

OptiTect™ FDH Coupler Modules

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Revision History

Issue	Date	Reason for Change
1	05/2004	Initial Release

Related Literature

SRP 003-668 OptiTect™ Premiere Cabinet, FDH-HDF
SRP 003-669 OptiTect™ Advantage Cabinet, FDH-SE

Admonishments

The precautionary terms used by Corning Cable Systems in its standard recommended procedures conform to the guidelines expressed in the American National Standards Institute document (ANSI Z235) for hazard alert messages. Alerts are included in this instruction based on the following:



DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.

1. PLANNING

This instruction describes installation of Corning Cable Systems OptiTect FDH Coupler Modules into the coupler storage area of the OptiTect Premiere and Advantage cabinets. Coupler modules are labeled on the housing with the serial number of the module to assist with fiber mapping and management. The input fiber is labeled with the serial number followed by -00, and each output fiber is labeled with a designation from -01 to -16 or -32, depending upon the module capacity. The preconnectorized output fibers from the coupler modules can be mated in the connector adapters for use now or routed to and stored in a connector storage field for connection later. Determine the configuration to be installed in each cabinet and contact a Customer Services Representative to order the appropriate coupler modules for your application.

2. MATERIALS AND TOOLS REQUIRED

- 216B tool (for entry into the interior of the cabinet)
- Corning Cable Systems' connector cleaning kit (purchased separately)
- Fusion splicer
- Fiber cleaver
- Lint-free wipes
- Isopropyl alcohol

3. COMPONENTS

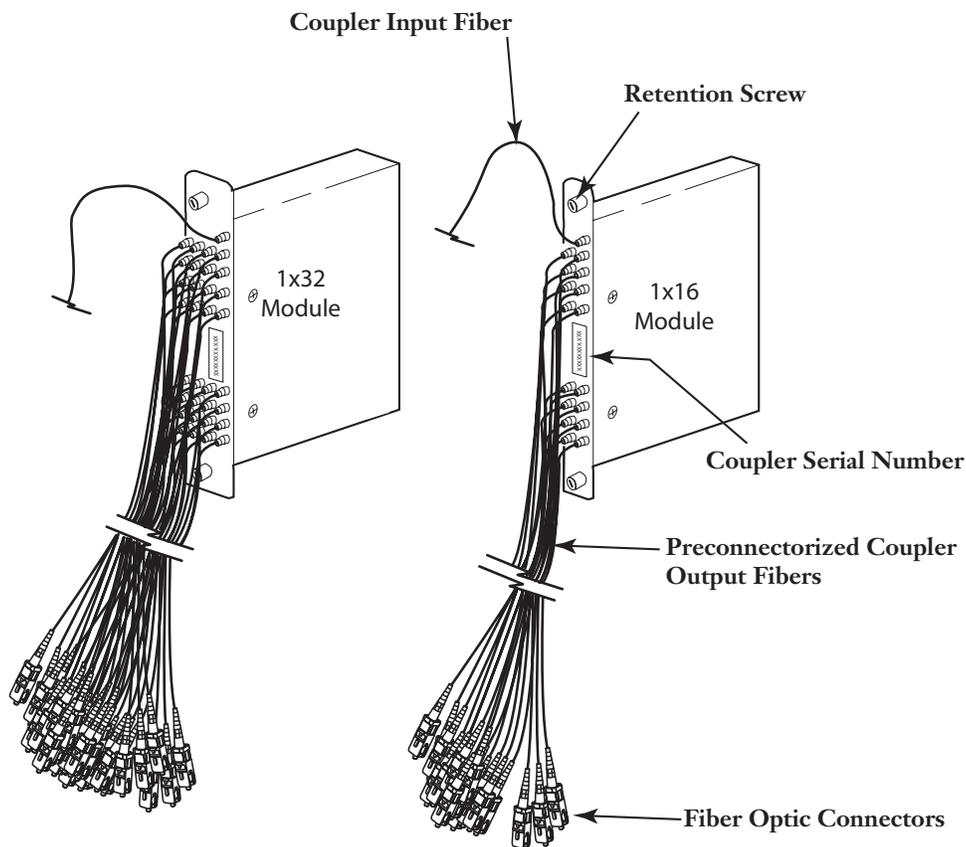


Figure 1 — Components

4. OPENING THE CABINET

Open the cabinet doors as shown in Figure 2.

To open the door, use a 216B tool to unlock the security feature. Rotate the door latch counterclockwise 90 degrees, using no more than 10 in-lb of torque. Ensure that 216B security feature is fully disengaged prior to rotating latch.

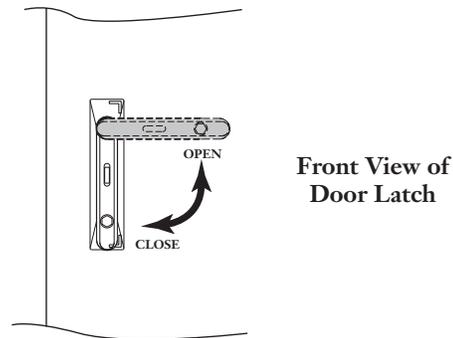


Figure 2 — Open Cabinet Doors

5. INSTALLING COUPLER MODULES IN THE OPTITECT FDH-HDF CABINET

5.1 Install Modules in Module Storage Area

Coupler modules are installed into the coupler storage area. The coupler storage area can contain up to 26 1x16 modules, 13 1x32 modules, or a combination of the two sizes of modules. Preconnectorized output fibers from the coupler modules can be mated in the HDF shelves or routed to and stored in a connector storage field for mating later.

Step 1 Remove coupler modules from their packaging and place each coupler module in the cabinet in the location shown in Figure 3. Note that two 1x16 modules occupy the same width as one 1x32 module.

Step 2 Secure the coupler module in the coupler storage area with the retention screws at each end of the module. Use the center hole of the three mounting holes for the 1x32-size module. Use the outer holes of the three mounting holes for each of the 1x16-size modules.

