NG3™ High Density Fiber Distribution Frame System

User Manual

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REVISION HISTORY

ISSUE	DATE	REASON FOR CHANGE
1	1/2003	Original.
2	6/2003	Add frame dimensions, lineup capacity, acceptance testing, etc.
3	9/2003	Add instructions for FiberGuide placement in lineups using FOTSP's.
4	12/2003	Update clearance dimensions related to upraised panel cover.
5	12/2004	Add a description of the Termination and Splice Panel and the Value Added Module Panel. Add current Customer Information and Assistance drawing and edit for clarity.
6	11/2009	Added references to the end guard and FOTSP installation manuals.

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ABOUT THIS MANUAL

This manual describes the NG3 High-Density Fiber Distribution Frame System and provides planning information and operation procedures.

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 952-917-3000, extension 73475 (outside U.S.A. and Canada). All ADC technical publications are also available on the ADC web site at **www.adc.com**.

Title/Description	ADCP Number
NG3 High-Density Fiber Distribution Frame System Rack Installation Manual: Raised Floor Provides step by step pictorial instructions for installing an NG3 rack on a raised floor.	**90-295**
NG3 High-Density Fiber Distribution Frame System Patch Cord Routing Guide Provides pictorial guidelines for routing patch cords on an NG3 lineup. This manual consists of laminated cards that hang on the lineup.	**90-296**
NG3 High-Density Fiber Distribution Frame System 72-Position Hinged Termination Panel User Manual Contains a product description and instructions for using the standard NG3 termination panel and the NG3 termination and splicing panel.	**90-297**
NG3 High-Density Fiber Distribution Frame System Rack Installation Manual: Concrete Floor Provides step by step pictorial instructions for installing an NG3 rack on a concrete floor.	**90-299**
NG3 High-Density Fiber Distribution Frame System End Guard Installation Instructions Contains a product description and instructions for installing the NG3 end guard on an NG3 rack or FOTSP.	**90-398**
NG3 High-Density Fiber Distribution Frame System Fiber Optic Storage Panel (FOTSP) Installation Instructions Contains a product description and instructions for installing the NG3 FOTSP on an NG3 rack.	**90-399**

TRAINING AND SUPPORT

Additional product and installation training and support are available from ADC. Please contact your ADC representative for more information.

ADMONISHMENTS

Important safety admonishments are used throughout this manual to warn of possible hazards to persons or equipment. These 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

⚠ **Danger:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not look directly into the optical adapters of the adapter packs. Exposure to invisible laser radiation may result. An optical power meter should be used to verify active fibers. A protective cap or hood MUST be immediately placed over any radiating adapter or optical fiber connector to avoid the potential of dangerous amounts of radiation exposure. This practice also prevents dirt particles from entering the adapter or connector.*

⚠ **Caution:** *When working with panels above easy reach, use an A-frame type of step ladder to provide a secure footing at the necessary height.*

LIST OF ACRONYMS

The following acronyms are used in this manual:

FOT	Fiber Optic Terminal
FOTSP	Fiber Optic Terminal Storage Panel
IFC	Intrafacility Fiber Cable
NG3	New Generation High-Density Fiber Distribution Frame
OSP	Outside Plant
VAM	Value Added Module

1 NG3 FRAME SYSTEM DESCRIPTION

1.1 Introduction

The NG3 New Generation High-Density Fiber Distribution Frame System, shown in Figure 1, is a modular assembly consisting of one or more frames on which are mounted various optical panels. The frames and optical panels function as a distribution system for optical fibers in high-density applications. A single high-density frame can hold up to twenty optical panels.

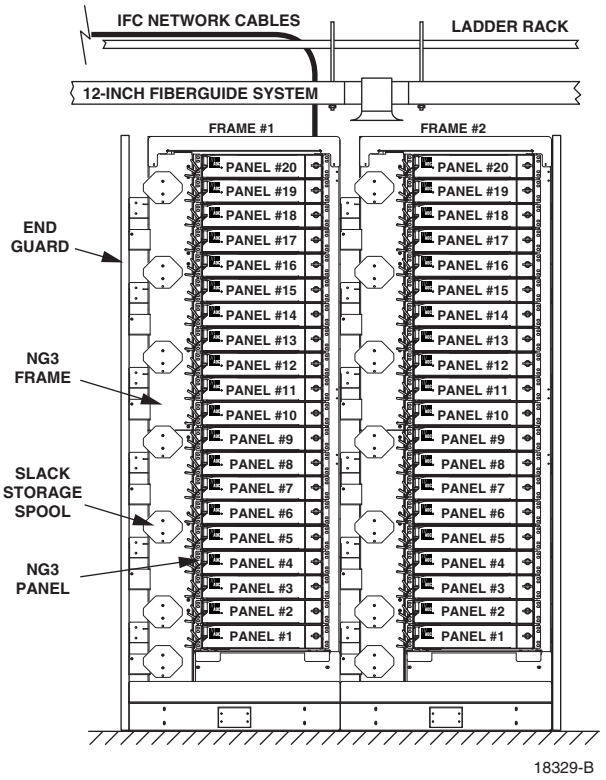

Figure 1. Typical NG3 High-Density Fiber Distribution Frame System

1.2 Frame System Components

The NG3 frame system consists of the following components (described in subsequent sections of this manual):

- NG3 High-Density Fiber Distribution Frame;
- NG3 72-position Hinged Termination Panel (available with adapters only or preterminated with Intra Facility Cable);
- NG3 72-position Hinged Termination and Splice Panel (for ribbon fusion splices only);
- NG3 12-position Hinged Value Added Module (VAM) Panel;
- NG3 Fiber Optic Storage Panel (FOTSP); and
- NG3 End Guard.

1.2.1 NG3 High-Density Fiber Distribution Frame

The NG3 High-Density Fiber Distribution Frame, shown in Figure 2 and Figure 3, provides the underlying physical structure of the NG3 system. A fully equipped NG3 frame consists of the following:

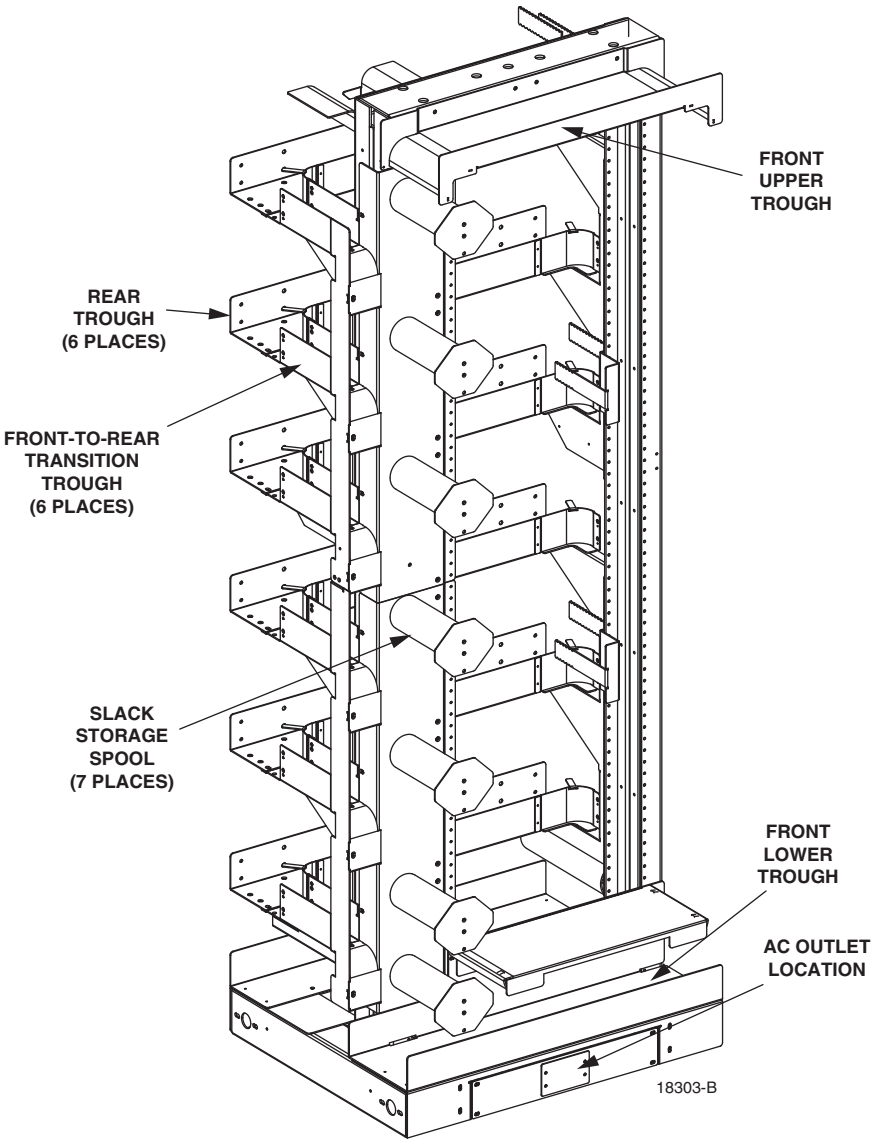

Figure 2. NG3 High Density Distribution Frame Main Components

- **Slack Storage Spools—**Used for storing cross-connect or Fiber Optic Terminal (FOT) patch cord slack. The total set of spools for an individual frame is called a “slack storage system.” The slack storage system can store up to 10 feet of slack per patch cord.
- **Front to Rear Transition Trough—**Used to route patch cords from the front of the frame to the rear trough.

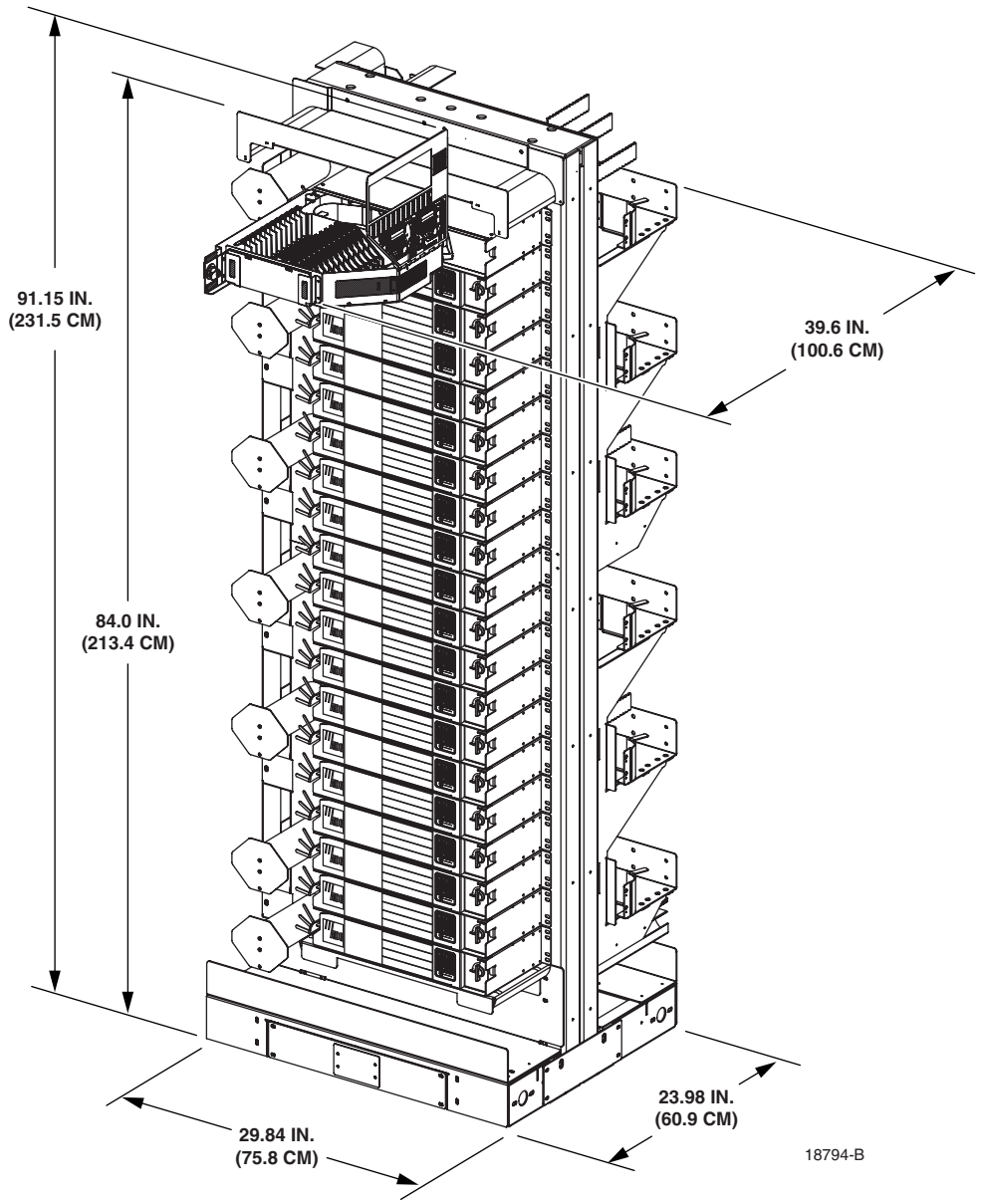

Figure 3. Frame Dimensions

- **Rear Trough**—Used to route cross-connect patch cords between frames. The patch cords, terminated on both ends on the front of the frame, enter and leave the rear trough through the front to rear transition trough.
- **Front Upper Trough—**May be used to route cross-connect patch cords between adjacent frames when at least one end of the patch cord terminates in the “top zone” of the frame (panels 11-20).
- **Front Lower Trough—**May be used to route cross-connect patch cords between adjacent frames when at least one end of the patch cord terminates in the “bottom zone” of the frame (panels 1-10).

1.2.2 NG3 High Density 72-Position Termination Panel

The NG3 72-Position Termination Panel is a rack-mount panel designed for mounting on the NG3 rack. The panel has a hinged drawer that swings out to provide access to the adapter packs within. The design of the panel allows for flexible deployment of all circuits without a required termination plan or scheme.

