Rack-Mount Panel and Wall-Mount Box

INTRODUCTION

FL1000 products provide solutions for terminating and splicing fibers in small fiber networks. The product line consists of three rack-mount panels and three wall-mount boxes. The rack-mount panels include a 12-fiber termination panel, a 24-fiber termination panel, and a 24-fiber termination/splicing panel. The wall-mount boxes include a 12-fiber termination/splicing box, a 24-fiber termination/splicing box, and a 48-fiber splicing box. Options include 6pak adapter plates, with or without pigtails, splice trays, and cable kits.

This manual contains all procedures required to install and operate any FL1000 product or product option. The procedures are presented in the order in which they would normally be done, with separate installation sections for rack-mount and wall-mount units. Select from the procedures based on your specific installation.

Revision History

ISSUE	DATE	REASON FOR CHANGE
Issue 1	09/1998	Original.
Issue 2	04/2001	Non-technical update.
Issue 3	08/2011	Revised for new two-door design for wallbox.
Issue 4	July 2016	Reformatted for CommScope.

Trademark Information

FL1000 is a registered trademark of CommScope. Inc.

ST is a registered trademark of AT&T Technologies, Inc.

Admonishments

Important safety admonishments are used throughout this manual to warn of possible hazards to persons or equipment. The admonishments — in the form of Dangers, Warnings, and Cautions — must be followed at all times.

⚠ **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   UNPACKING AND INSPECTION

Unpack and inspect the various components as follows:

1. Inspect the exterior of the shipping container(s) for evidence of rough handling that may have damaged the components in the container.

2. Unpack each container while carefully checking the contents for damage.

3. File a claim with the commercial carrier and notify BCG Technical Assistance Center, if damage is detected or if parts are missing. Save damaged cartons for inspection by the carrier.

4. Save all shipping containers for use if the equipment requires shipment at a future date.

2 RACK-MOUNT PANEL INSTALLATION

2.1 Installing a Rack-Mount Chassis

The FL1000 rack-mount panel can be installed on either a 19-inch (48.26 cm) or 23-inch (58.42 cm) rack. It is designed for mounting in an EIA style rack, but a WECO style rack can also be used. It can be mounted flush on the rack or with a 5-inch (12.7 cm) recess. The panel is shipped ready to be installed with a 5-inch recess on a 19-inch rack. For other mounting positions, the mounting brackets must be removed and remounted in a different orientation. Select from the procedures below based on your specific installation.

2.1.1 19-Inch Rack, 5-Inch Recess (as Shipped)

See Figure 1. Use the following procedure.

1. Position the chassis on the rack.

2. Attach the mounting brackets to the rack using the #12-24 screws supplied.

MOUNTING BRACKET POSITIONED FOR 5-INCH RECESS

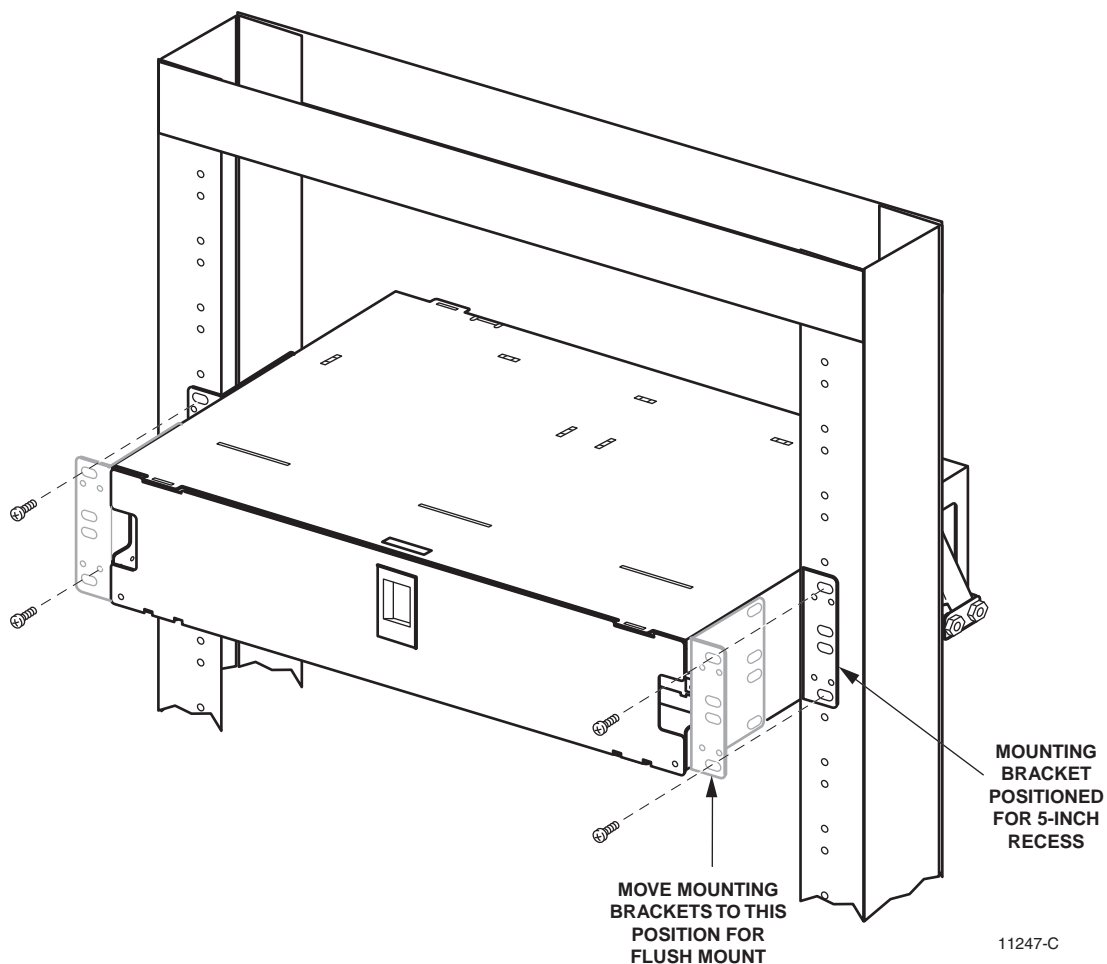MOVE MOUNTING BRACKETS TO THIS POSITION FOR FLUSH MOUNT

11247-C

Figure 1. Installing a Chassis on a 19-Inch Rack

2.1.2   19-Inch Rack, Flush; 23-Inch Rack, 5-Inch Recess; 23-Inch Rack, Flush

For these positions, the mounting brackets must be removed and remounted in a different orientation. Use the following procedure.

1. Remove the mounting brackets.

2. Remount the mounting brackets in the position shown:

    a. For 19-inch rack, flush mount, use Figure 1 forward position;

    b. For 23-inch rack, 5-inch recess mount, use Figure 2 back position;

    c. For 23-inch rack, flush mount, use Figure 2 forward position.

3. Attach the mounting brackets to the rack using the #12-24 screws supplied.

MOUNTING BRACKET POSITIONED FOR 5-INCH RECESS

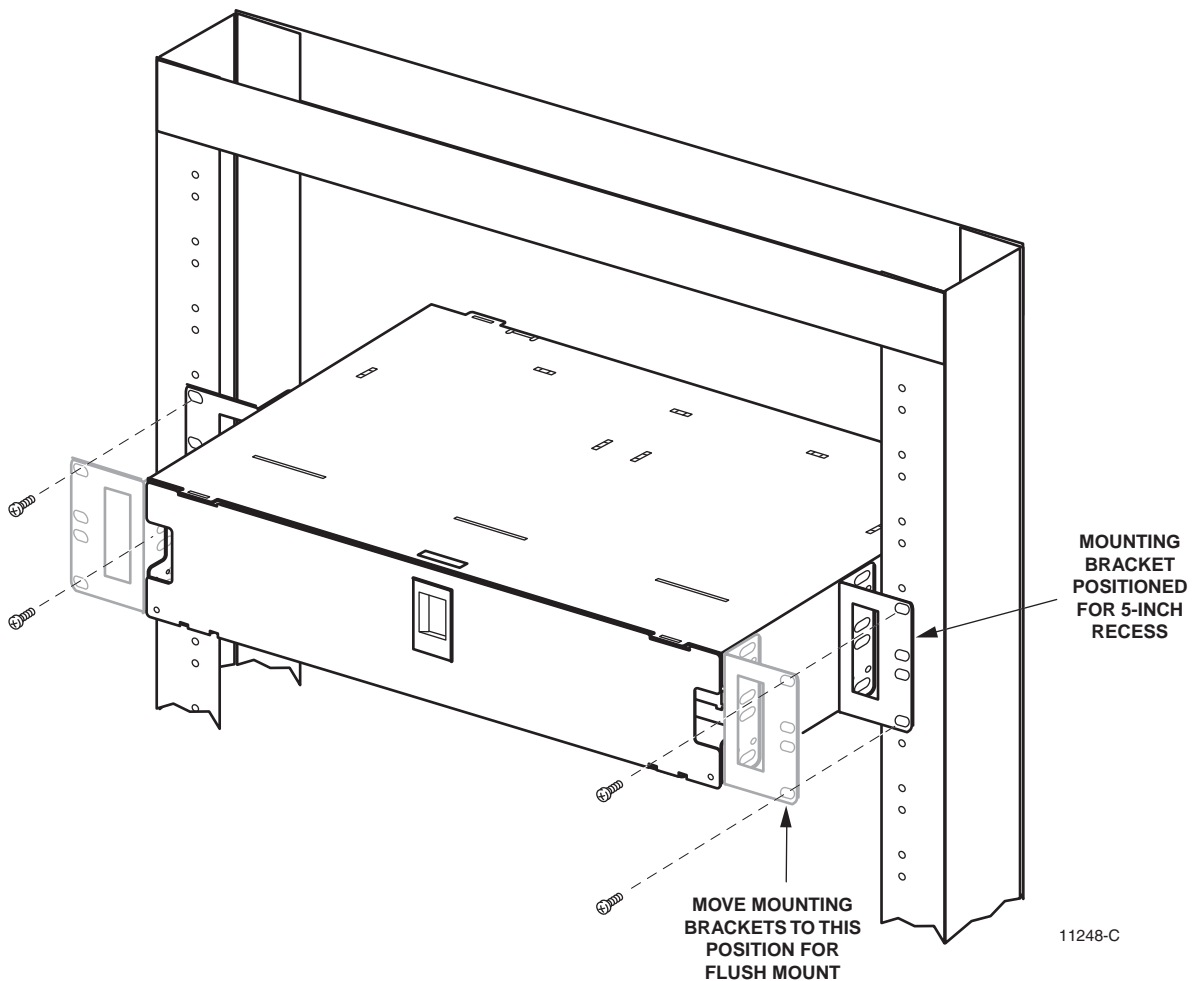MOVE MOUNTING BRACKETS TO THIS POSITION FOR FLUSH MOUNT

11248-C

Figure 2. Installing a Chassis on a 23-Inch Rack

2.2   Installing 6pak Adapter Plates and Pigtails

The 6pak adapter plates may be any of several types including:

- Simplex or duplex with adapters only

- Blank plates for filling in unused slots

- Simplex or duplex with adapters and attached pigtails

To install adapter plates without pigtails, refer to the first procedure below. To install adapter plates with pigtails, refer to the second procedure. Adapter plates with pigtails are used in the 24-fiber termination/splicing panel only.

2.2.1   Adapter Plates Without Pigtails (Blank or 6Pak)

Use the following procedure to install blanks or 6pak plates without pigtails:

1. Remove the front cover.

2. Align the adapter plate tabs with the notches in the mounting slot as shown in Figure 3.

3. Slide the 6pak or blank up into the slot until it snaps in place.
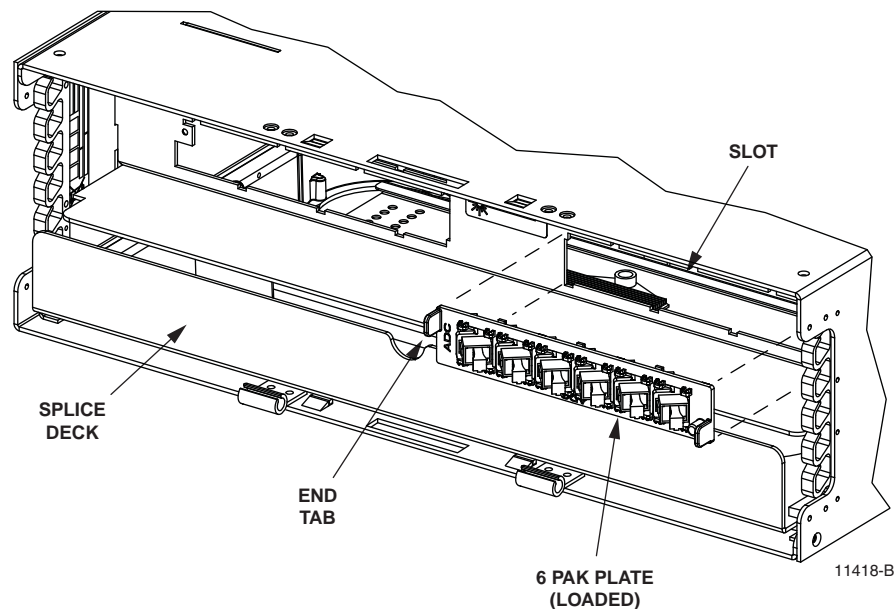

Figure 3. Installing 6pak Plates

2.2.2 Adapter Plates With Pigtails

Use the following procedure to install 6pak plates with pigtails in the 24-fiber termination/splicing panel.