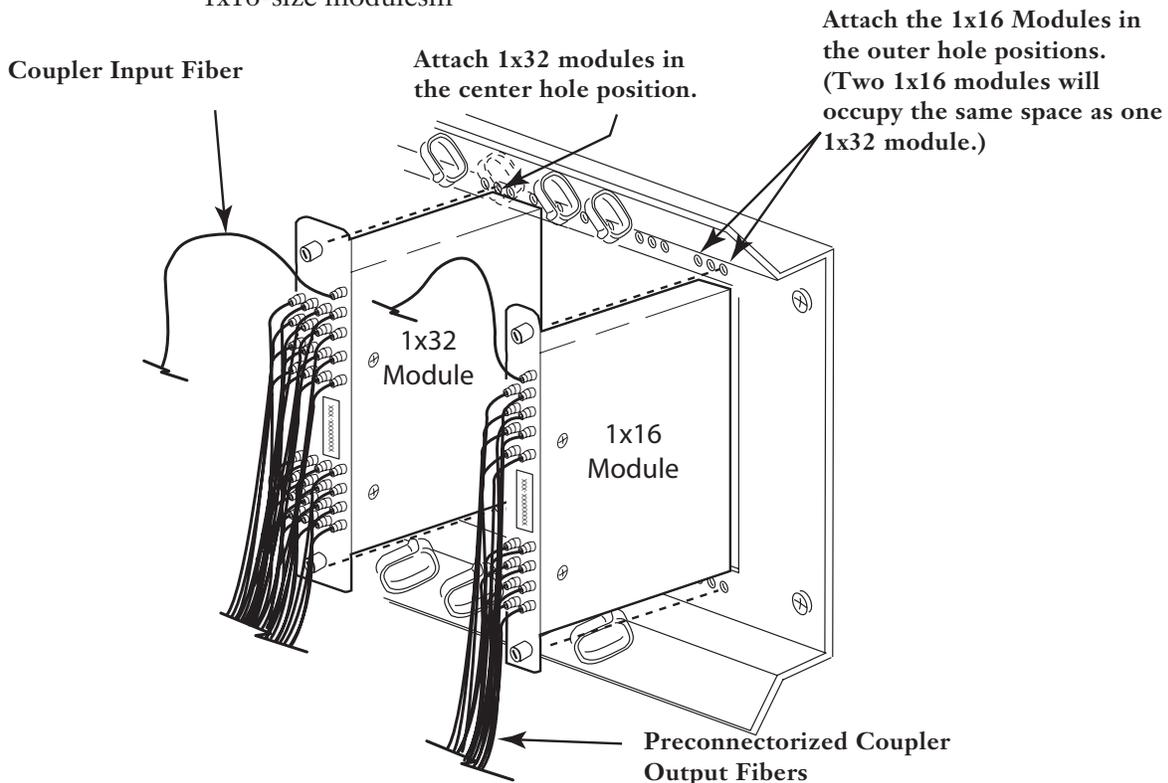


Figure 3 — Secure Coupler Module in Storage Area

5.2 Connect Feeder Cable to Coupler Input Fibers

The feeder cable has been prepared and its fiber stored in the splice drawer, ready for splicing to the coupler input fibers. Additional coupler input fibers may be installed and spliced without disturbing existing splices of cables. A maximum of 30 splices can be stored in the organizer in the splice drawer.



WARNING: *Never look directly into the end of a fiber that may be carrying laser light. Laser light is invisible and can damage your eyes. The iris of the eye will not close involuntarily as when viewing a bright light. Viewing laser light directly does not cause pain. Consequently, serious damage to the retina of the eye is possible. Should accidental eye exposure to laser light be suspected, arrange for an eye examination immediately.*



WARNING: *This product is designed to meet specifications for Class 3 lasers only and should not be used with optical fiber transmission systems containing lasers of classes for which they have not been certified. DO NOT use magnifiers in the presence of laser radiation. Diffused laser light can cause eye damage if focused with optical instruments. Should accidental eye exposure be suspected, arrange for an eye examination immediately.*

- Step 1** Turn the quarter-turn latch on the splice drawer and pull the drawer toward you to access the feeder fibers. Remove the cover over the splice organizer.
- Step 2** Route coupler input fibers to the splice drawer through the routing clips above the module storage area and down the left side of the cabinet as shown in Figure 4 into the splice drawer.
- Step 3** To determine the required fiber lengths and routing configuration, route both the coupler module input fiber to be spliced and the 900 μm fiber from the feeder cable to be spliced inside the splice drawer before cutting or cleaving the fibers. Be careful to maintain the minimum bend radius during fiber routing.
- Step 4** Coil coupler module input fiber slack around the radius guides on the left side of the drawer for storage until needed for splicing. Select the fiber that will be spliced to the feeder fiber and bring the end to a work surface. Slide a heatshrink protection device over the feeder fiber. Prepare the 2.0 mm jacketed input fiber as appropriate for fusion splicing.
- Step 5** From the ribbon fanout body, select the 900 μm fiber that will be spliced to the coupler module input fiber and bring the end to a work surface.
- Step 6** Cleave both fibers to obtain a clean fiber end face; fusion splice per the instructions provided with the splicer.



CAUTION: *Cleaved glass fibers are very sharp and can pierce the skin easily. Do not let cut pieces of fiber stick to your clothing or drop in the work area where they can cause injury later. Use tweezers to pick up cut or broken pieces of the glass fibers and place them on a loop of tape kept for that purpose alone. Good housekeeping is very important.*



CAUTION: *The wearing of safety glasses to protect the eyes from accidental injury is strongly recommended when handling chemicals and cutting fiber. Pieces of glass fiber are very sharp and can damage the cornea easily.*

- Step 7** Route and store feeder cable fiber slack in the slack storage spool (Figure 4).
- Step 8** Secure the splice point in the splice organizer.

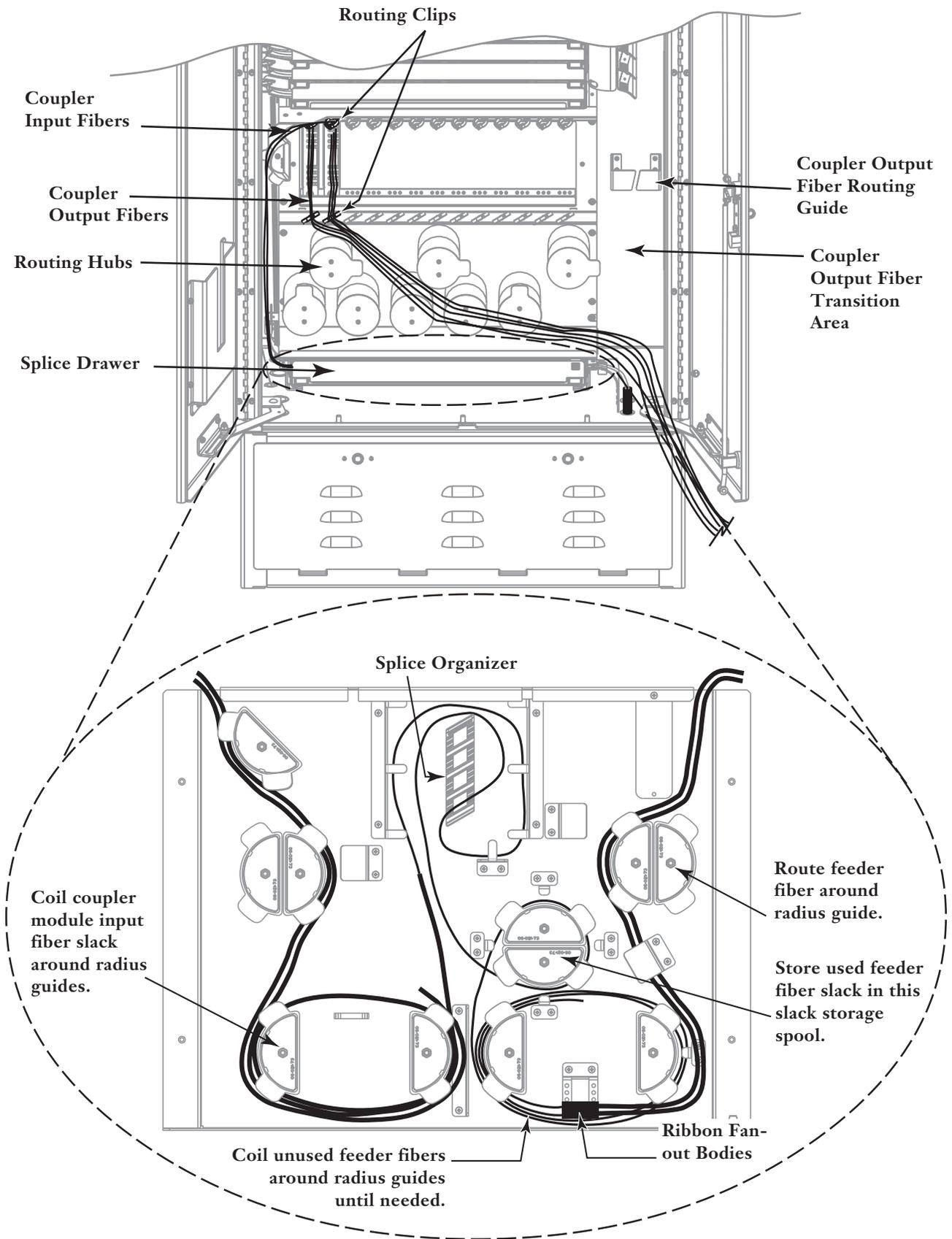


Figure 4 — Route and Splice Feeder Fiber and Coupler Module Input Fiber

- Step 9** Coil unused feeder fibers from the ribbon fanout body around the radius guides on the right side of the drawer. Uncoil additional fibers as needed for splicing to the next coupler input fiber, following the procedures above. Reinstall organizer cover.
- Step 10** Slide splice drawer into the cabinet and secure with the quarter-turn latch.

