DSXi™ Cross-Connect Panel Installation Instructions

INTRODUCTION

This manual describes the installation of the DSXi Digital Signal Cross-Connect Panel and related equipment at the users site. It is recommended that the installation instructions be read completely and understood before beginning installation.

Revision History

ISSUE	DATE	REASON FOR CHANGE
1	1/2002	Original

Trademark Information

ADC is a registered trademark of ADC Telecommunications, Inc., DSXi is a trademark of ADC Telecommunications, Inc.

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.*

General Safety Precautions

⚠ **Warning:** *Never install telephone 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 to prevent electrical shock.*

UL Certification

The DSXi Cross-Connect Panel complies with the requirements of UL 1950.

NEBS Certification

The DSXi Cross-Connect Panel complies with the requirements of GR-63-CORE, Issue 1, October 1995 and GR-1089-CORE, Issue 2, December 1997 with Revision 1, February 1999 as specified in SR-3580, Issue 1, 1995.

1 GENERAL

The DSXi DSX-1 products are designed to offer customers greater density and flexibility in an easier-to-use better designed product format. DSXi panels are offered in a variety of configurations, including four cross-connect options, various heights and widths, circuit densities, labeling formats, and equipment connections. DSXi products use industry standard accessories (patch cords, plugs, etc.) and mount in industry standard EIA and WECO racks and bays.

All rear cross-connect panels have front jack field access with the equipment cabling and cross-connect fields on the rear of the panel. All front cross-connect panels have jack field and cross-connect fields on the front of the panel with the equipment cabling on the rear. Finally, all total front access panels have the jack field, cross-connect field, and equipment cabling on the front of the panel.

Within the front cross-connect panel family, there are two specific options: front-split and front-below cross-connect. Every front-split panel has the cross-connect field located on either side of the jack field, half on the left side and half on the right side. The front-below panel has the cross-connect field located below the jack field.

On all total front access panels, the input/output cabling field is located below the jack field, while the cross connect field is split on either side of the jack field.

DSXi panels are available in configurations consisting of two widths, three heights, four cross-connect formats, four circuit densities, two impedance load ratings, and two circuit labeling formats. DSXi panels are available in circuit densities of 56, 60, 64 and 84. These are shown in Table 1. Each panel is equipped with vertical circuit identification strips and is designed for universal mounting in either EIA or WECO mounting racks. The panel can be mounted flush, or with a two, three, or four inch recess.

Table 1. DSXi Product Variety

CROSS-CONNECT ACCESS	DENSITY	H X W X D	CABLING	MOUNTING WIDTH
Rear	84	4” x 23” x 8”	Wire wrap/64pin	23”
Rear	56	4” x 19” x 8”	Wire wrap/64pin	19/23”
Front Split	84	4” x 23” x 8”	Wire wrap/64pin	23”
Front Split	56	4” x 19” x 8”	Wire wrap/64pin	19/23”
Rear	64	4” x 19” x 8”	Wire wrap	19/23”
Front Below	56	6” x 19” x 8”	Wire wrap/64pin	19/23”
Front Below	84	7” x 19” x 8”	Wire wrap	19/23”
Front Below	64	6” x 19” x 8”	Wire wrap	19/23”
Total Front Access	56	6” x 19” x 8”	Wire wrap	19/23”
Total Front Access	84	6” x 23” x 8”	Wire wrap	23”
Total Front Access	64	6” x 23” x 8”	Wire wrap	23”
Front Split	64	4” x 23” x 8”	Wire wrap	23”
Rear	60	4” x 19” x 8”	Wire wrap	19/23”
Rear	84	7” x 19” x 8”	Wire wrap	19/23”

2 INSTALLATION

⚠ **Warning:** *Never install telephone 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 to prevent electrical shock.*

This section provides installation procedures for DSXi Panels. A proper installation can not be accomplished unless the site has been appropriately prepared in accordance with standard guidelines.

2.1 Environment

The DSXi System will operate in any ambient temperature and humidity within the following ranges:

- Temperature: –5ºC to +55ºC (+23ºF to +131ºF) Per Telcordia GR-63.
- Humidity: up to 95% relative humidity without condensation. Per Telcordia GR-63.

