NT0H65AM **323-1701-546**

Nortel

Optical Metro 5100/5200

Maintenance and Replacement Procedures

Standard Release 8.0 Issue 1 April 2005

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NORTEL

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About this document

This document provides information about maintaining the hardware components of Nortel Optical Metro 5100/5200 (identified prior to Release 7 as Nortel Networks OPTera Metro 5000-series Multiservice Platform).

This document contains the following information:

- replacing shelf components
- replacing circuit packs

Audience for this document

This document is intended for the following audience:

- provisioners
- installers
- transmission standards engineers
- field maintenance engineers
- system line-up and testing (SLAT) personnel
- maintenance technicians
- network administrators

Optical Metro 5100/5200 library

The Optical Metro 5100/5200 library consists of the *Nortel Optical Metro 5100/5200 Nortel Technical Publications*, NT0H65AM.

Technical Publications

The *Optical Metro 5100/5200 Nortel Technical Publications* (NTP) consist of descriptive information and procedures.

Descriptive information

These NTPs provide detailed descriptive information about the Optical Metro 5100/5200 Multiservice Platform, including system software and hardware descriptions, technical specifications, ordering information, and TL1 user information.

Procedures

These NTPs contain all procedures required to install, provision, and maintain the Optical Metro 5100/5200. The following roadmap lists the documents in the Optical Metro 5100/5200 library.

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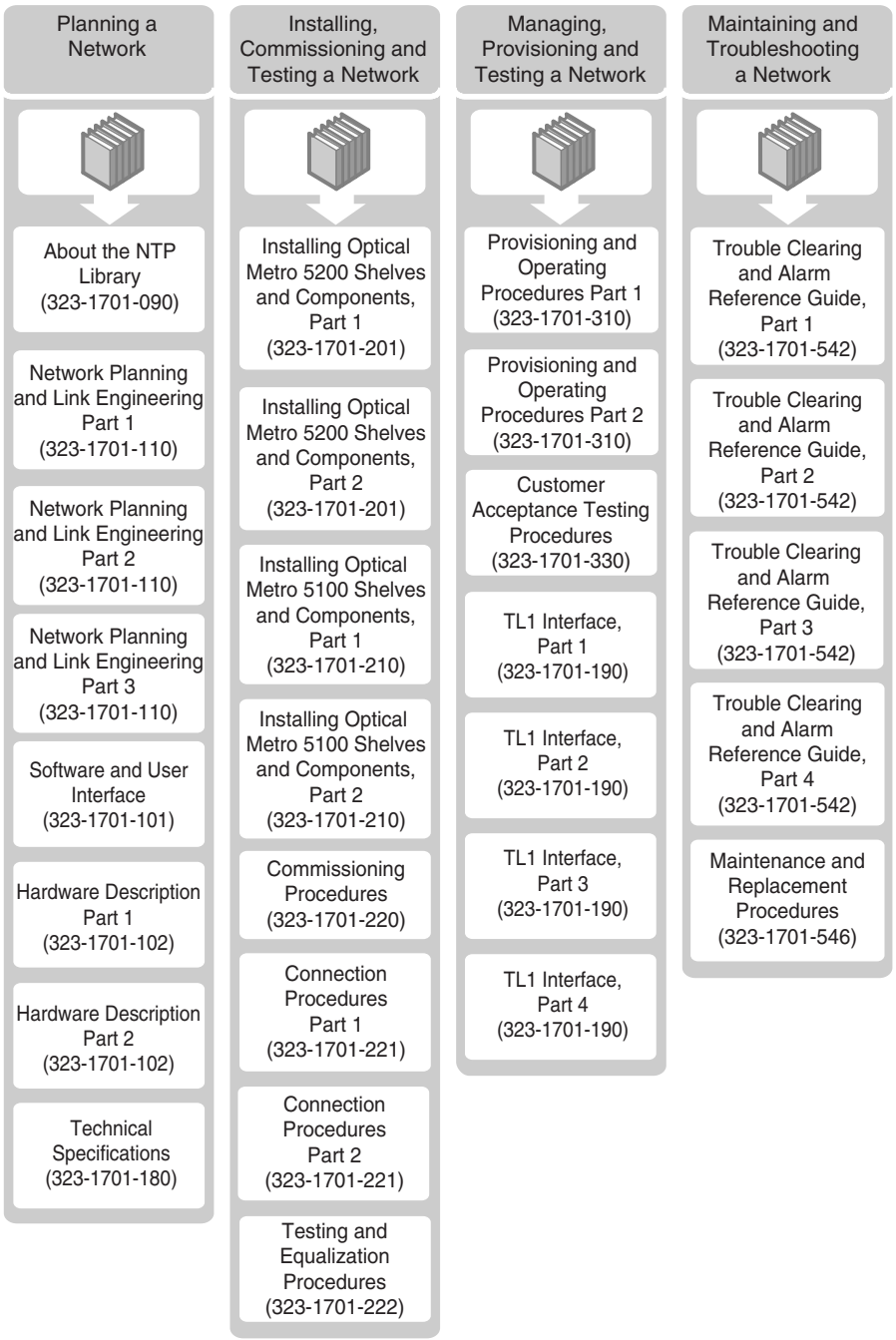

Technical assistance service telephone numbers

For technical support and information from Nortel Networks, refer to the following table.

Technical Assistance Service	
For service-affecting problems: For 24-hour emergency recovery or software upgrade support, that is, for: • restoration of service for equipment that has been carrying traffic and is out of service • issues that prevent traffic protection switching • issues that prevent completion of software upgrades	**North America:** 1-800-4NORTEL (1-800-466-7835) **International:** 001-919-992-8300
For non-service-affecting problems: For 24-hour support on issues requiring immediate support or for 14-hour support (8 a.m. to 10 p.m. EST) on upgrade notification and non-urgent issues.	**North America:** 1-800-4NORTEL (1-800-466-7835) ***Note:*** You require an express routing code (ERC). To determine the ERC, see our corporate Web site at www.nortel.com. Click on the Express Routing Codes link. **International:** Varies according to country. For a list of telephone numbers, see our corporate Web site at www.nortel.com. Click on the Contact Us link.
Global software upgrade support:	**North America:** 1-800-4NORTEL (1-800-466-7835) **International:** Varies according to country. For a list of telephone numbers, see our corporate Web site at www.nortel.com. Click on the Contact Us link.

Maintenance

This chapter identifies the maintenance schedule associated with the following Optical Metro 5200 and Optical Metro 5100 components:

- air filter in an Optical Metro 5200 shelf
- air filter in an Optical Metro 5100 shelf
- air filter in an Enhanced Trunk Switch (ETS) shelf

This chapter makes use of the replacement procedures in "Replacing shelf components" on page 2-1.

Maintenance schedule

Table 1-1 identifies the maintenance schedule for the components identified at the beginning of this chapter.

Table 1-1
Maintenance schedule for Optical Metro 5200 and Optical Metro 5100 components

Component	Maintenance schedule	Replacement procedure	Page
Air filter in an Optical Metro 5200 shelf	Replace the air filter every six months.	2-1 Replacing the air filter in an Optical Metro 5200 shelf	2-7
Air filter in an Optical Metro 5100 shelf	Replace the air filter every six months.	2-2 Replacing the air filter in an Optical Metro 5100 shelf	2-10
Air filter in an ETS shelf	Replace the ETS air filter at least once a year to maintain optimum cooling of the shelf components. In some sites the air filter may need to be replaced more frequently.	2-28 Replacing the air filter in an ETS Shelf	2-179

Components other than those listed above only need to be replaced in the event of a failure.

Replacing shelf components

Use the procedures in this chapter to replace the following Optical Metro 5200 and Optical Metro 5100 components:

- cooling unit air filter
- cooling unit
- OMX (Standard) tray
- OMX 4CH + Fiber Manager
- OMX 4CH Enhanced
- OMX 16CH DWDM
- OMX 1CH CWDM tray
- OMX 1CH CWDM drawer
- OMX 4CH CWDM drawer
- OMX (4CH or 8CH) ITU CWDM drawer
- OMX 1CH OADM ITU CWDM tray
- OMX 1CH OADM ITU CWDM drawer
- OMX 4CH OADM ITU CWDM drawer
- OSC tray
- OSC drawer
- Transponder Protection Tray
- patch panel
- C&L splitter/coupler module
- C&L splitter/coupler drawer
- Equalizer Coupler Tray (ECT)
- Per Band Equalizer (PBE)
- Optical Trunk Switch
- ETS Switch module
- ETS Comms module

- ETS fan module
- ETS air filter
- ETS fuses
- 1U APRS rectifier module
- 3U APRS rectifier module
- 1310 nm splitter/coupler module
- 1310 nm splitter/coupler drawer
- Discrete VOA module
- Discrete VOA drawer
- Equipment Inventory Unit
- Dispersion Slope Compensating Module (DSCM)

Precautions

CAUTION
Risk of equipment damage
Wear a grounded antistatic wrist strap connected to the shelf maintenance panel, or shoe straps, when handling equipment. Make sure you know how to handle electronic components correctly before you begin replacement procedures. Incorrect handling can cause damage to static-sensitive components.

CAUTION
Risk of shelf malfunction
Nortel Networks recommends that you do not use cellular phones at any Optical Metro 5100/5200 site. The use of cellular phones in proximity to Optical Metro equipment can cause shelf malfunction.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Handling modules

CAUTION
Risk of equipment damage
Make sure you know how to handle electronic components correctly before you begin installation procedures. Incorrect handling can cause damage to static-sensitive components.

To avoid possible damage to circuit packs by electrostatic discharge (ESD), use the following precautions:

- Wear a grounded antistatic wrist strap connected to the shelf maintenance panel, or shoe straps, when handling modules. Follow the manufacturer's instructions to test ESD protection before handling modules.
- Keep modules in their antistatic bags until you are ready to install the modules.
- Remove modules from their antistatic bags and install the modules directly into the unit. Do not pass modules to another person.
- If you need to put a modules down, put the module back into its antistatic bag first.
- Handle modules by their edges only. Do not touch the electronic components or any exposed printed circuits.
- Limit your movement during installation to reduce the build up of static electricity.

Procedure list

Table 2-1 lists the procedures in this chapter.

Table 2-1
Shelf component replacement procedures

Procedure	Page	Comments
2-1 Replacing the air filter in an Optical Metro 5200 shelf	2-7	Replace the air filter every six months.
2-2 Replacing the air filter in an Optical Metro 5100 shelf	2-10	Replace the air filter every six months.
2-3 Replacing the cooling unit in an Optical Metro 5200 shelf	2-14	Replace the cooling unit if one of the fans in the unit fails. The entire cooling unit must be replaced even if only one fan fails (and it must be replaced within 72 hours of the cooling unit fail/missing alarm being raised).

Table 2-1 (continued)
Shelf component replacement procedures

Procedure	Page	Comments
2-4 Replacing the cooling unit in an Optical Metro 5100 shelf	2-17	Replace the cooling unit if one of the fans in the unit fails. The entire cooling unit must be replaced even if only one fan fails (and it must be replaced within 72 hours of the cooling unit fail/missing alarm being raised).
2-5 Replacing an OMX (Standard) tray	2-21	Replace an OMX tray if it fails.
2-6 Replacing an OMX 4CH + Fiber Manager	2-30	Replace an OMX if it fails.
2-7 Replacing an OMX 4CH Enhanced	2-37	Replace an OMX if it fails.
2-8 Replacing an OMX 16CH DWDM	2-45	Replace an OMX 16CH DWDM if it fails.
2-9 Replacing an OMX 1CH CWDM tray within a drawer	2-50	Replace an OMX 1CH CWDM module if it fails.
2-10 Replacing an OMX 1CH CWDM drawer	2-57	Replace the OMX 1CH CWDM drawer if both OMX modules fail.
2-11 Replacing an OMX 4CH CWDM drawer	2-62	Replace the OMX 4CH CWDM drawer if an OMX 4CH CWDM module fails.
2-12 Replacing an OMX (4CH or 8CH) ITU CWDM drawer	2-69	Replace the OMX (4CH or 8CH) ITU CWDM drawer if an OMX (4CH or 8CH) ITU CWDM module fails.
2-13 Replacing an OMX 1CH OADM ITU CWDM tray within a drawer	2-76	Replace an OMX 1CH OADM ITU CWDM module if it fails.
2-14 Replacing an OMX 1CH OADM ITU CWDM drawer	2-83	Replace the OMX 1CH OADM ITU CWDM drawer if both OMX modules fail.
2-15 Replacing an OMX 4CH OADM ITU CWDM drawer	2-88	Replace the OMX 4CH OADM ITU CWDM drawer if an OMX 4CH OADM ITU CWDM module fails.
2-16 Replacing an OSC tray within an OSC drawer	2-95	Replace an OSC tray within the drawer if it fails.
2-17 Replacing an OSC drawer	2-104	Replace an OSC drawer if it fails.
2-18 Replacing a Transponder Protection Tray	2-110	Replace the Transponder Protection Tray if any of the filters fail.
2-19 Replacing a patch panel	2-115	Replace the patch panel if it fails.
2-20 Replacing a C&L splitter/coupler tray within a drawer	2-121	Replace a C/L splitter/coupler module within the drawer if it fails.
2-21 Replacing a C&L splitter/coupler drawer	2-128	Replace a C/L splitter/coupler drawer if it fails.

Table 2-1 (continued)
Shelf component replacement procedures

Procedure	Page	Comments
2-22 Replacing an ECT tray	2-134	Replace an ECT if it fails.
2-23 Replacing a PBE	2-145	Replace a PBE if it fails.
2-24 Replacing an Optical Trunk Switch	2-154	Replace an Optical Trunk Switch if it fails.
2-25 Replacing an ETS Switch module	2-160	Replace an ETS Switch module if it fails.
2-26 Replacing an ETS Comms module	2-167	Replace an ETS Comms module if it fails.
2-27 Replacing an ETS fan module	2-176	Replace an ETS fan module if it fails. The ETS fan module must be replaced within 96 hours, in the case of a single fan failure, or within 24 hours, in the case of a double fan failure.
2-28 Replacing the air filter in an ETS Shelf	2-179	Replace the ETS air filter at least once a year to maintain optimum cooling of the shelf components. In some sites the air filter may need to be replaced more frequently.
2-29 Replacing the fuses in an ETS Shelf	2-181	Replace an ETS fuse if it fails.
2-30 Replacing a 1U APRS rectifier module	2-184	Replace a 1U APRS rectifier module if the fan, or the module, fails.
2-31 Replacing a 3U APRS rectifier module	2-187	Replace a 3U APRS rectifier module if the fan, or the module, fails.
2-32 Replacing a 1310 nm splitter/coupler tray within a drawer	2-190	Replace a 1310 nm splitter/coupler module within a drawer if it fails.
2-33 Replacing a 1310 nm splitter/coupler drawer	2-197	Replace a 1310 nm splitter/coupler if it fails.
2-34 Replacing a VOA module within a Discrete VOA drawer	2-203	Replace a VOA module within the drawer if it fails.
2-35 Replacing a Discrete VOA drawer	2-209	Replace a Discrete VOA drawer if it fails.
2-36 Replacing an Equipment Inventory Unit	2-214	Replace an EIU if it fails.
2-37 Replacing a DSCM Tray within a DSCM Tray drawer	2-218	Replace a DSCM Tray within a DSCM Tray drawer if it fails or needs to be substituted for another DSCM Tray.

Procedure 2-1
Replacing the air filter in an Optical Metro 5200 shelf

Follow this procedure to replace the air filter in the cooling unit of an Optical Metro 5200 shelf.

ATTENTION
You must replace the air filter for each Optical Metro 5200 shelf every six months to maintain optimum cooling of the shelf components.

For more information, refer to the "Cooling unit" section in the "Optical Metro 5200 shelves" chapter in *Hardware Description,* 323-1701-102.

Requirements

Table 2-2 lists the tools and materials required to replace the air filter.

Table 2-2
Tools and materials for replacing an air filter

Item	Quantity	Supplied
Replacement air filter (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: For the product engineering code for the air filter, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-1 (continued)
Replacing the air filter in an Optical Metro 5200 shelf

Precautions

CAUTION
Risk of service interruption
The shelf can operate for a maximum of 10 minutes at room temperature (25 degrees Celsius/77 degrees Fahrenheit) with both the cooling unit and air filter removed.

CAUTION
Risk of service interruption
Do not disconnect power to the cooling unit when you replace the air filter. Disconnecting the power to the cooling unit will affect traffic as it shuts off the power to the whole shelf. The power of the cooling unit can stay ON for the entire duration of this procedure.

Action

Step	Action
1	Loosen the captive screws at the upper corners of the cooling unit cover and remove the cover.

DANGER
Risk of personal injury or equipment damage
Do not let go of the cooling unit cover when you open it. The cooling unit cover is not permanently attached to the shelf. You must remove the cooling unit cover completely. If you let go of the cooling unit cover when you open it, you can cause personal injury, damage to the equipment, or both.

2	Grasp the tab on the front of the filter and pull the filter toward you until it is free of the cooling unit, as shown in Figure 2-1 on page 2-9.
3	Discard the old air filter.
4	With the tab in front of you and the AIR FLOW arrows pointing up, slide the replacement filter into the guides at the top of the cooling unit.
5	Replace the cooling unit cover and tighten the captive screws.

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Procedure 2-1 (continued)
Replacing the air filter in an Optical Metro 5200 shelf

Figure 2-1
Replacing the air filter

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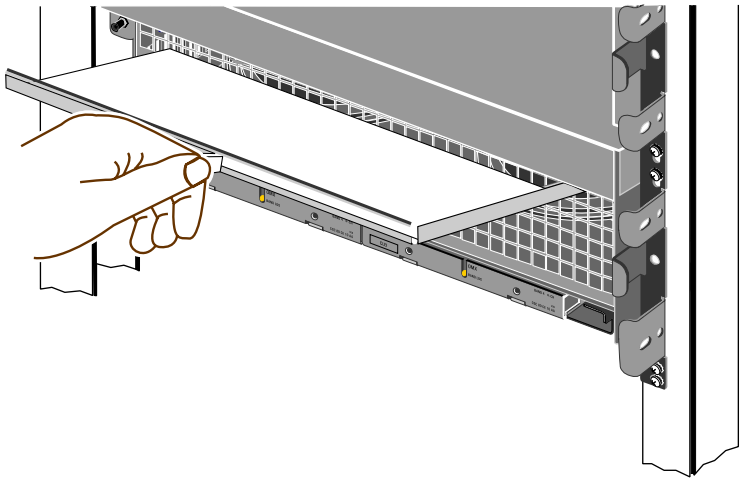

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Procedure 2-2
Replacing the air filter in an Optical Metro 5100 shelf

Follow this procedure to replace the air filter in the cooling unit of an Optical Metro 5100 shelf.

ATTENTION
You must replace the air filter for each Optical Metro 5100 shelf every six months to maintain optimum cooling of the shelf components.

For more information, refer to the "Cooling unit" section of the "Optical Metro 5200 shelves" chapter in *Hardware Description,* 323-1701-102.

Requirements

Table 2-3 lists the tools and materials required to replace the air filter.

Table 2-3
Tools and materials for replacing an air filter

Item	Quantity	Supplied
Replacement air filter (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: For the product engineering code for the air filter, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-2 (continued)
Replacing the air filter in an Optical Metro 5100 shelf

Precautions

CAUTION
Risk of service interruption
The shelf can operate for a maximum of 10 minutes at room temperature (25 degrees Celsius/77 degrees Fahrenheit) with both the cooling unit and air filter removed.

CAUTION
Risk of service interruption
Do not disconnect power to the cooling unit when you replace the air filter. Disconnecting the power to the cooling unit will affect traffic as it shuts off the power to the whole shelf. The power of the cooling unit can stay ON for the entire duration of this procedure.

Action

Step	Action
1	Remove the shelf cover by releasing the lock latches on the sides and lifting the door off its pivots.

DANGER
Risk of personal injury or equipment damage
Do not let go of the cooling unit cover when you open it. The shelf cover is not permanently attached to the shelf. You must remove the door completely. If you let go of the door when you open it, you can cause personal injury, damage to the equipment, or both.

2	Release the installed air filter by turning the quarter-turn latch counter-clockwise. The latch is located to the left of the air filter.
3	Remove the air filter by grasping the strap (shown in Figure 2-3) and pulling the filter toward you until it is free of the chassis.
4	Slide the replacement air filter into the cooling unit. Orient the replacement air filter correctly by making sure the air flow arrows that are stamped on the side of the filter frame point towards the right of the Optical Metro 5100 shelf (the arrows are stamped on the horizontal sides of the filter frame). See Figure 2-2.

—continued—

Procedure 2-2 (continued)
Replacing the air filter in an Optical Metro 5100 shelf

Step	Action

Figure 2-2
Air flow arrows

5 Turn the quarter-turn latch clockwise to secure the air filter.

Note: Before you replace the cover, be sure that the optical fibers are clear of the lower right corner of the cover flange and the shelf chassis.

6 The shelf cover can now be placed back on the shelf. Insert the bottom of the shelf cover in the correct position. Then, hold the latches on the side of the cover while inserting the top of the shelf cover in the correct position. Release the latches.

—continued—

Procedure 2-2 (continued)
Replacing the air filter in an Optical Metro 5100 shelf

Figure 2-3
Position of the air filter in an Optical Metro 5100 shelf

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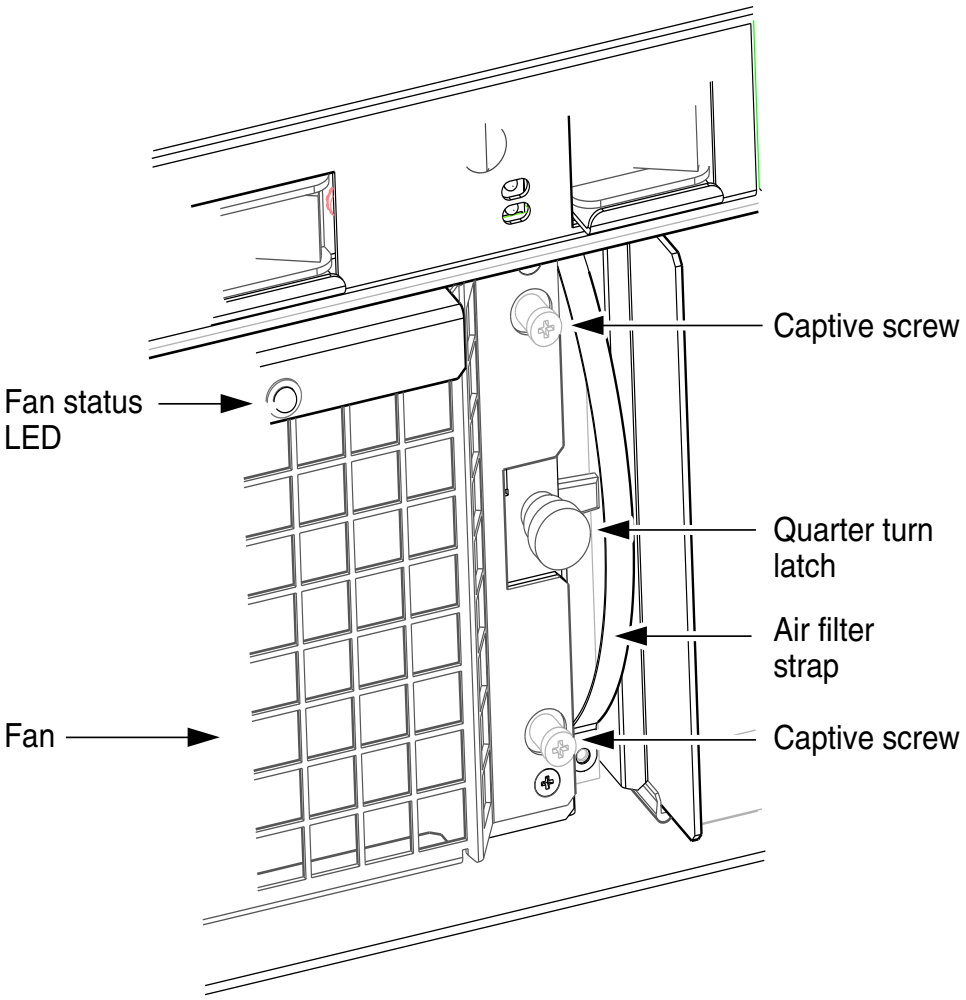

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Procedure 2-3
Replacing the cooling unit in an Optical Metro 5200 shelf

Follow this procedure to replace the cooling unit in an Optical Metro 5200 shelf.

For more information, refer to the "Cooling unit" section of the "Optical Metro 5200 shelves" chapter in *Hardware Description,* 323-1701-102.

You must replace the entire cooling unit even if only one fan fails. Nortel Networks recommends that you replace the cooling unit within 72 hours of the Cooling Unit Fail/Missing alarm being raised.

Requirements

Table 2-4 lists the tools and materials required to replace the cooling unit.

Table 2-4
Tools and materials for replacing a cooling unit

Item	Quantity	Supplied
Replacement cooling unit (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: For the product engineering code for the cooling unit, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Precautions

CAUTION
Risk of service interruption
The shelf can operate for a maximum of 10 minutes at room temperature (25 degrees Celsius/77 degrees Fahrenheit) with both the cooling unit and air filter removed.

CAUTION
Risk of service interruption
When replacing the cooling unit, the air filter as well as the cooling unit must be completely removed to ensure thermal convection cooling and maintain error free operation during the replacement interval.

—continued—

Procedure 2-3 (continued)
Replacing the cooling unit in an Optical Metro 5200 shelf

Action

Step	Action
1	Remove the new cooling unit from its packaging.
2	Loosen the captive screws at the upper corners of the cooling unit cover and remove the cover.See Figure 2-4 on page 2-16.

DANGER
Risk of personal injury or equipment damage
Do not let go of the cooling unit cover when you open it. The cooling unit cover is not permanently attached to the shelf. You must remove the cooling unit cover completely. If you let go of the cooling unit cover when you open it, you can cause personal injury, damage to the equipment, or both.

3	The air filter must be removed completely when replacing the cooling unit. Follow step 2 of Procedure 2-1 to remove the air filter, then go to step 4.

CAUTION
Risk of service interruption
Do not disconnect power to the cooling unit when you replace the air filter. Disconnecting the power to the cooling unit will affect traffic as it shuts off the power to the whole shelf. The power of the cooling unit can stay ON for the entire duration of this procedure.

4	Loosen the captive screws on the front of the cooling unit. Pull the unit toward you to remove it from the shelf. See Figure 2-4 on page 2-16.
5	Slide the new cooling unit into the guides at the sides of the shelf, as shown in Figure 2-4 on page 2-16. *The fans and the green indicator lamp come on and remain on when the unit is seated in the backplane connector.*
6	Tighten the screws on the front of the cooling unit to secure it to the chassis.
7	The air filter removed in step 3 can be replaced. If it has not been six months since the last filter replacement, use the same filter that was removed. If the filter was replaced more than six months ago, use a new air filter. Follow step 4 of Procedure 2-1 to place the air filter back in the shelf, then go to step 8.
8	Replace the cooling unit cover and tighten the screws.

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Procedure 2-3 (continued)
Replacing the cooling unit in an Optical Metro 5200 shelf

Figure 2-4
Replacing the cooling unit

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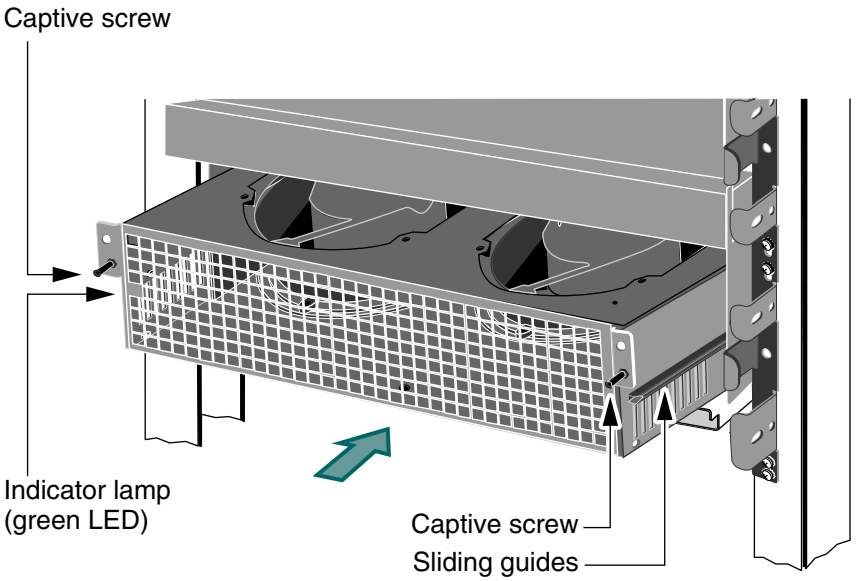

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Procedure 2-4
Replacing the cooling unit in an Optical Metro 5100 shelf

Follow this procedure to replace the cooling unit in an Optical Metro 5100 shelf.

For more information, refer to the "Cooling unit" section of the "Optical Metro 5200 shelves" chapter in *Hardware Description,* 323-1701-102.

You must replace the entire cooling unit even if only one fan fails. Nortel Networks recommends that you replace the cooling unit within 72 hours of the Cooling Unit Fail/Missing alarm being raised.

Requirements

Table 2-5 lists the tools and materials required to replace the cooling unit.

Table 2-5
Tools and materials for replacing a cooling unit

Item	Quantity	Supplied
Replacement cooling unit (see Note)	1	no
Phillips screwdriver	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: For the product engineering code for the cooling unit, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-4 (continued)
Replacing the cooling unit in an Optical Metro 5100 shelf

Precautions

CAUTION
Risk of service interruption
The shelf can operate for a maximum of 10 minutes at room temperature (25 degrees Celsius/77 degrees Fahrenheit) with both the cooling unit and air filter removed.

CAUTION
Risk of service interruption
When replacing the cooling unit, the air filter as well as the cooling unit must be completely removed to ensure thermal convection cooling and maintain error free operation during the replacement interval.

Action

Step	Action
1	Remove the new cooling unit from its packaging.
2	Remove the shelf cover by releasing the lock latches on the sides and lifting the door off its pivots.

DANGER
Risk of personal injury or equipment damage
Do not let go of the cooling unit cover when you open it. The cooling unit cover is not permanently attached to the shelf. You must remove the cooling unit cover completely. If you let go of the cooling unit cover when you open it, you can cause personal injury, damage to the equipment, or both.

3	The air filter must be removed completely when replacing the cooling unit. Follow step 2 and step 3 of Procedure 2-2 to remove the air filter, then go to step 4.

CAUTION
Risk of service interruption
Don’t turn off the power to the shelf, as it is carrying traffic. The power of the cooling unit can stay ON for the entire duration of this procedure.

—continued—

Procedure 2-4 (continued)
Replacing the cooling unit in an Optical Metro 5100 shelf

Step	Action
4	Release the two retaining captive screws on the right side, at the top and bottom of the cooling unit. Use the small Phillips screwdriver if the screws are tight. See Figure 2-5.
5	Pull the unit toward you until it is free of the chassis.
6	Align the replacement unit with the guides and slide it into the chassis until it is seated in the backplane connectors. *The fans and the green indicator lamp come on and remain on when the unit is seated in the backplane connector.*
7	Tighten the captive screws to secure the unit to the chassis.
8	The air filter removed in step 3 can be replaced. If it has not been six months since the last filter replacement, use the same filter that was removed. If the filter was replaced more than six months ago, use a new air filter. Follow step 4 and step 5 of Procedure 2-2 to place the air filter back in the shelf, then go to step 9.
9	The shelf cover can now be placed back on the shelf. Insert the bottom of the shelf cover in the correct position. Then, hold the latches on the side of the cover while inserting the top of the shelf cover in the correct position. Release the latches.

—continued—

Procedure 2-4 (continued)
Replacing the cooling unit in an Optical Metro 5100 shelf

Figure 2-5
Position of the air filter in an Optical Metro 5100 shelf

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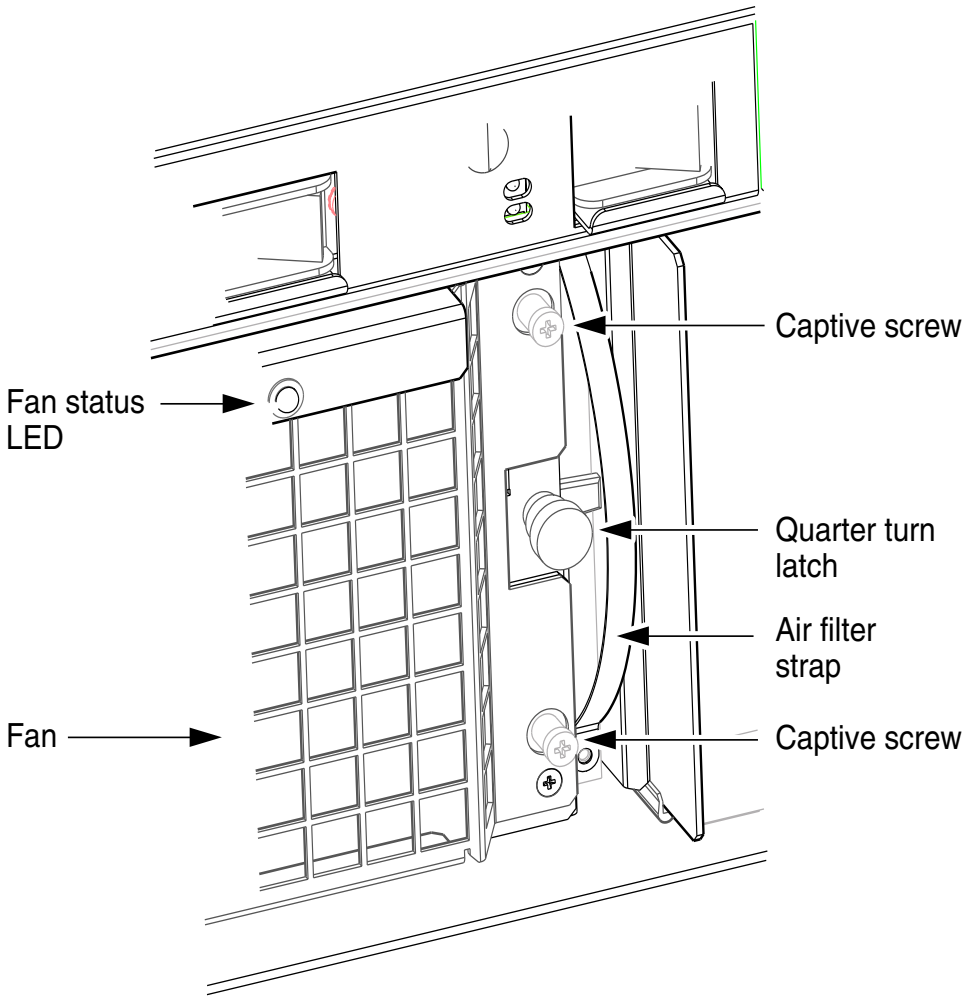

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Procedure 2-5
Replacing an OMX (Standard) tray

Follow this procedure to replace an OMX (Standard) tray in an Optical Metro 5200 shelf. If the traffic is protected (a user switch is possible), perform Procedure 2-5 completely for one OMX tray (east or west) at a time. In a protection switch scenario, one of the two OMX modules within the drawer (east or west) needs to stay in place while the other module is replaced, because it carries the protected signals.

For more information about OMX (Standard) tray, refer to the "OMX (Standard)" section in *Hardware Description,* 323-1701-102.

Requirements

Table 2-6 lists the tools and materials required to complete this procedure.

Table 2-6
Tools and materials for replacing an OMX tray (Standard)

Item	Quantity	Supplied
OMX (Standard) tray of the same band as the OMX that is being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
Small Phillips screwdriver	1	no
Note: For the product engineering code for the OMX (Standard) tray, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-5 (continued)
Replacing an OMX (Standard) tray

Precautions

CAUTION
Risk of service interruption
When you replace an OMX, traffic will be temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-5 (continued)
Replacing an OMX (Standard) tray

Action

Step	Action
1	Switch traffic off the span for the OMX you are replacing, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step. ***Note 2:*** If you are going to replace the east OMX and the west OMX, perform Procedure 2-5 completely for one OMX tray (east or west) at a time. When complete, perform Procedure 2-5 for the next OMX tray in the drawer. This prevents traffic loss, if the user switch was possible (even if there will be a short traffic interruption during the user switch procedure).
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Remove the cooling unit cover by loosening the captive screws on each side of the cover. Set the cover aside. **DANGER** **Risk of personal injury or equipment damage** Do not let go of the cooling unit cover when you open it. The cooling unit cover is not permanently attached to the shelf. You must remove the cooling unit cover completely. If you let go of the cooling unit cover when you open it, you can cause personal injury, damage to the equipment, or both.

—continued—

Procedure 2-5 (continued)
Replacing an OMX (Standard) tray

Step	Action
4	Disconnect and remove the optical fiber pigtails that connect the OCLD circuit packs to the OMX that is being removed. Make sure the fibers have been properly labelled. Replace protective connector caps on the OCLD connectors, and fiber caps on the OMX fiber pigtails.
5	Press and hold simultaneously the locking tabs on both sides of the OMX drawer, and pull the drawer towards you until it is fully extended.
6	Unscrew the retaining screws (up to 4) on the cover of the OMX, to remove the cover from the OMX you are replacing (east, west, or both). See on page 2-27.
7	On the OMX you are replacing (east, west, or both), disconnect all the fiber connections to the OMX: OTSin, OTSout, THRUin, THRUout. The fibers to disconnect are the ones coming from the front of the OMX module. In the case of an OMX crossover connection, fibers going from OMX east to west or west to east have to be disconnected (to be able to remove the tray). Make sure the fibers have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
8	Remove the OMX pigtails from the flexible fiber guide on the OMX you are replacing (east, west, or both), as well as any other fiber disconnected in the previous step.
9	Disconnect the data communication cables from both sides of the OMX drawers. They are identified on the OMX as “West OMX Monitor” and “East OMX Monitor”. Make sure the cable has been properly labelled.
10	Remove the screw that attaches the flexible fiber guide to the top of OMX tray you are replacing (east, west, or both). See Figure 2-6 on page 2-27. Move the fiber guide to the side of the shelf. Make sure you keep the screw to install the replacement drawer.

—continued—

Procedure 2-5 (continued)
Replacing an OMX (Standard) tray

Step	Action
11	Remove the two retaining screws on the front of the OMX tray you are replacing (east, west, or both). These screws hold the OMX in position in the drawer. See Figure 2-7 on page 2-28. Make sure you keep the screws to install the replacement drawer.
12	Remove the OMX tray from the drawer and place it on an antistatic surface.
13	Replace the cover removed in step 6 on the old OMX (Standard) drawer.
14	Remove the new replacement OMX from its packaging, and ensure that its PEC matches with the PEC of the OMX that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support. Repeat this step if both east and west OMX trays are being replaced.
15	Take the new replacement OMX and line up the hole in the back of the OMX with the pin in the back of the OMX drawer. Carefully lower the front of the OMX tray into the drawer. See Figure 2-8 on page 2-28.
16	Secure the new replacement OMX to the drawer with the two retaining screws that you removed in step 11.
17	Attach the flexible optical fiber guide to the OMX tray using the screw that you removed in step 10. See Figure 2-6 on page 2-27.
18	Place the OMX fiber pigtails removed in step 8 back in the flexible optical fiber guide.
19	Unscrew the retaining screws (up to 4) on the cover of the OMX, and remove the cover from the replacement OMX (east, west, or both). See on page 2-27.
20	Reconnect the east and west OMX communications cables to the OMX trays (the ones you removed in step 9). They are identified on the OMX trays as “East OMX Monitor” and “West OMX Monitor”. For more information, refer to Procedure 6-9 “Connecting passive devices to the maintenance panel” in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
21	Restore all the OMX connections that you removed in step 7. Use the labels applied in step 7 to guide the reconnection. You will need to remove the fiber caps on the pigtails. Make sure you clean each individual fiber pigtail before reconnection. For cleaning procedures, refer to “Cleaning connectors” in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
22	Replace the cover on the OMX tray (east, west, or both). Replace the retaining screws (up to 4) on the cover of the OMX. See Figure 2-9 on page 2-29.

—continued—

Procedure 2-5 (continued)
Replacing an OMX (Standard) tray

Step	Action	
23	Reconnect the OMX fiber pigtails to the OCLD circuit packs (the ones you removed in step 4). You will need to remove the protective connector caps and the fiber caps on the pigtails. Make sure you clean each individual fiber pigtail before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201. For information on reconnections, follow Procedure 3-19 "Connecting an OMX to OCLD circuit packs" in *Connection Procedures*, 323-1701-221.	
24	Press and hold simultaneously the locking tabs on both sides of the OMX drawer, and insert the drawer back in the shelf until completely seated.	
25	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.	
26	**If** your traffic was	**Then**
	protected (a traffic switch was executed in step 1)	Reroute traffic back to the original span for the OMX. Make sure that the force and manual switches are removed. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310. Then, go to step 27.
	unprotected (a traffic switch was not executed in step 1)	go to step 27.
27	Replace the cooling unit cover that you removed at step 3. Tighten the captive screws on each side of the cover.	