5.3 Route Coupler Output Fibers to the HDF Shelf

Coupler output fibers are mated in connector adapters in the HDF shelf drawers to provide service to each customer. The fibers can be mated at the time of the cabinet's installation or stored and mated later as new service is required. A maximum of 36 connections can be made in each drawer for a maximum of 144 connections per shelf, or 432 connections per cabinet.

The connector adapter bulkhead is compatible with SC, FC, and LC connector adapters. Keep the dust caps in place in unused adapters and on all connectors until mated to prevent contaminants from entering the adapters.

5.3.1 Route Coupler Output Fibers to be Connected Now

- Step 1** Select the coupler output fiber to be connected.
- Step 2** Transition the coupler output fiber to coupler output fiber transition area and through the coupler output fiber organizer.
- Step 3** Open the appropriate drawer in the designated HDF shelf where the connection will be made. Take the fiber over the retaining guide next to that drawer and around the radius guide into the shelf (Figure 5). Loosely secure the fiber to the retaining guide with the attached hook-and-loop strap.

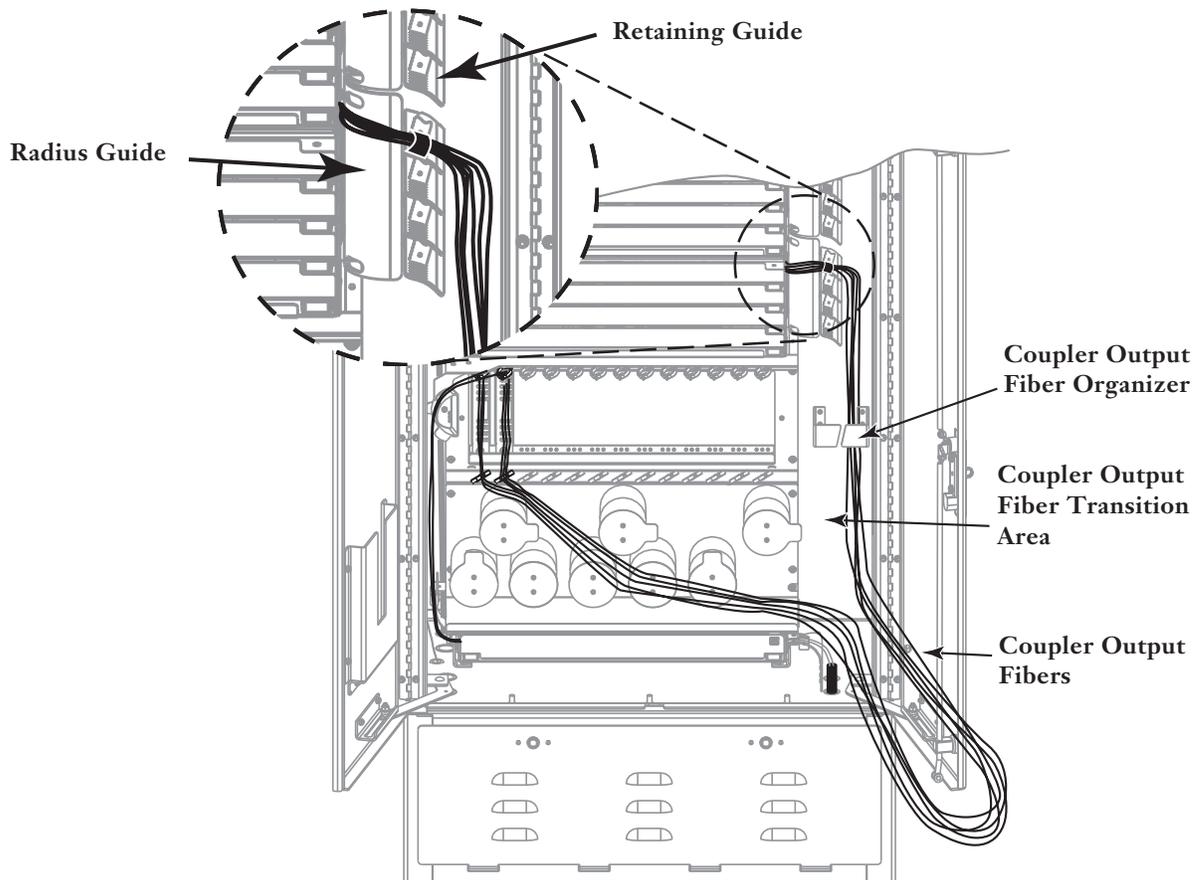


Figure 5 — Route Coupler Output Fibers to HDF Shelf

- Step 4** Locate and lift up the specific connector adapter where the connector will be inserted (Figure 6).
- Step 5** Remove the dust cap and connector from the distribution side of the adapter. Clean the adapter and connector end face as described in Section 8. Plug the connector back into the distribution side of the adapter.
- Step 6** Remove the dust cap from the coupler output fiber connector and clean the end face as described in Section 8.
- Step 7** Mate the coupler output fiber connector to the distribution connector.
- Step 8** Repeat Steps 1 through 8 for each coupler output fiber that is to be connected at this time.

