POWER Challenge, Origin200, or Origin2000 servers that you physically connect to and administer through the multiplexer and the workstation.

Once the Challenge, Onyx, and Origin systems are connected to the multiplexer and the workstation, you can use the IRISconsole GUI to do some or all of the following:

- set up a site or add or delete the systems in a site
- display, view, or take control of the console of a system
- generate a nonmaskable interrupt (NMI) or hardware reset, or power cycle a system
- view real-time graphs of hardware operating statistics of a system in a site, such as voltage, operating temperature, and blower speeds; save the graphs as files and display them
- set a threshold for operating statistics so that an alarm is activated and various activities are triggered when the threshold is exceeded
- view activity logs and other system reports

Note: In order to perform all of the functions listed, the IRISconsole must be connected to the Challenge, Onyx, and Origin systems by network interface as well as RS-232 cables.

Chapters in the *IRISconsole Administrator's Guide* (P/N 007-2872-*nnn*) explain how to set up sites and administer sites.

Figure 1-3 shows an example of a IRISconsole site installation.

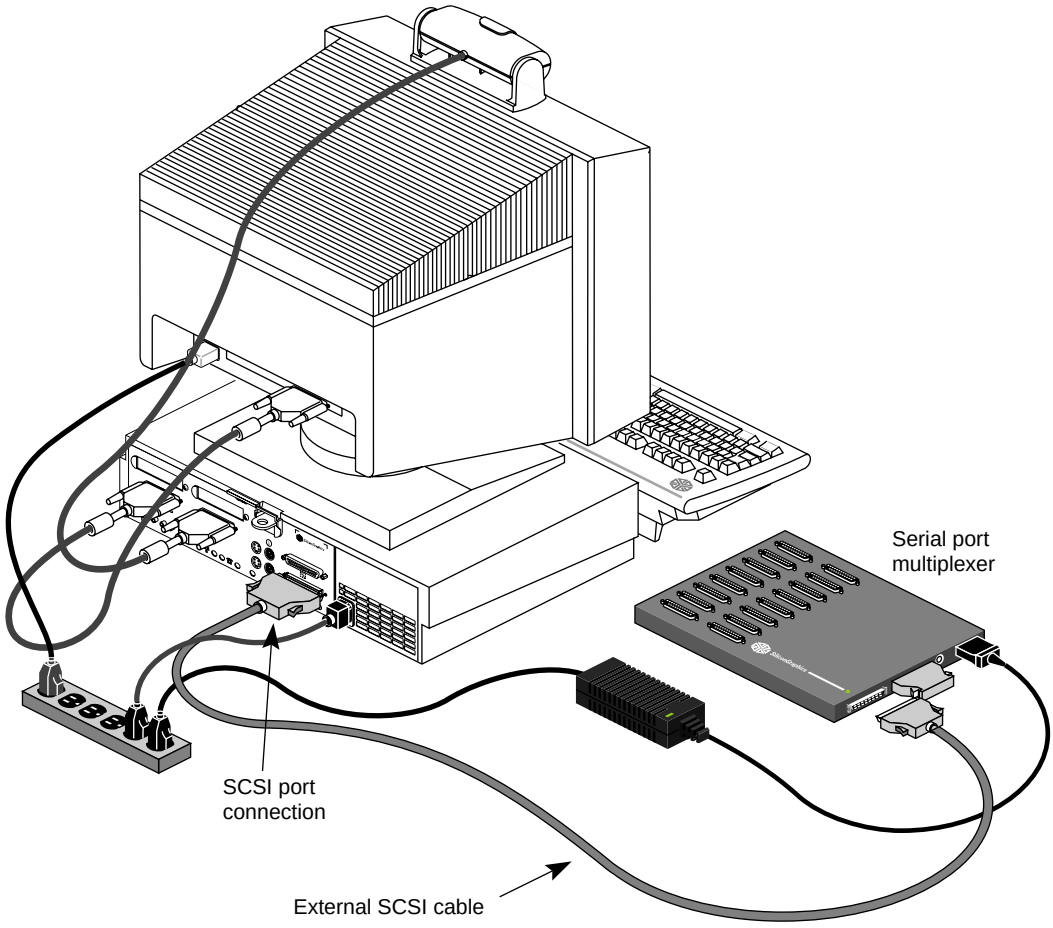

Figure 1-2 Example of an IRISconsole Station

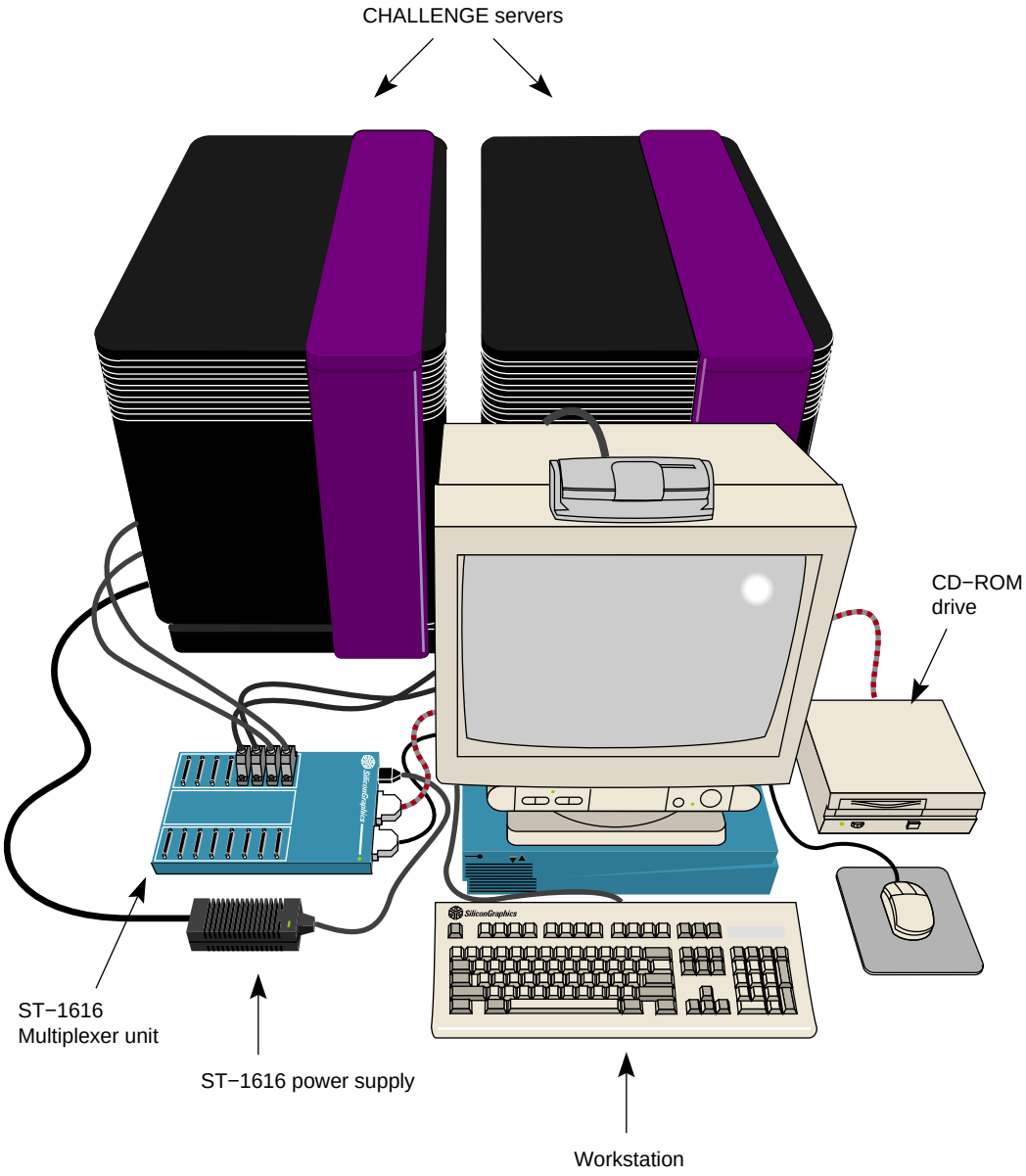

Figure 1-3 IRISconsole Site Example

Functional Checklist

In order for the multiplexer to function properly as a part of a site administration console, you must have the following three main subsystems:

- Silicon Graphics workstation
- IRISconsole serial port multiplexer kit and optional serial cables
- IRISconsole software

IRISconsole System Administration Components

This section provides information on the three main hardware subsystems that compose a working IRISconsole system.

To have a fully functional IRISconsole site, you must have all the hardware components connected in the proper manner. See Chapter 2 for complete details on connecting the multiplexer to both the Indy or O2 workstation and the Challenge, Onyx, or Origin systems.

Workstation Components

If you purchased an Indy or O2 workstation as part of the IRISconsole package, you should familiarize yourself with the unit. Read at least the first two chapters of the owner's guide before connecting the multiplexer system.

This guide provides information only on how to properly connect the workstation to the multiplexer. It does not describe how to install or configure the workstation.

Required Hardware and Software

If you already have a system designated to work as part of your multiplexer station, then be sure that it meets or exceeds the following functional criteria. Your workstation must have

- a system disk with at least 20 MB of available space
- at least 32 MB of RAM
- proper operating system and IRISconsole software drivers (see Table 1-1)

Table 1-1 Required Software to Support the IRISconsole

IRISconsole software version	Indy IRIX version	O2 IRIX version
1.2	6.2	6.3

Recommended Options

The following workstation options are recommended but not required:

- 24-bit graphics capability (for 1024 x 1280 presentation)
- a 20-inch monitor

Note: The managed Challenge, Onyx, or Origin systems at the site are not required to run IRIX® 6.2 or 6.3.

If you are using an existing workstation with your multiplexer system, you must upgrade it if it does not meet the specifications described in the "must have" list. Contact your sales or service representative to arrange for the appropriate upgrades.

Chapter 2 provides detailed examples of how to connect all the hardware components to make the multiplexer work.

The Serial Port Multiplexer

The Indy or O2 workstation interfaces to the various systems at the site by way of the high-performance serial multiplexer (see Figure 1-3 and Figure 1-4). The multiplexer has two microprocessors; one is dedicated to all the character processing for the 16 serial ports and the other handles the SCSI traffic.

The multiplexer connects to the Indy or O2 workstation's external SCSI connector. Serial cables connect from the multiplexer to each system at the site.

See the documentation included with the multiplexer for technical information pertaining to that model.

Multiplexer Kit Components

Your multiplexer kit should contain the serial port multiplexer, which includes

- the multiplexer's auto-ranging power supply
- a power cord for 110V applications
- a 0.5-meter SCSI cable with 50-pin high-density connectors on each end
- an external SCSI terminator

Note: Each connection between the multiplexer and a Challenge, Onyx, or Origin system requires two serial cables. Optional 25-foot (7.62 m) serial cables (marketing code XVIC25, part number 018-0527-001) are available specifically for this application.

Figure 1-4 shows the parts in the serial port multiplexer kit.