The DSX System can be shipped and stored in any ambient temperature and humidity within the following ranges:

- Temperature: –40ºC to +60ºC (–40ºF to +140ºF).
- Humidity: 10% to 95% relative humidity without condensation.

2.2 Unpacking and Inspection

The DSXi panel and accessory package are packaged separately for protection during shipping. Remove all items from their shipping containers. Verify that all parts on the packing slip have been received before discarding the shipping containers. If there are any damaged or missing parts file a claim with the commercial carrier and notify ADC.

2.2.1 Panel Positioning and Mounting

The accessory package contains screws, mounting brackets, cable rings, installation drawing, etc. Mounting brackets are installed on the panels before locating them in their assigned bay positions. A maximum of 14 DSXi Panels may be installed in a seven foot rack with a fifteen inch footprint. Ten to eleven DSXi panels may be installed in a seven foot rack with a twelve inch footprint.

When installing DSXi Panels in a raised floor environment, add the panels in the bay in a top to bottom order. When using a solid floor environment (over-head cabling), work in a bottom to top order. Install each DSXi Panel as follows:

1. Determine the new panel position in the bay.
2. Determine recess in the rack. Panel can be mounted flush or with 2, 3, or 4-inch recess. Remove mounting brackets and reposition as necessary.
3. Secure panel in place with screws through the upper and lower mounting holes of the panel.
4. On front cross-connect panels position cable ring mounting brackets and cable rings on the panel and tighten mounting screws. Cable rings may already be installed on rear cross-connect panels, if not install them at this time.
5. Rack filler panels are required between the DSXi racks. A 5-inch rack filler panel is recommended for installations using 56 to 64 position panels. A 7.5-inch rack filler panel is recommended for installations using 84 position panels.

3 SYSTEM WIRING AND CABLING

Wiring and cabling the DSXi System into the office requires connection of office power and ground, wiring of cross-aisle and interbay patching panels, cabling of network element input/output circuits, and installation of all cross-connect jumpers. The following paragraphs give procedures for installing the wiring and cabling.

⚠ **Caution:** *All DSX wiring and cabling should be connected with the system office battery input off or disconnected at the office distribution panel.*

3.1 Power Wiring

The DSXi System operates on –48 Vdc filtered office battery, fused or breakered at the office distribution panel. Approximate current requirements can be calculated based on one flashing LED (Bantam) drawing 0.01 Amps.

The number of LEDs lit at any one time will depend on local patching and testing procedures. It is recommended that individual DSXi panels be fused at the fuse panel with a 0.5 Amp fuse and connected to the fuse panel using 24 AWG solid copper wire. Each fuse panel dedicated to an individual DSXi bay serving only tracer lamps and LEDs should be connected with solid copper wires to the office battery supply and fused with a 3.0 Amp fuse.

DSXi Panels have power and ground terminal strips or blocks located at either the front or rear of the panel to provide connection to the office battery and ground. Typical configurations are shown in Figure 1 and Figure 2. Connect office battery and ground to the DSXi Panels as follows:

- Connect –48 Vdc office battery to the –48 V terminal on the terminal strip/block.
- Connect –48 Vdc office battery return to the RTN terminal on the terminal strip.
- Connect office frame ground to the GND terminal, follow local grounding practices. This is the recommended chassis grounding procedure.

➧ **Note:** The metal strap between the GND (chassis ground) and SG (shield ground) terminals may be removed to isolate shield ground from chassis ground.

- Connect the –48 Vdc office battery from the DSXi panel to the NEG (–) BUS terminal on the fuse panel. Match fuse position one to panel one, fuse position two to panel two, etc.
- Connect the office battery return (ground) from the DSXi panel to the POS (+) BUS terminal on the fuse panel.

ADC fuse panel busses are typically rated at 50 to 70 Amps. The size of the feeder wires between the fuse panel and the office battery should be calculated based on anticipated overall bay equipage and use of the fuse panel.