The panel provides 72 adapter mounting positions (12 adapter packs, each with six adapters). The adapters may be any of the standard singlemode and multimode types, including SC, FC, and ST. For a complete list of adapter options, contact your ADC representative. The primary components of the NG3 panel are shown in Figure 4 and consist of the following:

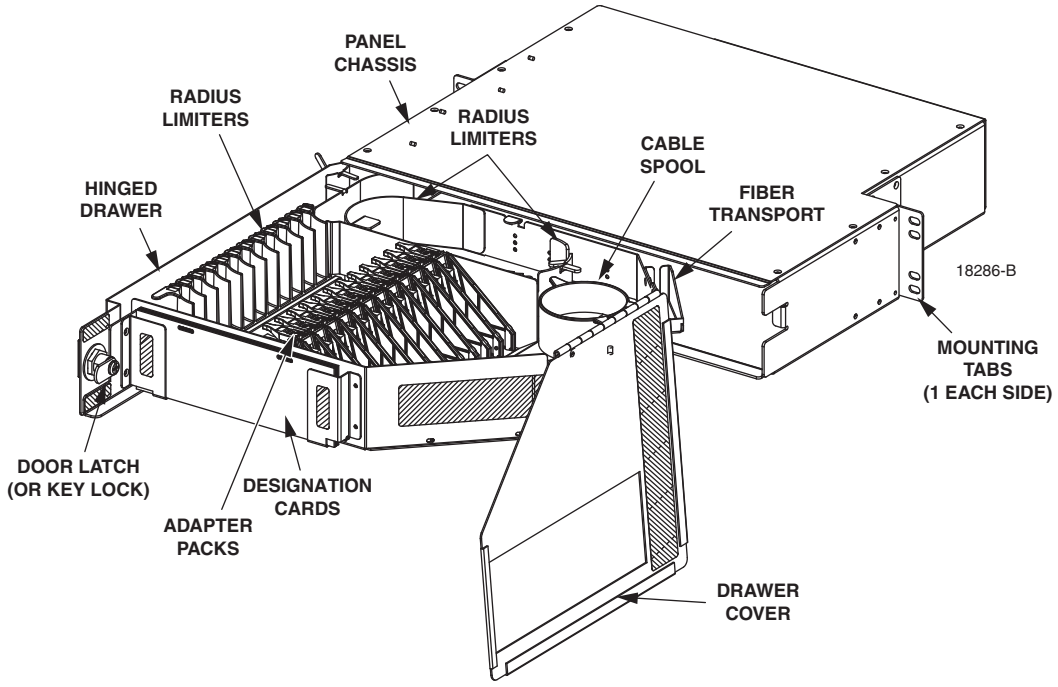

Figure 4. NG3 72-Position Termination Panel

- **Panel Chassis—**The foundation structure of the panel. It is 17.18 inches (43.6 cm) wide and 3.44 inches (8.7 cm) high. Each frame holds up to 20 panels of this size.
- **Radius Limiters—**Hold cables to a 1.5 inch minimum bend radius within the drawer to protect the cable from being damaged by too severe a bend.
- **Cable Spool—**Holds cables to a 1.5 inch minimum bend radius within the drawer and keeps cables in position when the drawer is opened.
- **Mounting Tabs—**Used to fasten the panel on the NG3 rack.
- **Drawer Cover—**Protects cables when closed and provides access to adapters when open. The cover is cut out above the adapter packs so as not to press on them when closed. The cover, when open, acts as a stop to prevent the drawer from being accidentally closed.

- **Designation Cards—**Provide two square inches each of port designation space for all 72 ports, front and rear.
- **Adapter Packs—**Separately mountable assemblies, each consisting of a housing and six adapters. The adapter packs swing up individually from their home position, providing full access to front and rear terminations.
- **Door Latch—**Holds the door in a closed position, can be replaced with a key lock for locations where security is a concern.
- **Hinged Drawer—**Swings out from within the panel to the position shown.
- **Radius Limiters—**Guide patch cords routed out of panel to front of frame.

1.3 NG3 High-Density 72-Position Termination and Splice Panel

The NG3 72-Position Termination and Splice Panel is similar to the standard termination panel described in Subsection 1.2.2 but includes additional features that allow a ribbon-type 72-fiber IFC cable to be routed to the panel and spliced to a connectorized cable assembly.

The termination and splice panel mounts in the NG3 rack and has a hinged drawer that swings out to provide access to the adapter packs and splice tray within. The termination and splice panel is primarily used in "tie panel" applications (see Subsection 3.1.2.1).

The termination and splice panel provides 72 adapter mounting positions (12 adapter packs, each with six adapters) and one splice tray for ribbon-type fusion splices. The same adapter types offered with the standard termination panel are available.

The termination and splice panel is equipped with a ribbon-type connectorized cable assembly which is pre-installed in the drawer and ready for splicing. The additional features and equipment provided with the termination and splice panel are shown in Figure 5 and described as follows:

- **Cable Clamp**–Used to secure the ribbon-type IFC cable to the rear side of the panel. Includes cable clamps, grommet, cover plate, and screws.
- **Ribbon Cable Blocking Kit**–Separates and protects the fiber ribbons at the cable break-out point. Includes a protective oval tube assembly for the six 12-fiber ribbons, a fanout base with cover, cover screws, cable ties, and tape. Instructions for kit assembly are included.
- **Splice Tray**–An all metal tray that protects and stores the completed splices and bare fiber ribbons. Includes a protective cover and two 6-position fusion-type ribbon splice chips for holding the splices.
- **Ribbon-Type Connectorized Cable Assembly**–A ribbon-type 72-fiber IFC cable assembly terminated with customer-specified connectors. The cable assembly is pre-installed in the drawer and the connectors are mated with the adapter packs. At the cable fanout point, the cable assembly is broken-out into six 12-fiber ribbons which are placed in protective tubing and routed to the splice tray.

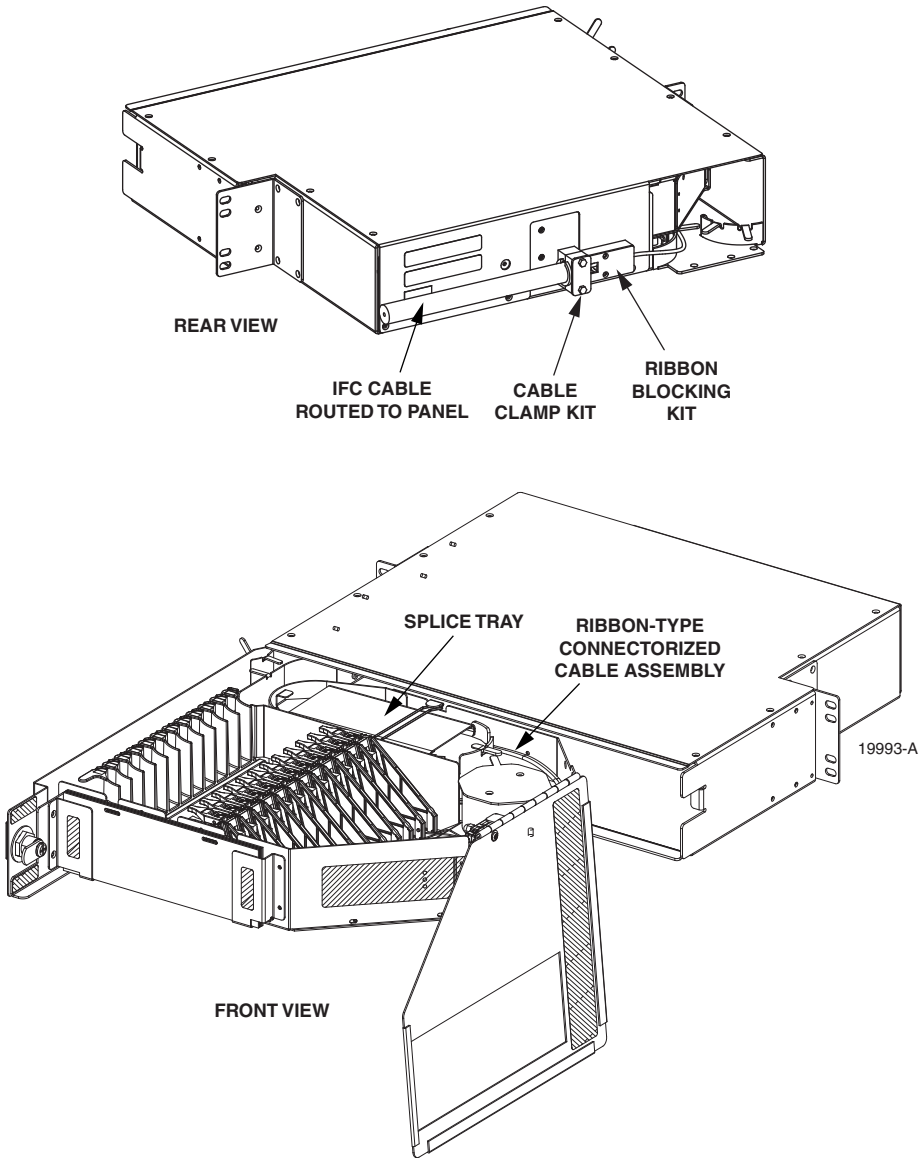

Figure 5. NG3 72-Position Termination and Splice Panel

1.4 NG3 High-Density 12-Position Value Added Module Panel

The NG3 12-Position Value Added Module Panel is a rack-mount panel designed for mounting on the NG3 rack. The panel has a hinged drawer that swings out to provide access to the Value Added Modules (VAM's) within. The VAM panel, shown in Figure 6, allows optical splitter or wavelength division multiplexing (WDM) functionality to be incorporated into specified optical circuits at the NG3 frame.

The VAM panel provides twelve micro VAM assembly mounting positions. The VAM assemblies must be ordered separately and installed in the panel on an as needed basis. Each VAM assembly, shown in Figure 7, provides a maximum of six front access input/output

adapter ports. The same adapter types offered with the termination panel and termination/splice panel are also available with the VAM assembly.

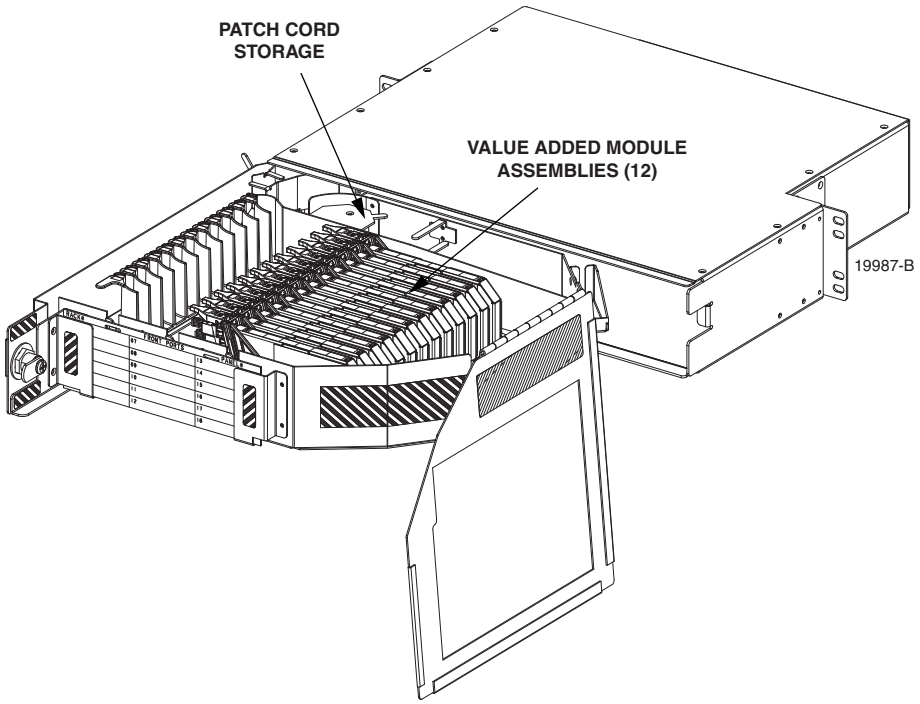

Figure 6. NG3 Value Added Module Panel

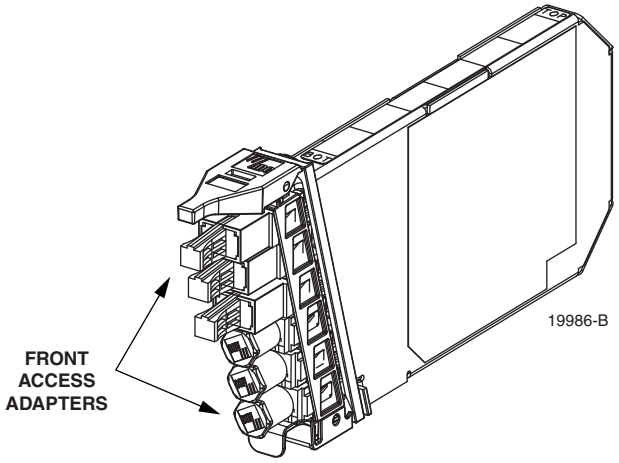

Figure 7. Micro Value Added Module

Optical splitters are used to divide the optical signal for distribution to multiple ports and to provide test, access, and monitoring capability. WDM's are used to increase transmission capacity, combine separate services on an existing network, and to provide nonintrusive testing. A variety of optical splitter and WDM configurations are available.

The VAM panel uses the same basic chassis and components as the 72-position termination panel. Fiber optic patch cords may be routed into the VAM panel from either the left side of the panel or the rear. All patch cords connect to the front side of the VAM assembly. Excess patch cord length may be stored using the cable spools located at the back of the hinged drawer.

1.5 NG3 Fiber Optic Storage Panel (FOTSP)

The end guard is a narrow filler panel mounted between frames and containing rear access slack storage spools for use with FOT equipment patch cords. FOTSP's are only used in cross-connect applications (described in Subsection 2.2.1). FOTSP's are placed to the left of FOT-dedicated frames, as shown in Figure 8. For information on installing FOTSP's, refer to Subsection 3.8.

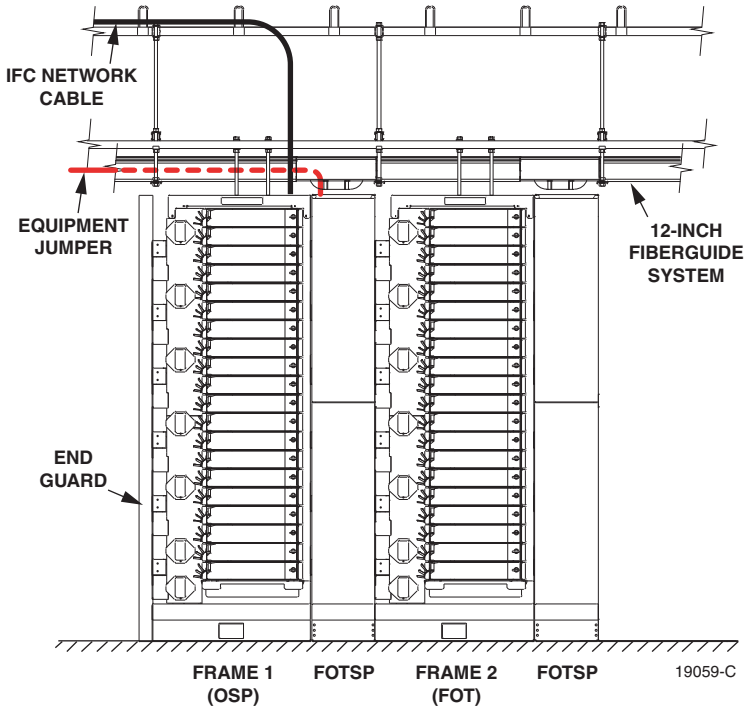

Figure 8. NG3 Lineup With FOTSP's

1.6 NG3 End Guard

The end guard is a narrow panel installed on each end of an NG3 lineup to dress up the lineup and protect the first and last frames. End guards can be seen on each end of the two-frame lineup shown in Figure 1 on page 1 of this manual.

1.7 FiberGuide System

The FiberGuide system is a protective guideway system for fiber-optic patch cords and pigtails. Designed for both the central office and customer premises, the FiberGuide system provides a

safe and efficient means for routing optical fibers to and from fiber optic terminal equipment and fiber distribution devices. A FiberGuide system consists of trough-like straight sections, angles, and drops, with related items such as junctions and supports.

For more information on the FiberGuide system, consult ADC Customer Service (1-800-366-3891, extension 73475). For a description of the FiberGuide system, refer to ADCP-95-005.

1.8 NG3 Accessories

Related NG3 products include the following:

- **Cable Clamp Kit**—provides a clamp and other hardware required for securing one IFC or OSP cable on the rear side of the NG3 panel.
- **IFC Cable Assemblies**—are available with singlemode or multimode fiber in specified lengths and with specified connectors.
- **Patch Cords**—are available with specified connectors in standard lengths of 3.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, and 12.0 meters. Single or dual patch cords can be used in the NG3 system as appropriate.
- **Adapter Packs**—are available separately with specified adapters, and can be used either as replacements for existing adapter packs or to add termination capacity. The adapters may be any of the standard singlemode and multimode types, including SC, FC, and ST. For a complete list of adapter options, contact your ADC representative.
- **AC Outlet Kit**—Installed on the front and rear of the NG3 High-Density Frame and in end guards. The neutral or grounding conductor of the AC power system should not be used for equipment grounding. Install electrical circuits according to all local electrical codes and the National Electrical Code (NEC) every 4.5 feet or per local distance practices. Do not use isolated ground receptacles with the NG3.