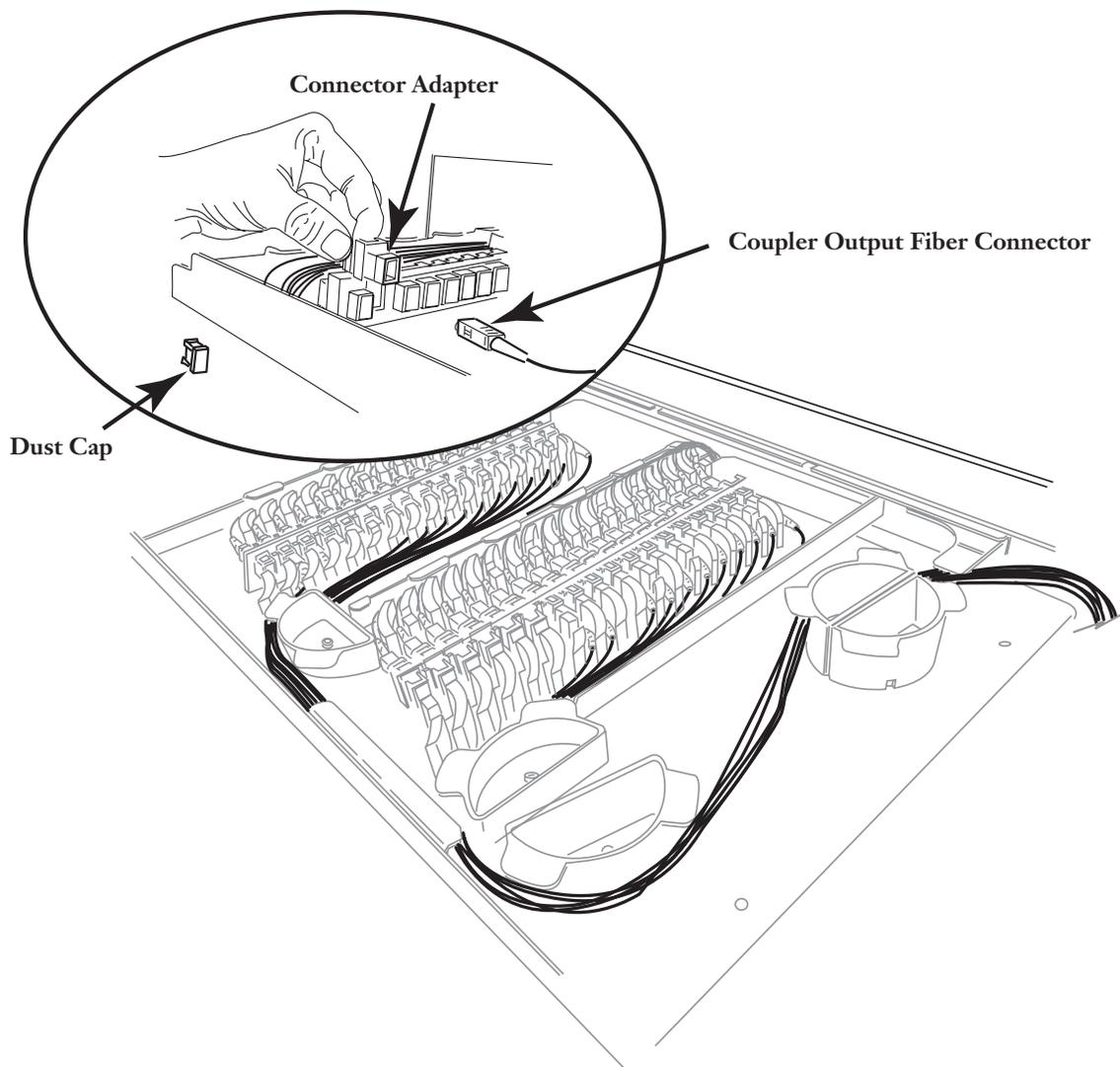


Figure 6 — Mate Connectors in Connector Adapters

Step 9 Update the coupler output fiber/distribution fiber mapping labels on the inside of the cabinet door and the housing drawers (Figure 11). Good recordkeeping is imperative for an orderly installation.

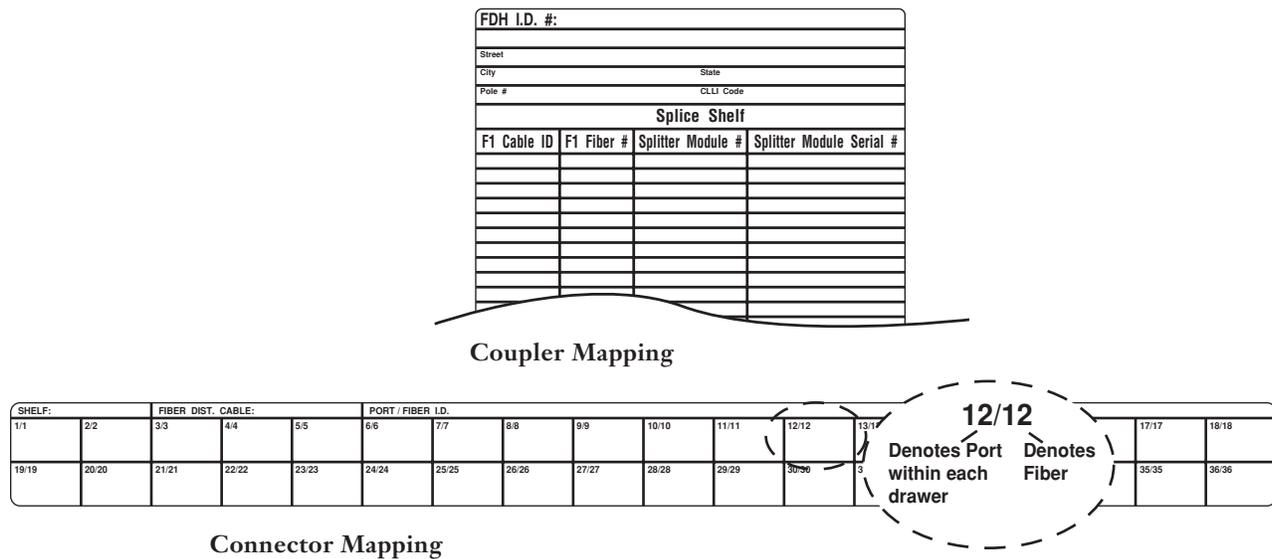


Figure 7 — Connector Mapping Labels

Step 10 Route the coupler output fiber slack through the organizer and to the right around the slack storage hubs as shown in Figure 7. Place the slack around the furthest hub to the left that it will reach without pulling on the connector in the shelf, the coupler module, or the fiber itself.

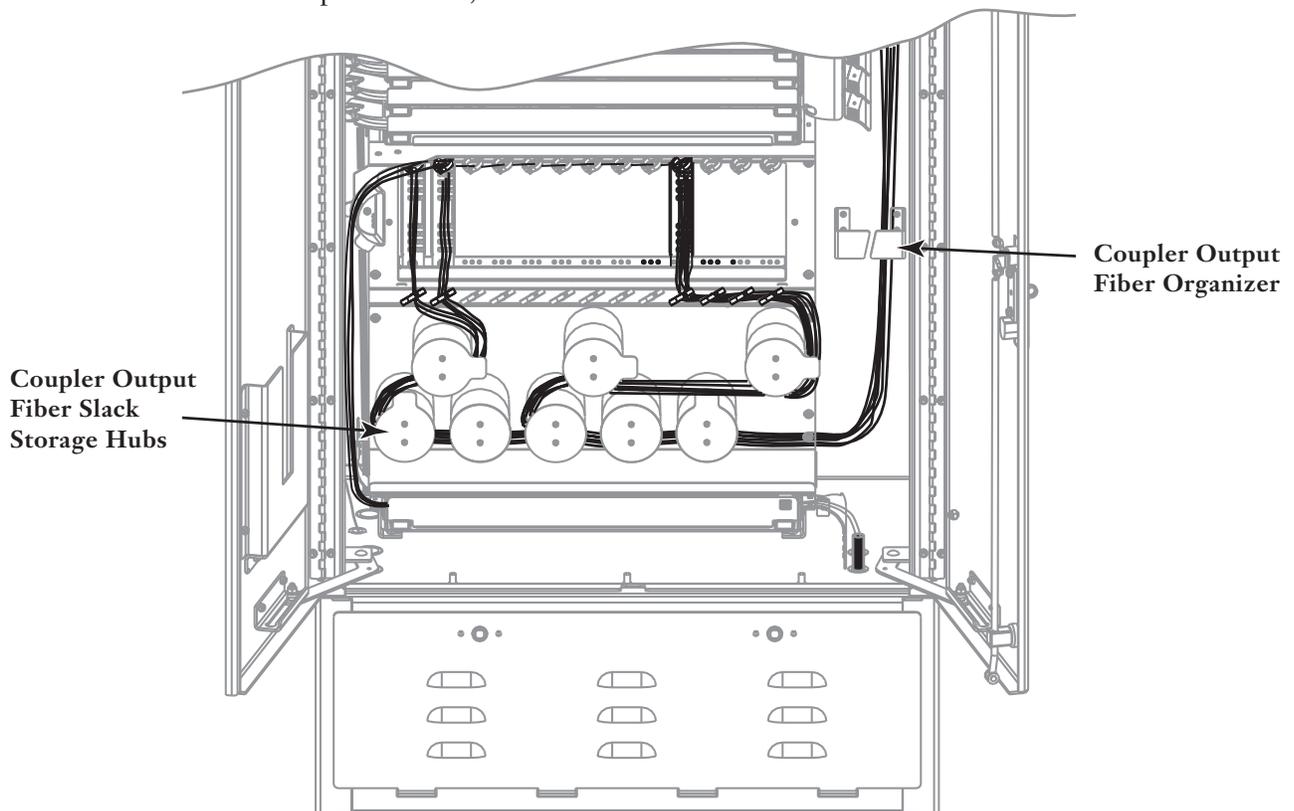


Figure 8 — Store Coupler Output Fiber Slack

5.3.2 Route and Store Coupler Output Fibers to be Connected Later

- Step 1** If a coupler output fiber is not to be connected at this time, route the fiber slack around the slack storage hubs in the slack storage area as shown in Figure 8. All fibers exit the slack storage area to the right.
- Step 2** Route the fiber around the slack storage guides on the right wall of the cabinet. Store the connector in the spare connector holder. Ensure the dust cap is in place over the connector end face to protect the connector ferrule from damage.
- Step 3** When you need to mate these connectors, refer to the FDH-HDF section, *Route Coupler Output Fibers to be Connected Now*.