Each fuse panel may be connected to a remote fuse alarm system. If this option is desired, connect the office fuse alarm system to the two REMOTE ALARM terminals on the fuse panel. A closure (dry loop) will be provided across these two terminals in the fuse panel whenever a fuse is activated.

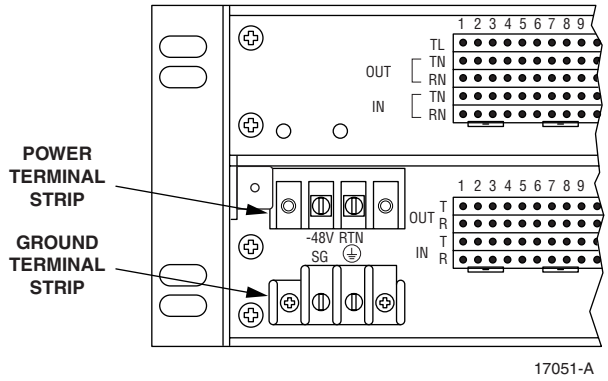


Figure 1. DSXi Power and Ground Terminal Strips (Typical Rear Cross-Connect)

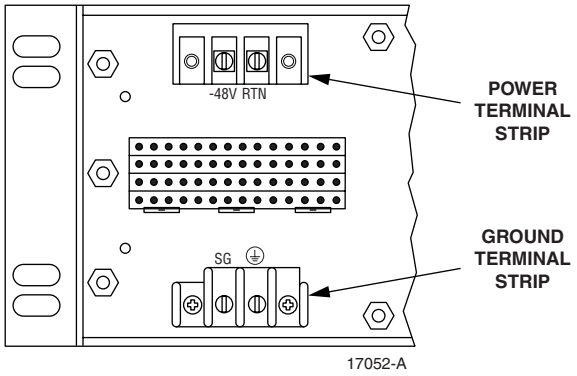


Figure 2. DSXi Power and Ground Terminal Strips (Typical Front Cross-Connect)

3.2 Cabling and Cross-Connect Wiring

3.2.1 Installation Drawings

All bays, chassis, modules, and panels are shipped with installation drawings. These drawings define the specific input/output and cross-connect terminals wired to each DSX circuit and front-panel jack.

3.2.2 Cable Routing

Note: To maximize cable density in the DSXi bay careful attention to cable dressing is critical. All cables must be neatly and securely tied or laced in place to prevent over crowding in the verticalduct area of the rack.

DSXi Systems are wired to the network element by means of cables at the front or rear of each bay, depending upon the access specified. All cabling should be in accordance with local practices.

If cables are entering the bay from above, cable attachment should start with the bottom panel and work up. If the cables are coming from below, cable attachment should begin at the top.

All cables should be secured to brackets at the rear of the bay or within the duct (unequal flange bays). The cable jacket should be stripped from an area past the last tie on the cable bracket at a level about even with the wire-wrap pins to which the wires will be connected. A six-inch service loop should be left before the cable is routed to the wire-wrap terminals.

3.2.3 Network Element Cabling

Using cables and wire-wrap tools, connect the network element to their designated DSX input/ output terminations. Typical connections are defined in the installation drawings accompanying the DSXi equipment. Terminate cabling for each network element receive to one pair of IN wire-wrap terminals, and each transmit to one pair of OUT wire-wrap terminals.

3.2.4 Cross-Aisle Panel Cabling

Cross-aisle tie cables between lineups in DS1 and DSXi systems should be connected in a manner similar to Figure 3 or Figure 4. Connect the tie cables to the wire-wrap terminals on the rear of the cross-aisle panels as defined in the installation drawing. The OUT terminals of the originating cross-aisle panel connect to the IN terminals of the terminating cross-aisle panel, and the IN terminals of the originating cross-aisle panel connect to the OUT terminals of the terminating cross-aisle panel.