1. Remove the front cover and slide out the splice deck.

2. Thread the pigtails through the empty mounting slot and loop the pigtails around the radius limiters in the chassis as shown in Figure 4.

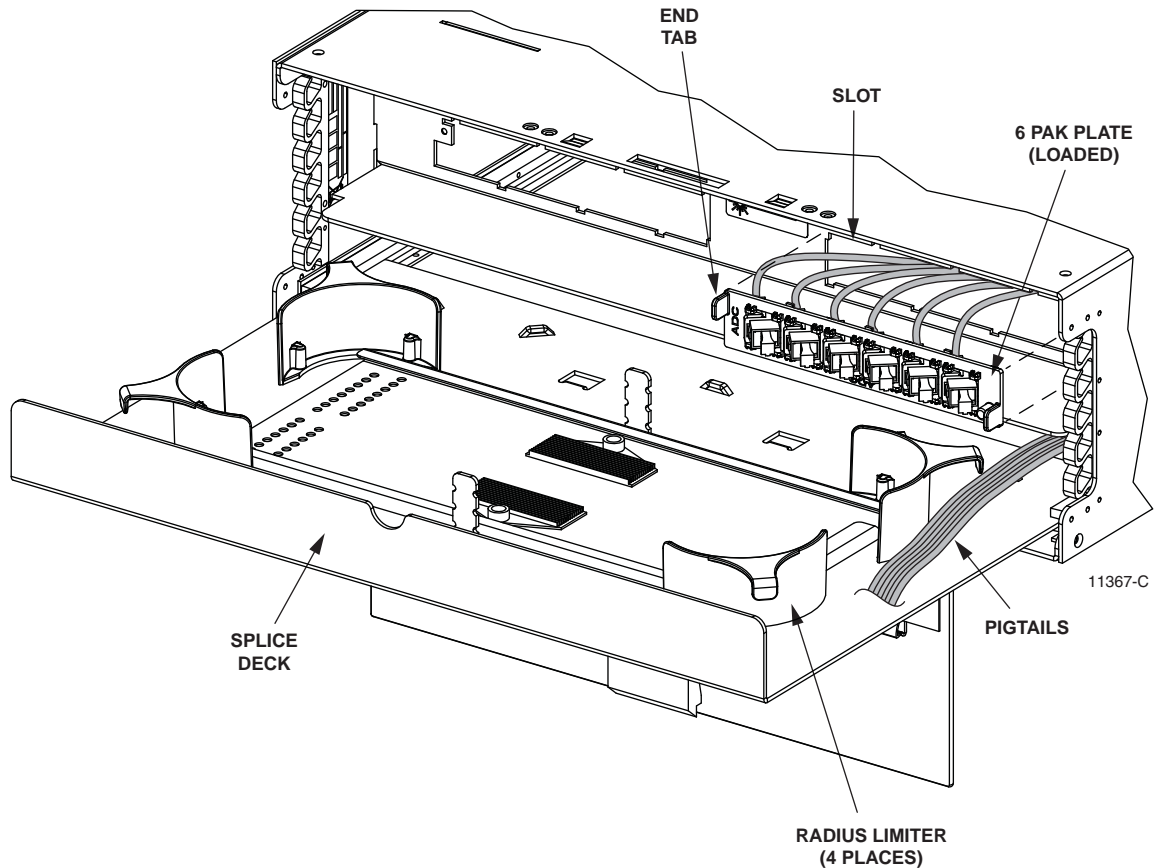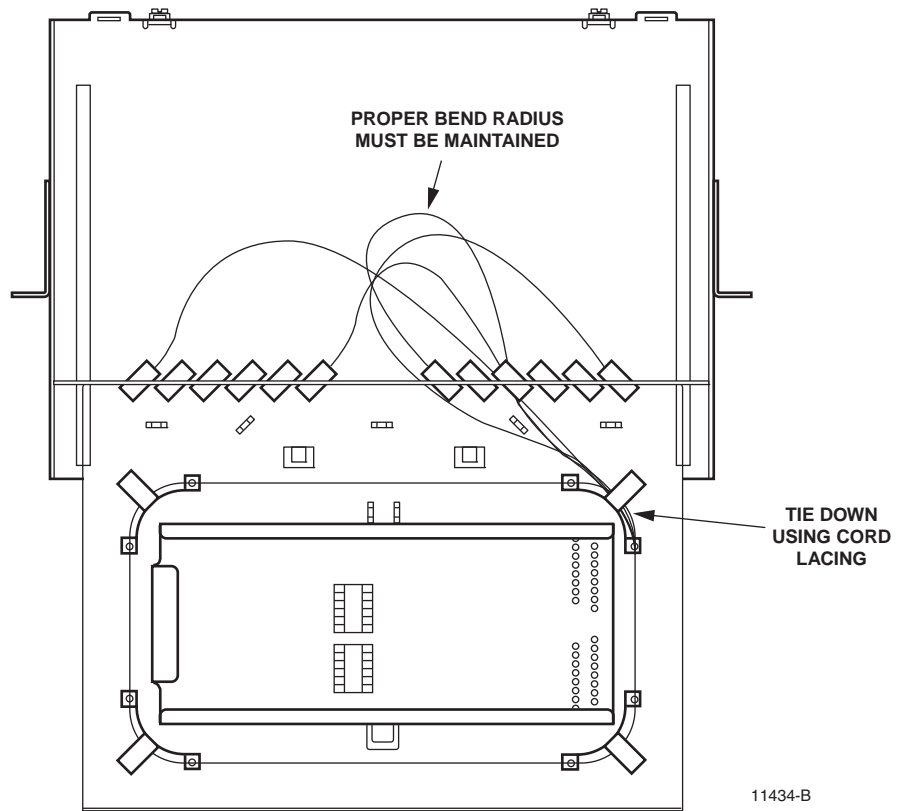
Figure 4. Installing 6pak Plates with Pigtails

3. Align the adapter plate tabs with the notches in the mounting slot as shown in Figure 4.

4. Slide the 6pak plate into the slot until it snaps in place.

5. Fan out the fibers and tie them to the radius limiter on the right rear side of the splice deck as shown in Figure 5. To tie the fibers, use cord lacing.

6. Route the fibers to the splice tray. For an illustration of correct routing, refer to subsection 3.4, Splicing, below.

**TIE DOWN
USING CORD
LACING**
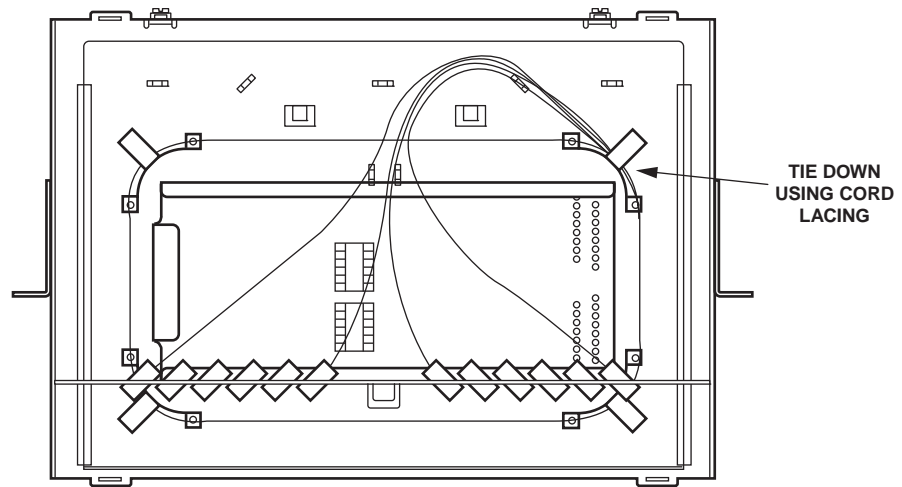
TOP VIEW WITH SPLICE DRAWER CLOSED

**PROPER BEND RADIUS
MUST BE MAINTAINED**

**TIE DOWN
USING CORD
LACING**

11434-B

TOP VIEW WITH SPLICE DRAWER OPEN

Figure 5. Correct Pigtail Routing within 24-Fiber Termination/Splicing Module

2.3   Installing Cables and Routing Fibers

The rack-mount panel can accommodate either IFC or OSP cable. The procedures used to install the cable differ slightly for the three chassis types (12-fiber termination panel, 24-fiber termination panel, and 24-fiber termination/splicing panel). Refer to the appropriate topic below for the type being installed.

2.3.1   12-Fiber Termination Rack Mount Panel

Figure 6 shows cable routing options and breakout dimensions for the 12-fiber termination rack-mount panel. The cable can enter from above or below the chassis and from the left or right side.

Use the following procedure to install the cable.

1. Route the cable to the chassis and break out the cable corresponding to Figure 6.
2. Secure the cable as follows:
    a. Fasten the tie-down bracket to the panel at the cable point of entry using the screws provided.
    b. Position the cable on the tie down bracket with the cable sheath extending about 0.75 inch (1.9 cm) beyond the bracket into the chassis.
    c. Tie down the cable using cord lacing.
    d. Secure the cable in a second location on the rack or wall using a user-provided clamp per local practice.
3. Remove the front access door and slide out the bulkhead deck.
4. Route the buffers within the chassis from the cable point of entry to the opposite side of the bulkhead deck, as shown in Figure 6.
5. Tie down the buffers in the location shown in Figure 6 using cord lacing secured to the lance.
6. At the buffer breakout point, fan out the fibers from the buffers and secure them using a curly lock at the location shown in Figure 6.

⚠ **Danger:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the optical bulkhead of an operational transmitter, or into the launching (output) end of an active fiber. A clean, protective cap or hood MUST be immediately placed over any radiating bulkhead receptacle or optical fiber connector to avoid exposure to potentially dangerous amounts of radiation. This practice also helps prevent contamination of connectors and adapters.*

7. Connect the fiber connectors to the adapters on the rear of the 6pak adapter plate.
8. Slide in the bulkhead deck to its closed position.
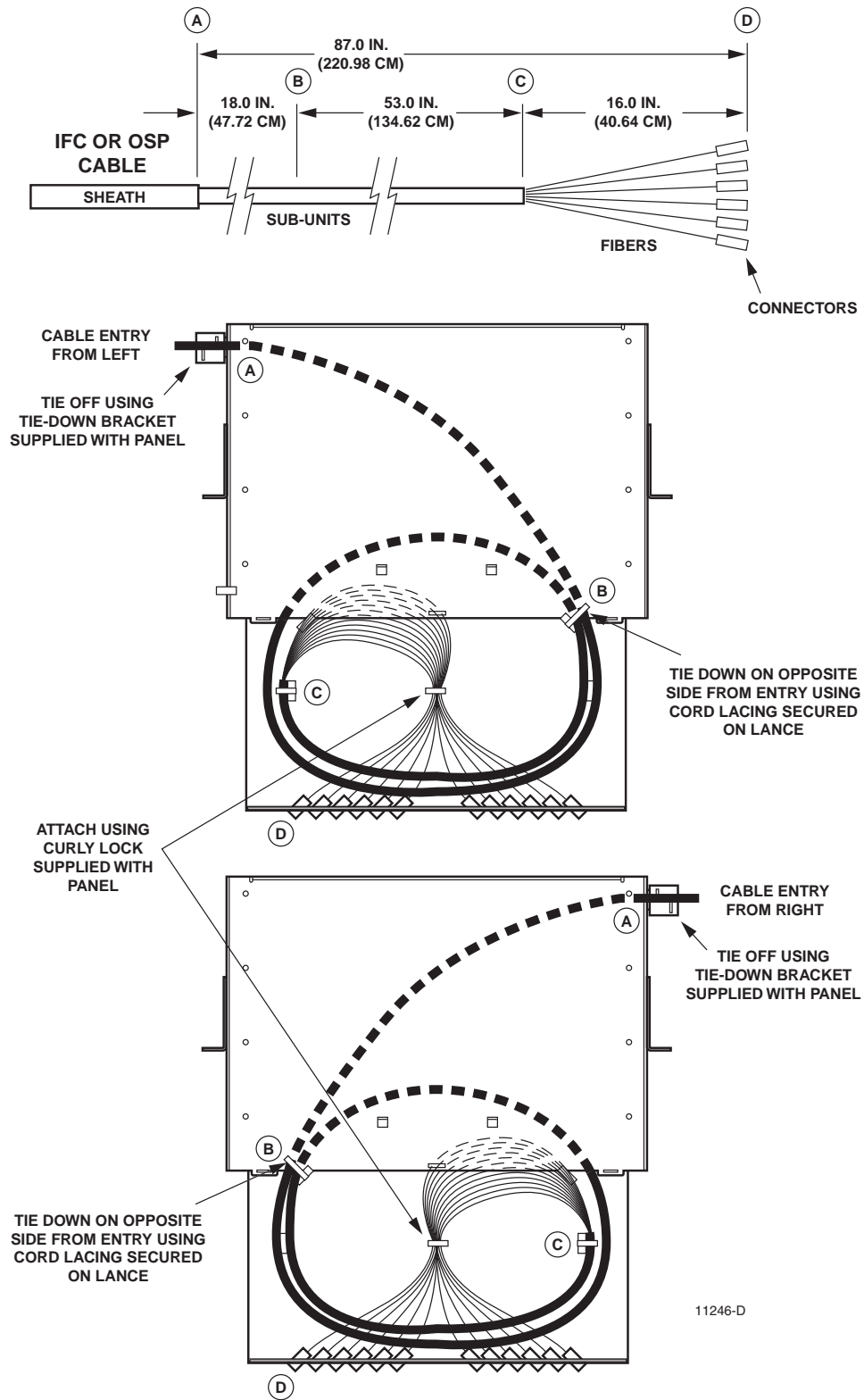9. Replace the front access cover.