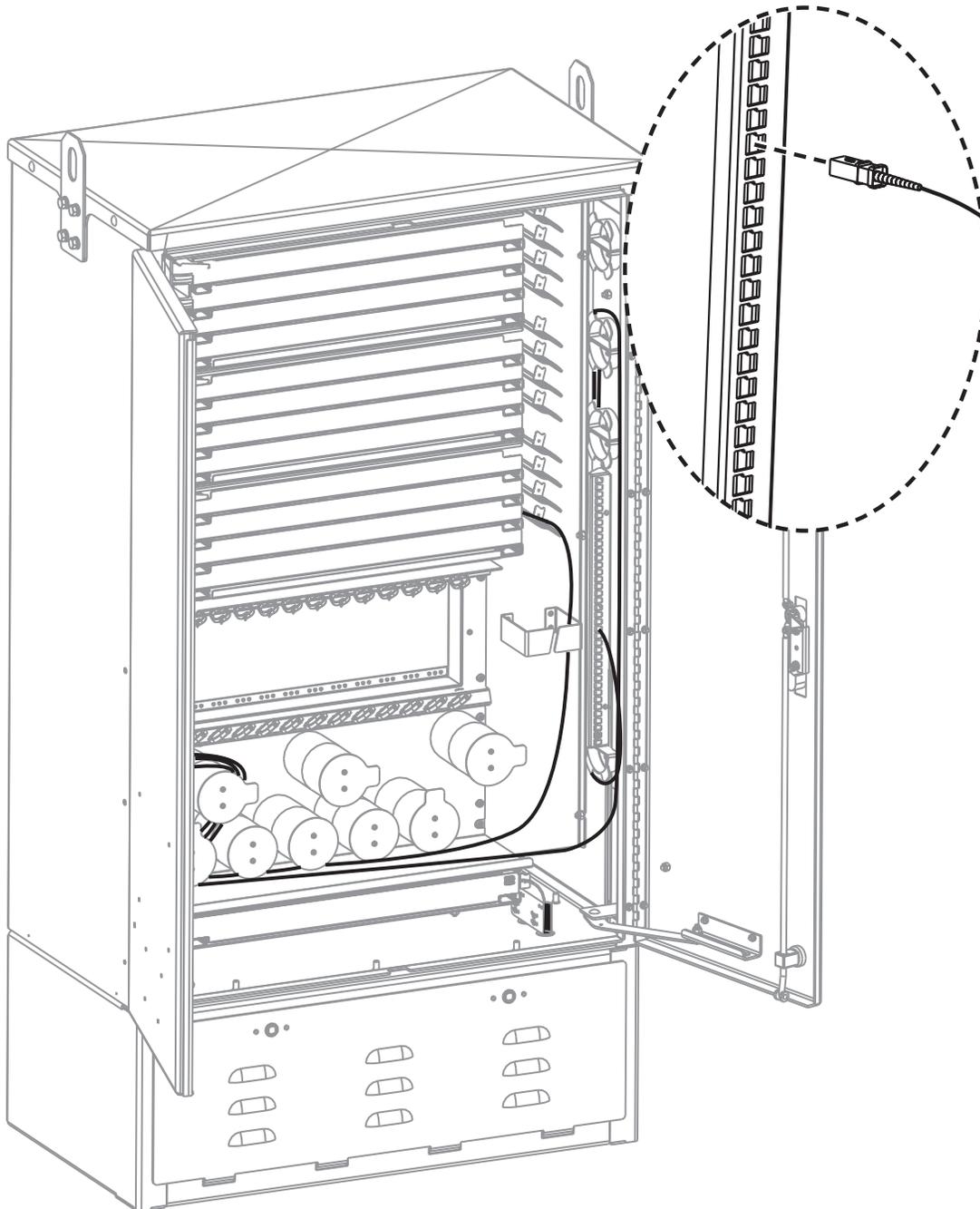


Figure 9 — Store Coupler Output Fibers to be Connected Later

6. INSTALLING COUPLER MODULES IN THE FDH-SE CABINET

6.1 Install Modules in the Module Storage Area

Coupler modules are installed into the coupler storage area. The coupler storage area can contain up to 24 1x16 modules, 12 1x32 modules, or a combination of the two sizes of modules. Preconnectorized output fibers from the coupler modules can be mated in the connector adapter panels or routed to and stored in a connector storage field for mating later.

- Step 1** Remove coupler modules from their packaging and place each coupler module in the cabinet in the location shown in Figure 10. Note that two 1x16 modules occupy the same width as one 1x32 module.
- Step 2** Secure the coupler module in the coupler storage area with the retention screws at each end of the module. Use the center hole of the three mounting holes for the 1x32 module. Use the outer holes of the three mounting holes for each of the 1x16 modules.

