DSX-3 (DSX-4H-24) Rear Cross-Connect Installation Manual

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INTRODUCTION

This manual provides installation instructions for installing or adding to ADC's Digital Signal Rear Cross-Connect System (DSX-4H-24).

Revision History

ISSUE	DATE	REASON FOR CHANGE
Issue 4	09/1996	Update.
Issue 5	03/1997	Non technical change, add front matter per current format standard.
Issue 6	02/1998	Updated to show new ADC corporate address.
Issue 7	01/2001	Non-technical update.

Trademark Information

ADC is a registered trademark of ADC Telecommunications, Inc.

Related Publications

Listed below are related manuals and their publication numbers. Copies of these publications can be ordered by contacting the ADC Technical Assistance Center at 1-800-366-3891 (in U.S.A. or Canada) or 952-946-3000, extension 63475 (outside U.S.A. and Canada).

Title	ADCP Number
Digital Signal Cross-Connect System (DSX-3) System Applications Guide	80-323
DSX-3 (DSX-4H-24) Rear Cross-Connect System User Manual	61-501
Coaxial Cable Performance and Application Guide	70-001

Admonishments

Important safety admonishments are used throughout this manual to warn of possible hazards to persons or equipment. An admonishment identifies a possible hazard and then explains what may happen if the hazard is not avoided. The admonishments — in the form of Dangers, Warnings, and Cautions — must be followed at all times. These warnings are flagged by use of the triangular alert icon (seen below), and are listed in descending order of severity of injury or damage and likelihood of occurrence.

⚠ **Danger**: *Danger is used to indicate the presence of a hazard that **will** cause severe personal injury, death, or substantial property damage if the hazard is not avoided.*

⚠ **Warning**: *Warning is used to indicate the presence of a hazard that **can** cause severe personal injury, death, or substantial property damage if the hazard is not avoided.*

⚠ **Caution**: *Caution is used to indicate the presence of a hazard that **will** or **can** cause minor personal injury or property damage if the hazard is not avoided.*

1 GENERAL

These installation instructions provide guidelines for installing or adding to the modular DS3 Digital Signal Rear Cross-Connect (DSX-4H-24) System at the user's site.

1.1 Signal Levels

Each DSX-4H-24 bay serves as an equal level transmission point, and all digital signals crossing a DSX-4H-24 bay must be maintained within a certain voltage power level for each specific bit rate. Reference ANSI T1.102-199x Draft, American National Standard for Telecommunications – Digital Hierarchy – Electrical Interfaces.

1.2 Cable Types

All DS3 and STS cables should be 75 ohm coaxial with tinned copper shield (735A Type and 734A Type or equivalent).

1.3 Cable Lengths

All digital equipment terminated at the DSX-4H-24 bay must have equalizers and/or pads which are adjusted for the particular cable lengths to maintain proper transmission levels. The maximum length between digital equipment and the DSX-4H-24 bay is governed by the specific equipment and cable type. (See Tables 1 and 2.)

Table 1. IN/OUT Equipment

EQUIPMENT TYPE	734A OR EQUIVALENT CABLE	735A OR EQUIVALENT CABLE
DS3	450 ft. (137.2 m)	225 ft. (68.6 m)
DS4NA	225 ft. (68.6 m)	146 ft. (44.5 m)
STS-1	439 ft. (133.8 m)	215 ft. (65.5 m)
STS-3	253 ft. (77.1 m)	125 ft. (31.8 m)

Table 2. Cross-Connect Jumpers

EQUIPMENT TYPE	RG59 CABLE	735A OR EQUIVALENT CABLE	TRIAX CABLE
DS3	29.0 ft. (7.4 m)	20.6 ft. (5.2 m)	13.4 ft. (3.4 m)
DS4NA	17.0 ft. (4.3 m)	13.0 ft. (3.3 m)	7.6 ft. (1.9 m)
STS-1	27.0 ft. (6.9 m)	18.0 ft. (4.6 m)	12.5 ft. (3.2 m)
STS-3	16.0 ft. (4.1 m)	11.0 ft. (2.8 m)	7.0 ft. (1.8 m)

2 INSTALLATION IN NETWORK EQUIPMENT BAY

⚠ **Warning:** *To prevent electrical shock, never install DSX equipment in a wet location or during a lightning storm. When installing or modifying telephone lines, disconnect lines at the network interface before working with uninsulated lines or terminals.*

2.1 Chassis (DSX-4H-24) Installation

Existing bays should be expanded from the bottom up if office cables are brought into bay from above, or from the top down if office cables are brought into the bay from below.

Mounting brackets, cable rings and hinged cable ring covers are shipped loose and must be attached with special thread forming screws (provided) to achieve proper grounding to the chassis. Screws must be tightened to 8 inch-pounds minimum.

Identify hole locations for mounting chassis (module) in a typical 7-foot by 19- or 23-inch (2.13 m × 48.26 or 58.42 cm) unequal flange equipment bay. See Figure 1.

Position chassis on bay in the appropriate location. Secure chassis to the bay using four #12-24 machine screws in the top and bottom holes on each side of the chassis, as shown in Figure 2.