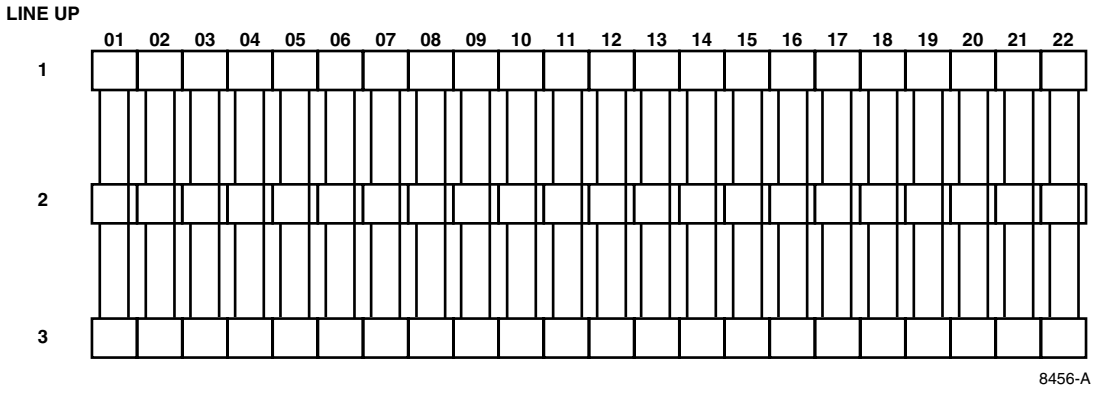


Figure 3. DSXi Cross-Aisle Panel Direct Wiring