—continued—

Procedure 2-5 (continued)
Replacing an OMX (Standard) tray
Removing the cover from an OMX tray

OM0121p

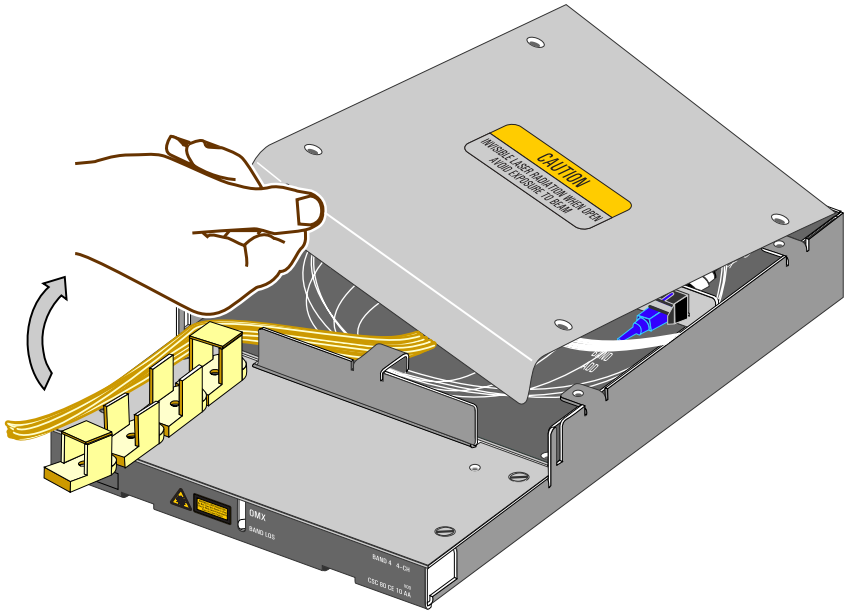
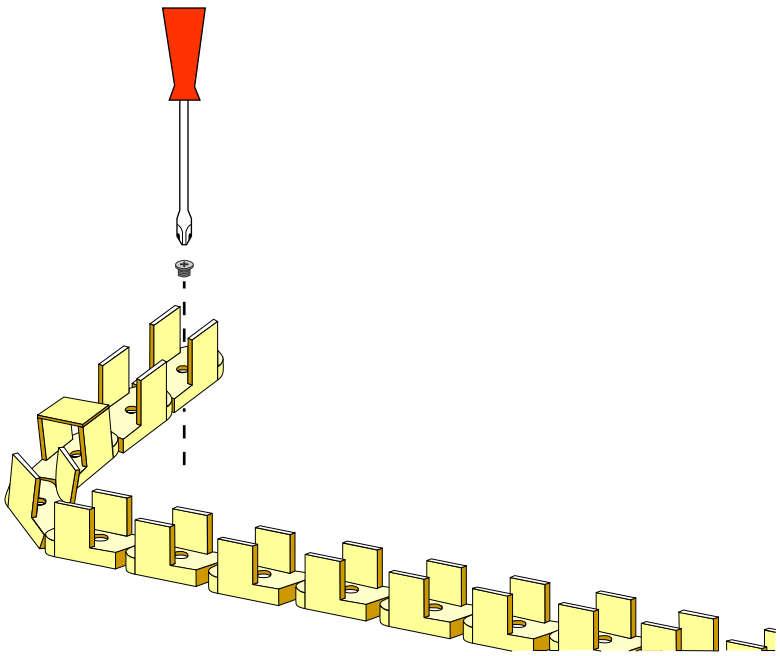


Figure 2-6
Securing the flexible optical fiber guide to the OMX tray

OM0127p



—continued—

Procedure 2-5 (continued)
Replacing an OMX (Standard) tray
Removing the cover from an OMX tray

Figure 2-7
Installing the retaining screws in the OMX tray

OM0125t

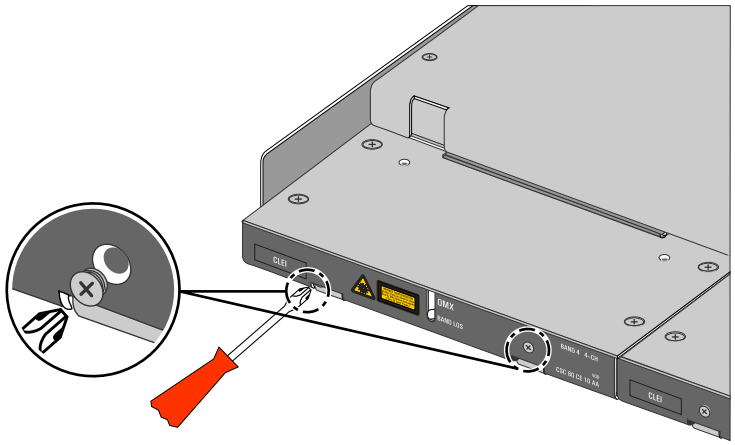
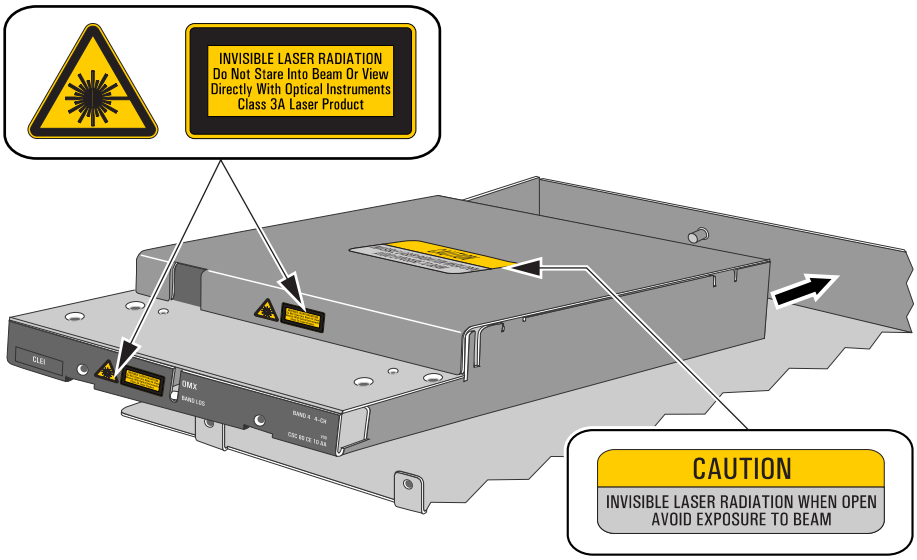


Figure 2-8
Installing an OMX tray (optical fibers are not shown)

OM0124ps

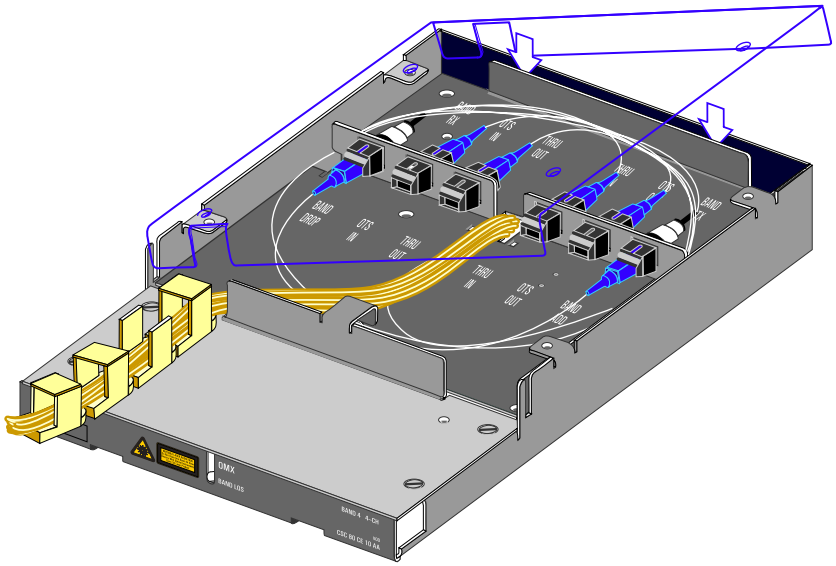


—continued—

Procedure 2-5 (continued)
Replacing an OMX (Standard) tray
Removing the cover from an OMX tray

Figure 2-9
Replacing the cover on an OMX tray

OM0122p



—end—

Procedure 2-6
Replacing an OMX 4CH + Fiber Manager

Follow this procedure to replace an OMX 4CH + Fiber Manager. This type of OMX is an integrated unit within a drawer. Therefore, you must install a new drawer to replace the OMX.

For more information about the OMX, refer to the "OMX 4CH + Fiber Manager" section in *Hardware Description,* 323-1701-102.

Requirements

Table 2-7 lists the tools and materials required to complete this procedure.

Table 2-7
Tools and materials for replacing an OMX 4CH + Fiber Manager

Item	Quantity	Supplied
OMX 4CH + Fiber Manager of the same band as the OMX that is being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Note: For the product engineering code for the OMX 4CH + Fiber Manager, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-6 (continued)
Replacing an OMX 4CH + Fiber Manager

Precautions

CAUTION
Risk of service interruption
When you replace an OMX 4CH + Fiber Manager, traffic will be temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-6 (continued)
Replacing an OMX 4CH + Fiber Manager

Action

Step	Action
1	Switch traffic off the span for the OMX 4CH + Fiber Manager that you are going to replace, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310.When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step. ***Note 2:*** If you are going to replace the east OMX 4CH + Fiber Manager and the west OMX 4CH + Fiber Manager, execute Procedure 2-6 completely for one tray at a time. When complete, repeat this procedure for the next tray. This prevents traffic loss, if the user switch was possible, if the user switch was possible (even if there will be a short traffic interruption during the user switch procedure).
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Open the OMX 4CH + Fiber Manager tray by simultaneously pushing through the center the two locking tabs on each side of the module (see Figure 2-10 on page 2-35). Pull the drawer towards you until it is fully extended.
4	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

5	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the OMX 4CH + Fiber Manager for the following ports (not all of them will have fiber to disconnect, depending on the configuration - see Figure 2-11 on page 2-36): OTS IN, OTS OUT, THRU IN, THRU OUT, CH 1 ADD, CH 1 DROP, CH 2 ADD, CH 2 DROP, CH 3 ADD, CH 3 DROP, CH 4 ADD, CH 4 DROP. The fibers to disconnect are the ones coming from the front of the OMX 4CH + Fiber Manager module (not the back). Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.

—continued—

Procedure 2-6 (continued)
Replacing an OMX 4CH + Fiber Manager

Step	Action
6	Remove the patch cords from the fiber guides in the tray. Leave the fiber patch cords hanging on the side of the rack (the connectors are protected with fiber caps).
7	After you disconnect the fibers, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
8	Unplug the data communication cable going into the OMX 4CH + Fiber Manager (see Figure 2-10 on page 2-35). Make sure the cable has been properly labelled.

9	**If** the drawer has a	**Then**
	non-spring-loaded locking clip	return the locking clip to the original upright position
	spring-loaded locking clip	push the clip down

10	Close the tray by pressing and holding the locking tabs on the sides of the drawer while you slide the tray into the rack (see Figure 2-10 on page 2-35).

ATTENTION
Make sure that the OMX 4CH + Fiber Manager is adequately supported while you are removing it from the rack.

11	Begin on the left side of the OMX 4CH + Fiber Manager and remove the ground wire from the rack rail. For illustrations of the ground wires on the rack rail, see Procedure 4-15 “Installing and grounding equipment drawers” in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
12	Remove the rest of the screws from the mounting bracket that is holding the left side of the drawer to the rack.
13	Remove the screws from the mounting bracket on the right side of the drawer.
14	Lift the drawer out of the rack.
15	Remove the replacement OMX 4CH + Fiber Manager from its packaging, and ensure that its PEC matches with the PEC of the OMX that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
16	Install and ground the replacement OMX 4CH + Fiber Manager. Follow Procedure 4-15, “Installing and grounding equipment drawers” in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
17	Open the OMX 4CH + Fiber Manager tray by simultaneously pushing through the center the two locking tabs on each side of the module (see Figure 2-10 on page 2-35). Pull the drawer towards you until it is fully extended.

—continued—

Procedure 2-6 (continued)
Replacing an OMX 4CH + Fiber Manager

Step	Action
18	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

19	Reconnect the data communication cable to the port located at the front of the drawer (that you removed in step 8, see Figure 2-10 on page 2-35). Follow Procedure 6-9, "Connecting passive devices to the maintenance panel" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
20	Re-route in the new OMX 4CH + Fiber Manager the fiber patch cords hanging on the side of the rack (that were removed in step 6).
21	Lift the pull-up tabs on the top of each bulkhead, and re-connect the fibers in the OMX for the following ports (not all of them will be connected, depending on the configuration - see Figure 2-11 on page 2-36): OTS IN, OTS OUT, THRU IN, THRU OUT, CH 1 ADD, CH 1 DROP, CH 2 ADD, CH 2 DROP, CH 3 ADD, CH 3 DROP, CH 4 ADD, CH 4 DROP. The fibers to connect are the ones coming from the front of the OMX module (the ones disconnected and labelled in step 5). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the OMX 4CH + Fiber Manager ports. You might also have to remove the protective connector caps on the OMX 4CH + Fiber Manager ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
22	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
23	**If** the drawer has a **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
24	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack (see Figure 2-10 on page 2-35). Be careful not to pinch any fibers, and to allow proper fiber slack.
25	Put the appropriate East or West label sticker on the faceplate of the drawer.

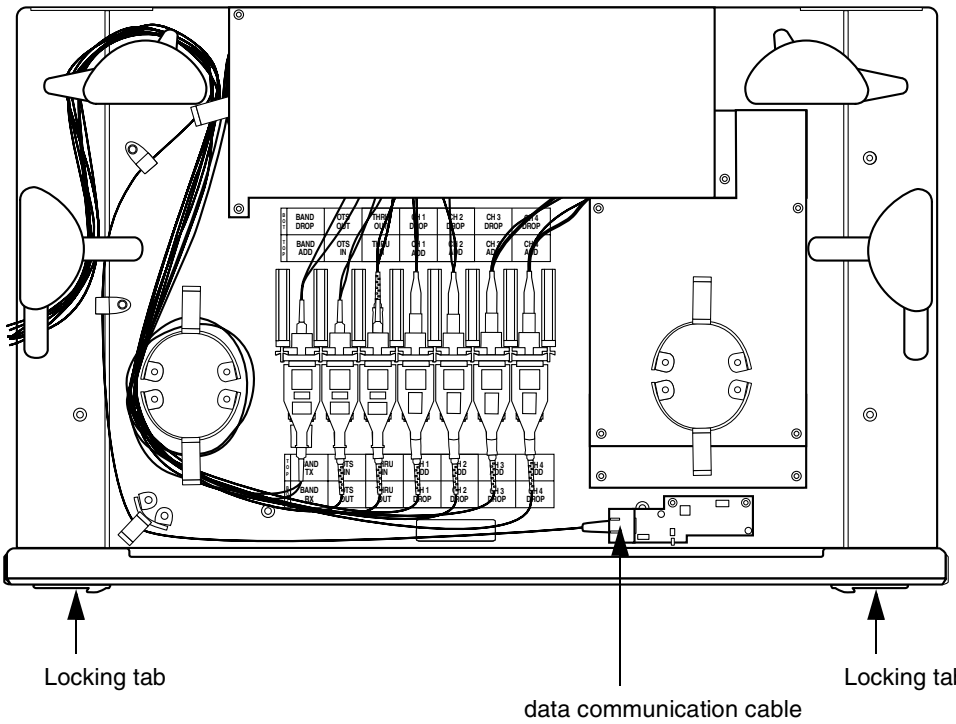
—continued—

Procedure 2-6 (continued)
Replacing an OMX 4CH + Fiber Manager

Step	Action
26	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.
27	**If** your traffic was — **Then**
	protected (a traffic switch was executed in step 1) — Reroute traffic back to the original span for the OMX. Make sure that the force and manual switches are removed. Follow Procedure 3-49 “Removing a manual, force, or lockout switch from a protection path” in *Provisioning and Operating Procedures*, 323-1701-310.
	unprotected (a traffic switch was not executed in step 1) — you have completed this procedure

Figure 2-10
OMX 4CH + Fiber Manager tray optical fiber routing (left side)

OM0515p

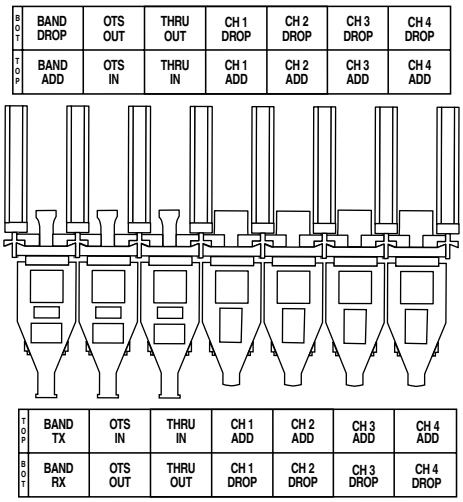


—continued—

Procedure 2-6 (continued)
Replacing an OMX 4CH + Fiber Manager

Figure 2-11
Connector labels in an OMX 4CH + Fiber Manager

OM0700t



—end—

Procedure 2-7
Replacing an OMX 4CH Enhanced

Follow this procedure to replace an OMX 4CH Enhanced. This type of OMX is an integrated unit within a drawer. Therefore, you must install a new drawer to replace the OMX.

For more information about the OMX, refer to the "OMX 4CH Enhanced" section in *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

Requirements

Table 2-8 lists the tools and materials required to complete this procedure.

Table 2-8
Tools and materials for replacing an OMX 4CH Enhanced

Item	Quantity	Supplied
OMX 4CH Enhanced of the same band as the OMX that is being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Note: For the product engineering code for the OMX 4CH Enhanced, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-7 (continued)
Replacing an OMX 4CH Enhanced

Precautions

CAUTION
Risk of service interruption
When you replace an OMX 4CH Enhanced, traffic will be temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instructions with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-7 (continued)
Replacing an OMX 4CH Enhanced

CAUTION
Risk of affecting network reliability
When a shelf component is replaced in an Extended Metro network, re-equalization is necessary. See Procedure 2-6 "Re-equalizing an Extended Metro amplified system" in *Testing and Equalization Procedures*, 323-1701-222.

Action

Step	Action
1	Switch traffic off the span for the OMX 4CH Enhanced that you are going to replace, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step. ***Note 2:*** If you are going to replace the east OMX 4CH Enhanced and the west OMX 4CH Enhanced, execute Procedure 2-7 completely for one tray at a time. When complete, repeat this procedure for the next tray. This prevents traffic loss, if the user switch was possible, if the user switch was possible (even if there will be a short traffic interruption during the user switch procedure).
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Open the OMX 4CH Enhanced tray by simultaneously pushing towards the center the two locking tabs on each side of the module (see Figure 2-12 on page 2-43). Pull the drawer towards you until it is fully extended.
4	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

—continued—

Procedure 2-7 (continued)
Replacing an OMX 4CH Enhanced

Step	Action
5	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the OMX 4CH Enhanced for the following ports (not all of them will have fiber to disconnect, depending on the configuration - see Figure 2-13 on page 2-44): OTS IN, OTS OUT, THRU IN, THRU OUT, CH 1 ADD, CH 1 DROP, CH 2 ADD, CH 2 DROP, CH 3 ADD, CH 3 DROP, CH 4 ADD, CH 4 DROP. The fibers to disconnect are the ones coming from the front of the OMX 4CH Enhanced module (not the back). Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
6	Remove the patch cords from the fiber guides in the tray. Leave the fiber patch cords hanging on the side of the rack (the connectors are protected with fiber caps).
7	After you disconnect the fibers, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
8	Unplug the data communication cable going into the OMX 4CH Enhanced (see Figure 2-10 on page 2-35). Make sure the cable has been properly labelled.
9	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
10	Close the tray by pressing and holding the locking tabs on the sides of the drawer while you slide the tray into the rack (see Figure 2-10 on page 2-35).

ATTENTION
Make sure that the OMX 4CH Enhanced is adequately supported while you are removing it from the rack.

11	Begin on the left side of the OMX 4CH Enhanced and remove the ground wire from the rack rail. For illustrations of the ground wires on the rack rail, see Procedure 4-15 “Installing and grounding equipment drawers” in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
12	Remove the rest of the screws from the mounting bracket that is holding the left side of the drawer to the rack.
13	Remove the screws from the mounting bracket on the right side of the drawer.
14	Lift the drawer out of the rack.

—continued—

Procedure 2-7 (continued)
Replacing an OMX 4CH Enhanced

Step	Action
15	Remove the replacement OMX 4CH Enhanced from its packaging, and ensure that its PEC matches with the PEC of the OMX that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
16	Install and ground the replacement OMX 4CH Enhanced. Follow Procedure 4-15, "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
17	Open the OMX 4CH Enhanced tray by simultaneously pushing towards the center the two locking tabs on each side of the module (see Figure 2-12 on page 2-43). Pull the drawer towards you until it is fully extended.
18	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

19	Reconnect the data communication cable to the port located at the front of the drawer (that you removed in step 8, see Figure 2-10 on page 2-35). Follow Procedure 6-9, "Connecting passive devices to the maintenance panel" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
20	Re-route in the new OMX Enhanced the fiber patch cords hanging on the side of the rack (that were removed in step 6).
21	Lift the pull-up tabs on the top of each bulkhead, and re-connect the fibers in the OMX for the following ports (not all of them will be connected, depending on the configuration - see Figure 2-11 on page 2-36): OTS IN, OTS OUT, THRU IN, THRU OUT, CH 1 ADD, CH 1 DROP, CH 2 ADD, CH 2 DROP, CH 3 ADD, CH 3 DROP, CH 4 ADD, CH 4 DROP. The fibers to connect are the ones coming from the front of the OMX module (the ones disconnected and labelled in step 5). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the OMX 4CH Enhanced ports. You might also have to remove the protective connector caps on the OMX 4CH Enhanced ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-7 (continued)
Replacing an OMX 4CH Enhanced

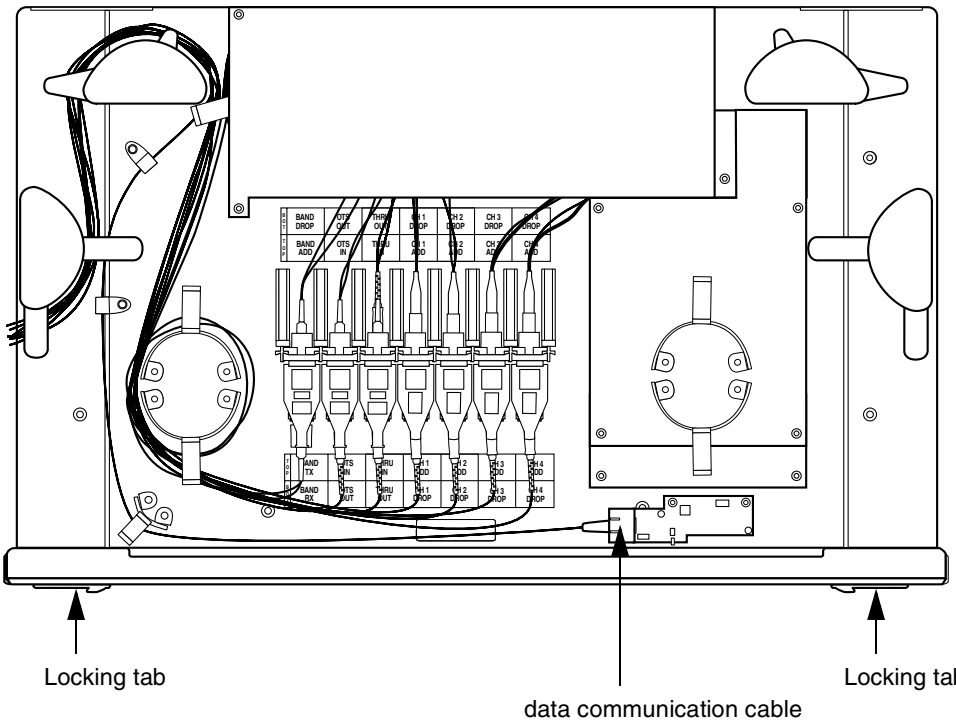
Step	Action
22	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
23	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
24	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack (see Figure 2-10 on page 2-35). Be careful not to pinch any fibers, and to allow proper fiber slack.
25	Put the appropriate East or West label sticker on the faceplate of the drawer.
26	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.
27	**If** your traffic was — **Then** protected (a traffic switch was executed in step 1) — Reroute traffic back to the original span for the OMX. Make sure that the force and manual switches are removed. Follow Procedure 3-49 “Removing a manual, force, or lockout switch from a protection path” in *Provisioning and Operating Procedures*, 323-1701-310. unprotected (a traffic switch was not executed in step 1) — you have completed this procedure

—continued—

Procedure 2-7 (continued)
Replacing an OMX 4CH Enhanced

Figure 2-12
OMX 4CH Enhanced tray optical fiber routing (left side)

OM0515p

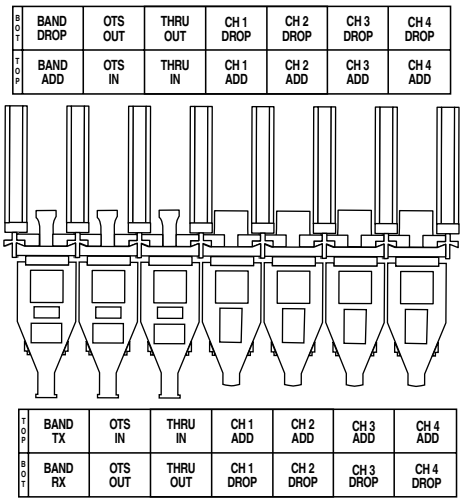


—continued—

Procedure 2-7 (continued)
Replacing an OMX 4CH Enhanced

Figure 2-13
Connector labels in an OMX 4CH Enhanced

OM0700t



—end—

Procedure 2-8
Replacing an OMX 16CH DWDM

Follow this procedure to replace an OMX 16CH DWDM.

For more information about the OMX, refer to the "OMX 16CH DWDM" section in *Hardware Description,* 323-1701-102.

Requirements

Table 2-9 lists the tools and materials required to complete this procedure.

Table 2-9
Tools and materials for replacing an OMX 16CH DWDM

Item	Quantity	Supplied
OMX 16CH DWDM that is the same as the OMX being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Phillips # 2 screwdriver	1	no
Note: For the product engineering code for the OMX 16CH DWDM, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-8 (continued)
Replacing an OMX 16CH DWDM

Precautions

CAUTION
Risk of service interruption
When you replace an OMX 16CH DWDM, traffic will be temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instructions with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-8 (continued)
Replacing an OMX 16CH DWDM

Action

Step	Action
1	If protection switching is available, switch traffic off the span for the OMX 16CH DWDM that you are going to replace, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step. ***Note 2:*** If you are going to replace the east OMX 16CH DWDM and the west OMX 16CH DWDM, execute this procedure twice, one OMX 16CH DWDM at a time. This prevents traffic loss, if protection switching is possible.
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Open the OMX 16CH DWDM front door.
4	Slide out the slider adapter and disconnect all mated fiber patch cords. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage. ***Note 1:*** The Band 1 or 2 fibers to disconnect are the ones coming from the left-hand side of the shelf. ***Note 2:*** All other fibers to disconnect are the ones coming from the right-hand side of the shelf.
5	Remove the patch cords from the OMX. Leave the fiber patch cords hanging on the side of the rack (the connectors are protected with fiber caps).
6	After you disconnect the fibers, slide in each slider adapter.
7	Unplug the data communication cable going into the OMX 16CH DWDM. Make sure the cable has been properly labelled.

—continued—

Procedure 2-8 (continued)
Replacing an OMX 16CH DWDM

Step	Action
8	Close the OMX 16CH DWDM front door.

ATTENTION
Make sure that the OMX 16CH DWDM is adequately supported before you begin to remove it from the rack.

9	Begin on the left side of the OMX 16CH DWDM and remove the ground wire from the rack rail. For illustrations of the ground wires on the rack rail, see Procedure 4-15 "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
10	Remove the rest of the screws from the mounting bracket that is holding the left side of the OMX 16CH DWDM to the rack.
11	Remove the screws from the mounting bracket on the right side of the OMX 16CH DWDM.
12	Lift the OMX 16CH DWDM out of the rack.
13	Remove the replacement OMX 16CH DWDM from its packaging, and ensure that its PEC matches with the PEC of the OMX 16CH DWDM that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
14	Install and ground the replacement OMX 16CH DWDM. Follow Procedure 4-15, "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
15	Open the OMX 16CH DWDM front door.
16	Reconnect the data communication cable to the port located at the front of the drawer (that you removed in step 8). Follow Procedure 6-9, "Connecting passive devices to the maintenance panel" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
17	Re-route in the OMX 16CH DWDM the fiber patch cords hanging on the side of the rack (that were removed in step 6).

—continued—

Procedure 2-8 (continued)
Replacing an OMX 16CH DWDM

Step	Action
18	Slide out the slider adapter and re-connect all fiber patch cords. (the ones disconnected and labelled in step 5). ***Note 1:*** The Band 1 or 2 fibers to re-connect are the ones coming from the left-hand side of the shelf. ***Note 2:*** All other fibers to re-connect are the ones coming from the right-hand side of the shelf. ***Note 3:*** Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the OMX 16CH DWDM ports. You might also have to remove the protective connector caps on the OMX 16CH DWDM ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
19	After all the fibers are connected, slide in each slider adapter.
20	Close the OMX 16CH DWDM front door. Be careful not to pinch any fibers, and to allow proper fiber slack.
21	Put the appropriate East or West label sticker on the faceplate of the drawer.
22	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.
23	**If** your traffic was — **Then** protected (a traffic switch was executed in step 1) — Reroute traffic back to the original span for the OMX 16CH DWDM. Make sure that the force and manual switches are removed. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310. unprotected (a traffic switch was not executed in step 1) — you have completed this procedure

—end—

Procedure 2-9
Replacing an OMX 1CH CWDM tray within a drawer

Follow this procedure to replace one of the OMX 1CH CWDM trays in the drawer.

The OMX 1CH CWDM trays are shipped installed in the drawer. This procedure assumes that you only need to replace one of the two OMX trays in the drawer. If you want to replace both of the OMX trays, repeat this procedure for the second tray, or replace the entire drawer by following Procedure 2-10 "Replacing an OMX 1CH CWDM drawer" on page 2-57 in this chapter.

For more information about the OMX, refer to the "CWDM OMX" section in *Hardware Description,* 323-1701-102.

Requirements

Table 2-10 lists the tools and materials required to complete this procedure.

Table 2-10
Tools and materials for replacing an OMX 1CH CWDM

Item	Quantity	Supplied
OMX 1CH CWDM tray of the same band as the OMX that is being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
Small Phillips screwdriver	1	no
Note: For the product engineering codes for the OMX 1CH CWDM tray, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-9 (continued)
Replacing an OMX 1CH CWDM tray within a drawer

Precautions

CAUTION
Risk of service interruption
When you replace an OMX 1CH CWDM, traffic is temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-9 (continued)
Replacing an OMX 1CH CWDM tray within a drawer

Action

Step	Action
1	Switch traffic off the span for the OMX 1CH CWDM you are going to replace, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step.
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
4	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

5	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the OMX tray that you are replacing (east or west). Disconnect all the fibers connected to the following ports: OTS OUT, OTS IN, THRU OUT, THRU IN, CH DROP, CH ADD. The fibers to disconnect are the ones routed from the back of the OMX tray. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
6	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
7	Gently remove the disconnected fibers from the fiber guides in the OMX 1CH CWDM tray to remove (east or west). Make sure to not cause damage to the fibers routed for the adjacent CWDM OMX tray. Leave those fibers hanging on the side of the shelf (they are protected by dust caps).

—continued—

Procedure 2-9 (continued)
Replacing an OMX 1CH CWDM tray within a drawer

Step	Action
8	Disconnect the data communication cable (if one is present) from the connector at the front of the OMX tray, and completely remove the cable from the tray. For an illustration of the cable, see Procedure 6-7 "Connecting alarms on the Optical Trunk Switch" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
9	Take note of the vintage of the optical tray and drawer combination that are currently installed: • a yellow chromate finish tray and a yellow chromate finish drawer • a black painted finish tray and a black painted finish drawer • a black painted finish tray and a yellow chromate finish drawer Select your next step.

If you have the following combination	**Then**
a yellow chromate finish tray and a yellow chromate finish drawer	go to step 10
a black painted finish tray and a black painted finish drawer	go to step 11
a black painted finish tray and a yellow chromate finish drawer	go to step 10

10	Remove the two screws that fasten the OMX tray to the drawer. The screws are at the front and back of the tray. See Figure 2-14 on page 2-56. Make sure that you keep the screws to install the replacement tray. Go to step 12.
11	Remove the screw that fastens the OMX tray to the drawer. The screw is located at the back of the OMX tray. Make sure that you keep the screw to install the replacement OMX tray.
12	Remove the OMX tray from the drawer and place it on an antistatic surface.
13	Remove the new replacement CWDM OMX tray from its packaging, and ensure that its PEC matches with the PEC of the OMX that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
14	Take Note of the vintage of the optical tray to be installed • A yellow chromate finish tray • A black painted finish tray

—continued—

Procedure 2-9 (continued)
Replacing an OMX 1CH CWDM tray within a drawer

Step	Action

15

CAUTION
Risk of equipment incapability
If you want to install a tray that has a black painted finish into a NT0H57BA drawer that has a yellow chromate finish, then you must use an NT0H57BF tray conversion kit.

Select your next step.

If you have the following combination	**Then**
a yellow chromate finish tray and a yellow chromate finish drawer	step 18
a black painted finish tray and a yellow chromate finish drawer and no conversion plate was previously installed	step 17
a yellow chromate finish tray and a black painted finish drawer	contact your next level of support
a black painted finish tray and a black painted finish drawer	step 19
a black painted finish tray and a yellow chromate finish drawer and a conversion plate was previously installed	step 16

16 Unscrew the four 4-40 flat head screws connecting conversion plate to the underside of the tray

17 Attach conversion plate to the underside of the replacement tray with the four 4-40 flat head screws provided or the four 4-40 flat head screws that you removed in step 16, and go to step 18.

18 Fasten the OMX tray to the drawer using the two screws that you removed in step 10, and go to step 20.

19 Fasten the optical tray to the drawer by inserting the tab at the front of the tray into the slot on the drawer. Then fasten the tray to the drawer using the same screw that you removed in step 11.

20 Reconnect the data communication cable that you removed in step 8, if one was present, to the OMX tray. Route the cables as instructed in Procedure 6-7, "Connecting alarms on the Optical Trunk Switch" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.

—continued—

Procedure 2-9 (continued)
Replacing an OMX 1CH CWDM tray within a drawer

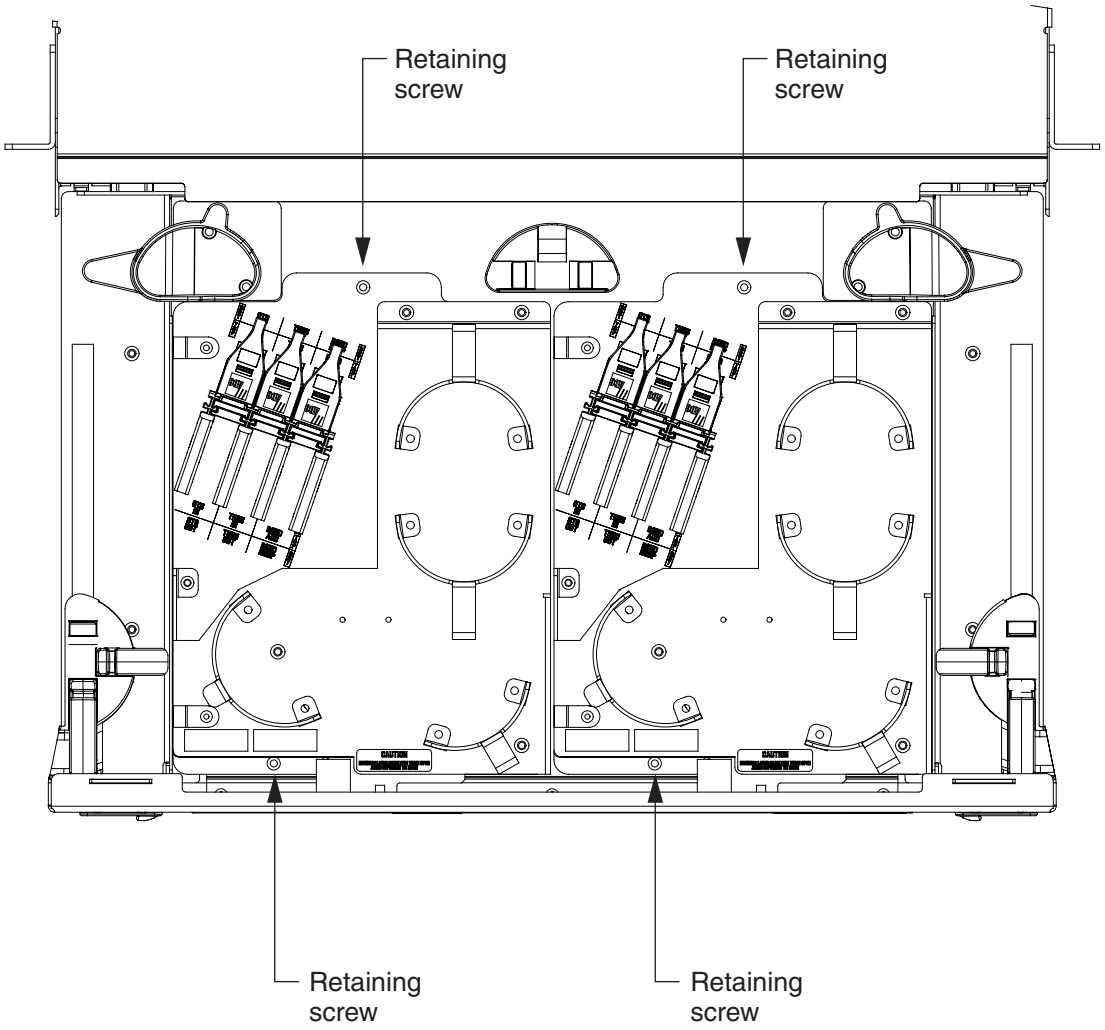
Step	Action
21	Re-route in the new OMX 1CH CWDM the fiber patch cords hanging on the side of the rack (the ones removed in step 7).
22	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the OMX for the following ports: OTS OUT, OTS IN, THRU OUT, THRU IN, CH DROP, CH ADD. The fibers to connect are the ones routed from the back of the OMX tray (the same as those that were disconnected and labelled in step 5). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the OMX 1CH CWDM ports. You might also have to remove the protective connector caps on the OMX 1CH CWDM ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
23	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
24	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
25	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
26	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.
27	**If** your traffic was — **Then** protected (a traffic switch was executed in step 1) — Reroute traffic back to the original span for the OMX. Make sure that the force and manual switches are removed. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310. unprotected (a traffic switch was not executed in step 1) — you have completed this procedure

—continued—

Procedure 2-9 (continued)
Replacing an OMX 1CH CWDM tray within a drawer

Figure 2-14
Removing an OMX 1CH CWDM tray

OM2314p



—end—

Procedure 2-10
Replacing an OMX 1CH CWDM drawer

Follow this procedure to replace an OMX 1CH CWDM drawer. If you want to replace only one of the OMX modules in the drawer, follow Procedure 2-9 "Replacing an OMX 1CH CWDM tray within a drawer" on page 2-50 in this chapter.

If the signal is protected (a manual switch is possible), you must perform Procedure 2-9 (one single-band CWDM module replacement at a time), rather than Procedure 2-10. In a protection switch scenario, one of the two OMX modules within the drawer (east or west) needs to stay in place while the other module is replaced, because it carries the protected signals.

For more information about the OMX, refer to the "CWDM OMX" section in *Hardware Description,* 323-1701-102.

Requirements

Table 2-11 lists the tools and materials required to complete this procedure.

Table 2-11
Tools and materials for replacing an OMX 1CH CWDM drawer

Item	Quantity	Supplied
OMX 1CH CWDM drawer of the same band as the OMX that is being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Note: For the product engineering codes for the OMX 1CH CWDM, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-10 (continued)
Replacing an OMX 1CH CWDM drawer

Precautions

CAUTION
Traffic will be lost
When you replace an OMX 1CH CWDM drawer, traffic will be lost during the procedure (because both OMX east and west modules are replaced at the same time). If you have protected signals and you want to avoid losing traffic, perform Procedure 2-9, "Replacing an OMX 1CH CWDM tray within a drawer", to replace one OMX module at a time within a drawer.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-10 (continued)
Replacing an OMX 1CH CWDM drawer

Action

Step	Action
1	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
2	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
3	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

4	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the OMX drawer. Disconnect all the fibers connected to the following ports (for both CWDM OMX modules east and west in the drawer): OTS OUT, OTS IN, THRU OUT, THRU IN, CH DROP, CH ADD. The fibers to disconnect are the ones routed from the back of the OMX module. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
5	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
6	Gently remove the disconnected fibers from the fiber guides in the drawer (for both east and west OMX 1CH CWDM modules). Leave those fibers hanging on the side of the shelf (they are protected by dust caps).
7	Disconnect the data communication cables from the front of both OMX modules, and completely remove the cables from the drawer. For an illustration of the cable, see Procedure 6-7 “Connecting alarms on the Optical Trunk Switch” in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.

—continued—

Procedure 2-10 (continued)
Replacing an OMX 1CH CWDM drawer

Step	Action

8 **If** the drawer has a … **Then**

non-spring-loaded locking clip	return the locking clip to the original upright position
spring-loaded locking clip	push the clip down

9 Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack.

ATTENTION
Make sure that the CWDM OMX drawer is adequately supported while you are removing it from the rack.

10 Begin on the left side of the OMX 1CH CWDM module and remove the ground wire from the rack rail. For an illustration of the ground wires on the rack rail, see Procedure 4-15 "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

11 Remove the rest of the screws from the mounting bracket that is holding the left side of the drawer to the rack.

12 Remove the screws from the mounting bracket on the right side of the drawer.

13 Lift the drawer out of the rack and place it on an antistatic surface.

14 Remove the replacement CWDM OMX drawer from its packaging, and ensure that its PEC matches with the PEC of the OMX drawer that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.

15 Complete Procedure 4-11, "Installing and grounding equipment drawers" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, to install and ground the OMX 1CH CWDM.

16 Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.

17 Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a …	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

—continued—

Procedure 2-10 (continued)
Replacing an OMX 1CH CWDM drawer

Step	Action
18	Re-route in the new OMX 1CH CWDM the fiber patch cords hanging on the side of the rack (the ones removed in step 6).
19	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the OMX drawer for the following ports (for both CWDM OMX modules east and west in the drawer): OTS OUT, OTS IN, THRU OUT, THRU IN, CH DROP, CH ADD. The fibers to connect are the ones routed from the back of the OMX module (the same as those that were disconnected and labelled in step 4). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the OMX 1CH CWDM ports. You might also have to remove the protective connector caps on the OMX 1CH CWDM ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
20	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
21	Reconnect the data communication cable (that was removed in step 7) to the OMX modules (east and west) routing the cables as instructed in Procedure 6-7, "Connecting alarms on the Optical Trunk Switch" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
22	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
23	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
24	Put the appropriate East or West label sticker on the faceplate of the drawer.
25	In the System Manager, make sure the only active alarms on the system match those noted in step 1. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.

—end—

Procedure 2-11
Replacing an OMX 4CH CWDM drawer

Follow this procedure to replace an OMX 4CH CWDM drawer. This type of OMX is an integrated unit within a drawer. Therefore, you must install a new drawer to replace the OMX.

> ***Note:*** The OMX 4CH CWDM with dual taps drawer, is interchangeable with a OMX 4CH CWDM without dual taps drawer.

For more information about the OMX, refer to the "CWDM OMX" section in *Hardware Description,* 323-1701-102.

Requirements

Table 2-12 lists the tools and materials required to complete this procedure.

Table 2-12
Tools and materials for replacing an OMX 4CH CWDM

Item	Quantity	Supplied
OMX 4CH CWDM drawer of the same band (C or L) as the OMX that is being replaced (see Note)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Note: For the product engineering codes for the OMX 4CH CWDM, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-11 (continued)
Replacing an OMX 4CH CWDM drawer

Precautions

CAUTION
Risk of service interruption
When you replace an OMX 4CH CWDM drawer, traffic will be temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instructions with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-11 (continued)
Replacing an OMX 4CH CWDM drawer

Action

Step	Action
1	Switch traffic off the span for the OMX 4CH CWDM you are going to replace, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step. ***Note 2:*** If you are replacing both east and west OMX 4CH CWDM drawers, you will need to perform this entire Procedure 2-11 twice (once for the west drawer and once for the east drawer).
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	If this is an OMX 4CH CWDM with dual taps drawer, disconnect any fibers connected to the OTS IN MONITOR and OTS OUT MONITOR ports. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
4	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
5	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

—continued—

Procedure 2-11 (continued)
Replacing an OMX 4CH CWDM drawer

Step	Action
6	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the OMX 4CH CWDM drawer. Disconnect all the fibers connected to the following ports (not all of them will have fiber to disconnect, depending on the configuration). For the C-band type of OMX 4CH CWDM drawer: OTS IN, OTS OUT, THRU IN, THRU OUT, BAND 1 ADD, BAND 1 DROP, BAND 2 ADD, BAND 2 DROP, BAND 3 ADD, BAND 3 DROP, BAND 4 ADD, BAND 4 DROP. For the L-band type of OMX 4CH CWDM drawer: OTS IN, OTS OUT, THRU IN, THRU OUT, BAND 1 ADD, BAND 1 DROP, BAND 2 ADD, BAND 2 DROP, BAND 3 ADD, BAND 3 DROP, BAND 4 ADD, BAND 4 DROP. The fibers to disconnect are the ones coming from the front of the OMX drawer. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
7	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
8	Gently remove the disconnected fibers from the fiber guides in the drawer. Leave those fibers hanging on the side of the shelf (they are protected by dust caps).
9	Disconnect the data communication cable from the front of the OMX module, and completely remove the cable from the drawer. For an illustration of the cable, see Procedure 6-9 “Connecting passive devices to the maintenance panel” in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
10	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
11	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack.
12	Begin on the left side of the OMX 4CH CWDM module and remove the ground wire from the rack rail. For an illustration of the ground wires on the rack rail, see Procedure 4-15 “Installing and grounding equipment drawers” in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-11 (continued)
Replacing an OMX 4CH CWDM drawer

Step	Action

ATTENTION
Make sure that the OMX 4CH CWDM is adequately supported while you are removing it from the rack.

13 Remove the rest of the screws from the mounting bracket that is holding the left side of the drawer to the rack.

14 Remove the screws from the mounting bracket on the right side of the drawer.

15 Lift the drawer out of the rack and place it on an antistatic surface.

16 Remove the new replacement OMX 4CH CWDM drawer from its packaging, and ensure that its PEC matches with the PEC of the OMX drawer that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.

Note: The OMX 4CH CWDM with dual taps drawer, is interchangeable with a OMX 4CH CWDM without dual taps drawer.

17 Follow Procedure 4-15, "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201 to install and ground the drawer.

18 Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.

19 Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

20 Reconnect the data communication cable (removed in step 9) to the OMX modules (east and west), routing the cables as instructed in Procedure 6-9 "Connecting passive devices to the maintenance panel" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.

21 Re-route in the new OMX 4CH CWDM drawer the fiber patch cords hanging on the side of the rack (the ones removed in step 8).

—continued—

Procedure 2-11 (continued)
Replacing an OMX 4CH CWDM drawer

Step	Action
22	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the OMX 4CH CWDM for the following ports (some of them may not have connections, depending on the configuration). ***Note:*** If this is an OMX 4CH CWDM with dual taps drawer, do not re-connected the OTS IN MONITOR and OTS OUT MONITOR ports at this point. For the C-band type of OMX 4CH CWDM drawer they will be labelled: OTS IN, OTS OUT, THRU IN, THRU OUT, BAND 1 ADD, BAND 1 DROP, BAND 2 ADD, BAND 2 DROP, BAND 3 ADD, BAND 3 DROP, BAND 4 ADD, BAND 4 DROP. For the L-band type of OMX 4CH CWDM drawer they will be labelled: OTS IN, OTS OUT, THRU IN, THRU OUT, BAND 1 ADD, BAND 1 DROP, BAND 2 ADD, BAND 2 DROP, BAND 3 ADD, BAND 3 DROP, BAND 4 ADD, BAND 4 DROP. The fibers to connect are the ones routed from the back of the OMX drawer (the same as those that were disconnected and labelled in step 6). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the OMX 4CH CWDM ports. You might also have to remove the protective connector caps on the OMX 4CH CWDM ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
23	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
24	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
25	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
26	If this is an OMX 4CH CWDM with dual taps drawer, re-connected the OTS IN MONITOR and OTS OUT MONITOR ports at this point.