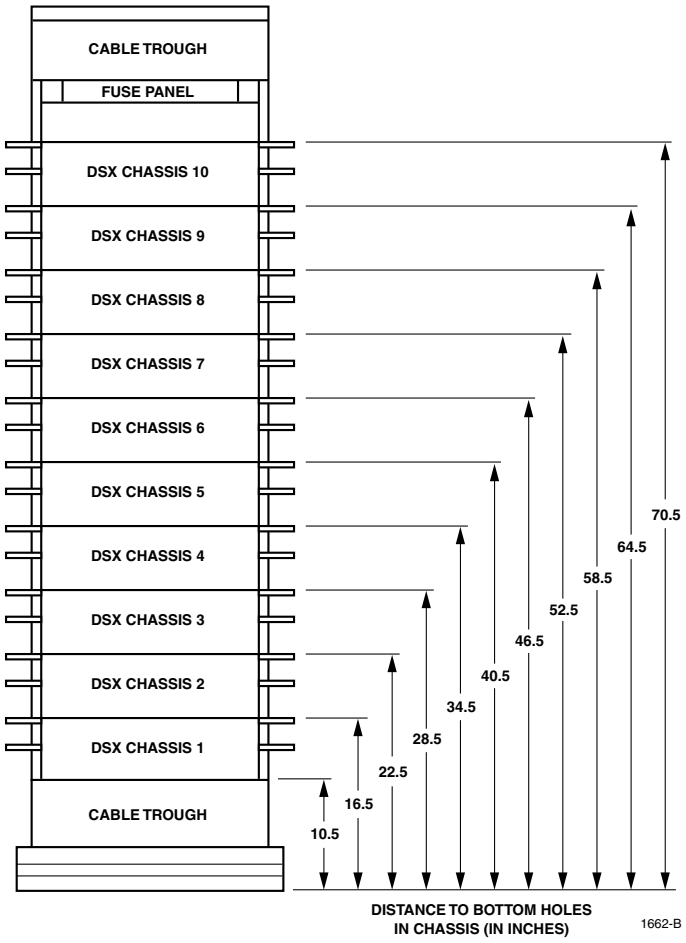

Figure 1. Mounting Hole Locations (Rear View)

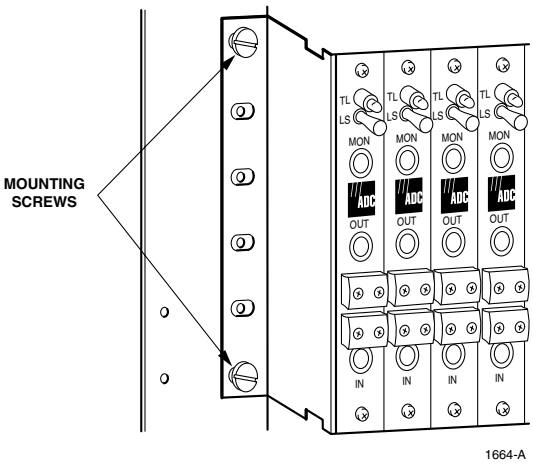

Figure 2. Chassis Installation

2.2 Circuit Module (DSX-4H) Installation

Install all DSX-4H circuit modules in the chassis. Press each module into the chassis. Secure each module with two #4-40 module retaining screws (provided), as shown in Figure 3.

2.3 Cable Ring Installation

Secure cable ring assembly to the mounting bracket located on the chassis side using the four #6-32 screws (provided), as shown in Figure 4.

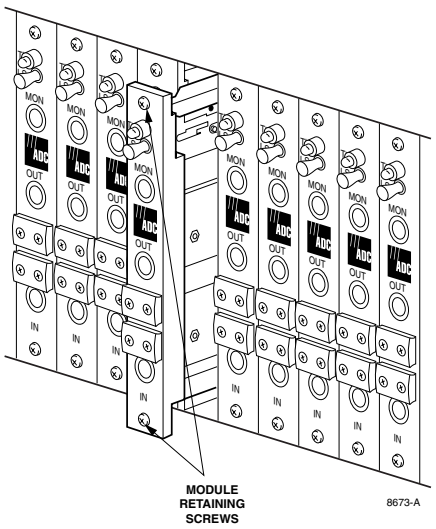

Figure 3. Circuit Module Installation

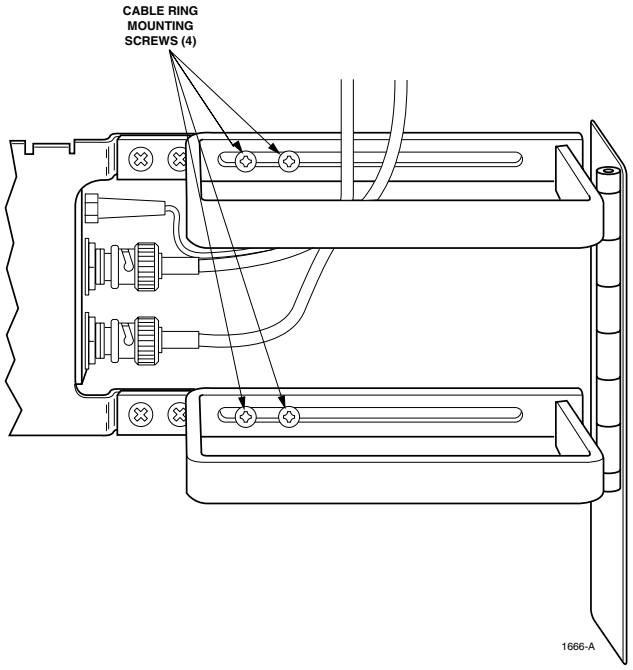

Figure 4. Cable Ring Installation (Side View)

3 POWER CONNECTIONS

Remove fuse from fuse panel for the chassis being installed. When viewed from the front, fuses going from left to right correlate to chassis going from bottom to top. There is one 0.5 Amp fuse for each chassis.

Note: One LED draws 0.01 Amp, 24 LEDs per chassis, equates to a 0.24 Amp load.

Connect 22 AWG wires to the respective –48 V and GND terminals on the back of the chassis, as shown in Figure 5. Route and connect the wires to the appropriate terminals located on the rear of the fuse panel, as shown in Figure 6. Connect remote alarm terminals to external alarm system, if required.

Connect one end of a 22 AWG wire from the chassis ground terminal located on the rear of the module chassis. See Figure 7. Connect the other end to the bay ground wire or bay ground posts, whichever is provided.