Figure 6. Cable Breakout for 12-Fiber Panel

2.3.2   24-Fiber Termination Rack Mount Panel

Figure 7 shows cable routing options and breakout dimensions for the 24-fiber termination rack-mount panel. The cable can enter from above or below the chassis and from the left or right side.
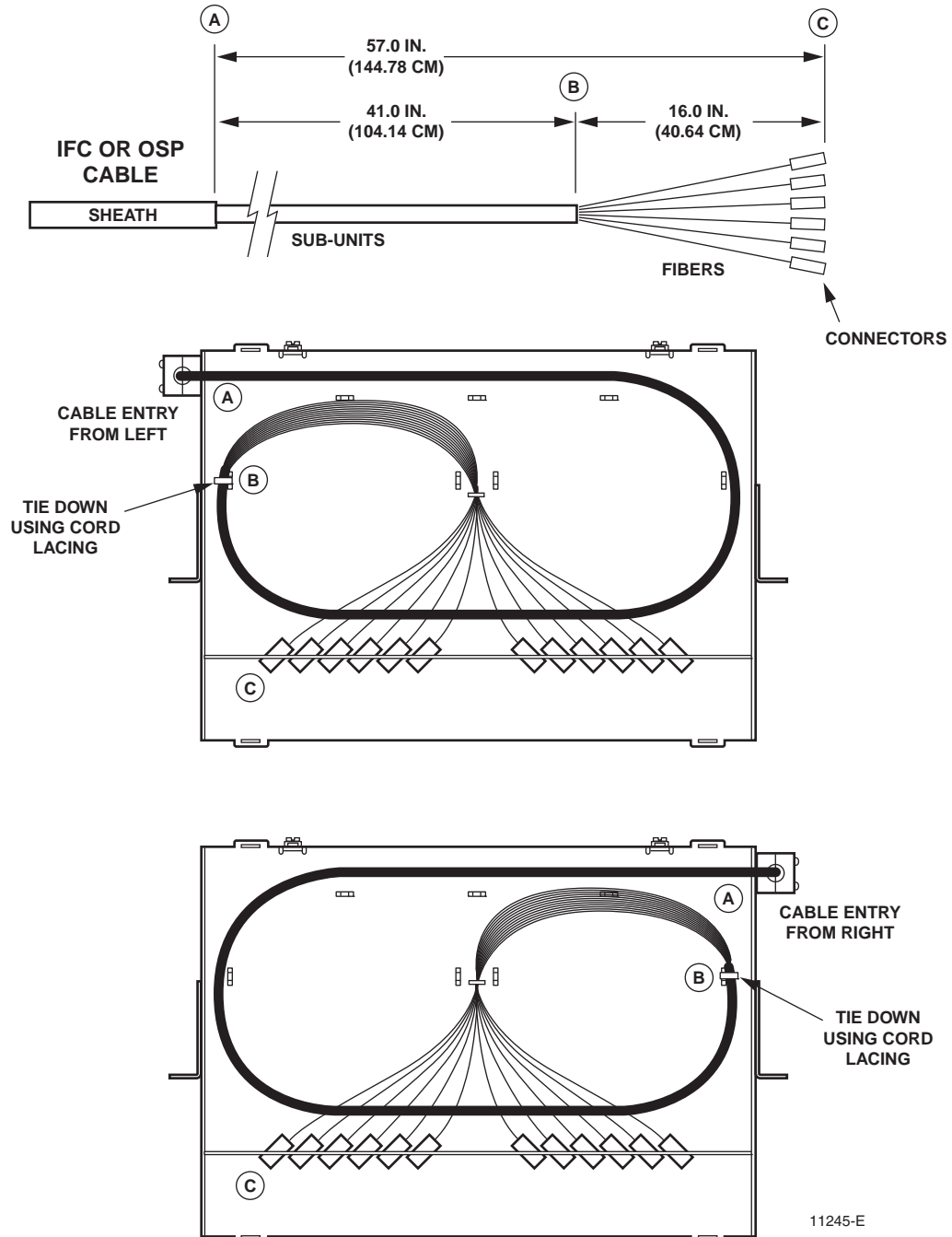

Figure 7. Cable Breakout for 24-Fiber Panel

Use the following procedure to install a cable in the 24-fiber termination rack-mount panel.

1. Route the cable to the chassis and break out the cable corresponding to Figure 7.

2. Secure the cable as follows (see Figure 8):

    a. Install the clamp bracket at the chosen clamp location by inserting the two integral bolts from inside the chassis.

    b. Sort through the rubber grommets in the kit and find the one that best fits the cable. If the cable is too small to fit snugly in the smallest grommet, build up the cable with tape of a suitable material per local standards.

    c. Assemble the cable clamp components on the bracket studs in the order shown in the figure and secure with the two nuts provided.
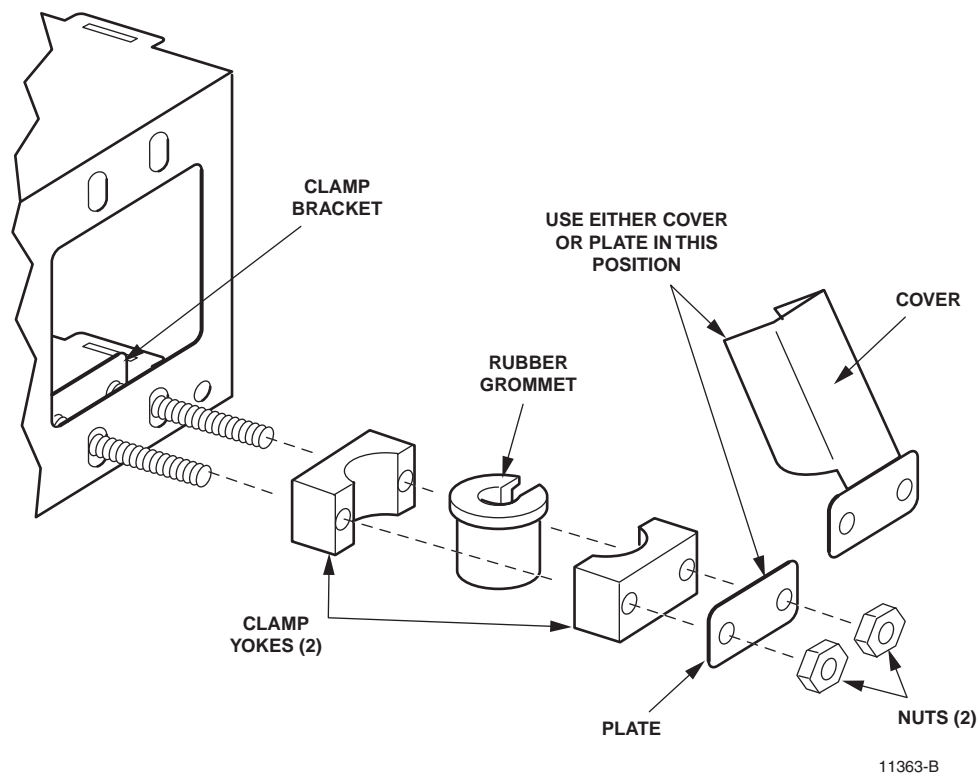

Figure 8. Installing a Cable Clamp on a Rack-Mount Panel (Select from Four Mounting Locations)

3. If the cable being installed is an OSP cable with a metallic strength member, bond the cable to ground following the instructions for the bonding/grounding kit.

4. Remove the rear door, if not already removed.

5. Route the fibers within the chassis as shown in Figure 7 and tie down the fibers in the B position shown.

⚠ **Danger:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the optical bulkhead of an operational transmitter, or into the launching (output) end of an active fiber. A clean, protective cap or hood MUST be immediately placed over any radiating bulkhead receptacle or optical fiber connector to avoid exposure to potentially dangerous amounts of radiation. This practice also helps prevent contamination of connectors and adapters.*

6. Connect the fiber connectors to the adaptors on the rear of the 6pak adapter plate.

7. Replace the rear door.

2.3.3   24-Fiber Termination/Splicing Rack-Mount Panel

Figure 9 shows cable routing options and breakout dimensions for the 24-fiber termination rack-mount panel. The cable can enter from above or below the chassis and from the left or right side.

Use the following procedure to install a cable in the 24-fiber termination/splicing rack-mount panel.

1. Route the cable to the chassis.

2. Pull out the splice drawer and thread the cable stub through the chassis onto the splice tray in the approximate position shown in Figure 9. Based on the figure, determine how much length of cable will be required for the B to C double loop section shown.

3. Break out the cable, leaving 36 inches (91.44 cm) of bare fiber for a splicing loop.

4. Secure the cable with a cable clamp in the position shown, about 0.75 inches (1.91 cm) before the breakout point. For instructions refer to Figure 8 in the previous procedure.

5. Tie the fibers down with cord lacing in the B position shown in Figure 9.

6. If the cable being installed is an OSP cable with a metallic strength member, bond the cable to ground following the instructions for the bonding/grounding kit.
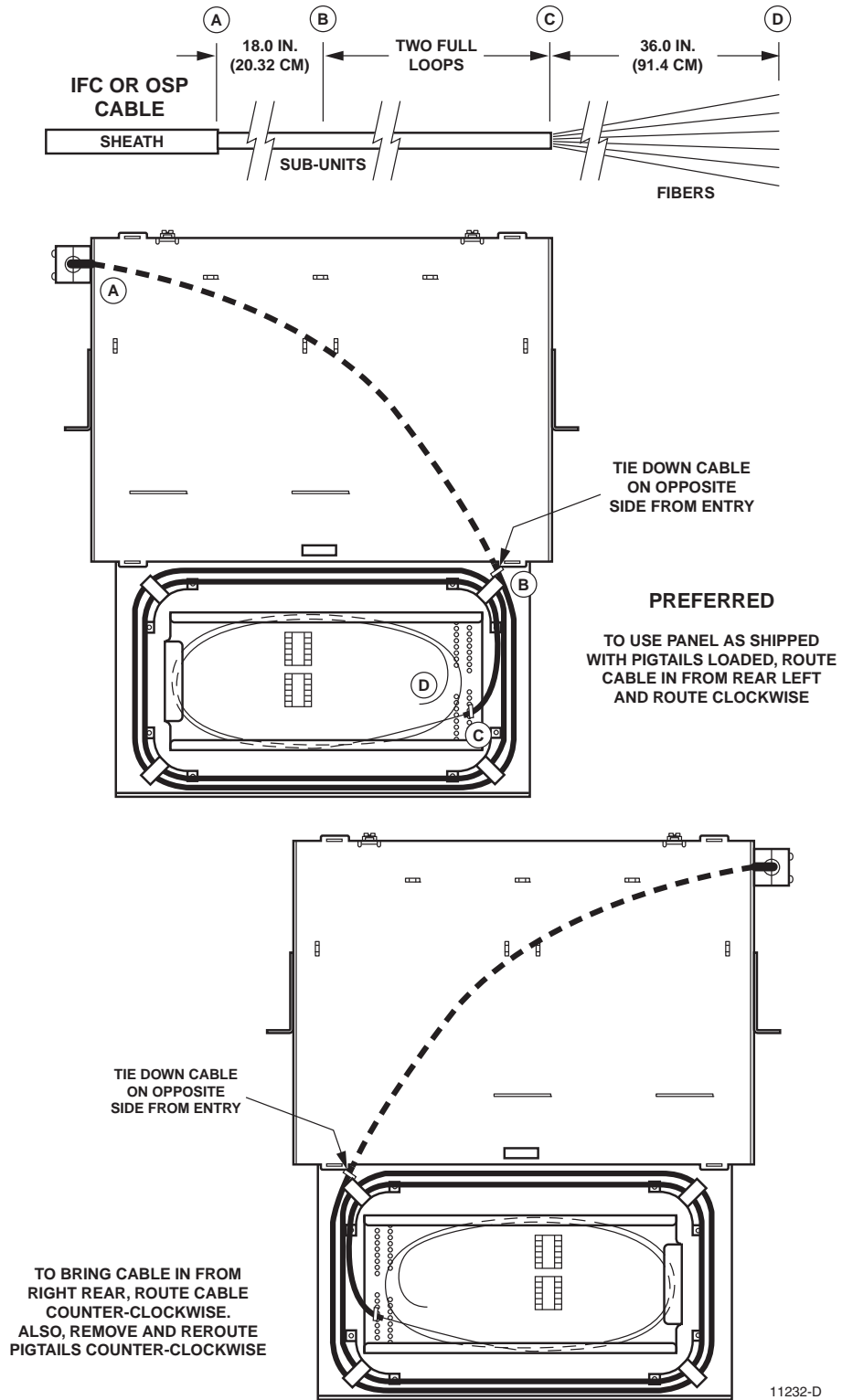
Figure 9. Fiber Routing in 24-Fiber Termination/Splicing Panel

2.4   Splicing

Use the following procedure for splicing.