1.9 System Specifications

The specifications for the NG3 frame system are listed in Table 1.

Table 1. NG3 System Specifications

PARAMETER	SPECIFICATION
System Capacity	
Number of terminations per frame	1440 with 2mm patch cords
Horizontal trough configuration per frame	Six 5-inch rear troughs and front upper and lower cable troughs
Maximum number of terminations before exceeding 2-inch pile up of 2 mm patch cords	24, 480
Maximum number of frames in a lineup using 2 mm patch cords	18
NG3 High-Density Frame	
Dimensions (H x W x D)	84 x 30 x 24 in. (214.0 x 76.2 x 61 cm)

Table 1. NG3 System Specifications

PARAMETER	SPECIFICATION
Weight without panels and cables	250 lbs. (113.40 Kg)
Weight with panels and cables	675 lbs. (306.17 Kg)
NG3 High-Density Panels	
Number of terminations (Termination Panels)	72
Micro VAM mounting slots (VAM Panel)	12
Connector types available ADC recommends using only connectors, jumpers, and cables that comply with appropriate industry standards (Telecordia GR-326-CORE, GR-20, GR-409)	Available in most standard types including singlemode PCSC, duplex PCSC, PCST, PCFC, PCST-HP, PCSC/HP, PCFC-HP, duplex PCSC-HP, 8° SC/APC, 8° FC/APC, 8° E-2000/APC, duplex 8° SC/APC, PCD4; and multimode SC, duplex SC, ST, or FC.
Panel dimensions (H x W x D) with drawer closed	3.44 x 18.31 x 16.38 in. (8.7 x 46.6 x 41.6 cm)
Panel dimensions (H x W x D) with drawer open	3.44 x 18.31 x 30.57 in. (8.7 x 46.6 x 77.6 cm)
Environment	
Operating temperature	–40° C to 65° C (–40° F to149° F)
Storage temperature	–40° C to 85° C (–40° F to185° F)
Operating	Up to 80%
Storage	Up to 95%

2 APPLICATION AND PLANNING

2.1 System Location

An NG3 system can be deployed in a central office, headend, CEV, customer premises, or other indoor environment without any special engineering procedures.

2.2 Interconnect vs. Cross-Connect Application

An NG3 frame system can be used in either an interconnect or cross-connect application. Each application uses a different approach for connecting IFC network cables with Fiber Optic Terminal (FOT) equipment. Interconnect applications are direct and require less equipment but provide less flexibility. Cross-connect applications require more equipment but provide more flexibility and operational efficiency. In both interconnect and cross-connect applications, IFC network cables are brought into the NG3 frame lineup from the rear. The difference between the two applications is in the routing of the FOT equipment patch cords.

2.2.1 Interconnect Application

Figure 9 shows a typical interconnect application.

The IFC network cables are routed to the rear of the frame from either the top or bottom and then vertically (up or down) to the opening at the rear side of the designated OSP termination panel. At the opening, the IFC cable is broken-out into individual fibers which are routed into the panel and connected to the rear access side of the adapter packs.

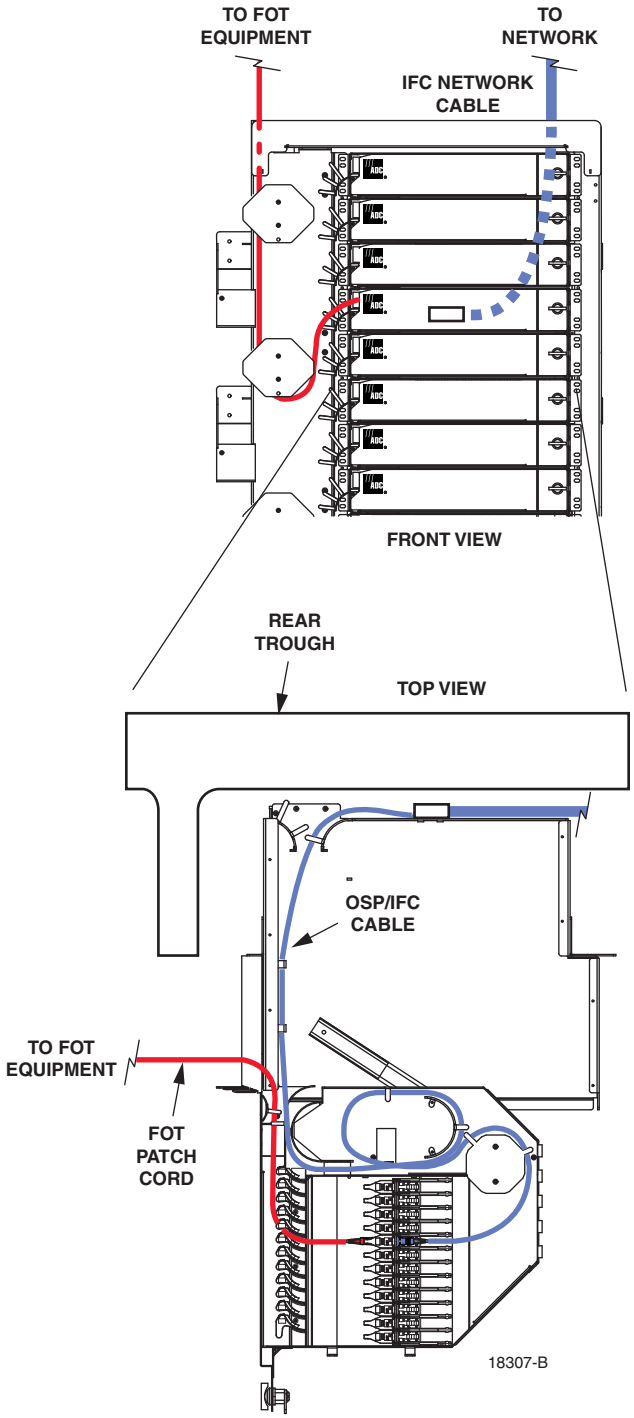

Figure 9. Typical Interconnect Application

2.2.2 Cross-Connect Application

Figure 10 shows a typical cross-connect application. Both the IFC network cables and the FOT patch cords are routed (from either the top or bottom) to the rear of the same frame or to separate frames within the same lineup.

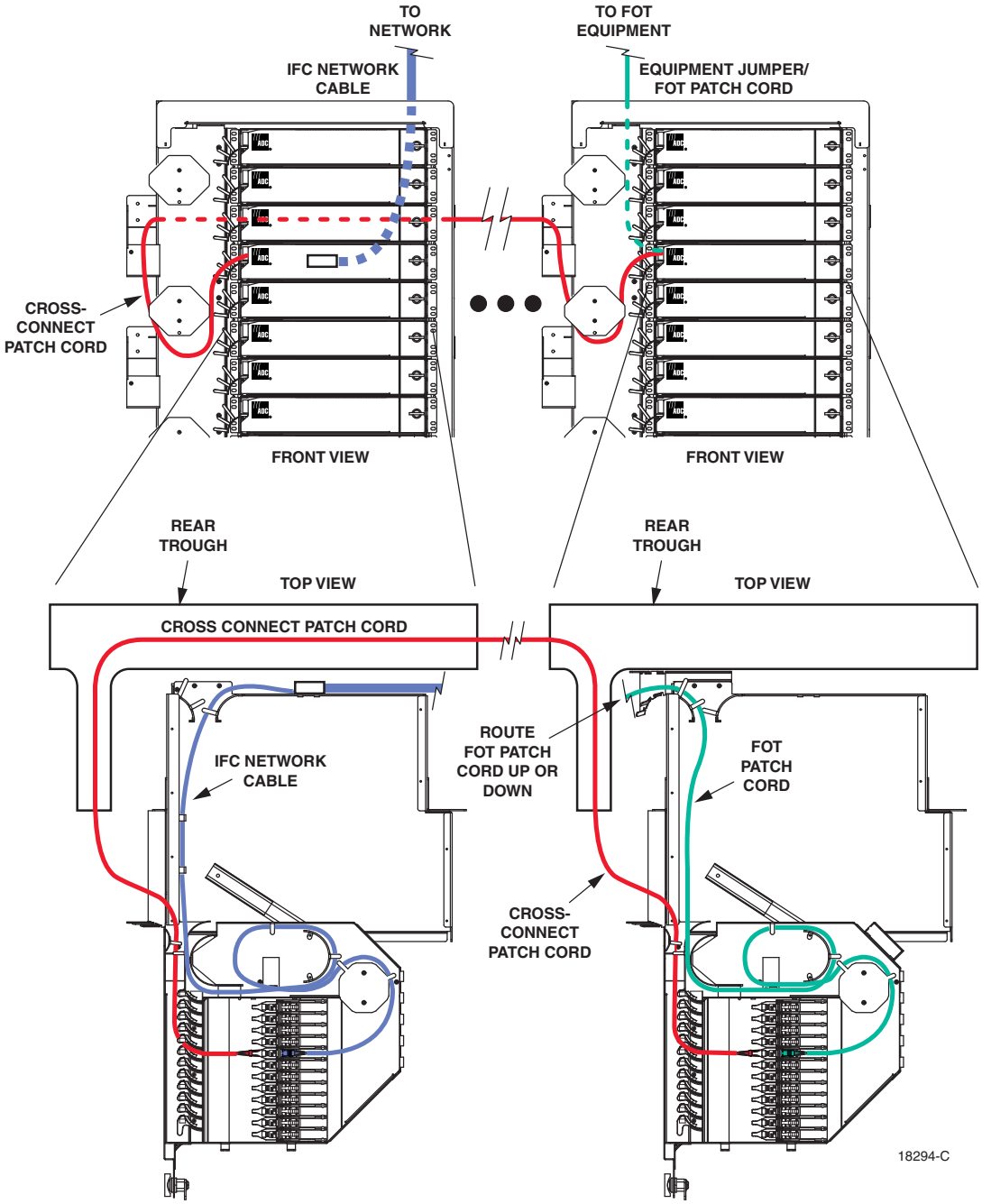

Figure 10. Typical Cross-Connect Application

The IFC network cables are routed vertically (up or down) to the opening at the rear side of a designated OSP termination panel. At the opening, the IFC cable is broken-out into individual fibers which are routed into the panel and connected to the rear access side of the adapter packs.

The FOT patch cords are routed vertically (up or down) to the opening at the rear side of a designated FOT termination panel. At the opening, the patch cords are routed into the panel and connected to the rear access side of the adapter packs.

Jumper (cross-connect) patch cords are routed along the front side of the frame(s) between the OSP and FOT termination panels. Within each panel, the jumper patch cords are connected to the front access side of the adapter packs. The jumper patch cords connect the IFC network cable terminations with the FOT equipment terminations.

2.3 Aisle Spacing

It is recommended that an aisle width of at least four feet be provided in front of the NG3 frame and three feet behind it. Figure 11 shows aisle spacing for a typical NG3 installation.

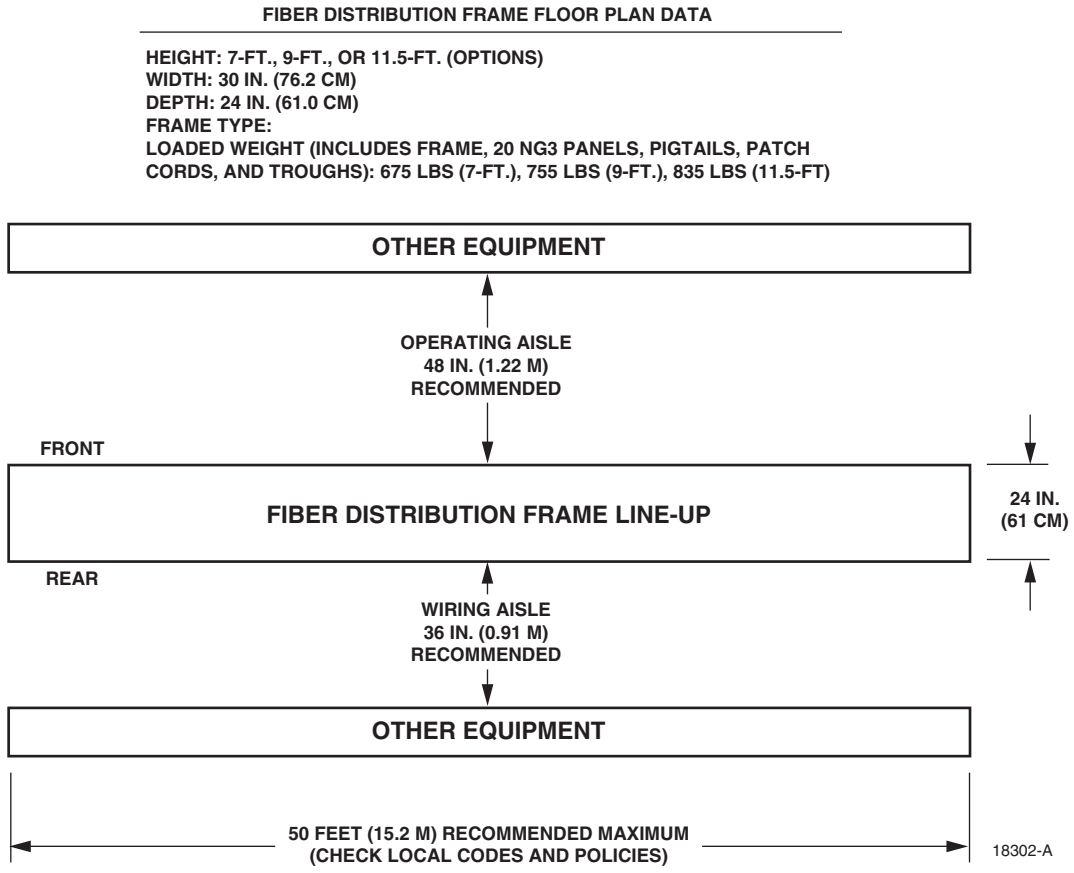

Figure 11. Recommended Aisle Spacing

2.4 Cable Vault vs. Frame Splicing

Splicing may be done at the cable vault or at a separate splice frame such as the Fiber Distribution Frame. Figure 12 compares the two options. Splicing at the cable vault is used when the frame is beyond the OSP indoor maximum distance specification. Frame splicing may be used when the OSP cable building entrance and splice frame are within the OSP indoor maximum distance specification. An IFC cable provides the link between the splice frame and the NG3 frame.