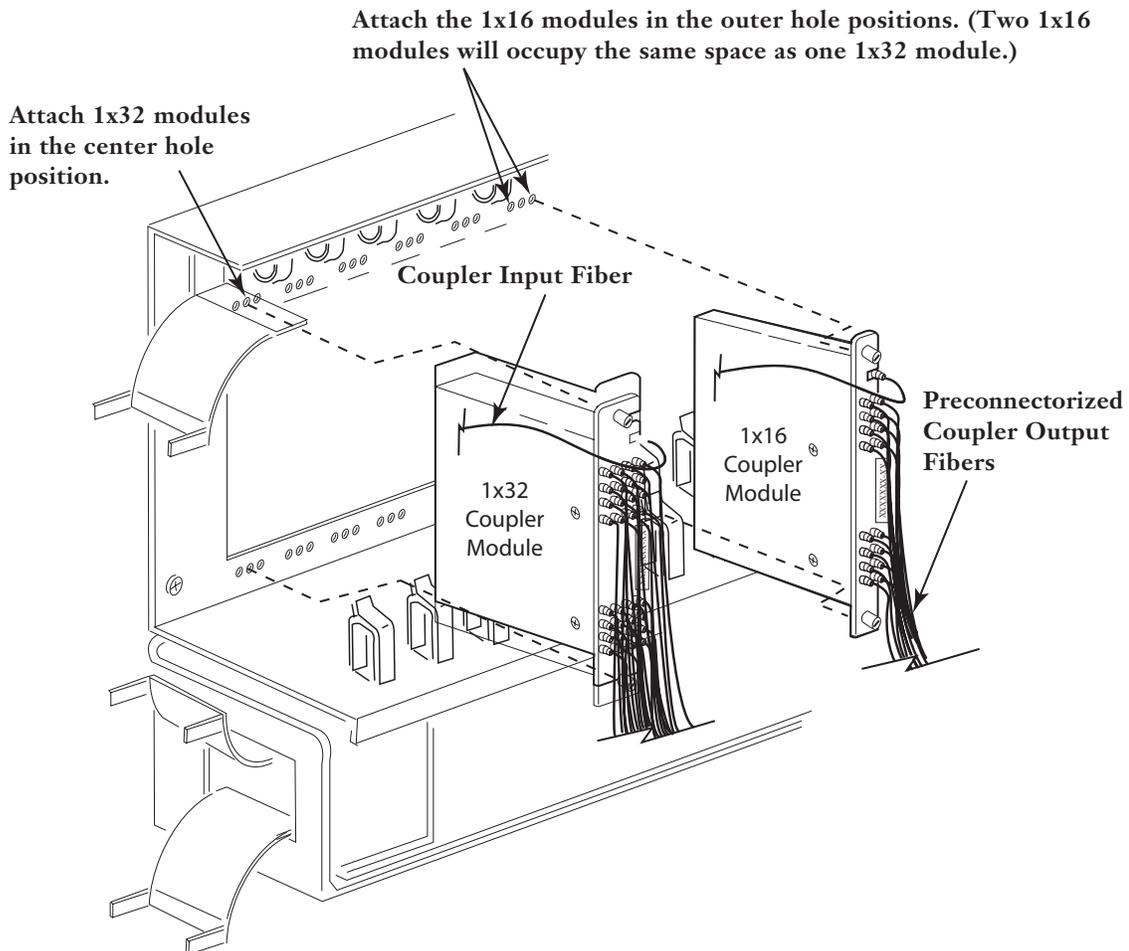


Figure 10 — Secure Coupler Module in Storage Area

6.2 Connect Feeder Cable to Coupler Input Fibers

The feeder cable has been prepared and its fiber stored in the splice drawer, ready for splicing to the coupler input fibers. Additional coupler input fibers may be installed and spliced without disturbing existing splices of cables. A maximum of 30 splices can be stored in the organizer in the splice drawer.



WARNING: *Never look directly into the end of a fiber that may be carrying laser light. Laser light is invisible and can damage your eyes. The iris of the eye will not close involuntarily as when viewing a bright light. Viewing laser light directly does not cause pain. Consequently, serious damage to the retina of the eye is possible. Should accidental eye exposure to laser light be suspected, arrange for an eye examination immediately.*



WARNING: *This product is designed to meet specifications for Class 3 lasers only and should not be used with optical fiber transmission systems containing lasers of classes for which they have not been certified. DO NOT use magnifiers in the presence of laser radiation. Diffused laser light can cause eye damage if focused with optical instruments. Should accidental eye exposure be suspected, arrange for an eye examination immediately.*

- Step 1** Pull up on the plunger on the splice drawer and pull the drawer toward you to access the feeder fibers.
- Step 2** Route coupler input fibers to the splice drawer through the routing clips above the module field and down the left side of the cabinet as shown in Figure 11 into the splice drawer.

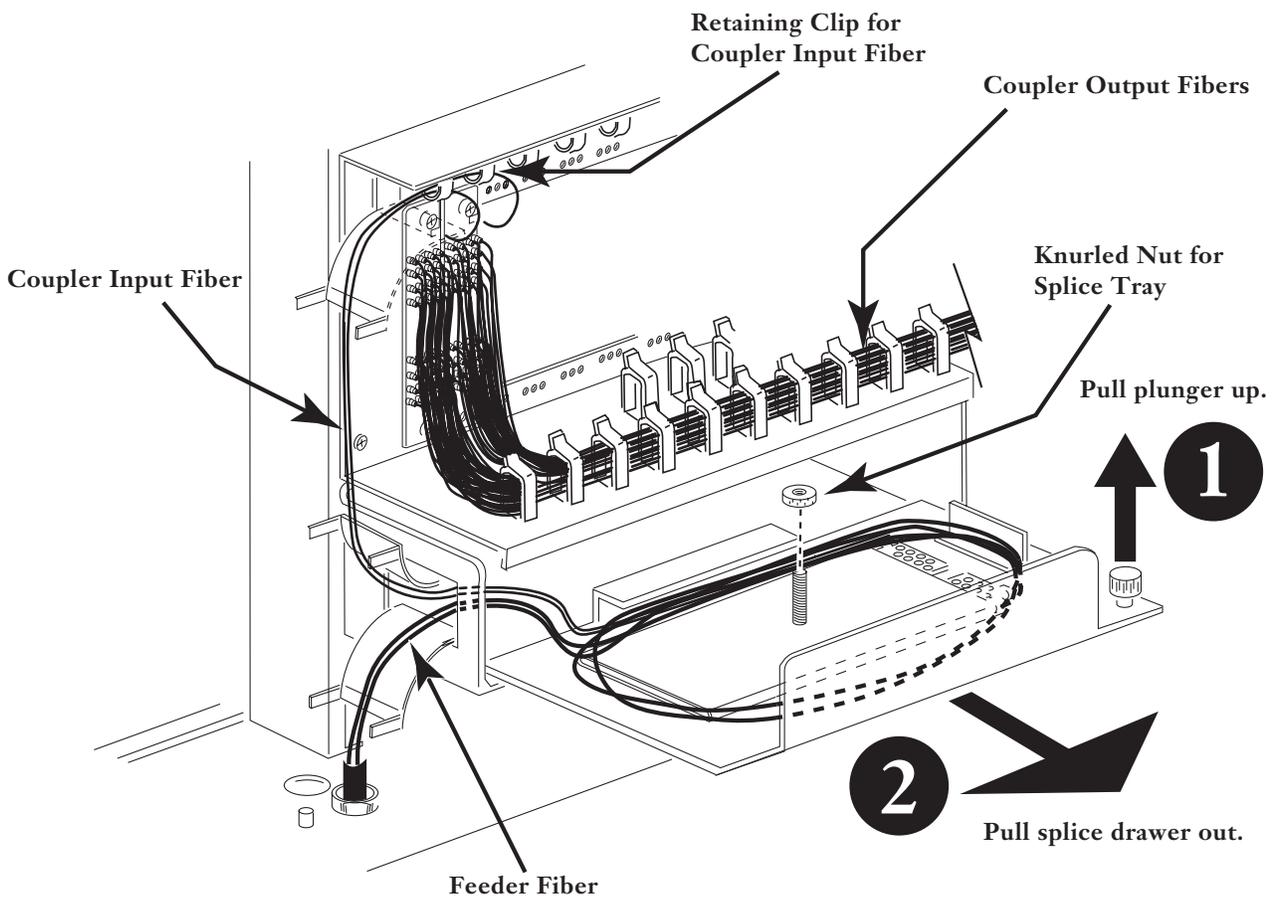


Figure 11 — Route and Splice Feeder Fiber and Coupler Module Input Fiber

- Step 3** Select the coupler module input fiber and feeder fiber that will be spliced and bring the ends to a work surface.
- Step 4** Remove the cover from a splice tray (purchased separately) and orient the tray so cable tie holes in the tray are toward the right side of the drawer.
- Step 5** Slide a heatshrink protection device over the feeder fiber per instructions provided with the splice tray. Clean, cleave, and splice feeder fiber to coupler module input fiber per instructions provided with the splicing equipment. Use the splicing equipment to shrink the tube over the splice point.
- Step 6** Follow the instructions provided with the splice tray to store the splice points in the organizer, route fibers inside the tray, and attach all the fibers to the tray. Attach cover to tray.
- Step 7** Install the splice tray in the splice drawer and secure with knurled nut.