1. Place a splice tray in the splice drawer (if not already there).

2. Route the fiber into the splice tray on the same side as the pigtail fiber that it is going to be spliced to, as shown in Figure 10. Loop the fiber around twice in the splice tray.

3. Splice per local practice.

4. Tie down the fibers with cord lacing in the C position shown in Figure 10. Refer also to Figure 9 for correct routing.
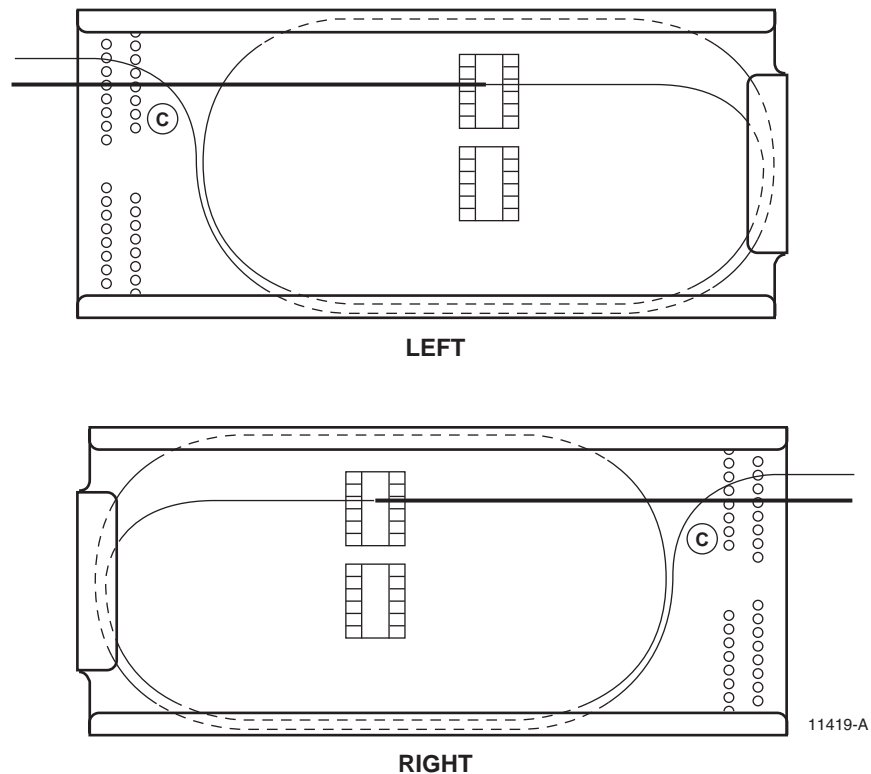
LEFT

11419-A

RIGHT

Figure 10. Routing Fibers on a Splice Tray

3   WALL-MOUNT BOX INSTALLATION

3.1   Installing the Wall-Mount Chassis

▶   **Note:** If using a cable clamp (as opposed to a compression fitting), install the cable clamp prior to mounting the box on the wall.

FL1000 wall-mount boxes can be mounted directly to any wall, but CommScope recommends that they be mounted, using the #12 woodscrews supplied with the unit, on a 3/4-inch thick plywood panel that is attached to the wall in accordance with local fire code.

Use the following procedure.

1. Make sure the location provides room for the door to swing out. See Figure 11 and Figure 12.

2. Position the box in its assigned location and mark the mounting hole locations.

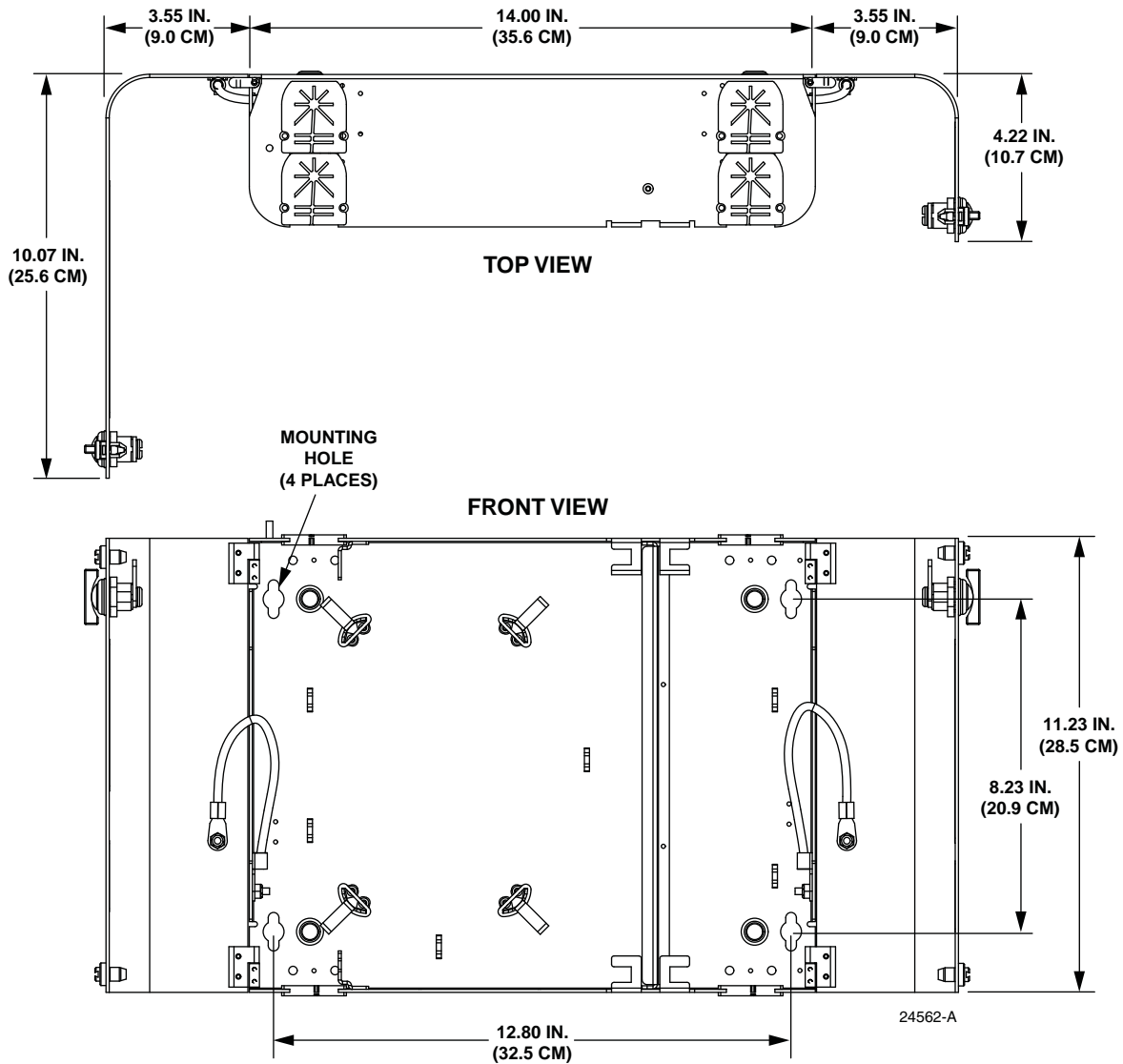3. Fasten using the four #10-1.25 inch wood screws provided. See Figure 11 and Figure 12 for mounting hole location.

Figure 11. 12-Fiber Wall-Mount Box Dimensions

3.55 IN.
(9.0 CM)

14.00 IN.
(35.6 CM)

3.55 IN.
(9.0 CM)

4.22 IN.
(10.7 CM)

TOP VIEW

10.07 IN.
(25.6 CM)

MOUNTING
HOLE
(4 PLACES)

FRONT VIEW

15.00 IN.
(38.1 CM)

12.00 IN.
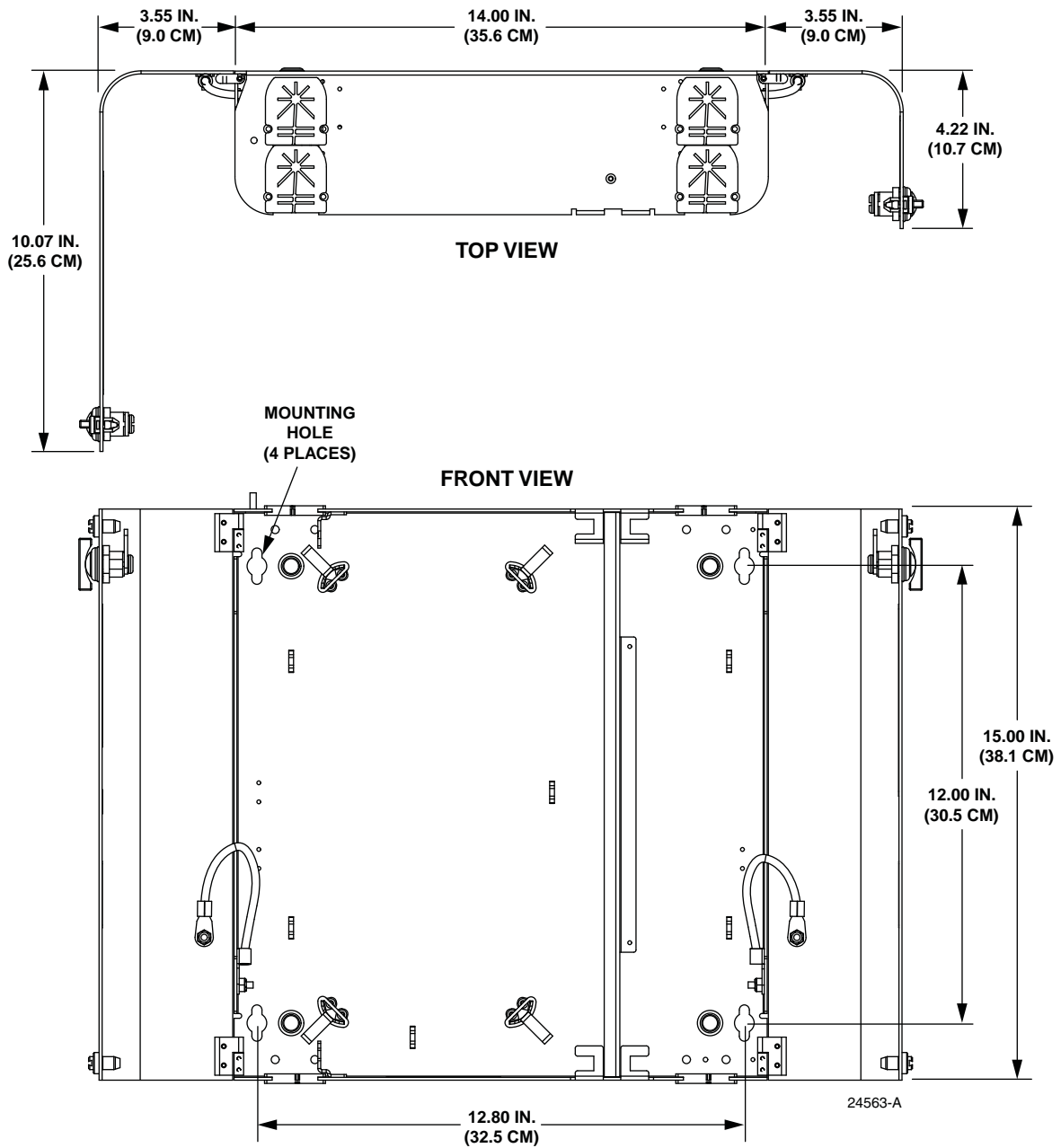(30.5 CM)

24563-A

12.80 IN.
(32.5 CM)

Figure 12. 24/48 Wall-Mount Box Dimensions

3.2   Installing 6pak Adapter Plates and Pigtails

Wall-mount boxes with a termination function have mounting slots for 6pak adapter plates. The 6pak adapter plates may be any of several types including:

- Simplex or duplex with adapters only

- Blank plates for filling in unused slots

- Simplex or duplex with adapters and attached pigtails

Use the following procedure to install adapter plates.