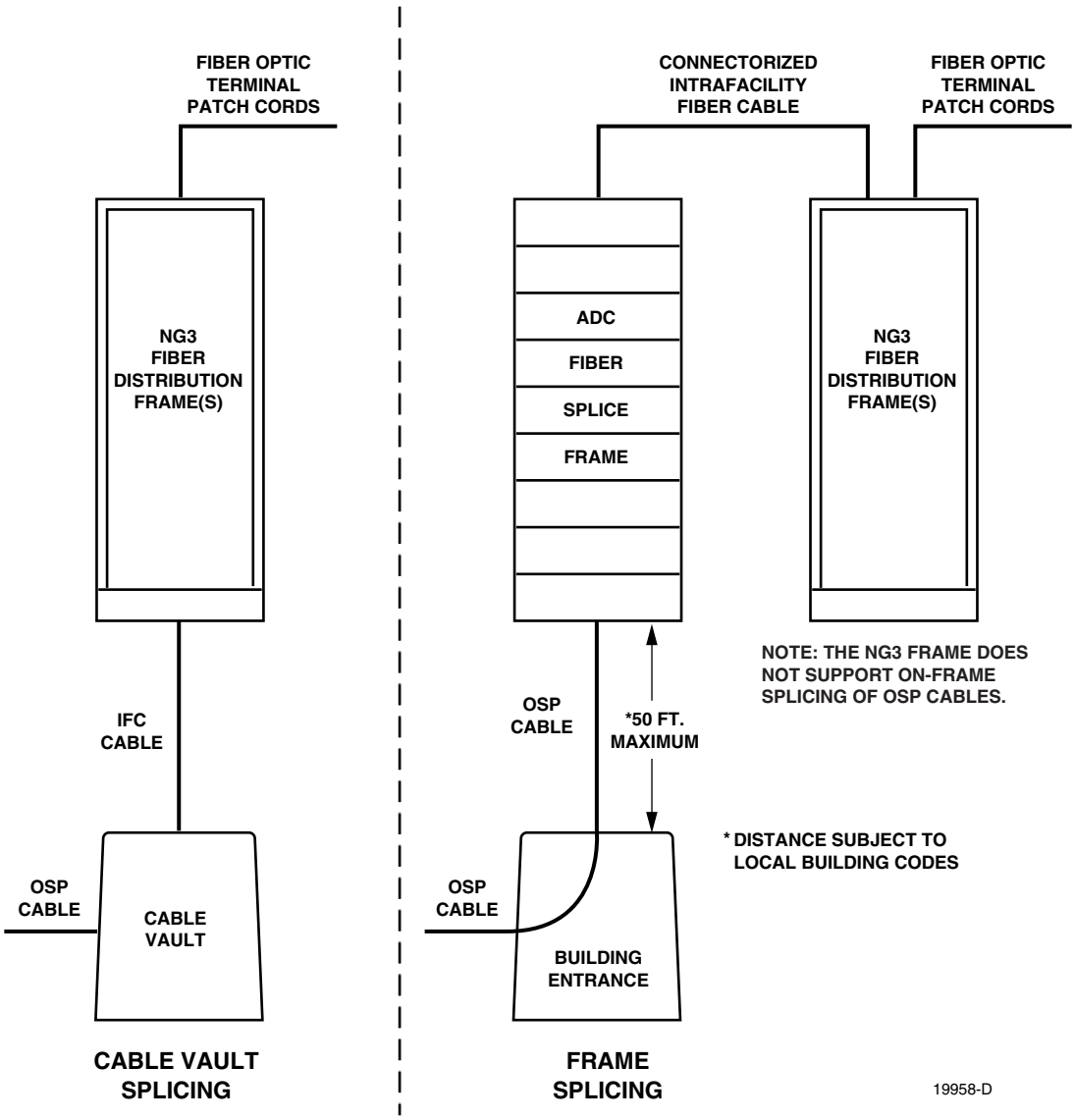

Figure 12. Cable Vault vs. On-Frame Splicing

2.5 Use of FOTSPs and End Guards

If the site plan requires installation of an NG3 system next to an existing Fiber Distribution Frame (FDF) system, contact ADC Technical Support for guidelines before proceeding.

2.6 Installing NG3 Next to FDF

If the site plan requires installation of an NG3 system next to an existing Fiber Distribution Frame (FDF) system, contact ADC Technical Support for guidelines before proceeding.

3 INSTALLATION

Installation of the NG3 system consists of installing frames and frame accessories, mounting panels on frames, installing IFC cables, and installing FOT patch cords. The following subsections provide basic guidelines for installing an NG3 frame system. References to other publications are included where appropriate whenever more detailed information is available.

3.1 Lineup

The NG3 frame is typically installed as part of a contiguous lineup consisting of multiple frames together with frame accessories. However, non-contiguous lineups may be configured if required. The following subsections provide guidelines for various situations that may be encountered when constructing lineups.

3.1.1 Contiguous Lineup

The standard NG3 frame system lineup is referred to as “contiguous” because it is comprised of multiple frames mounted side by side and fastened together. Brackets called “splice brackets” are used to fasten the frames together. End guards positioned on each end of the lineup protect the outside frames.

A typical lineup (in this case, for a cross-connect application) is shown in Figure 13. NG3 lineups can be built from left to right, from right to left, or from center outward. For instructions on installing splice brackets and end guards, refer to the publications shipped with those products. For FiberGuide information, refer to ADCP-95-005. A contiguous lineup equipped with Fiber Optic Terminal Storage Panels (FOTSP) is shown in Figure 14. FOTSP’s may be used to provide additional storage for FOT patch cords in a cross-connect application.

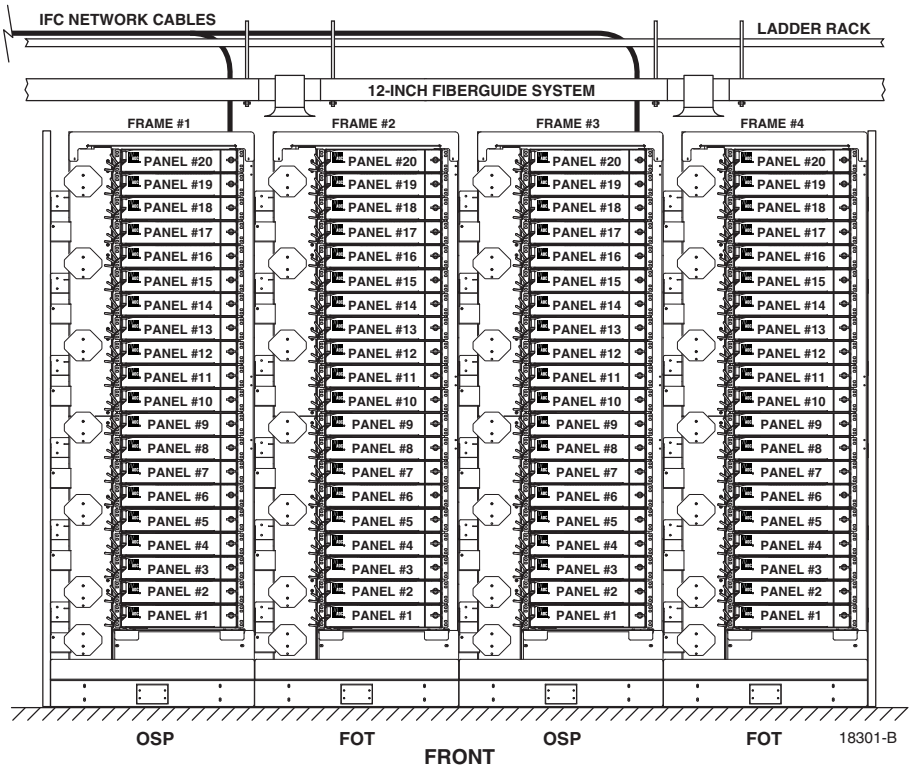

Figure 13. Example of a Contiguous Lineup

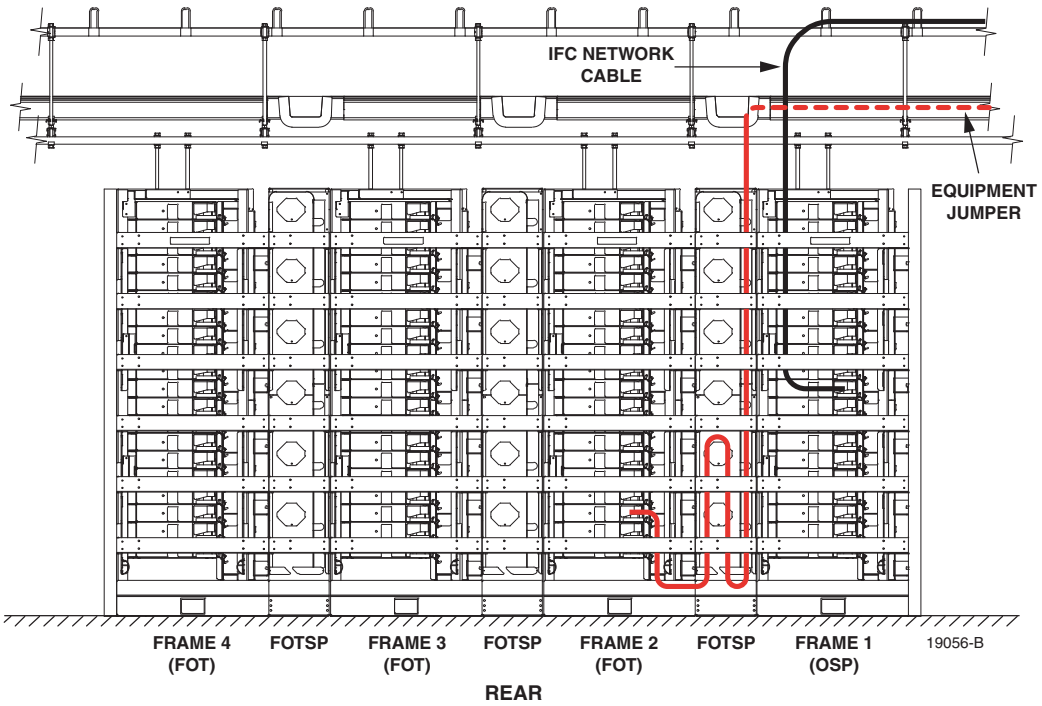

Figure 14. Example of a Contiguous Lineup With FOTSP's

3.1.2 Non-Contiguous Lineup

A “non-contiguous” lineup is one in which there is a gap in the frame lineup. The following options may be used to bridge a gap between frames:

- Tie panels
- Cross-aisle bridges
- Rear trough transition kits

The following subsections describe the non-contiguous lineup options.

3.1.2.1 Tie Panels

The tie panel option involves installing a separate termination panel on either side of the lineup gap. The termination locations on each tie panel are configured to be identical. At the rear side of the frame, “tie cables” are used to connect the adapters (rear-access side) on one tie panel to the same adapters (rear-access side) on the other panel. At the front side of the frame, jumper patch cords are installed between each tie panel and the corresponding OSP and FOT termination panels. A typical tie panel configuration is shown in Figure 15.

Several methods may be used for connecting the two tie panels. The tie cable may consist of individual patch cords that are routed between the two panels. The tie cable may also be a connectorized IFC cable. The connectorized IFC cable must be the exact length required to reach between the two panels without requiring excess slack storage. A final tie cable option involves using a standard termination panel (equipped with a ribbon type IFC cable) and a splice and termination panel (see Subsection 1.3). The stub end of the IFC cable is routed from the standard panel to the splice and termination panel for splicing to the panel’s cable assembly.

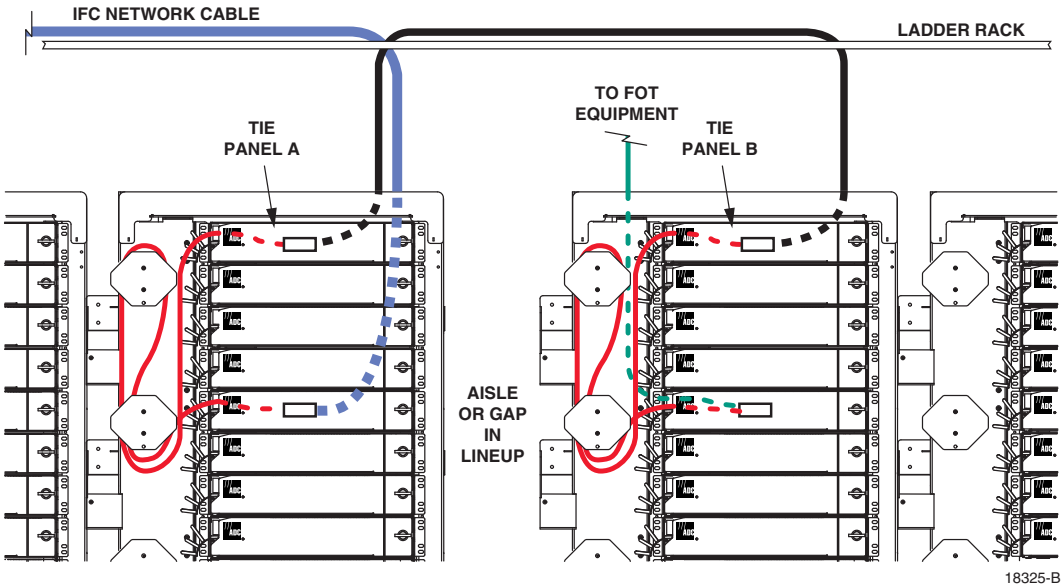

Figure 15. Use of Tie Panels in a Non-Contiguous Lineup

3.1.2.2 Cross-Aisle Bridges

Cross-aisle bridges provide an overhead pathway between lineups separated by an aisle. Depending on office requirements, solutions will vary. For more information, contact an ADC representative for technical support.

3.1.2.3 Rear Trough Transition Kits

Rear trough transition kits are available for use in column lineups. Depending on office requirements, solutions will vary. For more information, contact an ADC representative for technical support.

3.1.3 Lineup Expansion

NG3 contiguous lineups can be expanded to the right or left side without interfering with any installed circuits.

3.2 Frame

The NG3 frame may be installed on a concrete floor or raised floor. For step by step pictorial instructions, refer to ADCP-90-295 for raised floor installations and ADCP-90-299 for concrete floor installations. The dimensions of a single frame and end guard are shown in Figure 16.

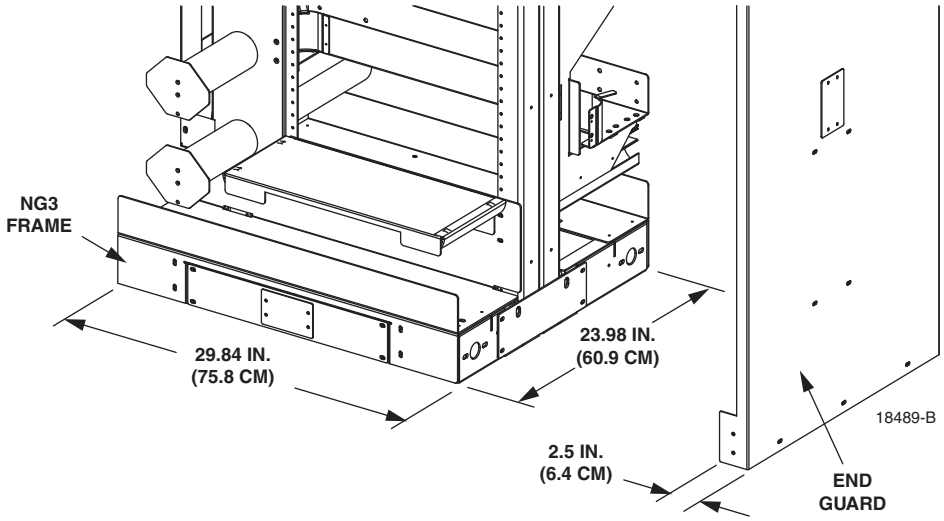

Figure 16. Dimensions of Single Frame and End Guard

3.3 Frame Accessories

As indicated in Section 3.1 on page 15, an NG3 frame is typically installed as part of a lineup having an end guard on each end of the lineup and, in some cases, FOTSPs between frames. The end guard may be installed on a frame or on a FOTSP.

3.3.1 Installing a FOTSP on a Frame

For instructions on installing a FOTSP on a frame, see ADCP-90-399.

3.3.2 Installing an End Guard on a Frame or FOTSP

For instructions on installing an end guard on a FOTSP on a frame, see ADCP-90-398.