—continued—

Procedure 2-11 (continued)
Replacing an OMX 4CH CWDM drawer

Step	Action
27	Put the appropriate East or West label sticker on the faceplate of the drawer.
28	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.
29	**If** your traffic was — **Then** protected (a traffic switch was executed in step 1) — Reroute traffic back to the original span for the OMX. Make sure that the force and manual switches are removed. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310. unprotected (a traffic switch was not executed in step 1) — you have completed this procedure

Note: If you need to replace the OMX 4CH CWDM drawer in the opposite direction (east or west), perform this entire procedure again, for the other CWDM OMX drawer.

—end—

Procedure 2-12
Replacing an OMX (4CH or 8CH) ITU CWDM drawer

Follow this procedure to replace an OMX (4CH or 8CH) ITU CWDM drawer. This type of OMX is an integrated unit within a drawer. Therefore, you must install a new drawer to replace the OMX.

For more information about the OMX (4CH or 8CH) ITU CWDM, refer to the "ITU CWDM OMX" section in *Hardware Description,* 323-1701-102.

Requirements

Table 2-13 lists the tools and materials required to complete this procedure.

Table 2-13
Tools and materials for replacing an OMX (4CH or 8-H) ITU CWDM module

Item	Quantity	Supplied
OMX ITU CWDM module of the same type as the one that is being replaced (see Note)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Note: For the product engineering codes for the OMX (4CH or 8CH) ITU CWDM, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-12 (continued)
Replacing an OMX (4CH or 8CH) ITU CWDM drawer

Precautions

CAUTION
Risk of service interruption
When you replace an OMX ITU CWDM drawer, traffic will be temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instructions with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-12 (continued)
Replacing an OMX (4CH or 8CH) ITU CWDM drawer

Action

Step	Action
1	Switch traffic off the span for the OMX ITU CWDM you are going to replace, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step. ***Note 2:*** If you are replacing both east and west OMX ITU CWDM drawers, you will need to perform this entire Procedure 2-12 twice (once for the west drawer and once for the east drawer).
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
4	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

—continued—

Procedure 2-12 (continued)
Replacing an OMX (4CH or 8CH) ITU CWDM drawer

Step	Action
5	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the OMX ITU CWDM drawer. Disconnect all the fibers connected to the following ports (not all of them will have fiber to disconnect, depending on the configuration): For the 4CH variant of OMX ITU CWDM drawer: OTS IN, OTS OUT, 1510 nm ADD, 1510 nm DROP, 1530 nm ADD, 1530 nm DROP, 1550 nm ADD, 1550 nm DROP, 1570 nm ADD, 1570 nm DROP. For the 8CH variant of OMX ITU CWDM drawer: OTS IN, OTS OUT, 1470 nm ADD, 1470 nm DROP, 1490 nm ADD, 1490 nm DROP, 1510 nm ADD, 1510 nm DROP, 1530 nm ADD, 1530 nm DROP, 1550 nm ADD, 1550 nm DROP, 1570 nm ADD, 1570 nm DROP, 1590 nm ADD, 1590 nm DROP, 1610 nm ADD, 1610 nm DROP. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
6	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
7	Gently remove the disconnected fibers from the fiber guides in the drawer. Leave those fibers hanging on the side of the shelf (they are protected by dust caps).
8	Disconnect the data communication cable from the front of the OMX ITU CWDM module, and completely remove the cable from the drawer. For an illustration of the cable, see Procedure 6-9 “Connecting passive devices to the maintenance panel” in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210. ***Note:*** Procedure 6-9 “Connecting passive devices to the maintenance panel” is applicable to an OMX (4-CH or 8-CH) ITU CWDM drawer, although it does not state “ITU” in the procedure.
9	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
10	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the drawer into the rack.

—continued—

Procedure 2-12 (continued)
Replacing an OMX (4CH or 8CH) ITU CWDM drawer

Step	Action
11	Begin on the left side of the OMX ITU CWDM drawer and remove the ground wire from the rack rail. For an illustration of the ground wires on the rack rail, see Procedure 4-15 "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

ATTENTION
Make sure that the OMX ITU CWDM is adequately supported while you are removing it from the rack.

12	Remove the rest of the screws from the mounting bracket that is holding the left side of the drawer to the rack.
13	Remove the screws from the mounting bracket on the right side of the drawer.
14	Lift the drawer out of the rack and place it on an antistatic surface.
15	Remove the new replacement OMX ITU CWDM drawer from its packaging, and ensure that its PEC matches with the PEC of the drawer that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
16	Follow Procedure 4-15, "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201 to install and ground the drawer.
17	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
18	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

—continued—

Procedure 2-12 (continued)
Replacing an OMX (4CH or 8CH) ITU CWDM drawer

Step	Action
19	Reconnect the data communication cable (removed in step 8) to the OMX modules (east and west), routing the cables as instructed in see Procedure 6-9 "Connecting passive devices to the maintenance panel" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210. ***Note:*** Procedure 6-9 "Connecting passive devices to the maintenance panel" is applicable to an OMX (4CH or 8CH) ITU CWDM drawer, although it does not state "ITU" in the procedure.
20	Re-route in the new drawer the fiber patch cords hanging on the side of the rack (the ones removed in step 7).
21	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the OMX ITU CWDM for the following ports (some of them may not have connections, depending on the configuration: For the 4CH variant of OMX ITU CWDM drawer: OTS IN, OTS OUT, 1510 nm ADD, 1510 nm DROP, 1530 nm ADD, 1530 nm DROP, 1550 nm ADD, 1550 nm DROP, 1570 nm ADD, 1570 nm DROP. For the 8CH variant of OMX ITU CWDM drawer: OTS IN, OTS OUT, 1470 nm ADD, 1470 nm DROP, 1490 nm ADD, 1490 nm DROP, 1510 nm ADD, 1510 nm DROP, 1530 nm ADD, 1530 nm DROP, 1550 nm ADD, 1550 nm DROP, 1570 nm ADD, 1570 nm DROP, 1590 nm ADD, 1590 nm DROP, 1610 nm ADD, 1610 nm DROP. The fibers to connect are the ones that were disconnected and labelled in step 5. Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the OMX ITU CWDM ports. You might also have to remove the protective connector caps on the OMX ITU CWDM ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
22	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
23	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
24	Close the tray by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
25	Put the appropriate East or West label sticker on the faceplate of the drawer.

—continued—

Procedure 2-12 (continued)
Replacing an OMX (4CH or 8CH) ITU CWDM drawer

Step	Action
26	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.
27	**If** your traffic was — **Then**
	protected (a traffic switch was executed in step 1) — Reroute traffic back to the original span for the OMX. Make sure that the force and manual switches are removed. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310.
	unprotected (a traffic switch was not executed in step 1) — you have completed this procedure
	Note: If you need to replace the OMX ITU CWDM drawer in the opposite direction (east or west), perform this entire procedure again, for the other OMX ITU CWDM drawer.

—end—

Procedure 2-13
Replacing an OMX 1CH OADM ITU CWDM tray within a drawer

Follow this procedure to replace one of the OMX 1CH OADM ITU CWDM trays in the drawer.

The OMX 1CH OADM ITU CWDM trays are shipped installed in the drawer. This procedure assumes that you only need to replace one of the two OMX trays in the drawer. If you want to replace both of the OMX trays, repeat this procedure for the second tray, or replace the entire drawer by following Procedure 2-14 "Replacing an OMX 1CH OADM ITU CWDM drawer" on page 2-83 in this chapter.

For more information about the OMX, refer to the "ITU CWDM OMX" section in *Hardware Description,* 323-1701-102.

Requirements

Table 2-14 lists the tools and materials required to complete this procedure.

Table 2-14
Tools and materials for replacing an OMX 1CH OADM ITU CWDM

Item	Quantity	Supplied
OMX 1CH OADM ITU CWDM tray of the same ITU CWDM channel as the OMX that is being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
Small Phillips screwdriver	1	no
Note: For the product engineering codes for the OMX 1CH OADM ITU CWDM tray, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-13 (continued)
Replacing an OMX 1CH OADM ITU CWDM tray within a drawer

Precautions

CAUTION
Risk of service interruption
When you replace an OMX 1CH OADM ITU CWDM, traffic is temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-13 (continued)
Replacing an OMX 1CH OADM ITU CWDM tray within a drawer

Action

Step	Action
1	Switch traffic off the span for the OMX 1CH OADM ITU CWDM you are going to replace, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step.
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
4	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

5	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the OMX tray that you are replacing (east or west). Disconnect all the fibers connected to the following ports (ports for the 1471 nm variant of the OMX 1CH OADM ITU CWDM are shown as an example): OTS IN, OTS OUT, 1471 nm ADD, 1471 nm DROP, THRU IN, THRU OUT. The fibers to disconnect are the ones routed from the back of the OMX tray. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
6	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
7	Gently remove the disconnected fibers from the fiber guides in the OMX 1CH OADM ITU CWDM tray to remove (east or west). Make sure to not cause damage to the fibers routed for the adjacent CWDM OMX tray. Leave those fibers hanging on the side of the shelf (they are protected by dust caps).

—continued—

Procedure 2-13 (continued)
Replacing an OMX 1CH OADM ITU CWDM tray within a drawer

Step	Action
8	Disconnect the data communication cable (if one is present) from the connector at the front of the OMX tray, and completely remove the cable from the tray. For an illustration of the cable, see Procedure 6-7 "Connecting alarms on the Optical Trunk Switch" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
9	Take note of the vintage of the optical tray and drawer combination that are currently installed: • a yellow chromate finish tray and a yellow chromate finish drawer • a black painted finish tray and a black painted finish drawer • a black painted finish tray and a yellow chromate finish drawer Select your next step.

If you have the following combination	**Then**
a yellow chromate finish tray and a yellow chromate finish drawer	go to step 10
a black painted finish tray and a black painted finish drawer	go to step 11
a black painted finish tray and a yellow chromate finish drawer	go to step 10

10	Remove the two screws that fasten the OMX tray to the drawer. The screws are at the front and back of the tray. Make sure that you keep the screws to install the replacement tray. Go to step 12.
11	Remove the screw that fastens the OMX tray to the drawer. The screw is located at the back of the OMX tray. See Figure 2-15 on page 2-82. Make sure that you keep the screw to install the replacement OMX tray.
12	Remove the OMX tray from the drawer and place it on an antistatic surface.
13	Remove the new replacement CWDM OMX tray from its packaging, and ensure that its PEC matches with the PEC of the OMX that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support. ***Note:*** If an OSC tray with dual optical taps is installed in a dual filter drawer that does not include front apertures, access to the monitor ports is not possible.
14	Take Note of the vintage of the optical tray to be installed • A yellow chromate finish tray • A black painted finish tray

—continued—

Procedure 2-13 (continued)
Replacing an OMX 1CH OADM ITU CWDM tray within a drawer

Step	Action

15

CAUTION
Risk of equipment incapability
If you want to install a tray that has a black painted finish into a NT0H57BA drawer that has a yellow chromate finish, then you must use an NT0H57BF tray conversion kit.

Select your next step.

If you have the following combination	**Then**
a yellow chromate finish tray and a yellow chromate finish drawer	step 18
a black painted finish tray and a yellow chromate finish drawer and no conversion plate was previously installed	step 17
a yellow chromate finish tray and a black painted finish drawer	contact your next level of support
a black painted finish tray and a black painted finish drawer	step 19
a black painted finish tray and a yellow chromate finish drawer and a conversion plate was previously installed	step 16

16 Unscrew the four 4-40 flat head screws connecting conversion plate to the underside of the tray

17 Attach conversion plate to the underside of the replacement tray with the four 4-40 flat head screws provided or the four 4-40 flat head screws that you removed in step 16, and go to step 18.

18 Fasten the OMX tray to the drawer using the two screws that you removed in step 10, and go to step 20.

19 Fasten the optical tray to the drawer by inserting the tab at the front of the tray into the slot on the drawer. Then fasten the tray to the drawer using the same screw that you removed in step 11.

20 Reconnect the data communication cable that you removed in step 8, if one was present, to the OMX tray. Route the cables as instructed in Procedure 6-7, "Connecting alarms on the Optical Trunk Switch" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.

—continued—

Procedure 2-13 (continued)
Replacing an OMX 1CH OADM ITU CWDM tray within a drawer

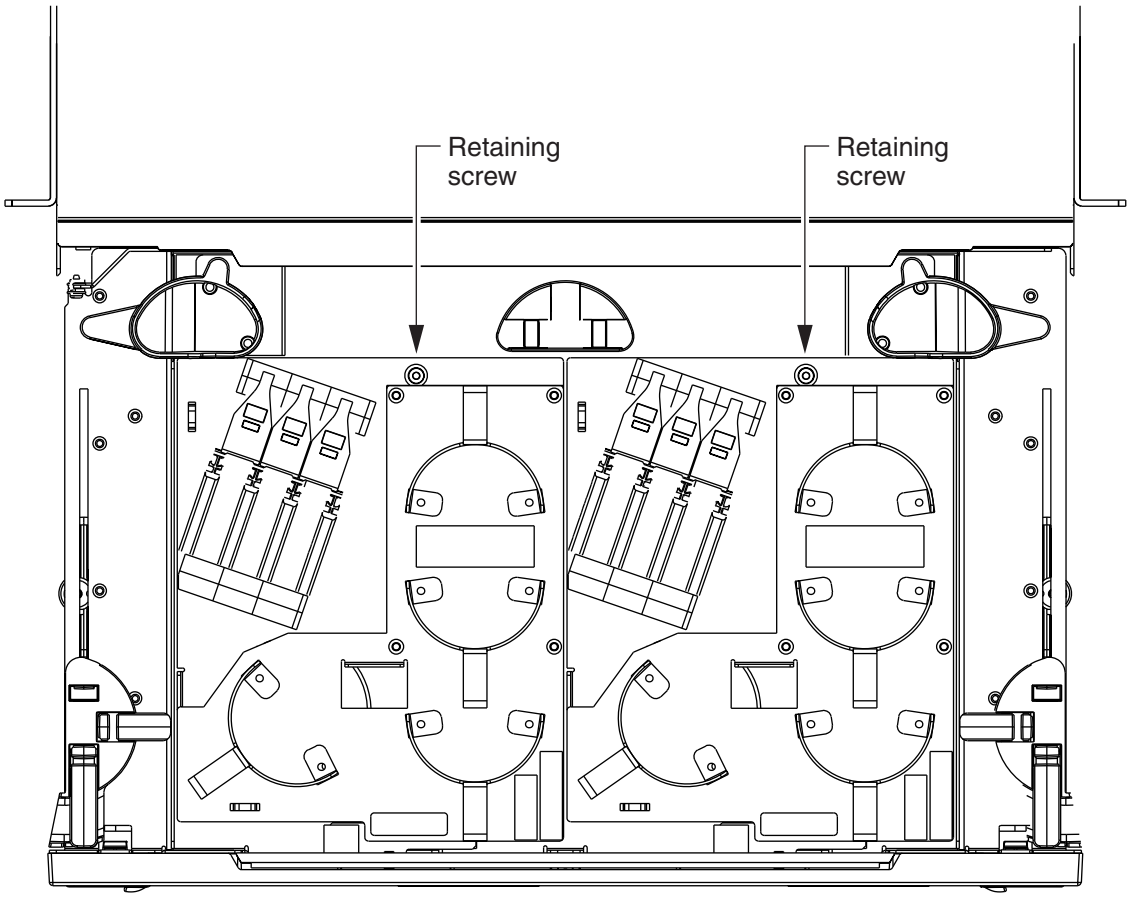
Step	Action
21	Re-route in the new OMX 1CH OADM ITU CWDM the fiber patch cords hanging on the side of the rack (the ones removed in step 7).
22	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the OMX for the following ports (ports for the 1471 nm variant of the OMX 1CH OADM ITU CWDM are shown as an example): OTS IN, OTS OUT, 1471 nm ADD, 1471 nm DROP, THRU IN, THRU OUT. The fibers to connect are the ones routed from the back of the OMX tray (the same as those that were disconnected and labelled in step 5). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the OMX 1CH OADM ITU CWDM ports. You might also have to remove the protective connector caps on the OMX 1CH OADM ITU CWDM ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
23	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
24	**If** the drawer has a — **Then**
	non-spring-loaded locking clip — return the locking clip to the original upright position
	spring-loaded locking clip — push the clip down
25	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
26	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.
27	**If** your traffic was — **Then**
	protected (a traffic switch was executed in step 1) — Reroute traffic back to the original span for the OMX. Make sure that the force and manual switches are removed. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310.
	unprotected (a traffic switch was not executed in step 1) — you have completed this procedure

—continued—

Procedure 2-13 (continued)
Replacing an OMX 1CH OADM ITU CWDM tray within a drawer

Figure 2-15
Removing an OMX 1CH OADM ITU CWDM tray

OM2703p



—end—

Procedure 2-14
Replacing an OMX 1CH OADM ITU CWDM drawer

Follow this procedure to replace an OMX 1CH OADM ITU CWDM drawer. If you want to replace only one of the OMX modules in the drawer, follow Procedure 2-13 "Replacing an OMX 1CH OADM ITU CWDM tray within a drawer" on page 2-76 in this chapter.

If the signal is protected (a manual switch is possible), you must perform Procedure 2-13 (one ITU CWDM tray replacement at a time), rather than Procedure 2-14. In a protection switch scenario, one of the two OMX modules within the drawer (east or west) needs to stay in place while the other module is replaced, because it carries the protected signals.

For more information about the OMX, refer to the "ITU CWDM OMX" section in *Hardware Description,* 323-1701-102.

Requirements

Table 2-15 lists the tools and materials required to complete this procedure.

Table 2-15
Tools and materials for replacing an OMX 1CH OADM ITU CWDM drawer

Item	Quantity	Supplied
OMX 1CH OADM ITU CWDM drawer of the same ITU CWDM channel as the OMX that is being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Note: For the product engineering codes for the OMX 1CH OADM ITU CWDM, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-14 (continued)
Replacing an OMX 1CH OADM ITU CWDM drawer

Precautions

CAUTION
Traffic will be lost
When you replace an OMX 1CH OADM ITU CWDM drawer, traffic will be lost during the procedure (because both OMX east and west modules are replaced at the same time). If you have protected signals and you want to avoid losing traffic, perform Procedure 2-13, "Replacing an OMX 1CH OADM ITU CWDM tray within a drawer", to replace one OMX module at a time within a drawer.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-14 (continued)
Replacing an OMX 1CH OADM ITU CWDM drawer

Action

Step	Action
1	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
2	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
3	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the OMX drawer. Disconnect all the fibers connected to the following ports for both ITU CWDM trays east and west in the drawer (ports for the 1471 nm variant of the OMX 1CH OADM ITU CWDM are shown as an example): OTS IN, OTS OUT, 1471 nm ADD, 1471 nm DROP, THRU IN, THRU OUT. The fibers to disconnect are the ones routed from the back of the OMX module. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
4	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
5	Gently remove the disconnected fibers from the fiber guides in the drawer (for both east and west OMX 1CH OADM ITU CWDM modules). Leave those fibers hanging on the side of the shelf (they are protected by dust caps).
6	Disconnect the data communication cables (if such cables are present) from the front of both OMX modules, and completely remove the cables from the drawer. For an illustration of the cable, see Procedure 6-7 “Connecting alarms on the Optical Trunk Switch” in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
7	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack.

ATTENTION
Make sure that the CWDM OMX drawer is adequately supported while you are removing it from the rack.

—continued—

Procedure 2-14 (continued)
Replacing an OMX 1CH OADM ITU CWDM drawer

Step	Action
8	Begin on the left side of the OMX 1CH OADM ITU CWDM drawer and remove the ground wire from the rack rail. For an illustration of the ground wires on the rack rail, see Procedure 4-15 "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
9	Remove the rest of the screws from the mounting bracket that is holding the left side of the drawer to the rack.
10	Remove the screws from the mounting bracket on the right side of the drawer.
11	Lift the drawer out of the rack and place it on an antistatic surface.
12	Remove the replacement ITU CWDM drawer from its packaging, and ensure that its PEC matches with the PEC of the OMX drawer that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
13	Complete Procedure 4-11, "Installing and grounding equipment drawers" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, to install and ground the OMX 1CH OADM ITU CWDM.
14	Re-route in the new OMX 1CH OADM ITU CWDM the fiber patch cords hanging on the side of the rack (the ones removed in step 5).
15	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the OMX drawer for the following ports for both CWDM OMX modules east and west in the drawer (ports for the 1471 nm variant of the OMX 1CH OADM ITU CWDM are shown as an example): OTS IN, OTS OUT, 1471 nm ADD, 1471 nm DROP, THRU IN, THRU OUT. The fibers to connect are the ones routed from the back of the OMX module (the same as those that were disconnected and labelled in step 3). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the OMX 1CH OADM ITU CWDM ports. You might also have to remove the protective connector caps on the OMX 1CH OADM ITU CWDM ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
16	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
17	Reconnect the data communication cables (if such cables were removed in step 6) to the OMX modules (east and west) routing the cables as instructed in Procedure 6-7, "Connecting alarms on the Optical Trunk Switch" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
18	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.

—continued—

Procedure 2-14 (continued)
Replacing an OMX 1CH OADM ITU CWDM drawer

Step	Action
19	Put the appropriate East or West label sticker on the faceplate of the drawer.
20	In the System Manager, make sure the only active alarms on the system match those noted in step 1. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.

—end—

Procedure 2-15
Replacing an OMX 4CH OADM ITU CWDM drawer

Follow this procedure to replace an OMX 4CH OADM ITU CWDM drawer. This type of OMX is an integrated unit within a drawer. Therefore, you must install a new drawer to replace the OMX.

For more information about the OMX 4CH OADM ITU CWDM, refer to the "ITU CWDM OMX" section in *Hardware Description,* 323-1701-102.

Requirements

Table 2-16 lists the tools and materials required to complete this procedure.

Table 2-16
Tools and materials for replacing an OMX 4CH OADM ITU CWDM drawer

Item	Quantity	Supplied
OMX ITU CWDM drawer of the same type as the one that is being replaced (see Note)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Note: For the product engineering codes for the OMX 4CH OADM ITU CWDM, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-15 (continued)
Replacing an OMX 4CH OADM ITU CWDM drawer

Precautions

CAUTION
Risk of service interruption
When you replace an OMX ITU CWDM drawer, traffic will be temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instructions with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-15 (continued)
Replacing an OMX 4CH OADM ITU CWDM drawer

Action

Step	Action
1	Switch traffic off the span for the OMX ITU CWDM you are going to replace, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step. ***Note 2:*** If you are replacing both east and west OMX ITU CWDM drawers, you will need to perform this entire Procedure 2-15 twice (once for the west drawer and once for the east drawer).
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
4	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.. **If** the drawer has a — **Then** non-spring-loaded locking clip — lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step spring-loaded locking clip or no locking clip — go to the next step

—continued—

Procedure 2-15 (continued)
Replacing an OMX 4CH OADM ITU CWDM drawer

Step	Action
5	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the OMX ITU CWDM drawer. Disconnect all the fibers connected to the following ports (not all of them will have fiber to disconnect, depending on the configuration): For the 1471-1531 nm variant of the OMX 4CH OADM ITU CWDM drawer: OTS IN, OTS OUT, 1471 nm ADD, 1471 nm DROP, 1491 nm ADD, 1491 nm DROP, 1511 nm ADD, 1511 nm DROP, 1531 nm ADD, 1531 nm DROP, THRU IN, THRU OUT. For the 1551-1611 nm variant of the OMX 4CH OADM ITU CWDM drawer: OTS IN, OTS OUT, 1551 nm ADD, 1551 nm DROP, 1571 nm ADD, 1571 nm DROP, 1591 nm ADD, 1591 nm DROP, 1611 nm ADD, 1611 nm DROP, THRU IN, THRU OUT. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
6	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
7	Gently remove the disconnected fibers from the fiber guides in the drawer. Leave those fibers hanging on the side of the shelf (they are protected by dust caps).
8	Disconnect the data communication cable (if such a cable is present) from the front of the OMX ITU CWDM module, and completely remove the cable from the drawer. For an illustration of the cable, see Procedure 6-9 “Connecting passive devices to the maintenance panel” in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210. ***Note:*** Procedure 6-9 “Connecting passive devices to the maintenance panel” is applicable to an OMX 4CH OADM ITU CWDM drawer, although it does not state “ITU” in the procedure.
9	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
10	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the drawer into the rack.

—continued—

Procedure 2-15 (continued)
Replacing an OMX 4CH OADM ITU CWDM drawer

Step	Action

11 Begin on the left side of the OMX ITU CWDM drawer and remove the ground wire from the rack rail. For an illustration of the ground wires on the rack rail, see Procedure 4-15 "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

ATTENTION
Make sure that the OMX ITU CWDM is adequately supported while you are removing it from the rack.

12 Remove the rest of the screws from the mounting bracket that is holding the left side of the drawer to the rack.

13 Remove the screws from the mounting bracket on the right side of the drawer.

14 Lift the drawer out of the rack and place it on an antistatic surface.

15 Remove the new replacement OMX ITU CWDM drawer from its packaging, and ensure that its PEC matches with the PEC of the drawer that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.

16 Follow Procedure 4-15, "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201 to install and ground the drawer.

17 Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.

18 Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

—continued—

Procedure 2-15 (continued)
Replacing an OMX 4CH OADM ITU CWDM drawer

Step	Action
19	Reconnect the data communication cable (if such a cable was removed in step 8) to the OMX modules (east and west), routing the cables as instructed in see Procedure 6-9 "Connecting passive devices to the maintenance panel" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210. ***Note:*** Procedure 6-9 "Connecting passive devices to the maintenance panel" is applicable to an OMX 4CH OADM ITU CWDM drawer, although it does not state "ITU" in the procedure.
20	Re-route in the new drawer the fiber patch cords hanging on the side of the rack (the ones removed in step 7).
21	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the OMX ITU CWDM for the following ports (some of them may not have connections, depending on the configuration: For the 1471-1531 nm variant of the OMX 4CH OADM ITU CWDM drawer: OTS IN, OTS OUT, 1471 nm ADD, 1471 nm DROP, 1491 nm ADD, 1491 nm DROP, 1511 nm ADD, 1511 nm DROP, 1531 nm ADD, 1531 nm DROP, THRU IN, THRU OUT. For the 1551-1611 nm variant of the OMX 4CH OADM ITU CWDM drawer: OTS IN, OTS OUT, 1551 nm ADD, 1551 nm DROP, 1571 nm ADD, 1571 nm DROP, 1591 nm ADD, 1591 nm DROP, 1611 nm ADD, 1611 nm DROP, THRU IN, THRU OUT. The fibers to connect are the ones that were disconnected and labelled in step 5. Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the OMX ITU CWDM ports. You might also have to remove the protective connector caps on the OMX ITU CWDM ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
22	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
23	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
24	Close the tray by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
25	Put the appropriate East or West label sticker on the faceplate of the drawer.

—continued—

Procedure 2-15 (continued)
Replacing an OMX 4CH OADM ITU CWDM drawer

Step	Action
26	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.
27	**If** your traffic was / **Then** protected (a traffic switch was executed in step 1) — Reroute traffic back to the original span for the OMX. Make sure that the force and manual switches are removed. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310. unprotected (a traffic switch was not executed in step 1) — you have completed this procedure

Note: If you need to replace the OMX ITU CWDM drawer in the opposite direction (east or west), perform this entire procedure again, for the other OMX ITU CWDM drawer.

—end—

Procedure 2-16
Replacing an OSC tray within an OSC drawer

Two OSC trays are required at each site: one for west traffic and one for east traffic. One OSC drawer contains the required two OSC trays. This procedure assumes that you only need to replace one of the two trays within the drawer (east or west). If you want to replace both trays, repeat this procedure for the second tray, or replace the entire drawer by following Procedure 2-17 "Replacing an OSC drawer" in this chapter.

> ***Note:*** The OSC with dual taps drawer, is interchangeable with a OSC without dual taps drawer.

For more information about the OSC trays, refer to the "OSC circuit packs" chapter in *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 2-16 (continued)
Replacing an OSC tray within an OSC drawer

Requirements

Table 2-17 lists the tools and materials required to complete this procedure. Both OSC trays in the drawer (east and west) should be of the same type. If not, contact your next level of support.

Table 2-17
Tools and materials for replacing an OSC tray

Item	Quantity	Supplied
OSC tray of the same type (with or without tap) as the OSC that is being replaced (see Note)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Small Phillips screwdriver	1	no
Note: For the product engineering codes for the OSC tray, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-16 (continued)
Replacing an OSC tray within an OSC drawer

Precautions

CAUTION
Risk of service interruption
When you replace an OSC tray with an OSC drawer, traffic is temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-16 (continued)
Replacing an OSC tray within an OSC drawer

CAUTION
Risk of affecting network reliability
When a shelf component is replaced in an Extended Metro network, re-equalization is necessary. See Procedure 2-6 "Re-equalizing an Extended Metro amplified system" in *Testing and Equalization Procedures*, 323-1701-222.

Action

Step	Action
1	Switch traffic off the span of the OSC tray to be replaced, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step.
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
4	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

5	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the OSC tray that you are replacing (east or west). Disconnect all the fibers connected to the following ports (not all of them will have fiber to disconnect, depending on the configuration): WSC to RX, WSC fm TX, OSC DROP, OSC ADD, THRU OUT, THRU IN, OTS OUT, OTS IN.

—continued—

Procedure 2-16 (continued)
Replacing an OSC tray within an OSC drawer

Step	Action
	The fibers to disconnect are the ones coming from the back of the OMX drawer. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage. ***Note:*** If the OSC tray has optical tap(s) that are connected to fiber(s), disconnect these fibers as well.
6	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
7	Gently remove the disconnected fibers from the fiber guides in the OSC tray you are replacing (east or west). Leave those fibers hanging on the side of the shelf (they are protected by dust caps). ***Note:*** Make sure to not cause damage to the fibers routed for the adjacent OSC tray.
8	Disconnect the data communication cable (if one is present) from the connector at the front of the optical tray, and completely remove the cable from the tray. For an illustration of the cable, see Procedure 6-7 "Connecting alarms on the Optical Trunk Switch" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
9	Take note of the vintage of the optical tray and drawer combination that are currently installed: • a yellow chromate finish tray and a yellow chromate finish drawer • a black painted finish tray and a black painted finish drawer • a black painted finish tray and a yellow chromate finish drawer Select your next step.

If you have the following combination	**Then** go to
a yellow chromate finish tray and a yellow chromate finish drawer	step 10
a black painted finish tray and a black painted finish drawer	step 11
a black painted finish tray and a yellow chromate finish drawer	step 10

10	Remove the two screws that fasten the OSC tray to the drawer. The screws are at the front and back of the tray. Make sure that you keep the screws to install the replacement tray. Go to step 12.
11	Remove the screw that fastens the OSC tray to the drawer. The screw is located at the back of the OSC tray. See Figure 2-16 on page 2-103. Make sure that you keep the screw to install the replacement OSC tray.

—continued—

Procedure 2-16 (continued)
Replacing an OSC tray within an OSC drawer

Step	Action
12	Remove the OSC tray from the drawer and place it on an antistatic surface.
13	Remove the new replacement OSC tray from its packaging, and ensure that its PEC matches with the PEC of the OSC that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
14	Take Note of the vintage of the optical tray to be installed • A yellow chromate finish tray • A black painted finish tray
15	**CAUTION** **Risk of equipment incapability** If you want to install a tray that has a black painted finish into a NT0H57BA drawer that has a yellow chromate finish, then you must use an NT0H57BF tray conversion kit. Select your next step.

If you have the following combination	**Then**
a yellow chromate finish tray and a yellow chromate finish drawer	go to step 18
a black painted finish tray and a yellow chromate finish drawer and no conversion plate was previously installed	go to step 17
a yellow chromate finish tray and a black painted finish drawer	contact your next level of support
a black painted finish tray and a black painted finish drawer	go to step 19
a black painted finish tray and a yellow chromate finish drawer and a conversion plate was previously installed	go to step 16

16	Unscrew the four 4-40 flat head screws connecting conversion plate to the underside of the tray
17	Attach conversion plate to the underside of the replacement tray with the four 4-40 flat head screws provided or the four 4-40 flat head screws that you removed in step 16, and go to step 18.

—continued—

Procedure 2-16 (continued)
Replacing an OSC tray within an OSC drawer

Step	Action
18	Fasten the OSC tray to the drawer using the two screws that you removed in step 10, and go to step 20. ***Note:*** If applicable, you must remove dust caps from the front of the monitoring ports of the OSC tray with dual taps (NT0H57GA), to be able to insert the tray into the drawer. Once the tray is in place, reinstall the dust caps on the monitoring ports.
19	Fasten the optical tray to the drawer by inserting the tab at the front of the tray into the slot on the drawer. Then fasten the tray to the drawer using the same screw that you removed in step 11. ***Note:*** If applicable, you must remove dust caps from the front of the monitoring ports of the OSC tray with dual taps (NT0H57GA), to be able to insert the tray into the drawer. Once the tray is in place, reinstall the dust caps on the monitoring ports.
20	Reconnect the data communication cable that you removed in step 8, if one was present, to the OSC tray. Route the cables as instructed in Procedure 6-7, "Connecting alarms on the Optical Trunk Switch" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
21	Re-route in the new OSC tray the fiber patch cords hanging on the side of the rack (the ones removed in step 7). Route the fibers as instructed in Procedure 8-11, "Routing fibers for the OSC tray" or Procedure 8-12, "Routing fibers for the OSC tray with dual taps" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
22	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the OSC tray for the following ports (some of them may not have connections, depending on the configuration): WSC to RX, WSC fm TX, OSC DROP, OSC ADD, THRU OUT, THRU IN, OTS OUT, OTS IN. The fibers to connect are the ones routed from the back of the OSC tray (the same as those that were disconnected and labelled in step 5). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the OSC tray ports. You might also have to remove the protective connector caps on the OSC tray ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201. ***Note:*** If the OSC tray has optical tap(s), reconnect the fiber patch cord(s) if they were disconnected in step 5.
23	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.

—continued—

Procedure 2-16 (continued)
Replacing an OSC tray within an OSC drawer

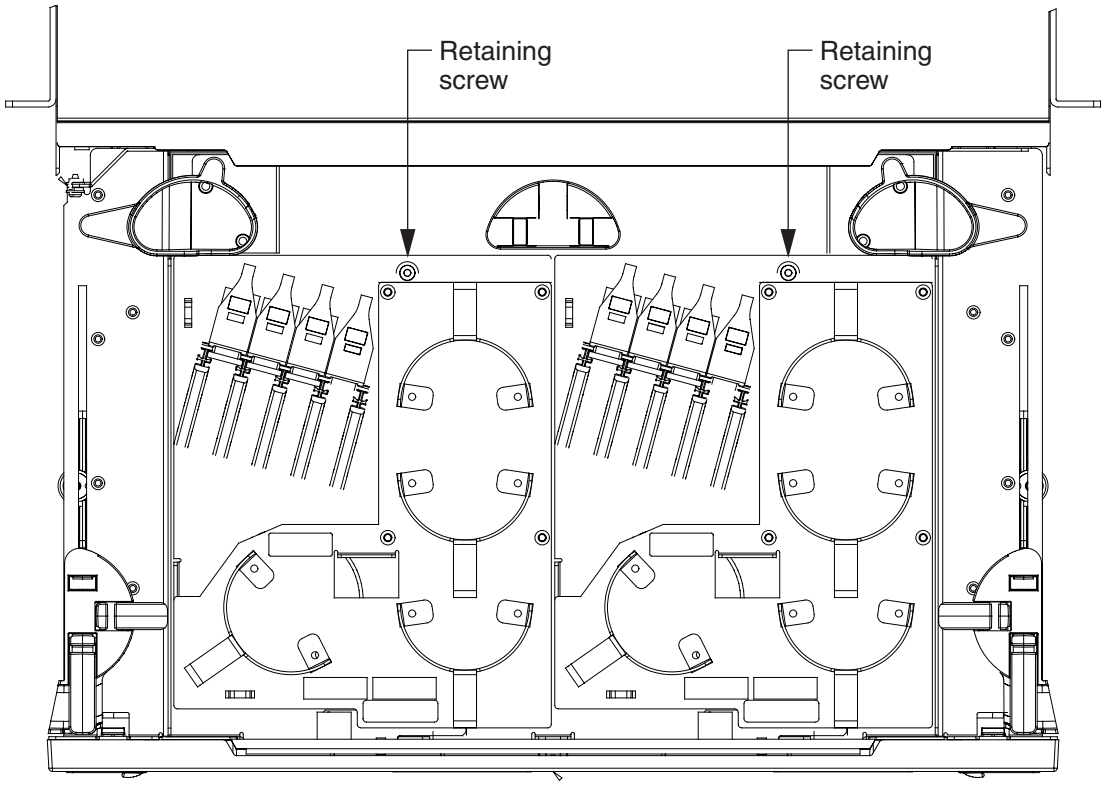
Step	Action	
24	**If** the drawer has a	**Then**
	non-spring-loaded locking clip	return the locking clip to the original upright position
	spring-loaded locking clip	push the clip down
25	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.	
26	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.	
27	**If** your traffic was	**Then**
	protected (a traffic switch was executed in step 1)	Reroute traffic back to the original span for the OSC tray. Make sure that the force and manual switches are removed. Follow Procedure 3-49 “Removing a manual, force, or lockout switch from a protection path” in *Provisioning and Operating Procedures*, 323-1701-310.
	unprotected (a traffic switch was not executed in step 1)	you have completed this procedure

—continued—

Procedure 2-16 (continued)
Replacing an OSC tray within an OSC drawer

Figure 2-16
Removing an OSC tray (OSC without optical tap shown)

OM2313p



—end—

Procedure 2-17
Replacing an OSC drawer

Follow this procedure to replace an OSC drawer. If you want to replace only one of the OSC trays in the drawer, follow Procedure 2-16 “Replacing an OSC tray within an OSC drawer” on page 2-95 in this chapter.

If the signal is protected (a manual switch is possible), you must perform Procedure 2-16 (replacement of a single OSC tray within the drawer), rather than Procedure 2-17. In a protection switch scenario, one of the two OSC trays within the drawer (east or west) needs to stay in place while the other tray is replaced, because it carries the protected signals.

For more information about the OMX, refer to the “OSC trays” section in *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 2-17 (continued)
Replacing an OSC drawer

Requirements

Table 2-18 lists the tools and materials required to complete this procedure.

Table 2-18
Tools and materials for replacing an OSC drawer

Item	Quantity	Supplied
OSC drawer of the same type as the OSC that is being replaced (see Note)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Note: For the product engineering codes for the OMX 1CH CWDM, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-17 (continued)
Replacing an OSC drawer

Precautions

CAUTION
Traffic will be lost
When you replace an OSC drawer, traffic will be lost during the procedure (because both OSC trays are replaced at the same time). If you have protected signals and you want to avoid losing traffic, perform Procedure 2-16, "Replacing an OSC tray within an OSC drawer", to replace one OSC tray at a time within a drawer.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-17 (continued)
Replacing an OSC drawer

Action

Step	Action

1 In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.

2 Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.

3 Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

4 Lift the pull-up tabs on the top of each bulkhead, and disconnect all the fibers connected to the following ports (for both the east and the west OSC trays within the drawer):

WSC to RX, WSC fm TX, OSC DROP, OSC ADD, THRU OUT, THRU IN, OTS OUT, OTS IN.

Note 1: If the OSC drawer supports optical taps, disconnect all the fibers connected to the monitor ports.

Note 2: The fibers to disconnect are the ones routed from the back of the OSC drawer. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.

5 After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.

6 Gently remove the disconnected fibers from the fiber guides in the drawer (for both OSC trays). Leave those fibers hanging on the side of the shelf (they are protected by dust caps).

7

If the drawer has a	**Then**
non-spring-loaded locking clip	return the locking clip to the original upright position
spring-loaded locking clip	push the clip down

—continued—

Procedure 2-17 (continued)
Replacing an OSC drawer

Step	Action
8	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack.

ATTENTION
Make sure that the OSC drawer is adequately supported while you are removing it from the rack.

9	Begin on the left side of the OSC drawer and remove the ground wire from the rack rail. For an illustration of the ground wires on the rack rail, see Procedure 4-15 "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
10	Remove the rest of the screws from the mounting bracket that is holding the left side of the tray to the rack.
11	Remove the screws from the mounting bracket on the right side of the tray.
12	Lift the tray out of the rack and place it on an antistatic surface.
13	Remove the new replacement OSC drawer from its packaging, and ensure that its PEC matches with the PEC of the OSC drawer that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
14	Complete Procedure 4-11, "Installing and grounding equipment drawers" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, to install and ground the OSC drawer. ***Note:*** During the installation, you can use the west and east labels shipped with the drawer to identify your west and east trays. For the OSC tray with dual taps, Nortel Networks recommends that you place the east and west labels on the left side of the LED windows on the faceplate of the drawer.
15	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
16	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

17	Re-route in the new OSC drawer the fiber patch cords hanging on the side of the rack (the ones removed in step 6).

—continued—

Procedure 2-17 (continued)
Replacing an OSC drawer

Step	Action
18	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the OSC drawer for the following ports (for both the east and west OSC trays within the drawer): WSC to RX, WSC fm TX, OSC DROP, OSC ADD, THRU OUT, THRU IN, OTS OUT, OTS IN. ***Note 1:*** If the OSC drawer supports optical taps, reconnect the fibers to the monitor ports if disconnected in step 4. ***Note 2:*** The fibers to connect are the ones routed from the back of the OMX module (the same as those that were disconnected and labelled in step 4). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the OSC ports. You might also have to remove the protective connector caps on the OSC drawer. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
19	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
20	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
21	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
22	In the System Manager, make sure the only active alarms on the system match those noted in step 1. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.

—end—

Procedure 2-18
Replacing a Transponder Protection Tray

Follow this procedure to replace a Transponder Protection Tray of the same type: single-mode four-filter, single-mode two-filter, multimode four-filter, or multimode two-filter.

For more information about the Transponder Protection Tray, refer to the "Transponder Protection Tray" section in *Hardware Description,* 323-1701-102.

Requirements

Table 2-19 lists the tools and materials required to complete this procedure.

Table 2-19
Tools and materials required to replace a Transponder Protection Tray

Item	Quantity	Supplied
Transponder Protection Tray of the same type (single-mode four-filter, single-mode two-filter, multimode four-filter, or multimode two-filter) as the Transponder Protection Tray that is being replaced (see Note)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Note: For the product engineering codes for the Transponder Protection Tray, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-18 (continued)
Replacing a Transponder Protection Tray

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Traffic will be lost
When you replace a Transponder Protection Tray, traffic will be lost during the procedure.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-18 (continued)
Replacing a Transponder Protection Tray

Action

Step	Action
1	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
2	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
3	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

4	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the Transponder Protection Tray. Disconnect all the fibers connected to ports 1-2 (two-filter) or ports 1-2-3-4 (four-filter) (some of them may not have connections, depending on the configuration): CLIENT IN, CLIENT OUT, TO CLIENT RX 1, FM CLIENT TX1, TO CLIENT RX 2, FM CLIENT TX 2. The fibers to disconnect are the ones routed from the back of the Transponder Protection Tray. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
5	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
6	Gently remove the disconnected fibers from the fiber guides in the drawer. Leave those fibers hanging on the side of the shelf (they are protected by dust caps).
7	**If** the drawer has a … **Then** …

If the drawer has a	**Then**
non-spring-loaded locking clip	return the locking clip to the original upright position
spring-loaded locking clip	push the clip down

—continued—

Procedure 2-18 (continued)
Replacing a Transponder Protection Tray

Step	Action
8	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the drawer into the rack.

ATTENTION
Make sure that the Transponder Protection Tray is adequately supported while you are removing it from the rack.

9	Begin on the left side of the Transponder Protection Tray and remove the ground wire from the rack rail. For an illustration of the ground wires on the rack rail, see Procedure 4-15 "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
10	Remove the rest of the screws from the mounting bracket that is holding the left side of the drawer to the rack.
11	Remove the screws from the mounting bracket on the right side of the drawer.
12	Lift the drawer out of the rack and place it on an antistatic surface.
13	Remove the replacement Transponder Protection Tray from its packaging, and ensure that its PEC matches with the PEC of the Transponder Protection Tray that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
14	To install the new Transponder Protection Tray, follow Procedure 4-11, "Installing and grounding equipment drawers" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
15	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
16	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

17	Re-route in the new Transponder Protection Tray the fiber patch cords hanging on the side of the rack (the ones removed in step 6).