Install a 0.5 Amp fuse in the fuse panel for the chassis being added.

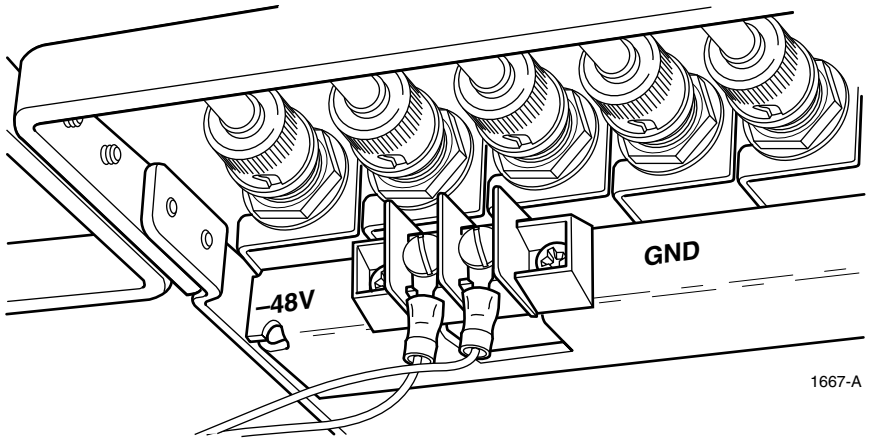

Figure 5. Power Connections on DSX-4H-24 Chassis (Rear View)

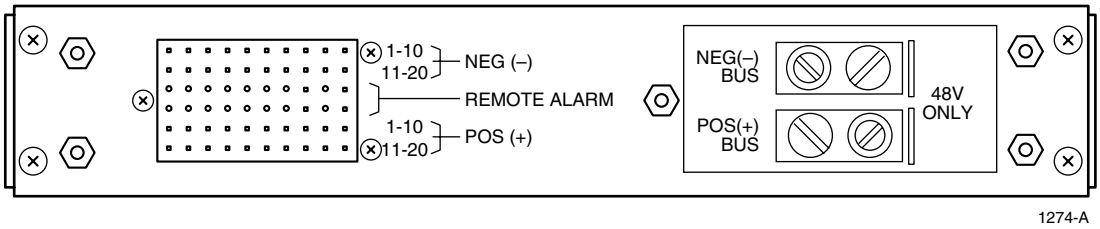

Figure 6. Fuse Panel (Rear View)

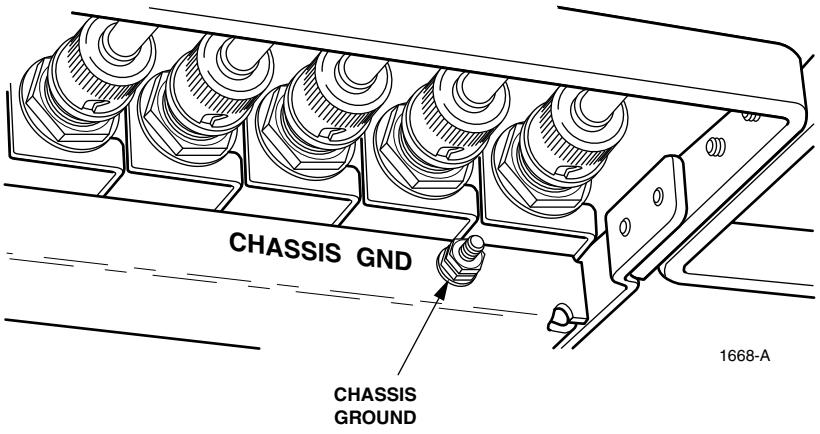

Figure 7. Chassis Ground Connection on DSX-4H-24 Chassis (Rear View)

4 INSTALLATION OF CABLING

4.1 Office/Equipment Cable Routing

Office/equipment cabling to the DSX-4H-24 is brought into the bay from either above or below and runs along the sides.

When viewed from the rear, make sure circuits 1 through 12 of each chassis run in the right side rack ducts and circuits 13–24 of each chassis run in the left side rack ducts.

Note: Equipment cabling should not infringe on the vertical cross-connect ring area.

4.1.1 Top Feed Cabling System

If cables are coming into the bay from above, cable attachment should start at the bottom and work up the bay, as shown in Figure 8. Using nylon tie-wraps or cable lacing, separate cables into two bundles of 24 cables for each chassis.