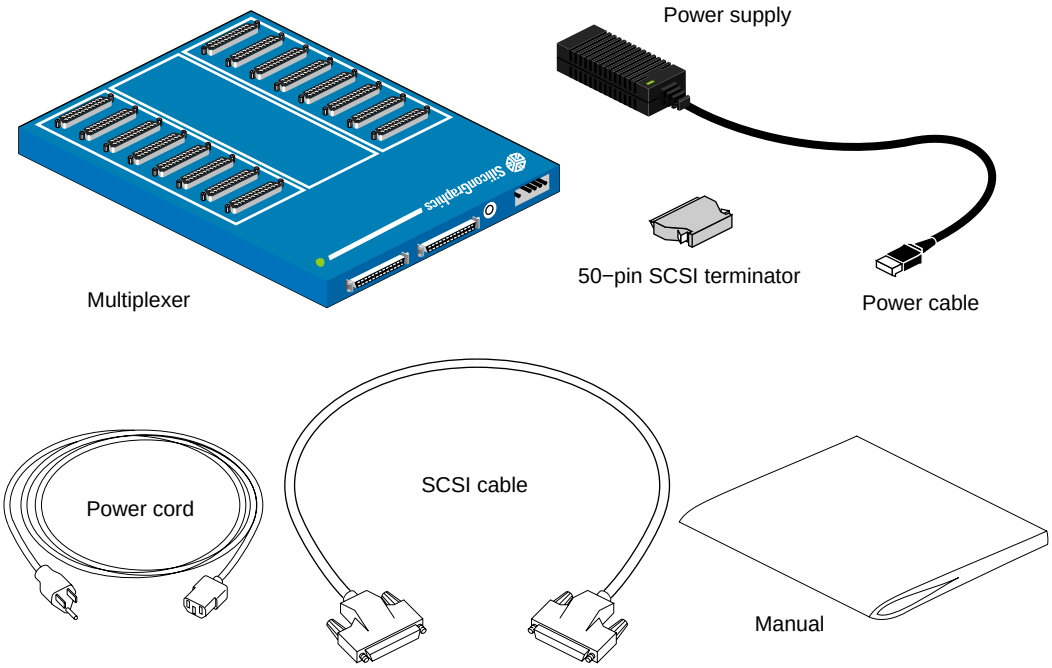

Figure 1-4 Multiplexer Kit Components

The multiplexer has two SCSI-2 connector receptacles, a SCSI ID switch, and a power supply receptacle on the back. The multiplexer has two SCSI connectors and can be "daisy-chained" with additional units or connected to other types of SCSI devices. Be sure to review the cabling and configuration information in Chapter 2 carefully before making additional SCSI connections to the multiplexer.

Challenge, Onyx, and Origin Systems

When you have the Indy or O2 host system, multiplexer, serial cables, and IRISconsole software, you are ready to monitor a Challenge, Onyx, or Origin site.

The Challenge, Onyx, or Origin onsite systems that are monitored and administered from the IRISconsole should be as centrally located as possible. Silicon Graphics sells serial cables (see Chapter 2) for use with the multiplexer that measures 25 feet (7.62 meters). Use of serial cables that exceed 50 feet (15.2 meters) is not recommended, unless an electrical serial signal-extending device is used as well.

If you are monitoring a large group of systems from the console, connecting serial cables to them all may not be possible without electrical serial signal extenders.

Be sure that each Challenge or Onyx system you wish to monitor and control has a 9-pin connector labeled **Remote Sys Control SSE Use Only** located just to the right of the main I/O panel assembly. See Figure 1-5 for an example connector.

Note: You cannot reset a system or access the hardware status monitor on a Challenge or Onyx system if it does not have the Remote System Control connector. Other monitoring functions are available if you have network and tty_1 connections to the system. If you need to monitor a Challenge or Onyx system that does not have the remote system control connector, contact your service provider to order an upgrade (P/N 013-0624-003).

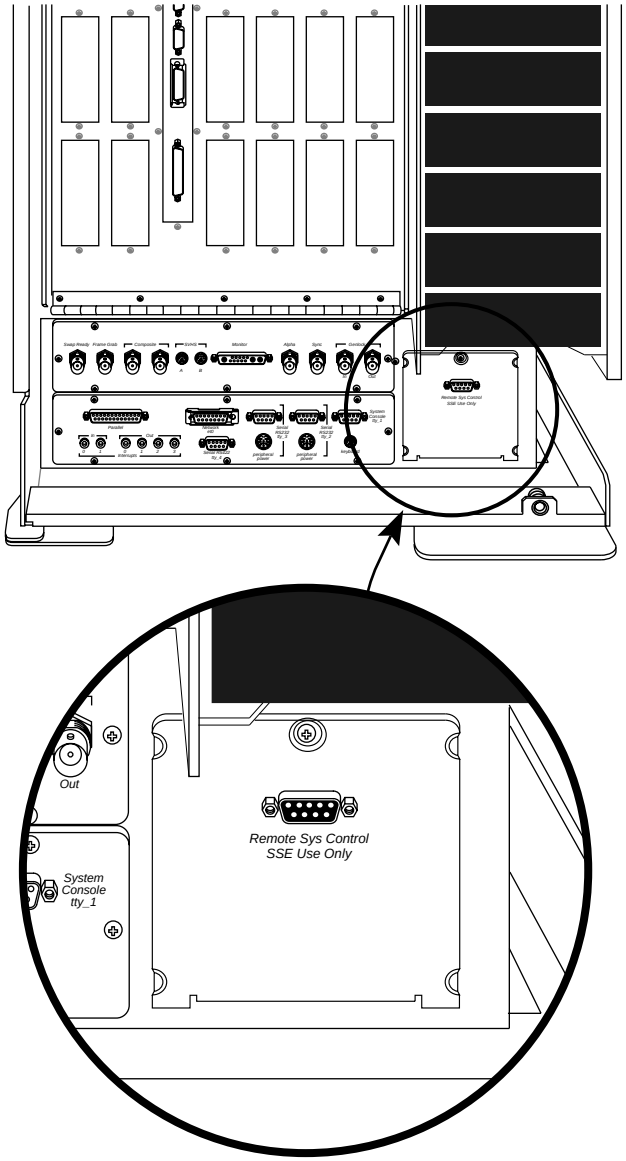

Figure 1-5 Remote System Control 9-Pin Connector Example

Figure 1-6 shows a site with a combination of different systems being monitored.

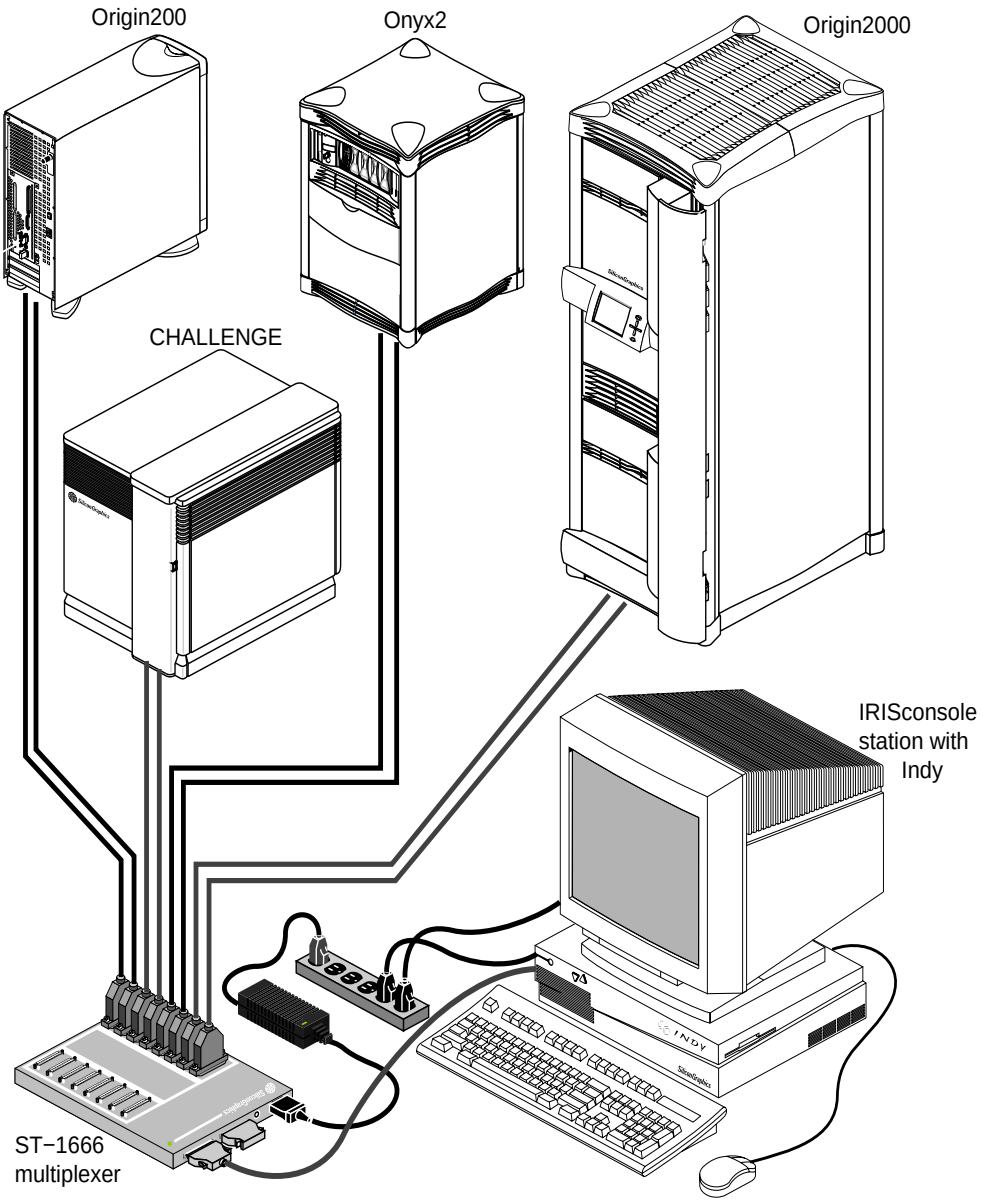

Figure 1-6 Four Different Systems and IRISconsole

Figure 1-7 shows a site with a Challenge and Origin2000 system being monitored.

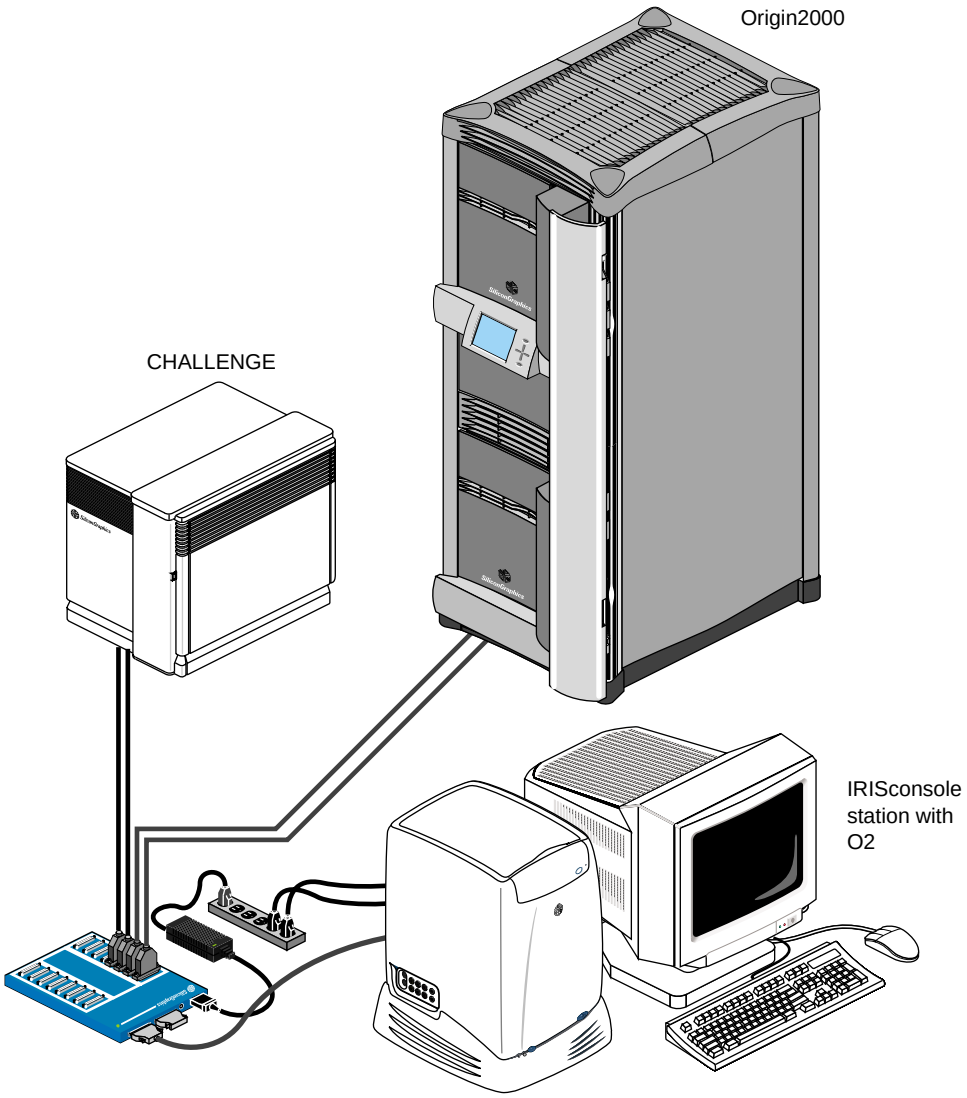

Figure 1-7 Challenge, Origin2000, and IRISconsole

Chapter 2

Multiplexer to Challenge, Onyx, and Origin Installation and Cabling

This chapter covers the physical placement and cabling of the multiplexer and other hardware components necessary to administer a Challenge, Onyx, or Origin site. Some basic troubleshooting information is provided.