—continued—

Procedure 2-18 (continued)
Replacing a Transponder Protection Tray

Step	Action
18	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the Transponder Protection Tray for ports 1-2 (two-filter) or ports 1-2-3-4 (four-filter) (some of them may not have connections, depending on the configuration): CLIENT IN, CLIENT OUT, TO CLIENT RX 1, FM CLIENT TX1, TO CLIENT RX 2, FM CLIENT TX 2. The fibers to connect are the ones routed from the back of the Transponder Protection Tray (the same as those that were disconnected and labelled in step 4). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the Transponder Protection Tray. You might also have to remove the protective connector caps on the Transponder Protection Tray. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
19	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
20	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
21	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
22	In the System Manager, make sure the only active alarms on the system match those noted in step 1. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.

—end—

Procedure 2-19
Replacing a patch panel

Follow this procedure to replace a patch panel.

For more information about the patch panel, refer to the "Patch panel" section in *Hardware Description,* 323-1701-102.

> ***Note:*** The 16-port patch panel is interchangeable with a 20-port patch panel. If you are replacing a 20-port panel with a 16-port panel, ensure that no more than 16-ports are required.

Requirements

Table 2-20 lists the tools and materials required to complete this procedure.

Table 2-20
Tools and materials required to replace a patch panel

Item	Quantity	Supplied
Replacement patch panel (see Note)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Note: For the product engineering codes for the patch panel, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-19 (continued)
Replacing a patch panel

Precautions

CAUTION
Risk of service interruption or traffic loss
When you replace a patch panel, depending on what has been connected, the traffic going through the fibers can either be lost, or temporarily interrupted (if a user switch has been performed).

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

Action

Step	Action
1	Consult your network plan to determine which fibers are going through the patch panel that is being replaced. Determine if the channels carried through those fibers are protected or not.

—continued—

Procedure 2-19 (continued)
Replacing a patch panel

Step	Action

2 **If** / **Then**

If	Then
none of the channels are protected	you will lose traffic for all the channels during the replacement of the patch panel. Advise your network administrator before proceeding with step 3.
some, but not all, the channels are protected	you will lose traffic for all the unprotected channels during the replacement of the patch panel. Advise your network administrator about the channels that will lose traffic. For the protected channels, if a manual user switch is possible, switch the traffic to the protection channel assignment path before replacing the patch panel. To perform a manual traffic switch, refer to Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. Then proceed to step 3.
the channels are protected and a manual user switch is possible	switch the traffic to the protection channel assignment path before replacing the patch panel. To perform a manual traffic switch, refer to Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. Then proceed to step 3.

3 In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.

4 Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.

5 Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

—continued—

Procedure 2-19 (continued)
Replacing a patch panel

Step	Action
6	Lift the pull-up tabs on the top of each bulkhead, and disconnect all the fibers in the patch panel. Disconnect the fibers connected to any of ports 1-8 (in the 16-port patch panel) or 1-10 (in the 20-port patch panel), for both the Nortel side (routed from the back of the patch panel) and for the CPE side (routed from the front of the patch panel). The Nortel and the CPE fibers for ports 1 to 8 or 1 to 10 are called To RX and Fm TX. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
7	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
8	Gently remove the disconnected fibers from the fiber guides in the drawer. Leave those fibers hanging on the side of the shelf (they are protected by dust caps).
9	**If** the drawer has a — **Then**
	non-spring-loaded locking clip — return the locking clip to the original upright position
	spring-loaded locking clip — push the clip down
10	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the drawer into the rack.

ATTENTION
Make sure that the patch panel is adequately supported while you are removing it from the rack.

11	Begin on the left side of the patch panel and remove the ground wire from the rack rail. For an illustration of the ground wires on the rack rail, see Procedure 4-15 “Installing and grounding equipment drawers” in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
12	Remove the rest of the screws from the mounting bracket that is holding the left side of the drawer to the rack.
13	Remove the screws from the mounting bracket on the right side of the drawer.
14	Lift the drawer out of the rack and place it on an antistatic surface.
15	Remove the patch panel from its packaging, and ensure that its PEC matches with the PEC of the patch panel that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support. ***Note:*** The 16-port patch panel is interchangeable with a 20-port patch panel. If you are replacing a 20-port panel with a 16-port panel.
16	To install the new patch panel, follow Procedure 4-11, “Installing and grounding equipment drawers” in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.

—continued—

Procedure 2-19 (continued)
Replacing a patch panel

Step	Action
17	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
18	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

19	Re-route in the new patch panel the fiber patch cords hanging on the side of the rack (the ones removed in step 8).
20	Lift the pull-up tabs on the top of each bulkhead, and reconnect all the fibers in the patch panel for ports 1-8 or 1 to 10, for both the Nortel side (routed from the back of the patch panel) and for the CPE side (routed from the front of the patch panel). The fibers to reconnect are the ones that were disconnected and labelled in step 6, so it is possible that not all the ports have fibers to reconnect. The Nortel and the CPE fibers for ports 1 to 8 or 1 to 10 are called To RX and Fm TX. Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the patch panel. You might also have to remove the protective connector caps on the patch panel. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
21	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
22	

If the drawer has a	**Then**
non-spring-loaded locking clip	return the locking clip to the original upright position
spring-loaded locking clip	push the clip down

23	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
24	In the System Manager, make sure the only active alarms on the system match those noted in step 3. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.

—continued—

Procedure 2-19 (continued)
Replacing a patch panel

Step	Action	
25	**If** the traffic going through the patch panel fibers was	**Then**
	protected (a traffic switch was executed in step 2	reroute the traffic back to the original span. Make sure that the force and manual switches are removed. Follow Procedure 3-49 “Removing a manual, force, or lockout switch from a protection path” in *Provisioning and Operating Procedures*, 323-1701-310.
	unprotected (a traffic switch was not executed in step 2)	you have completed this procedure.

—end—

Procedure 2-20
Replacing a C&L splitter/coupler tray within a drawer

Two C&L splitter/coupler trays are required at each site: one for west traffic and one for east traffic. One C&L splitter/coupler drawer contains the required two C&L splitter/coupler trays. This procedure assumes that you only need to replace one of the two trays within the drawer (east or west). If you want to replace both trays, repeat this procedure for the second tray, or replace the entire drawer by following Procedure 2-21 in this chapter.

For more information about the C&L splitter/coupler, refer to the "C&L splitter/coupler" section in *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

Requirements

Table 2-21 lists the tools required to complete this procedure.

Table 2-21
Tools and materials required for replacing a C&L splitter/coupler tray

Item	Quantity	Supplied
C&L splitter/coupler tray (see Note)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Small Phillips screwdriver	1	no
Note: For the product engineering code for the C&L splitter/coupler tray, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-20 (continued)
Replacing a C&L splitter/coupler tray within a drawer

Precautions

CAUTION
Risk of service interruption
When you replace a C&L splitter/coupler tray within a C&L splitter/coupler drawer, traffic is temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instructions with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-20 (continued)
Replacing a C&L splitter/coupler tray within a drawer

CAUTION
Risk of affecting network reliability
When a shelf component is replaced in an Extended Metro network, re-equalization is necessary. See Procedure 2-6 "Re-equalizing an Extended Metro amplified system" in *Testing and Equalization Procedures*, 323-1701-222.

Action

Step	Action
1	Switch traffic off of the span for the C&L splitter/coupler tray to be replaced, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step.
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
4	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

5	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the C&L splitter/coupler tray that you are replacing (east or west). Disconnect all the fibers connected to the following ports: L BAND OUT, L BAND IN, C BAND OUT, C BAND IN, OTS OUT, OTS IN. The fibers to disconnect are the ones routed from the back of the C&L splitter/coupler tray. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.

—continued—

Procedure 2-20 (continued)
Replacing a C&L splitter/coupler tray within a drawer

Step	Action
6	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
7	Gently remove the disconnected fibers from the fiber guides in the C&L splitter/coupler tray you are replacing (east or west). Leave those fibers hanging on the side of the shelf (they are protected by dust caps).
8	Disconnect the data communication cable (if one is present) from the connector at the front of the optical tray, and completely remove the cable from the tray. For an illustration of the cable, see Procedure 6-7 "Connecting alarms on the Optical Trunk Switch" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
9	Take note of the vintage of the optical tray and drawer combination that are currently installed: • a yellow chromate finish tray and a yellow chromate finish drawer • a black painted finish tray and a black painted finish drawer • a black painted finish tray and a yellow chromate finish drawer Select your next step.

If you have the following combination	**Then**
a yellow chromate finish tray and a yellow chromate finish drawer	go to step 10
a black painted finish tray and a black painted finish drawer	go to step 11
a black painted finish tray and a yellow chromate finish drawer	go to step 10

10	Remove the two screws that fasten the C&L splitter/coupler tray to the drawer. The screws are at the front and back of the tray. See Figure 2-17 on page 2-127. Make sure that you keep the screws to install the replacement tray. Go to step 12.
11	Remove the screw that fastens the C&L splitter/coupler tray to the drawer. The screw is located at the back of the C&L splitter/coupler tray. Make sure that you keep the screw to install the replacement C&L splitter/coupler tray.
12	Remove the C&L splitter/coupler tray from the drawer and place it on an antistatic surface.
13	Remove the new replacement C&L splitter/coupler tray from its packaging, and ensure that its PEC matches with the PEC of the C&L splitter/coupler tray that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.

—continued—

Procedure 2-20 (continued)
Replacing a C&L splitter/coupler tray within a drawer

Step	Action
14	Take Note of the vintage of the optical tray to be installed • A yellow chromate finish tray • A black painted finish tray
15	**CAUTION** **Risk of equipment incapability** If you want to install a tray that has a black painted finish into a NT0H57BA drawer that has a yellow chromate finish, then you must use an NT0H57BF tray conversion kit. Select your next step.

If you have the following combination	**Then**
a yellow chromate finish tray and a yellow chromate finish drawer	step 18
a black painted finish tray and a yellow chromate finish drawer and no conversion plate was previously installed	step 17
a yellow chromate finish tray and a black painted finish drawer	contact your next level of support
a black painted finish tray and a black painted finish drawer	step 19
a black painted finish tray and a yellow chromate finish drawer and a conversion plate was previously installed	step 16

16	Unscrew the four 4-40 flat head screws connecting conversion plate to the underside of the optical tray.
17	Attach conversion plate to the underside of the replacement optical tray with the four 4-40 flat head screws provided or the four 4-40 flat head screws that you removed in step 16, and go to step 18.
18	Fasten the optical tray to the drawer using the two screws that you removed in step 10, and go to step 20.
19	Fasten the optical tray to the drawer by inserting the tab at the front of the tray into the slot on the drawer. Then fasten the tray to the drawer using the same screw that you removed in step 11.

—continued—

Procedure 2-20 (continued)
Replacing a C&L splitter/coupler tray within a drawer

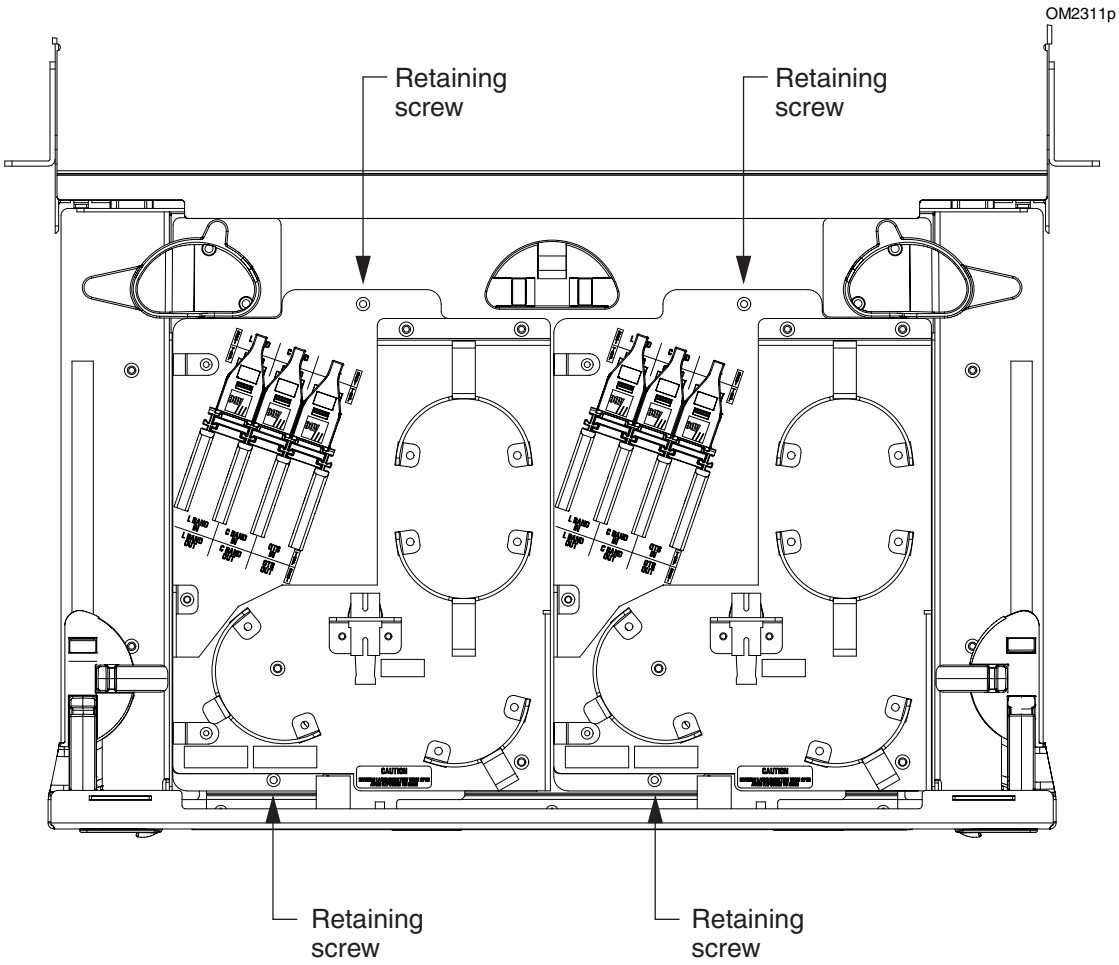
Step	Action
20	Reconnect the data communication cable that you removed in step 8, if one was present, to the C&L splitter/coupler tray. Route the cables as instructed in Procedure 6-7, "Connecting alarms on the Optical Trunk Switch" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
21	Re-route in the new optical tray the fiber patch cords hanging on the side of the rack (the ones removed in step 7). For more information refer to Figure 17-1 in the "C&L splitter/coupler" section in *Hardware Description*, 323-1701-102.
22	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the C&L splitter/coupler tray for the following ports: L BAND OUT, L BAND IN, C BAND OUT, C BAND IN, OTS OUT, OTS IN. The fibers to connect are the ones routed from the back of the C&L splitter/coupler tray (the same as those that were disconnected and labelled in step 5). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the C&L splitter/coupler tray ports. You might also have to remove the protective connector caps on the C&L splitter/coupler tray ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
23	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
24	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
25	Close the tray by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
26	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.

—continued—

Procedure 2-20 (continued)
Replacing a C&L splitter/coupler tray within a drawer

27	**If** your traffic was	**Then**
	protected (a traffic switch was executed in step 1)	Reroute traffic back to the original span for the C&L splitter/coupler tray. Make sure that the force and manual switches are removed. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310.
	unprotected (a traffic switch was not executed in step 1)	you have completed this procedure

Figure 2-17
Removing a C&L splitter/coupler tray



—end—

Procedure 2-21
Replacing a C&L splitter/coupler drawer

Follow this procedure to replace a C&L splitter/coupler drawer. If you want to replace only one of the C&L splitter/coupler modules in the drawer, follow Procedure 2-20 "Replacing a C&L splitter/coupler tray within a drawer" on page 2-121 in this chapter.

If the signal is protected (a manual switch is possible), you must perform Procedure 2-20 (replacement of a single C&L splitter/coupler module within the drawer), rather than Procedure 2-21. In a protection switch scenario, one of the two C&L splitter/coupler modules within the drawer (east or west) needs to stay in place while the other module is replaced, because it carries the protected signals.

For more information about the C&L splitter/coupler, refer to the "C&L splitter/coupler" section in *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 2-21 (continued)
Replacing a C&L splitter/coupler drawer

Requirements

Table 2-22 lists the tools and materials required to complete this procedure.

Table 2-22
Tools and materials for replacing a C&L splitter/coupler drawer

Item	Quantity	Supplied
C&L splitter/coupler drawer (see Note)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Note: For the product engineering codes for the C&L splitter/coupler, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-21 (continued)
Replacing a C&L splitter/coupler drawer

Precautions

CAUTION
Traffic will be lost
When you replace a C&L splitter/coupler drawer, traffic will be lost during the procedure (because both C&L splitter/coupler east and west modules are replaced at the same time). If you have protected signals and you want to avoid losing traffic, perform Procedure 2-20, "Replacing a C&L splitter/coupler tray within a drawer", to replace one C&L splitter/coupler module at a time within a drawer.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Action

Step	Action
1	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
2	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.

—continued—

Procedure 2-21 (continued)
Replacing a C&L splitter/coupler drawer

Step	Action
3	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

4 Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the C&L splitter/coupler drawer. Disconnect all the fibers connected to the following ports (for both the east and the west C/L splitter/coupler modules):

L BAND OUT, L BAND IN, C BAND OUT, C BAND IN, OTS OUT, OTS IN.

The fibers to disconnect are the ones routed from the back of the C&L splitter/coupler module. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.

5 After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.

6 Gently remove the disconnected fibers from the fiber guides in the drawer (for both east and west C&L splitter/coupler modules). Leave those fibers hanging on the side of the shelf (they are protected by dust caps).

7

If the drawer has a	**Then**
non-spring-loaded locking clip	return the locking clip to the original upright position
spring-loaded locking clip	push the clip down

8 Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack.

ATTENTION
Make sure that the C&L splitter/coupler drawer is adequately supported while you are removing it from the rack.

9 Begin on the left side of the C&L splitter/coupler module and remove the ground wire from the rack rail. For an illustration of the ground wires on the rack rail, see Procedure 4-15 “Installing and grounding equipment drawers” in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

10 Remove the rest of the screws from the mounting bracket that is holding the left side of the tray to the rack.

—continued—

Procedure 2-21 (continued)
Replacing a C&L splitter/coupler drawer

Step	Action
11	Remove the screws from the mounting bracket on the right side of the tray.
12	Lift the tray out of the rack and place it on an antistatic surface.
13	Remove the replacement C&L splitter/coupler drawer from its packaging, and ensure that its PEC matches with the PEC of the C&L splitter/coupler drawer that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
14	Install and ground the new C&L splitter/coupler by completing Procedure 4-11, "Installing and grounding equipment drawers" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
15	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
16	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

17	Re-route in the new C&L splitter/coupler the fiber patch cords hanging on the side of the rack (the ones removed in step 6).
18	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the C&L splitter/coupler for the following ports (for both the east and the west C&L splitter/coupler modules): L BAND OUT, L BAND IN, C BAND OUT, C BAND IN, OTS OUT, OTS IN. The fibers to connect are the ones routed from the back of the C&L splitter/coupler module (the same as those that were disconnected and labelled in step 4). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the C&L splitter/coupler ports. You might also have to remove the protective connector caps on the C&L splitter/coupler ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
19	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.

—continued—

Procedure 2-21 (continued)
Replacing a C&L splitter/coupler drawer

Step	Action	
20	**If** the drawer has a	**Then**
	non-spring-loaded locking clip	return the locking clip to the original upright position
	spring-loaded locking clip	push the clip down
21	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.	
22	In the System Manager, make sure the only active alarms on the system match those noted in step 1. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.	

—end—

Procedure 2-22
Replacing an ECT tray

Follow this procedure to replace an ECT tray with one that is identical (C-band equalizer with splitter/coupler, L-band equalizer with splitter/coupler, C-band and L-band with splitter/coupler or C-band and L-band splitter/coupler with VOAs).

For more information about the ECT, refer to the "Per Band Equalizer" chapter in *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 2-22 (continued)
Replacing an ECT tray

Requirements

Table 2-23 lists the tools and materials required to complete this procedure.

Table 2-23
Tools and materials required to replace an ECT

Item	Quantity	Supplied
ECT tray of the same type as the one that is being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
2 mm flat screwdriver for mVOAs	1	no
Small Phillips screwdriver	1	no
Fiber patch cord to connect the OSA input to the ECT (most likely an SC-SC fiber), long enough to go from the OSA to the ECT	1	no
Optical spectrum analyzer (OSA)	1	no
Note: For the product engineering codes for the ECT, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-22 (continued)
Replacing an ECT tray

Precautions

CAUTION
Risk of service interruption
When you replace an ECT, traffic will be temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

DANGER
Risk of personal injury or equipment damage
Do not let go of the cooling unit cover when you open it. The cooling unit cover is not permanently attached to the shelf. You must remove the cooling unit completely. If you let go of the cooling unit when you open it, you can cause personal injury, damage to the equipment, or both.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

—continued—

Procedure 2-22 (continued)
Replacing an ECT tray

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Action

Step	Action
1	Switch traffic off the span for the ECT tray to be replaced, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" of *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step.
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Remove the cooling unit cover by loosening the captive screws on each side of the cover. Set the cover aside.
4	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
5	Loosen the screws on the top left side of the ECT cover, and remove the cover. You will see inputs and outputs for C-band, L-band, and OTS connections. See Figure 2-18.
6	If the fiber patch cords coming out from the front of the ECT are not already labelled, label each one for easy reconnection before going to the next step.

—continued—

Procedure 2-22 (continued)
Replacing an ECT tray

Step	Action
7	Depending on the ECT tray type, you will have fibers connected to either C OUT, L OUT, or both. Perform this step for all the fibers connected to C OUT and L OUT ports in the ECT.

a. Disconnect the fiber from the output port on the ECT C-band (or L-band) port: C OUT (or L OUT). Put protective caps on the ends of the patch cords to protect them from contamination and damage, and let the fiber hang on the side of the shelf.

b. Take a new fiber patch-cord (most likely SC-SC), long enough to go from the ECT to the OSA. Carefully clean both ends of this fiber. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

c. Connect one end of the fiber to the OSA input, and the other end to the C OUT (or L OUT) port on the ECT from step a.

d. You will need the following information to adjust the power level in the replacement ECT:

If on the OSA you are connected to	**Then** record the power readings associated with
the C OUT port	Band 1 (1528-77 nm to 1533.47 nm) Band 2 (1538-19 nm to 1542.94 nm) Band 3 (1547.72 nm to 155.52 nm), and Band 4 (1557.36 nm to 1562.23 nm)
the L OUT port	Band 5 (1570.42 nm to 1575.37 nm) Band 6 (1580.35 nm to 1585.36 nm) Band 7 (1590.31 nm to 1595.49 nm), and Band 8 (1600.60 nm to 1605.73 nm)

Note: If you are replacing the ECT because it is defective (for example, if the VOA is defective), or if you doubt the measurements taken for the power of a band (or for all the powers of the bands), then you will need to contact the system administrator to get the original power target per band as recommended by the Network Modeling Tool (NMT).

e. After measurements are complete, disconnect the fiber from the OSA and the ECT output port, and put a protective dust cap on each end of the fiber.

f. If there are any other Output ports that remain connected in the ECT, repeat step a. through step e. for that port.

—continued—

Procedure 2-22 (continued)
Replacing an ECT tray

Step	Action
8	Disconnect all the fiber-optic patch cords from the following ports in the ECT (some of them might not be connected): OTS IN, OTS OUT, C IN, C OUT, L IN, L OUT. The fibers to disconnect are the ones routed from the front of the ECT module. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
9	Gently remove the disconnected fibers from the fiber guides in the ECT module. Leaves the fibers hanging on the side of the shelf (they are protected by dust caps).
10	Disconnect the communication cable from the monitor port located on the left side of the ECT tray.
11	Remove the screw that attaches the flexible fiber guide to the left side of the ECT. See Figure 2-19.
12	Remove the two screws in the front of the ECT that attaches it to the drawer. See Figure 2-20.

—continued—

Procedure 2-22 (continued)
Replacing an ECT tray

Step	Action
13	Remove the tray from the drawer and place it on an antistatic surface. See Figure 2-21.
14	Remove the replacement ECT module from its packaging, and ensure that its PEC matches with the PEC of the ECT that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
15	Follow Procedure 4-19, "Installing an ECT tray in a drawer" in *Installing Optical Metro 5200 Shelves and Components,* 323-1701-201.
16	Loosen the screws on the top left side of the ECT cover, and remove the cover. You will see inputs and outputs for C-band, L-band and OTS connections.
17	Reconnect the communication -cable removed in step 10. Follow Procedure 6-9, "Connecting passive devices to the maintenance panel" in *Installing Optical Metro 5200 Shelves and Components,* 323-1701-201.
18	Route the patch cords hanging on the side of the bay through the flexible fiber guide.
19	Reconnect in the ECT the patch cords to the OTS IN and OTS OUT ports. The fibers to connect are the ones routed from the front of the ECT module (the ones disconnect in step 8). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the ports. You might also have to remove the protective connector caps on the ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
20	Depending on the ECT tray type, you will need to reconnect fibers to either the C OUT, L OUT, or both. Perform this step for all the fibers connected to C OUT and L OUT ports in the ECT. **a.** Take the fiber patch-cord used previously with the OSA (most likely an SC-SC patch-cord). This fiber has to be long enough to go from the ECT to the OSA. Carefully clean both ends of this fiber. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201 **b.** Connect one end of the fiber to the OSA input, and the other end to the C OUT (or L OUT) port on the ECT. **c.** Make sure to have the information about the band power level measurements (from step 7). If any of these measurements don't make sense, or if you know the ECT being replaced is defective (this could lead to incorrect power levels), stop this procedure and contact the network manager to get the original power target per band before proceeding to the next step.

—continued—

Procedure 2-22 (continued)
Replacing an ECT tray

Step	Action

d. You will need the following information to adjust the power level in the replacement ECT:

If on the OSA you are connected to	**Then** adjust the OSA setting, using a 2 mm flat screwdriver for mVOA, to achieve the power level associated with
the C OUT port	Band 1 (1528.77 nm to 1533.47 nm) Band 2 (1538.19 nm to 1542.94 nm) Band 3 (1547.72 nm to 155.52 nm), and Band 4 (1557.36 nm to 1562.23 nm)
the L OUT port	Band 5 (1570.42 nm to 1575.37 nm) Band 6 (1580.35 nm to 1585.36 nm) Band 7 (1590.31 nm to 1595.49 nm), and Band 8 (1600.60 nm to 1605.73 nm)

Note: To increase attenuation, turn the mVOA screwdriver clockwise. To decrease attenuation, turn the mVOA screwdriver counter-clockwise. Turning the mVOA screwdriver too much will put the power out of the mVOA range.

e. Once the mVOA equalization adjustments for the C-band (or L-band) are complete, disconnect the fiber from the ECT output port (C OUT or L OUT).

f. Repeat step a. to step e. for the remaining output ports on the ECT (C OUT or L OUT, which you took band measurements from in step 7).

21 Reconnect all the remaining fibers in the ECT, for the following ports:

C IN, C OUT, L IN, or L OUT.

The fibers to connect are the ones routed from the front of the ECT module. Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the ECT ports. You might also have to remove the protective connector caps on the ECT module. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

22 Close the access door on the top of the ECT and secure it with screws. See Figure 2-18.

23 Close the tray by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.

24 Put the appropriate East or West label sticker on the faceplate of the drawer.

25 Replace the cooling unit cover by securing the captive screws on each side of the cover.

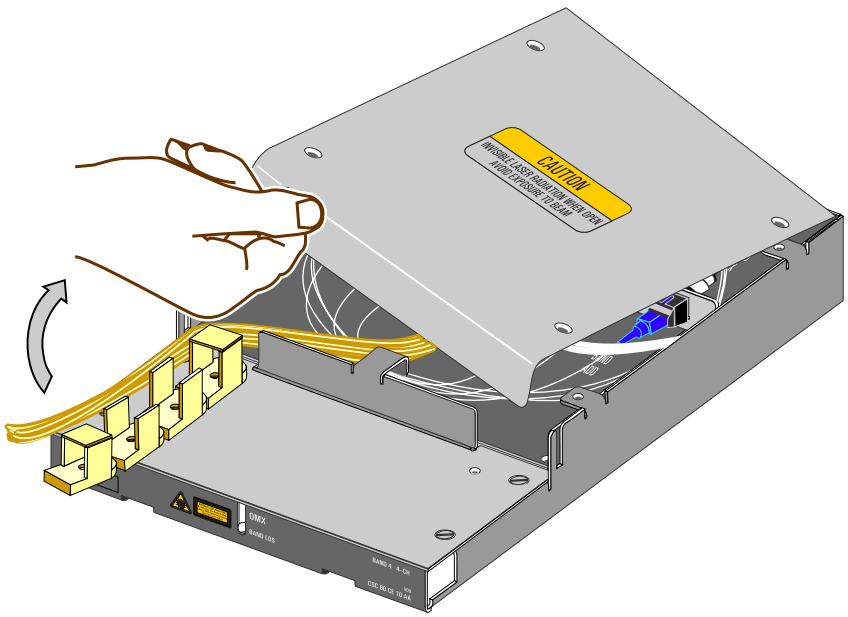
—continued—

Procedure 2-22 (continued)
Replacing an ECT tray

Step	Action	
26	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.	
27	**If** your traffic was	**Then**
	protected (a traffic switch was executed in step 1)	Reroute traffic back to the original span for the ECT. Make sure that the force and manual switches are removed. Follow Procedure 3-49 “Removing a manual, force, or lockout switch from a protection path” in *Provisioning and Operating Procedures*, 323-1701-310.
	unprotected (a traffic switch was not executed in step 1)	you have completed this procedure

Figure 2-18
Removing the cover from an ECT tray

OM0121p



—continued—

Procedure 2-22 (continued)
Replacing an ECT tray

Figure 2-19
Removing or securing the flexible optical fiber guide to the ECT tray

OM0127p

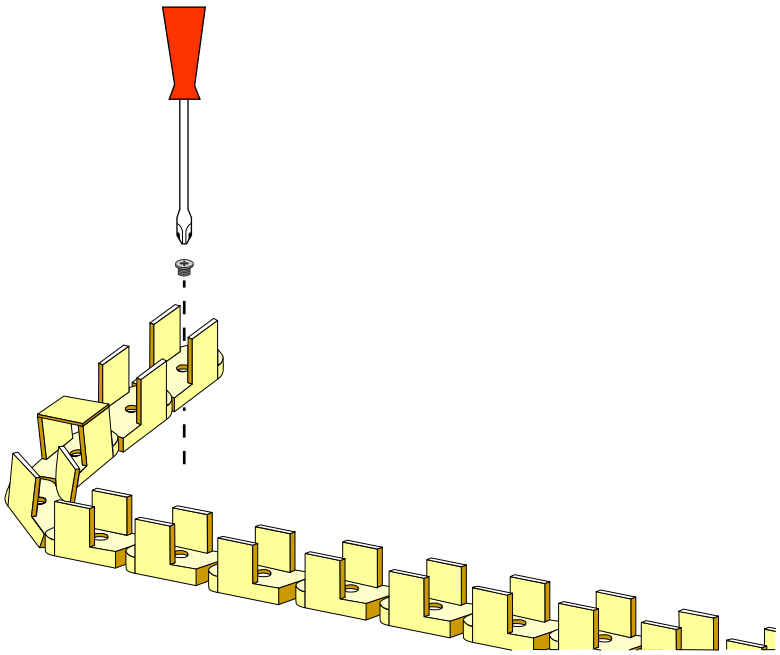
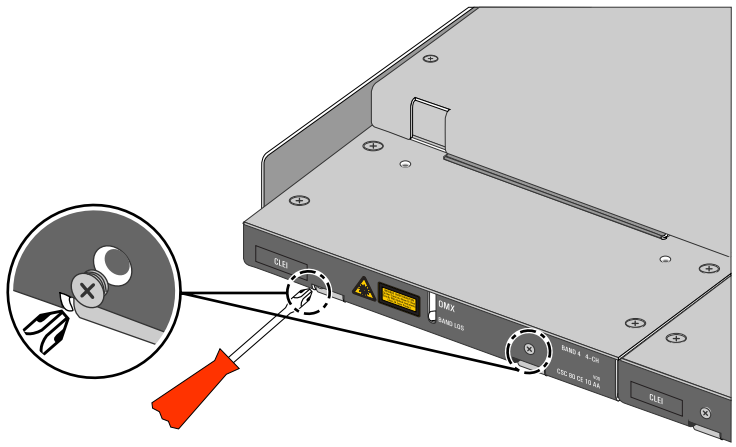


Figure 2-20
Removing or installing the retaining screws in the ECT tray

OM0125t

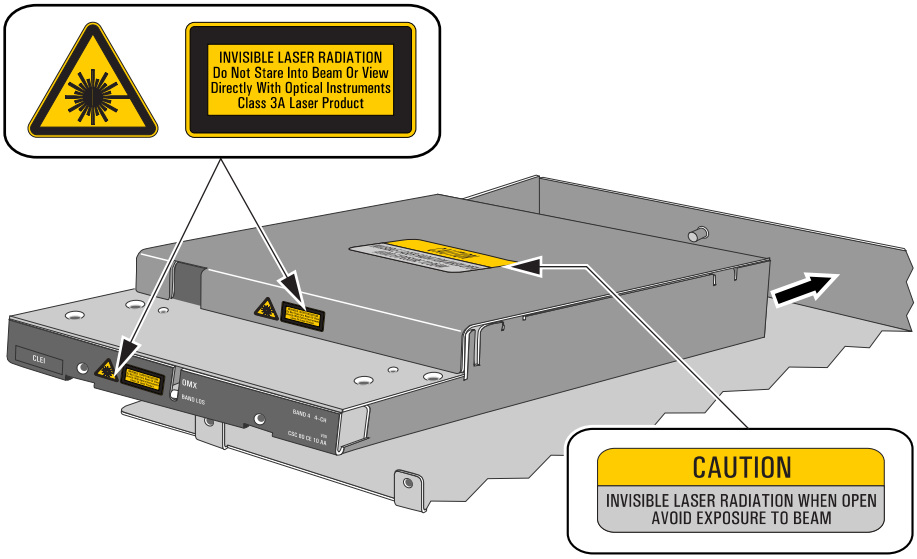


—continued—

Procedure 2-22 (continued)
Replacing an ECT tray

Figure 2-21
Removing or installing an ECT tray (optical fibers are not shown)

OM0124ps



—end—

Procedure 2-23
Replacing a PBE

Follow this procedure to replace a Per Band Equalizer (PBE) with one that is of the identical type: C-band PBE, L-band PBE, C&L-band PBE.

For more information, refer to "Per Band Equalizer" chapter in *Hardware Description*, 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 2-23 (continued)
Replacing a PBE

Requirements

Table 2-24 lists the tools and equipment you need to complete this procedure.

Table 2-24
Tool and materials required to replace a PBE

Item	Quantity	Supplied
Per Band Equalizer of the same type (C-band, L-band, or C&L band) than the one that is being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
Fiber patch cord to connect the OSA input to the PBE (most likely an SC-SC fiber), long enough to go from the OSA to the PBE	1	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
2 mm flat screwdriver for mVOAs	1	no
Optical spectrum analyzer (OSA)	1	no
Note: For the product engineering codes for the PBE, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-23 (continued)
Replacing a PBE

Precautions

CAUTION
Risk of service interruption
When you replace a PBE tray, traffic will be temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instructions with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-23 (continued)
Replacing a PBE

CAUTION
Risk of affecting network reliability
When a shelf component is replaced in an Extended Metro network, re-equalization is necessary. See Procedure 2-6 "Re-equalizing an Extended Metro amplified system" in *Testing and Equalization Procedures*, 323-1701-222.

Action

Step	Action
1	Switch traffic off the span for the PBE tray to be replaced, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" of *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step.
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
4	If the fiber patch cords coming out from the front of the PBE are not already labelled, label each one for easy reconnection before going to the next step.
5	Depending on the PBE tray type, you will have fibers connected to either C BAND OUT, L BAND OUT, or both. Perform this step for all the patch-cords connected to C BAND OUT and L BAND OUT ports in the PBE. **a.** Disconnect the fiber from the output port on the PBE labelled C BAND OUT (or L BAND OUT). To have easier access to the fiber connections, lift the pull-up tabs on the top of each bulkhead. Put protective caps on the ends of the patch cords to protect them from contamination and damage. Gently remove the disconnected fiber from the fiber guides in the drawer. Let the fibers hang on the side of the shelf (they are protected by dust caps). **b.** Take a new fiber patch-cord (most likely SC-SC), long enough to go from the PBE to the OSA. Carefully clean both ends of this fiber. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201. **c.** Connect one end of the fiber to the OSA input, and the other end to the C BAND OUT (or L BAND OUT) port on the PBE from step a.

—continued—

Procedure 2-23 (continued)
Replacing a PBE

Step	Action

d. You will need the following information to adjust the power level in the replacement PBE:

If on the OSA you are connected to	**Then** record the power readings associated with
the C BAND OUT port	Band 1 (1528.77 nm to 1533.47 nm) Band 2 (1538.19 nm to 1542.94 nm) Band 3 (1547.72 nm to 155.52 nm), and Band 4 (1557.36 nm to 1562.23 nm)
the L BAND OUT port	Band 5 (1570.42 nm to 1575.37 nm) Band 6 (1580.35 nm to 1585.36 nm) Band 7 (1590.31 nm to 1595.49 nm), and Band 8 (1600.60 nm to 1605.73 nm)

Note: If you are replacing the PBE because it is defective (for example, if the VOA is defective), or if you doubt the measurements taken for the power of a band (or for all the powers of the bands), then you will need to contact the system administrator to get the original power target per band as recommended by the Network Modeling Tool (NMT).

e. After measurements are complete, disconnect the fiber from the OSA and the PBE output port, and put a protective dust cap on each end of the fiber.

f. If there are any other Output ports that remain connected in the PBE, repeat step a. through step e. for that port.

—continued—

Procedure 2-23 (continued)
Replacing a PBE

Step	Action
6	Disconnect all the fiber-optic patch cords from the following ports in the PBE (some of them might not be connected): C BAND IN, L BAND IN. The fibers to disconnect are the ones routed from the front of the PBE module. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage. ***Note:*** To have easier access to the fiber connections, lift the pull-up tabs on the top of each bulkhead.
7	Gently remove the disconnected fibers from the fiber guides in the PBE module. Leave the fibers hanging on the side of the shelf (they are protected by dust caps).
8	After you disconnect the fibers, lower each bulkhead by pressing down on the tab until the unit snaps into place.
9	Close the drawer by pressing and holding the locking tabs on the front while sliding the tray into the rack.

ATTENTION
Make sure that the PBE is adequately supported while you are removing it from the rack.

10	Begin on the left side of the drawer, remove screw that is holding the ground wire to the rack rail, and remove the ground wire. For an illustration of the ground wires on the rack rail, see Procedure 4-15 "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201
11	Remove the rest of the screws from the mounting bracket that is holding the left side of the drawer to the rack.
12	Remove the screws from the mounting bracket on the right side of the drawer.
13	Lift the PBE out of the rack and place it on an antistatic surface.
14	Remove the replacement PBE module from its packaging, and ensure that its PEC matches with the PEC of the PBE that was removed in the previous step (C-band PBE, L-band PBE, or C&L band PBE). If it does not match, stop this procedure and contact your next level of support.
15	To install and ground the new PBE in the rack, follow Procedure 4-15, "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components,* 323-1701-201.
16	Route the patch cords hanging on the side of the bay through the internal fiber guides of the PBE.

—continued—

Procedure 2-23 (continued)
Replacing a PBE

Step	Action
17	Depending on the PBE tray type, reconnect the following fibers: C BAND IN, L BAND IN, or both. The fibers to connect are the ones routed from the front of the PBE module. Use the labels on the fibers to guide you during reconnection. To have easier access to the fiber connections, lift the pull-up tabs on the top of each bulkhead. You will need to remove the protection dust caps on the fibers before reconnecting to the PBE ports. You might also have to remove the protective connector caps on the PBE module. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
18	Depending on the PBE type, you will need to reconnect fibers to either the C BAND OUT, L BAND OUT, or both. Perform this step for all the fibers connected to C BAND OUT and L BAND OUT ports in the PBE. **a.** Take the fiber patch-cord used previously with the OSA (most likely an SC-SC patch-cord). This fiber has to be long enough to go from the PBE to the OSA. Carefully clean both ends of this fiber. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201 **b.** Connect one end of the fiber to the OSA input, and the other end to the C BAND OUT (or L BAND OUT) port on the PBE. **c.** Make sure to have the information about the band power level measurements (from step 5). If any of these measurements don't make sense, or if you know the PBE being replaced is defective (this could lead to incorrect power levels), stop this procedure and contact the network manager to get the original power target per band before proceeding to the next step.

—continued—

Procedure 2-23 (continued)
Replacing a PBE

Step	Action

d. You will need the following information to adjust the power level in the replacement PBE:

If on the OSA you are connected to	**Then** adjust the OSA setting, using a 2 mm flat screwdriver for mVOA, to achieve the power level associated with
the C BAND OUT port	Band 1 (1528.77 nm to 1533.47 nm) Band 2 (1538.19 nm to 1542.94 nm) Band 3 (1547.72 nm to 155.52 nm), and Band 4 (1557.36 nm to 1562.23 nm)
the L BAND OUT port	Band 5 (1570.42 nm to 1575.37 nm) Band 6 (1580.35 nm to 1585.36 nm) Band 7 (1590.31 nm to 1595.49 nm), and Band 8 (1600.60 nm to 1605.73 nm)

Note: To increase attenuation, turn the mVOA screwdriver clockwise. To decrease attenuation, turn the mVOA screwdriver counter-clockwise. Turning the mVOA screwdriver too much will put the power out of the mVOA range.

e. Once the mVOA equalization adjustments for the C-band (or L-band) are complete, disconnect the fiber from the PBE output port (C BAND OUT or L BAND OUT).

f. Repeat step a. to step e. for the remaining output ports on the ECT (C BAND OUT or L BAND OUT, which you took band measurements from in step 5).

—continued—

Procedure 2-23 (continued)
Replacing a PBE

Step	Action
19	Depending on your PBE type, reconnect all the remaining fibers int he PBE, identified as C BAND OUT, or L BAND OUT. The fibers to connect are the ones routed from the front of the PBE module. Use the labels on the fibers to guide you during reconnection. To have easier access to the fiber connections, lift the pull-up tabs on the top of each bulkhead. You will need to remove the protection dust caps on the fibers before reconnecting to the PBE ports. You might also have to remove the protective connector caps on the PBE module. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
20	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
21	Close the drawer by pressing and holding the locking tabs on the sides of the drawer while you slide the it into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
22	Put the appropriate East or West label sticker on the faceplate of the drawer.
23	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.
24	**If** your traffic was — **Then** protected (a traffic switch was executed in step 1) — Reroute traffic back to the original span for the PBE. Make sure that the force and manual switches are removed. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310. unprotected (a traffic switch was not executed in step 1) — you have completed this procedure

—end—

Procedure 2-24
Replacing an Optical Trunk Switch

Follow this procedure to replace an Optical Trunk Switch (OTS) module.

This is a service-affecting procedure. The OTS is a standalone component that provides optical line protection for Optical Metro 5100/5200 unamplified point-to-point configurations. When you replace an OTS, traffic will be lost because both primary and standby fiber pairs are disconnected so no redundant optical fiber path is available during the duration of this procedure.

For more information about the Optical Trunk Switch, refer to the "Optical Trunk Switch" section in *Hardware Description,* 323-1701-102.

—continued—

Procedure 2-24 (continued)
Replacing an Optical Trunk Switch

Requirements

Table 2-25 lists the tools and materials you need to replace an Optical Trunk Switch.

Table 2-25
Tools and materials for replacing an Optical Trunk Switch

Item	Quantity	Supplied
Optical Trunk Switch mounting brackets (NTUG90AK) ***Note:*** For easier identification, each type of bracket is labelled with a letter as indicated below: • 19-inch racks with wide or universal hole spacing (A) • 19-inch racks with 25-mm hole spacing (B) • 23-inch racks with wide or universal hole spacing (C) • 23-inch racks with 25-mm hole spacing (D) • 535-mm racks or cabinets with 25-mm hole spacing (E)	1 set of each	Installed
Phillips screwdriver	1	No
Phillips pan head screws 6-32 x 3/8 inch with external lock washers (for attaching mounting brackets to the Optical Trunk Switch)	8	Installed
Phillips screws with external lock washers (for mounting the Optical Trunk Switch in the rack)	4	Yes
Grounding lug	2	No
10 AWG wire (for grounding)	1	No

—continued—

Procedure 2-24 (continued)
Replacing an Optical Trunk Switch

Precautions

CAUTION
Risk of service interruption
This is a service-affecting procedure. When you replace an Optical Trunk Switch module, the traffic cannot be switched, and traffic will be lost.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

Action

Step	Action
1	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.