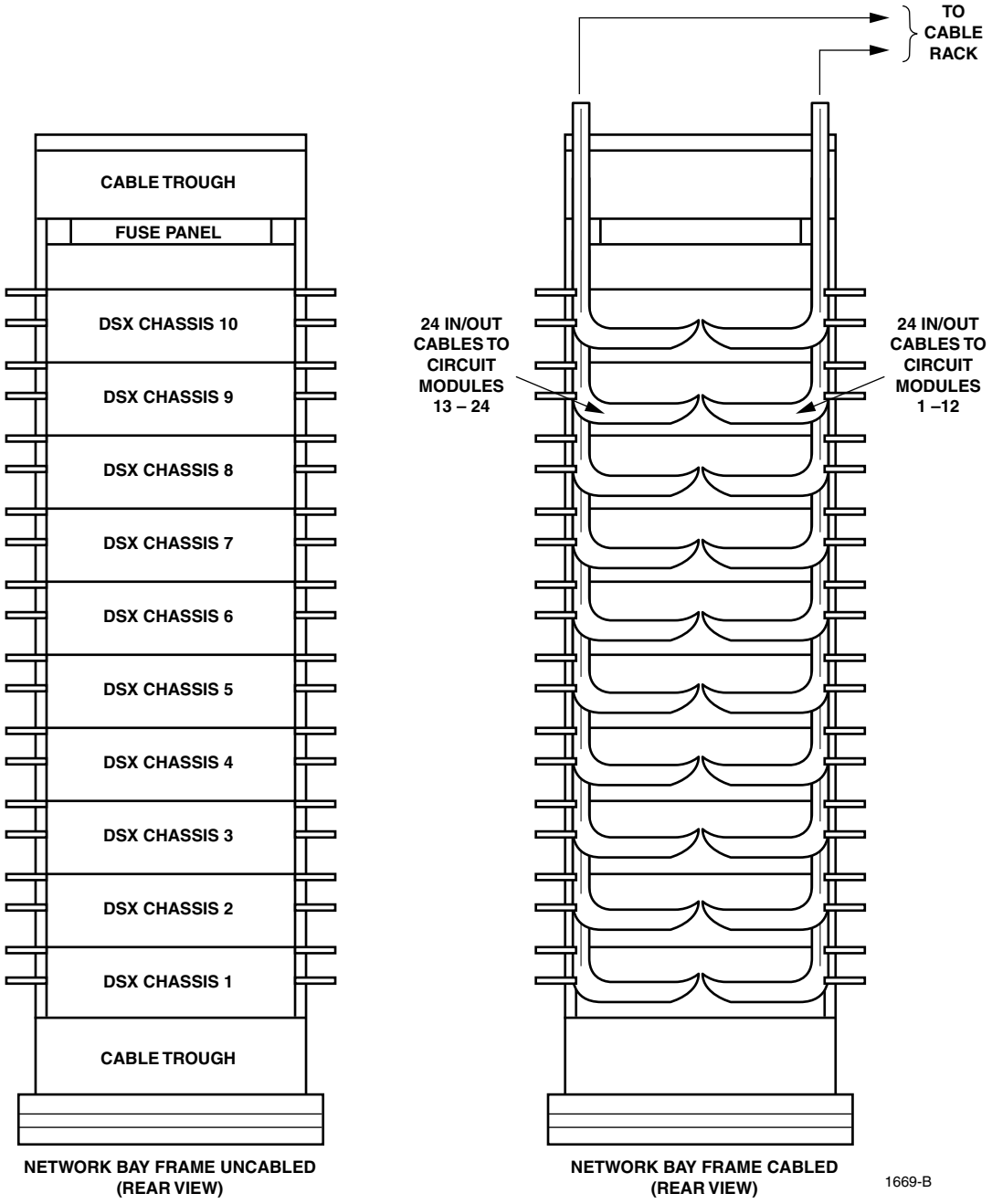

Figure 8. Cable Routing for Top Feed Cabling System

Place cables into rack ducts as shown below in Figure 9.

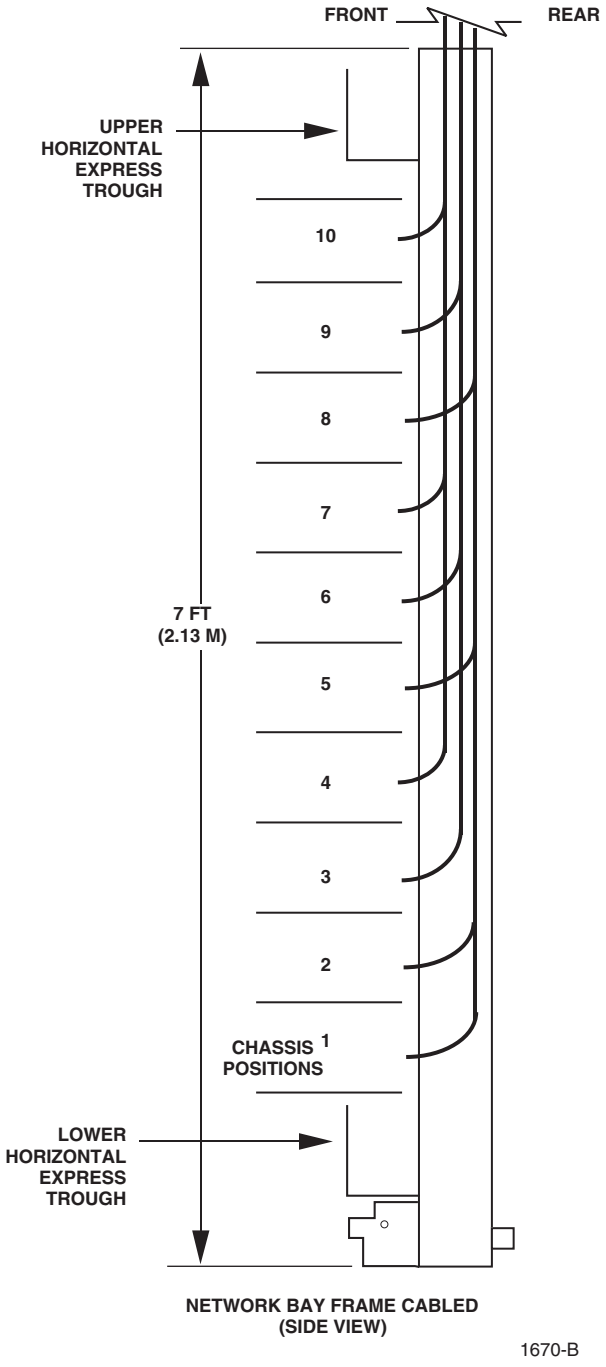

Figure 9. Cable Bundle Placement for Top Feed Cabling System

4.1.2 Bottom Feed Cabling System

If cables are coming into the bay from below, cable attachment should start at the top and work down the bay, as shown in Figure 10. Using nylon tie-wraps or cable lacing, separate cables into two bundles of 24 cables for each chassis.