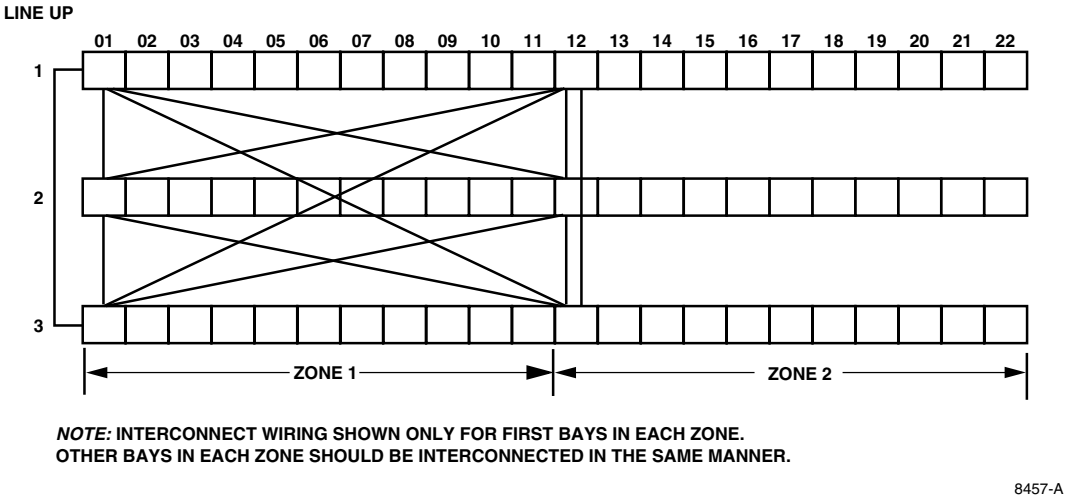
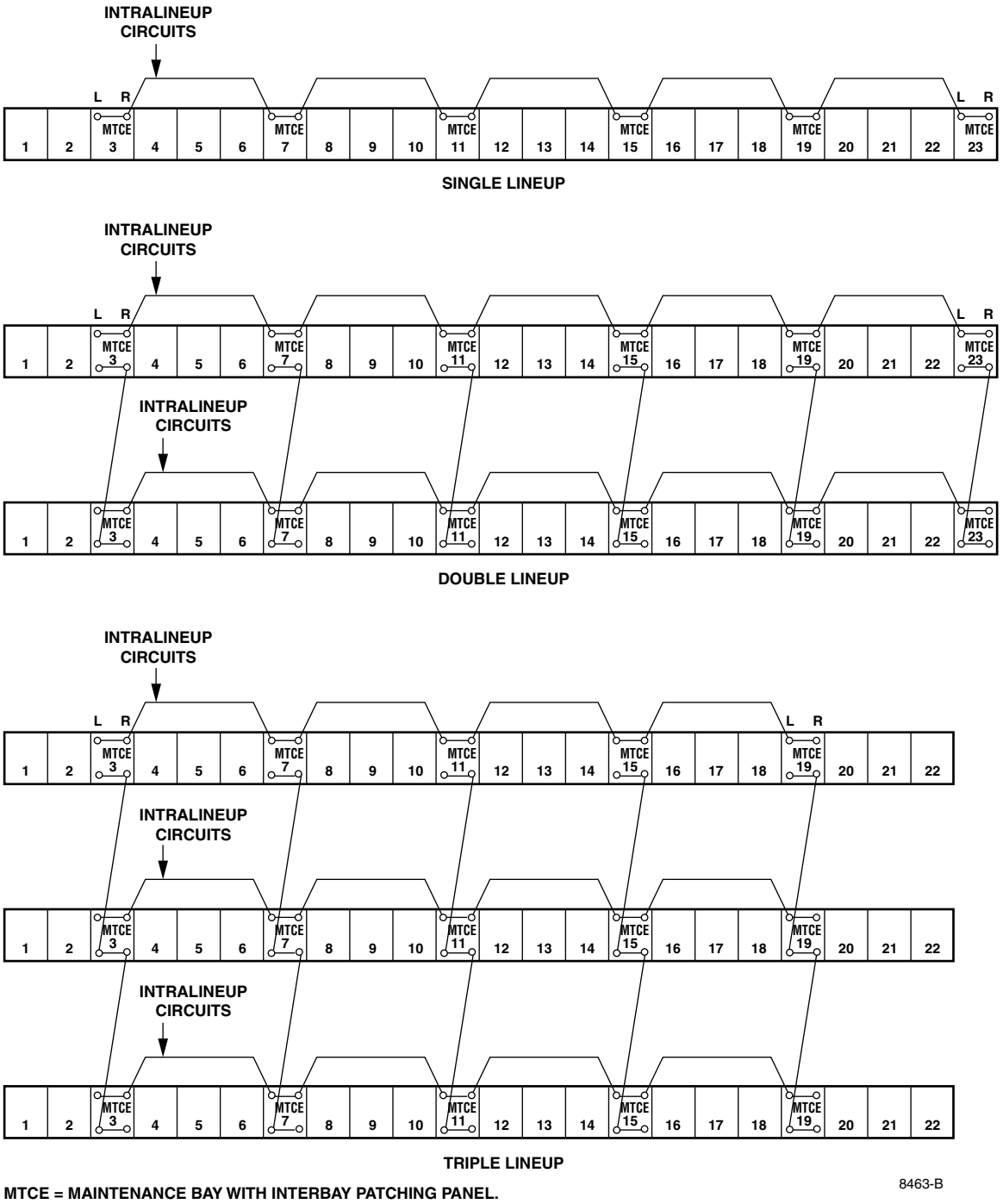