3.4 Panels

Individual NG3 panels may be installed in any of the 20 pre-determined locations on the NG3 frame. For detailed information on installing a particular panel in the frame, refer to the publication shipped with the panel.

If the incoming cables enter the frame from overhead, it is recommended that panels be loaded into the NG3 frame starting at the bottom and working toward the top. If the incoming cables enter the frame from the bottom, it is recommended that panels be loaded into the NG3 frame starting at the top and working toward the bottom. NG3 panels may be loaded into any open position if necessary.

3.5 IFC Network Cables

Termination panels are available either with or without a pre-installed IFC cable. If the panel does not have a pre-installed IFC cable, then the IFC cable must be routed to the frame and installed in the panel at the installation site. In both **interconnect** and **cross-connect** applications, IFC cables are routed to the **rear** of the frame. Entry to the frame may be from either an **overhead** or **underfloor** raceway system. The routing for overhead entry in a typical installation is shown in Figure 17.

As viewed from the rear, IFC cables are routed vertically up or down the left side of the frame to the rear side of the termination panel. IFC cables that are not pre-installed in a termination panel should not exceed 72 fibers. Each IFC cable requires a 72-position termination panel.

The frame is equipped with tie bars that may be used to secure IFC cables to the rear of the frame using wax lacing. At the entry point into the panel, the cable must be clamped and broken-out into subunits and individual fibers. For details on installing a cable clamp and routing the cable subunits into the termination panel, refer to the manual shipped with the panel.

Caution: *Applying excessive tension when lacing cables can cause physical damage and attenuation of optical fibers.*

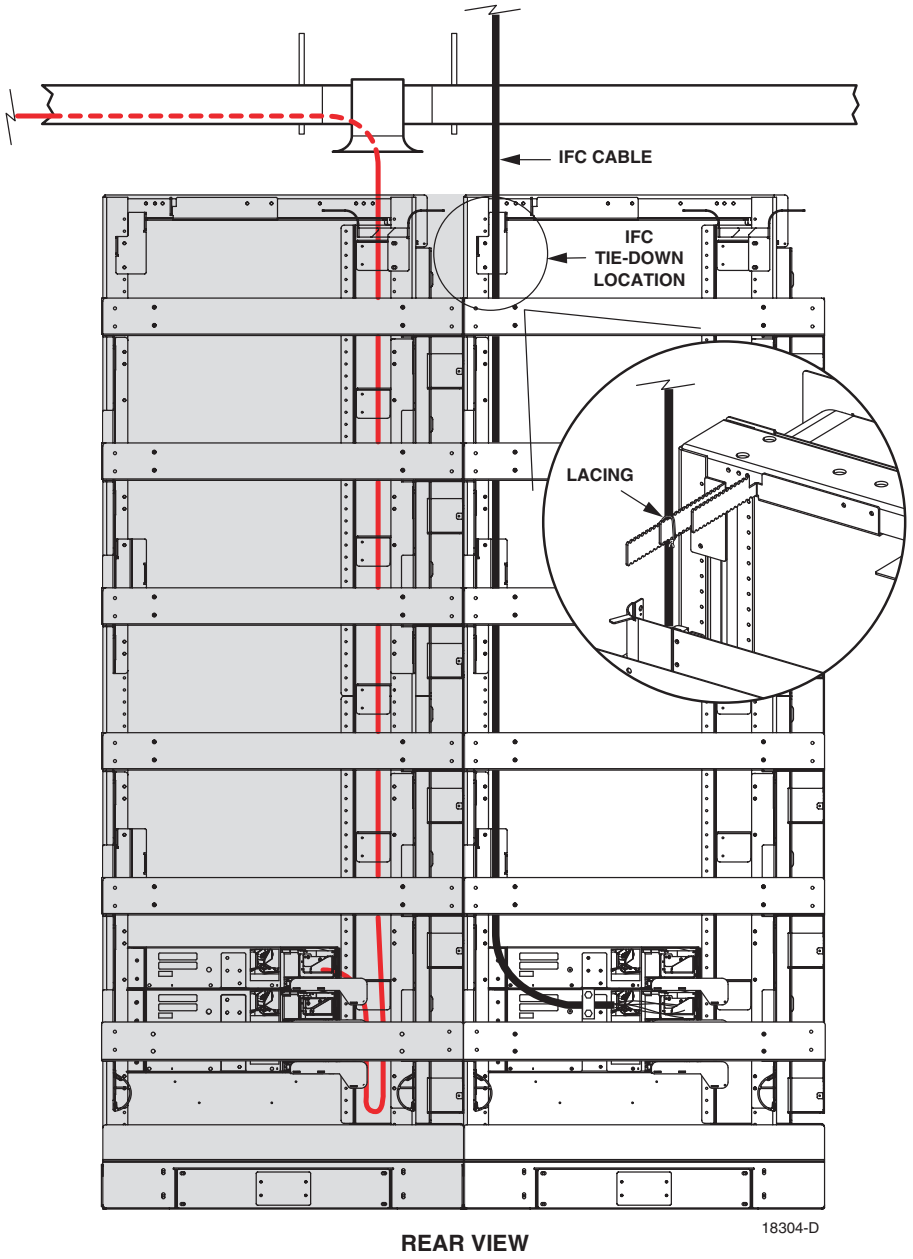

Figure 17. Typical IFC Cable Overhead Routing - All Applications

The IFC cable should maintain a minimum bend radius that is ten times greater than the cable outside diameter when inside the raceway, exiting the raceway, and within the NG3 frame. Secure cable to overhead raceway per local practice.

When the IFC cable is pre-installed in the termination panel, the stub end of the cable is routed from the frame to either a splice frame or a splice enclosure at the cable vault. IFC cables with fiber counts of 12, 24, 36, 48, 72, 144, or 216 fibers are available.

3.6 FOT Patch Cords

The routing and installation of Fiber Optic Terminal (FOT) equipment patch cords is dependent on whether the frame is used for an interconnect or cross-connect application.

In an **interconnect** application, the FOT patch cords are routed to the **front** of the frame. Entry to the frame is from an **overhead** guideway. The routing for overhead entry in a typical interconnect application is shown in Figure 18. As viewed from the front, the FOT patch cords are routed vertically down the left side of the frame.

Note: Fiber entry from an underfloor guideway is not possible at the front of the frame.

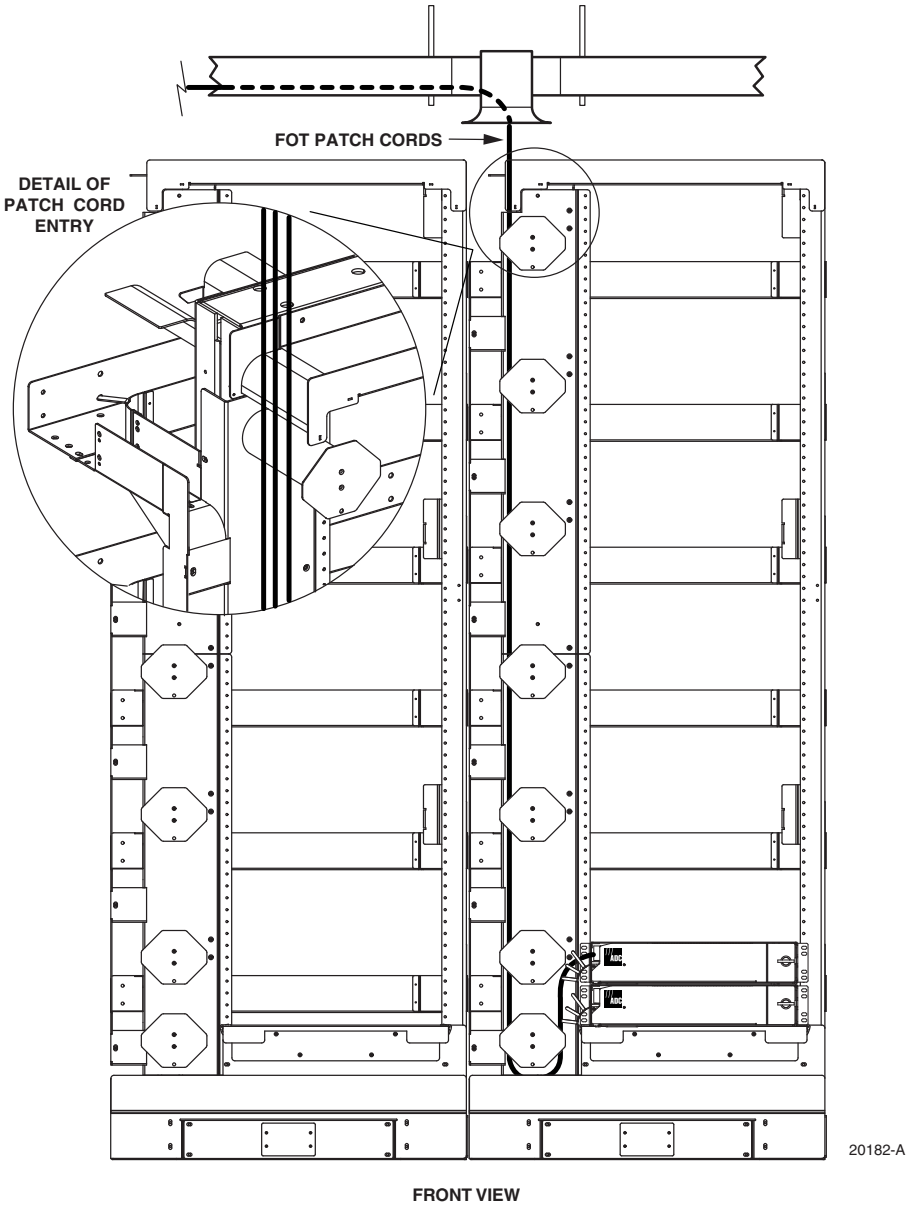

Figure 18. Typical FOT Patch Cord Overhead Routing - Interconnect Application

In a **cross-connect** application, the FOT patch cords are routed to the **rear** of the frame. Entry to the frame may be from either an **overhead** or **underfloor** guideway. The routing for overhead entry in a typical cross-connect application is shown in Figure 19.

As viewed from the rear, the FOT patch cords are routed vertically up or down the right side of the frame to the rear side of the termination panel.

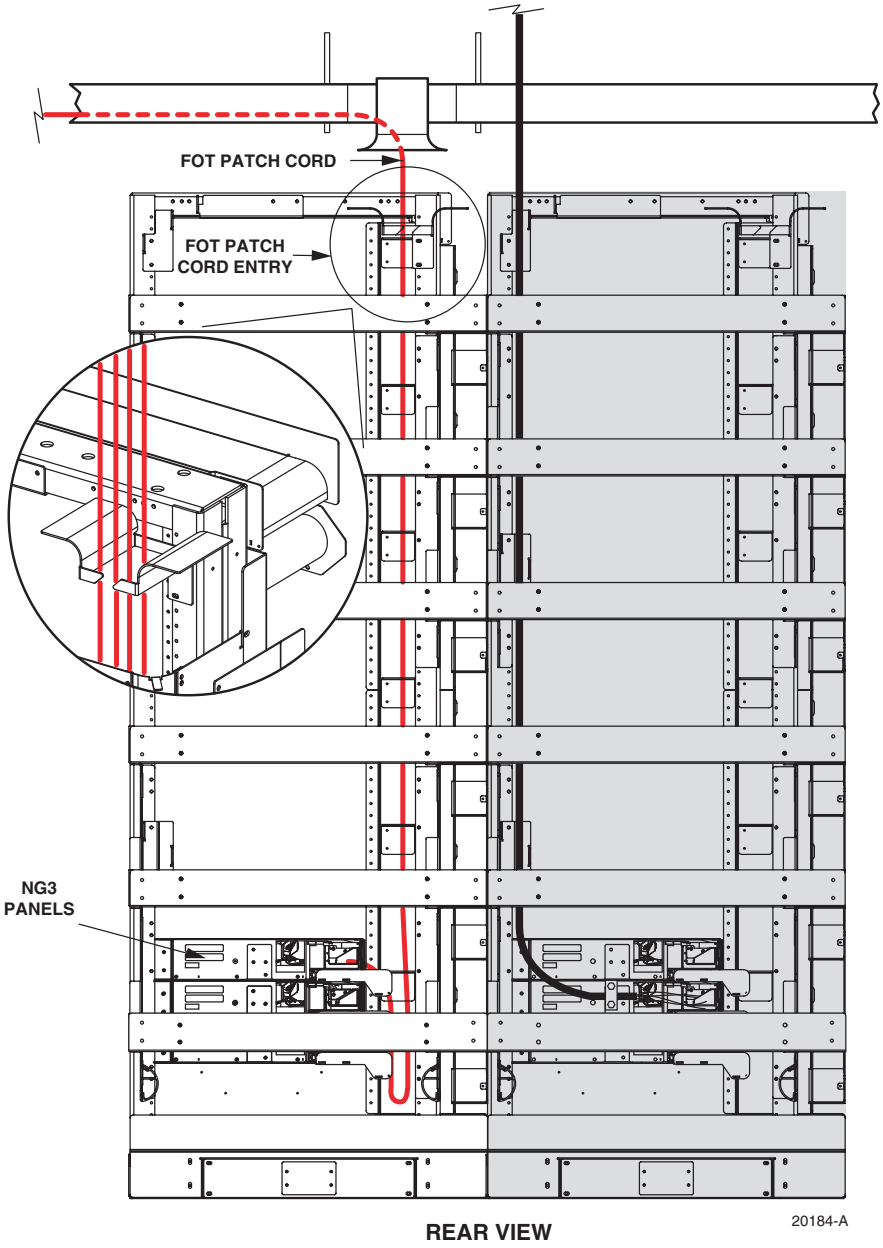

Figure 19. Typical FOT Patch Cord Routing - Cross-Connect Application

The FOT patch cords should maintain a minimum bend radius of 1.5 inches or ten times greater than the jacket outside diameter, whichever is greater, inside the raceway, exiting the raceway, and within the NG3 frame. For details on routing the patch cords into the panel, refer to the manual shipped with the panel.

Note: IFC cables and FOT patch cords should be routed through separate raceways and not placed together within the same raceway.

In an NG3 lineup constructed per ADC guidelines, FOT patch cords are used in conjunction with the FiberGuide System which provides raceways and troughs for routing the patch cords to the frame. The recommended routing and entry point of the patch cords into the frame and the related placement of FiberGuide components with respect to the NG3 frame lineup depend on the application and configuration. Refer to Subsection 3.8 for specific recommendations for using the FiberGuide System with the NG3 Frame System.

3.7 VAM Panel IFC Cables and Patch Cords

The VAM panel provides mounting positions for up to 12 micro VAM assemblies. With a maximum of 6 ports per VAM assembly, a fully loaded VAM panel could have a maximum of 72 optical ports. Each VAM assembly provides both input and output ports. The input ports are generally connected to the FOT equipment. The output ports are generally connected to the OSP cable terminations or provide circuit access.

The VAM panel input optical ports may be accessed from either the front or rear side of the frame. FOT patch cords may be routed to the **front** of the VAM panel using the same guidelines that apply when routing FOT patch cords in **interconnect** applications. FOT patch cords may also be routed to the **rear** of the VAM panel using the same guideline that apply when routing FOT patch cords in **cross-connect** applications. A connectorized IFC cable may also be used to connect the VAM panel input ports to the FOT equipment. When IFC cable is used, it must be routed to the **rear** of the VAM panel using the same guidelines that apply to routing IFC network cables. The VAM panel output optical ports are generally accessed from the front side of the frame. Jumper patch cords may be routed between the VAM panel and OSP termination panel using the same guidelines that apply when routing cross-connect patch cords in **cross-connect** applications.