CAUTION: *Cleaved glass fibers are very sharp and can pierce the skin easily. Do not let cut pieces of fiber stick to your clothing or drop in the work area where they can cause injury later. Use tweezers to pick up cut or broken pieces of the glass fibers and place them on a loop of tape kept for that purpose alone. Good housekeeping is very important.*



CAUTION: *The wearing of safety glasses to protect the eyes from accidental injury is strongly recommended when handling chemicals and cutting fiber. Pieces of glass fiber are very sharp and can damage the cornea easily.*

- Step 8** Route and store fiber slack in the splice drawer as shown in Figure 11.
- Step 9** Slide splice drawer into the cabinet by pulling up on the plunger. Ensure the plunger reactivates to secure the drawer in place.

6.3 Route Coupler Output Fibers to Connector Adapter Panels

Coupler output fibers are mated in adapter panels in the connector adapter fields to provide service to each customer. The fibers can be mated at the time of the cabinet's installation or stored and mated later as new service is required. A maximum of 12 connections can be made in each of the 18 panel positions for a maximum of 216 connections per adapter field, or 432 connections per cabinet.

The connector bulkhead is compatible with SC, FC, and LC adapters. Keep the dust caps in place in unused adapters to prevent contaminants from entering the adapters.

6.3.1 Route Coupler Output Fibers to be Connected Now

- Step 1** Select the connectorized coupler output fiber to be mated.
- Step 2** Transition the coupler output fibers into the routing clips. Route the output fibers from the first nine coupler modules, beginning at the left of the coupler module storage field, through the routing clips at the front edge of the shelf. Route the output fibers from the last nine coupler modules through the routing clips at the rear of the shelf (Figure 12).

- Step 6** Route the coupler output fiber slack from the used coupler output fibers in the back partition of the slack storage hubs as shown in Figure 14.

NOTICE: *Unused coupler output fiber slack should be stored in the front partition of the slack storage hubs until needed to avoid disturbing connections in service.*

- Step 7** Place the slack around the highest hub that it will reach without pulling on the connector in the adapter, the coupler module, or the fiber itself.

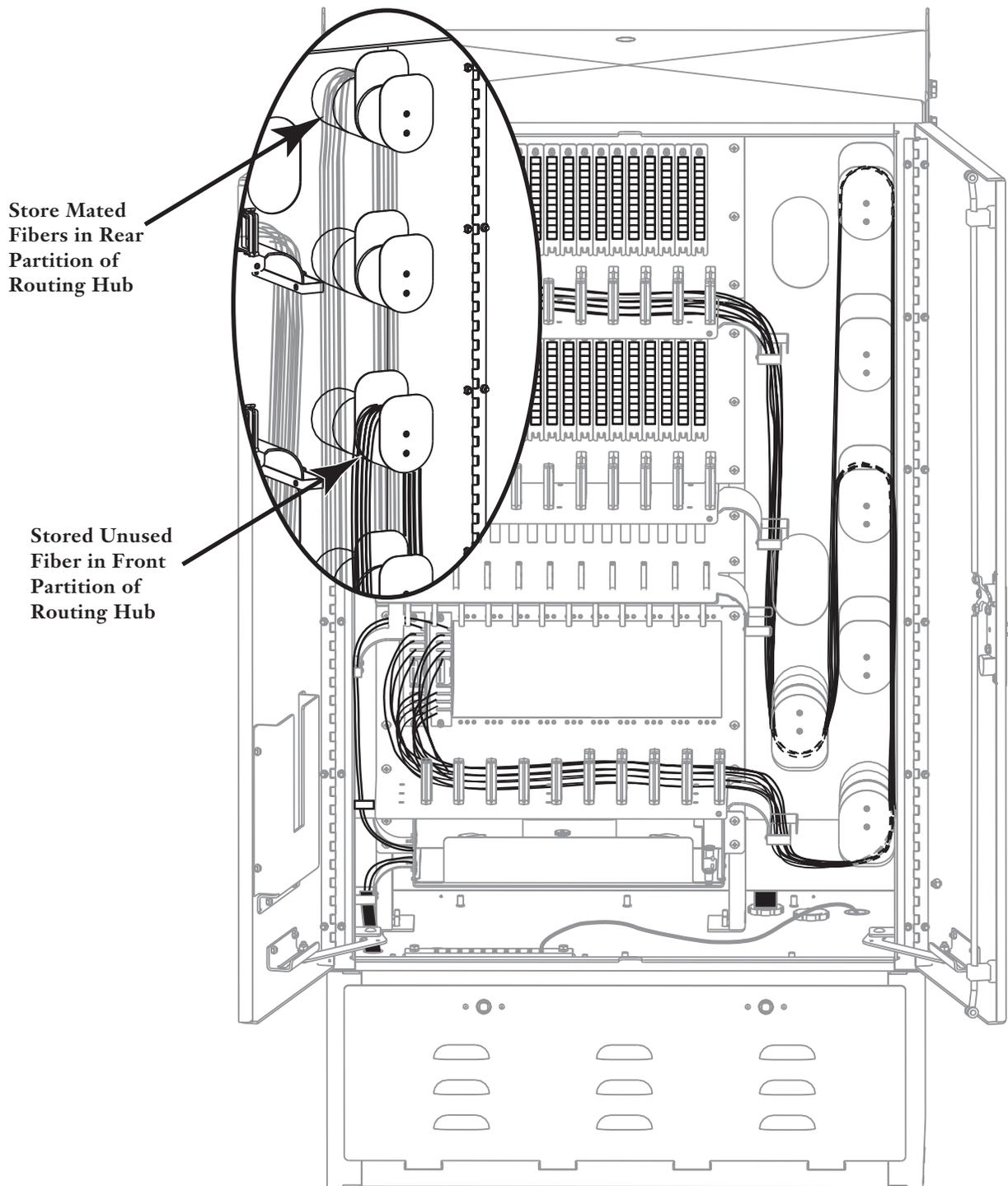


Figure 14 — Store Coupler Output Fiber Slack

6.3.2 Route and Store Coupler Output Fibers to be Connected Later

- Step 1** If a coupler output fiber is not to be connected at this time, route the output fibers from the first nine coupler modules, beginning at the left of the coupler module storage field, through the routing clips at the front edge of the shelf. Route the output fibers from the last nine coupler modules through the routing clips at the rear of the shelf (Figure 15).
- Step 2** Remove the dust caps from an adapter in the connector storage field and from the output fiber connector. Plug the connector into the adapter.