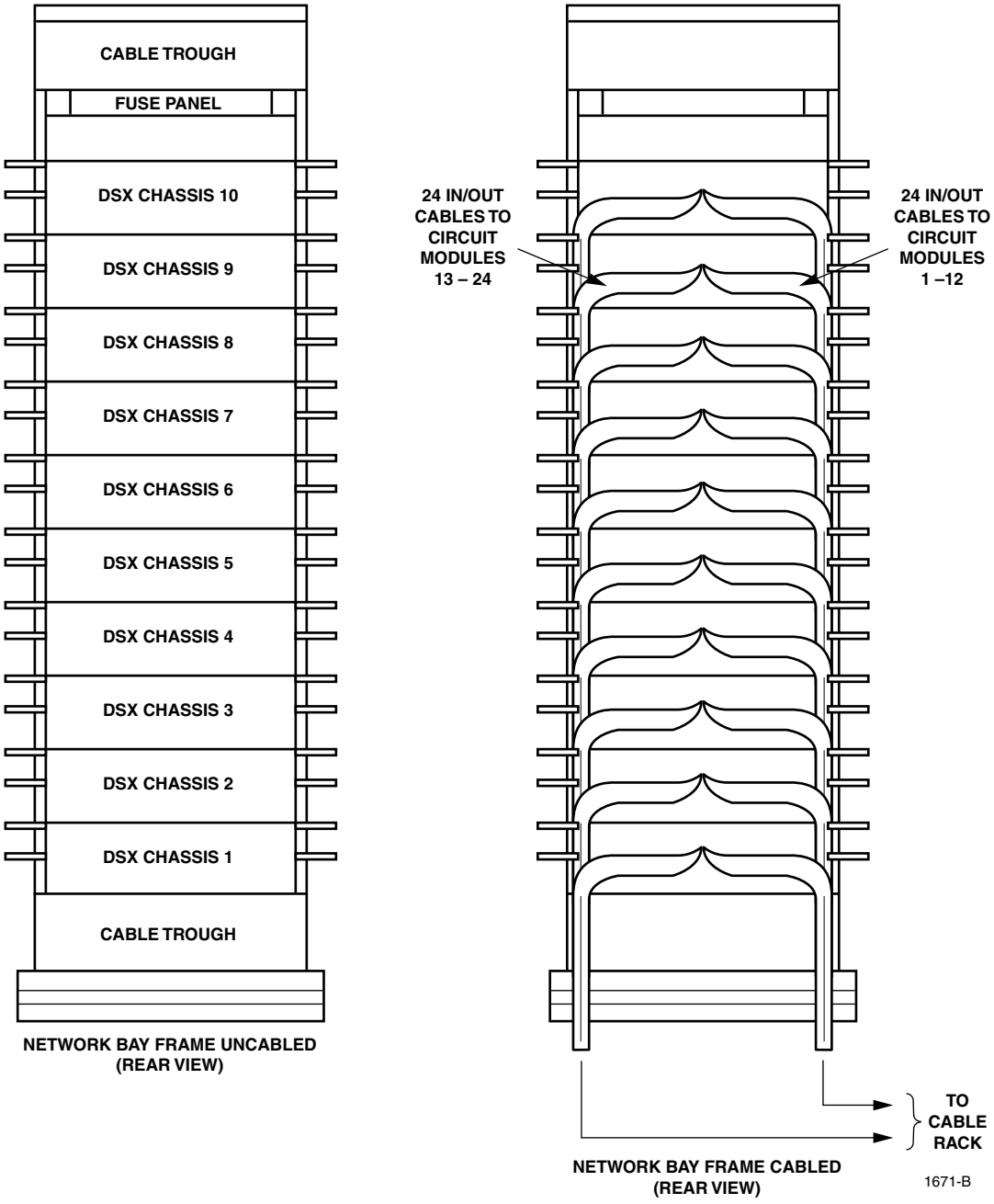

Figure 10. Cable Routing for Bottom Feed Cabling System

Place cables into rack ducts as shown below in Figure 11. The floor clearance hole on each side of the frame should be 4 inches by 4 inches (10.2 cm by 10.2 cm), when using 734A or equivalent cable, or 2 inches by 4 inches (5 cm by 10.2 cm) if using 735A or equivalent cable.