3.8 FiberGuide System

The 12- or 24-Inch FiberGuide System is recommended for management and routing of FOT patch cords in an NG3 system. In general, three configurations are used: interconnect, cross-connect without FOTSP's, and cross-connect with FOTSP's.

Note: All illustrations in this section show the 12-Inch FiberGuide System.

Note: For a complete description of the FiberGuide System, with exploded views of FiberGuide kits, refer to ADCP-95-005.

Note: IFC cables and FOT patch cords should be routed through separate raceways and not placed together within the same raceway.

3.8.1 Interconnect

In an interconnect application, the FOT patch cords are routed to the front of the frame. FiberGuide drops are positioned over the storage spools located on the left front side of the frame. FOT patch cords are routed down into the channel located to the left of the storage spools. A typical configuration is shown in Figure 20. Note the clearance required between the top of the frame and the auxiliary framing used to support the FiberGuide System. This clearance is for the top panel cover, which when opened, swings upward above the top of the frame.

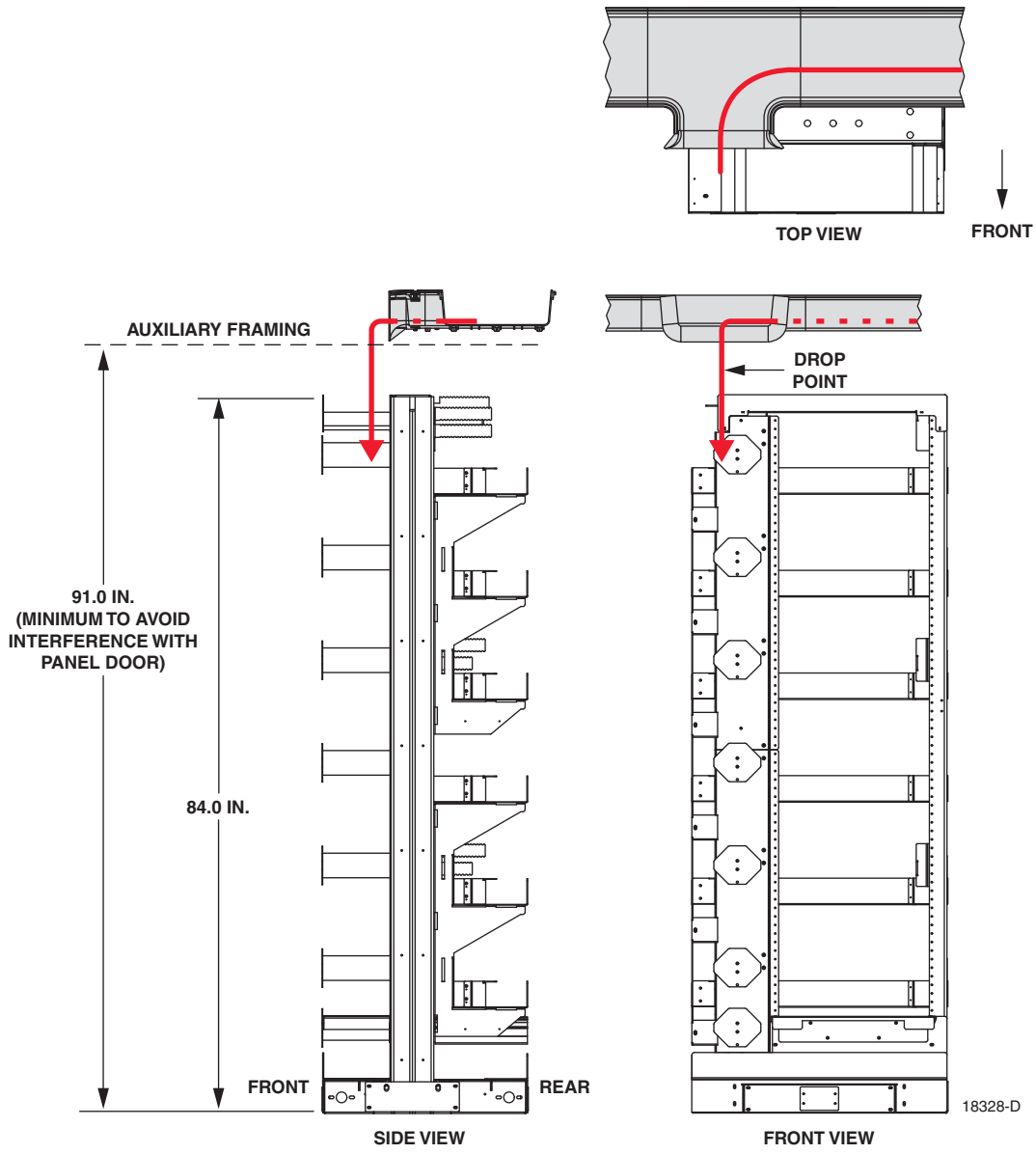

Figure 20. FiberGuide Placement for Interconnect Application

3.8.2 Cross-Connect Without FOTSP's

In a cross-connect application, the FOT patch cords are routed to the rear of the frame. When FOTSP's are not installed, the FiberGuide drop is positioned directly above the vertical trough on the rear of the frame. The FOT patch cords may also enter the frame from an underfloor raceway system. The FOT patch cords are routed down (or up) the right side (viewed from the rear) of the frame. A cross-connect application without FOTSP's is shown in Figure 20. Note the clearance required between the top of the frame and the auxiliary framing used to support the FiberGuide System. This clearance is for the top panel cover, which when opened swings upward above the top of the frame.

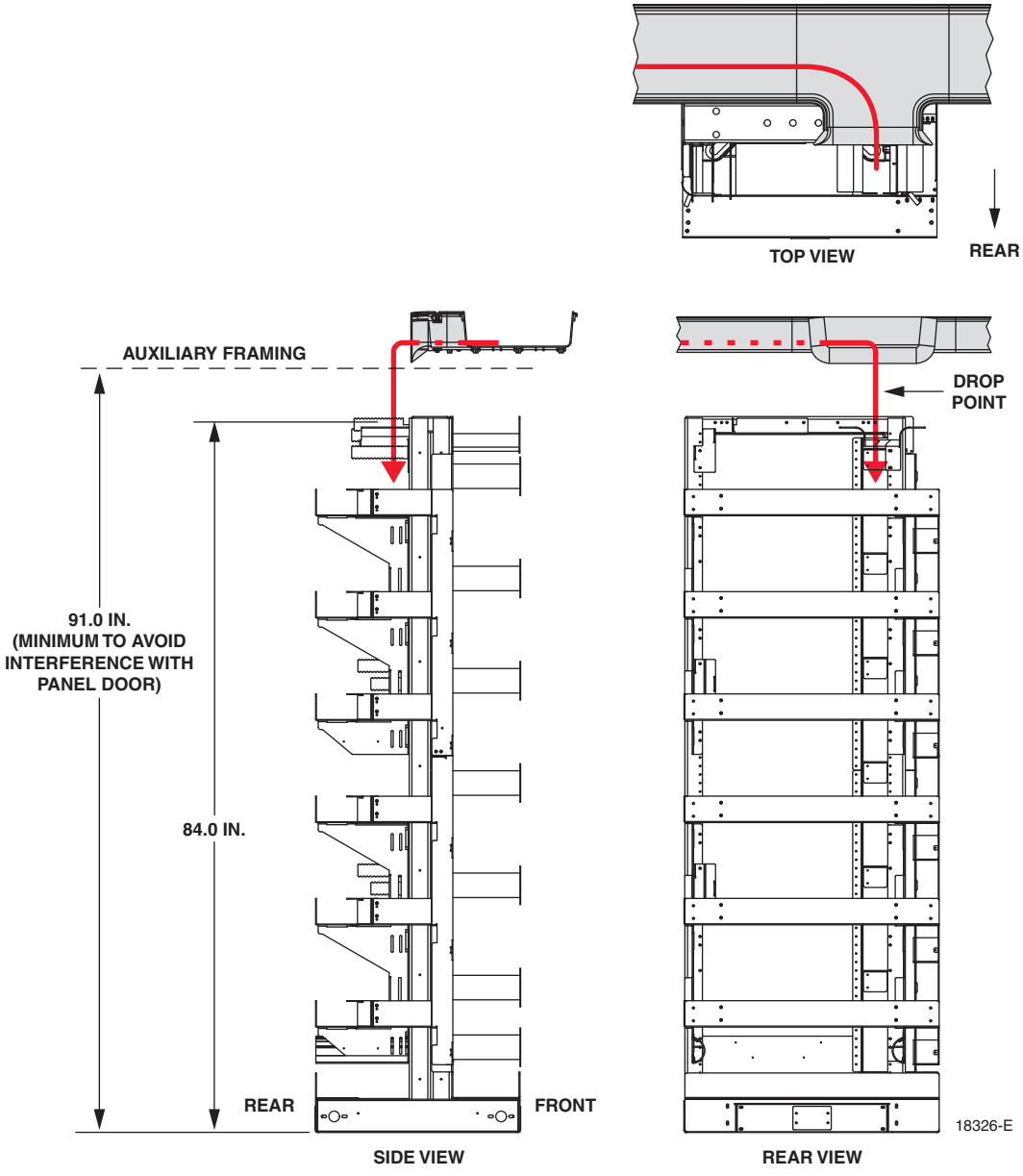

Figure 21. FiberGuide Placement for Cross-Connect Application

3.8.3 Cross-Connect With FOTSP's

In a cross-connect application, the FOT patch cords are routed to the rear of the frame. When FOTSP's are installed, the FiberGuide drop is positioned above the FOTSP and centered on the vertical cableway just to the right (viewed from the rear) of the storage spools as shown in Figure 22. The FOT patch cords are routed down into the vertical cableway, around the spools, and from the spools to the frame located immediately to the left (viewed from the rear) of the FOTSP. A front view of a cross-connect application with FOTSP's showing the frame and FOTSP dimensions and the cross-connect jumper routing is shown in Figure 23.

A side view of a cross-connect application with FOTSP's showing the dimensions for FiberGuide placement is shown in Figure 24. Note the clearance required between the top of the frame and the auxiliary framing used to support the FiberGuide System. This clearance is for the top panel cover which, when opened, swings upward above the top of the frame.

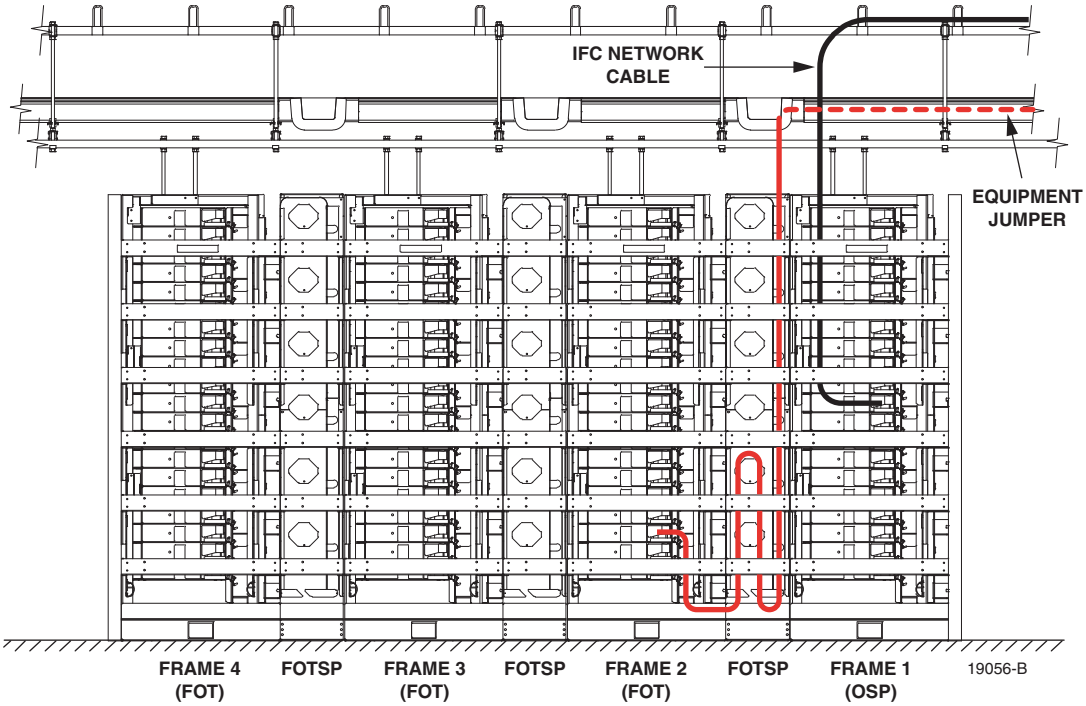

Figure 22. Cross-Connect With FOTSP's - Rear View

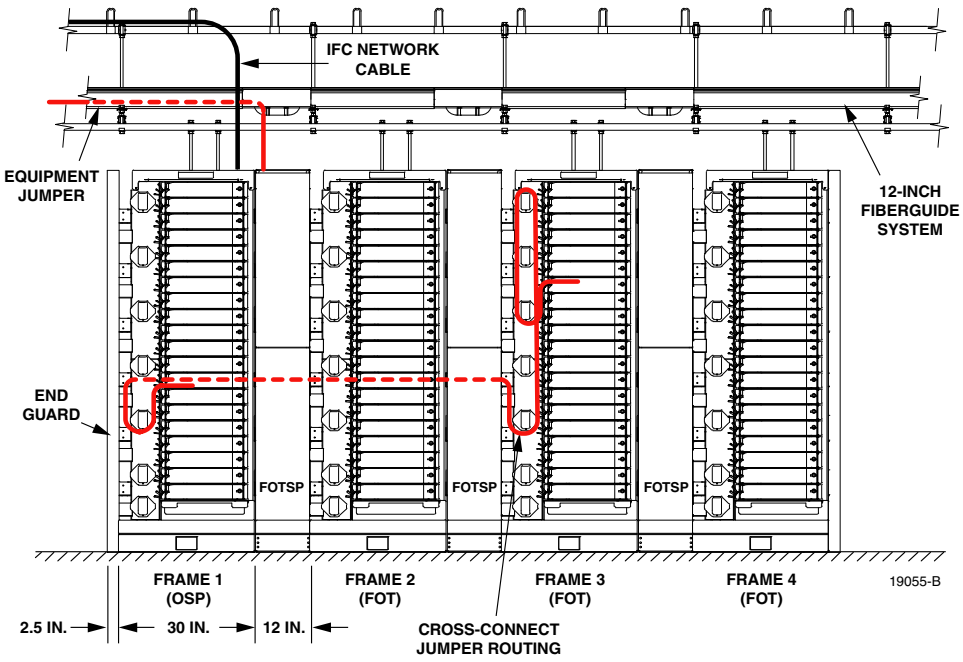

Figure 23. Cross-Connect With FOTSP's - Front View

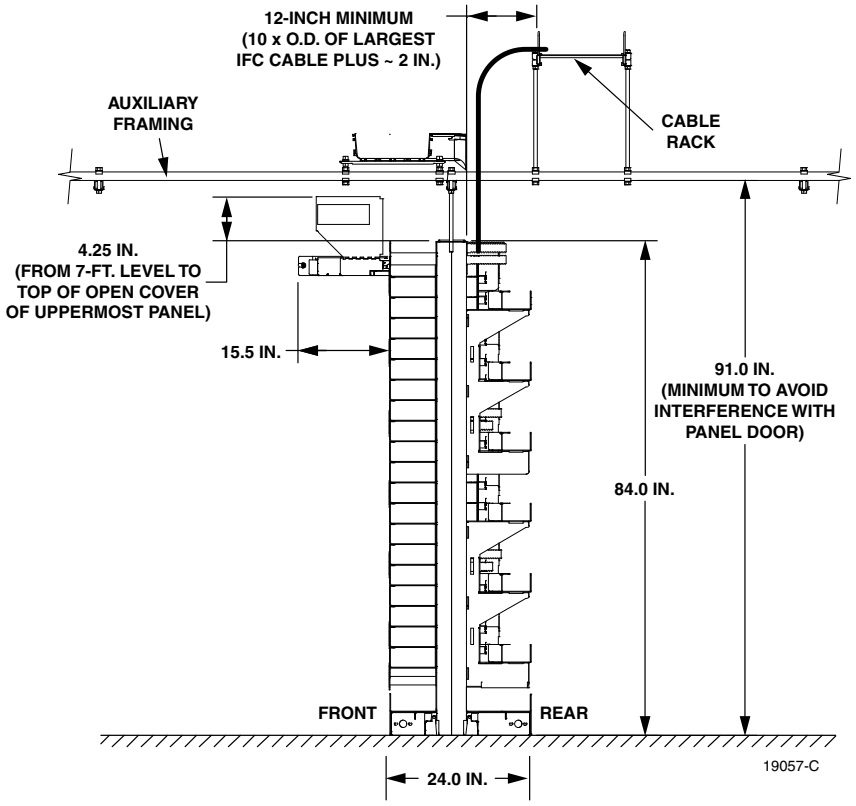

Figure 24. Cross-Connect With FOTSP's (Side View)

3.8.4 Alternative Rear Placement of FiberGuide

In the FiberGuide configurations described in the previous subsections, the FiberGuide system is offset to the front of the lineup with the drop facing toward the rear. If required by spatial considerations, an alternative placement can be used with the FiberGuide raceway offset to the rear of the lineup and with the drop facing toward the front.