1. If the 6pak plate has attached pigtails, thread the pigtails through the empty mounting slot and loop the pigtails around the radius limiters in the chassis, as shown in Figure 13 below.
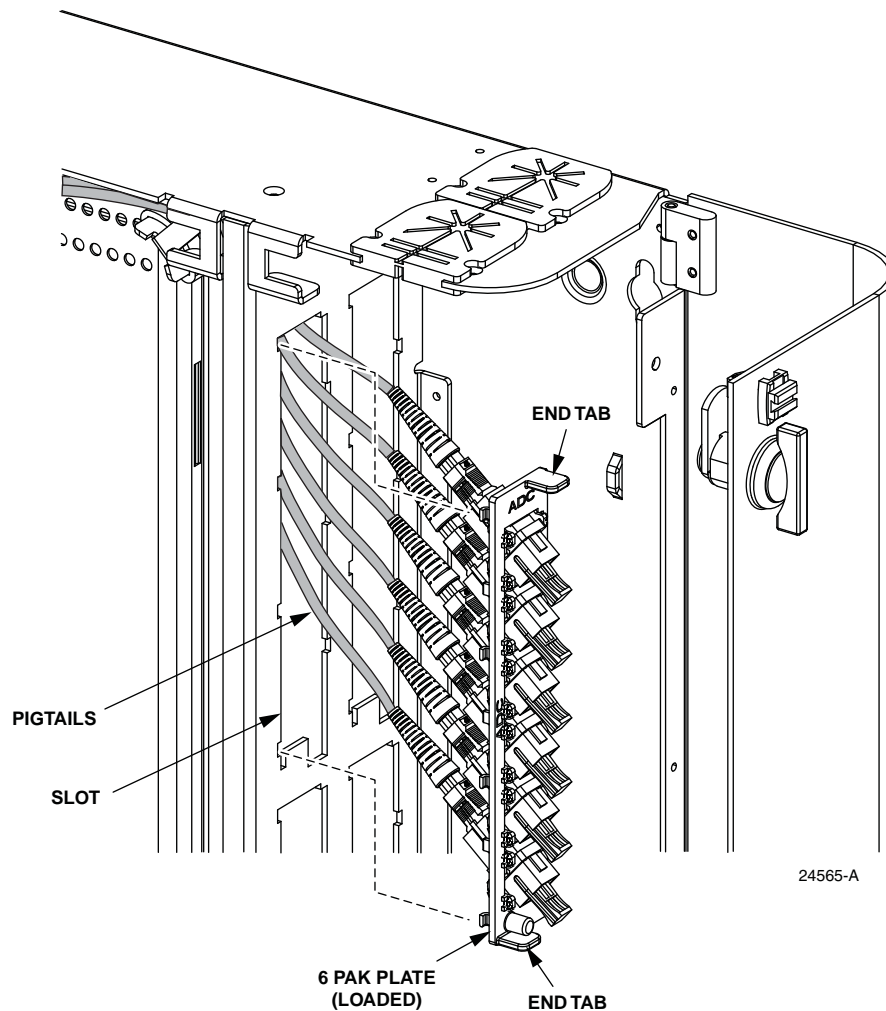

Figure 13. Installing a 6Pak Plate with Pigtails in a Wall-Mount Box

2. Align the tabs on the 6pak plate with the notches in the mounting slot.

3. Slide the 6pak or blank up into the slot until it snaps in place.

4. If installing pigtails, route the fibers within the chassis corresponding to Figure 14 and Figure 15 for the 12-fiber and 24-fiber termination/splicing panel, respectively.
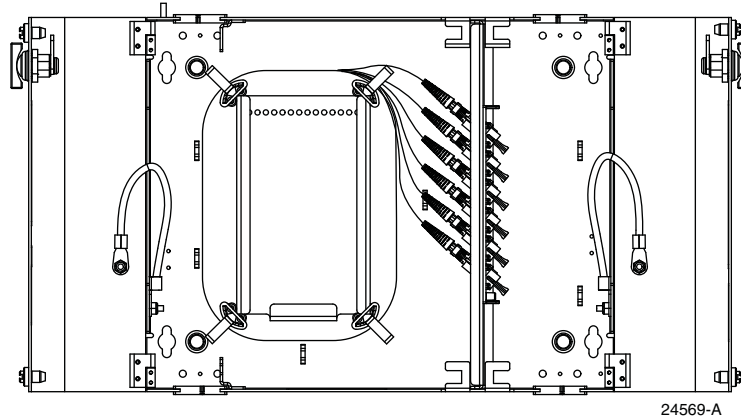
24569-A

Figure 14. Pigtail Routing in 12-Fiber Termination/Splicing Panel
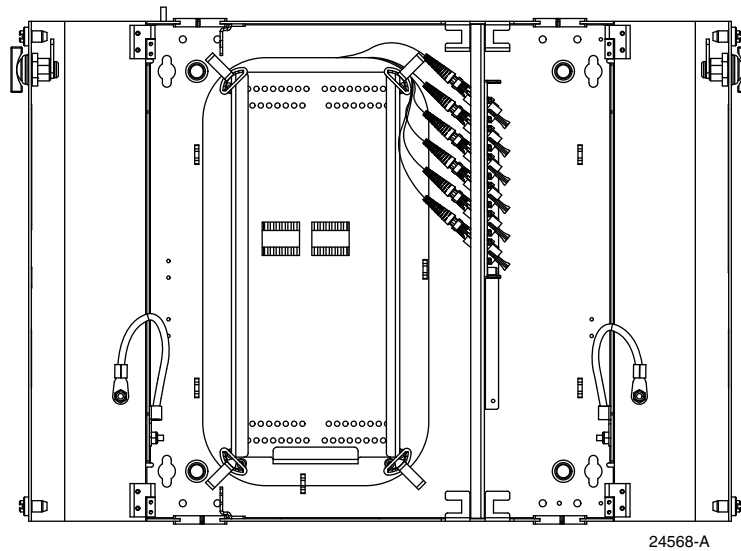
24568-A

Figure 15. Pigtail Routing in 24-Fiber Termination/Splicing Panel

3.3   Installing Cables and Routing Fibers

The cable must be routed within the chassis in an orderly way that provides maximum protection for the fibers and ease in future maintenance. For details refer to the following topics for the three different types of wall-mount boxes. When routing and terminating fibers, observe the following precaution to avoid potential eye damage.

⚠ **Danger:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the optical bulkhead of an operational transmitter, or into the launching (output) end of an active fiber. A clean, protective cap or hood MUST be immediately placed over any radiating bulkhead receptacle or optical fiber connector to avoid exposure to potentially dangerous amounts of radiation. This practice also helps prevent contamination of connectors and adapters.*

3.3.1   12-Fiber Termination/Splicing Wall-Mount Box

This unit can be used for either field termination or splicing. Figure 16 and Figure 17 show the correct breakout for field termination. Figure 18 shows the correct breakout for splicing.
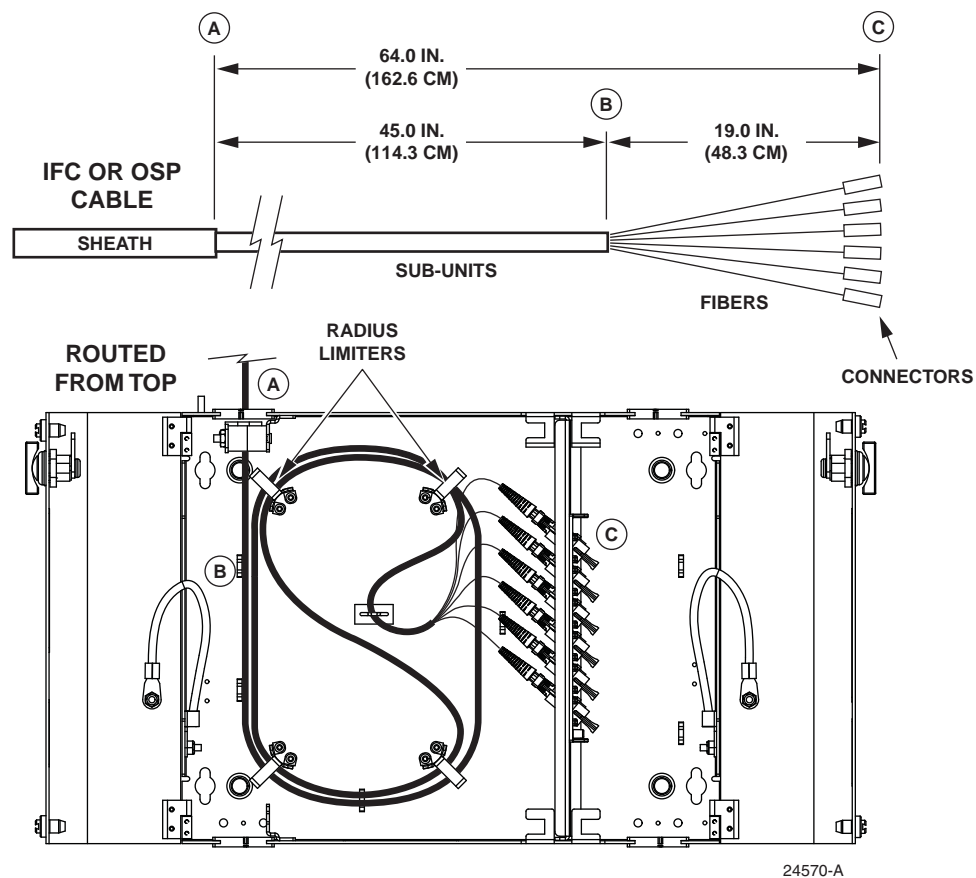

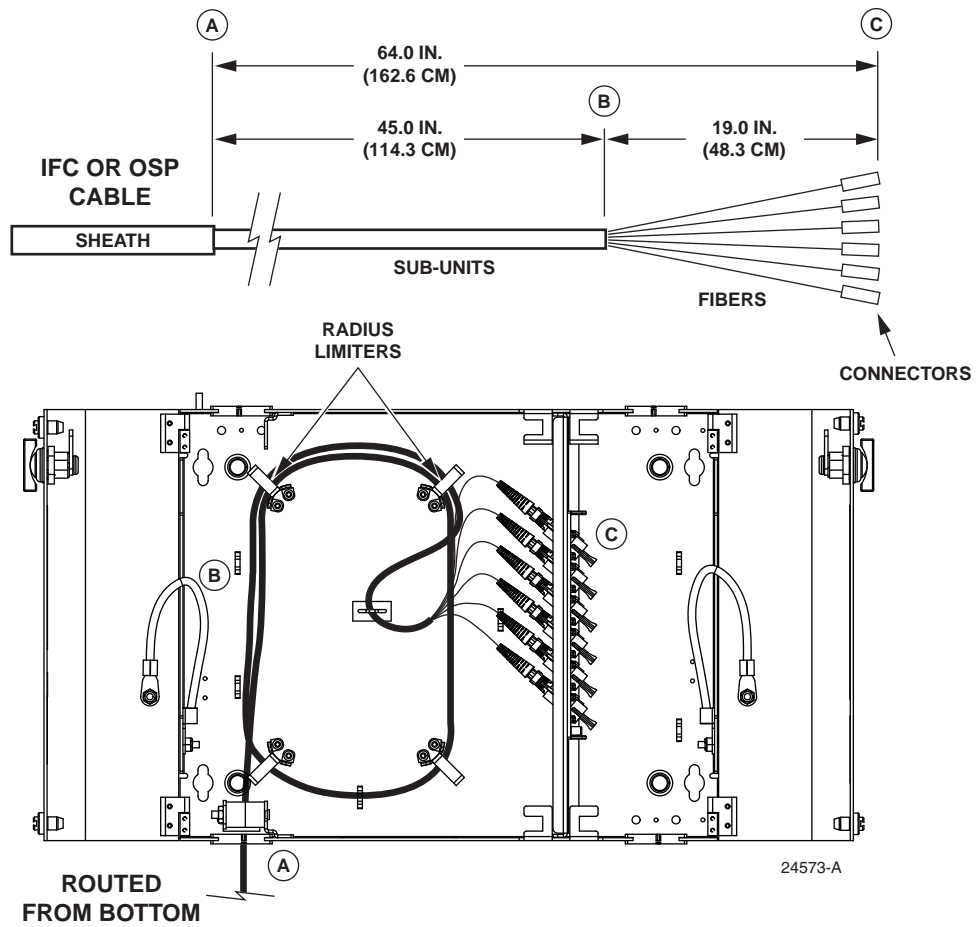Figure 16. Field Termination Breakout and Routing, 12-Fiber Wall-Mount Box (Top Entry)