The following topics are covered:

- "Installation and Cabling Summary"
- "Loading Software on the Workstation"
- "Cable Connections"
- "Cabling and SCSI Guidelines"
- "Cabling the Workstation to the Multiplexer"
- "Connecting the Multiplexer to Challenge, Onyx, and Origin Systems"
- "Troubleshooting"

Installation and Cabling Summary

It is important that all installation and cabling steps be followed in order, or the IRISconsole system administration procedures may not work properly. The procedures are as follows:

1. Load all applicable multiplexer and IRISconsole software and operating system upgrades onto the workstation using the CD(s) provided with the IRISconsole option.
2. Shut down and power off the workstation.
3. Select the SCSI device ID for the multiplexer and install all cables.
4. Power on the multiplexer and then the workstation.
5. As superuser (root), enter **`/sbin/cdmknods`** to create tty devices corresponding to the SCSI device ID used by the multiplexer.
6. Start the IRISconsole window system and begin adding sites.

Loading Software on the Workstation

To make the IRISconsole system work, you must load the required IRISconsole applications onto the workstation. Note that the IRISconsole software and drivers can be ordered separately.

Follow these steps:

1. Load the IRISconsole CD into a drive.
2. As superuser, bring up the software manager by entering **`swmgr`** at the prompt.
3. After the interface comes up, load the appropriate applications (for example, IRISconsole for 6.2 if your workstation is running IRIX 6.2) from the disc into your IRISconsole workstation. Note that if you have reference (man) pages or online help remotely mounted, the *swmgr* interface returns an error message. Select and load only the core applications to prevent this error.
4. Reboot the workstation after loading all the applications.
5. If you are bringing up the workstation for the first time after multiplexer installation, or have changed the multiplexer SCSI device ID, then you must enter **`/sbin/cdmknods`** as the superuser. This creates tty devices corresponding to the SCSI device ID used by the multiplexer.

6. Bring up the IRISconsole interface by entering **`/usr/sbin/ic`** at the shell prompt.
7. Select the appropriate interface(s). See the *IRISconsole Administrator's Guide* (P/N 007-2872-*nnn*) for information on the IRISconsole GUI.

Cable Connections

As mentioned in Chapter 1, the multiplexer site administration station should be physically connected (cabled) to each system you want to monitor. Silicon Graphics sells 25-foot (7.62 meter) serial cables (see Table 2-1) with 25-pin serial connectors at one end and 9-pin connectors at the other end.

Note: These cables are designed for connecting the multiplexer specifically to deskside and rackmount Challenge and Onyx systems.

Cables for connecting the multiplexer to desktop Challenge S systems (P/N 018-0526-001, marketing code XDIC25) can also be ordered separately.

See your sales or service representative to find out about additional cables available for your multiplexer. Chapter 3 has information on pin and signal specifications for customers who wish to assemble their own cables.

Caution: To remain in compliance with all regulatory emission limits, use properly shielded and grounded cables and connectors.

Cabling and SCSI Guidelines

Each multiplexer is capable of connecting to a maximum of eight systems at a site. To cable the maximum number of systems, follow these guidelines:

- Daisy-chain multiple multiplexers together using short SCSI cables that do not exceed a total of two meters (6.6 feet). Note that you should count an additional 6 inches (2.4 cm) of length for each device on the SCSI bus.
- Select a different SCSI ID number for each multiplexer. Never select SCSI ID 1 or 0 for any of the multiplexers.
- Use Silicon Graphics serial cables that match the pinout listings shown in Chapter 3.
- Always properly terminate the last SCSI device on a chain.

Note: When a serial cable is connected from the multiplexer to port tty_1 on Challenge or Onyx systems, do not use the 8-pin powered serial connector below it.

- Silicon Graphics recommends the use of RS-232 serial cables no longer than 50 feet (15.2 meters). Longer runs introduce a greater possibility of line noise occurring. This can affect data transmission and cause errors. For cable runs longer than 50 feet (15.2 meters), use an appropriate extender device.
- To make the cable connections consistent and easier to organize, you should connect port 1 on the multiplexer to serial port tty_1 on all systems, with the exception of the Origin2000 and Onyx2 rack configurations (see "Connecting the Multiplexer to Challenge, Onyx, and Origin Systems" on page 22). Port 2 on the multiplexer is then connected to a specified port on the system. Repeat the process for all the multiplexer connections. Follow the same guidelines if you add a second multiplexer to the workstation.
- Place a label on each end of the serial cable with the system name or ID for better tracking of cable and port connections on each system at the site.

Cabling the Workstation to the Multiplexer

To cable the multiplexer to an Indy or O2 system, follow these steps:

1. Obtain the correct SCSI cable for your workstation. The Indy uses a 50-pin-to-50-pin cable (P/N 018-0689-001). The O2 uses a 50-pin-to-68-pin cable (P/N 018-8123-001).
2. Connect the multiplexer to the workstation's SCSI port, as shown in Figure 2-2 or Figure 2-3.