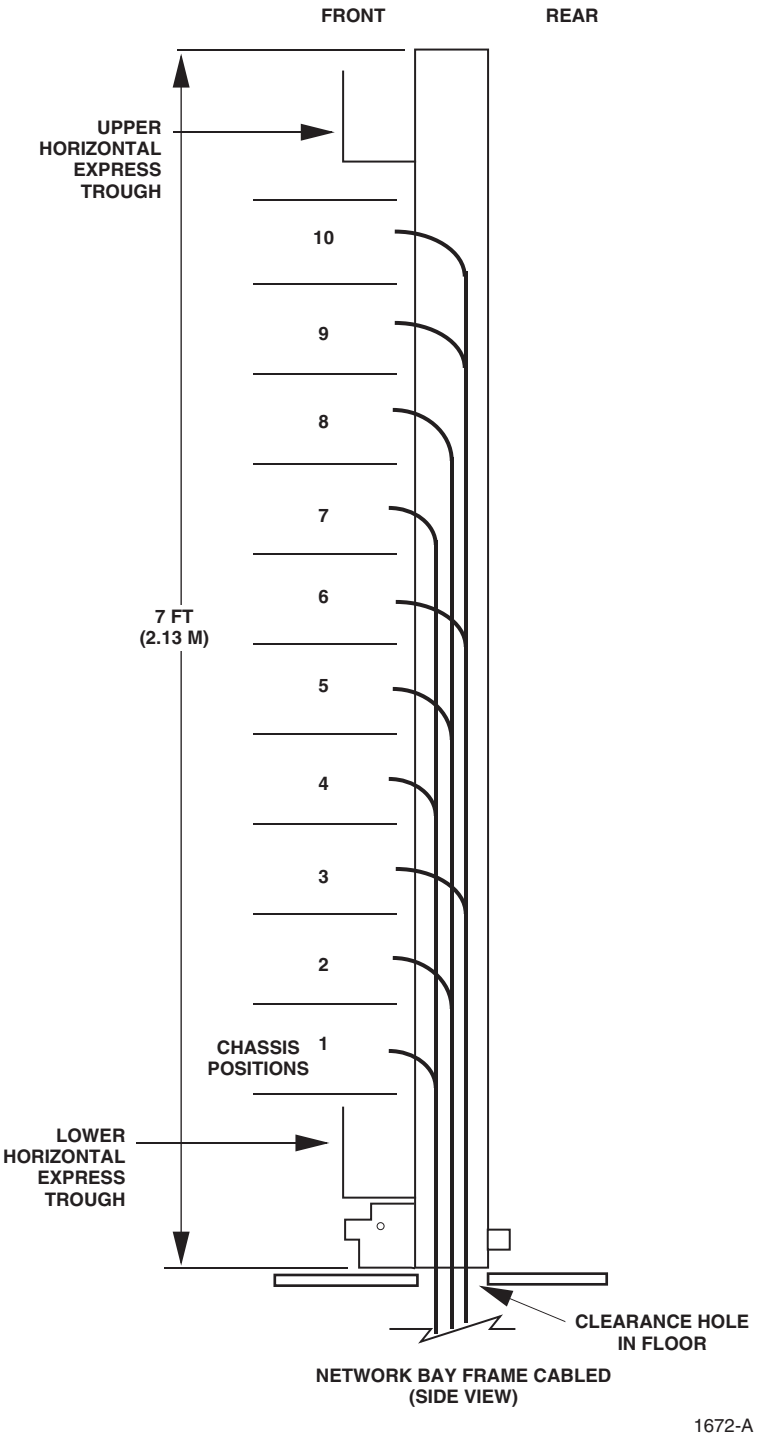

Figure 11. Cable Placement for Bottom Feed Cabling System

4.2 Office Equipment Cable Termination

Office equipment cables should be terminated to BNC or TNC connectors at the rear of the DSX-4H circuit modules.

Install BNC or TNC connector on each cable. Refer to Figure 12 for correct cable lengths, and to the Recommended Procedures for Coaxial Termination – Type 735A or 734A Cable with BNC and TNC Straight Connectors section within ADCP-70-001, Coaxial Cable Performance and Application Guide.

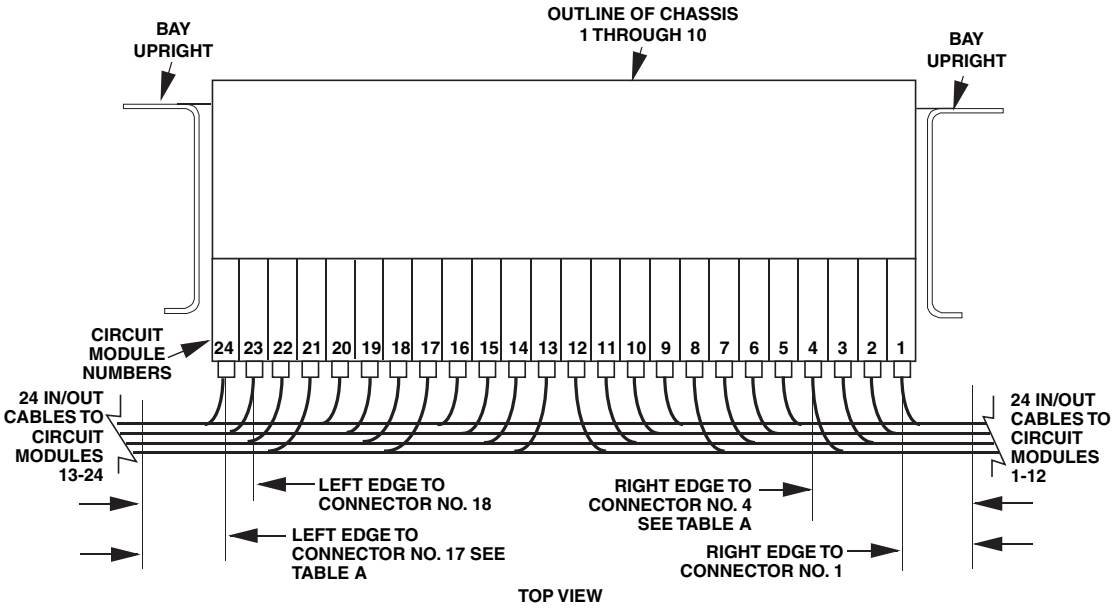

TABLE A. CABLE TRIM LENGTH

MODULE	"OUT" CONN AND "IN" CONN TO RIGHT EDGE (INCHES)	MODULE	"OUT" CONN AND "IN" CONN TO LEFT EDGE (INCHES)
1	3.1	13	13.0
2	4.0	14	12.1
3	4.9	15	11.2
4	5.8	16	10.3
5	6.7	17	9.4
6	7.6	18	8.5
7	8.5	19	7.6
8	9.4	20	6.7
9	10.3	21	5.8
10	11.2	22	4.9
11	12.1	23	4.0
12	13.0	24	3.1

TABLE B. CABLE BEND RADIUS

CABLE TYPE	MINIMUM BEND RADIUS
734A OR EQUIVALENT	0.5 INCHES
735A OR EQUIVALENT	0.25 INCHES

1673-B

Figure 12. DSX-4H Module Cable Lengths

Terminate each pair of cables from the DS3 office equipment to the IN and OUT connectors on a circuit module. Using tie-wraps, secure cables to the cable bar located on the back of each chassis. Figure 13 shows a fully terminated DSX-3 bay installation. Record all terminations on the adhesive-backed designation label on the rear of the chassis. Record similar information on the designation strip on the front of the module.