Figure 17. Field Termination Breakout and Routing, 12-Fiber Wall-Mount Box (Bottom Entry)
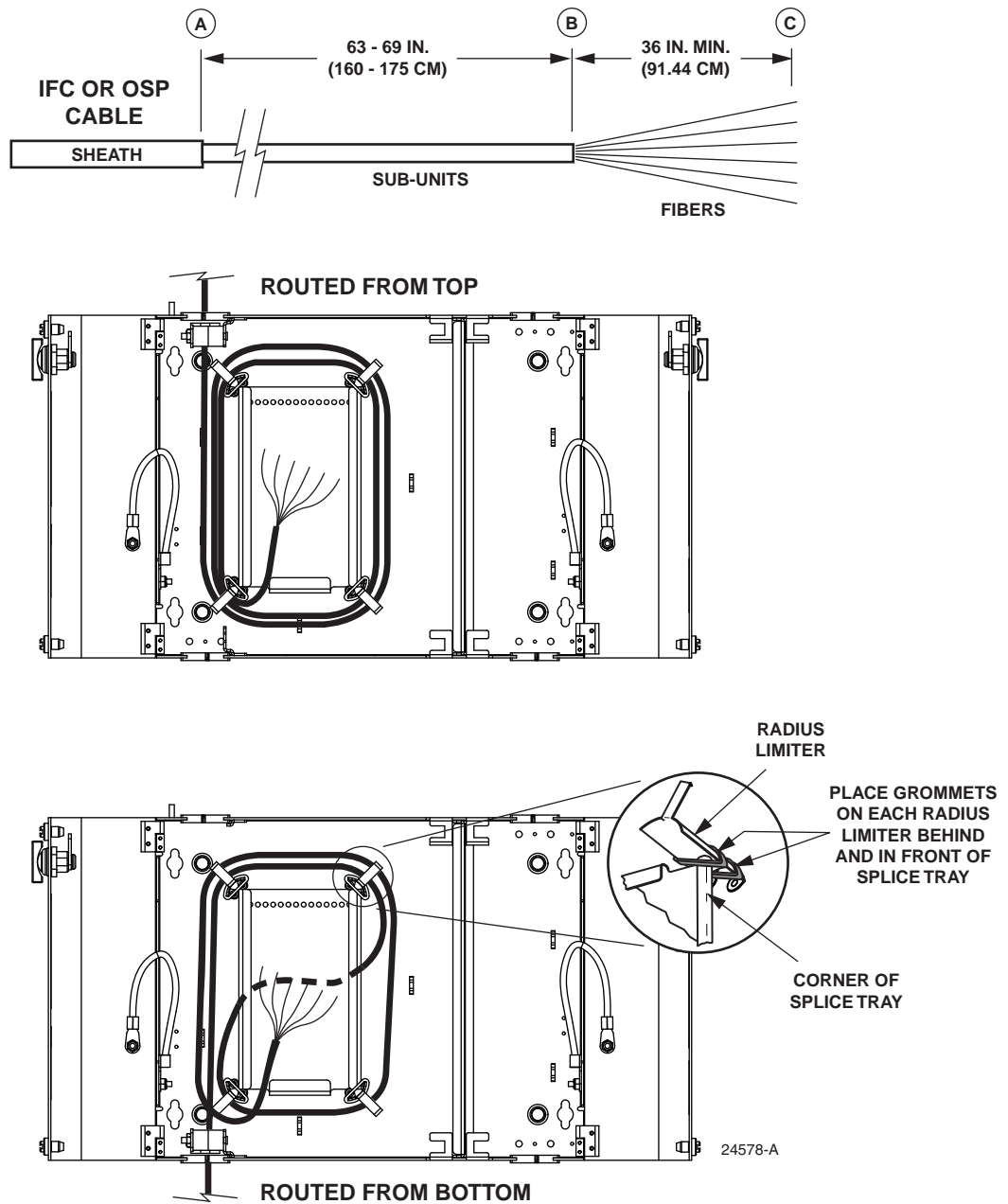
Figure 18. Splicing Breakout and Routing, 12-Fiber Wall-Mount Box

Use the following procedure to prepare and install the cable.

1. Determine whether a cable clamp or compression fitting will be used to hold the cable. In general, a cable clamp is intended for a larger diameter cable, but either method can be used for securing the cable.

2. Strip the outer sheath of the cable to expose the inner fiber bundles. Figure 16 and Figure 17 show the correct breakout for termination. Figure 18 shows the correct breakout for splicing. The cable sheath should extend about 0.75 inch (1.9 cm) beyond the cable clamp or compression fitting.

3. If using a cable clamp (Figure 19):

    a. Before mounting the wall-mount chassis to the wall, determine which of the four available mounting locations will be used and install the clamp bracket by inserting the two integral bolts from the rear, as shown. If the cable is routed to the wall box from above, install the cable clamp bracket in the upper part of the box. If the cable is routed to the wall box from below, install the cable clamp bracket in the lower part of the box.

    b. Sort through the rubber grommets in the kit and find the one that best fits the cable. If the cable is too small to fit snugly in the smallest grommet, build up the cable with tape of a suitable material per local standards.

    c. Assemble the cable clamp components on the integral bolts in the order shown in the figure and secure with the two nuts provided.
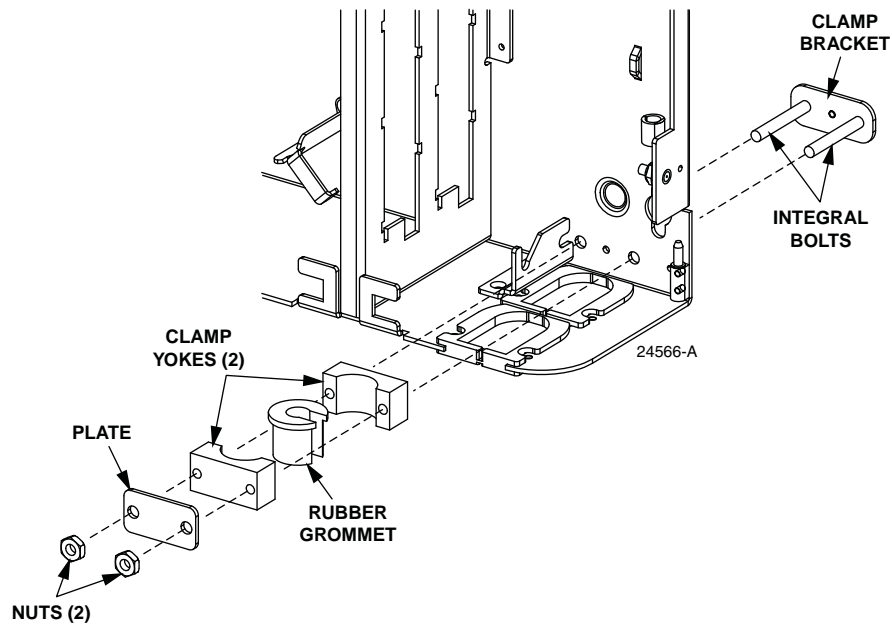

Figure 19. Cable Clamp Assembly (Select from Four Mounting Locations)

4. If using a compression fitting (Figure 20):

   a. Thread the cable through the cap and housing.

   b. Determine which of the eight available mounting slots will be used and insert the housing into the slot.

   c. Fasten to box using lock nut provided.

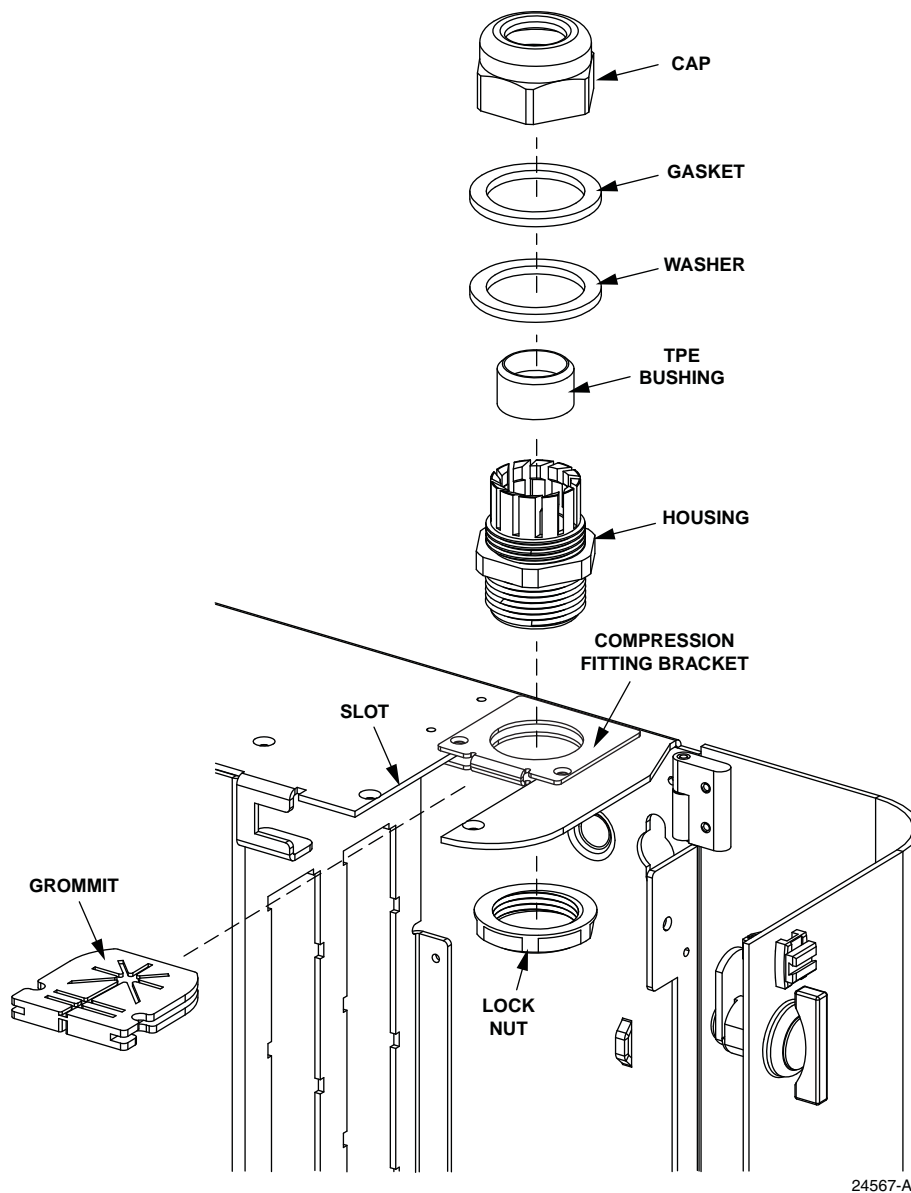   d. Turn cap clockwise until tight on cable.

Figure 20. Compression Fitting (Select from Eight Mounting Locations)

5. If the cable being installed is an OSP cable with a metallic strength member, bond the cable to ground following the instructions for the bonding/grounding kit.

6. Route the fibers within the wall-mount box as shown in Figure 16, Figure 17, and Figure 18. Tie the fibers down in the location shown using cord lacing.

⚠️ **Danger:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the optical bulkhead of an operational transmitter, or into the launching (output) end of an active fiber. A clean, protective cap or hood MUST be immediately placed over any radiating bulkhead receptacle or optical fiber connector to avoid exposure to potentially dangerous amounts of radiation. This practice also helps prevent contamination of connectors and adapters.*

7. Refer to subsection 3.4, Splicing for splicing instructions.

3.3.2   24-Fiber Termination/Splicing Wall-Mount Box

This unit can be used for either field termination or splicing. Figure 21 and Figure 22 show the correct breakout for field termination when the cable is routed in from the top. Figure 23 and Figure 24 show the correct breakout for field termination when the cable is routed in from the bottom. Figure 25 shows the correct breakout for splicing.
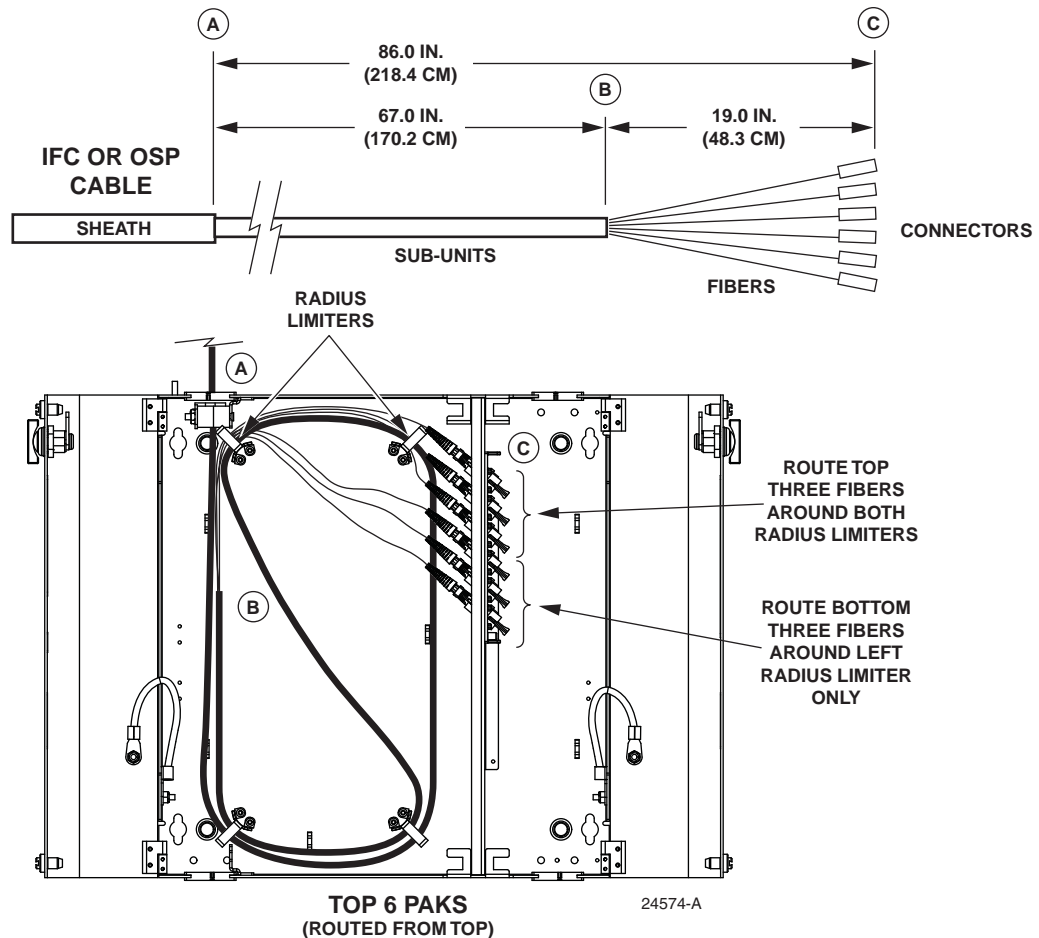