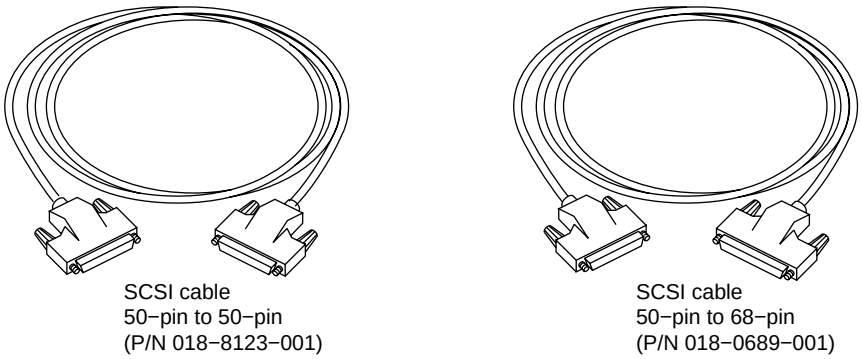

Figure 2-1 Multiplexer SCSI Cables

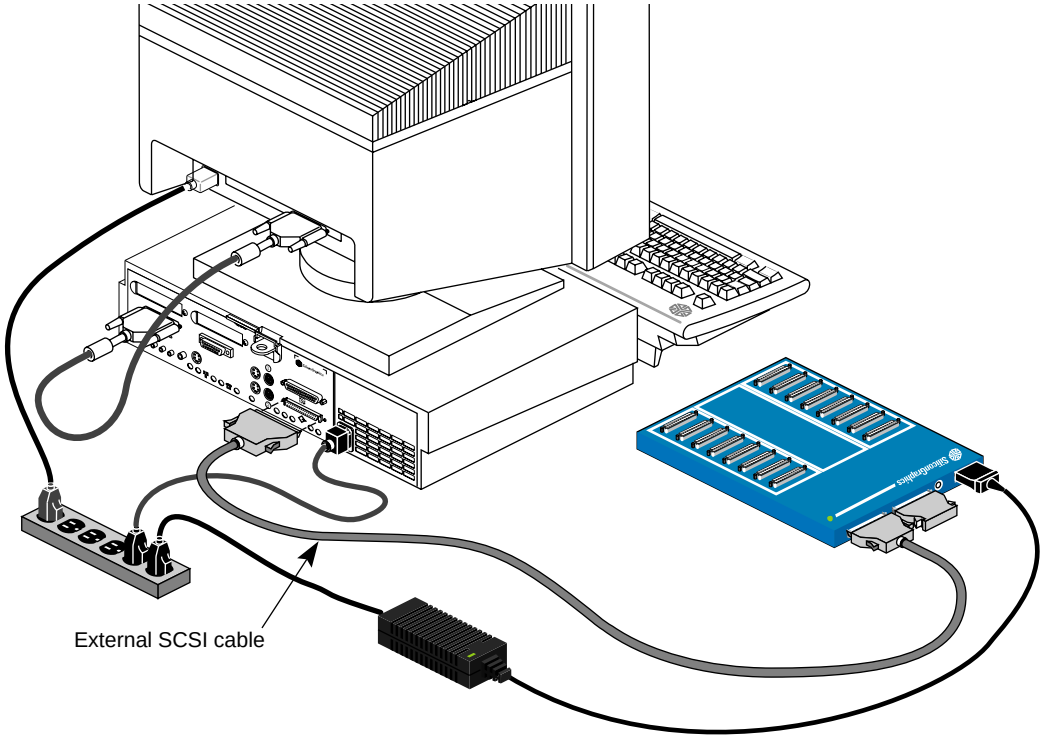

Figure 2-2 Connecting the Multiplexer SCSI Cable to an Indy Workstation

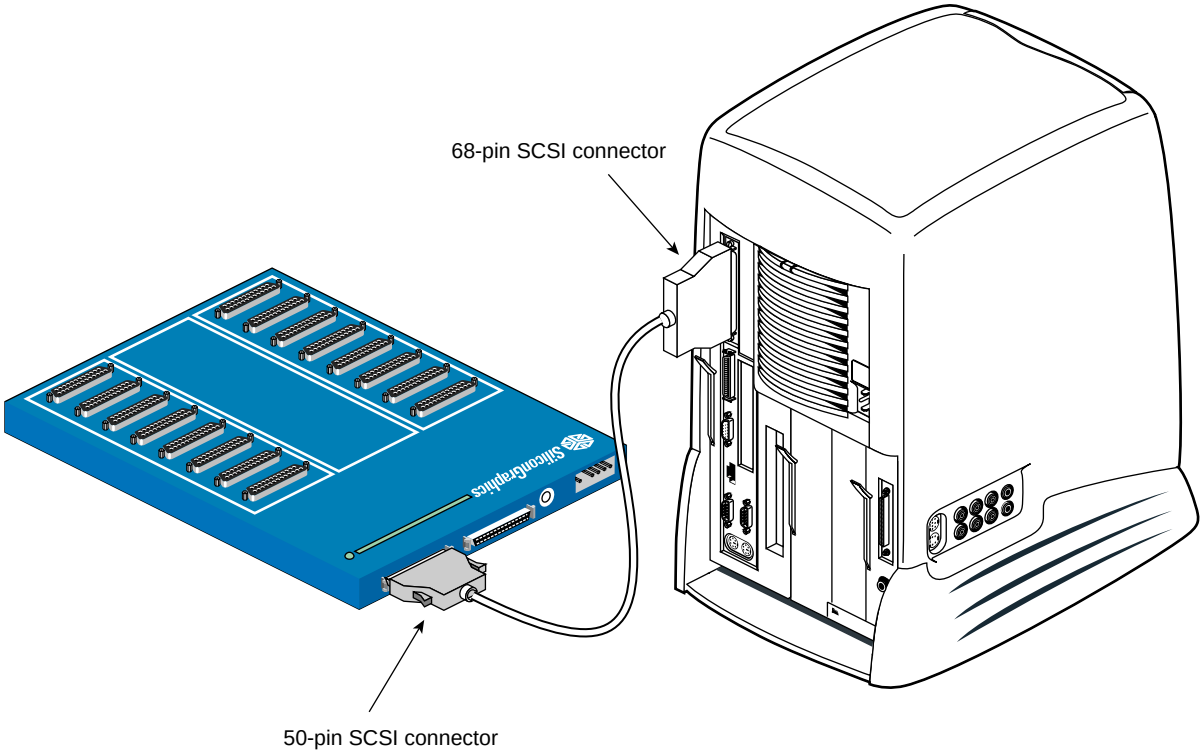

Figure 2-3 Connecting the Multiplexer's SCSI Cable to an O2 Workstation

3. Attach the other end of the cable to the leftmost socket on the back of the multiplexer, as shown in Figure 2-4.

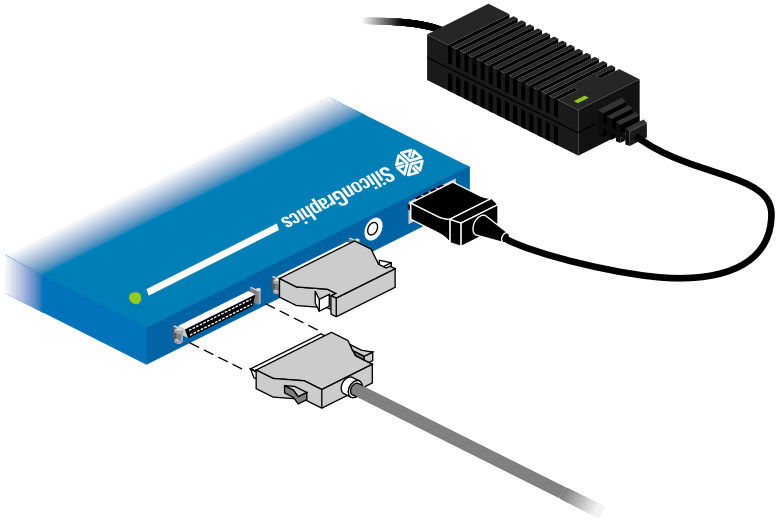

Figure 2-4 Connecting the SCSI Cable to the Multiplexer

4. Select an appropriate SCSI ID number by inserting a small screwdriver or other tool and rotating the arrow, as shown in Figure 2-5. Using SCSI ID 7 on early models of the multiplexer will cause the power indication LED to blink. Select another ID and the LED glows steadily with no blink.

   Note: The system disk in the Indy and O2 workstation is always SCSI target ID 1. Never select SCSI ID 1 for a multiplexer.

5. If the multiplexer is the last SCSI device on the workstation's standard external SCSI port, terminate it properly by attaching the external SCSI terminator included in the multiplexer shipment. See Figure 2-5.

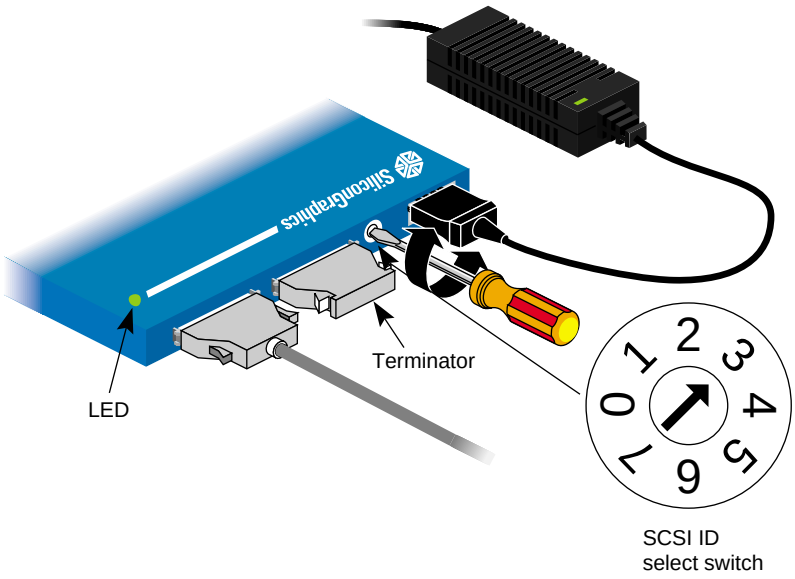

Figure 2-5 Setting the Multiplexer SCSI ID

6. Reboot the workstation.

After the workstation boots up, become superuser at the shell prompt to determine if the system recognizes the multiplexer. As the superuser, enter **`/sbin/cdscanbus`** and you should see something similar to this:

```
# /sbin/cdscanbus
------------------------------------------------------------
SCSI ID: 1
Device type: 0x0
Vendor ID: 'SGI '
Product ID: '[productID]'
Firmware: '8640'
Vendor Unique:
30 30 32 33 34 31 34 34 00 00 00 00 00 00 00 00 00234144........
------------------------------------------------------------
SCSI ID: 5
Device type: 0x9
Vendor ID: 'CenData '
Product ID: '[modelname]'
Firmware: 'V[revisionlevel]'
Vendor Unique:
20 53 65 6e 64 20 4c 55 4e 20 00 00 00 00 00 00 .Send.LUN.......


Available SCSI ID numbers on bus 0: 2 3 4 6 7
```

If the multiplexer does not appear in the */sbin/cdscanbus* listing, recheck all these items:

- SCSI cable connections
- SCSI terminator and ID
- multiplexer power connection
- proper software installation

You must have the multiplexer software drivers installed, or the *cdscanbus* command will not work. See the section "Troubleshooting" on page 37 for additional troubleshooting tips.

Connecting the Multiplexer to Challenge, Onyx, and Origin Systems

You can plug the Challenge, Onyx, and Origin cables into the multiplexer in virtually any arrangement and map it with the IRISconsole software; see the *IRISconsole Administrator's Guide* (P/N 007-2872-*nnn*). For example:

1. Select the appropriate serial cable (see Table 2-1 and Figure 2-6) for your system:

Table 2-1 Serial Cables to Use With Servers

Server	Quantity	Part number	Description/Notes
Challenge S	1	018-526-001	25-pin-to-8-pin
Challenge DM/L/XL; POWER Challenge L/XL; Onyx and POWER Onyx	2	018-0527-001	25-pin-to-9-pin (*male*) connector
Origin 200	1 1	018-0526-001 018-0671-101	25-pin-to-8-pin 25-pin-to-9-pin (*female*) connector
Origin2000 or Onyx2 deskside	2	018-067-101	25-pin-to-9-pin (*female*) connector
Origin2000 or Onyx2 rackmount	2	018-526-001	25-pin-to-8-pin

Note: All cable lengths are 25 feet (7.62 m) long.

2. Each system requires a pair of serial cable connections to the multiplexer. Connect the 25-pin end of a serial cable to port 1 on the multiplexer and connect the second serial cable to port 2 (see Figure 2-7). Connect the cable from serial port 1 on the multiplexer as follows:
   - to the connector labeled **System Console tty_1** on the I/O panel of the Challenge or Onyx (see Figure 2-8)
   - to the connector labeled **System Console tty_1** on the Origin200 (see Figure 2-9)
   - to the connector labeled **tty_1 Console** on the rear of the Origin2000 and Onyx2 deskside systems (see Figure 2-10)
   - to the multimodule system controller (MMSC) **Console (COM 1)** port on Origin2000 and Onyx2 rack systems (see Figure 2-11)

Note: If you already have a terminal connected to this port, move the terminal to another available connector on the BaseIO panel such as **tty_2** (see Figure 2-11).

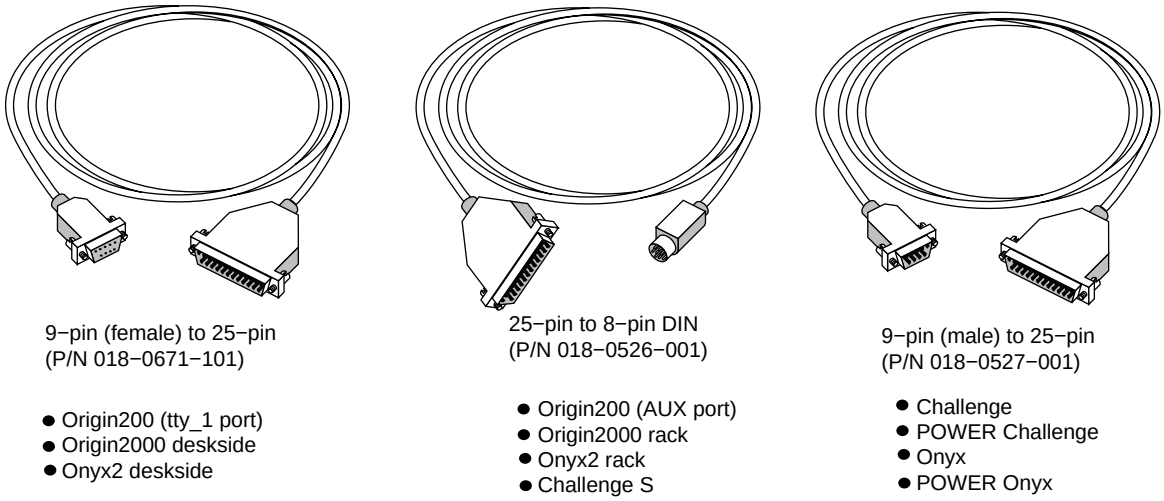

Figure 2-6 Multiplexer Serial Cables

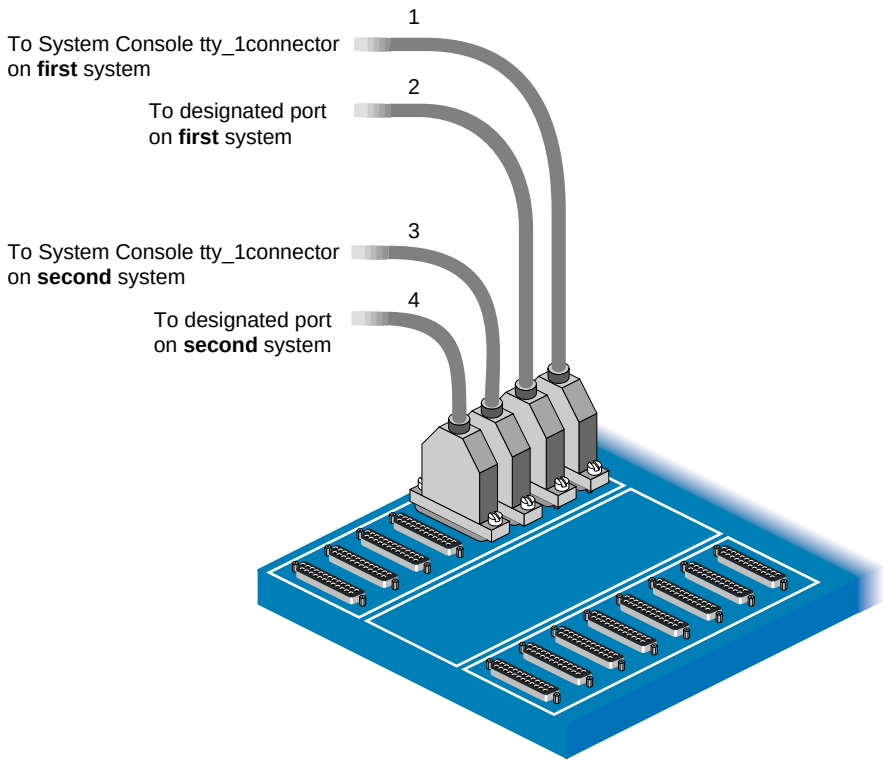

Figure 2-7 Connecting the Serial Cables to the Multiplexer: Example

- Cables 1 and 3 connect as illustrated for all systems except the Origin2000 and Onyx2 rack systems (see Figure 2-11).
- The designated port for cables 2 and 4 varies for each system (see "Connecting the Multiplexer to Challenge, Onyx, and Origin Systems" on page 22).