Figure 4. DSXi Cross-Aisle Panel Two Zone Wiring

3.2.5 Interbay Patching Panel Cabling

Connect all Interbay Patching Panels using tie cables to wire-wrap terminals at the back of each panel. Specific wire-wrap terminals are defined in the installation drawing. Interbay patching panels are normally located in every fourth bay of DS1 and DSXi systems as shown in Figure 5.

Recommended interpanel cabling is also shown in Figure 5. The wire-wrap terminals designated LEFT should be cabled to the preceding interbay panel, and the terminals designated RIGHT should be cabled to the succeeding interbay panel.

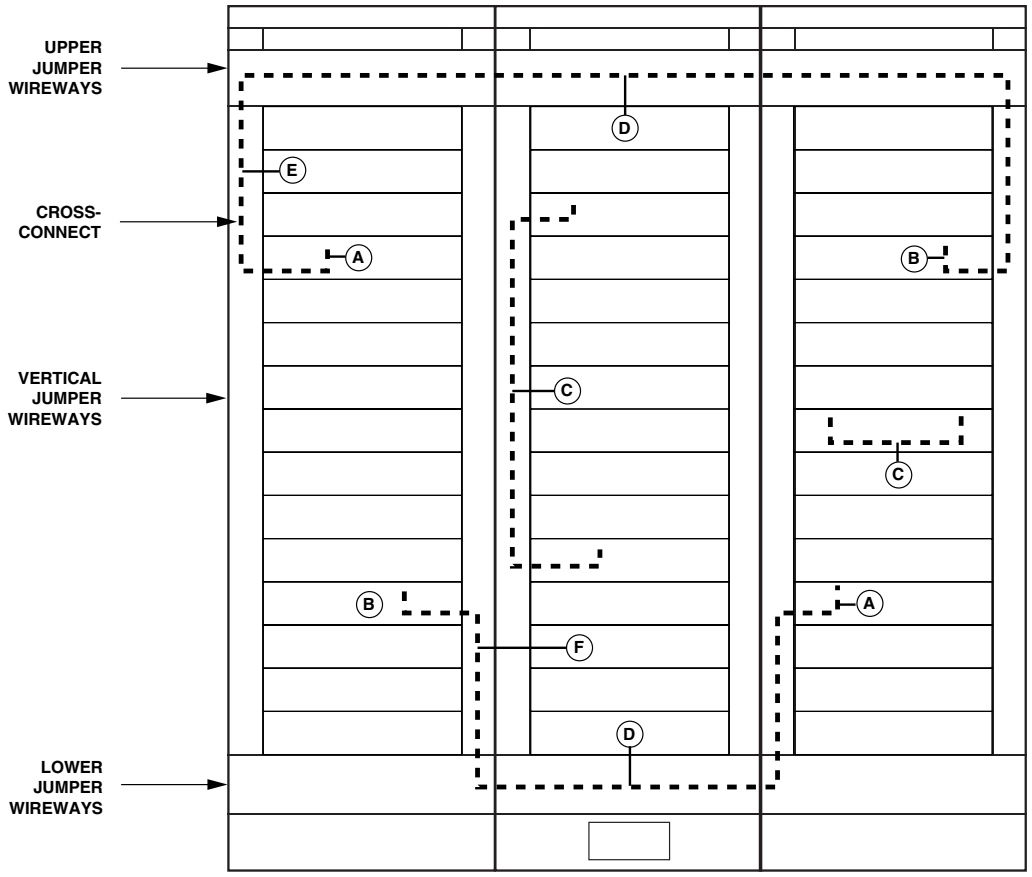


MTCE = MAINTENANCE BAY WITH INTERBAY PATCHING PANEL.

Figure 5. Typical DSXi Bay Arrangements Showing Interbay Patch Panel Wiring

3.2.6 Cross-Connect Wiring

Cross-connect jumpers should be routed as shown in Figure 6 and Figure 7. All cross-connect jumpers should use the horizontal wireways between bays, and the vertical wireways within the bay. Whenever a jumper changes direction, it should do so where a ring, tray or fanning strip is located. This will allow the jumpers to be dressed neatly without strain or interfering with other jumpers. All discontinued jumpers should be removed from the DSX wireways, to prevent unnecessary buildup and congestion.



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 JUMPERS SHOULD USE HORIZONTAL WIREWAYS.

E. ALL INTERBAY JUMPERS ORIGINATING IN THE UPPER HALF OF THE CROSS-CONNECT FIELD SHOULD ROUTE VIA THE UPPER HORIZONTAL WIREWAYS.

F. ALL INTERBAY JUMPERS ORIGINATING IN THE LOWER HALF OF THE CROSS-CONNECT FIELD SHOULD ROUTE VIA THE LOWER HORIZONTAL WIREWAYS.

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Figure 6. Recommended Cross-Connect Routing In DSXi Bays

Figure 7 also shows cross-connect terminal block with an example of a cross connect jumper. Wire congestion is held to a minimum if all recommendations are carefully followed. This simplifies installation, provides for easy wire tracing and simpler DSXi expansion and maintenance.