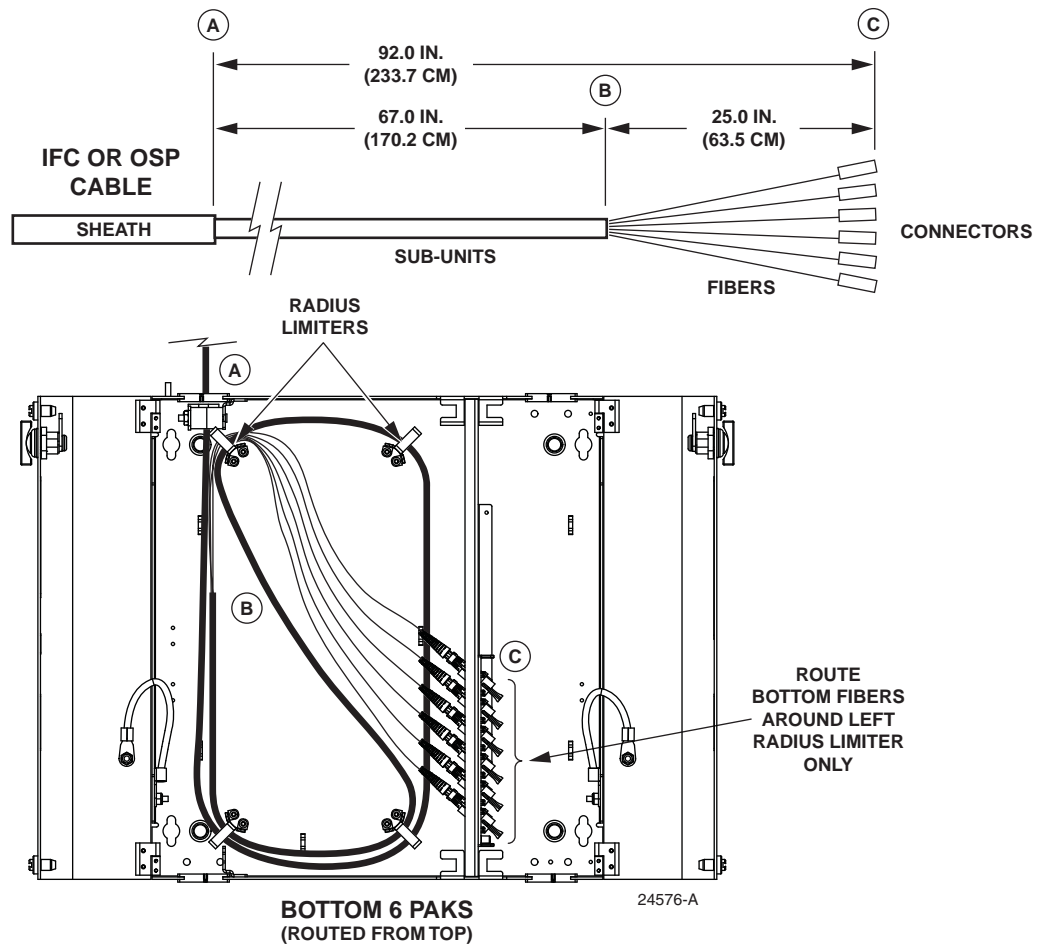**Figure 21. Field Termination Breakout and Routing, 24-Fiber Wall-Mount Box (Top Entry, Top 6paks)**

Figure 22. Field Termination Breakout and Routing, 24-Fiber Wall-Mount Box (Top Entry, Bottom 6paks)
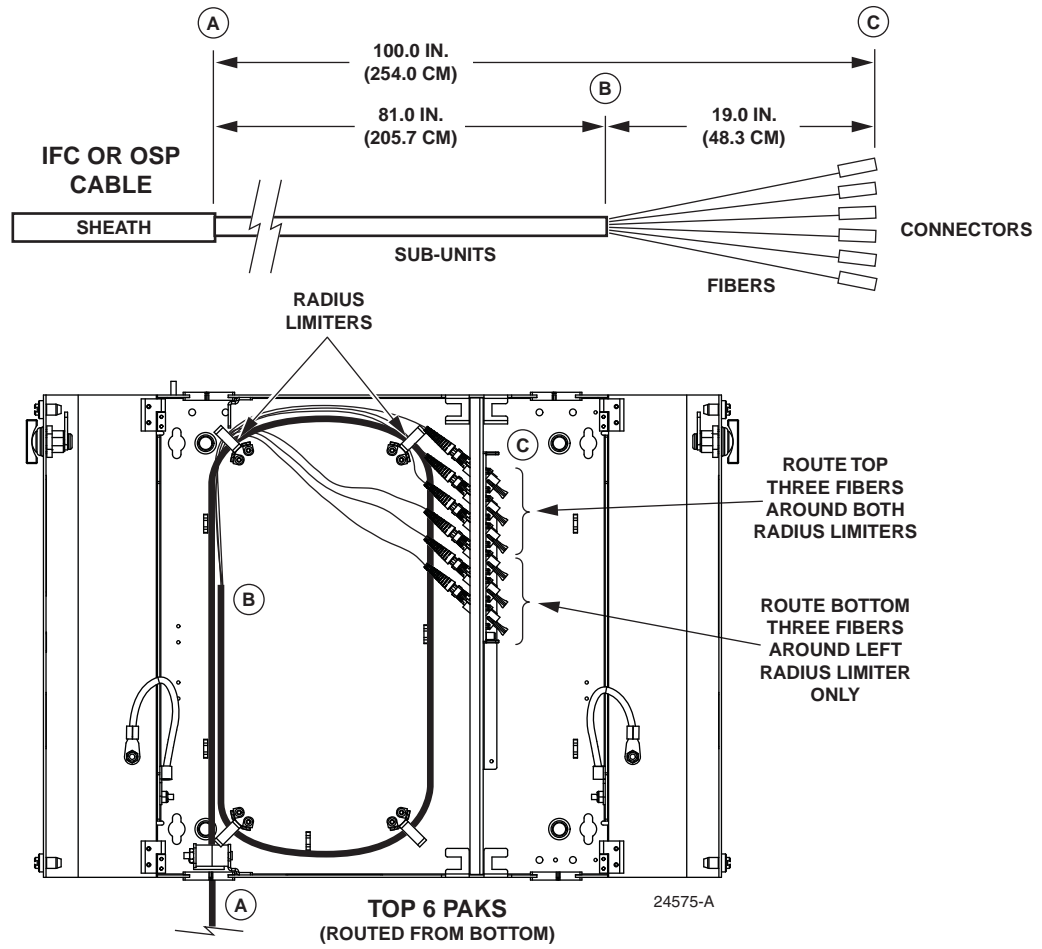
Figure 23. Field Termination Breakout and Routing, 24-Fiber Wall-Mount Box (Bottom Entry, Top 6paks)
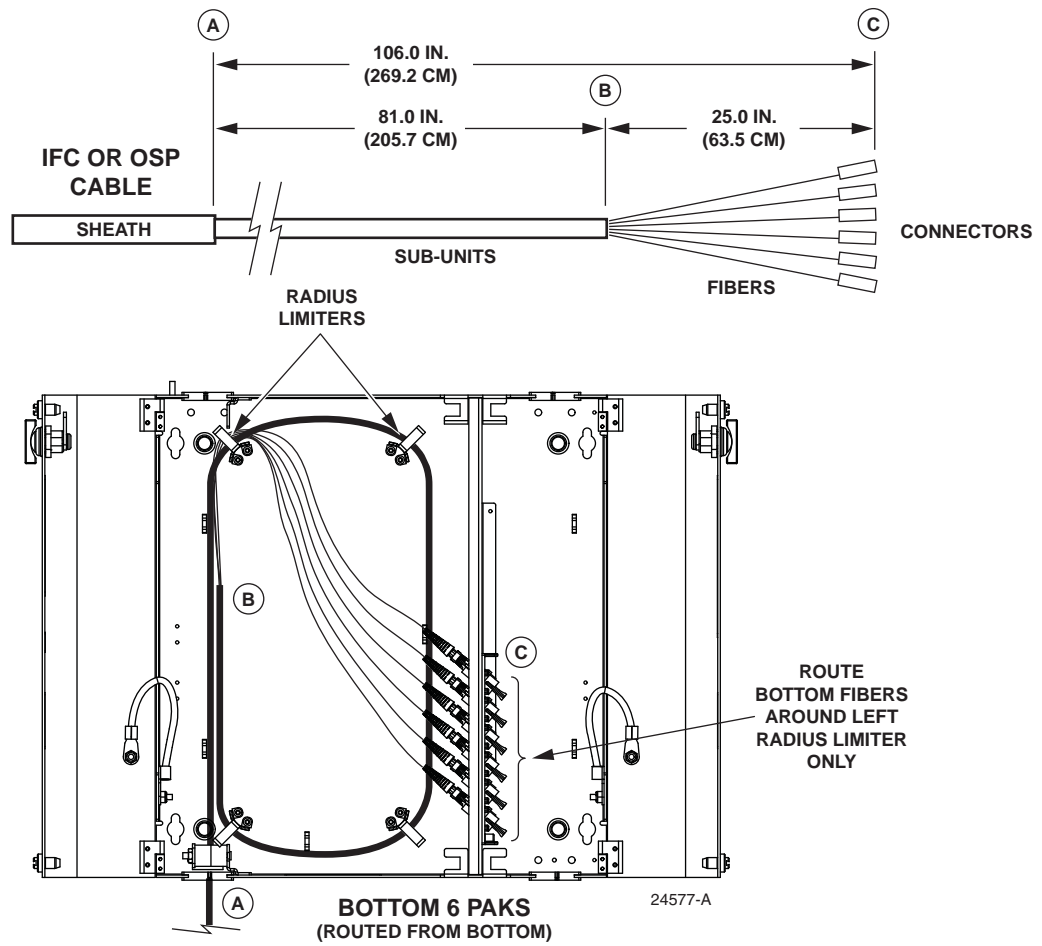
Figure 24. Field Termination Breakout and Routing, 24-Fiber Wall-Mount Box (Bottom Entry, Bottom 6paks)
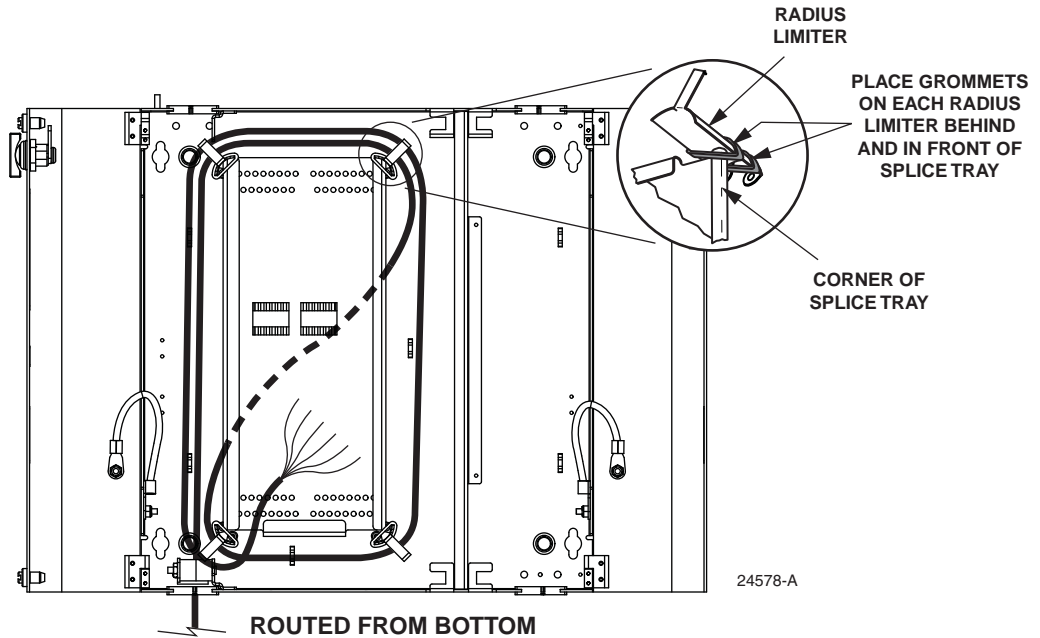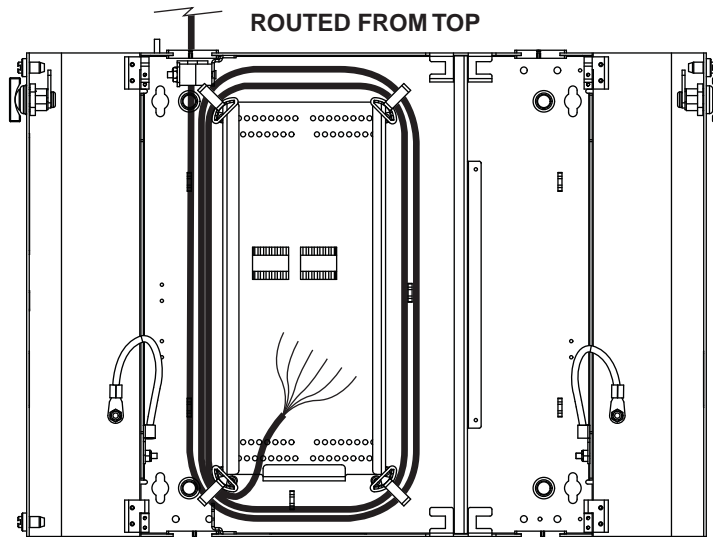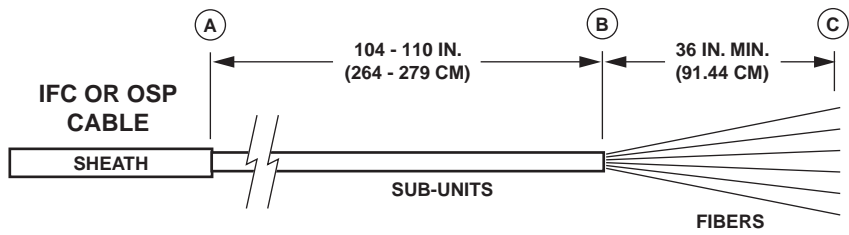
Figure 25. Splicing Breakout and Routing 24-Fiber Wall-Mount Box

Use the following procedure to prepare and install the cable.