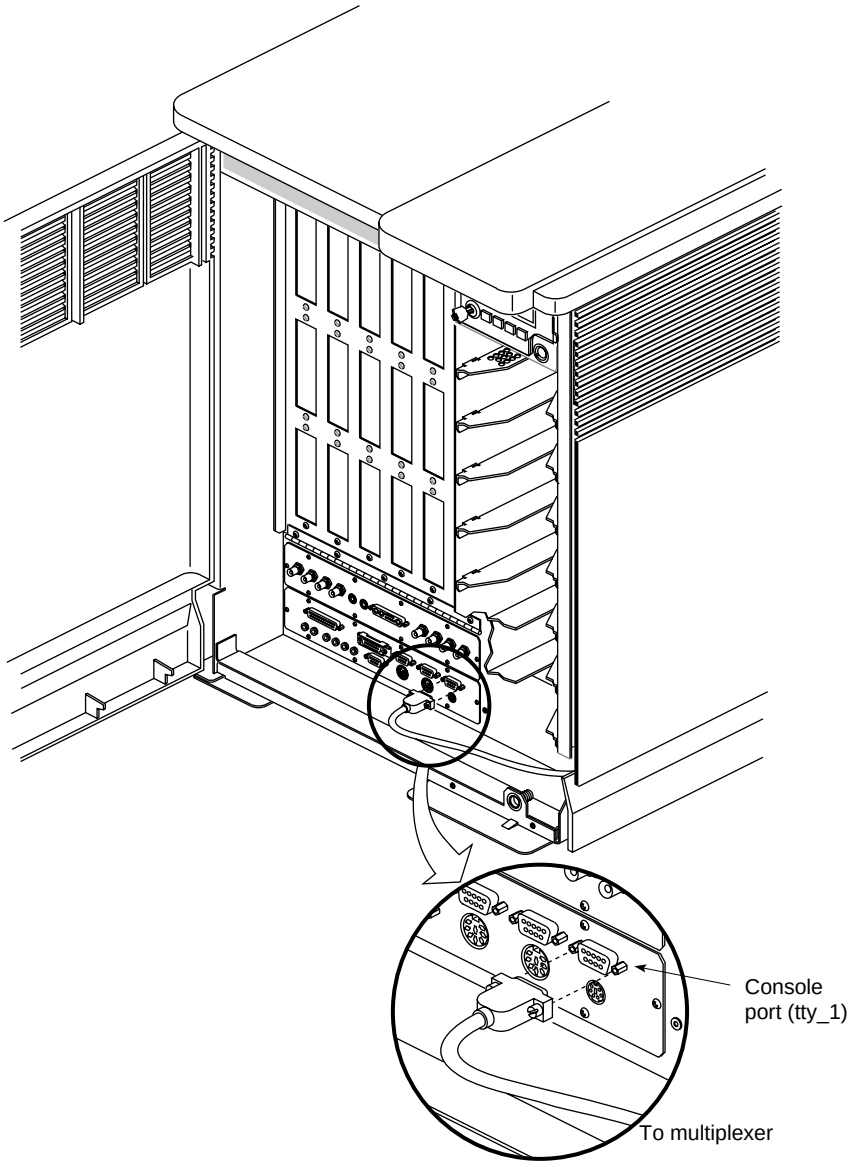

Figure 2-8 Location of Console Port (tty_1) on Challenge and Onyx Systems

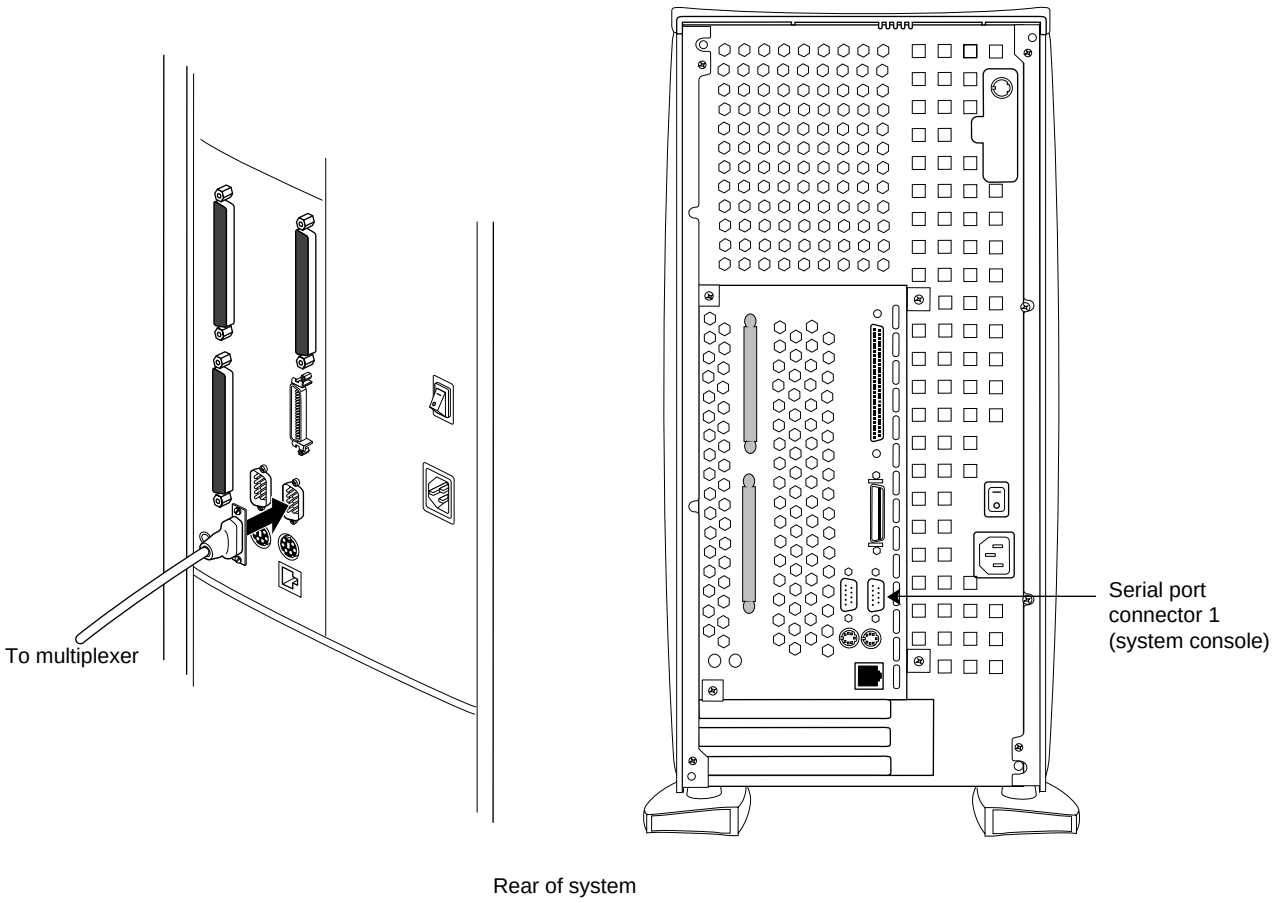

Figure 2-9 Location of Console Port (tty_1) on Origin200 Systems

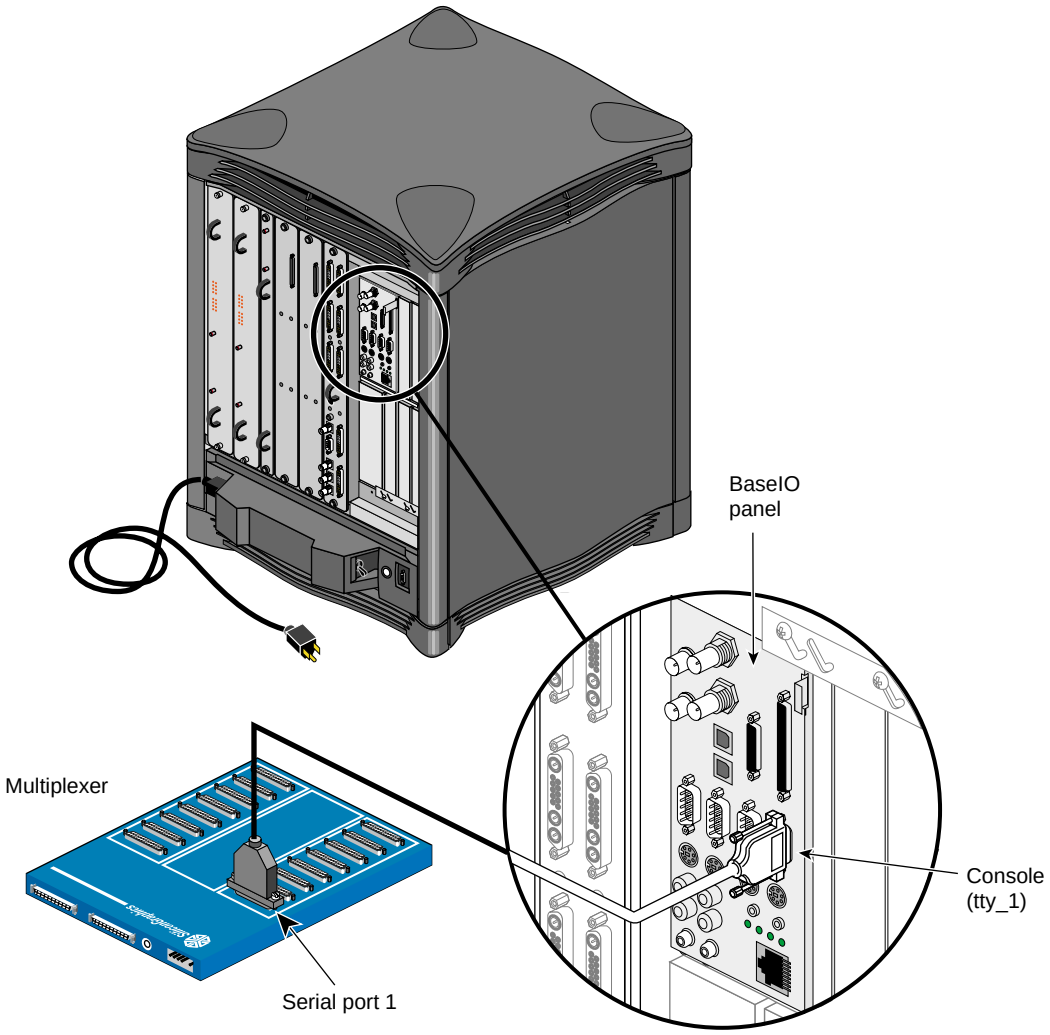

Figure 2-10 Location of Console Port (tty_1) on Origin2000 and Onyx2 Deskside Systems