—continued—

Procedure 2-24 (continued)
Replacing an Optical Trunk Switch

Step	Action
2	Ensure that all power is off before disconnecting the power connections to the Optical Trunk Switch. ***Note:*** Turn off the power source providing DC power to the Optical Trunk Switch. This can be either the 3U APRA rectifier or a secondary distribution panel (SDP). Power control should be controlled using a Breaker Interface Panel (BIP). Power distribution is controlled by turning off the breaker connected to the Optical Trunk Switch.
3	Locate the power terminal block on the back right side of the Optical Trunk Switch. See Figure 2-22 for power terminal block locations.

Figure 2-22
Rear view of an Optical Trunk Switch

OM1299p

4	Disconnect the A and B power source on the Optical Trunk Switch.
5	Locate the alarm block on the back right side of the Optical Trunk Switch.
6	Disconnect all the connections made on the alarm block on the Optical Trunk Switch. ***Note:*** To facilitate the reconnection later in this procedure, each wire connected to the alarm block should be properly and clearly labelled before disconnecting.
7	If applicable, disconnect the data communication cable at the back left side of the Optical Trunk Switch.
8	Locate the primary ground at the back left side of the Optical Trunk Switch. See Figure 2-22 for grounding locations.
9	Disconnect the system grounding point on the Optical Trunk Switch.

—continued—

Procedure 2-24 (continued)
Replacing an Optical Trunk Switch

Step	Action
10	Make sure all the patch cords connected to the powers on the front panel have been properly labelled. Disconnect all the following ports: OTS OUT, OTS IN, PRI Tx, PRI Rx, STNBY Tx, STNBY Rx Put protective caps on the ends of the patch cords to protect them from contamination and damage.
11	Gently remove the disconnected patch cords and let then hang on side of the shelf. Ensure each fiber is protected by a dust cap.

ATTENTION
Make sure that the Optical Trunk Switch is adequately supported while you are removing it from the rack.

12	Remove the screws from the mounting bracket that is holding the left side of the module to the rack.
13	Remove the screws from the mounting bracket that is holding the right side of the module to the rack.
14	Lift the module out of the rack and place it on an antistatic surface.
15	Remove the replacement Optical Trunk Switch from its packaging, and ensure that its PEC matches with the PEC of the Optical Trunk Switch that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
16	Place the Optical Trunk Switch on a hard, level surface with the front facing toward you.
17	Remove the mounting brackets that are installed on the V. These brackets are not for use on the Optical Metro 5200. ***Note:*** Do not use the factory installed mounting brackets. Replace them with the correct mounting brackets listed in Table 2-25 to avoid damaging the equipment.
18	Select the appropriate mounting brackets from the NTUG90AK bracket mounting kit (see Table 2-25).
19	With the front panel toward you, start on the right side of the Optical Trunk Switch. Attach one mounting bracket against the holes for front-mounting or mid-mounting.
20	Insert and tighten the four screws.
21	Repeat step 19 and step 20 for the left side of the Optical Trunk Switch.
22	Support the Optical Trunk Switch in position on the equipment rack. On one side of the rack, insert and tighten one screw into the mounting bracket and rack rail holes. Insert and tighten the rest of the screws.

—continued—

Procedure 2-24 (continued)
Replacing an Optical Trunk Switch

Step	Action
23	Reconnect the fibers to the Optical Trunk Switch for the following ports: OTS OUT, OTS IN, PRI Tx, PRI Rx, STNBY Tx, STNBY Rx The fibers to connect are the ones disconnected in step 10). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the Optical Trunk Switch. You might also have to remove the protective connector caps on the ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
24	Reconnect the system grounding point (FGND) at the back left side of the Optical Trunk Switch (that you removed in step 9). See Figure 2-22 for grounding locations.
25	If applicable, reconnect the data communication cable at the back left side of the Optical Trunk Switch (that you removed in step 7).
26	Reconnect the wires at the alarm block at the back of the Optical Trunk Switch (the ones removed in step 6). ***Note:*** For more details, refer to Procedure 6-3 "Connecting alarms on the Optical Trunk Switch" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
27	Reconnect the A and B power source on the Optical Trunk Switch (the ones removed in step 4). ***Note:*** For more details, refer to Procedure 5-4 "Connecting power leads to the Optical Trunk switch" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
28	Turn on the power source providing DC power to the Optical Trunk Switch. This can be either the 3U APRS rectifier or a secondary distribution panel (SDP). Power control should be controlled using a Breaker Interface Panel (BIP).
29	Ensure that the primary path is the active path (PRI ACT indicator lamp should be lit green). This applies to both Optical Trunk Switches (the one that was replaced and the one at the other end of the path).
30	Ensure the operation mode is set to Automatic (*AUTO/MAN indicator lamp should be lit with a green LED). This applies to both Optical Trunk Switches (the one that was replaced and the one at the other end of the path).
31	In the System Manager, make sure the only active alarms on the system match those noted in step 1. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.

—end—

Procedure 2-25
Replacing an ETS Switch module

Follow this procedure to replace an ETS Switch module.

For more information about the ETS, refer to the "Enhanced Trunk Switch" section in *Hardware Description*, 323-1701-102, and the "Enhanced Trunk Switch OAM&P" section in *Provisioning and Operating Procedures*, 323-1701-310.

This chapter presents many TL1 commands in detail so that each will execute successfully. If you have any problem or require more information on ETS TL1 commands, refer to the *TL1 Interface, Part 4 of 4*, 323-1701-190.

Requirements

Table 2-26 lists the tools and materials you need to replace an ETS Switch module.

Table 2-26
Tools and materials for replacing an ETS Switch module

Item	Quantity	Supplied
Replacement ETS Switch module (see Note 1 and Note 2)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
Note 1: The replacement ETS Switch module must have the same software load as the existing module. ***Note 2:*** For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-25 (continued)
Replacing an ETS Switch module

The ETS Switch module stores the following persistent configuration data on the module itself:

- Switch mode (SWMODE): default is FIXED
- Absolute Switching Level Threshold (ASLTH): default is -35 dBm
- Upper Window Switching Range (UWSR): default is 6 dB
- Lower Window Switching Range (LWSR): default is 6 dB
- Revertive switching mode (RVRTV): default is N
- Automatic Protection Switching (APS): default is ON

Note: The Reference Power Level (RPL) is also stored on the module; however, this parameter is set using the 'THR/PRI/SEC' button on the front panel and not using a TL1 command.

The general procedure for replacing an ETS Switch module is as follows:

1 Log into the ETS Comms module.

2 Retrieve and record all configurable settings.

3 Remove the ports and module from service.

4 Disconnect fibers and remove the existing ETS Switch module.

5 Insert the replacement module and connect the fibers.

6 Push the 'THR/PRI/SEC' push button on the ETS Switch module to set the reference power level.

7 Push the 'INIT' button on the ETS Comms module to refresh the shelf inventory.

8 Wait 30 seconds to one minute for the ETS Comms module to restore communications with the replacement ETS Switch module.

9 Enter all configurable settings, using TL1 commands, that do not match factory defaults.

10 Log out of the ETS Comms module.

—continued—

Procedure 2-25 (continued)
Replacing an ETS Switch module

Precautions

CAUTION
Risk of service interruption
This is a service-affecting procedure. When you replace an ETS Switch module, traffic cannot be switched, and traffic will be lost because both primary and standby fiber pairs are disconnected so no redundant optical fiber path is available for the duration of this procedure.

CAUTION
Risk of losing events logs
The ETS Switch module stores events logs in Flash memory. This information is lost after replacing the module.

Invoke the RTRV-LOG TL1 command to retrieve the event logs and save them for future reference.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling modules. Refer to "Handling modules" on page 2-4 in this book.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

—continued—

Procedure 2-25 (continued)
Replacing an ETS Switch module

Action

Step	Action

ATTENTION

This procedure includes steps that contain TL1 commands that sometimes require a value for TID, AID and CTAG. If the subsequent steps require a value for these parameters, note the following.

The value of the ETS Switch module's <tid> assigned in the steps below is "TID001" to make it easy to identify this parameter. If you do not know the actual <tid>, invoke the RTRV-TIDS command and substitute "TID001" with the obtained <tid>.

Since the ETS Switch module is always installed in slot 2, the value for <aid> is always "1-2".

The value of the <ctag> assigned in the subsequent steps is "CTAG" to make it easy to identify this parameter.

Every TL1 command invoked returns a response. If the response does not return COMPLD ("Completed" is the normal response) or contain DENY (error response), re-try the TL1 command or refer to *TL1 Interface, Part 4 of 4*, 323-1701-190, for support.

Capture relevant settings on the existing ETS Switch module

1 Log into the ETS Shelf:

```
>act-user::SUPERUSER:CTAG::Sup%9User;
```

—continued—

Procedure 2-25 (continued)
Replacing an ETS Switch module

Step	Action

2 Retrieve the provisionable parameters and record the values in Table 2-27 on page 2-164:

```
>rtrv-eqpt:TID001:1-2:CTAG;
```

Note: The response to this command contains pertinent provisionable parameters such as APS, SWMODE, RVRTV, ASLTH, UWSR and LWSR.

Table 2-27
Provisionable switch module parameters

Parameter	Default	Current value
APS	ON	
SWMODE	FIXED	
RVRTV	N	
ASLTH	-35	
UWSR	6	
LWSR	6	

Replace the existing ETS Switch module

When you remove the ports and module from service, this clears any standing alarms raised against them. This also prevents further alarms from being raised against them and prevents the generation of unwanted alarm messages when fibers are disconnected in the next step.

In order to take an ETS Switch module out-of-service (OOS), you must take both of its ports OOS. Always take the ports OOS before taking the module OOS.

3 Remove the ports and module from service:

Primary port:

```
>rmv-och::1-2-1:CTAG::,;
```

Secondary port:

```
>rmv-och::1-2-2:CTAG::,;
```

Equipment

```
>rmv-eqpt::1-2:CTAG::,;
```

—continued—

Procedure 2-25 (continued)
Replacing an ETS Switch module

Step	Action

ATTENTION
Keep track of fibers as they are disconnected by ensuring that they are labelled. They must be reconnected to the same ports on the replacement ETS Switch module.

ATTENTION
When the module is removed, a major CARD-MISSING alarm is generated against the slot from which it was removed. This alarm is cleared when the replacement module is inserted into the same slot.

4 Disconnect all fibers from the existing ETS Switch module. Ensure the fibers are properly labelled.

5 Replace the original ETS Switch module with the replacement ETS Switch module.

Note: Refer to Procedure 7-3 "Installing an ETS Switch module in an ETS shelf" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201, for details on how to handle the module and insert it into the ETS Shelf.

6 Reconnect each fiber to the same port that it was previously connected to on the previous ETS Switch module.

7 Press the 'THR/PRI/SEC' button on the front panel of the ETS Switch module once to calibrate the reference power level on both optical inputs.

Note: To manually set the reference power level, a valid signal must be present on both the primary and secondary paths and the module must be in automatic mode.

8 Press the 'INIT' button on the front panel of the ETS Comms module to refresh the shelf inventory and reset LEDs, alarms, etc.

Note: During initialization, the ETS Comms module checks for internal hardware errors and loss of signal on the ports. Also, the module and all its ports start up in-service by default but if any errors occur during initialization, the module starts up out-of-service.

9 Wait approximately one minute for communications between the ETS Switch module and the ETS Comms module to be restored.

—continued—

Procedure 2-25 (continued)
Replacing an ETS Switch module

Step	Action

Provision relevant settings on the replacement ETS Switch module

ATTENTION
The default values for all provisionable settings are described at the beginning of this document and also listed in Table 2-27 on page 2-164. It is only necessary to configure settings that differ from these defaults.

10 Configure the ETS Switch module settings according to the values recorded in Table 2-27 on page 2-164 from the ETS Switch module that was removed. For example:

a. Set the Automatic Protection Switching (APS) parameter, if necessary.

```
>ed-eqpt:TID001:1-2:CTAG:::APS=ON;
```

b. Set the switch mode (SWMODE), if necessary.

```
>ed-eqpt:TID001:1-2:CTAG:::SWMODE=FIXED;
```

c. Set the Revertive Switch Mode (RVRTV) parameter, if necessary.

```
>ed-eqpt:TID001:1-2:CTAG:::RVRTV=Y;
```

d. Set the absolute switching level threshold (ASLTH), if necessary.

```
>ed-eqpt:TID001:1-2:CTAG:::ASLTH=-35;
```

e. Set the upper window switching range (UWSR), if necessary.

```
>ed-eqpt:TID001:1-2:CTAG:::UWSR=6;
```

f. Set the lower window switching range (LWSR), if necessary.

```
>ed-eqpt:TID001:1-2:CTAG:::LWSR=6;
```

11 Log out of the ETS Shelf.

```
>canc-user:TID001:SUPERUSER:CTAG;
```

—end—

Procedure 2-26
Replacing an ETS Comms module

Follow this procedure to replace an ETS Comms module.

For more information about the ETS, refer to the "Enhanced Trunk Switch" section in *Hardware Description*, 323-1701-102, and the "Enhanced Trunk Switch OAM&P" section in *Provisioning and Operating Procedures*, 323-1701-310.

This chapter presents many TL1 commands in detail so that each will execute successfully. If you have any problem or require more information on ETS TL1 commands, refer to the *TL1 Interface, Part 4 of 4*, 323-1701-190.

Requirements

Table 2-28 lists the tools and materials you need to replace an ETS Comms module.

Table 2-28
Tools and materials for replacing an ETS Comms module

Item	Quantity	Supplied
Replacement ETS Comms module (see Note 1 and Note 2)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note 1: The replacement ETS Comms module must have the same software load as the existing module. ***Note 2:*** For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

The ETS Comms module stores persistent configuration data in two places: on the ETS Shelf and on the ETS Comms module itself.

The following information is stored on the ETS Shelf and; therefore, will not be lost:

- the superuser account information (userid, pid, privileges)
- the Tid
- the shelf IP, subnet mask, and gateway addresses

—continued—

Procedure 2-26 (continued)
Replacing an ETS Comms module

The remainder of the persistent configuration information is stored on the ETS Comms module itself. Therefore, before replacing the ETS Comms module, the following information must be collected from the existing module:

- Security warnings using the RTRV-ATTR-SECULOG command
- Session timeout settings using the RTRV-EQPT command
- SNMP settings using the RTRV-EQPT command
- User profiles using the RTRV-USER-SECU command
- User profile inhibits using the RTRV-STATUS command
- Alarm/event attributes using the RTRV-ATTR-ALL command
- Alarm/event inhibits using the RTRV-COND-ALL command
- Security alarm/event attributes using the RTRV-ALM-SECU command

The general procedure for replacing an ETS Comms module is as follows:

1 Log into the existing ETS Comms module.

2 Retrieve and record all possible configurable settings that will not survive replacement.

3 Log out of the existing ETS Comms module.

4 Replace the existing ETS Comms module.

5 Log into the new ETS Comms module.

6 Enter all configurable settings so that the new ETS Comms module settings match the replaced module's settings.

7 Log out of the new ETS Comms module.

—continued—

Procedure 2-26 (continued)
Replacing an ETS Comms module

Precautions

CAUTION
Risk of losing security and system events logs
The ETS Comms module stores security and system events logs in Flash memory. This information is lost after replacing the ETS Comms module.

Invoke the RTRV-LOG TL1 command to retrieve the event logs and save them for future reference.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling modules. Refer to "Handling modules" on page 2-4 in this book.

—continued—

Procedure 2-26 (continued)
Replacing an ETS Comms module

Action

Step	Action

ATTENTION

This procedure includes steps that contain TL1 commands that sometimes require a value for TID, AID and CTAG. If the subsequent steps require a value for these parameters, note the following.

The value of the ETS Switch module's <tid> assigned in the steps below is "TID001" to make it easy to identify this parameter. If you do not know the actual <tid>, invoke the RTRV-TIDS command and substitute "TID001" with the obtained <tid>.

The <aid> for the ETS Comms module is always "1-C".

The value of the <ctag> assigned in the subsequent steps is "CTAG" to make it easy to identify this parameter.

Every TL1 command invoked returns a response. If the response does not return COMPLD ("Completed" is the normal response) or contain DENY (error response), re-try the TL1 command or refer to *TL1 Interface, Part 4 of 4*, 323-1701-190, for support.

Capture relevant settings on the existing ETS Comms module

1 Log into the existing ETS Comms module.

```
>act-user::SUPERUSER:CTAG::Sup%9User;
```

2 Retrieve and record the security warnings and event logs

```
>rtrv-attr-seculog:TID001:1-C:CTAG;
```

Note 1: The security warning message that displays before a session is initiated is enclosed in escaped quotes (for example: /* WARNING NOTICE : This system is restricted ... */).

Note 2: A list of security log events to be logged are delimited by an ampersand (&). Refer to *TL1 Interface, Part 4 of 4*, 323-1701-190, for details on the RTRV-ATTR-SECULOG TL1 command.

—continued—

Procedure 2-26 (continued)
Replacing an ETS Comms module

Step	Action
3	Retrieve the session timeout setting and, if SNMP was enabled on the original ETS Comms module, retrieve the SNMP related settings such as SNMP trap and SNMP trap destination. Refer to Table 2-29 on page 2-175 for a listing of settings to capture and proceed to record them in the same table. `>rtrv-eqpt:TID001:1-C:CTAG;`
4	If additional users (other than the superuser) were created on the original ETS Comms module, retrieve the user account profiles and record them in Table 2-30 on page 2-175. ***Note:*** The RTRV-USER-SECU command returns the security parameters associated with a user except the user's password. `>rtrv-user-secu:TID001::CTAG;`
5	If one or more user accounts were inhibited on the original ETS Comms module, determine which user accounts were inhibited and record them in Table 2-30 on page 2-175 ***Note 1:*** The RTRV-STATUS command returns a list of users currently logged in as well as a list of users that are inhibited. Refer to the RTRV-STATUS command details in *TL1 Interface, Part 4 of 4*, 323-1701-190 on how to disect the response to obtain the inhibited user ids. ***Note 2:*** If no users were inhibited, record "N" for each uid in Table 2-30 on page 2-175. `>rtrv-status:TID001::CTAG;`
6	Retrieve and record all alarms/events along with their attributes. `>rtrv-attr-all:TID001:1-C:CTAG::,,,,;`
7	If one or more alarms/events were inhibited on the original ETS Comms module, retrieve the inhibited alarms/events and record them. `>rtrv-cond-all:TID001:1-C:CTAG::,,,;` ***Note 1:*** The command returns a list of non-alarmed events from which you can obtain the inhibited alarms/events. Refer to the RTRV-COND command details in *TL1 Interface, Part 4 of 4*, 323-1701-190. ***Note 2:*** If no users were inhibited, record "N" for each uid in Table 2-30 on page 2-175.

—continued—

Procedure 2-26 (continued)
Replacing an ETS Comms module

Step	Action
8	Retrieve and record all security alarms/events and record them along with their attributes. `>RTRV-ALM-SECU:TID001:1-C:CTAG;`
9	Log out of the existing ETS Comms module. `>canc-user:`*`TID001`*`:SUPERUSER:`*`CTAG`*`;`

Replace the ETS Comms module

10	Replace the original ETS Comms module with the replacement ETS Comms module. ***Note:*** Refer to Procedure 7-2 "Installing an ETS Comms module in an ETS shelf" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201, for details on how to handle the module and insert it into the ETS Shelf.

Copy relevant settings to the replacement ETS Comms module

11	Log into the replacement ETS Comms module. `>act-user::SUPERUSER:`*`CTAG`*`::Sup%9User;`
12	Set the security warnings, if the default setting has been changed. For example: `>set-attr-seculog:`*`TID001`*`:1-C:`*`CTAG`*`::WARN="`*`This should be the same warning message that was recorded in step 2.`*`",;`
13	Set the date and time. For example: `>ed-dat:`*`TID001`*`::`*`CTAG`*`::04-03-13,11-15-00;`

14	Configure the replacement ETS Comms module's settings according to the values recorded in Table 2-29 on page 2-175 if different from the default setting. For example:
	a. Set the session timeout parameter, if necessary.
	`>ed-eqpt:`*`TID001`*`:1-C:`*`CTAG`*`:::SESSIONTMOUT=15;`
	b. Enable SNMP, if necessary.
	`>ed-eqpt:`*`TID001`*`:1-C:`*`CTAG`*`:::SNMP=ENABLED;`

—continued—

Procedure 2-26 (continued)
Replacing an ETS Comms module

Step	Action
	c. Enable SNMP traps, if necessary. `>ed-eqpt:`*`TID001`*`:1-C:`*`CTAG`*`:::SNMPTRAPS=ENABLED;`

	d. Set the SNMP trap destinations, if necessary.
	`>ed-eqpt:`*`TID001`*`:1-C:`*`CTAG`*`:::SNMPTRAPDEST1=172.19.14.101;`
	`>ed-eqpt:`*`TID001`*`:1-C:`*`CTAG`*`:::SNMPTRAPDEST2=172.19.14.102;`
	`>ed-eqpt:`*`TID001`*`:1-C:`*`CTAG`*`:::SNMPTRAPDEST3=172.19.14.103;`
	`>ed-eqpt:`*`TID001`*`:1-C:`*`CTAG`*`:::SNMPTRAPDEST4=172.19.14.104;`

15	Reset the ETS Comms module for the SNMP configuration to take effect. `>INIT-SYS:`*`TID001`*`:1-C:`*`CTAG`*`::0;`
16	If additional users (other than the superuser) were created on the original ETS Comms module, set the user account profiles based on Table 2-30 on page 2-175. For example: `>ent-user-secu:`*`TID001`*`:CRAFTUSER:`*`CTAG`*`::WELCOME%1,,S5&P5&PM1&M5&T5:PAGE=60,PCND=7,PCNN=3,UOUT=90;`
17	Refer to Table 2-30 on page 2-175 to determine if one or more user accounts were inhibited on the original ETS Comms module. If necessary, inhibit the appropriate user account. For example: `>inh-user-secu:`*`TID001`*`:1-C:`*`CTAG`*`::CRAFTUSER;`
18	If default alarm/event attributes have been changed on the original ETS Comms module, set the alarm/event attributes. For example: `set-attr-`*`xxxx`*`:`*`TID001`*`:1-C:`*`CTAG`*`::MJ,PWR,,,;` ***Note:*** Replace xxxx by either EQPT or COM depending on the type of alarm/event attribute that you must modify.
19	If one or more alarms/events were inhibited on the original ETS Comms module, set the alarm/event inhibits. For example: `>inh-msg-`*`xxxx`*`:`*`TID001`*`:1-C:`*`CTAG`*`::NA,LOGBUFR90-EVTLOG,;` ***Note:*** Replace xxxx by either EQPT or COM depending on the type of alarm/event attribute that you must modify.

—continued—

Procedure 2-26 (continued)
Replacing an ETS Comms module

Step	Action
20	If default security alarm attributes (that is, alarm severity, alarm message) were changed on the original ETS Comms module, set the security alarm/event attributes. For example: `>set-attr-secualm:`*`TID001`*`:1-c:`*`CTAG`*`::MN,LOGBUFR90-SECULOG, MESSAGE,,"Log Buffer 90 percent Full";`
21	If one or more security alarm messages were inhibited on the original ETS Comms module, set the security alarm/event inhibits. For example: `>inh-msg-secu:`*`TID001`*`:1-C:`*`CTAG`*`::LOGBUFR90-SECULOG;` ***Note:*** Since there is no way to determine which security alarms/events have been inhibited prior to replacing the ETS Comms module, contact your network administrator for a listing of which security events/alarms that need to be inhibited.
22	Log out of the replacement ETS Comms module. `>canc-user:`*`TID001`*`:SUPERUSER:`*`CTAG`*`;`

—continued—

Procedure 2-26 (continued)
Replacing an ETS Comms module

Table 2-29
Provisionable ETS Comms module parameters

Parameter	Default	Current value
Session Timeout	35	
SNMP	disabled	
SNMP Traps	disabled	
SNMP Traps Destination 1	0.0.0.0	
SNMP Traps Destination 2	0.0.0.0	
SNMP Traps Destination 3	0.0.0.0	
SNMP Traps Destination 4	0.0.0.0	

Table 2-30
User accounts

uid	uap					Parameter block				User inhibited
	S	P	PM (see Note)	M	T	PAGE	PCND	PCNN	UOUT	Y/N
			1							
			1							
			1							
			1							
			1							
			1							

Note: Although PM may display a value other than 1, you do not need to record it as it is not supported. If you need to provide a value for PM in step 16 (ent-user-secu), always use 1.

—end—

Procedure 2-27
Replacing an ETS fan module

Follow this procedure to replace an ETS fan module.

ATTENTION
The ETS fan module must be replaced within 96 hours, in the case of a single fan failure, or within 24 hours, in the case of a double fan failure.

ATTENTION
You must keep the ETS Shelf air inlets and outlets clean and unobstructed to prevent the risk of overheating. The ETS fan module is required to cool the ETS Shelf.

For more information about the ETS, refer to the "Enhanced Trunk Switch" section in *Hardware Description*, 323-1701-102.

Requirements

Table 2-31 lists the tools and materials you need to replace an ETS fan module.

Table 2-31
Tools and materials for replacing an ETS fan module

Item	Quantity	Supplied
Replacement ETS fan module (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Phillips screwdriver	1	No
Note: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Precautions

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling modules. Refer to "Handling modules" on page 2-4 in this book.

—continued—

Procedure 2-27 (continued)
Replacing an ETS fan module

CAUTION
Risk of equipment damage
The two cable harnesses that connect the fan module to the ETS Shelf are installed by the manufacturer. The harnesses are accessible through the fan cavity in the ETS Shelf.

Be careful not to damage or disconnect the cables when you pull them out of the unit.

Action

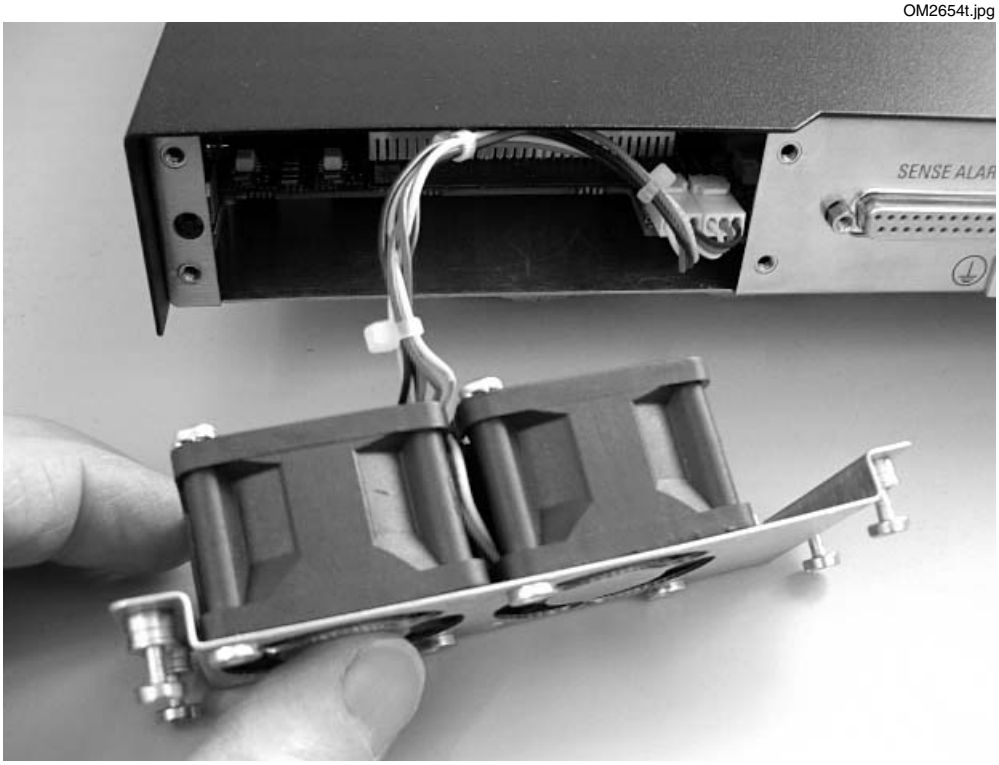
Step	Action
1	Locate the fan module cover plate on the rear, left side of the ETS Shelf, as shown in Figure 2-23.
2	Remove the four screws in the cover plate and detach the cover plate from the shelf. This ensures that the power supply to the fan cables is shut off.
3	Inside the fan cavity, gently pull the two cable harnesses free of the unit.
4	Remove the replacement fan module from its packaging and replace the appropriate fan module.
5	Re-attach the two cable harnesses inside the fan cavity that were previously removed in step 3. ***Note:*** In the next step, ensure that the two cable harnesses slide over the top of the backplane connector and that you do not pinch or crush them.
6	Replace the cover plate using the screws that were previously removed. This restores the power supply to the fan module. When power is restored, the fans should start. If either red Fan Fail LED is lit, see "Troubleshooting the Enhanced Trunk Switch" in *Trouble Clearing and Alarm Reference Guide*, 323-1701-542.

—continued—

Procedure 2-27 (continued)
Replacing an ETS fan module

Figure 2-23
Replacing the ETS fan module

OM2654t.jpg



—end—

Procedure 2-28
Replacing the air filter in an ETS Shelf

Follow this procedure to replace the air filter in an ETS Shelf.

ATTENTION
You must replace the ETS air filter at least once a year to maintain optimum cooling of the shelf components. In some sites the air filter may need to be replaced more frequently.

For more information about the ETS, refer to the "Enhanced Trunk Switch" section in *Hardware Description*, 323-1701-102.

Requirements

Table 2-32 lists the tools and materials you need to replace the air filter in an ETS Shelf.

Table 2-32
Tools and materials for replacing the air filter in an ETS Shelf

Item	Quantity	Supplied
Replacement ETS air filter (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Precautions

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling modules. Refer to "Handling modules" on page 2-4 in this book.

—continued—

Procedure 2-28 (continued)
Replacing the air filter in an ETS Shelf

Action

Step	Action

Removing the old air filter

1 Pull the plunger on the filter cover to unlock it (see Figure 2-24).

2 Remove the air filter.

Inserting the new air filter

3 Insert a new air filter.

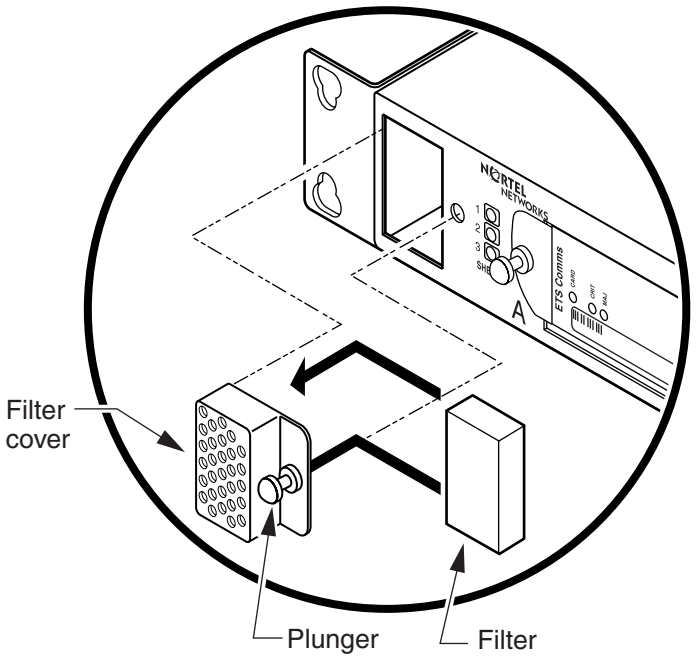
4 Align the tab on the filter cover with the side slot behind the faceplate.

5 Align the Nylatch fastener with the faceplate hole.

6 Push the plunger to lock the filter cover in place.

Figure 2-24
Replacing the ETS air filter

OM2669t



—end—

Procedure 2-29
Replacing the fuses in an ETS Shelf

Follow this procedure to replace the fuses in an ETS Shelf.

For more information about the ETS, refer to the "Enhanced Trunk Switch" section in *Hardware Description*, 323-1701-102.

Requirements

Table 2-32 lists the tools and materials you need to replace the fuses in an ETS Shelf.

Table 2-33
Tools and materials for replacing the fuses in an ETS Shelf

Item	Quantity	Supplied
Replacement ETS fuse (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Action

Step	Action
1	Remove the fuse from the back of the ETS Shelf by pulling out first the transparent plastic fuse cap and then the fuse. ***Note:*** Fuses for the ETS Shelf power supply are located on the back of the shelf, one fuse for each power supply (A and B). See Figure 2-25 for the fuse location.
2	Insert the replacement fuse (see Figure 2-26) and then the transparent plastic fuse cap (see Figure 2-27).

—continued—

Procedure 2-29 (continued)
Replacing the fuses in an ETS Shelf

Figure 2-25
ETS fuse location

OM2655t.jpg

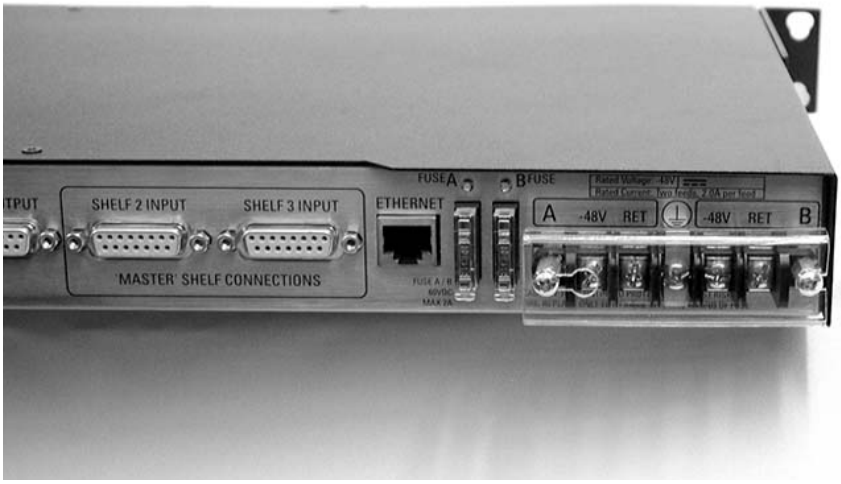
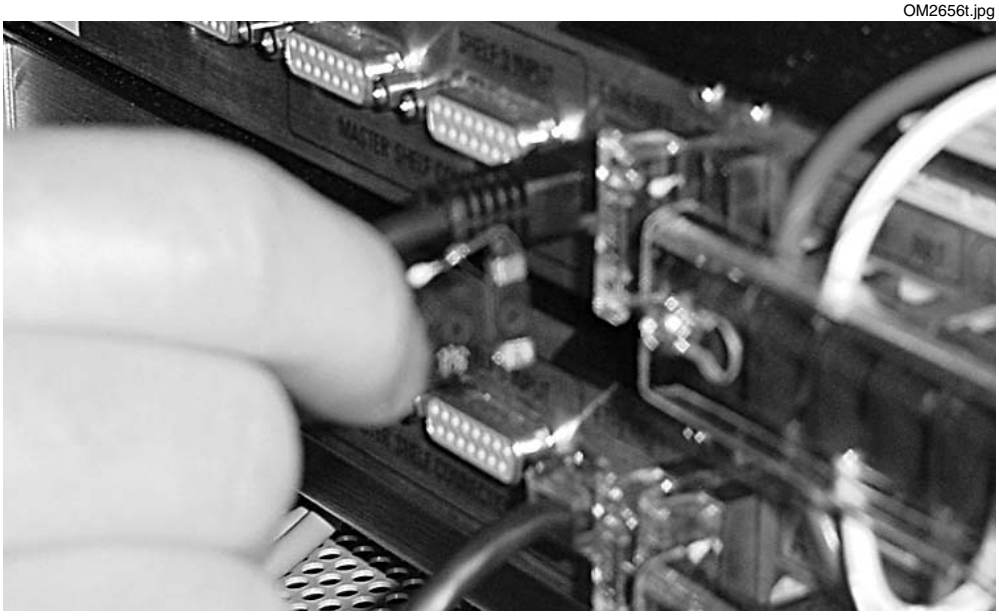


Figure 2-26
Inserting the replacement ETS fuse

OM2656t.jpg

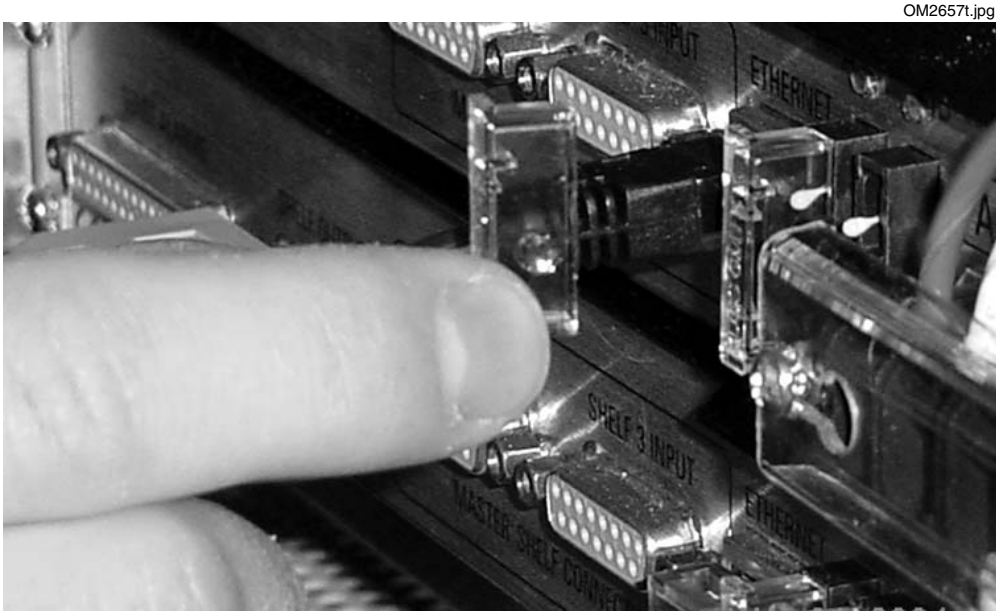


—continued—

Procedure 2-29 (continued)
Replacing the fuses in an ETS Shelf

Figure 2-27
Inserting the transparent plastic fuse cap

OM2657t.jpg



—end—

Procedure 2-30
Replacing a 1U APRS rectifier module

Follow this procedure to replace a 1U APRS rectifier module.

Note: If a fan in the module fails, you must replace the module.

Requirements

Table 2-34 lists the tools and materials you need to complete this procedure.

Table 2-34
Tools and materials needed to complete this procedure

Item	Quantity	Supplied
1U APRS rectifier module (see Note)	1	no
Small Phillips screwdriver	1	no
3/32-inch slot screwdriver	1	no
Note: For the product engineering codes for the 1U APRS rectifier module, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Precautions

DANGER
Risk of personal injury
Make sure that all power to the rectifier is off before you make connections on the terminal block. Do not handle live wires. If you handle live wires you can cause personal injury, damage to equipment, or both.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

—continued—

Procedure 2-30 (continued)
Replacing a 1U APRS rectifier module

Action

Step	Action
1	Turn off the alternating current (ac) power supply to the module you are going to replace. This needs to be done from the power distribution panel of the room or building.
2	Set the switch of the 1U rectifier module you are replacing (left or right) to the Off (O) position. For an illustration of the recitifier modules (left and right), see Figure 22-10 in the "Rectifiers" chapter in *Hardware Description*, 323-1701-102.
3	Using a small Phillips screwdriver, loosen the screw on the stress relief clamp of the ac power cord (the screw is on top of the AC connector, on the left of the rectifier module). See Figure 2-28 on page 2-186.
4	Unplug the ac power cable from the module.

ATTENTION
Be careful not to allow the ends of the DC wires to touch each other, or to come in contact with the surrounding metal areas or the equipment rack.

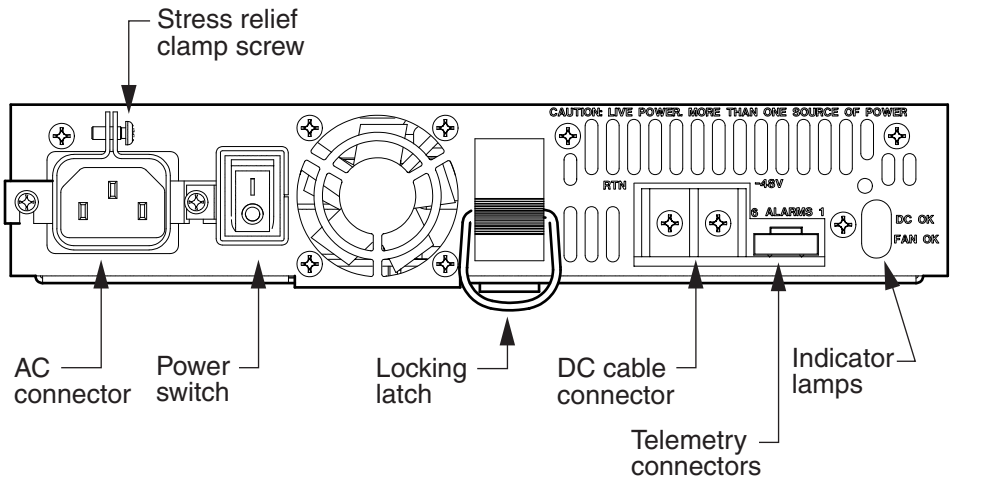
5	Remove the terminal block cover from the front of the module (the transparent plastic cover on top of the DC power cables and the telemetry connectors). **a.** Using a small Phillips screwdriver, remove the screw that secures the cover to the module. The screw is located between the alarms connector and the indicators lamps, on the right side of the module. **b.** Pull the cover away from the module. The cover pivots on a flange on the left side, that is inserted into the grill slot on the left side of the terminal block.
6	Using the 3/32-inch slot screwdriver, disconnect the direct current (dc) power cables from the terminal block on the module.
7	Disconnect the telemetry cable by pressing the latch on top of plug and pulling the plug toward you.
8	Pull up on the locking latch (to unlock), located on the front of the module, and pull the module forward until it is clear of the chassis.
9	Place the module on an antistatic surface.
10	Slide the replacement module into the chassis until the locking latch clicks into place.
11	Using the 3/32-inch slot screwdriver, reconnect the dc power cables to the terminals on the module.

—continued—

Procedure 2-30 (continued)
Replacing a 1U APRS rectifier module

Step	Action
12	Reconnect the telemetry cable. Push the plug to the connector until it clicks into place.
13	Reconnect the ac power cable to the module.
14	Using the small Phillips screwdriver, tighten the screw on the stress relief clamp to secure the cable to the module.
15	Replace the cover over the terminal block (the transparent plastic cover is in an individual plastic bag, if this is a brand new 1U APRS rectifier module). **a.** Insert the flange on the left side of the cover into the grill slot located directly to the left of the terminal block. **b.** Align the hole in the right side of the cover with the screw hole in the module. **c.** Using the small Phillips screwdriver, insert the screw into the hole and tighten the screw.
16	Turn on the ac power supply to the module. This needs to be done from the power distribution panel of the room or building.
17	Set the power switch on the module to the ON (|) position.
18	Check to see that both the DC OK and the FAN OK indicator lamps are green.

Figure 2-28
1U APRS module



—end—

Procedure 2-31
Replacing a 3U APRS rectifier module

Follow this procedure to replace a 3U APRS rectifier module.

Note: If a fan in the module fails, you must replace the module.

Requirements

Table 2-35 lists the tools and materials you need to complete this procedure.

Table 2-35
Tools and materials needed to complete this procedure

Item	Quantity	Supplied
3U APRS rectifier module (see Note)	1	no
Note: For the product engineering codes for the 3U APRS rectifier module, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Precautions

DANGER
Risk of personal injury
Make sure that all power to the rectifier is off before you make connections on the terminal block. Do not handle live wires. If you handle live wires you can cause personal injury, damage to equipment, or both.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

—continued—

Procedure 2-31 (continued)
Replacing a 3U APRS rectifier module

Action

Step	Action
1	Turn off the alternating current (ac) power supply to the module you are going to replace. This needs to be done from the power distribution panel of the room or building.
2	**If** / **Then** you are going to replace the left module — set the PS1 switch to the Off position you are going to replace the right module — set the PS2 switch to the Off position ***Note:*** The switches are located on the right side of the rectifier chassis. See Figure 2-29 on page 2-189.
3	Rotate the locking knob counter-clockwise to unlock the rectifier from the chassis (the locking knob is located on the bottom left side of the rectifier module).
4	Pull the module towards you until it is out of the chassis.
5	Place the module on an antistatic surface.
6	Push the new module firmly to align it against the chassis.
7	Rotate the locking knob clockwise to lock the rectifier in the chassis.