Figure 25 shows the recommended dimensions for such a configuration. In this configuration, patch cord pileup is a potential problem. Therefore, the FiberGuide drop must be positioned 5 to 6 inches (12.7 to 15.24 cm) behind the frame central supports as shown.

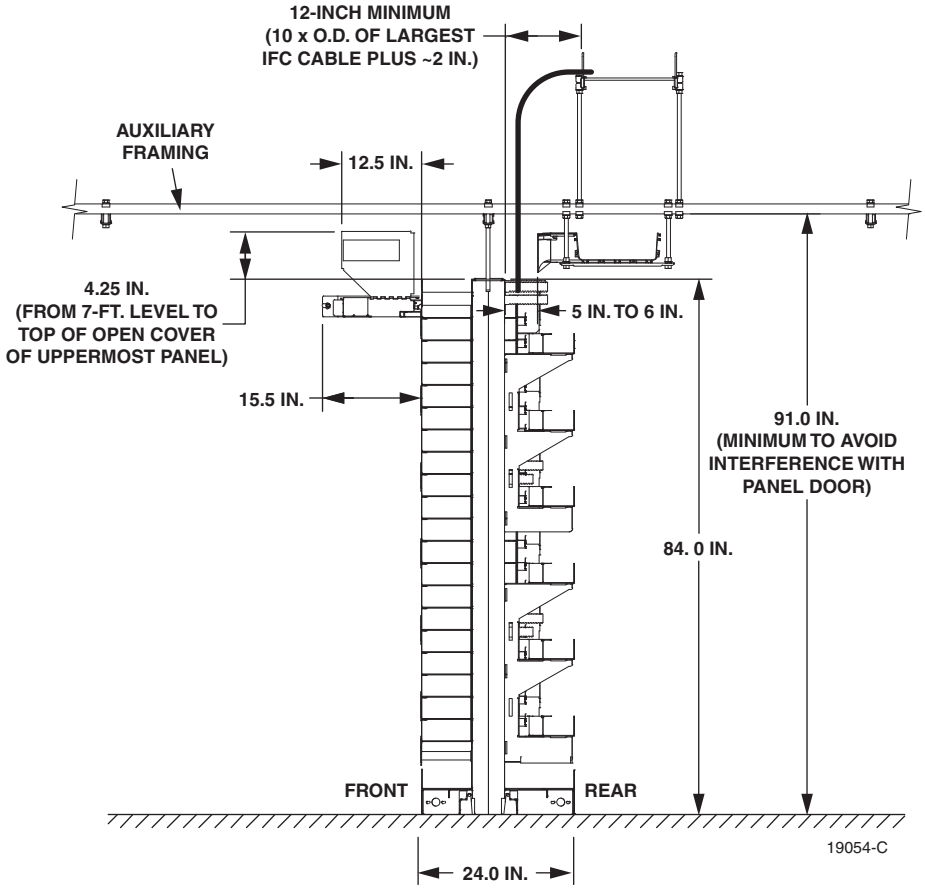

Figure 25. Alternative Placement of FiberGuide Raceway (Offset to Rear Rather Than Front Side)

3.9 Acceptance Testing

ADC recommends performance acceptance testing of installed circuits before turning up service. ADC recommends performing the test per local requirements. If local testing requirements are not available, contact ADC Customer Service for recommendations.

4 SYSTEM PROCEDURES

System procedures, listed below, address general troubleshooting situations in terms of connections between circuits.

- Series test access (Subsection 4.1)
- Temporary service restoral (Subsection 4.2)
- Moving optical fiber to new equipment (Subsection 4.3)

4.1 Series Test Access

This procedure is used to obtain series test access to the FOT equipment or IFC network cable at the NG3 frame. The appropriate test equipment may then be connected to the FOT equipment or network cable that requires testing. Separate procedures are provided for interconnect and cross-connect applications. Refer to Figure 26 for a schematic diagram of the procedure.

The same procedures are used for bidirectional test access which requires breaking a circuit to access both directions. Test equipment should be used on a secure surface at a convenient work level. Do not support test equipment on the NG3 panel.

Note: For general patch cord routing guidelines, refer to Section 5.

Danger: *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not look directly into the optical adapters of the adapter packs. Exposure to invisible laser radiation may result. An optical power meter should be used to verify active fibers. A protective cap or hood MUST be immediately placed over any radiating adapter or optical fiber connector to avoid the potential of dangerous amounts of radiation exposure. This practice also prevents dirt particles from entering the adapter or connector.*

4.1.1 Interconnect Application

For interconnect applications, use the following procedure:

1. Locate the adapter that serves as the termination point for the FOT equipment or network cable that requires testing (see Figure 26).
2. Disconnect the FOT equipment patch cord connector from the front side of the adapter located in step 1.
3. Place a clean dust cap on the connector to prevent contamination.
4. Connect appropriate test equipment to the network cable adapter or the FOT equipment patch cord. Note that a separate patch cord or test cord with the proper adapters may be needed to make the required connection to the test equipment.
5. Install dust caps on all adapters and connectors that will not be used during the test.

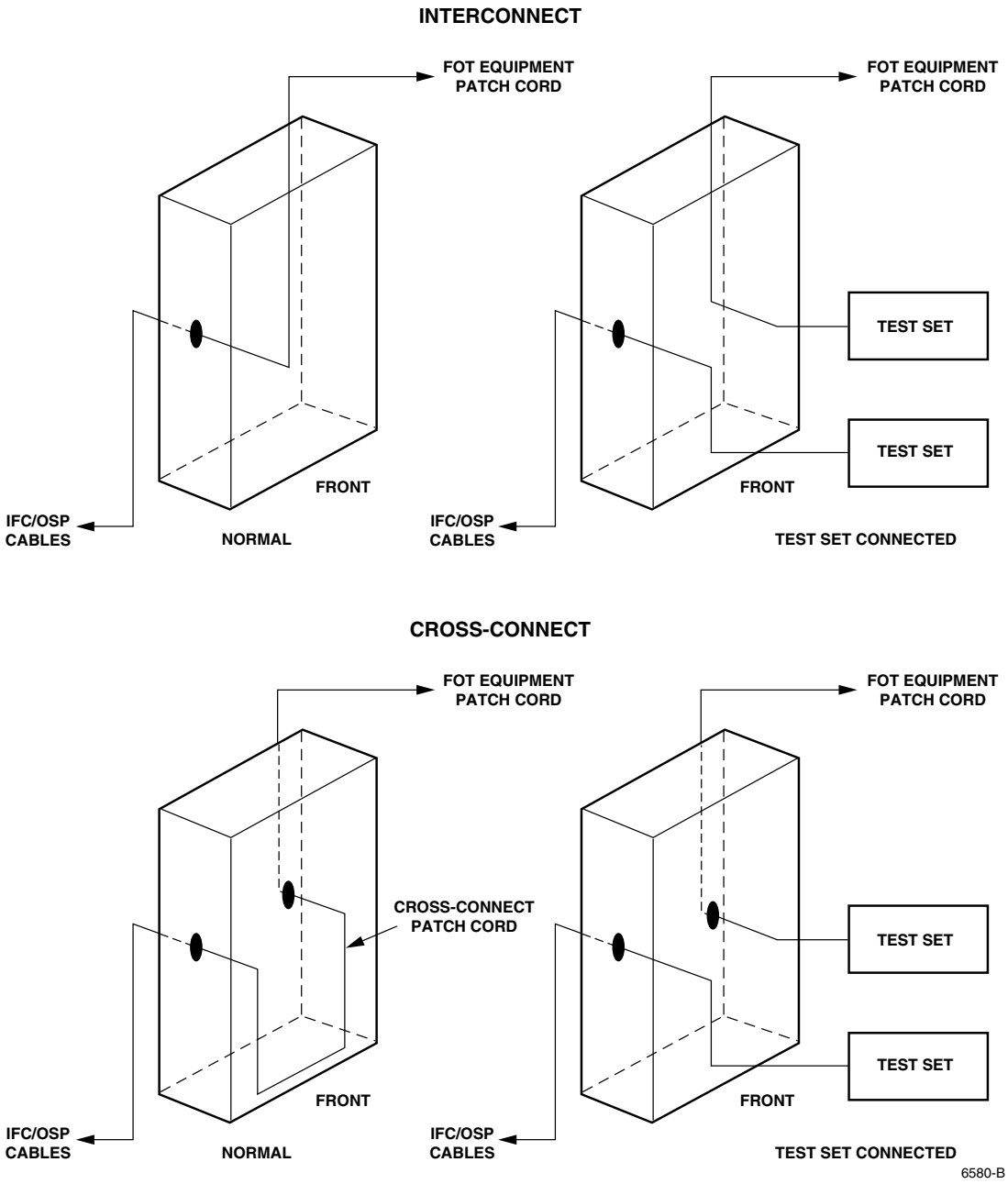

Figure 26. Series Test Access

4.1.2 Cross-Connect Application

For cross-connect applications, use the following procedure:

1. Locate the adapter that serves as the termination point for the FOT equipment or network cable that requires testing (see Figure 26).

2. Disconnect the cross-connect patch cord connector from the front side of the adapter located in step 1.
3. Place a clean dust cap on the connector to prevent contamination.
4. Connect appropriate test equipment to the network cable adapter or the FOT equipment patch cord. Note that a separate patch cord or test cord with the proper adapters may be needed to make the required connection to the test equipment.
5. Install dust caps on all adapters and connectors that will not be used during the test.

4.2 Temporary Service Restoral

This procedure is used to temporarily restore service after an IFC network cable has been cut or damaged. To perform this procedure, a spare network cable must be available. Separate procedures are provided for interconnect and cross-connect applications. Refer to Figure 27 for a schematic diagram of this procedure.

Note: For general patch cord routing guidelines, refer to Section 5.

Danger: *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not look directly into the optical adapters of the adapter packs. Exposure to invisible laser radiation may result. An optical power meter should be used to verify active fibers. A protective cap or hood MUST be immediately placed over any radiating adapter or optical fiber connector to avoid the potential of dangerous amounts of radiation exposure. This practice also prevents dirt particles from entering the adapter or connector.*

4.2.1 Interconnect Application

For interconnect applications, use the following procedure:

1. Locate the adapter that serves as the termination point for the damaged network cable (see Figure 27).
2. Disconnect the FOT equipment patch cord connector from the front side of the network cable adapter located in step 1.
3. Place a clean dust cap on the connector to prevent contamination.
4. Locate the adapter that serves as the termination point for the spare network cable.
5. Route the FOT equipment patch cord to the adapter for the spare network cable and mate the patch cord connector with the spare network cable adapter. If the patch cord is too short, select and route a new patch cord between the FOT equipment and the spare network cable adapter.
6. Install a dust cap on the adapter for the damaged network cable.

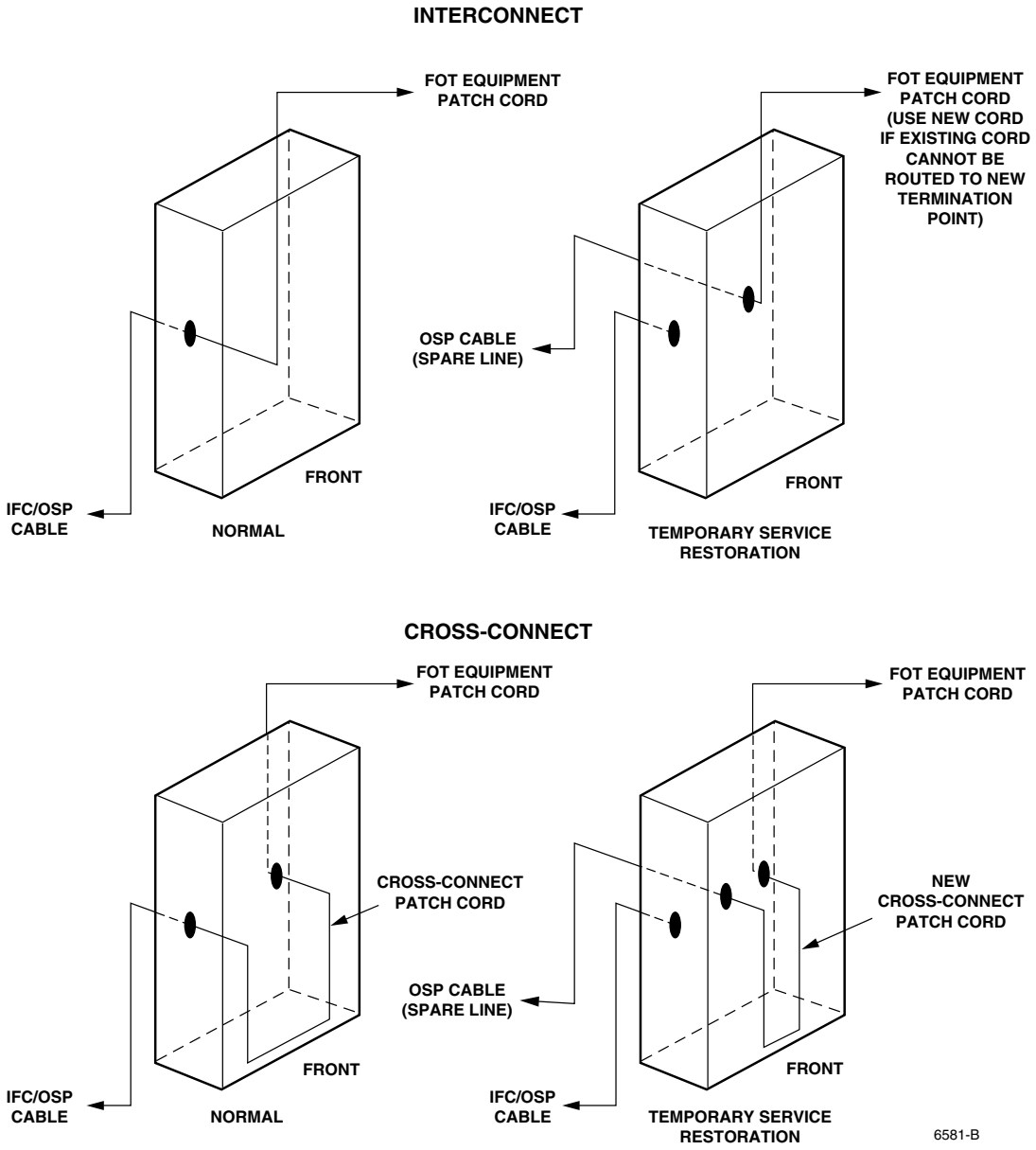

Figure 27. Temporary Service Restoral

4.2.2 Cross-Connect Application

For cross-connect applications, use the following procedure:

1. Locate the adapter that serves as the termination point for the damaged network cable (see Figure 27).

2. Disconnect the cross-connect patch cord connector from the front side of the network cable adapter located in step 1.
3. Place a clean dust cap on the connector to prevent contamination.
4. Locate the adapter that serves as the termination point for the spare network cable.
5. Route the FOT equipment patch cord to the adapter for the spare network cable and mate the patch cord connector with the spare network cable adapter. If the patch cord is too short, select and route a new patch cord between the FOT equipment and the spare network cable adapter.
6. Install a dust cap on the adapter for the damaged cable line.