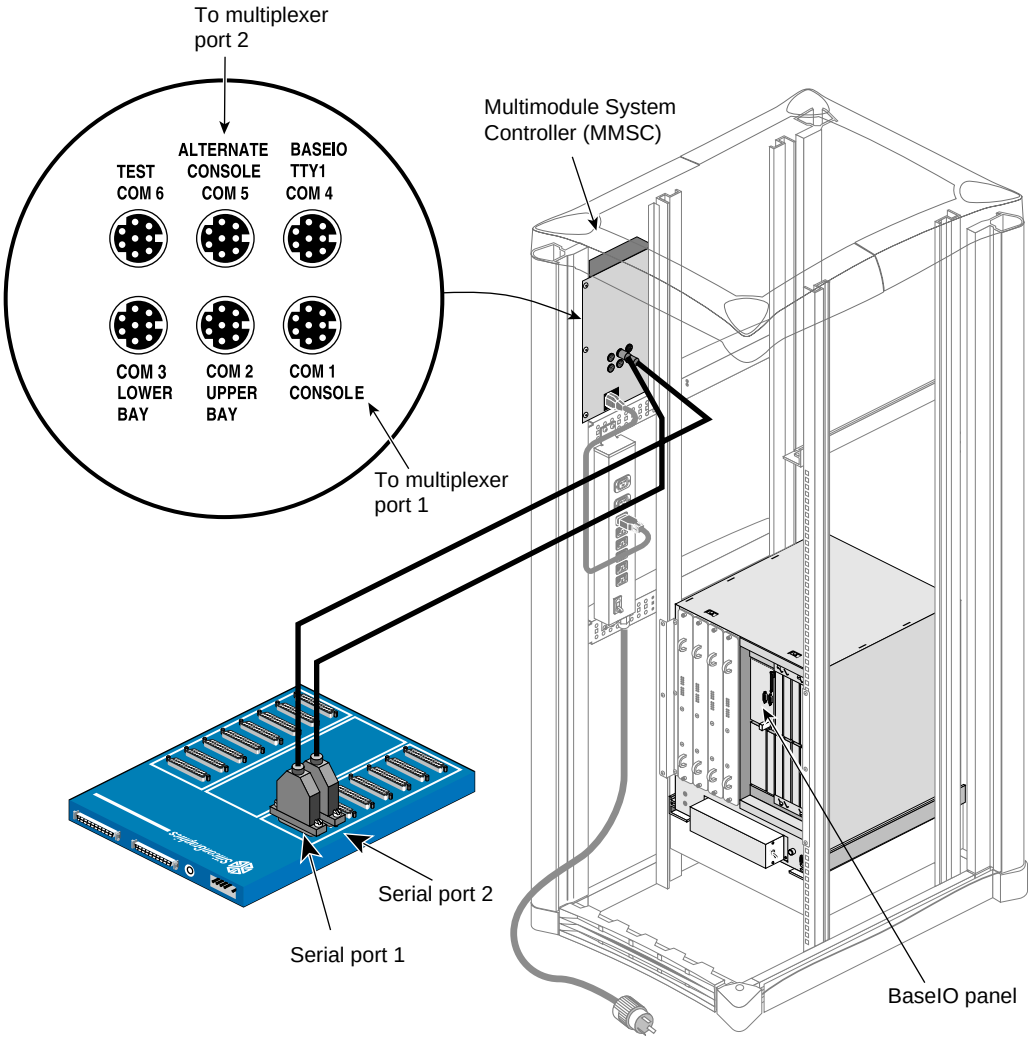

Figure 2-11 Connection to Rack

3. Attach the connector from serial port 2 cable from the multiplexer as follows:
   - To the connector labeled **Remote Sys Control SSE Use Only** on the panel to the right of the I/O panel on the Challenge or Onyx. Figure 2-12 through Figure 2-15 show the location of the **System Console tty_1** and **Remote Sys Control SSE Use Only** connectors.
   - To the connector labeled **AUX** port on the rear of the Origin200 (see Figure 2-16).
   - To the 9-pin serial connector on the rear of the Origin2000 and Onyx2 deskside system (see Figure 2-17).
   - To the **Alternate Console (COM 5)** connector on the MMSC (see Figure 2-11).
4. Repeat these steps to connect additional Challenge, Onyx, and Origin systems to the multiplexer(s) used as part of the IRISconsole.

   Note: Do not run cables through areas that are electrically noisy, such as areas where large electric motors, welding apparatus, or X-ray machines operate. Bury outside wiring in conduit, as lightning strikes can damage the system.

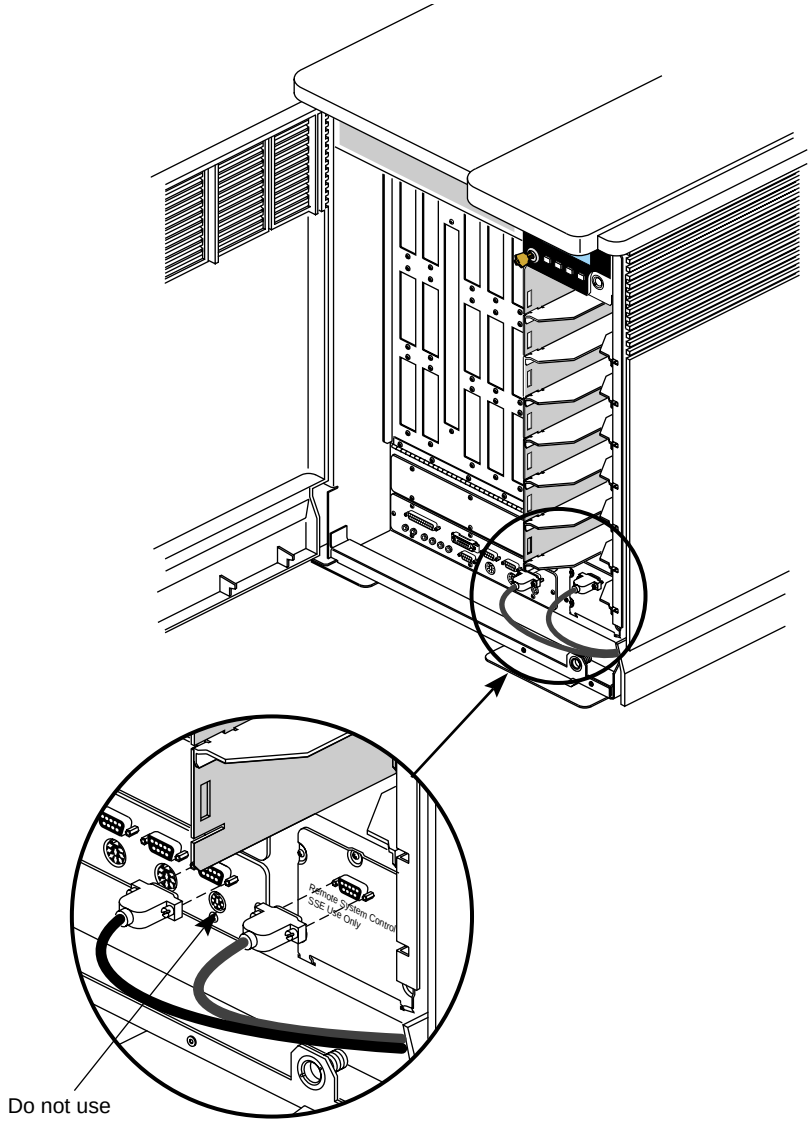

Figure 2-12 Cabling the Challenge L Server System Control Connectors

Note: Do not use the 8-pin powered serial connector for other uses in systems that have the IRISconsole multiplexer installed.

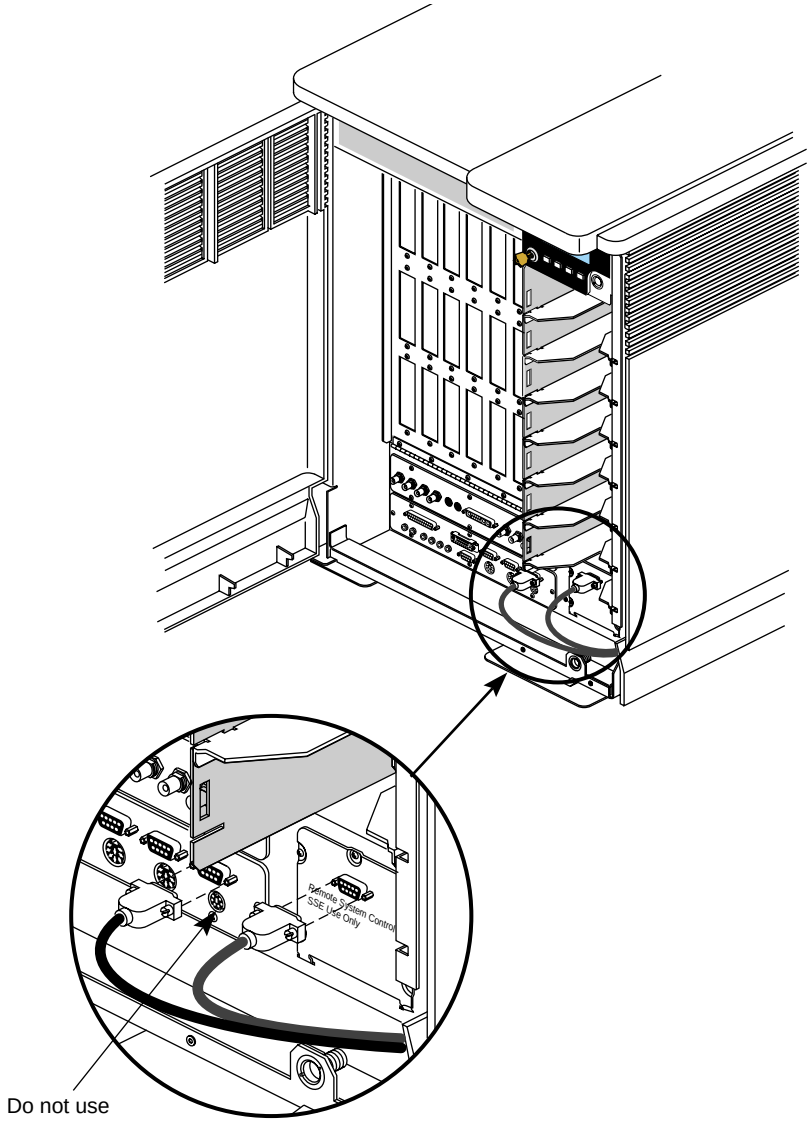

Figure 2-13 Cabling the Onyx Serial Connectors

Note: Do not use the 8-pin powered serial connector for other uses in systems that have the IRISconsole multiplexer installed.

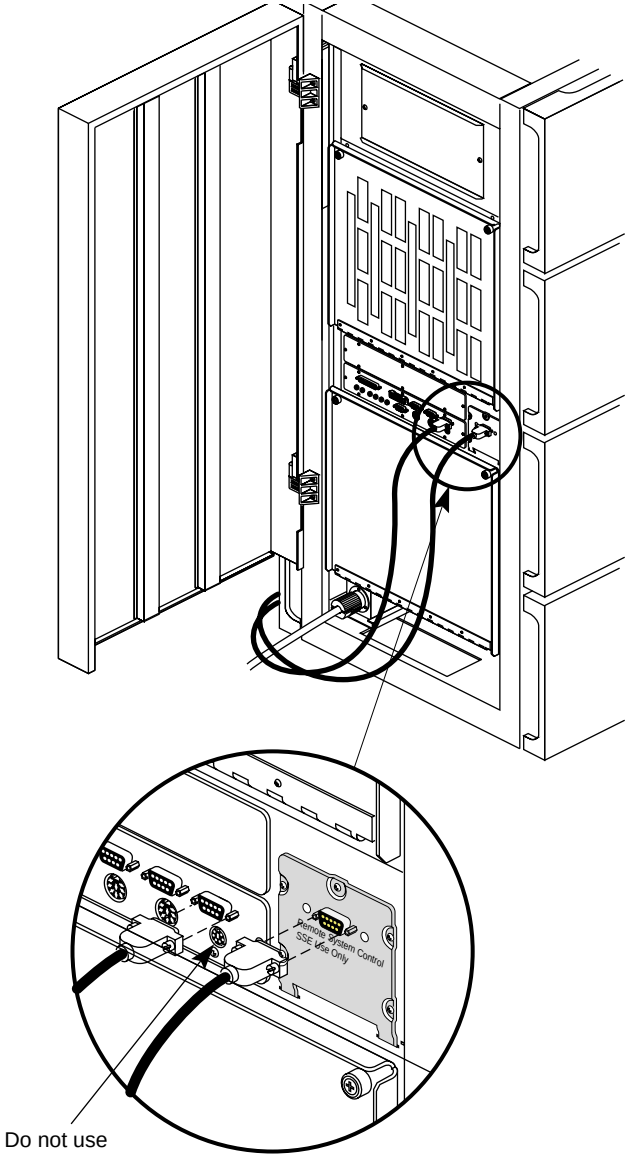

Figure 2-14 Cabling the Challenge XL Serial Connectors

Note: Do not use the 8-pin powered serial connector for other uses in systems that have the IRISconsole multiplexer installed.