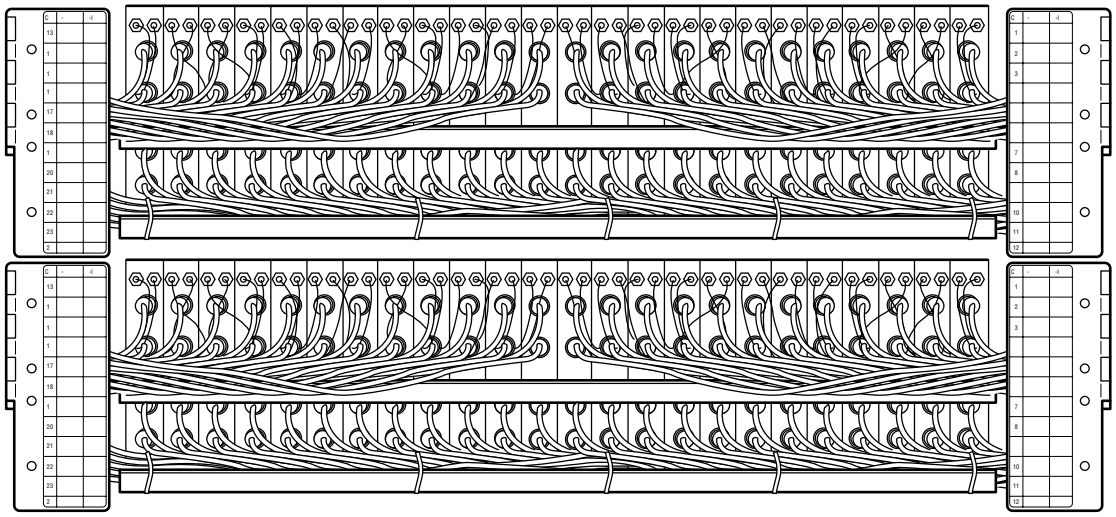

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Figure 13. Fully Terminated DSX-4H-24 System

4.3 Cross-Connect Cable Routing

Cross-connect jumpers are installed at the rear of the DSX-4H modules. BNC or TNC cross-connectors are provided on the rear of each circuit module. Cross-connect jumpers should not exceed the lengths shown in paragraph 1.04 for each specific equipment type.

When installing cross-connect jumpers, congestion must be held to a minimum. This will simplify jumper installation and provide optimal jumper traceability. This will also make DSX-4H-24 expansion and maintenance easier.

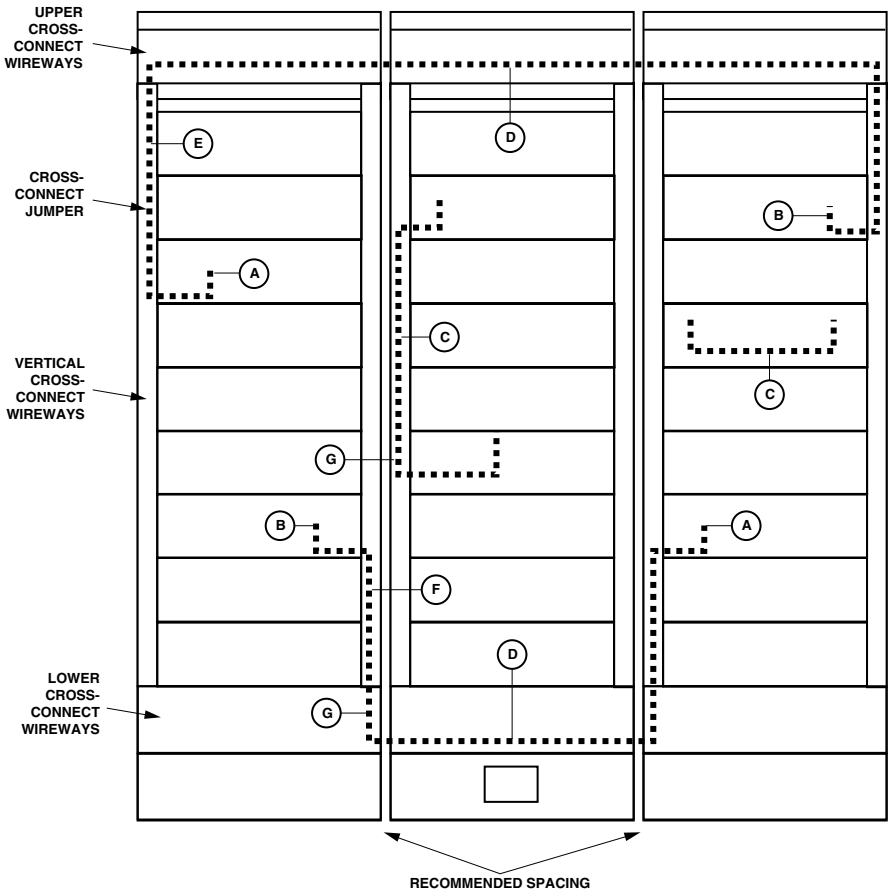
Recommended rules of jumper routing are shown in Figure 14. This figure shows a three bay system, however, the same basic rules apply for any number of bays. To prevent unnecessary jumper buildup and congestion, all unused cross connects should be removed from the wireways.

4.4 Cross-Connect Cabling

ADC DSX-4H-24 cross-connect jumpers are available in various lengths ranging from 1 to 27 feet (0.3 to 8.2 m). Cross-connect jumpers are also available with one connector or plug-attached and the other connector or plug-furnished unattached. These single-ended jumpers can be cut to the exact length required, which will reduce cross-connect congestion.

Using 735A type jumpers and accompanying messenger wires, cross-connect all necessary DSX-4H-24 circuits as shown in Figure 15.