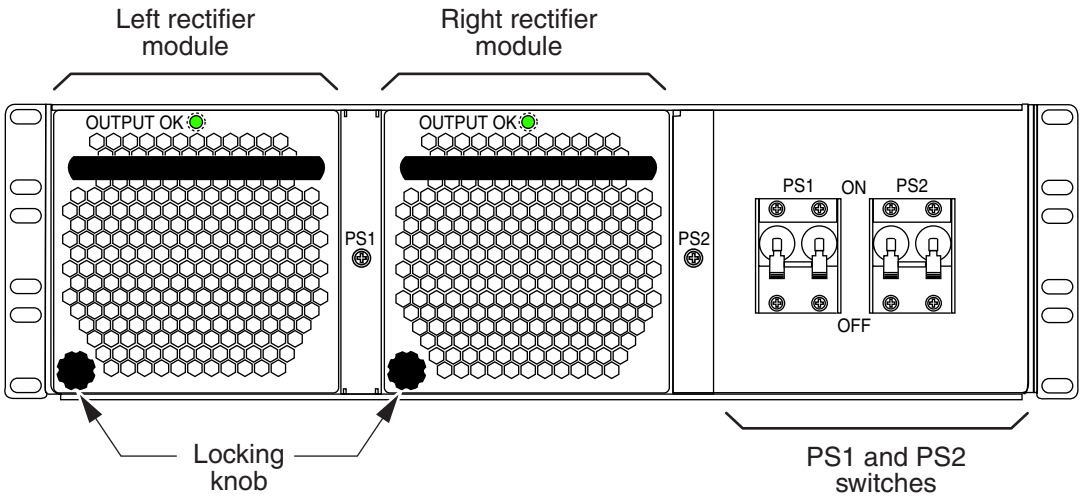
—continued—

Procedure 2-31 (continued)
Replacing a 3U APRS rectifier module

Step	Action	
8	Turn on the ac power supply to the module. This needs to be done from the power distribution panel of the room or building.	
9	**If**	**Then**
	you replaced the left module	set the PS1 switch to the ON position
	you replaced the right module	set the PS2 switch to the ON position
	Note: The switches are located on the right side of the rectifier chassis. See Figure 2-29 on page 2-189.	
10	Check to see that the rectifier is providing power.	

Figure 2-29
Front view of a 3U APRS chassis with two rectifier modules installed

OM1953



—end—

Procedure 2-32
Replacing a 1310 nm splitter/coupler tray within a drawer

Two 1310 nm splitter/coupler trays are required at each site: one for west traffic and one for east traffic. One 1310 nm splitter/coupler drawer contains the required two 1310 nm splitter/coupler trays. This procedure assumes that you only need to replace one of the two trays within the drawer (east or west). If you want to replace both trays, repeat this procedure for the second tray, or replace the entire drawer by following Procedure 2-33 "Replacing a C&L splitter/coupler drawer" in this chapter.

For more information about the 1310 nm splitter/coupler, refer to the "1310 nm splitter/coupler" chapter in *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 2-32 (continued)
Replacing a 1310 nm splitter/coupler tray within a drawer

Requirements

Table 2-36 lists the tools and materials required to complete this procedure.

Table 2-36
Tools and materials for replacing a 1310 nm splitter/coupler tray

Item	Quantity	Supplied
1310 nm splitter/coupler of the same type that is being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
Small Phillips screwdriver	1	no
Note: For the product engineering codes for the 1310 nm splitter/coupler tray, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-32 (continued)
Replacing a 1310 nm splitter/coupler tray within a drawer

Precautions

CAUTION
Risk of service interruption
When you replace a 1310 nm splitter/coupler tray within a drawer, traffic is temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instructions with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-32 (continued)
Replacing a 1310 nm splitter/coupler tray within a drawer

Action

Step	Action
1	Switch traffic off the span for the 1310 nm splitter/coupler you are going to replace, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step.
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
4	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

5	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the splitter/coupler that you are replacing (east or west). Disconnect all the fibers connected to the following ports: OTS OUT, OTS IN, THRU OUT, THRU IN, 1310 nm DROP, 1310 nm ADD. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
6	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
7	Gently remove the disconnected fibers from the fiber guides in the splitter/coupler to remove (east or west). Make sure to not cause damage to the fibers routed for the adjacent splitter/coupler. Leave those fibers hanging on the side of the shelf (they are protected by dust caps).
8	Disconnect the data communication cable (if one is present) from the connector at the front of the splitter/coupler, and completely remove the cable from the splitter/coupler.

—continued—

Procedure 2-32 (continued)
Replacing a 1310 nm splitter/coupler tray within a drawer

Step	Action
9	Take note of the vintage of the optical tray and drawer combination that are currently installed: • a yellow chromate finish tray and a yellow chromate finish drawer • a black painted finish tray and a black painted finish drawer • a black painted finish tray and a yellow chromate finish drawer Select your next step.

If you have the following combination	**Then**
a yellow chromate finish tray and a yellow chromate finish drawer	go to step 10
a black painted finish tray and a black painted finish drawer	go to step 11
a black painted finish tray and a yellow chromate finish drawer	go to step 10

10	Remove the two screws that fasten the 1310 nm splitter/coupler tray to the drawer. The screws are at the front and back of the tray. Make sure that you keep the screws to install the replacement tray. Go to step 12.
11	Remove the screw that fastens the 1310 nm splitter/coupler to the drawer. The screw is located at the back of the 1310 nm splitter/coupler. Make sure that you keep the screw to install the replacement splitter/coupler.
12	Remove the 1310 nm splitter/coupler tray from the drawer and place it on an antistatic surface.
13	Remove the new replacement 1310 nm splitter/coupler tray from its packaging, and ensure that its PEC matches with the PEC of the 1310 nm splitter/coupler that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
14	Take Note of the vintage of the optical tray to be installed • A yellow chromate finish tray • A black painted finish tray

—continued—

Procedure 2-32 (continued)
Replacing a 1310 nm splitter/coupler tray within a drawer

Step	Action

15

CAUTION
Risk of equipment incapability
If you want to install a tray that has a black painted finish into a NT0H57BA drawer that has a yellow chromate finish, then you must use an NT0H57BF tray conversion kit.

Select your next step.

If you have the following combination	**Then**
a yellow chromate finish tray and a yellow chromate finish drawer	step 18
a black painted finish tray and a yellow chromate finish drawer and no conversion plate was previously installed	step 17
a yellow chromate finish tray and a black painted finish drawer	contact your next level of support
a black painted finish tray and a black painted finish drawer	step 19
a black painted finish tray and a yellow chromate finish drawer and a conversion plate was previously installed	step 16

16 Unscrew the four 4-40 flat head screws connecting conversion plate to the underside of the tray

17 Attach conversion plate to the underside of the replacement tray with the four 4-40 flat head screws provided or the four 4-40 flat head screws that you removed in step 16, and go to step 18.

18 Fasten the 1310 nm splitter/coupler tray to the drawer using the two screws that you removed in step 10, and go to step 20.

19 Fasten the optical tray to the drawer by inserting the tab at the front of the tray into the slot on the drawer. Then fasten the tray to the drawer using the same screw that you removed in step 11.

20 Reconnect the data communication cable that you removed in step 8, if one was present, to the 1310 nm splitter/coupler.

21 Re-route in the new splitter/coupler the fiber patch cords hanging on the side of the rack (the ones removed in step 7).

—continued—

Procedure 2-32 (continued)
Replacing a 1310 nm splitter/coupler tray within a drawer

Step	Action
22	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the splitter/coupler for the following ports: OTS OUT, OTS IN, THRU OUT, THRU IN, 1310 nm DROP, 1310 nm ADD. The fibers to connect are the ones that were disconnected and labelled in step 5. Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the ports. You might also have to remove the protective connector caps on the ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
23	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
24	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
25	Close the tray by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
26	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.
27	**If** your traffic was — **Then** protected (a traffic switch was executed in step 1) — Reroute traffic back to the original span for the tray. Make sure that the force and manual switches are removed. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310. unprotected (a traffic switch was not executed in step 1) — you have completed this procedure

—end—

Procedure 2-33
Replacing a 1310 nm splitter/coupler drawer

Follow this procedure to replace a 1310 nm splitter/coupler drawer. If you want to replace only one of the 1310 nm splitter/coupler modules in the drawer, follow Procedure 2-32 "Replacing a 1310 nm splitter/coupler tray within a drawer" on page 2-190 in this chapter.

If the signal is protected (a manual switch is possible), you must perform Procedure 2-32 (replacement of a single 1310 nm splitter/coupler module within the drawer), rather than Procedure 2-33. In a protection switch scenario, one of the two 1310 nm splitter/coupler modules within the drawer (east or west) needs to stay in place while the other module is replaced, because it carries the protected signals.

For more information about the 1310 nm splitter/coupler, refer to the "1310 nm splitter/coupler" chapter in *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 2-33 (continued)
Replacing a 1310 nm splitter/coupler drawer

Requirements

Table 2-37 lists the tools and materials required to complete this procedure.

Table 2-37
Tools and materials for replacing a 1310 nm splitter/coupler drawer

Item	Quantity	Supplied
1310 nm splitter/coupler drawer (see Note)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Small Phillips screwdriver	1	no
Note: For the product engineering codes for the 1310 nm splitter/coupler, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-33 (continued)
Replacing a 1310 nm splitter/coupler drawer

Precautions

CAUTION
Traffic will be lost
When you replace a 1310 nm splitter/coupler drawer, traffic will be lost during the procedure (because both 1310 nm splitter/coupler east and west modules are replaced at the same time). If you have protected signals and you want to avoid losing traffic, perform Procedure 2-32, "Replacing a 1310 nm splitter/coupler tray within a drawer", to replace one 1310 nm splitter/coupler module at a time within a drawer.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-33 (continued)
Replacing a 1310 nm splitter/coupler drawer

Action

Step	Action
1	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
2	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
3	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

4	Lift the pull-up tabs on the top of each bulkhead, and disconnect all the fibers in the 1310 nm splitter/coupler drawer. Disconnect all the fibers connected to the following ports (for both the east and the west 1310 nm splitter/coupler modules): OTS OUT, OTS IN, THRU OUT, THRU IN, 1310 nm DROP, 1310 nm ADD The fibers to disconnect are the ones routed from the back of the 1310 nm splitter/coupler module. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
5	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
6	Gently remove the disconnected fibers from the fiber guides in the drawer (for both east and west 1310 nm splitter/coupler modules). Leave those fibers hanging on the side of the shelf (they are protected by dust caps).
7	**If** the drawer has a … **Then** …

If the drawer has a	**Then**
non-spring-loaded locking clip	return the locking clip to the original upright position
spring-loaded locking clip	push the clip down

—continued—

Procedure 2-33 (continued)
Replacing a 1310 nm splitter/coupler drawer

Step	Action
8	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack.

ATTENTION
Make sure that the 1310 nm splitter/coupler drawer is adequately supported while you are removing it from the rack.

9	Begin on the left side of the 1310 nm splitter/coupler module and remove the ground wire from the rack rail. For an illustration of the ground wires on the rack rail, see Procedure 4-15 "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
10	Remove the rest of the screws from the mounting bracket that is holding the left side of the tray to the rack.
11	Remove the screws from the mounting bracket on the right side of the tray.
12	Lift the tray out of the rack and place it on an antistatic surface.
13	Remove the replacement 1310 nm splitter/coupler drawer from its packaging, and ensure that its PEC matches with the PEC of the 1310 nm splitter/coupler drawer that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
14	Install and ground the new 1310 nm splitter/coupler by completing Procedure 4-11, "Installing and grounding equipment drawers" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
15	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
16	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

17	Re-route in the new 1310 nm splitter/coupler the fiber patch cords hanging on the side of the rack (the ones removed in step 6).

—continued—

Procedure 2-33 (continued)
Replacing a 1310 nm splitter/coupler drawer

Step	Action
18	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the 1310 nm splitter/coupler for the following ports (for both the east and the west 1310 nm splitter/coupler modules): OTS OUT, OTS IN, THRU OUT, THRU IN, 1310 nm DROP, 1310 nm ADD The fibers to connect are the ones routed from the back of the 1310 nm splitter/coupler module (the same as those that were disconnected and labelled in step 4). Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the 1310 nm splitter/coupler ports. You might also have to remove the protective connector caps on the 1310 nm splitter/coupler ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
19	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
20	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
21	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
22	Ensure that the appropriate East or West label sticker is on the faceplate of the drawer.
23	In the System Manager, make sure the only active alarms on the system match those noted in step 1. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.

—end—

Procedure 2-34
Replacing a VOA module within a Discrete VOA drawer

Two VOA modules (east and west) can be installed in each Discrete VOA drawer. This procedure assumes that you only need to replace one of the two modules within the drawer. If you want to replace both modules, repeat this procedure for the second module, or replace the entire drawer by following Procedure 2-35 "Replacing a Discrete VOA drawer" in this chapter.

For more information about the VOA trays, refer to the "Discrete VOA" chapter in *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 2-34 (continued)
Replacing a VOA module within a Discrete VOA drawer

Requirements

Table 2-38 lists the tools and materials required to complete this procedure. Both VOA modules in the drawer (east and west) should be of the same type. If not, contact your next level of support.

Table 2-38
Tools and materials for replacing a VOA module

Item	Quantity	Supplied
VOA module of the same type as the VOA that is being replaced (see Note)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Small Phillips screwdriver	1	no
Note: For the product engineering codes for the VOA module, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-34 (continued)
Replacing a VOA module within a Discrete VOA drawer

Precautions

CAUTION
Risk of service interruption
When you replace a VOA module with a Discrete VOA drawer, traffic will be temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instructions with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-34 (continued)
Replacing a VOA module within a Discrete VOA drawer

CAUTION
Risk of affecting network reliability
When a shelf component is replaced in an Extended Metro network, re-equalization is necessary. See Procedure 2-6 "Re-equalizing an Extended Metro amplified system" in *Testing and Equalization Procedures*, 323-1701-222.

Action

Step	Action
1	Switch traffic off the span of the VOA module to be replaced, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step.
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
4	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

5	Lift the pull-up tabs on the top of each bulkhead, and disconnect the fibers in the VOA module that you are replacing (east or west). Disconnect all the fibers connected to the following ports (not all of them will have fiber to disconnect, depending on the configuration): VOA A OUT, VOA A IN, VOA B OUT, VOA B IN Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.

—continued—

Procedure 2-34 (continued)
Replacing a VOA module within a Discrete VOA drawer

Step	Action
6	After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
7	Gently remove the disconnected fibers from the fiber guides in the VOA module you are replacing (east or west). Leave those fibers hanging on the side of the shelf (they are protected by dust caps). ***Note:*** Make sure to not cause damage to the fibers routed for the adjacent VOA module.
8	Remove the two screws that fasten the VOA module to the drawer. The screws are located at the front and back of the tray. Make sure you keep the screws to install the replacement module. **CAUTION** **Do not damage optical fibers in the adjacent VOA** Be sure to avoid causing damage to the optical fibers connected to the adjacent VOA module during the removal and replacement procedure.
9	Remove the VOA module from the drawer and place it on an antistatic surface.
10	Remove the replacement VOA module from its packaging, and ensure that its PEC matches with the PEC of the VOA module that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
11	Fasten the VOA module to the drawer using the two screws that you removed in step 8.
12	Re-route in the new VOA module the fiber patch cords hanging on the side of the rack (the ones removed in step 7).
13	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the VOA module for the following ports (some of them may not have connections, depending on the configuration): VOA A OUT, VOA A IN, VOA B OUT, VOA B IN The fibers to connect are the ones that were disconnected and labelled in step 5. Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the VOA module ports. You might also have to remove the protective connector caps on the VOA module ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
14	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.

—continued—

Procedure 2-34 (continued)
Replacing a VOA module within a Discrete VOA drawer

Step	Action	
15	**If** the drawer has a	**Then**
	non-spring-loaded locking clip	return the locking clip to the original upright position
	spring-loaded locking clip	push the clip down
16	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.	
17	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.	
18	**If** your traffic was	**Then**
	protected (a traffic switch was executed in step 1)	Reroute traffic back to the original span for the VOA module. Make sure that the force and manual switches are removed. Follow Procedure 3-49 “Removing a manual, force, or lockout switch from a protection path” in *Provisioning and Operating Procedures*, 323-1701-310.
	unprotected (a traffic switch was not executed in step 1)	you have completed this procedure

—end—

Procedure 2-35
Replacing a Discrete VOA drawer

Follow this procedure to replace a Discrete VOA drawer. If you want to replace only one of the VOA modules in the drawer, follow Procedure 2-34 "Replacing a VOA module within a Discrete VOA drawer" on page 2-203 in this chapter.

For more information about the Discrete VOA, refer to the "Discrete VOA" section in *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

Requirements

Table 2-39 lists the tools and materials required to complete this procedure.

Table 2-39
Tools and materials for replacing a Discrete VOA drawer

Item	Quantity	Supplied
VOA drawer of the same type as the VOA that is being replaced (see Note)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Automatic drill with Hex nut tip, or manual hex nut driver	1	no
Note: For the product engineering codes for the Discrete VOA, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-35 (continued)
Replacing a Discrete VOA drawer

Precautions

CAUTION
Traffic will be lost
When you replace a Discrete VOA drawer, traffic will be lost during the procedure (because both VOA modules are replaced at the same time). If you have protected signals and you want to avoid losing traffic, perform Procedure 2-34, "Replacing a VOA module within a Discrete VOA drawer", to replace one VOA module at a time within a drawer.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instructions with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

CAUTION
Risk of affecting network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 2-35 (continued)
Replacing a Discrete VOA drawer

Action

Step	Action

1 In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.

2 Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.

3 Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

4 Lift the pull-up tabs on the top of each bulkhead, and disconnect all the fibers connected to the following ports (for both VOA modules within the drawer):

VOA A OUT, VOA A IN, VOA B OUT, VOA B IN

Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.

5 After all the fibers are disconnected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.

6 Gently remove the disconnected fibers from the fiber guides in the drawer (for both VOA modules). Leave those fibers hanging on the side of the shelf (they are protected by dust caps).

7

If the drawer has a	**Then**
non-spring-loaded locking clip	return the locking clip to the original upright position
spring-loaded locking clip	push the clip down

—continued—

Procedure 2-35 (continued)
Replacing a Discrete VOA drawer

Step	Action
8	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack.

ATTENTION
Make sure that the VOA drawer is adequately supported while you are removing it from the rack.

9	Begin on the left side of the VOA drawer and remove the ground wire from the rack rail. For an illustration of the ground wires on the rack rail, see Procedure 4-15 "Installing and grounding equipment drawers" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
10	Remove the rest of the screws from the mounting bracket that is holding the left side of the tray to the rack.
11	Remove the screws from the mounting bracket on the right side of the tray.
12	Lift the tray out of the rack and place it on an antistatic surface.
13	Remove the new replacement Discrete VOA drawer from its packaging, and ensure that its PEC matches with the PEC of the Discrete VOA drawer that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
14	Complete Procedure 4-11, "Installing and grounding equipment drawers" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, to install and ground the new Discrete VOA drawer.
15	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
16	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

17	Re-route in the new Discrete VOA drawer the fiber patch cords hanging on the side of the rack (the ones removed in step 6).

—continued—

Procedure 2-35 (continued)
Replacing a Discrete VOA drawer

Step	Action
18	Lift the pull-up tabs on the top of each bulkhead, and reconnect the fibers in the Discrete VOA drawer for the following ports (for both VOA modules within the drawer): VOA A OUT, VOA A IN, VOA B OUT, VOA B IN The fibers to connect are the ones that were disconnected and labelled in step 4. Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the VOA ports. You might also have to remove the protective connector caps on the VOA drawer. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
19	After all the fibers are connected, lower each bulkhead by pressing down on the pull-up tab until the unit snaps into place.
20	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
21	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
22	In the System Manager, make sure the only active alarms on the system match those noted in step 1. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.

—end—

Procedure 2-36
Replacing an Equipment Inventory Unit

Follow this procedure to replace an Equipment Inventory Unit (EIU).

For more information about the EIU, refer to the "Equipment Inventory Unit" chapter in *Hardware Description,* 323-1701-102.

Requirements

Table 2-40 lists the tools and materials you need to replace an EIU.

Table 2-40
Tools and materials for replacing an Equipment Inventory Unit

Item	Quantity	Supplied
replacement Equipment Inventory Unit (NT0H43HA)	1	No
Phillips screwdriver	1	No
Phillips pan head screws 6-32 x 3/8 inch with external lock washers (for attaching mounting brackets to the EIU)	8	Installed
Phillips screws with external lock washers (for mounting the EIU in the rack)	4	Yes
Grounding lug	2	No
10 AWG wire (for grounding)	1	No
Note: For the product engineering codes for the EIU, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-36 (continued)
Replacing an Equipment Inventory Unit

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
The Optical Metro 5100/5200 Maintenance Panel can take up to 5 minutes to detect that an Optical Tray (OMX, ECT/PBE, OSC tray, EIU, 1310 nm S/C, Transponder Protection Tray, or Manual VOA) is missing after the RJ-45 cable is disconnected. If the same or a different unit is reconnected to the Maintenance Panel before the recommended 5 minutes (before original unit and all of its manufacturing data has been cleared from inventory), the old unit description and manufacturing data will remain in the Equipment Inventory list.

Action

Step	Action
1	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
2	Switch the “Breaker A Amp” and “Breaker B Amp” switches on the front of the EIU to the OFF position.
3	Ensure that all power is off before disconnecting the power connections to the EIU. ***Note:*** Turn off the power source providing DC power to the EIU. This can be either the 3U APRS rectifier or a secondary distribution panel (SDP). Power control should be controlled using a Breaker Interface Panel (BIP). Power distribution is controlled by turning off the breaker connected to the EIU.
4	Locate the power terminal block on the faceplate of the EIU.
5	Disconnect the A and B power source on the EIU.
6	Locate the primary ground on the front of the EIU.
7	Disconnect the system grounding point on the EIU.

—continued—

Procedure 2-36 (continued)
Replacing an Equipment Inventory Unit

Step	Action
8	Make sure all the cables connected to the connector ports on the front panel have been properly labelled. The labels should indicate which passive optical device is connected to the cables, and the port to which the cables is connected.
9	Disconnect all the cables.
10	Gently remove the disconnected cables and let them hang on side of the shelf.

ATTENTION
Make sure that the EIU is adequately supported while you are removing it from the rack.

11	Remove the screws from the mounting bracket that is holding the left side of the module to the rack.
12	Remove the screws from the mounting bracket that is holding the right side of the module to the rack.
13	Lift the module out of the rack and place it on an antistatic surface.
14	Remove the replacement EIU from its packaging, and ensure that its PEC matches with the PEC of the EIU that was removed in the previous step. If it does not match, stop this procedure and contact your next level of support.
15	Place the EIU on a hard, level surface with the front facing toward you.
16	With the front panel toward you, start on the right side of the EIU. Attach one mounting bracket against the holes for front-mounting or mid-mounting.
17	Insert and tighten the four screws.
18	Repeat step 16 and step 17 for the left side of the EIU.
19	Support the EIU in position on the equipment rack. On one side of the rack, insert and tighten one screw into the mounting bracket and rack rail holes. Insert and tighten the rest of the screws.
20	Reconnect the cables to the connector ports on the EIU. The fibers to connect are the ones disconnected in step 9. Use the labels on the fibers to guide you during reconnection.
21	Reconnect the system grounding point at the front of the EIU (that you removed in step 7).
22	Reconnect the A and B power source on the EIU (the ones removed in step 5).

—continued—

Procedure 2-36 (continued)
Replacing an Equipment Inventory Unit

Step	Action
23	Turn on the power source providing DC power to the EIU. This can be either the 3U APRS rectifier or a secondary distribution panel (SDP). Power control should be controlled using a Breaker Interface Panel (BIP).
24	Switch the “Breaker A Amp” and “Breaker B Amp” switches on the front of the EIU to the ON position.
25	Ensure that the two green/red power LEDs are lit green (indicating that the power is applied and switched on).
26	In the System Manager, make sure the only active alarms on the system match those noted in step 1. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault

—end—

Procedure 2-37
Replacing a DSCM Tray within a DSCM Tray drawer

Typically, several DSCM Trays are required at a site. This procedure assumes that you only need to replace one of the DSCM Trays. If you need to replace more than one DSCM Tray, repeat this procedure for the other DSCM Trays.

For more information about the DSCM Tray, refer to the "DSCMs" chapter in *Hardware Description*, 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

Requirements

Table 2-41 lists the tools and materials required to complete this procedure.

Table 2-41
Tools and materials for replacing a DSCM Tray

Item	Quantity	Supplied
DSCM Tray of the same type as the DSCM Tray that is being replaced (see)	1	no
Labels to identify fiber patch-cords being disconnected	as required	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Small Phillips screwdriver	1	no
nut driver, 5/16 in.	1	no
For the product engineering codes for the DSCM Tray, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 2-37 (continued)
Replacing a DSCM Tray within a DSCM Tray drawer

Precautions

CAUTION
Risk of service interruption
When you replace a DSCM Tray, traffic will be temporarily interrupted during the user switch procedure (when the traffic is switched away from the component being replaced). In the case of unprotected signals, the traffic cannot be switched, and traffic will be lost for the duration of the procedure.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instructions with proper optical attenuation.

CAUTION
Risk of network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing OPTera Metro 5200 Shelves and Components*, 323-1701-201.

CAUTION
Risk of affecting network reliability
When a shelf component is replaced in an Extended Metro network, re-equalization is necessary. See Procedure 2-6 "Re-equalizing an Extended Metro amplified system" in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 2-37 (continued)
Replacing a DSCM Tray within a DSCM Tray drawer

Action

Step	Action
1	Switch traffic off the span of the DSCM Tray to be replaced, as described in Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures*, 323-1701-310. When complete, proceed to step 2 of this procedure. ***Note 1:*** If the signals are unprotected, the traffic cannot be switched. In this case the traffic is going to be lost for the duration of this procedure. Advise the network administrator before proceeding with the next step.
2	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
3	Press and hold the locking tabs on the sides of the drawer, and pull the drawer toward you until it is fully extended.
4	Verify if the drawer has a spring-loaded or non-spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks the drawer into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and go to the next step
spring-loaded locking clip or no locking clip	go to the next step

5	Locate the bulkheads and disconnect the fibers to the DSCM Tray that you are replacing. Disconnect all the fibers connected to the IN and OUT ports. Make sure the patch cords have been properly labelled. Put protective caps on the ends of the patch cords to protect them from contamination and damage.
6	Gently move away the disconnected fibers from the DSCM Tray you are replacing and leave the fibers hanging on the side of the shelf (they are protected by dust caps).
7	Remove the four nuts that fasten the DSCM Tray to the drawer. The nuts are located at the front and back of the tray. Make sure you keep the nuts to install the replacement module.
8	Remove the DSCM Tray from the drawer.
9	Remove the replacement DSCM Tray from its packaging, and ensure that its PEC matches with the PEC of the DSCM Tray that was removed in the previous step. If it does not match, ensure that the correct DSCM Tray is about to be installed.

—continued—

Procedure 2-37 (continued)
Replacing a DSCM Tray within a DSCM Tray drawer

Step	Action
10	Fasten the DSCM Tray to the drawer using the four nuts that you removed in step 7.
11	Re-route the fiber patch cords hanging on the side of the rack (the ones removed in step 5 and step 6).
12	Reconnect the fibers (the ones removed in step 5) Use the labels on the fibers to guide you during reconnection. You will need to remove the protection dust caps on the fibers before reconnecting to the DSCM Tray ports. You might also have to remove the protective connector caps on the DSCM Tray ports. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing OPTera Metro 5200 Shelves and Components*, 323-1701-201.
13	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
14	Close the drawer by pressing and holding the locking tabs on the sides of the tray while you slide the tray into the rack. Be careful not to pinch any fibers, and to allow proper fiber slack.
15	In the System Manager, make sure the only active alarms on the system match those noted in step 2. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.
16	**If** your traffic was — **Then** protected (a traffic switch was executed in step 1) — Reroute traffic back to the original span for the OSC tray. Make sure that the force and manual switches are removed. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310. unprotected (a traffic switch was not executed in step 1) — you have completed this procedure

—end—

Replacing circuit packs

Use the procedures in this chapter to replace the following Optical Metro 5200 and Optical Metro 5100 circuit packs (or module) in an in-service (IS) shelf:

- Optical Channel Interface (OCI)
- Optical Channel Laser and Detector (OCLD)
- Optical Transponder (OTR)
- Muxponder (MOTR)
- Small Form Factor Pluggable (SFP) module
- Optical Channel Manager (OCM)
- Optical Supervisory Channel (OSC)
- Optical Fiber Amplifier (OFA)
- Amplified Per Band Equalizer (APBE)
- Shelf Processor (SP)

Precautions

Read these precautions before you follow any of the procedures in this section.

CAUTION
Risk of equipment damage
Do not let go of the shelf cover when you open it.
The shelf cover is not permanently attached to the shelf and you must remove the door completely. If you let go of the door when you open it, you may injure yourself or damage the equipment.

CAUTION
Risk of equipment damage
Do not leave slots in the shelf empty. Use a filler card to ensure proper air flow when the shelf does not require an active circuit pack.

Precautions

CAUTION
Risk of service interruption
Failure to take a circuit pack out-of-service before you remove it from the shelf can cause loss of traffic.

CAUTION
Risk of operations failure
Optical Metro 5100/5200 software automatically provisions circuit packs that you insert into an in-service shelf. The autoprovisioning process takes approximately one minute to complete for most circuit packs. Wait two minutes for the autoprovisioning process to complete for a database carrying circuit pack on the Optical Metro 5100 shelf. Failure to wait until the autoprovisioning is complete can result in operations failure.

DANGER
Risk of personal injury
Make sure that all power to the rectifier is off before you make connections on the terminal block. Do not handle live wires. If you handle live wires you can cause personal injury, damage to equipment, or both.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of shelf malfunction
Nortel Networks recommends that you do not use cellular phones at any Optical Metro 5100/5200 site. The use of cellular phones in proximity to Optical Metro equipment can cause shelf malfunction.

CAUTION
Risk of network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

CAUTION
Risk of loss of contact
When you remove all of the OCLDs or OTRs on a shelf, you may cause loss of contact with some of the shelves in the network, depending on network configuration.

Handling circuit packs

CAUTION
Risk of equipment damage
Make sure you know how to handle electronic components correctly before you begin installation procedures. Incorrect handling can cause damage to static-sensitive components.

To avoid possible damage to circuit packs by electrostatic discharge (ESD), use the following precautions:

- Wear a grounded antistatic wrist strap connected to the shelf maintenance panel, or shoe straps, when handling circuit packs. Follow the manufacturer's instructions to test ESD protection before handling circuit packs.
- Keep circuit packs in their antistatic bags until you are ready to install the circuit packs.
- Remove circuit packs from their antistatic bags and install the circuit packs directly into the unit. Do not pass circuit packs to another person.
- If you need to put a circuit pack down, put the circuit pack back into its antistatic bag first.

- Handle circuit packs by their edges only. Do not touch the electronic components or any exposed printed circuits.
- Limit your movement during installation to reduce the build up of static electricity.

Deleting channel assignments and removing associated hardware

ATTENTION
You will generate transient alarms on the network, such as Overhead Link Failure alarms, when deleting OCLD or OTR circuit packs.

Deleting channel assignments is only required when you are replacing an OCI or OCLD circuit pack with an OCI or OCLD circuit pack of a different type. Delete channel assignments and associated hardware on a shelf-by-shelf basis, beginning with the originating or terminating shelf. Follow the sequence outlined below to reduce the number of alarms generated. See the "Provisioning circuit packs and managing traffic" chapter of *Provisioning and Operating Procedures*, 323-1701-310 for help with any of the bulleted items.

In the Channel Assignment window, all possible connections are organized by band and channel. All of the elements for a particular channel assignment are grouped together, which helps identify the facilities and circuit packs that need to be placed out-of-service (OOS).

Sequence for removing OCLD and OCI circuit packs in the Optical Metro 5100/5200

CAUTION
Risk of losing data for an Optical Metro 5100 shelf
Removing the active database circuit pack automatically switches the standby circuit pack to an active state, and copies the database to the next available circuit pack for standby. When you remove a database carrying circuit pack from an Optical Metro 5100 shelf, you must wait two minutes before inserting a circuit pack in this slot. When you remove all circuit packs from slots 1 to 4, and slot 6, you will decommission the shelf.

Perform a network wide operation to avoid unnecessary alarms. To delete OCLD/OCI channel assignments and remove the circuit packs:

- place all the facilities that are part of the channel assignment Out-of-Service (OOS)
- place the inventories of corresponding OCLDs OOS
- place the inventories of corresponding OCIs OOS
- delete the channel assignment

- delete the corresponding OCLD facilities
- delete the corresponding OCI facilities
- delete the corresponding OCLD inventories
- delete the corresponding OCI inventories
- disconnect the optical fiber from the OCLD/OCI circuit packs
- remove all associated OCI and OCLD circuit packs from the shelf
- proceed to the next shelf

Sequence for removing OTR and Muxponder circuit packs in the Optical Metro 5100/5200

The following high-level network-wide operations prevent unnecessary alarms when replacing OTR and Muxponder circuit packs. Perform the following to delete channel assignments and remove the circuit packs:

- place the OTR/MOTR Line Signal (LS) and Client Signal (CS) facilities OOS
- place the corresponding OTR/MOTR inventories OOS
- delete the channel assignment
- delete the OTR/MOTR Line Signal (LS) and Client Signal (CS) facilities
- delete the corresponding OTR/MOTR inventories
- disconnect the optical cables from the OTR/MOTR circuit packs
- remove the deleted OTR/MOTR circuit packs from the shelf
- proceed to the next shelf

Replacing OCLDs and OCI circuit packs to change the rate of traffic to or from 2.5 Gbit/s

Changing the rate of traffic can affect link budgeting, and should be done in close consultation with your network planner. See *Network Planning and Link Engineering*, 323-1701-110.

If you intend to change the rate of traffic to or from 2.5 Gbit/s, replace the OCLD circuit packs in the path first, then replace the OCI circuit packs.

The replacement OCLD circuit pack must match the existing OCLD circuit pack band and channel. Otherwise, the circuit packs will not communicate and will not carry traffic. To change the rate of traffic to or from 2.5 Gbit/s, follow the sequence below:

- place the OCLD facility OOS
- place the OCLD circuit pack inventory OOS
- delete the channel assignment
- disconnect the optical cables from the OCLD

- remove the OCLD circuit pack and replace it with the new OCLD circuit pack for the required rate of traffic
- reconnect the optical cables to the new OCLD circuit pack

OCIs at the originating and terminating shelves must be of the same type.

- put the OCI facility OOS
- put the OCI circuit pack OOS in the inventory
- delete the OCI facility and its inventory
- disconnect the optical fiber from the OCI
- remove the OCI circuit pack and replace it with the OCI for the new rate of traffic (autoprovisions to facility OOS)
- place the OCI facility IS
- make the channel assignment
- connect the OCI to the traffic source
- proceed to the next shelf

Procedure list

Table 3-1 lists the procedures in this chapter.

Table 3-1
Circuit pack replacement procedures

Procedure	Page
3-1 Replacing an OCI circuit pack	3-8
3-2 Replacing an OCLD circuit pack	3-14
3-3 Replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack	3-22
3-4 Replacing Flex with Universal circuit packs or Universal with Flex circuit packs	3-22
3-5 Replacing an OTR circuit pack	3-41
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3-10 Replacing an OFA circuit pack	3-75
3-11 Replacing a Low Input Power OFA circuit pack with a High Input Power OFA circuit pack	3-81
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Table 3-1 (continued)
Circuit pack replacement procedures

Procedure	Page
3-13 Replacing an SP circuit pack	3-94
3-14 Replacing an SP circuit pack - upgrading the bootloader on a PC	3-108
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3-18 Replacing an SP circuit pack - upgrading the software load on the replacement SP circuit pack on a Solaris workstation	3-122
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Procedure 3-1
Replacing an OCI circuit pack

Follow this procedure to replace an OCI circuit pack (including Subrate Multiplexer (SRM) OCI circuit packs). Refer to the "Compatibility requirements" chapter in *Technical Specifications*, 323-1701-180, to understand which OCI circuit packs are compatible with each other within a network (at client-side endpoints). You can replace an OCI circuit pack with an OCI circuit pack that is not of the same type as the OCI to replace if it is listed as being compatible in the *Technical Specifications* NTP.

For more information about OCI circuit packs, refer to "OCI circuit packs" chapter in *Hardware Description,* 323-1701-102.

Requirements

Table 3-2 lists the tools and materials required to complete this procedure.

Table 3-2
Tools and materials for replacing an OCI circuit pack

Item	Quantity	Supplied
Replacement OCI circuit pack of the same type as the OCI circuit pack being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: If the OCI circuit pack type is different, refer to the "Compatibility requirements" chapter in *Technical Specifications*, 323-1701-180, to understand if the OCI circuit packs are compatible with each other within a network (at client-side endpoints). If the OCI circuit packs are compatible, you only need to perform this procedure for the OCI circuit pack that is to be replaced. If the OCI circuit packs are not compatible, then both the near-end and the far-end OCI circuit packs must be replaced. For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Optical Metro 5200

Before replacing a circuit pack, the SP and at least one OCM must be seated in the shelf and the software load on the shelf must be in a committed state.

—continued—

Procedure 3-1 (continued)
Replacing an OCI circuit pack

Optical Metro 5100

Before replacing a circuit pack, the software load on the shelf must be in a committed state.

For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart.

For Optical Metro 5100 shelf configurations consisting of one SP, the circuit pack you are replacing and other circuit packs, if you remove a circuit pack that has the active or standby database on it, another circuit pack will automatically be selected to carry the database. Wait for at least two minutes to allow data transfer to the newly selected circuit pack. The System Manager shows database-carrying circuit packs in bold text. You can also use the Optical Metro Inventory dialog box to locate the standby database.

Precautions

CAUTION
Risk of network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

CAUTION
Traffic will be lost
When you replace an OCI circuit pack, traffic will be lost during the entire duration of the procedure.

CAUTION
Release 3.2 software baseline requirement
All circuit packs installed on an Optical Metro 5100 shelf must meet the release 3.2 software baseline requirement. For details, contact Nortel Networks. Refer to the "About this document" chapter in this book for contact information.

—continued—

Procedure 3-1 (continued)
Replacing an OCI circuit pack

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling the circuit packs. Refer to "Handling circuit packs" on page 3-3 in this book.

CAUTION
Risk of service interruption
Facilities for an OCI circuit pack that you deleted are not available until the replacement OCI circuit pack is reprovisioned.

CAUTION
Risk of service interruption
Deleted OCI circuit packs are not available until the OCI circuit pack is reprovisioned or reseated.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

Action

Step	Action
1	Make sure that the replacement OCI circuit pack is of the same type as the circuit pack you are replacing.
2	Release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the cooling unit cover when you open it. The cooling unit cover is not permanently attached to the shelf. You must remove the cooling unit cover completely. If you let go of the cooling unit cover when you open it, you can cause personal injury, damage to the equipment, or both.

3	Identify the circuit pack to be replaced.
4	Start (restart) the Web browser and launch the System Manager.

—continued—

Procedure 3-1 (continued)
Replacing an OCI circuit pack

Step	Action
5	Log into the network with read and write access to the system. Follow Procedure 1-1 "Logging into the network" in *Provisioning and Operating Procedures* 323-1701-310.
6	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
7	In System Manager, query the facilities for the OCI circuit pack to be replaced. Note all the facilities that are currently in-service.
8	Put all the facilities for the OCI circuit pack out-of-service. Follow Procedure 3-13 "Taking a circuit pack facility or SFP facility out-of-service" in *Provisioning and Operating Procedures* 323-1701-310.
9	Put the OCI circuit pack out-of-service. Follow Procedure 3-8 "Taking a circuit pack or SFP out-of-service" in *Provisioning and Operating Procedures* 323-1701-310.
10	**If** the replacement OCI circuit pack type is — **Then** go to identical to the circuit pack you are removing — step 14 not identical to the circuit pack you are removing — step 11
11	Delete the channel assignments for the OCI circuit pack you are replacing. Follow Procedure 3-4 "Deleting channel assignments" in *Provisioning and Operating Procedures*, 323-1701-310. ***Note:*** In the Channel Assignment window, when you select a line that lists an OCI SRM circuit pack in the End Point column, the System Manager displays the channel assignments for each port of the OCI SRM circuit pack.
12	Delete the facilities of the OCI circuit pack you are replacing. Follow Procedure 3-14 "Deleting a circuit pack or SFP facility" in *Provisioning and Operating Procedures*, 323-1701-310. ***Note:*** If you are replacing an OCI SRM circuit pack, you must delete the SRM port facilities associated with the circuit pack. Repeat step 12 for the SRM facilities you want to delete.
13	Delete the OCI circuit pack inventory you are replacing. Follow Procedure 3-9 "Deleting a circuit pack or SFP from the inventory" in *Provisioning and Operating Procedures*, 323-1701-310.
14	Label the optical cables connected to the OCI circuit pack you are replacing. Disconnect the optical cables and put protective caps on both the OCI circuit pack connectors and the optical cables to protect them from contamination and damage.
15	Release the lock latches at the top and bottom of the circuit pack.
16	Pull the circuit pack toward you until it is free of the circuit pack guides and put the circuit pack on an antistatic surface.

—continued—

Procedure 3-1 (continued)
Replacing an OCI circuit pack

Step	Action
17	Remove the replacement circuit pack from the antistatic bag.
18	Lift the lock latches on the faceplate (the unlocked position). Push the OCI into the backplane connector. ***Note 1:*** If the replacement OCI circuit pack is not identical in type to the OCI circuit pack that you removed, the replacement OCI circuit pack will autoprovision immediately after you seat it in the backplane connector. Wait until the autoprovisioning is complete. This process takes between 15 to 75 seconds. Autoprovisioning puts the OCI circuit pack in-service, but the OCI facility is out-of-service. ***Note 2:*** For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart. The sequence of events is: a few minutes after the replacement circuit pack is inserted, the data restore completes, the Database Copies Are Unavailable alarm is cleared and the SP automatically restarts. Wait for this sequence to occur and the SP to complete the restart (about 10 minutes). After the SP restart completes, log back into the shelf.
19	Push the lock latches flat against the faceplate to lock the circuit pack in position.
20	**If** the replacement OCI circuit pack type is — **Then** go to identical to the circuit pack that you removed — step 21 not identical to the circuit pack that you removed — step 22
21	Put the OCI equipment in-service. Follow Procedure 3-7 “Putting a circuit pack or SFP in-service” in *Provisioning and Operating Procedures,* 323-1701-310.
22	Put the OCI facilities that you noted in step 7 in-service. Follow Procedure 3-10 “Putting a circuit pack or SFP facility in-service” in *Provisioning and Operating Procedures,* 323-1701-310.

—continued—

Procedure 3-1 (continued)
Replacing an OCI circuit pack

Step	Action	
23	**If** the replacement OCI circuit pack is	**Then**
	identical in type to the OCI that you are replacing	go to step 25
	not identical in type to the OCI that you are replacing	refer to the "Compatibility requirements" chapter in *Technical Specifications*, 323-1701-180, to understand if the OCI circuit packs are compatible with each other within a network (at client-side endpoints). If the OCI circuit packs are compatible, go to step 24. If the OCI circuit packs are not compatible, then you must replace the OCI at the far-end of the circuit path. Go to step 2 and repeat this procedure to replace the far-end OCI, then proceed with step 24.
24	Provision channel assignments for the new OCI circuit pack. Follow Procedure 3-3 "Making or modifying channel assignments" in *Provisioning and Operating Procedures* 323-1701-310.	
25	Reconnect the optical cables removed in step 14 to the ports on the replacement OCI circuit pack. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.	
26	In the System Manager, make sure the only active alarms on the system match those noted in step 6. If there are additional alarms, stop this procedure and contact your next level of support. To view alarms in the System Manager, select the Fault tab, then the Active Alarms tab.	
27	Re-install the front cover door on the shelf where the OCI circuit pack was replaced.	

—end—

Procedure 3-2
Replacing an OCLD circuit pack

Follow this procedure to replace an OCLD circuit pack with a spare OCLD circuit pack of the same type (same band and channel).

For more information about OCLD circuit packs, refer to the "OCLD circuit packs" chapter in *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 3-2 (continued)
Replacing an OCLD circuit pack

Requirements

Table 3-3 lists the tools and materials required to complete this procedure.

Table 3-3
Tools and materials for replacing an OCLD circuit pack

Item	Quantity	Supplied
Replacement OCLD circuit pack of the same type (same band and channel) as the OCLD circuit pack being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: To replace a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack, refer to Procedure 3-3 "Replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack". To replace a OCLD 2.5 Gbit/s Flex circuit pack with a OCLD 2.5 Gbit/s Universal circuit pack, refer to Procedure 3-4 "Replacing Flex with Universal circuit packs or Universal with Flex circuit packs". For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Optical Metro 5200

Before replacing a circuit pack, the SP and at least one OCM must be seated in the shelf and the software load on the shelf must be in a committed state.