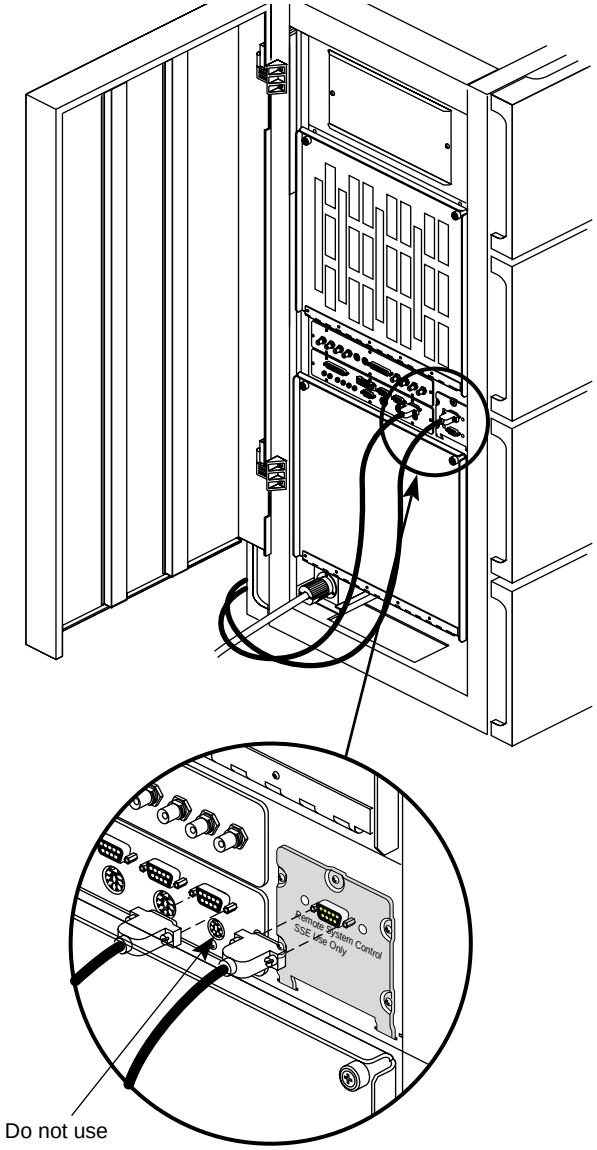

Figure 2-15 Cabling the Onyx Rackmount System Serial Connectors

Note: Do not use the 8-pin powered serial connector for other uses in systems that have the IRISconsole multiplexer installed.

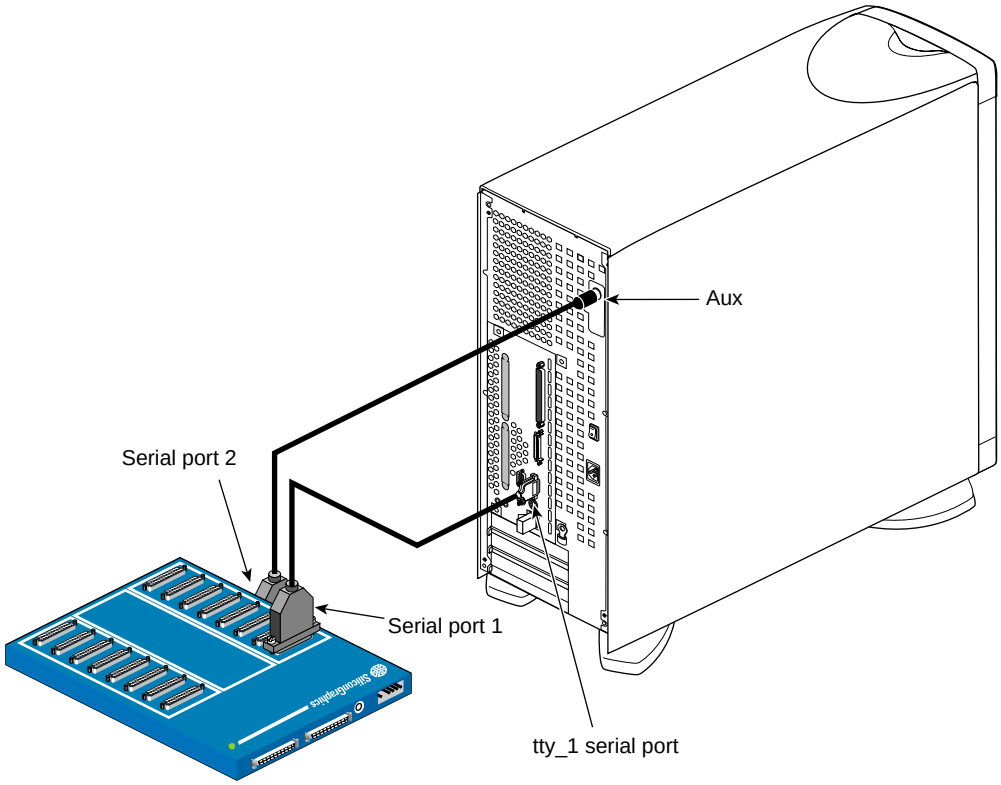

Figure 2-16 Connecting the Multiplexer to the Origin200

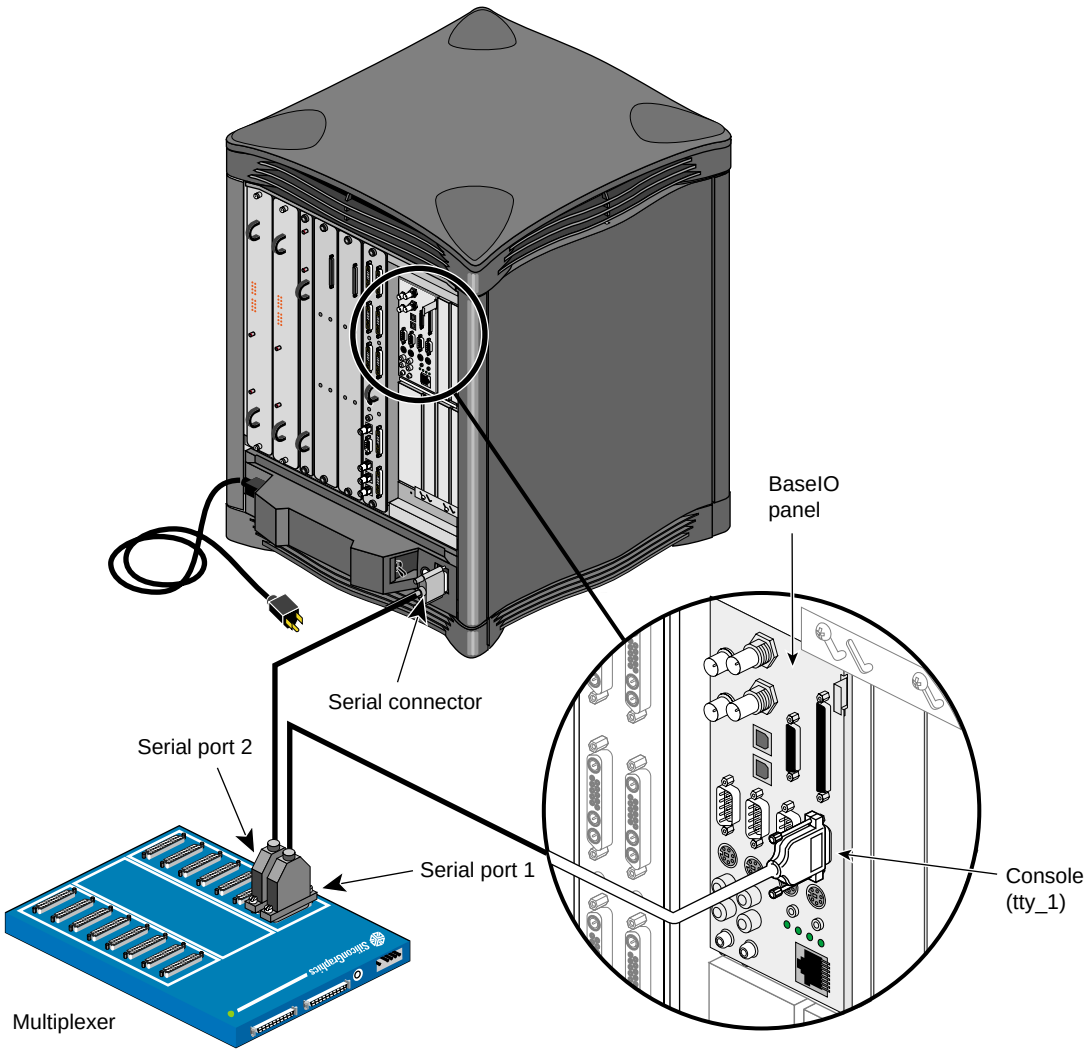

Figure 2-17 Connecting the Multiplexer to the Origin2000 or Onyx2 Deskside System Second Serial Port

Connecting a Second Multiplexer

You can add a second multiplexer (see Figure 2-18) to the IRISconsole station using a 50-pin-to-50-pin SCSI cable (P/N 018-8123-001). This enables a single IRISconsole station to monitor a maximum of 16 individual systems.

1. Remove the SCSI terminator from the first multiplexer and attach the SCSI cable.
2. Plug the other end of the SCSI cable to first (or leftmost) connector on the rear of the second multiplexer (see Figure 2-18).
3. Attach a terminator to the unused SCSI port on the second multiplexer.

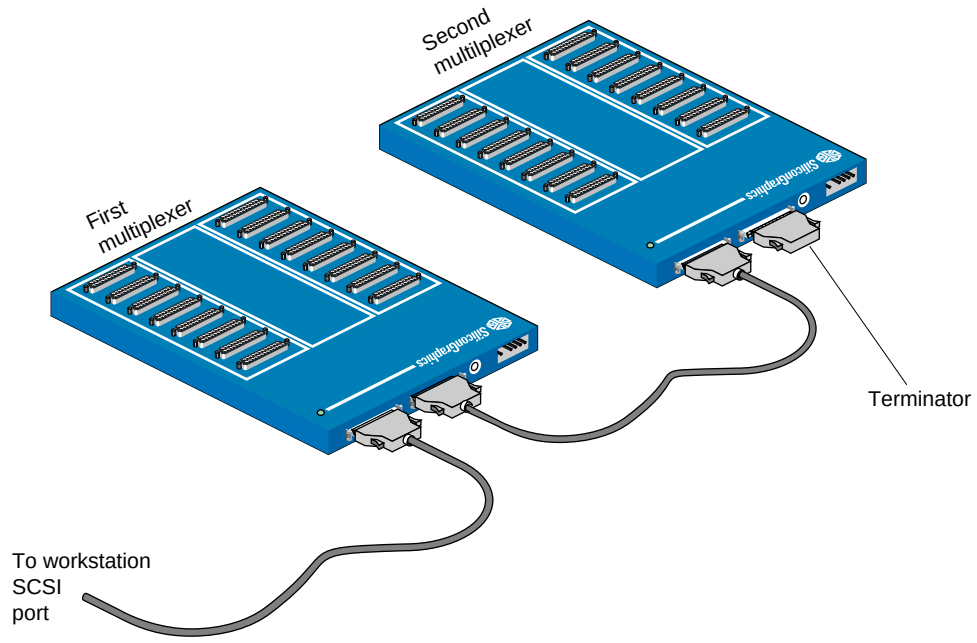

Figure 2-18 Connecting a Second Multiplexer

Troubleshooting

After the multiplexer is installed and operating correctly, it should never be powered off unless the system is shut down. If the multiplexer is powered off and then powered back on, restart all connections from the workstation to the multiplexer. Note that the multiplexer driver software recovers without rebooting the system.

If you do reboot the workstation, always be sure that the power is restored to the multiplexer before the system reboot begins.

Multiplexer Power LED

When the multiplexer is operating normally, the power LED glows steadily (see Figure 2-19). A blinking or unlighted LED on the multiplexer is probably a sign of malfunction.

Power-up tests are run each time the multiplexer is turned on, prior to execution of the run-time diagnostics and the main firmware. Failures result in a blinking or inactive power LED.

Check for these other possible causes:

- Some early units blink when set with SCSI ID 7. Check to see if the multiplexer is set to ID 7 and change as necessary.
- Confirm that both ends of the power supply connectors are properly installed.
- Shut down the IRISconsole host system, then power cycle the multiplexer before powering on the workstation.

If none of these solutions resolve the problem, contact your service support organization for further assistance.