4.3 Moving Optical Fiber to New Equipment

This procedure is used to disconnect an IFC network cable termination and reconnect it to new equipment. Separate procedures are provided for interconnect and cross-connect applications. Refer to Figure 28 for a schematic diagram of the procedure.

Note: For general patch cord routing guidelines, refer to Section 5.

Danger: *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not look directly into the optical adapters of the adapter packs. Exposure to invisible laser radiation may result. An optical power meter should be used to verify active fibers. A protective cap or hood MUST be immediately placed over any radiating adapter or optical fiber connector to avoid the potential of dangerous amounts of radiation exposure. This practice also prevents dirt particles from entering the adapter or connector.*

4.3.1 Interconnect Application

For interconnect applications, use the following procedure:

1. Locate the adapter for the network cable that is to be connected to the new equipment (see Figure 28).
2. Disconnect the FOT equipment patch cord connector from the front side of the adapter located in step 1.
3. Place a clean dust cap on the connector to prevent contamination.
4. Select and route a new patch cord between the new FOT equipment and the adapter for the network cable. Mate patch cord connector with adapter.
5. Remove the old FOT patch cord from the frame and raceway system as described in the NG3 Termination Panel User Manual (ADCP-90-297).

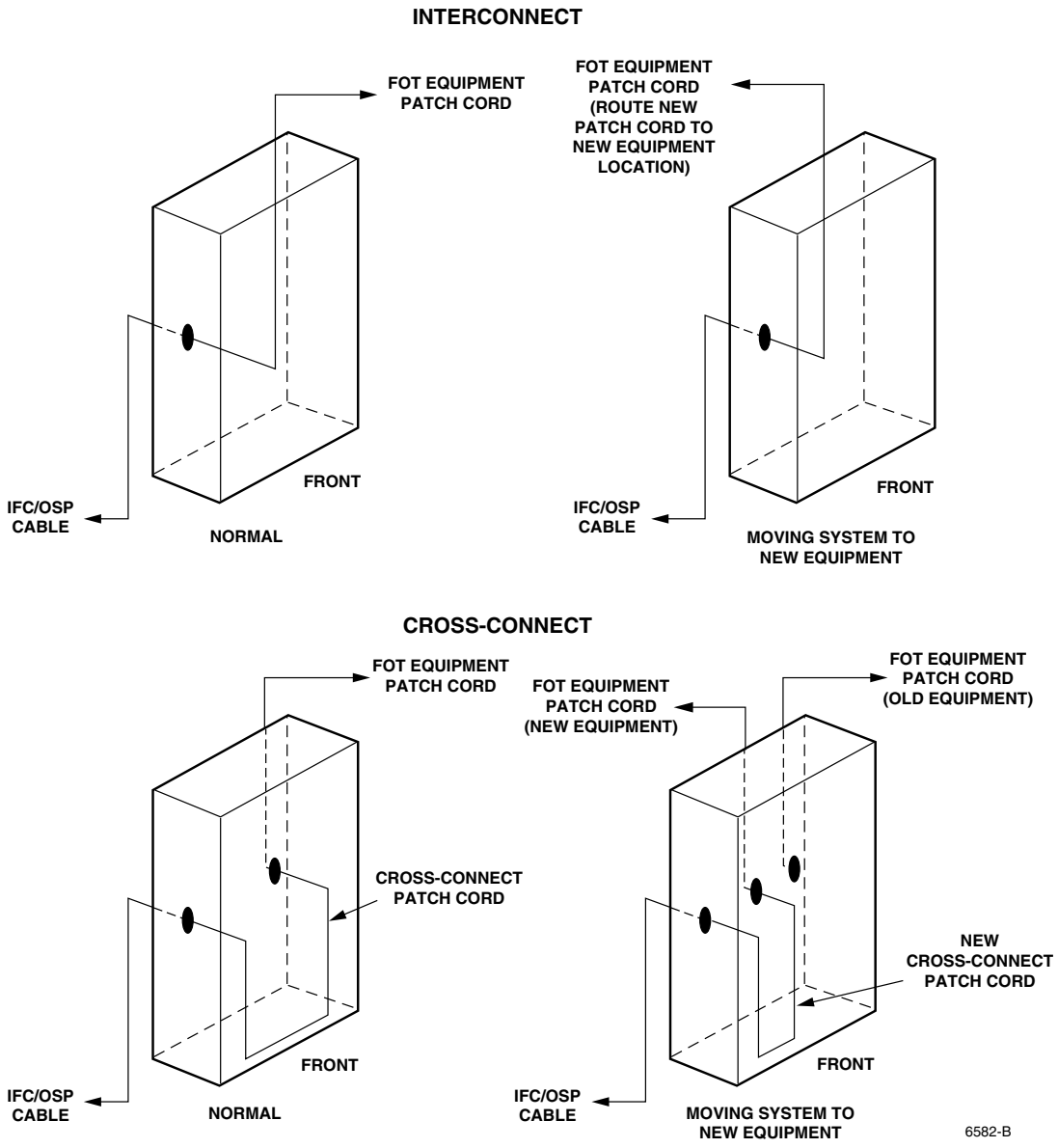

Figure 28. Moving Optical Fiber to New Equipment

4.3.2 Cross-Connect Application

For cross-connect applications, use the following procedure:

1. Locate the adapter for the present FOT equipment (see Figure 28).

2. Disconnect the cross-connect patch cord connector from the front side of the adapter located in step 1.
3. Place a clean dust cap on the connector to prevent contamination.
4. Locate the adapter for the new FOT equipment.
5. Route the FOT end of the cross-connect patch cord to the new FOT equipment adapter and mate the patch cord connector with the adapter. If the patch cord is too short, select and route a new cross-connect patch cord between the network cable adapter and the new FOT equipment adapter and mate the patch cord with the adapter.
6. If a new cross-connect patch cord was installed, remove the old cross-connect patch cord from the frame and raceway system.
7. Install a dust cap on the adapter for the old FOT equipment adapter.

5 GENERAL CROSS-CONNECT PATCH CORD PROCEDURE AND GUIDELINES

To minimize cable and patch cord congestion, observe the following guidelines:

1. Locate the panels containing the adapters to be connected.
2. Select a patch cord of the appropriate length based on how many frames apart the adapters are and where they are located on the frames. To determine where to route patch cords, refer to the laminated cards on the frame (see ADCP-90-296).
3. Find the appropriate routing diagram (see ADCP-90-296).
4. Open the panel

⚠ **Danger:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not look directly into the optical adapters of the adapter packs. Exposure to invisible laser radiation may result. An optical power meter should be used to verify active fibers. A protective cap or hood MUST be immediately placed over any radiating adapter or optical fiber connector to avoid the potential of dangerous amounts of radiation exposure. This practice also prevents dirt particles from entering the adapter or connector.*

⚠ **Caution:** *Placing a load in excess of 20 pounds onto an open drawer will result in misalignment or damage to the drawer.*

5. Locate and lift up the adapter pack to access the adapters.
6. Clean connectors per local practice.
7. Remove the dust cap from the designated adapter and mate the patch cord connector with the adapter.
8. Route the patch cord from the adapter through the radius limiters and out through the rear left corner of the drawer as shown in Figure 29.

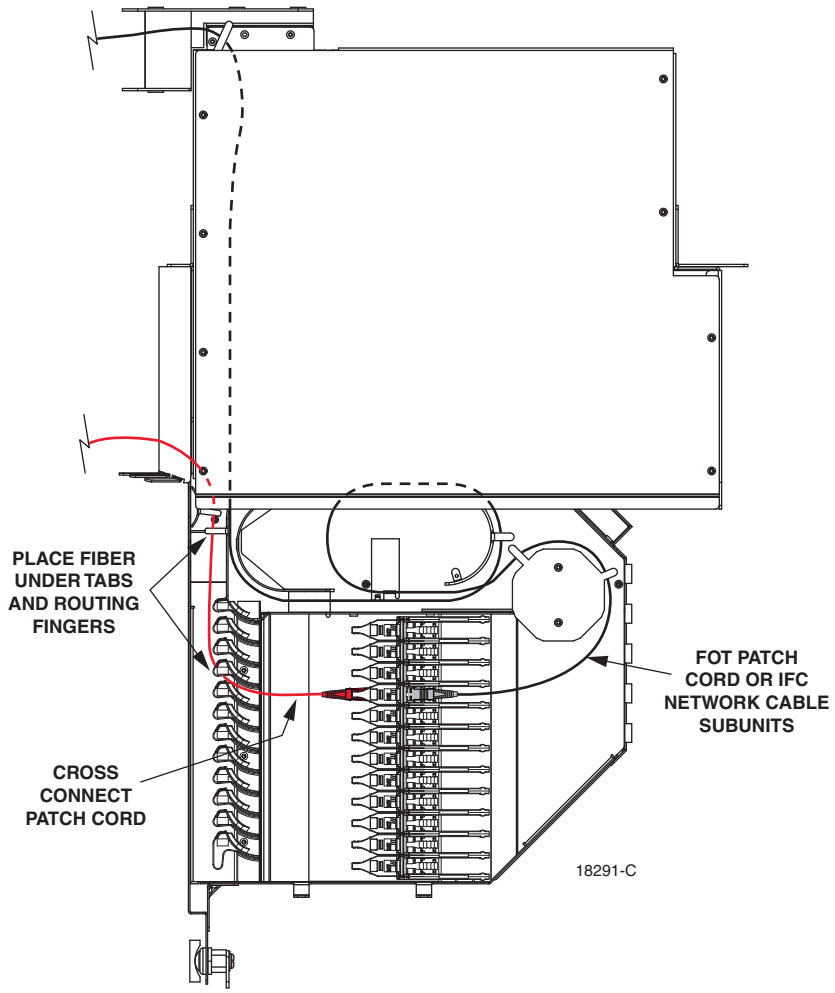

Figure 29. Patch Cord Routing Within Panel

9. Route the patch cord from the panel out of the panel and down as shown in Figure 30.

Note: To avoid patch cord congestion, always route the patch cord down (never up) from the panel.

10. To determine where to route the patch cord, refer to the laminated cards on the frame (see ADCP-90-296).
11. If using the rear trough, route the patch cord into the trough as shown in Figure 31 and then in either direction toward the designated adapter at the other end of the cross-connection being made.

12. Connect the patch cord at the second panel in the order indicated in the appropriate diagram (see ADCP-90-296).
13. When done, close all panel drawers and place dust caps on any adapters left exposed in the preceding steps.

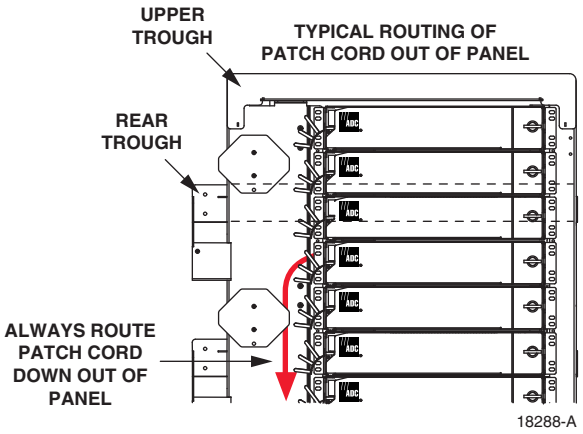

Figure 30. Typical Routing on Top Half of Frame

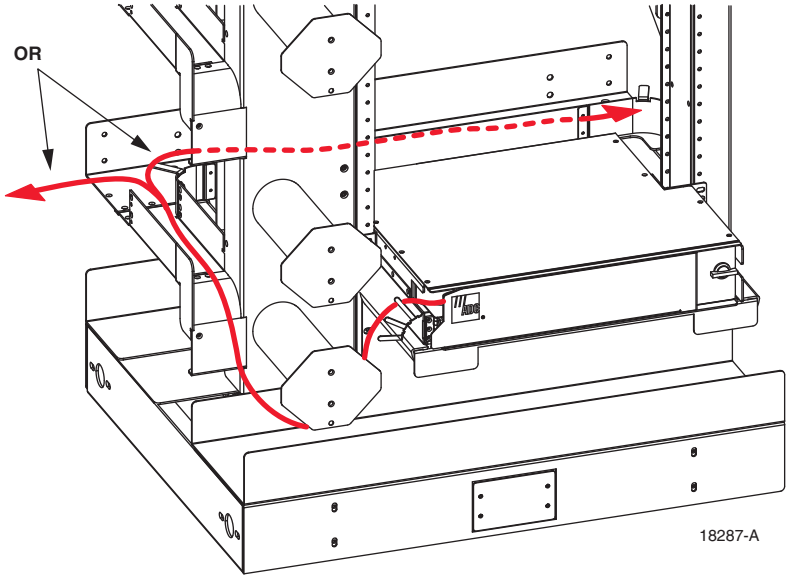

Figure 31. Path Cord Route Into Rear Trough

6 CUSTOMER INFORMATION AND ASSISTANCE

PHONE:

U.S.A. or CANADA

Sales: 1-800-366-3891
Extension 73000
Technical Assistance: 1-800-366-3891
Connectivity Extension: 73475
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Spain: 900 983291
France: 0800 914032
Italy: 0800 782374

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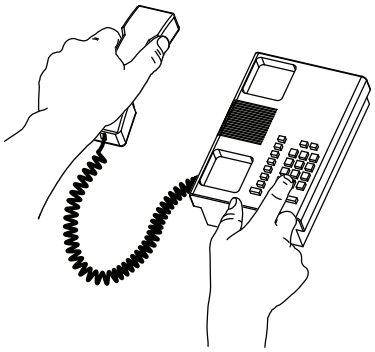
Technical Assistance: +65-6393-0739

ELSEWHERE

Sales Administration: +1-952-917-3000
Technical Assistance: +1-952-917-3475



13944-Q

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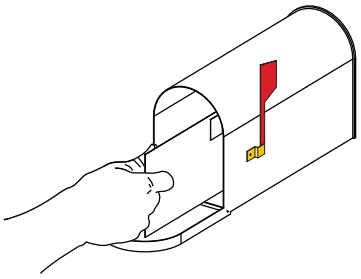
1930 Zaventem, Belgium



PRODUCT INFORMATION AND TECHNICAL ASSISTANCE:

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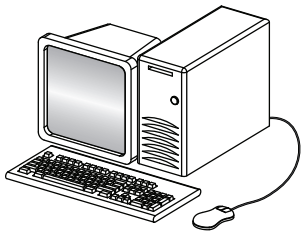

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