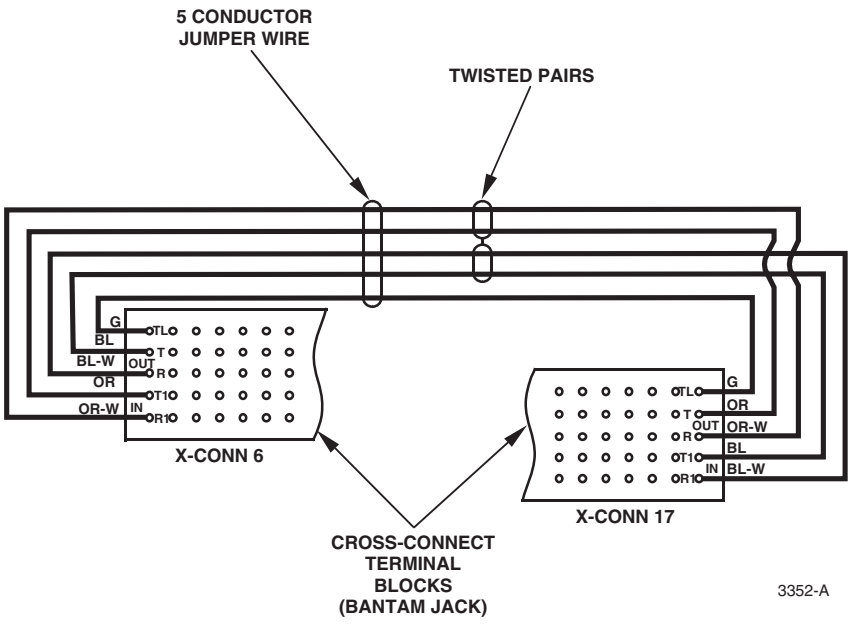


Figure 7. Basic Five-Wire DSXi Cross-Connect Wiring

3.2.7 DSXi Cross Connects

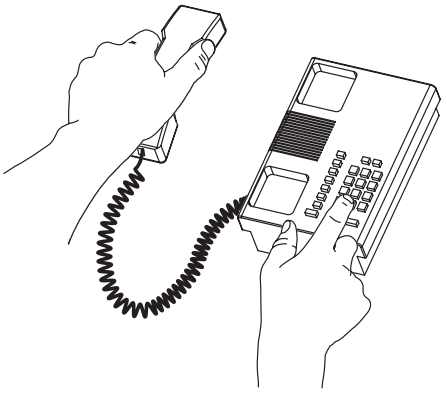
Using five-conductor 24 AWG jumpers, cross-connect DSXi circuits as shown in Figure 7. Terminal identification is as shown in the installation drawing accompanying each panel.

- Connect the TL of the first termination to the TL of the second termination (green wire).
- Connect the OUT of the first termination to the IN of the second termination (blue wire and blue and white wire).
- Connect the IN of the first termination to the OUT of the second termination (orange wire and orange and white wire).

Remove any discontinued jumper by disconnecting each end and cutting off the bare ends. Remove each end of the jumper from the vertical wireways, and carefully remove the jumper from the horizontal wireway by pulling at either end. This method will allow the jumper to be removed without snagging or placing undue strain on the remaining jumpers.

4 CUSTOMER INFORMATION AND ASSISTANCE

PHONE:



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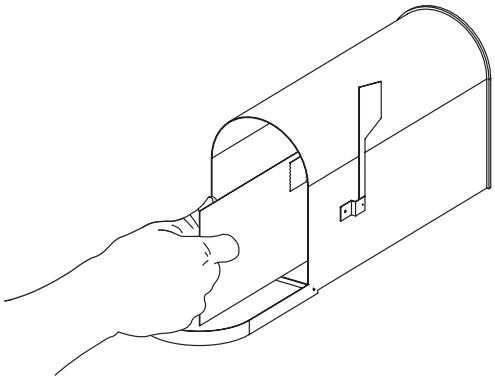

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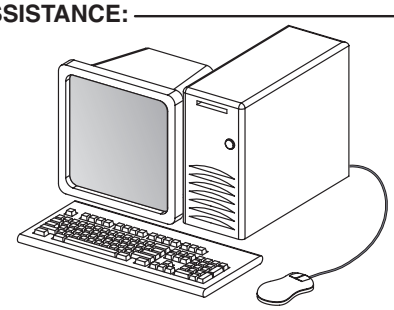

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