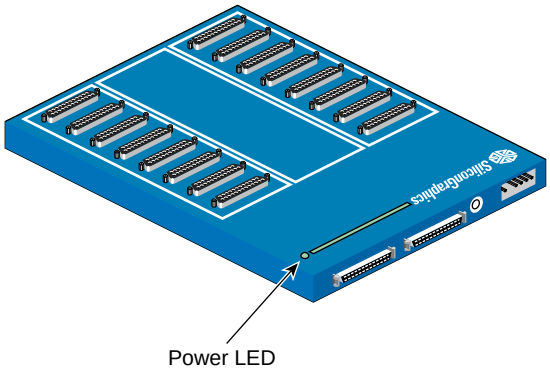

Figure 2-19 Location of Power LED on the Multiplexer

IRISconsole Malfunctions

Because the IRISconsole is a complex system of interconnecting units, you may have to check several likely sources to determine the cause of an intermittent malfunction.

Possible causes of intermittent malfunctions include

- loose, broken, or bent pins on the SCSI or serial port connectors
- two SCSI devices connected to the workstation with the same SCSI ID selected
- improper or no termination of the SCSI bus
- use of a tape drive not supplied by Silicon Graphics on the same SCSI bus as the multiplexer, which can cause SCSI bus timeouts that might affect multiplexer functionality
- SCSI bus that exceeds two meters (6.6 feet), which may cause signal malfunction on the bus (count an additional 6 inches [2.4 cm]) of length for each device on the SCSI bus)
- connecting the multiplexer to an optional SCSI board on the workstation

  IRISconsole is supported only on the workstation's built-in interface; attach the multiplexer only to the workstation's standard SCSI connector. Connection to optional SCSI interface cards is not supported.

For additional useful information on serial ports and configuration, see the reference (man) pages for the following:

- inittab
- gettydefs
- ttytype
- terminfo
- stty
- termio
- cdstty
- cdscanbus

Chapter 3

Technical Specifications

This chapter covers technical aspects of the hardware connections as well as power, physical, and environmental requirements for the hardware. This chapter discusses

- multiplexer serial ports
- multiplexer power, physical, and environmental specifications

Multiplexer Serial Ports

All ports are asynchronous, with Data Terminal Equipment (DTE) pinouts and full modem control. Allowed baud rates range from 75 baud to 115.2 Kbaud out. The RS-232 signals supported are TXD, RXD, RTS, CTS, DSR, DTR, DCD, and GND.

Note: The RS-232 serial ports on Challenge and Onyx systems transmit asynchronous data at a maximum rate of 19.2 Kbaud.

The ST-1600 and ST-1616 multiplexer are Data Terminal Equipment devices (DTE). See Figure 3-1 for the pin numbers on the 25-pin multiplexer connector.

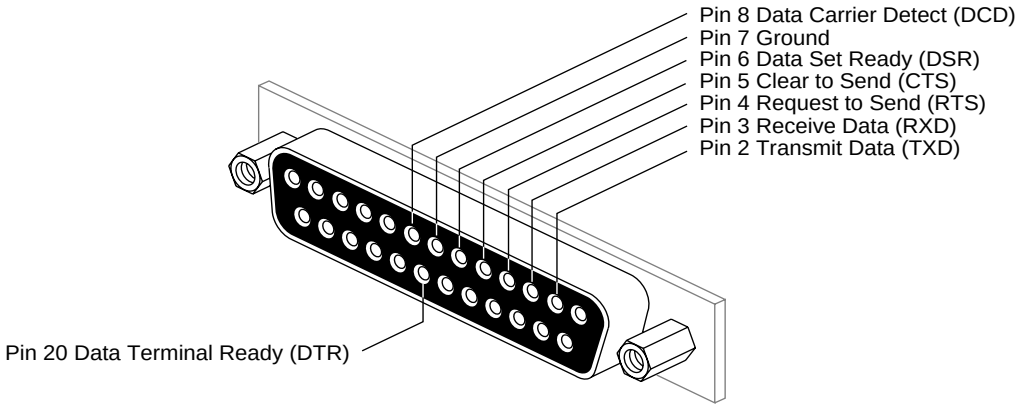

Figure 3-1 25-Pin Connector on the Multiplexer

The Challenge or Onyx system is a DTE device for purposes of serial port connection. See Figure 3-2 for the pin assignment on the 9-pin Challenge or Onyx serial port connector.

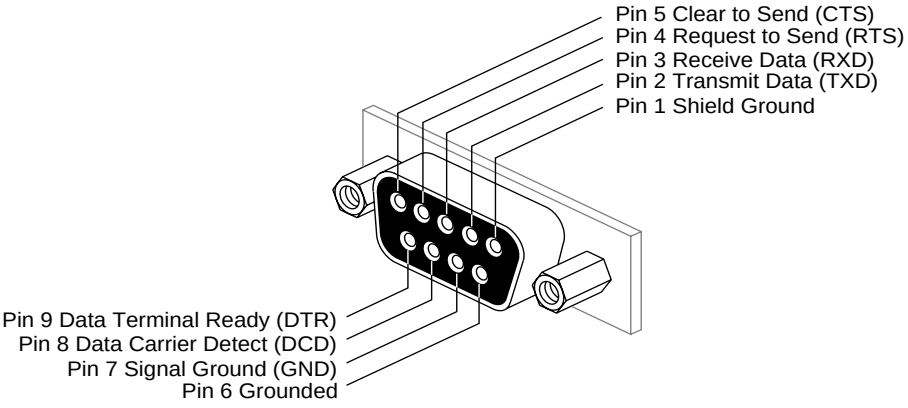

Figure 3-2 9-Pin Connector on Challenge or Onyx Systems

Table 3-1 shows a DTE to DTE serial connection such as would be made between the multiplexer and a Challenge or Onyx system.

Note: Both pins 6 (DSR) and 8 (DCD) on the multiplexer are tied to pin 9 (DTR) on the Challenge or Onyx 9-pin connection.

Table 3-1 9-Pin DTE to 25-Pin DTE Connection

9-Pin Connector Signal	Pin #	25-Pin Connector on Multiplexer
Transmitted Data (TXD)	2	3 (RXD)
Received Data (RXD)	3	2 (TXD)
Request to Send (RTS)	4	5 (CTS)
Clear to send (CTS)	5	4 (RTS)
Data Terminal Ready (DTR)	9	6 Data Set Ready (DSR)
Signal Ground (GND)	7	7 (GND)
Data Terminal Ready (DTR)	9	8 (DCD)
Data Carrier Detect (DCD)	8	20 Data Terminal Ready (DTR)

The RS-232 standard recommends the use of serial cables no longer than 50 feet (15.2 meters). Longer runs introduce a greater possibility of line noise occurring. This can affect data transmission and cause errors. For cable runs longer than 50 feet (15.2 meters), use an appropriate extender device.

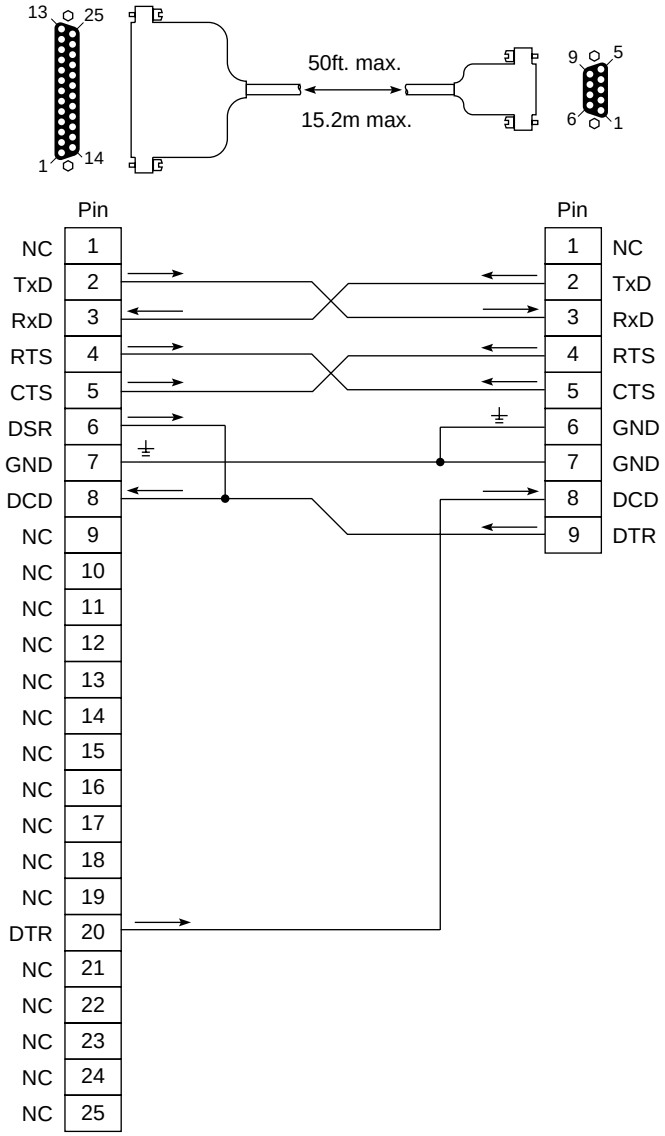

Figure 3-3 25-Pin to 9-Pin Serial Connection Cable (Challenge and Onyx Systems)

9-Pin (Male) Serial Port

The Origin200 (tty_1 Console port), Origin2000 deskside, and Onyx2 deskside systems use a 9-pin male port to connect to the multiplexer. Figure 3-4 provides the pin specifications for this connector.

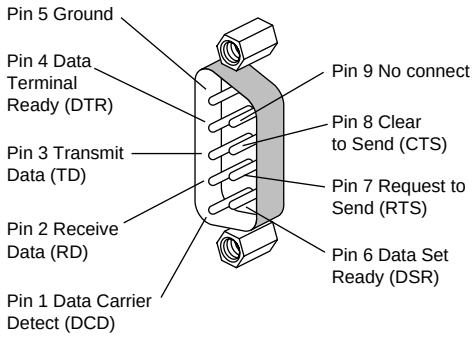

Figure 3-4 Origin200 tty_1 Console, Origin2000, and Onyx2 Deskside Serial Port

8-Pin DIN Serial Port

The Origin2000 and Onyx2 rack multimodule system controller (MMSC) ports and the Origin200 AUX port are 8-pin serial connectors. Table 3-2 and Figure 3-5 provide pin specifications for this 8-pin connector.

Table 3-2 4D Compatible Pin Assignments (RS-232)

Pin	Assignment	Description
1	DTR	Data Terminal Ready
2	CTS	Clear To Send
3	TD	Transmit Data
4	SG	Signal Ground
5	RD	Receive Data

Table 3-2 (continued) 4D Compatible Pin Assignments (RS-232)

Pin	Assignment	Description
6	RTS	Request To Send
7	DCD	Data Carrier Detect
8	SG	Signal Ground

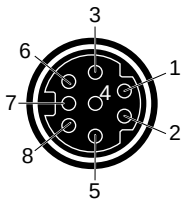

Figure 3-5 8-Pin Serial Port Pinout Assignment for Origin200 System and Origin2000 and Onyx2 Rack System

Multiplexer Power, Physical, and Environmental Specifications

All power requirements are provided by the standalone power supply included with your unit.

The power supply is auto-ranging and comes with a 110-VAC power cord in Japan and North America. All other destinations should use a 220-VAC rated power cord.

Power usage is typically as follows:

- +5 VDC, 1500 mA maximum, 1110 mA typical
- 12 VDC, 100 mA maximum (full load), 1 mA (unloaded)

The operating environment for the multiplexer should meet the following specifications:

- operating temperature: 0°C to 55°C
- storage temperature: -40°C to 75°C
- operating/storage humidity: 0 to 95% non-condensing

Each type of multiplexer uses the following amount of space (be sure to allow for all cable connections when choosing a location for placement):

- depth: 11.0 inches (28.1 cm)
- width: 8.1 inches (20.6 cm)
- height: 1.2 inches (3.1 cm)
- weight: 3.8 lbs (1.7 kg)

The shipping weight of the multiplexer is 14 lbs (6.3 kg), maximum, with power supply, excluding optional cables or other equipment.

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