1. Connect cross-connect OUT (XO) of the first termination to the cross-connect IN (XI) of the second termination. Connect the messenger wire pins of this cross-connect to either pin jack (XO or XI) on each termination.
2. Connect cross-connect IN (XI) of the first termination to the cross-connect OUT (XO) of the second termination. Connect the messenger wire pins of this cross-connect to the remaining pin jack on each termination.



NOTE: BASED ON THE TYPE OF CABLE SELECTED FOR EQUIPMENT IN/OUT CABLING AND CROSS-CONNECT JUMPER, THE ADC RECOMMENDED SPACING IS AS FOLLOWS:

APPLICATION		
EQUIPMENT I/O	X-CONN	SPACERS REQUIRED FOR UEF BAYS
735A/734A	735A OR 0222	ONE 10-INCH (25.4 CM) BETWEEN BAYS WITH ONE 5-INCH (12.7 CM) ON THE ENDS

ROUTING RULES

A. All jumpers in the left-hand side of the cross-connect field should enter and leave the bay from the left vertical wireways.

B. All jumpers in the right-hand side of the cross-connect field should enter and leave the bay from the right vertical wireways.

C. All intrabay cross-connects should use the vertical rings except when terminations are in the same panel.

D. All interbay cross-connects should use the horizontal wireways.

E. All jumpers originating in the upper half of the cross-connect field should route via the upper horizontal wireways.

F. All jumpers originating in the lower half of the cross-connect field should route via the lower horizontal wireways.

G. Whenever a jumper changes direction, it should do so at a ring or wireway.

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Figure 14. Recommended Cross-Connect Routing

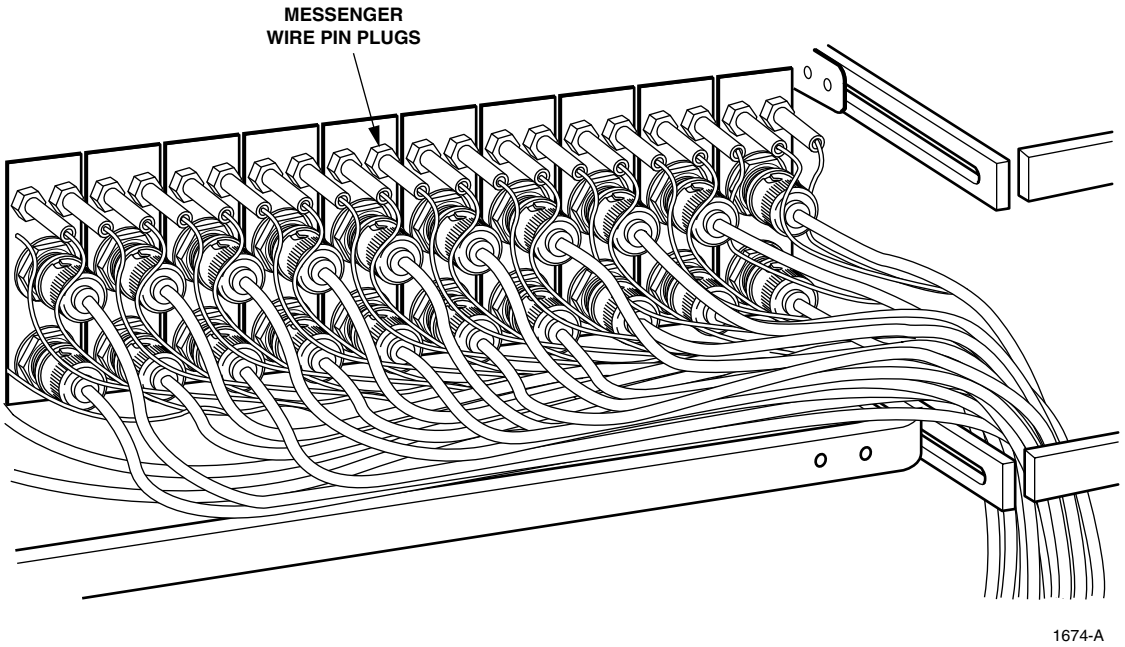

Figure 15. DSX-4H-24 Cross Connections

5 SYSTEM CHECKOUT

Place a 0.5 Amp fuse in the fuse panel for each DSX-4H-24 chassis added to each bay. When viewed from the front, fuses going from left to right correlate to chassis going from bottom to top.

Cross-connect wiring can be checked as necessary by pulling the tracer lamp button at the top of any DSX-4H circuit module. Pulling this button should cause the corresponding tracer lamp and the tracer lamp at the other end of the cross-connect to flash for approximately 30 seconds and then remain lit until the button is pushed back in.

6 CUSTOMER INFORMATION AND ASSISTANCE

For customers wanting information on ADC products or help in using them, ADC offers the services listed below. To obtain any of these services by telephone, first dial the central ADC telephone number, then dial the extension provided below.

The central number for calls originating in the U.S.A. or Canada is **1-800-366-3891**. For calls originating outside the U.S.A. or Canada, dial country code "1" then dial **952-946-3000**.

Sales Assistance **Extension 63000**	• Quotation Proposals • Ordering and Delivery • General Product Information
Systems Integration **Extension 63000**	• Complete Solutions (from Concept to Installation) • Network Design and Integration Testing • System Turn-Up and Testing • Network Monitoring (Upstream or Downstream) • Power Monitoring and Remote Surveillance • Service/Maintenance Agreements • Systems Operation
BCG Technical Assistance Center **Extension 63475** **E-Mail: bcg_tac@adc.com**	• Technical Information • System/Network Configuration • Product Specification and Application • Training (Product-Specific) • Installation and Operation Assistance • Troubleshooting and Repair
Product Return Department **Extension 63748** **E-Mail: repair&return@adc.com**	• ADC Return Authorization number and instructions must be obtained before returning products.

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