—continued—

Procedure 3-2 (continued)
Replacing an OCLD circuit pack

Optical Metro 5100

Before replacing a circuit pack, the software load on the shelf must be in a committed state.

For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart.

For Optical Metro 5100 shelf configurations consisting of one SP, the circuit pack you are replacing and other circuit packs, if you remove a circuit pack that has the active or standby database on it, another circuit pack will automatically be selected to carry the database. Wait for at least two minutes to allow data transfer to the newly selected circuit pack. The System Manager shows database-carrying circuit packs in bold text. You can also use the Optical Metro Inventory dialog box to locate the standby database.

Precautions

CAUTION
Release 3.2 software baseline requirement
All circuit packs installed on an Optical Metro 5100 shelf must meet the release 3.2 software baseline requirement. For details, contact Nortel Networks. Refer to the "About this document" chapter in this book for contact information.

CAUTION
Traffic is lost in an unprotected network
Traffic is interrupted when you replace an OCLD circuit pack in an unprotected network. To verify if you can add path protection in your network, refer to the "Supported configurations" chapter in *Network Planning and Link Engineering,* 323-1701-110. To add path protection to an unprotected network, refer to Procedure 3-47 "Adding path protection to an unprotected path" in *Provisioning and Operating Procedures*, 323-1701-310.

—continued—

Procedure 3-2 (continued)
Replacing an OCLD circuit pack

CAUTION
Risk of service interruption
You must put the OCLD circuit pack facility in-service before reconnecting the optical cables to the new OCLD circuit pack. Failure to do so can cause traffic interruption.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling circuit packs. Refer to "Handling circuit packs" on page 3-3 in this book.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

CAUTION
Risk of affecting network reliability
When a circuit pack is replaced in an Extended Metro network, re-equalization is necessary. See Procedure 2-6 "Re-equalizing an Extended Metro amplified system" in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 3-2 (continued)
Replacing an OCLD circuit pack

Action

Step	Action
1	Make sure that the replacement OCLD circuit pack is of the same type (same band and channel) as the circuit pack you are replacing.
2	Release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the shelf cover when you open it. The shelf cover is not permanently attached to the shelf and you must remove the door completely. If you let go of the door when you open it, you can cause personal injury, damage to the equipment, or both.

3	Identify the circuit pack to be replaced.
4	Start (restart) the Web browser and launch the System Manager.
5	Log in with read and write access to all of the system. See Procedure 1-1 "Logging into the network" in *Provisioning and Operating Procedures,* 323-1701-310.
6	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
7	From the Connections tab in System Manager, verify the type of traffic (protected, unprotected, passthrough, unselected) running on the OCLD circuit pack you are replacing.

8	**If** the Mode column in the Connections tab indicates	**Then** go to
	Unprot-West or Unprot-East	step 12
	Protected or Active	step 9
	Passthrough	step 12
	Unselected (no channel assignment)	step 12

9	Identify whether the OCLD to be replaced is in the west or east direction. Check the Chan. ID field of the Channel Assignments window under the Connections tab.

—continued—

Procedure 3-2 (continued)
Replacing an OCLD circuit pack

Step	Action	
10	**If** the OCLD to be replaced is	**Then**
	in the west direction	operate a force switch to the east OCLD. Refer to Procedure 3-48 "Forcing traffic to one path on a protected channel" in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 11.
	in the east direction	operate a force switch to the west OCLD. Refer to Procedure 3-48 "Forcing traffic to one path on a protected channel" in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 11.
11	**If** the far-end OCLD is also protected, and	**Then**
	the OCLD to be replaced is in the west direction	operate a force switch to the west OCLD at the far-end. Refer to Procedure 3-48 "Forcing traffic to one path on a protected channel" in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 12.
	the OCLD to be replaced is in the east direction	operate a force switch to the east OCLD at the far-end. Refer to Procedure 3-48 "Forcing traffic to one path on a protected channel" in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 12.
12	Put the facility of the OCLD circuit you are replacing out-of-service. Follow Procedure 3-13 "Taking a circuit pack facility or SFP facility out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310.	
13	Put the OCLD circuit pack you are replacing out-of-service. Follow Procedure 3-8 "Taking a circuit pack or SFP out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310.	
14	Label the optical cables connected to the OCLD circuit pack you are replacing. Disconnect the Tx and Rx optical cables and put protective caps on both the OCLD circuit pack connectors and the optical cables to protect them from contamination and damage	
15	Release the lock latches at the top and bottom of the circuit pack.	

—continued—

Procedure 3-2 (continued)
Replacing an OCLD circuit pack

Step	Action
16	Slide the circuit pack out of the guides and put the circuit pack on an antistatic surface.
17	Remove the replacement circuit pack from the antistatic bag.
18	Make sure that the new replacement OCLD circuit pack has the same PEC as the OCLD circuit that you removed. If the circuit pack has a different PEC, stop this procedure and contact your next level of support.
19	Align the replacement OCLD circuit pack with the circuit pack guides.
20	Keep the lock latches flat against the faceplate (in the locked position) so the circuit pack does not seat into the backplane connector. Carefully slide the circuit pack toward the back of the shelf until it stops.
21	Place the lock latches in the unlocked position.
22	Seat the replacement OCLD circuit pack in the backplane connector and place the lock latches in the locked position. ***Note 1:*** The OCLD circuit pack autoprovisions immediately after it is placed in the backplane connector. Wait until the autoprovisioning is finished. This process takes less than two minutes. The autoprovisioning is finished when the LOS lamp is lit yellow. ***Note 2:*** For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart. The sequence of events is: a few minutes after the replacement circuit pack is inserted, the data restore completes, the Database Copies Are Unavailable alarm is cleared and the SP automatically restarts. Wait for this sequence to occur and the SP to complete the restart (about 10 minutes). After the SP restart completes, log back into the shelf.
23	Put the replacement OCLD circuit pack in-service. Refer to Procedure 3-7 “Putting a circuit pack or SFP in-service” in *Provisioning and Operating Procedures,* 323-1701-310.
24	Put the facility of the replacement OCLD circuit pack in-service. Refer to Procedure 3-10 “Putting a circuit pack or SFP facility in-service” in *Provisioning and Operating Procedures,* 323-1701-310.
25	Reconnect the Tx and Rx optical cables removed in step 14 to the Tx and Rx ports on the replacement OCLD circuit pack. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to “Cleaning connectors” in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 3-2 (continued)
Replacing an OCLD circuit pack

Step	Action	
26	**If** at step 8, the Mode column in the Connections tab indicated	**Then** go to
	Protected or Active	step 27
	Unprot-West, Unprot-East, Passthrough, or Unselected	step 29
27	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. The “Forced Switch to East path active” (minor, NSA) or “Forced Switch to West path active” (minor, NSA) alarm will be raised. Make sure that all other active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.	
28	Release the force switch at the shelf where the OCLD was replaced and at the far-end shelf. Refer to Procedure 3-49 “Removing a manual, force, or lockout switch from a protection path” in Provisioning and Operating Procedures, 323-1701-310.	
29	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.	
30	Re-install the front cover door on the shelf where the OCLD circuit pack was replaced.	

—end—

Procedure 3-3
Replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack

Follow this procedure to replace a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack of the same band and channel.

For more information about OCLD circuit packs, refer to the "OCLD circuit packs" chapter in *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

Requirements

Before starting this procedure, you must validate the link engineering for the new circuit pack using the Network Modeling Tool (NMT). If the NMT validates the circuit pack replacement, proceed with this procedure. If the NMT does not validate the circuit pack replacement, you should attempt to replace both ends with OCLD 2.5 Gbit/s Flex circuit packs.

Table 3-4 lists the tools and materials required to complete this procedure.

—continued—

Procedure 3-3 (continued)
Replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack

Table 3-4
Tools and materials for replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack

Item	Quantity	Supplied
Replacement OCLD 2.5 Gbit/s Flex circuit pack of the same band and channel as the OCLD 2.5 Gbit/s circuit pack being replaced (see Note 1)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
FC-LC optical patch cord and an FC-FC adaptor (for the pigtail) to connect the OMX to the OCLD 2.5 Gbit/s Flex circuit pack (see Note 2)	1	no
SC-LC duplex optical patch cords to connect the OMX to the OCLD 2.5 Gbit/s Flex circuit pack (see Note 3 and Note 4)	1	no

Note 1: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.

Note 2: Use an FC-LC optical patch cord and an FC-FC adaptor (for the pigtail) to connect the OMX to the OCLD 2.5 Gbit/s Flex circuit pack (if your shelf is equipped with a Standard OMX). You must extend the length of the OMX pigtail using an optical patch cord with an adaptor that connects to the OMX pigtail, and a connector that connects to the OCLD.

Note 3: Use SC-LC duplex optical patch cords to connect the OMX to the OCLD 2.5 Gbit/s Flex circuit pack if your shelf is equipped with any other type of DWDM OMX.

Note 4: Use SC-LC duplex optical patch cords to connect the OMX to the OCLD 2.5 Gbit/s Flex circuit pack if your shelf is equipped with any other type of OMX, (DWDM 4CH +FM, 1CH CWDM or 4CH CWDM).

—continued—

Procedure 3-3 (continued)
Replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack

Optical Metro 5200

Before replacing a circuit pack, the SP and at least one OCM must be seated in the shelf and the software load on the shelf must be in a committed state.

Optical Metro 5100

Before replacing a circuit pack, the software load on the shelf must be in a committed state.

For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart.

For Optical Metro 5100 shelf configurations consisting of one SP, the circuit pack you are replacing and other circuit packs, if you remove a circuit pack that has the active or standby database on it, another circuit pack will automatically be selected to carry the database. Wait for at least two minutes to allow data transfer to the newly selected circuit pack. The System Manager shows database-carrying circuit packs in bold text. You can also use the Optical Metro Inventory dialog box to locate the standby database.

Precautions

CAUTION
Risk of network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

CAUTION
Release 3.2 software baseline requirement
All circuit packs installed on an Optical Metro 5100 shelf must meet the release 3.2 software baseline requirement. For details, contact Nortel Networks. Refer to the "About this document" chapter in this book for contact information.

—continued—

Procedure 3-3 (continued)
Replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack

CAUTION
Traffic is lost in an unprotected network
Traffic is interrupted when you replace an OCLD circuit pack in an unprotected network. To verify if you can add path protection in your network, refer to the "Supported configurations" chapter in *Network Planning and Link Engineering,* 323-1701-110. To add path protection to an unprotected network, refer to Procedure 3-47 "Adding path protection to an unprotected path" in *Provisioning and Operating Procedures*, 323-1701-310.

CAUTION
Risk of service interruption
You must put the OCLD circuit pack facility in-service before reconnecting the optical cables to the new OCLD circuit pack. Failure to do so can cause traffic interruption.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling circuit packs. Refer to "Handling circuit packs" on page 3-3 in this book.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

—continued—

Procedure 3-3 (continued)
Replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack

Action

Step	Action
1	Make sure that the replacement OCLD circuit pack is the same band and channel as the circuit pack you are replacing.
2	Release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the shelf cover when you open it. The shelf cover is not permanently attached to the shelf and you must remove the door completely. If you let go of the door when you open it, you can cause personal injury, damage to the equipment, or both.

3	Identify the circuit pack to be replaced.
4	Start (restart) the Web browser and launch the System Manager.
5	Login with read and write access to the system. See Procedure 1-1, "Logging into the network" in *Provisioning and Operating Procedures,* 323-1701-310.
6	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
7	From the Connections tab in System Manager, verify the type of traffic (protected, unprotected, passthrough, unselected) running on the OCLD circuit pack you are replacing.

8 **If** the Mode column in the Connections tab indicates — **Then** go to

If	Then
Unprot-west or Unprot-east	step 17
Protected or Active	step 9
Passthrough	step 17
Unselected (no channel assignment)	step 17

9	Identify whether the OCLD circuit pack you are replacing is in the west or east direction. Check the Chan. ID field of the Channel Assignments window under the Connections tab.

—continued—

Procedure 3-3 (continued)
Replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack

Step	Action	
10	**If** the OCLD to be replaced is	**Then**
	in the west direction	operate a force switch to the east OCLD. Refer to Procedure 3-48 "Forcing traffic to one path on a protected channel" in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 11.
	in the east direction	operate a force switch to the west OCLD. Refer to Procedure 3-48 "Forcing traffic to one path on a protected channel" in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 11.
11	**If** the far-end OCLD is also protected, and	**Then**
	the OCLD to be replaced is in the west direction	operate a force switch to the west OCLD at the far-end. Refer to Procedure 3-48 "Forcing traffic to one path on a protected channel" in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 12.
	the OCLD to be replaced is in the east direction	operate a force switch to the east OCLD at the far-end. Refer to Procedure 3-48 "Forcing traffic to one path on a protected channel" in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 12.
12	At the near end, double-click on the channel assignment of the mate OCLD, identified as "Active" in the Mode column. *The Optical Metro Channel Assignments dialog box opens.*	
13	Select Unprot-west or Unprot-east from the Mode drop down list in the Channel Characteristics section.	
14	Click **OK**. *A confirmation window appears.*	
15	Click **Yes**. *The forced switch is automatically released, and the connection on that shelf becomes unprotected.*	
16	Go to step 18.	

—continued—

Procedure 3-3 (continued)
Replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack

Step	Action
17	Delete the unprotected or passthrough channel assignments for the OCLD circuit pack you are replacing. Follow Procedure 3-4, "Deleting channel assignments" in *Provisioning and Operating Procedures*, 323-1701-310.
18	Put the facility of the OCLD circuit pack you are replacing out-of-service. Follow Procedure 3-13, "Taking a circuit pack facility or SFP facility out-of-service" in *Provisioning and Operating Procedures*, 323-1701-310.
19	Put the OCLD circuit pack you are replacing out-of-service. Follow Procedure 3-10 "Putting a circuit pack or SFP facility in-service" in *Provisioning and Operating Procedures,* 323-1701-310.
20	Delete the facilities of the OCLD circuit pack you are replacing. Follow Procedure 3-14 "Deleting a circuit pack or SFP facility" in *Provisioning and Operating Procedures,* 323-1701-310.
21	Delete the OCLD circuit pack inventory on the OCLD circuit pack you are replacing. Follow Procedure 3-9 "Putting a circuit pack or SFP facility in-service" in *Provisioning and Operating Procedures,* 323-1701-310.
22	Label the optical cables connected to the OCLD circuit pack you are replacing. Disconnect the Tx and Rx optical cables and put protective caps on both the OCLD circuit pack connectors and the optical cables to protect them from contamination and damage.
23	Release the lock latches at the top and bottom of the circuit pack.
24	Slide the circuit pack out of the guides and put the circuit pack on an antistatic surface.
25	Remove the replacement circuit pack from the antistatic bag.
26	Make sure that the new replacement OCLD circuit pack has the same band and channel as the OCLD circuit that you removed. If the circuit pack has a different band or channel, stop this procedure and contact your next level of support.
27	Align the replacement Flex OCLD circuit pack with the circuit pack guides.
28	Keep the lock latches flat against the faceplate (in the locked position) so the circuit pack does not seat into the backplane connector. Carefully slide the circuit pack toward the back of the shelf until it stops.
29	Place the lock latches in the unlocked position.

—continued—

Procedure 3-3 (continued)
Replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack

Step	Action
30	Seat the replacement OCLD circuit pack in the backplane connector and place the lock latches in the locked position. ***Note 1:*** The OCLD circuit pack autoprovisions immediately after it is placed in the backplane connector. Wait until the autoprovisioning is finished. This process takes less than two minutes. The autoprovisioning is finished when the LOS lamp is lit yellow. ***Note 2:*** For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart. The sequence of events is: a few minutes after the replacement circuit pack is inserted, the data restore completes, the Database Copies Are Unavailable alarm is cleared and the SP automatically restarts. Wait for this sequence to occur and the SP to complete the restart (about 10 minutes). After the SP restart completes, log back into the shelf.
31	In System Manager, note the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. If the “Incomplete Provisioning” (minor, NSA) is raised, use Procedure 3-36 “Provisioning the optical system identifier (OSID)” in *Provisioning and Operating Procedures*, 323-1701-310, to clear the alarm. Make sure that all other active alarms on the system match the alarms you noted in step 6. If they do not match, stop this procedure and contact your next level of support.
32	**If** at step 8, the Mode column in the Connections tab indicated — **Then** go to Active or Protected — step 33 Unprot-West, Unprot-East, Passthrough, or Unselected — step 40
33	Put the facility of the OCLD circuit pack you replaced in-service. Follow Procedure 3-10, “Putting a circuit pack or SFP facility in-service” in *Provisioning and Operating Procedures*, 323-1701-310.
34	From the Connections tab, highlight the channel assignment for the mate OCLD circuit pack (the active circuit pack in the OCLD pair).
35	Double-click on the channel assignment associated with the mate OCLD circuit pack (the active circuit pack in the OCLD pair). *The Optical Metro Channel Assignments dialog box opens.*
36	In the Channel Characteristics section of the dialog box, select Protected from the Mode drop down list and None from the West/East PM Mode.
37	Click **Ok**. *A confirmation window appears.*

—continued—

Procedure 3-3 (continued)
Replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack

Step	Action
38	Click **Yes.**
39	Go to step 41.
40	Add the unprotected or passthrough connection for the new OCLD circuit pack. Refer to 3-3 "Making or modifying channel assignments" in *Provisioning and Operating Procedures*, 323-1701-310.
41	Reconnect the Tx and Rx optical cables removed in step 22 to the Tx and Rx ports on the replacement OCLD circuit pack. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
42	Connect the OCLD circuit pack to the OMX. Refer to Procedure 3-19 "Connecting an OMX to OCLD circuit packs" in *Connection Procedures*, 323-1701-221. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
43	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.
44	Release the force switch at the far-end shelf. Refer to Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310.
45	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.
46	Re-install the front cover door on the shelf where the OCLD circuit pack was replaced.

—end—

Procedure 3-4
Replacing Flex with Universal circuit packs or Universal with Flex circuit packs

Follow this procedure for one of the following scenarios:

- replace a OCLD 2.5 Gbit/s Flex circuit pack with a OCLD 2.5 Gbit/s Universal circuit pack
- replace a OCLD 2.5 Gbit/s Universal circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack
- replace a OTR 2.5 Gbit/s Flex 1310 nm circuit pack with a OTR 2.5 Gbit/s Universal 1310 nm circuit pack
- replace a OTR 2.5 Gbit/s Flex 850 nm circuit pack with a OTR 2.5 Gbit/s Universal 850 nm circuit pack
- replace a OTR 2.5 Gbit/s Universal 1310 nm circuit pack with a OTR 2.5 Gbit/s Flex 1310 nm circuit pack
- replace a OTR 2.5 Gbit/s Universal 850 nm circuit pack with a OTR 2.5 Gbit/s Flex 850 nm circuit pack

  Note 1: The replacement circuit pack and the original circuit pack must be the same band and channel.

  Note 2: Since the Universal circuit pack has better link engineering characteristics, ensure that the Flex circuit pack can support the optical link before replacing a Universal circuit pack with a Flex circuit pack.

  Note 3: After a Flex circuit pack is replaced with a Universal circuit pack, the far-end circuit pack must also be replaced with a Universal circuit pack. Also, after a Universal circuit pack is replaced with a Flex circuit pack, the far-end circuit pack must also be replaced with a Flex circuit pack. During the period where one end is Flex and the other end is Universal, the Far End Circuit Pack Mismatch alarm will be active at both ends of the link. The new Far end circuit pack mismatch alarm is raised since fault detection and Link Engineering cannot be guaranteed on this link (traffic will be carried on best effort basis).

For more information about OCLD circuit packs, refer to the "OCLD circuit packs" chapter in *Hardware Description,* 323-1701-102.

For more information about OTR circuit packs, refer to the "OTR circuit packs" chapter in *Hardware Description,* 323-1701-102.

—continued—

Procedure 3-4 (continued)
Replacing Flex with Universal circuit packs or Universal with Flex circuit packs

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

Requirements

Table 3-5 lists the tools and materials required to complete this procedure.

Table 3-5
Tools and materials for this procedure

Item	Quantity	Supplied
Replacement circuit pack of the same band and channel as the circuit pack being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: To replace a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack, refer to Procedure 3-3 "Replacing a OCLD 2.5 Gbit/s circuit pack with a OCLD 2.5 Gbit/s Flex circuit pack". For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 3-4 (continued)
Replacing Flex with Universal circuit packs or Universal with Flex circuit packs

Optical Metro 5200

Before replacing a circuit pack, the SP and at least one OCM must be seated in the shelf and the software load on the shelf must be in a committed state.

Optical Metro 5100

Before replacing a circuit pack, the software load on the shelf must be in a committed state.

For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart.

For Optical Metro 5100 shelf configurations consisting of one SP, the circuit pack you are replacing and other circuit packs, if you remove a circuit pack that has the active or standby database on it, another circuit pack will automatically be selected to carry the database. Wait for at least two minutes to allow data transfer to the newly selected circuit pack. The System Manager shows database-carrying circuit packs in bold text. You can also use the Optical Metro Inventory dialog box to locate the standby database.

—continued—

Procedure 3-4 (continued)
Replacing Flex with Universal circuit packs or Universal with Flex circuit packs

Precautions

CAUTION
Release 3.2 software baseline requirement
All circuit packs installed on an Optical Metro 5100 shelf must meet the release 3.2 software baseline requirement. For details, contact Nortel Networks. Refer to the "About this document" chapter in this book for contact information.

CAUTION
Traffic is lost in an unprotected network
Traffic is interrupted when you perform this procedure in an unprotected network. To verify if you can add path protection in your network, refer to the "Supported configurations" chapter in *Network Planning and Link Engineering,* 323-1701-110. To add path protection to an unprotected network, refer to Procedure 3-47 "Adding path protection to an unprotected path" in *Provisioning and Operating Procedures*, 323-1701-310.

After a Flex circuit pack is replaced with a Universal circuit pack, the far-end circuit pack must also be replaced with a Universal circuit pack. Also, after a Universal circuit pack is replaced with a Flex circuit pack, the far-end circuit pack must also be replaced with a Flex circuit pack. During the period where one end is Flex and the other end is Universal, the Far End Circuit Pack Mismatch alarm will be active at both ends of the link. The new Far end circuit pack mismatch alarm is raised since fault detection and Link Engineering cannot be guaranteed on this link (traffic will be carried on best effort basis).

—continued—

Procedure 3-4 (continued)
Replacing Flex with Universal circuit packs or Universal with Flex circuit packs

CAUTION
Risk of service interruption
You must put the circuit pack facility in-service before reconnecting the optical cables to the new circuit pack. Failure to do so can cause traffic interruption.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling circuit packs. Refer to "Handling circuit packs" on page 3-3 in this book.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

CAUTION
Risk of affecting network reliability
When a circuit pack is replaced in an Extended Metro network, re-equalization is necessary. See Procedure 2-6 "Re-equalizing an Extended Metro amplified system" in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 3-4 (continued)
Replacing Flex with Universal circuit packs or Universal with Flex circuit packs

Action

Step	Action
1	Make sure that the replacement circuit pack is of the same band and channel as the circuit pack you are replacing.
2	Release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the shelf cover when you open it. The shelf cover is not permanently attached to the shelf and you must remove the door completely. If you let go of the door when you open it, you can cause personal injury, damage to the equipment, or both.

3	Identify the circuit pack to be replaced.
4	Start (restart) the Web browser and launch the System Manager.
5	Log in with read and write access to all of the system. See Procedure 1-1 "Logging into the network" in *Provisioning and Operating Procedures,* 323-1701-310.
6	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
7	From the Connections tab in System Manager, verify the type of traffic (protected, unprotected, passthrough, unselected) running on the circuit pack you are replacing.

8 **If** the Mode column in the Connections tab indicates — **Then** go to

Unprot-West or Unprot-East	step 12
Protected or Active	step 9
Passthrough	step 12
Unselected (no channel assignment)	step 12

9 Identify whether the circuit pack to be replaced is in the west or east direction. Check the Chan. ID field of the Channel Assignments window under the Connections tab.

—continued—

Procedure 3-4 (continued)
Replacing Flex with Universal circuit packs or Universal with Flex circuit packs

Step	Action	
10	**If** the circuit pack to be replaced	**Then**
	is in the west direction	operate a force switch to the east circuit pack. Refer to Procedure 3-48 "Forcing traffic to one path on a protected channel" in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 11.
	is in the east direction	operate a force switch to the west circuit pack. Refer to Procedure 3-48 "Forcing traffic to one path on a protected channel" in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 11.
11	**If** the far-end circuit pack is also protected, and	**Then**
	the circuit pack to be replaced is in the west direction	operate a force switch to the west circuit pack at the far-end. Refer to Procedure 3-48 "Forcing traffic to one path on a protected channel" in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 12.
	the circuit pack to be replaced is in the east direction	operate a force switch to the east circuit pack at the far-end. Refer to Procedure 3-48 "Forcing traffic to one path on a protected channel" in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 12.
12	Put the facility of the circuit pack you are replacing out-of-service. Follow Procedure 3-13 "Taking a circuit pack facility or SFP facility out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310. ***Note:*** If you are replacing an OTR circuit pack, put the Line Signal (LS) and the Client Signal (CS) facilities of the circuit pack you are replacing out-of-service.	
13	Put the circuit pack you are replacing out-of-service. Follow Procedure 3-8 "Taking a circuit pack or SFP out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310.	

—continued—

Procedure 3-4 (continued)
Replacing Flex with Universal circuit packs or Universal with Flex circuit packs

Step	Action
14	Label the optical cables connected to the circuit pack you are replacing. Disconnect the optical cables and put protective caps on both the circuit pack connectors and the optical cables to protect them from contamination and damage.
15	Release the lock latches at the top and bottom of the circuit pack.
16	Slide the circuit pack out of the guides and put the circuit pack on an antistatic surface.
17	Remove the replacement circuit pack from the antistatic bag.
18	Make sure that the replacement circuit pack has the same band and channel as the circuit pack that you removed. If the circuit pack has a different band and channel, stop this procedure and contact your next level of support.
19	Align the replacement circuit pack with the circuit pack guides.
20	Keep the lock latches flat against the faceplate (in the locked position) so the circuit pack does not seat into the backplane connector. Carefully slide the circuit pack toward the back of the shelf until it stops.
21	Place the lock latches in the unlocked position.
22	Seat the replacement circuit pack in the backplane connector and place the lock latches in the locked position. ***Note 1:*** The circuit pack initializes immediately after it is placed in the backplane connector. Wait until the initialization is finished. This process takes less than two minutes. The initialization is finished when the LOS lamp is lit yellow. ***Note 2:*** For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart. The sequence of events is: a few minutes after the replacement circuit pack is inserted, the data restore completes, the Database Copies Are Unavailable alarm is cleared and the SP automatically restarts. Wait for this sequence to occur and the SP to complete the restart (about 10 minutes). After the SP restart completes, log back into the shelf.
23	In the System Manager Equipment Inventory screen, right click on the replacement circuit pack and select Modify. *The Optical Metro Inventory dialog box appears. The provision type shown in this window still shows the original circuit pack type.*

—continued—

Procedure 3-4 (continued)
Replacing Flex with Universal circuit packs or Universal with Flex circuit packs

Step	Action

24 **If** the replacement circuit pack type is **Then** select

Universal	Universal from the Flex Type drop-down list and click **OK**
Flex	Standard from the Flex Type drop-down list and click **OK**

25 Put the replacement circuit pack in-service. Refer to Procedure 3-7 "Putting a circuit pack or SFP in-service" in *Provisioning and Operating Procedures,* 323-1701-310.

26 Put the facility of the replacement circuit pack in-service. Refer to Procedure 3-10 "Putting a circuit pack or SFP facility in-service" in *Provisioning and Operating Procedures,* 323-1701-310.

Note: If you are replacing an OTR circuit pack, put the Line Signal (LS) and the Client Signal (CS) facilities of the circuit pack you are replacing in-service.

27 Reconnect the optical cables removed in step 14 to the Tx and Rx ports on the replacement circuit pack. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

28 **If** at step 8, the Mode column in the Connections tab indicated **Then** go to

Protected or Active	step 29
Unprot-West, Unprot-East, Passthrough, or Unselected	step 31

29 In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. The "Forced Switch to East path active" (minor, NSA) or "Forced Switch to West path active" (minor, NSA) alarm will be raised. Make sure that all other active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.

Note: If the far end circuit pack connected optically to the just replaced circuit pack is not the same type (e.g. the replaced circuit pack is Universal and the far end circuit pack is a Flex) then the Far End Circuit Pack Mismatch alarm will be raised at both ends of the link. To clear the alarm, repeat this procedure at the far end circuit pack.

30 Release the force switch at the shelf where the circuit pack was replaced and at the far-end shelf. Refer to Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures,* 323-1701-310.

—continued—

Procedure 3-4 (continued)
Replacing Flex with Universal circuit packs or Universal with Flex circuit packs

Step	Action
31	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support. ***Note:*** If the far end circuit pack connected optically to the just replaced circuit pack is not the same type (for example, the replaced circuit pack is Universal and the far end circuit pack is a Flex) then the Far End Circuit Pack Mismatch alarm will be raised at both ends of the link. To clear the alarm, repeat this procedure at the far end circuit pack.
32	Re-install the front cover door on the shelf where the circuit pack was replaced.

—end—

Procedure 3-5
Replacing an OTR circuit pack

Follow this procedure to replace an OTR circuit pack with an identical circuit pack.

For more information about OTR circuit packs, refer to the "OTR circuit packs" chapter in *Hardware Description,* 323-1701-102.

> ***Note:*** 10 Gbit/s OTR circuit packs are only supported on an Optical Metro 5200 shelf. 10 Gbit/s OTR Enhanced, 2.5 Gbit/s Flex 1310 nm or 2.5 Gbit/s Flex 850 nm OTR circuit packs are supported on both Optical Metro 5200 and Optical Metro 5100 shelves.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 3-5 (continued)
Replacing an OTR circuit pack

Requirements

Table 3-6 lists the tools and materials required to complete this procedure.

Table 3-6
Tools and materials for replacing an OTR circuit pack

Item	Quantity	Supplied
Replacement OTR circuit pack of the same type (same band and channel) as the OTR circuit pack being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Optical Metro 5200

Before replacing a circuit pack, the SP and at least one OCM must be seated in the shelf and the software load on the shelf must be in a committed state.

Optical Metro 5100

Before replacing a circuit pack, the software load on the shelf must be in a committed state.

For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart.

For Optical Metro 5100 shelf configurations consisting of one SP, the circuit pack you are replacing and other circuit packs, if you remove a circuit pack that has the active or standby database on it, another circuit pack will automatically be selected to carry the database. Wait for at least two minutes to allow data transfer to the newly selected circuit pack. The System Manager shows database-carrying circuit packs in bold text. You can also use the Optical Metro Inventory dialog box to locate the standby database.

—continued—

Procedure 3-5 (continued)
Replacing an OTR circuit pack

Precautions

CAUTION
Traffic is lost in an unprotected network
Traffic is interrupted when you replace an OTR circuit pack in an unprotected network. To verify if you can add path protection in your network, refer to the "Supported configurations" chapter in *Network Planning and Link Engineering,* 323-1701-110. To add path protection to an unprotected network, refer to Procedure 3-47 "Adding path protection to an unprotected path" in *Provisioning and Operating Procedures*, 323-1701-310.

CAUTION
Risk of service interruption
OTR circuit pack protection is dependent on the Shelf Processor (SP) circuit pack. Verify that the SP is inserted and operating correctly before attempting to either replace an OTR circuit pack, or put the circuit pack out-of-service.

CAUTION
Risk of service interruption
You must disconnect the optical cables from the OTR LINE and CLIENT Tx and Rx connectors (step 14) before removing the circuit pack (step 15). Failure to follow the procedure exactly can be service affecting.

CAUTION
Risk of network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in Installing Optical Metro 5200 Shelves and Components, 323-1701-201.

CAUTION
Risk of service interruption
You must put the OTR circuit pack facility in-service before reconnecting the optical cables to the new OTR circuit pack. Failure to do so can cause traffic interruption.

—continued—

Procedure 3-5 (continued)
Replacing an OTR circuit pack

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling circuit packs. Refer to "Handling circuit packs" on page 3-3 in this book.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
When a circuit pack is replaced in an Extended Metro network, re-equalization is necessary. See Procedure 2-6 "Re-equalizing an Extended Metro amplified system" in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 3-5 (continued)
Replacing an OTR circuit pack

Action

Step	Action
1	Make sure that the replacement OTR circuit pack is the same type (same band and channel) as the OTR circuit pack you are replacing.
2	Release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the cooling unit cover when you open it. The cooling unit cover is not permanently attached to the shelf. You must remove the cooling unit cover completely. If you let go of the cooling unit cover when you open it, you can cause personal injury, damage to the equipment, or both.

3	Identify the circuit pack to be replaced.
4	Start (restart) the Web browser and launch the System Manager.
5	Log in with read and write access to all of the system. Follow Procedure 1-1 "Logging into the network" in *Provisioning and Operating Procedures,* 323-1701-310.
6	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
7	From the Connections tab in System Manager, verify the type of traffic (protected, unprotected, passthrough, unselected) running on the OTR circuit pack you are replacing.

8

If the Mode column in the Connections tab indicates	**Then** go to
Unprot-west or Unprot-east	step 12
Protected or Active	step 9
Passthrough	step 12
Unselected (no channel assignment)	step 12

9 Identify whether the OTR to be replaced is in the west or east direction. Check the Chan. ID field of the Channel Assignments window under the Connections tab.

—continued—

Procedure 3-5 (continued)
Replacing an OTR circuit pack

Step	Action	
10	**If** the OTR to be replaced is	**Then**
	in the west direction	operate a force switch to the east OTR. Refer to Procedure 3-48 “Forcing traffic to one path on a protected channel” in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 11.
	in the east direction	operate a force switch to the west OTR. Refer to Procedure 3-48 “Forcing traffic to one path on a protected channel” in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 11.
11	**If** the far-end OTR is also protected, and	**Then**
	the OTR to be replaced is in the west direction	operate a force switch to the west OTR at the far-end. Refer to Procedure 3-48 “Forcing traffic to one path on a protected channel” in *Provisioning and Operating Procedure*s, 323-1701-310. Go to step 12.
	the OTR to be replaced is in the east direction	operate a force switch to the east OTR at the far-end. Refer to Procedure 3-48 “Forcing traffic to one path on a protected channel” in *Provisioning and Operating Procedures*, 323-1701-310. Go to step 12.
12	Put the Line Signal (LS) and the Client Signal (CS) facilities of the OTR circuit pack you are replacing out-of-service. Follow Procedure 3-13 “Taking a circuit pack facility or SFP facility out-of-service” in *Provisioning and Operating Procedures,* 323-1701-310.	
13	Put the OTR circuit pack you are replacing out-of-service. Follow Procedure 3-8 “Taking a circuit pack or SFP out-of-service” in *Provisioning and Operating Procedures,* 323-1701-310x.	
14	Label the optical cables connected to the OTR circuit pack you are replacing. Disconnect the optical cables and put protective caps on both the OTR circuit pack connectors and the optical cables to protect them from contamination and damage	
15	Release the lock latches at the top and bottom of the circuit pack.	

—continued—

Procedure 3-5 (continued)
Replacing an OTR circuit pack

Step	Action
16	Slide the circuit pack out of the guides and put the circuit pack on an antistatic surface.
17	Remove the replacement circuit pack from the antistatic bag.
18	Make sure that the replacement OTR circuit pack has the same PEC as the OTR circuit that you removed. If the circuit pack has a different PEC, stop this procedure and contact your next level of support.
19	Align the replacement OTR circuit pack with the circuit pack guides.
20	Keep the lock latches flat against the faceplate (in the locked position) so the circuit pack does not seat into the backplane connector. Carefully slide the circuit pack toward the back of the shelf until it stops.
21	Place the lock latches in the unlocked position.
22	Seat the OTR circuit pack in the backplane connector and place the lock latches in the locked position. ***Note 1:*** The OTR circuit pack autoprovisions immediately after it is placed in the backplane connector. Wait until the autoprovisioning is finished. This process takes less than two minutes. The autoprovisioning is finished when the LOS lamps are lit yellow. ***Note 2:*** For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart. The sequence of events is: a few minutes after the replacement circuit pack is inserted, the data restore completes, the Database Copies Are Unavailable alarm is cleared and the SP automatically restarts. Wait for this to occur and the SP to complete the restart (about 10 minutes). After the SP restart completes, log back into the shelf.
23	Put the replacement OTR circuit pack in-service. Follow Procedure 3-7 “Putting a circuit pack or SFP in-service” in *Provisioning and Operating Procedures,* 323-1701-310.
24	Put the Line Signal (LS) and the Client Signal (CS) facilities of the replacement OTR back in-service. Follow Procedure 3-10 “Putting a circuit pack or SFP facility in-service” in *Provisioning and Operating Procedures,* 323-1701-310.
25	Reconnect the Tx and Rx optical cables removed in step 14 to the Tx and Rx ports on the replacement OTR circuit pack. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to “Cleaning connectors” in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 3-5 (continued)
Replacing an OTR circuit pack

Step	Action
26	**If** at step 8, the Mode column in the Connections tab indicated **Then** go to Active or Protected → step 27 Unprot-West, Unprot-East, Passthrough, or Unselected → step 29
27	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. The “Forced Switch to East path active” (minor, NSA) or “Forced Switch to West path active” (minor, NSA) alarm will be raised. Make sure that all other active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.
28	Release the force switch at the shelf where the OTR was replaced and at the far-end shelf. Refer to Procedure 3-49 “Removing a manual, force, or lockout switch from a protection path” in *Provisioning and Operating Procedures*, 323-1701-310.
29	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.
30	Re-install the front cover door on the shelf where the OTR circuit pack was replaced.

—end—

Procedure 3-6
Replacing a Muxponder circuit pack

Follow this procedure to replace a Muxponder circuit pack with an identical circuit pack.

For more information about Muxponder circuit packs, refer to the "Muxponder circuit packs" chapter in *Hardware Description,* 323-1701-102.

Note: Muxponder circuit packs are supported on both Optical Metro 5200 and Optical Metro 5100 shelves.

ATTENTION

Nortel Networks has conducted failure mode analysis regarding the repeated insertion and removal of an SFP. Under normal operating conditions, once inserted and carrying live traffic, SFP modules operate as fixed transceivers on current Optical Metro 5100/5200 circuit packs. However, if an SPF module is inserted and removed repeatedly, it is possible for the electrical contacts on the SFP module or the SFP receptacle on the Muxponder circuit pack to wear out prematurely. Unnecessary or repeated insertions and removals are not considered normal and accepted operating practice, and as such Nortel Networks recommends that this be avoided. Nortel Networks recommends that SFP removal and insertion be performed only as normal operating practice (for example, during maintenance, card replacement and trouble clearing operations).

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 3-6 (continued)
Replacing a Muxponder circuit pack

Requirements

Table 3-7 lists the tools and materials required to complete this procedure.

Table 3-7
Tools and materials for replacing an Muxponder circuit pack

Item	Quantity	Supplied
Replacement Muxponder circuit pack of the same type (same band and channel) as the Muxponder circuit pack being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap and foot strap)	1	no
Note: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Optical Metro 5200

Before replacing a circuit pack, the SP and both OCMs must be seated in the shelf and the software load on the shelf must be in a committed state.

Optical Metro 5100

Before replacing a circuit pack, the software load on the shelf must be in a committed state.

For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart.

—continued—

Procedure 3-6 (continued)
Replacing a Muxponder circuit pack

For Optical Metro 5100 shelf configurations consisting of one SP, the circuit pack you are replacing and other circuit packs, if you remove a circuit pack that has the active or standby database on it, another circuit pack will automatically be selected to carry the database. Wait for at least two minutes to allow data transfer to the newly selected circuit pack. The System Manager shows database-carrying circuit packs in bold text. You can also use the Optical Metro Inventory dialog box to locate the standby database.

Precautions

CAUTION
Traffic will be lost
When you replace a Muxponder circuit pack, traffic will be lost during the entire duration of the procedure. Traffic will not be lost if the protection Muxponder circuit pack is replaced.

CAUTION
Risk of service interruption
Muxponder circuit pack protection is dependent on the Shelf Processor (SP). In an Optical Metro 5200 shelf, the Muxponder circuit pack protection is also dependent on the OCM circuit packs. Verify that the SP and the OCM circuit packs (if replacing a Muxponder in an Optical Metro 5200 shelf) are inserted and operating correctly before attempting to either replace a Muxponder circuit pack, or put the circuit pack out-of-service.

—continued—

Procedure 3-6 (continued)
Replacing a Muxponder circuit pack

CAUTION
Risk of service interruption
You must disconnect the optical cables from the Muxponder LINE and SFP connectors before removing the circuit pack. Failure to follow the procedure exactly can be service affecting.

CAUTION
Risk of network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

CAUTION
Risk of service interruption
You must put the Muxponder circuit pack facility in-service before reconnecting the optical cables to the new Muxponder circuit pack. Failure to do so prevents traffic from resuming.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling circuit packs. Refer to "Handling circuit packs" on page 3-3 in this book.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
When a circuit pack is replaced in an Extended Metro network, re-equalization is necessary. See Procedure 2-6 "Re-equalizing an Extended Metro amplified system" in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 3-6 (continued)
Replacing a Muxponder circuit pack

Action

Step	Action
1	Make sure that the replacement Muxponder circuit pack has the same PEC as the Muxponder circuit pack you are replacing.
2	If applicable, release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the shelf cover when you open it. The shelf cover is not permanently attached to the shelf and you must remove the door completely. If you let go of the door when you open it, you can cause personal injury, damage to the equipment, or both.

3	Start (restart) the Web browser and launch the System Manager.
4	Log in with read and write access to all of the system. Follow Procedure 1-1 "Logging into the network" in *Provisioning and Operating Procedures,* 323-1701-310.
5	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
6	From the Connections tab in System Manager, verify the type of traffic that is running on the Muxponder circuit pack you are replacing.

7

If the Mode column in the Connections tab indicates	**Then** go to
Unprot-west, Unprot-east, Unselected	step 26
Protected or Active	step 8

8

If you are replacing the	**Then** go to
working Muxponder circuit pack	step 26
protection Muxponder circuit pack	step 9

9 Operate a lockout at the near-end node and far-end node. Refer to Procedure 3-52 "Performing a lockout on a Muxponder circuit pack" in *Provisioning and Operating Procedures*, 323-1701-310.

Note: A Lockout-R condition may already be active at the far-end node. If so, you do not need to operate a Lockout at the far-end node.

—continued—

Procedure 3-6 (continued)
Replacing a Muxponder circuit pack

Step	Action
10	Put the Line Signal (LS) facility of the Muxponder circuit pack you are replacing out-of-service. Follow Procedure 3-13 "Taking a circuit pack facility or SFP facility out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310.
11	Put the Muxponder circuit pack you are replacing out-of-service. Follow Procedure 3-8 "Taking a circuit pack or SFP out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310.
12	Label all the optical fiber patch cords connected to the Muxponder circuit pack you are replacing. Disconnect the fiber patch cords and put protective caps on both the Muxponder circuit pack connectors and the fiber patch cords to protect them from contamination and damage.
13	Release the lock latches at the top and bottom of the circuit pack.
14	Slide the circuit pack out of the guides and put the circuit pack on an antistatic surface.
15	Remove the replacement circuit pack from the antistatic bag.
16	Make sure that the replacement Muxponder circuit pack has the same PEC as the Muxponder circuit that you removed. If the circuit pack has a different PEC, stop this procedure and contact your next level of support.
17	Align the replacement Muxponder circuit pack with the circuit pack guides.
18	Keep the lock latches flat against the faceplate (in the locked position) so the circuit pack does not seat into the backplane connector. Carefully slide the circuit pack toward the back of the shelf until it stops.
19	Place the lock latches in the unlocked position.
20	Seat the Muxponder circuit pack in the backplane connector and place the lock latches in the locked position. ***Note 1:*** The Muxponder circuit pack autoprovisions immediately after it is placed in the backplane connector. Wait until the autoprovisioning is finished. This process takes less than two minutes. The autoprovisioning is finished when the LINE LOS lamp is lit yellow. ***Note 2:*** For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart. The sequence of events is: a few minutes after the replacement circuit pack is inserted, the data restore completes, the Database Copies Are Unavailable alarm is cleared and the SP automatically restarts. Wait for this to occur and the SP to complete the restart (about 10 minutes). After the SP restart completes, log back into the shelf.