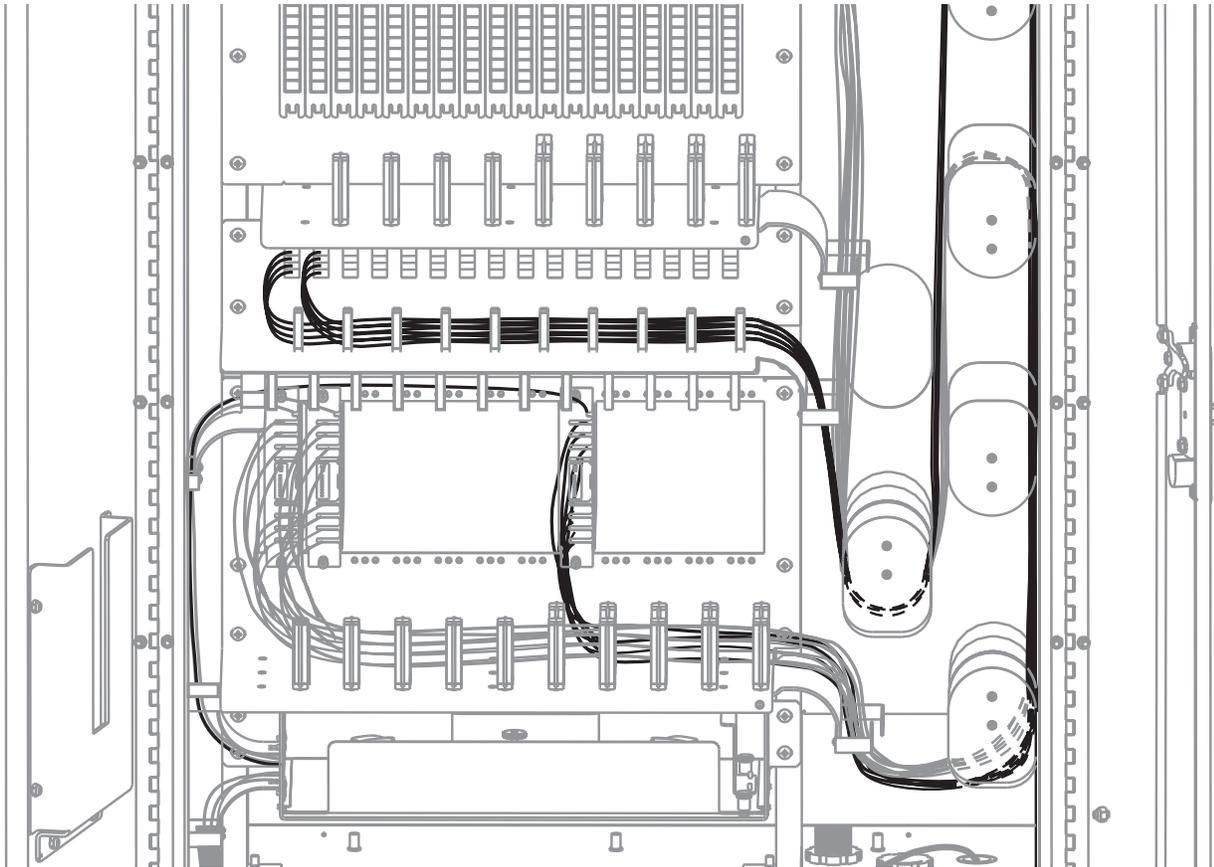


Figure 15 — Route and Store Coupler Output Fiber for Termination Later

- Step 3** Route the coupler output fiber slack in the front partition of the slack storage hubs as shown in Figure 14.

NOTICE: *Unused coupler output fiber slack should be stored in the front partition of the slack storage hubs until needed to avoid disturbing connections in service.*

- Step 4** Place the slack around the highest hub that it will reach without pulling on the connector in the adapter, the coupler module, or the fiber itself.

- Step 5** When you need to mate these connectors, refer to the FHD-SE section, *Route Coupler Output Fibers to be Connected Now*.

7. OPTICAL HYGIENE

Cleanliness is the key to a high performance fiber optic network. Contaminated connectors are the single biggest cause of poor attenuation performance. For this reason, proper handling and cleaning is especially important during installation and optical acceptance testing.

Each time a contaminated connector ferrule is inserted into the connector adapter, some of the debris will inevitably remain inside the adapter. When a mating connector plug is inserted, the contaminants are pushed into the mating surface. At the very least, this will have adverse effects on return loss and attenuation. In the worst case, the contaminants may cause permanent damage to the connectors.

Corning Cable Systems recommends following the cleaning process recommended by the connector manufacturer, or at a minimum, observing the following process steps to ensure connector performance.

- Always keep dust caps on connectors when not in use.
- Ensure dust caps are clean before reuse.
- Use optical cleaning materials as standardized by your company.
- Clean the connector before every remate, especially for test equipment patch cords.
- A minimum level of cleaning is listed below. Local procedures may require more rigorous cleaning methods.

Step 1 Remove plugs from the connector adapter.

Step 2 Wipe the connector ferrule twice with a lint-free wiping material moistened with isopropyl alcohol. Then wipe across the end of the ferrule.



CAUTION: *Isopropyl alcohol is flammable with a flashpoint of 54°F. It can cause irritation to eyes on contact. In case of eye contact, flush eyes with water for at least 15 minutes. Inhaling fumes can cause dizziness. In case of ingestion, consult a physician.*

Step 3 Repeat Step 2 with a dry wipe.

Step 4 Insert the connector into the adapter.

Step 5 Repeat Steps 1 through 4 for each connector.

8. SECURING THE CABINET

Step 1 Disengage each door restraint by lifting it to release the door.

Step 2 Close the doors and rotate the door latch 90 degrees in a clockwise direction to latch the doors (Figure 16).

Step 3 Lock the doors with a 216B tool.

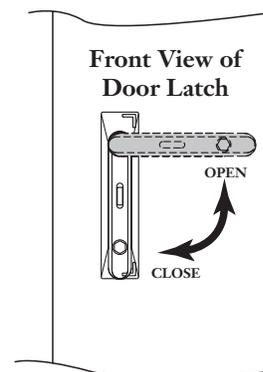


Figure 16 — Close Door Latch

9. TESTING

9.1 Provisioning Tests

Equipment should be tested from the source (or central office) to receiver at the time of provisioning to verify signal continuity and acceptable loss limits. Use an optical power meter to verify signal continuity and determine loss measurements are within specified local standards.

9.2 Troubleshooting Tests

An optical power meter can be used to perform the first step in troubleshooting. A power meter designed for measuring only dBm power levels is suitable for maintenance purposes.

Once a fault is isolated to the installed cable link, an OTDR (Optical Time Domain Reflectometer) is needed. AN OTDR can locate fiber events and measure the losses attributable to cable, connectors, splices, and/or other components. The graphical display of loss over a cable's entire length provides the most revealing analysis and documentation available on a cable link, commonly referred to as its signature trace. Corning Cable Systems recommends performing an OTDR analysis to document the integrity of the cable system, locate and measure each event or component, and uncover faults throughout the cable

Follow the instructions provided with the OTDR tester you are using.

10. MAINTENANCE

The coupler module requires very little maintenance to make sure fibers and parts remain in good condition. Components should be checked periodically for the following:

- Check fiber optic cable to make sure bends do not exceed the minimum bend radius. Check cable for unnecessary strain. Check cable entries and exits for crimping or crushing.
- Check unit record labels to make sure all are clear and accurate.
- If disruption to service is reported, refer to the section, *Testing*, for methods to isolate the problem.

11. GROWTH

An OptiTect cabinet that is not full to capacity can be expanded to a maximum of 432 connections by installing additional coupler modules as described in this installation instruction.

GLOSSARY

Acronyms

ANSI	American National Standards Institute
FDH	Fiber Distribution Hub
HDF	High-density Fiber

TERMINOLOGY

Adapter

A mechanical media termination device designed to align and join fiber optic connectors; often referred to as a coupling, bulkhead, or interconnect sleeve.

Buffer Tube Fanout Body

A device to branch the fibers from a buffer tube into pairs of fibers protected by tubing that can then be terminated according to hardware interface requirements.

Cable

An assembly of optical fibers and other material providing mechanical and environmental protection.

Connector

A mechanical device used to align and join two fibers together to provide a means for attaching to and decoupling from a transmitter, receiver, or another fiber (patch panel).

Coupler Module

A passive fiber optic device that combines or splits optical signal power.

Ferrule

A mechanical fixture, generally a rigid tube, used to protect and align a fiber in a connector; generally associated with fiber optic connectors.

Fusion Splice

A permanent joint produced by the application of localized heat sufficient to fuse or melt the ends of the optical fiber, forming a continuous single fiber.

Customer Service and Information

Telephone: _____

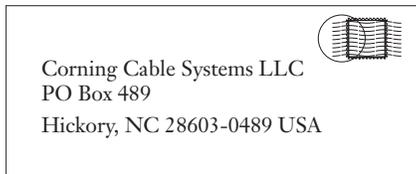
Customer Service—US or Canada: 1-800-743-2671

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Fax: +1-828-325-5060



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Product Information: _____

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