1. Determine whether a cable clamp or compression fitting will be used to hold the cable. In general, a cable clamp is intended for a larger diameter cable, but either method can be used for securing the cable.

2. Strip the outer sheath of the cable to expose the inner fiber bundles. Figure 21, Figure 22, Figure 23, and Figure 24 show the correct breakout for termination. Figure 25 shows the correct breakout for splicing. The cable sheath should extend about 0.75 inch (1.9 cm) beyond the cable clamp or compression fitting.

3. If using a cable clamp, refer to Figure 19 and associated text in the procedure above for the 12-fiber wall-mount box.

4. If using a compression fitting, refer to Figure 20 and associated text in the procedure above for the 12-fiber wall-mount box.

5. If the cable being installed is an OSP cable with a metallic strength member, bond the cable to ground following the instructions for the bonding/grounding kit.

6. Route the fibers within the wall-mount box as shown in Figure 21, Figure 22, Figure 23, Figure 24, or Figure 25. Tie the fibers down in the location shown using cord lacing.

⚠ **Danger:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the optical bulkhead of an operational transmitter, or into the launching (output) end of an active fiber. A clean, protective cap or hood MUST be immediately placed over any radiating bulkhead receptacle or optical fiber connector to avoid exposure to potentially dangerous amounts of radiation. This practice also helps prevent contamination of connectors and adapters.*

7. Refer to subsection 3.4, Splicing, below, for splicing instructions.

3.3.3   48-Fiber Splicing Wall-Mount Box

Figure 26 shows the three routing options within the chassis for the 48-fiber splicing wall-mount box. At least two cables are always involved. They may both enter from the top, both enter from the bottom, or enter from both top and bottom, on the left side. If from top and bottom, then an "S" curve, under the splice tray, must be used to reverse the direction of one cable so that they may both enter the splice tray from the bottom.
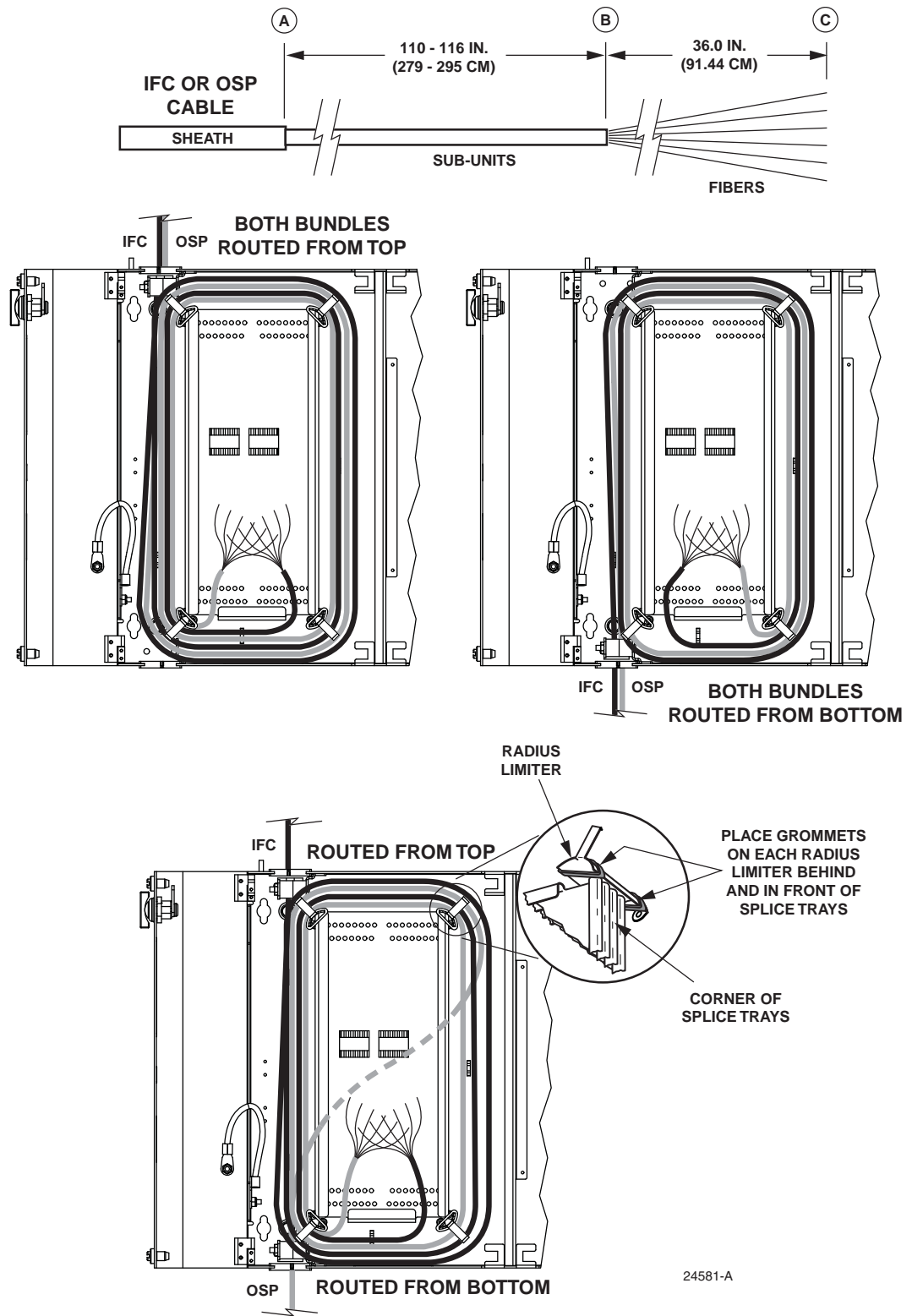
Figure 26. Routing within 48-Fiber Splicing Wall-Mount Box

Use the following procedure to route the cable.

1. Determine whether a cable clamp or compression fitting will be used to hold the cables. In general, a cable clamp is intended for a larger diameter cable, but either method can be used for securing the cable.

2. Strip the outer sheath of the cables to expose the inner fiber bundles as shown in Figure 26 above. The cable sheath should extend about 0.75 inch (1.9 cm) beyond the cable clamp or compression fitting.

3. If using a cable clamp, refer to Figure 19 and associated text in the procedure above for the 12-fiber wall-mount box.

4. If using a compression fitting, refer to Figure 20 and associated text in the procedure above for the 12-fiber wall-mount box.

5. If either cable being installed is an OSP cable with a metallic strength member, bond the cable to ground following the instructions for the bonding/grounding kit.

6. Route the fibers within the wall-mount box as shown in Figure 26 and tie the fibers down in the location shown using cord lacing.

⚠ **Danger:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the optical bulkhead of an operational transmitter, or into the launching (output) end of an active fiber. A clean, protective cap or hood MUST be immediately placed over any radiating bulkhead receptacle or optical fiber connector to avoid exposure to potentially dangerous amounts of radiation. This practice also helps prevent contamination of connectors and adapters.*

7. Refer to subsection 3.4, Splicing, below, for splicing instructions.

3.4   Splicing

Use the following procedure to install a splice tray and set up a splice.

1. If there is an "S" fiber curve within the chassis and crossing through the area where the splice tray will be installed, place grommets on the radius limiters to hold the splice tray above the "S" curve. (Refer to previous topic for an illustration of the grommets).

2. Place the splice tray within the radius limiters in the desired orientation based on the routing diagrams presented in the foregoing topics.

3. Route all fibers to the open end of the splice tray (without foldover tab), divided into left and right groups corresponding to which splice chip they are going to be splice at. Figure 27 shows the recommended route within the splice tray using this method. Tie down the fibers with cord lacing using the tie-down holes (shown below) on the open side of the splice tray.

4. Remove the splice tray to a working surface and complete the splice per local practice.

5. Repeat steps 2 to 4 above for any additional splice tray.

6. Place the splice trays back in the splice deck and place grommets on the radius limiters above the splice trays to hold it in place within the splice deck (see Figure 26 insert).
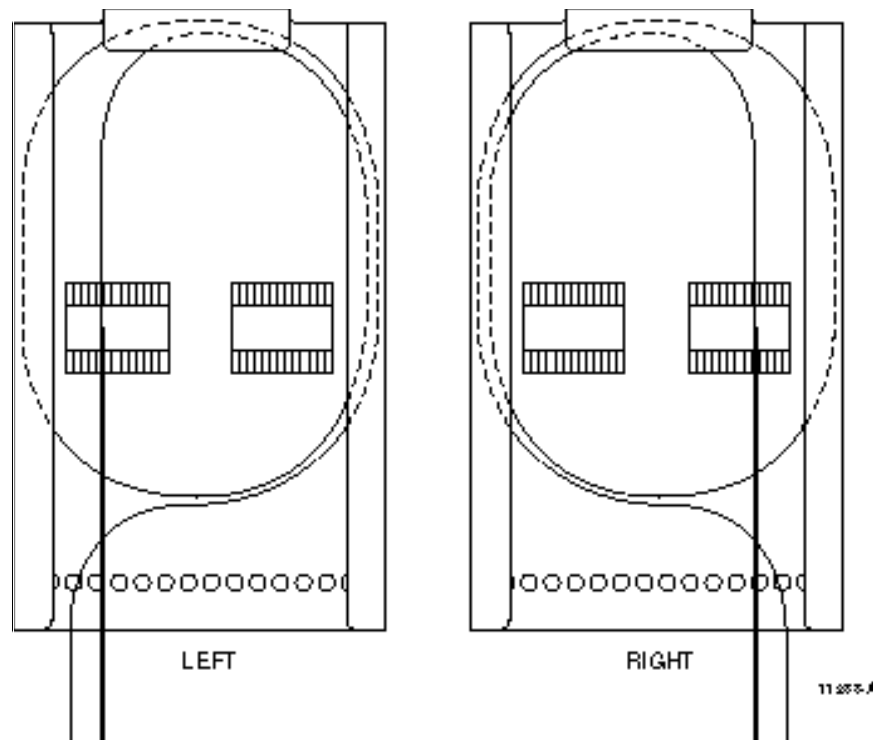

Figure 27. Routing Fibers on a Splice Tray

4 OPERATION

In all operation procedures, observe the following precaution.

⚠ **Danger:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the optical bulkhead of an operational transmitter, or into the launching (output) end of an active fiber. A clean, protective cap or hood MUST be immediately placed over any radiating bulkhead receptacle or optical fiber connector to avoid exposure to potentially dangerous amounts of radiation. This practice also helps prevent contamination of connectors and adapters.*

4.1 Installing Patch Cords

Use the following procedure to install patch cords.

1. Clean all connectors according to local practice.

2. Open the front cover and connect patch cords at the applicable receptacles on the bulkhead panel.

3. Route the patch cords in the direction of the angled adaptor toward the side of the FL1000 unit and then to office equipment (interconnect) or another FL1000 unit (cross-connect).

4. Record the cable fiber identification on the designation label on the front cover.

4.2 Cleaning Adapters and Connectors

Dust and other contaminants on fiber optic connectors and adapters can seriously degrade circuit performance.

To prevent contamination, each unused connector or adapter must be protected with a ***clean*** dust cap. Routine termination activity can also introduce contaminants; therefore, it is essential that connectors and adapters be cleaned before making connections.

The cleaning kit available from CommScope (catalog number FPC-CLNKIT) can be used to clean any style connector, or any adapters that are accessible from both sides (such as those on the 6pak).

5   TECHNICAL ASSISTANCE

Contact the **Technical Assistance Center (TAC)** for technical question. Call 800.830.5056 or send an email to TAC.Americas@commscope.com.

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