—continued—

Procedure 3-6 (continued)
Replacing a Muxponder circuit pack

Step	Action
21	Put the replacement Muxponder circuit pack in-service. Follow Procedure 3-7 "Putting a circuit pack or SFP in-service" in *Provisioning and Operating Procedures,* 323-1701-310.
22	Put the Line Signal (LS) facility of the replacement Muxponder back in-service. Follow Procedure 3-10 "Putting a circuit pack or SFP facility in-service" in *Provisioning and Operating Procedures,* 323-1701-310.
23	Reconnect the Tx and Rx fiber patch cords removed in step 12 to the Tx and Rx ports on the replacement Muxponder circuit pack. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For cleaning connectors procedures, refer to "Cleaning connectors" in *Installing OPTera Metro 5200 Shelves and Components*, 323-1701-201.
24	Release the lockout at the near-end node and far-end node. Refer to Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures,* 323-1701-310. ***Note:*** The lockout may not need to be removed at the far-end node if it was not operated due to a Lockout-R condition.
25	Go to step 51.
26	Put the Line Signal (LS) and the Client Signal (CS) facilities of the Muxponder circuit pack you are replacing out-of-service. Follow Procedure 3-13 "Taking a circuit pack facility or SFP facility out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310. ***Note:*** Take note of which CS facilities you put in the out-of-service state since these will need to be returned to the in-service state later in this procedure.
27	Put the SFP modules and the Muxponder circuit pack you are replacing out-of-service. Follow Procedure 3-8 "Taking a circuit pack or SFP out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310. ***Note:*** Take note of which SFP modules you put in the out-of-service state since these will need to be returned to the in-service state later in this procedure.
28	Label all the optical fiber patch cords connected to the Muxponder circuit pack you are replacing. Disconnect the fiber patch cords and put protective caps on both the Muxponder circuit pack connectors and the fiber patch cords to protect them from contamination and damage.
29	Release the lock latches at the top and bottom of the circuit pack.
30	Slide the circuit pack out of the guides and put the circuit pack on an antistatic surface.
31	Remove the replacement circuit pack from the antistatic bag.

—continued—

Procedure 3-6 (continued)
Replacing a Muxponder circuit pack

Step	Action
32	Make sure that the replacement Muxponder circuit pack has the same PEC as the Muxponder circuit that you removed. If the circuit pack has a different PEC, stop this procedure and contact your next level of support.
33	Align the replacement Muxponder circuit pack with the circuit pack guides.
34	Keep the lock latches flat against the faceplate (in the locked position) so the circuit pack does not seat into the backplane connector. Carefully slide the circuit pack toward the back of the shelf until it stops.
35	Place the lock latches in the unlocked position.
36	Seat the Muxponder circuit pack in the backplane connector and place the lock latches in the locked position. ***Note:*** The Muxponder circuit pack autoprovisions immediately after it is placed in the backplane connector. Wait until the autoprovisioning is finished. This process takes less than two minutes. The autoprovisioning is finished when the LINE LOS lamp is lit yellow.
37	On the removed Muxponder circuit pack, release the latch on an SFP module and use the latch to carefully pull the SFP module out of its receptacle.
38	Take the SFP module you removed in step 37 or a new SFP with the same PEC and slide the SFP module into the same port receptacle of the replacement Muxponder circuit pack making sure to orient the SFP module as follows before sliding the SFP module into the SFP receptacle (see Figure 3-1 on page 3-64): • orient the SFP module such that the SFP latch opens towards the right (or towards the top if the Muxponder is in an Optical Metro 5100 shelf) when the SFP module needs to be inserted into an odd numbered SFP receptacle • orient the SFP module such that the SFP latch opens towards the left (or towards the bottom if the Muxponder is in an Optical Metro 5100 shelf) when the SFP module needs to be inserted into an even numbered SFP receptacle
39	Close the SFP latch and then completely slide the SFP module into the SFP receptacle until it locks into place.
40	Repeat step 37 to step 39 for each SFP module equipped on the removed Muxponder circuit pack.
41	Put the replacement Muxponder circuit pack and SFP modules in-service. Follow Procedure 3-7 “Putting a circuit pack or SFP in-service” in *Provisioning and Operating Procedures,* 323-1701-310.
42	Put the Line Signal (LS) and the Client Signal (CS) facilities of the replacement Muxponder back in-service. Follow Procedure 3-10 “Putting a circuit pack or SFP facility in-service” in *Provisioning and Operating Procedures,* 323-1701-310.

—continued—

Procedure 3-6 (continued)
Replacing a Muxponder circuit pack

Step	Action

43 **If** the Muxponder circuit pack is in an … **Then** go to

If	Then go to
Optical Metro 5200	step 44
Optical Metro 5100	step 47

44 Reconnect the Tx and Rx fiber patch cords removed in step 28 to the Tx and Rx ports on the replacement Muxponder circuit pack. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For cleaning connectors procedures, refer to "Cleaning connectors" in *Installing OPTera Metro 5200 Shelves and Components*, 323-1701-201. Make sure that all fiber adaptor housings are cleaned before you make the connections. For cleaning information, see Procedure 9-5, "Cleaning the SFP adapter housing" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

45 Route all the optical cables through the exit apertures of the shelf fiber management trough under the Muxponder circuit pack as they were before you started the procedure. See Figure 3-2 on page 3-65.

46 Go to step 49.

47 Reconnect the Tx and Rx fiber patch cords removed in step 28 to the Tx and Rx ports on the replacement Muxponder circuit pack. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For connector cleaning procedures, refer to "Cleaning connectors" in *Installing OPTera Metro 5100 Shelves and Components*, 323-1701-210. Make sure that all fiber adaptor housings are cleaned before you make the connections. For cleaning information, see the Procedure 9-5, "Cleaning the SFP adapter housing" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.

48 Route all the optical cables through the exit apertures of the shelf vertical fiber rail to the right of the Muxponder circuit pack as they were before you started the procedure. See Figure 3-2 on page 3-65.

49 In the System Manager, click on Connections/Channel Assignments.

If	Then go to
the Mode column shows Active or Protected	step 51
the Mode column shows Unprot-West, Unprot-East, or Unselected	step 51
the Path State column shows WTR	step 50

50 Wait for the WTR to expire or you can operate and release a lockout to clear the WTR condition. If you are using unidirectional protection mode, you may also need to operate and release a lockout at the far-end node to clear the WTR at the far-end node.

—continued—

Procedure 3-6 (continued)
Replacing a Muxponder circuit pack

Step	Action
51	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all active alarms on the system match the alarms noted in step 5. If they do not match, stop this procedure and contact your next level of support.
52	Re-install the front cover door on the shelf where the Muxponder circuit pack was replaced.

—end—

Procedure 3-7
Replacing a Small Form Factor Pluggable (SFP) module

Follow this procedure to replace an SFP module. SFP modules are supported on the following circuit packs:

- Muxponder 10 Gbit/s GbE/FC circuit packs
- Muxponder 10 Gbit/s GbE/FC VCAT circuit pack

Requirements

Table 3-8 lists the tools and materials required to complete this procedure.

Table 3-8
Tools and materials for replacing an SFP module

Item	Quantity	Supplied
Replacement SFP module of the same type as the SFP module being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap and foot strap)	1	no
Universal fiber tool to help remove and insert duplex LC-SC client fiber patch cords.	1	yes, provided with the Muxponder circuit pack
Note: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

—continued—

Procedure 3-7 (continued)
Replacing a Small Form Factor Pluggable (SFP) module

Precautions

CAUTION
Traffic will be lost
When you replace an SFP module, traffic will be lost during the entire duration of the procedure.

CAUTION
Risk of affecting traffic on adjacent SFP modules
Due to the close proximity of adjacent in-service SFP modules, there is a significant risk of mechanical interference when adding and removing SFP modules and thereby causing traffic errors. A universal fiber tool is provided with each circuit pack that support SFPs. Using the universal fiber tool to connect and disconnect client optical fiber patchcords reduces this risk.

CAUTION
Risk of network reliability
Make sure that all fiber connectors are cleaned before you make the connections (or re-connections) described in this chapter. For cleaning information, see the Procedure 9-5 “Cleaning the SFP adapter housing”.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling circuit packs. Refer to “Handling circuit packs” on page 3-3 in this book.

—continued—

Procedure 3-7 (continued)
Replacing a Small Form Factor Pluggable (SFP) module

Action

Step	Action
1	Make sure that the replacement SFP module is of the same type as the one that you are replacing.
2	Release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the cooling unit cover when you open it. The cooling unit cover is not permanently attached to the shelf. You must remove the cooling unit cover completely. If you let go of the cooling unit cover when you open it, you can cause personal injury, damage to the equipment, or both.

3	Identify the SFP to replace.
4	Start (restart) the Web browser and launch the System Manager.
5	Log in with read and write access to all of the system. Follow Procedure 1-1 "Logging into the network" in *Provisioning and Operating Procedures,* 323-1701-310.
6	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.

7	**If** the SFP module to replace is in a Muxponder circuit pack equipped in an	**Then** go to
	Optical Metro 5200	step 8
	Optical Metro 5100	step 20

8	Carefully remove the optical cables from the exit apertures of the shelf fiber management trough under the Muxponder circuit pack in order to create some slack to allow you to remove the SFP module.
9	Label the optical cables connected to the SFP module that you are replacing.
10	Position the universal fiber tool on either side of the duplex LC fiber-optic cables connected to the SFP module to remove.
11	Squeeze the universal fiber tool firmly and gently pull the fiber-optic cables towards the front. The optical cables are now disconnected.
12	Put a dust cap on the SFP module and the optical cables to protect them from contamination and damage.

—continued—

Procedure 3-7 (continued)
Replacing a Small Form Factor Pluggable (SFP) module

Step	Action
13	Release the latch on the SFP module by: • pulling the latch towards the right if the SFP module is in an odd numbered port of the Muxponder circuit pack • pulling the latch towards the left if the SFP module is in an even numbered port of the Muxponder circuit pack
14	Using the latch, carefully pull the SFP module out from its receptacle.
15	Slide the new SFP module into the appropriate circuit pack faceplate SFP receptacle making sure to orient the SFP module as follows before sliding the SFP module into the SFP receptacle: • orient the SFP module such that the SFP latch opens towards the right when the SFP module needs to be inserted into an odd numbered SFP receptacle • orient the SFP module such that the SFP latch opens towards the left when the SFP module needs to be inserted into an even numbered SFP receptacle
16	Close the SFP latch and then completely slide the SFP module into the SFP receptacle until it locks into place.
17	Reconnect the fiber patchcords that were disconnected in step 11 to the SFP module. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For connector cleaning procedures, refer to "Cleaning connectors" in *Installing OPTera Metro 5200 Shelves and Components*, 323-1701-201. Make sure that all fiber adaptor housings are cleaned before you make the connections. For cleaning information, see the Procedure 9-5, "Cleaning the SFP adapter housing" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
18	Route all the optical cables through the exit apertures of the shelf fiber management trough under the Muxponder circuit pack as they were before you started the procedure. See Figure 3-1 on page 3-64.
19	Go to step 31.
20	Carefully remove the optical cables from the exit apertures of the shelf vertical fiber rail to right of the Muxponder circuit pack in order to create some slack to allow you to remove the SFP module.
21	Label the optical cables connected to the SFP module that you are replacing.
22	Position the universal fiber tool on either side of the duplex LC fiber-optic cables connected to the SFP module to remove.
23	Squeeze the universal fiber tool firmly and gently pull the fiber-optic cables towards the front. The optical cables are now disconnected.

—continued—

Procedure 3-7 (continued)
Replacing a Small Form Factor Pluggable (SFP) module

Step	Action
24	Put a dust cap on the SFP module and the optical cables to protect them from contamination and damage.
25	Release the latch on the SFP module by: • pulling the latch towards the top if the SFP module is in an odd numbered port of the Muxponder circuit pack • pulling the latch towards the bottom if the SFP module is in an even numbered port of the Muxponder circuit pack
26	Using the latch, carefully pull the SFP module out from its receptacle.
27	Slide the new SFP module into the appropriate circuit pack faceplate SFP receptacle making sure to orient the SFP module as follows before sliding the SFP module into the SFP receptacle: • orient the SFP module such that the SFP latch opens towards the top when the SFP module needs to be inserted into an odd numbered SFP receptacle • orient the SFP module such that the SFP latch opens towards the left when the SFP module needs to be inserted into an even numbered SFP receptacle
28	Close the SFP latch and then completely slide the SFP module into the SFP receptacle until it locks into place.
29	Reconnect the fiber patchcords that were disconnected in step 23 to the SFP module. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For connector cleaning procedures, refer to "Cleaning connectors" in *Installing OPTera Metro 5100 Shelves and Components*, 323-1701-210. Make sure that all fiber adaptor housings are cleaned before you make the connections. For cleaning information, see the Procedure 9-5, "Cleaning the SFP adapter housing" in *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210.
30	Route all the optical cables through the exit apertures of the shelf vertical fiber rail to the right of the Muxponder circuit pack as they were before you started the procedure. See Figure 3-2 on page 3-65.
31	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.
32	Re-install the front cover door on the shelf where the Muxponder circuit pack was replaced.

—end—

Figure 3-1
Routing fibers through the exit apertures - Optical Metro 5200 shelf

OM2615p.jpg

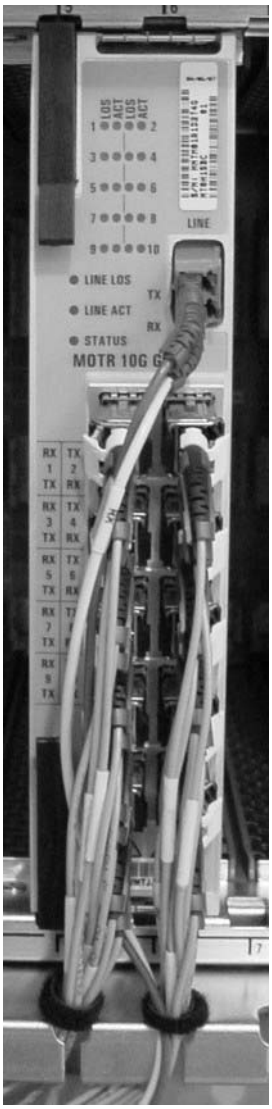
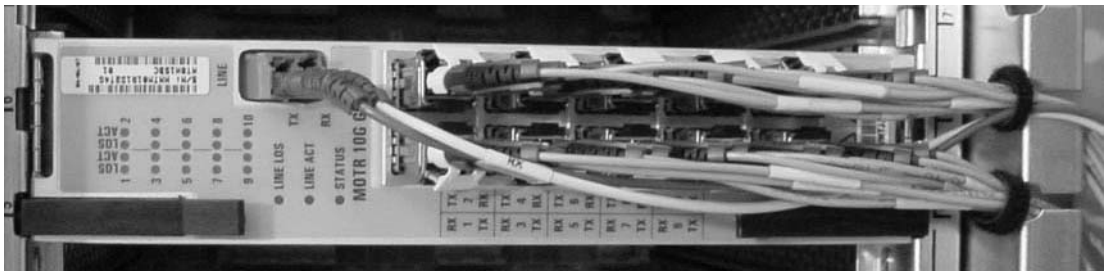


Figure 3-2
Routing fibers through the vertical fiber rail - Optical Metro 5100 shelf

OM2616p.jpg



Procedure 3-8
Replacing an OCM circuit pack

Follow this procedure to replace an OCM circuit pack with an identical circuit pack.

For more information about OCM circuit packs, refer to the "OCM circuit packs" chapter in *Hardware Description,* 323-1701-102.

> ***Note:*** OCM circuit packs are only supported on Optical Metro 5200 shelves.

Requirements

Table 3-9 lists the tools and materials required to complete this procedure.

Table 3-9
Tools and materials for replacing an OCM circuit pack

Item	Quantity	Supplied
Replacement OCM circuit pack of the same type as the OCM circuit pack being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Optical Metro 5200

You must have two OCM circuit packs and one SP circuit pack seated in the Optical Metro 5200 shelf in order to replace one OCM circuit pack. Also, make sure that the software load on the shelf is in a committed state.

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

—continued—

Procedure 3-8 (continued)
Replacing an OCM circuit pack

CAUTION
Risk of service interruption
Removing the active database circuit pack will automatically switch the standby circuit pack to an active state, and copy the database to the next available circuit pack to act as standby. In the event of a complete loss of database (for example, if both OCM circuit packs fail in an Optical Metro 5200 shelf), the database information is automatically backed up to the Shelf Processor and the commissioning and provisioning information is preserved.

When you remove a OCM circuit pack from an Optical Metro 5200 shelf, you must wait two minutes before inserting a circuit pack in this slot. OCM circuit pack replacement must always be done one circuit pack at a time. Always insert one OCM circuit pack at a time in the shelf.

CAUTION
Risk of service interruption
Since both OCM circuit packs are required to provide a Muxponder protection scheme, the protection path is unavailable when one of the two OCM circuit packs is removed (or has failed). If your network currently supports protected service using Muxponders, ensure that traffic is active on the Muxponder's working path.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling circuit packs. Refer to "Handling circuit packs" on page 3-3 in this book.

—continued—

Procedure 3-8 (continued)
Replacing an OCM circuit pack

Action

Step	Action
1	Make sure that the replacement OCM circuit pack is the same type as the OCM circuit pack you are replacing.
2	Release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the cooling unit cover when you open it. The cooling unit cover is not permanently attached to the shelf. You must remove the cooling unit cover completely. If you let go of the cooling unit cover when you open it, you can cause personal injury, damage to the equipment, or both.

3	Identify the circuit pack to be replaced.
4	Start (restart) the Web browser and launch the System Manager.
5	Login with read and write access to all of the system. Follow Procedure 1-1 "Logging into the network" in *Provisioning and Operating Procedures,* 323-1701-310.
6	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.

7

If you have	**Then**
at least one channel which uses an OCI and OCLD circuit pack	switch traffic to the other OCM. Follow Procedure 3-51 "Force switching on OCM circuit packs" in *Provisioning and Operating Procedures* 323-1701-310, then go to step 8.
otherwise	go to step 8

8	Put the OCM circuit pack out-of-service. Follow Procedure 3-8 "Taking a circuit pack or SFP out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310.
9	Release the lock latches at the top and bottom of the circuit pack.
10	Slide the circuit pack out of the guides and put the circuit pack on an antistatic surface.
11	Remove the replacement circuit pack from the antistatic bag.
12	Make sure that the new replacement OCM circuit pack has the same PEC as the OCM circuit that you removed. If the circuit pack has a different PEC, stop this procedure and contact your next level of support.

—continued—

Procedure 3-8 (continued)
Replacing an OCM circuit pack

Step	Action
13	Align the replacement OCM circuit pack with the circuit pack guides.
14	Keep the lock latches flat against the faceplate (in the locked position) so the circuit pack does not seat into the backplane connector. Carefully slide the circuit pack toward the back of the shelf until it stops.
15	Place the lock latches in the unlocked position.
16	Carefully seat the replacement OCM circuit pack in the backplane connector and place the lock latches in the locked position. ***Note:*** The circuit pack autoprovisions immediately after it is seated in the backplane connector. Wait until the autoprovisioning is finished. This process takes about one minute. If you do not wait for the autoprovisioning to finish, you can cause backup failures.
17	Put the replacement OCM circuit pack in-service. Follow Procedure 3-8 "Putting a circuit pack or SFP in-service" in *Provisioning and Operating Procedures,* 323-1701-310.
18	Release the force switch on the OCM circuit pack. Follow Procedure 3-58 "Removing a force switch from an OCM" in *Provisioning and Operating Procedures,* 323-1701-310.
19	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.
20	Re-install the front cover door on the shelf where the OCM circuit pack was replaced.

—end—

Procedure 3-9
Replacing an OSC circuit pack

Follow this procedure to replace an OSC circuit pack.

For more information about the OSC circuit pack, refer to "OSC circuit packs" chapter of *Hardware Description,* 323-1701-102.

Requirements

Table 3-10 lists the tools and materials required to complete this procedure.

Table 3-10
Tools and materials for replacing an OSC circuit pack

Item	Quantity	Supplied
Replacement OSC circuit pack (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Optical Metro 5200

Before replacing a circuit pack, the SP and at least one OCM must be seated in the shelf and the software load on the shelf must be in a committed state.

Optical Metro 5100

Before replacing a circuit pack, the software load on the shelf must be in a committed state.

For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart.

For Optical Metro 5100 shelf configurations consisting of one SP, the circuit pack you are replacing and other circuit packs, if you remove a circuit pack that has the active or standby database on it, another circuit pack will automatically be selected to carry the database. Wait for at least two minutes to allow data transfer to the newly selected circuit pack. The System Manager shows database-carrying circuit packs in bold text. You can also use the Optical Metro Inventory dialog box to locate the standby database.

—continued—

Procedure 3-9 (continued)
Replacing an OSC circuit pack

Precautions

CAUTION
Risk of losing visibility
If the OSC circuit pack is unseated in an OFA shelf, any user logged into the system will lose visibility to the shelf.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling circuit packs. Refer to "Handling circuit packs" on page 3-3 in this book.

CAUTION
Release 3.2 software baseline requirement
All circuit packs installed on an Optical Metro 5100 shelf must meet the release 3.2 software baseline requirement. For details, contact Nortel Networks. Refer to the "About this document" chapter in this book for contact information.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 3-9 (continued)
Replacing an OSC circuit pack

Action

Step	Action
1	Stop the System Level Equalization Controller if it is running. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.
2	Release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the shelf cover when you open it. The shelf cover is not permanently attached to the shelf and you must remove the door completely. If you let go of the door when you open it, you can cause personal injury, damage to the equipment, or both.

3	Identify the circuit pack to be replaced.
4	Start (restart) the Web browser and launch the System Manager.
5	Login with read and write access to all of the system. Follow Procedure 1-1 "Logging into the network" in *Provisioning and Operating Procedures,* 323-1701-310.
6	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
7	In System Manager, query the facilities for the OSC circuit pack (OSC-W, OSC-E, WSC-W, and WSC-E) you are replacing and note all facilities that are currently in-service.
8	Put all facilities associated with the OSC circuit pack (OSC-W, OSC-E, WSC-W, and WSC-E) you are replacing out-of-service. Follow Procedure 3-13 "Taking a circuit pack facility or SFP facility out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310.
9	Put the OSC circuit pack you are replacing out-of-service. Follow Procedure 3-8 "Taking a circuit pack or SFP out-of-service" in *Provisioning and Operating Procedures* 323-1701-310.
10	Label the optical cables connected to the OSC circuit pack you are replacing. Disconnect the optical cables and put protective caps on both the OSC circuit pack connectors and the optical cables to protect them from contamination and damage
11	Release the lock latches at the top and bottom of the circuit pack.
12	Slide the circuit pack out of the guides and put the circuit pack on an antistatic surface.

—continued—

Procedure 3-9 (continued)
Replacing an OSC circuit pack

Step	Action
13	Remove the replacement OSC circuit pack from the antistatic bag.
14	Align the replacement OSC circuit pack with the circuit pack guides.
15	Keep the lock latches flat against the faceplate (in the locked position) so the circuit pack does not seat into the backplane connector. Carefully slide the circuit pack toward the back of the shelf until it stops.
16	Place the lock latches in the unlocked position.
17	Carefully seat the replacement OSC circuit pack in the backplane connector and place the lock latches in the locked position. ***Note 1:*** The circuit pack initializes immediately after it is placed in the backplane connector. Wait until the initialization is finished. This process takes less than two minutes. The initialization is finished when the LOS lamps are lit yellow. ***Note 2:*** For Optical Metro 5100 shelf configurations consisting of one SP and only the circuit pack you are replacing (as the database carrying circuit pack), do not reseat or reboot the SP during this procedure. An automatic data restore is performed and interrupting this restore will cause the shelf to decommission. During the automatic data restore operation the SP will automatically restart. The sequence of events is: a few minutes after the replacement circuit pack is inserted, the data restore completes, the Database Copies Are Unavailable alarm is cleared and the SP automatically restarts. Wait for this to occur and the SP to complete the restart (about 10 minutes). After the SP restart completes, log back into the shelf. ***Note 3:*** If the OSC circuit pack does not initialize properly, this could be as a result of the replacement OSC circuit pack running Release 4.0 or older software load. If this is the case, remove the OSC circuit pack from the shelf, deprovision the slot (see Procedure 3-9 “Deleting a circuit pack or SFP from the inventory” in *Provisioning and Operating Procedures,* 323-1701-310.) and then re-insert the circuit pack. Alternatively, you can try a different replacement OSC circuit pack.
18	Put the replacement OSC circuit pack in-service. Follow Procedure 3-7 “Putting a circuit pack or SFP in-service” in *Provisioning and Operating Procedures,* 323-1701-310.
19	Put all the OSC port facilities that you noted at step 7 in-service. Follow Procedure 3-10 “Putting a circuit pack or SFP facility in-service” in *Provisioning and Operating Procedures,* 323-1701-310.
20	Reconnect the optical cables removed in step 10 to the replacement OSC circuit pack. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to “Cleaning connectors” in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 3-9 (continued)
Replacing an OSC circuit pack

Step	Action
21	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all other active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.
22	Re-install the front cover door on the shelf where the OSC circuit pack was replaced.
23	Restart the System Level Equalization Controller if it was stopped in step 1. See Procedure 2-13 to start SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—end—

Procedure 3-10
Replacing an OFA circuit pack

Follow this procedure to replace an OFA circuit pack with an identical circuit pack.

For more information about OFA circuit packs, refer to the "OFA circuit packs" chapter of *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

Requirements

Table 3-11 lists the tools and materials required to complete this procedure.

Table 3-11
Tools and materials for replacing an OFA circuit pack

Item	Quantity	Supplied
Replacement OFA circuit pack of the same PEC as the OFA circuit pack being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Optical Metro 5200

Before replacing a circuit pack, the SP and at least one OCM circuit pack must be seated in the shelf and the software load on the shelf must be in a committed state.

—continued—

Procedure 3-10 (continued)
Replacing an OFA circuit pack

Precautions

CAUTION
Risk of service interruption
You must put the OFA circuit pack facility in-service before reconnecting the optical cables to the new OFA circuit pack. Failure to do so can cause traffic interruption.

CAUTION
Traffic is lost in an unprotected network
Traffic is interrupted when you replace an OFA circuit pack in an unprotected network. To verify if you can add path protection in your network, refer to the "Supported configurations" chapter in *Network Planning and Link Engineering,* 323-1701-110. To add path protection to an unprotected network, refer to Procedure 3-47 "Adding path protection to an unprotected path" in *Provisioning and Operating Procedures*, 323-1701-310.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling circuit packs. Refer to "Handling circuit packs" on page 3-3 in this book.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—continued—

Procedure 3-10 (continued)
Replacing an OFA circuit pack

CAUTION
Risk of affecting network reliability
When a circuit pack is replaced in an Extended Metro network, re-equalization is necessary. See Procedure 2-6 "Re-equalizing an Extended Metro amplified system" in *Testing and Equalization Procedures*, 323-1701-222.

Action

Step	Action
1	Make sure that the replacement OFA circuit pack is the same PEC as the circuit pack you are replacing.
2	Release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the cooling unit cover when you open it. The cooling unit cover is not permanently attached to the shelf. You must remove the cooling unit cover completely. If you let go of the cooling unit cover when you open it, you can cause personal injury, damage to the equipment, or both.

3	Identify the circuit pack to be replaced.
4	Start (restart) the Web browser and launch the System Manager.
5	Login with read and write access to all of the system. Follow Procedure 1-1 "Logging into the network" in *Provisioning and Operating Procedures,* 323-1701-310.
6	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
7	Disable both automatic laser shutdown (ALS) and automatic laser recovery (ALR) if they are enabled. Follow Procedure 1-43 "Enabling or disabling automatic laser shutdown" and Procedure 1-44 "Enabling or disabling automatic laser recovery" in *Provisioning and Operating Procedures,* 323-1701-310.

—continued—

Procedure 3-10 (continued)
Replacing an OFA circuit pack

Step	Action
8	If intrasite fault sectionalization (IFS) is enabled on your network, disable this feature. Follow Procedure 3-39 "Disabling intrasite fault sectionalization (IFS)" in *Provisioning and Operating Procedures,* 323-1701-310.

CAUTION
Risk of traffic loss
If the system is unprotected, the traffic cannot be switched and traffic will be lost for the whole duration of this procedure. Advise the network administrator before proceeding with the next step.

9	Switch traffic off the span where the OFA circuit pack you are replacing is located. Follow Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures,* 323-1701-310.
10	Put the facility of the OFA circuit pack you are replacing out-of-service. Follow Procedure 3-13 "Taking a circuit pack facility or SFP facility out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310.

CAUTION
Risk of damage to downstream circuit packs
When replacing a OFA VGA, the newly inserted circuit pack equalizes to the power level of the original OFA if the OFA facilities are not put OOS. If the output power is higher, damage to downstream equipment can occur.

Ensure all OFA facilities are placed OOS.

11	Put the OFA circuit pack you are replacing out-of-service. Follow Procedure 3-8 "Taking a circuit pack or SFP out-of-service" in *Provisioning and Operating Procedures* 323-1701-310.
12	Label the optical cables connected to the IN and OUT ports of the OFA circuit pack you are replacing. Disconnect the optical cables and put protective caps on the optical cables to protect them from contamination and damage.
13	Release the lock latches at the top and bottom of the circuit pack.
14	Slide the circuit pack out of the guides and put the circuit pack on an antistatic surface.
15	Remove the replacement OFA circuit pack from the antistatic bag.
16	Align the replacement OFA circuit pack with the circuit pack guides.
17	Keep the lock latches flat against the faceplate (in the locked position) so the circuit pack does not seat into the backplane connector. Slide the circuit pack toward the back of the shelf until it stops.

—continued—

Procedure 3-10 (continued)
Replacing an OFA circuit pack

Step	Action
18	Place the lock latches in the unlocked position.
19	Carefully seat the OFA circuit pack in the backplane connector. ***Note:*** The OFA circuit pack autoprovisions immediately after it is placed in the backplane connector. Wait until the autoprovisioning is finished. This process takes less than two minutes. The autoprovisioning is finished when the LOS lamp is lit yellow.
20	Place the lock latches in the locked position.
21	Put the OFA circuit pack in-service. Follow Procedure 3-7 "Putting a circuit pack or SFP in-service" in *Provisioning and Operating Procedures,* 323-1701-310.
22	Put the OFA circuit pack facility in-service. Follow Procedure 3-10 "Putting a circuit pack or SFP facility in-service" in *Provisioning and Operating Procedures,* 323-1701-310.
23	Reconnect the optical cables removed in step 12 to the IN and OUT ports of the replacement OFA circuit pack. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
24	**If** the OFA type is — **Then** go to OFA VGA — step 25 otherwise — step 30
25	**If** this site is — **Then** go to under continuos system level equalization control — step 30 not under continuos system level equalization control — step 26
26	In the Selected Shelves area of the System Manager, select the shelf that contains the OFA VGA circuit pack you replaced and then click on Apply.
27	Select the Equipment tab and then the Facilities tab.
28	Right-click on the OFA VGA circuit pack and then select Equalize. *The Component Level Power Equalization window is displayed.*
29	Click on the Adjust Power button. *After a few seconds, the Power Control Status field displays Completed.*

—continued—

Procedure 3-10 (continued)
Replacing an OFA circuit pack

Step	Action	
30	**If**	**Then**
	at step 9, Procedure 4-7 was performed	re-route traffic to the original path. Follow Procedure 3-49 “Removing a manual, force, or lockout switch from a protection path” in *Provisioning and Operating Procedures* 323-1701-310, then go to step 31.
	otherwise	go to step 31
31	If intrasite fault sectionalization was enabled on your network and you disabled it in step 8, enable the feature. Follow Procedure 3-38 “Enabling intrasite fault sectionalization (IFS)”in *Provisioning and Operating Procedures,* 323-1701-310.	
32	Enable both automatic laser shutdown (ALS) and automatic laser recovery (ALR) if they were disabled in step 7. Follow Procedure 1-43 “Enabling or disabling automatic laser shutdown” and Procedure 1-44 “Enabling or disabling automatic laser recovery” in *Provisioning and Operating Procedures,* 323-1701-310.	
33	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all other active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.	
34	Re-install the front cover door on the shelf where the OFA circuit pack was replaced.	

—end—

Procedure 3-11
Replacing a Low Input Power OFA circuit pack with a High Input Power OFA circuit pack

Follow this procedure to replace a Low Input Power OFA circuit pack with a High Input Power OFA circuit pack.

For more information about OFA circuit packs, refer to the "OFA circuit packs" chapter of *Hardware Description,* 323-1701-102.

Requirements

Table 3-12 lists the tools and materials required to complete this procedure.

Table 3-12
Tools and materials for replacing a Low Input Power OFA circuit pack with a High Input Power OFA circuit pack

Item	Quantity	Supplied
Replacement High Input Power OFA circuit pack of the same band (C-Band or L-Band) as the Low Input Power OFA circuit pack being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Optical Spectrum Analyzer (OSA)	1	no
SC-SC optical cables to connect the OSA to the monitor port on the High Input Power OFA circuit pack	1	no
Note: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Optical Metro 5200

Before replacing a circuit pack, the SP and at least one OCM circuit pack must be seated in the shelf and the software load on the shelf must be in a committed state.

—continued—

Procedure 3-11 (continued)
Replacing a Low Input Power OFA circuit pack with a High Input Power OFA circuit pack

Precautions

CAUTION
Risk of service interruption
This procedure is for Low Input Power OFA circuit pack replacement only. If you are doing network configuration, you must run the Network Modeling Tool (NMT) and update the APBE configuration data based on the NMT output.

CAUTION
Risk of service interruption
You must put the OFA circuit pack facility in-service before reconnecting the optical cables to the new OFA circuit pack. Failure to do so can cause traffic interruption.

CAUTION
Traffic is lost in an unprotected network
Traffic is interrupted when you replace an OFA circuit pack in an unprotected network. To verify if you can add path protection in your network, refer to the "Supported configurations" chapter in *Network Planning and Link Engineering,* 323-1701-110. To add path protection to an unprotected network, refer to Procedure 3-47 "Adding path protection to an unprotected path" in *Provisioning and Operating Procedures*, 323-1701-310.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling circuit packs. Refer to "Handling circuit packs" on page 3-3 in this book.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

—continued—

Procedure 3-11 (continued)
Replacing a Low Input Power OFA circuit pack with a High Input Power OFA circuit pack

CAUTION
Risk of network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Action

Step	Action
1	Make sure that the replacement High Input Power OFA circuit pack is the same band (C-band or L-band) as the Low Input Power OFA circuit pack you are replacing.
2	Release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the cooling unit cover when you open it. The cooling unit cover is not permanently attached to the shelf. You must remove the cooling unit cover completely. If you let go of the cooling unit cover when you open it, you can cause personal injury, damage to the equipment, or both.

3	Identify the circuit pack to be replaced.
4	Start (restart) the Web browser and launch the System Manager.
5	Login with read and write access to all of the system. Follow Procedure 1-1 "Logging into the network" in *Provisioning and Operating Procedures,* 323-1701-310.
6	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.

—continued—

Procedure 3-11 (continued)
Replacing a Low Input Power OFA circuit pack with a High Input Power OFA circuit pack

Step	Action
7	If intrasite fault sectionalization (IFS) is enabled on your network, disable this feature. Follow Procedure 3-39 "Disabling intrasite fault sectionalization (IFS)" in *Provisioning and Operating Procedures,* 323-1701-310.

CAUTION
Risk of traffic loss
If the system is unprotected, the traffic cannot be switched and traffic will be lost for the whole duration of this procedure. Advise the network administrator before proceeding with the next step.

8	Switch traffic off the span where the OFA circuit pack you are replacing is located. Follow Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures,* 323-1701-310.
9	In System Manager, select Inventory under the Equipment tab. Double-click on the Low Input Power OFA circuit pack to replace and write down the Location, the Direction and the Optical System Identifier (OSID) of the OFA circuit pack.
10	Put the facility of the OFA circuit pack you are replacing out-of-service. Follow Procedure 3-13 "Taking a circuit pack facility or SFP facility out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310.
11	Put the OFA circuit pack you are replacing out-of-service. Follow Procedure 3-8 "Taking a circuit pack or SFP out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310.
12	Delete the Low Input Power OFA circuit pack facility. Follow Procedure 3-14 "Deleting a circuit pack or SFP facility" in *Provisioning and Operating Procedures* 323-1701-310.
13	Delete the Low Input Power OFA circuit pack inventory. Follow Procedure 3-9 "Deleting a circuit pack or SFP from the inventory" in *Provisioning and Operating Procedures* 323-1701-310.
14	Label the optical cables connected to the IN and OUT ports of the Low Input Power OFA circuit pack you are replacing. Disconnect the optical cables and put protective caps on the optical cables to protect them from contamination and damage.
15	Connect an optical fiber from the Rx port to an OSA and examine the input power level, wavelengths and OSNR levels present at the input of the Low Input Power OFA circuit pack.

—continued—

Procedure 3-11 (continued)
Replacing a Low Input Power OFA circuit pack with a High Input Power OFA circuit pack

Step	Action
16	Re-equalize the input power in the OFA circuit pack. If necessary, use an APBE/PBE or fixed pads. Follow Procedure 2-12 "Re-equalizing optical power of a band" in *Testing and Equalization Procedures* 323-1701-222. ***Note:*** This is required to support the higher input power of the High Input Power OFA circuit pack and to improve OSNR levels.
17	Disconnect the optical fiber from the Rx port of the OSA.
18	Release the lock latches at the top and bottom of the circuit pack.
19	Slide the circuit pack out of the guides and put the circuit pack on an antistatic surface.
20	Remove the replacement High Input Power OFA circuit pack from the antistatic bag.
21	Align the replacement High Input Power OFA circuit pack with the circuit pack guides.
22	Keep the lock latches flat against the faceplate (in the locked position) so the circuit pack does not seat into the backplane connector. Slide the circuit pack toward the back of the shelf until it stops.
23	Place the lock latches in the unlocked position.
24	Carefully seat the replacement High Input Power OFA circuit pack in the backplane connector and place the lock latches in the locked position. ***Note:*** The OFA circuit pack autoprovisions immediately after it is placed in the backplane connector. Wait until the autoprovisioning is finished. This process takes approximately 15 seconds.
25	In System Manager, select Inventory under the Equipment tab. Double-click on the High Input Power OFA circuit pack that you just seated and verify that the AMP type indicates High Input Power.
26	Refer to step 9 and provision the Location, Direction and Optical System Identifier (OSID) for the new High Input Power circuit pack. Follow Procedure 3-36, "Provisioning the optical system identifier (OSID)" in *Provisioning and Operating Procedures*, 323-1701-310.
27	**If** / **Then** go to an APBE circuit pack is present — step 28 otherwise — step 34
28	In the System Manager, select the Equipment tab. *The Equipment page appears.*
29	Select the Inventory tab.

—continued—

Procedure 3-11 (continued)
Replacing a Low Input Power OFA circuit pack with a High Input Power OFA circuit pack

Step	Action
30	Double-click the line that contains the APBE, or right-click on the line and select Modify. *The Optical Metro Inventory window appears.*
31	From the OFA Type drop-down list, select High Input Power. *The Re-equalization Warning window appears.*
32	Click **Close**.
33	Click **OK**.
34	Put the High Input Power OFA circuit facility in-service. Follow Procedure 3-10 "Putting a circuit pack or SFP facility in-service" in *Provisioning and Operating Procedures,* 323-1701-310.
35	Reconnect the optical cables removed in step 14 to the IN and OUT ports of the High Input Power OFA circuit pack. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
36	Connect an Optical Spectrum Analyzer (OSA) test set to the Optical Input Monitor (OIM) port on the faceplate of the High Input Power OFA circuit pack and examine the input power levels and the wavelengths present. Refer to the "Circuit pack specifications" chapter in *Technical Specifications*, 323-1701-180, to ensure that the aggregate optical input power level is within the specifications. ***Note:*** For information on using the monitoring port see "Using the monitoring port" section in T*rouble Clearing and Alarm Reference Guide*, 323-1701-542.
37	**If** / **Then** at step 8, Procedure 4-7 was performed — re-route traffic to the original path. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures*, 323-1701-310, then go to step 38 otherwise — go to step 38
38	If intrasite fault sectionalization was enabled on your network, enable the feature. Follow Procedure 3-38 "Enabling intrasite fault sectionalization (IFS)"in *Provisioning and Operating Procedures,* 323-1701-310.

—continued—

Procedure 3-11 (continued)
Replacing a Low Input Power OFA circuit pack with a High Input Power OFA circuit pack

Step	Action
39	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all other active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.
40	Re-install the front cover door on the shelf where the OFA circuit pack was replaced.

—end—

Procedure 3-12
Replacing an APBE circuit pack

Follow this procedure to replace an APBE circuit pack with an identical circuit pack.

> ***Note:*** The APBE and APBE Enhanced circuit packs are interchangeable. Although the two APBE types have different loss specifications, the APBEs are re-equalized during this procedure.

For more information about APBE circuit packs, refer to the "APBE circuit packs" chapter of *Hardware Description,* 323-1701-102.

ATTENTION

You can perform this procedure while Continuous SLEC is running. However, SLEC will raise the Equalization Failed event for one or multiple sites and the following status results can appear in the SLEC System Manager screen during the procedure; Topology error, Unexpected input power change, Detected incomplete transmit/receive pair, A component upstream failed to equalize.

Failures occur because SLEC detects changes in the system topology. To ensure correct operation, SLEC only attempts equalization when the system topology is stable and determined to be accurate. To avoid the failure event generation, you can stop Continuous SLEC before the procedure is started. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 3-12 (continued)
Replacing an APBE circuit pack

Requirements

Table 3-13 lists the tools and materials required to complete this procedure.

Table 3-13
Tools and materials for replacing an APBE circuit pack

Item	Quantity	Supplied
Replacement APBE circuit pack of the same band (C-Band or L-Band) as the APBE circuit pack being replaced (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

Optical Metro 5200

Before replacing circuit pack, the SP and at least one OCM circuit pack must be seated in the shelf and the software load on the shelf must be in a committed state.

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of service interruption
You must put the APBE circuit pack facility in-service before reconnecting the optical cables to the new APBE circuit pack. Failure to do so can cause traffic interruption.

—continued—

Procedure 3-12 (continued)
Replacing an APBE circuit pack

CAUTION
Traffic is lost in an unprotected network
Traffic is interrupted when you replace an APBE circuit pack in an unprotected network. To verify if you can add path protection in your network, refer to the "Supported configurations" chapter in *Network Planning and Link Engineering,* 323-1701-110. To add path protection to an unprotected network, refer to Procedure 3-47 "Adding path protection to an unprotected path" in *Provisioning and Operating Procedures*, 323-1701-310.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling circuit packs. Refer to "Handling circuit packs" on page 3-3 in this book.

CAUTION
Risk of network reliability
Make sure that all connectors are cleaned before you make the connections (or re-connections) described in this procedure. For cleaning information, see the chapter "Cleaning connectors", in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

CAUTION
Risk of affecting network reliability
When a circuit pack is replaced in an Extended Metro network, re-equalization is necessary. See Procedure 2-6 "Re-equalizing an Extended Metro amplified system" in *Testing and Equalization Procedures*, 323-1701-222.

—continued—

Procedure 3-12 (continued)
Replacing an APBE circuit pack

Action

Step	Action
1	Make sure that the replacement APBE circuit pack is the same band (C-band or L-band) as the circuit pack you are replacing.
2	Release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the cooling unit cover when you open it. The cooling unit cover is not permanently attached to the shelf. You must remove the cooling unit cover completely. If you let go of the cooling unit cover when you open it, you can cause personal injury, damage to the equipment, or both.

3	Identify the circuit pack to be replaced.
4	Start (restart) the Web browser and launch the System Manager.
5	Login with read and write access to all of the system. Follow Procedure 1-1 "Logging into the network" in *Provisioning and Operating Procedures,* 323-1701-310.
6	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
7	Disable both automatic laser shutdown (ALS) and automatic laser recovery (ALR) if they are enabled. Follow Procedure 1-43 "Enabling or disabling automatic laser shutdown" and Procedure 1-44 "Enabling or disabling automatic laser recovery" in *Provisioning and Operating Procedures,* 323-1701-310.
8	If intrasite fault sectionalization (IFS) is enabled on your network, disable this feature. Follow Procedure 3-39 "Disabling intrasite fault sectionalization (IFS)" in *Provisioning and Operating Procedures,* 323-1701-310.

CAUTION
Risk of traffic loss
If the system is unprotected, the traffic cannot be switched and traffic will be lost for the whole duration of this procedure. Advise the network administrator before proceeding with the next step.

—continued—

Procedure 3-12 (continued)
Replacing an APBE circuit pack

Step	Action
9	Switch traffic off the span where the APBE circuit pack you are replacing is located. Follow Procedure 4-7 "Switching traffic off a span in a path-protected network" in *Provisioning and Operating Procedures,* 323-1701-310.
10	Put all bands for the APBE circuit pack you are replacing out-of-service. Follow Procedure 3-13 "Taking a circuit pack facility or SFP facility out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310.

CAUTION
Risk of damage to downstream circuit packs
When replacing an APBE, the newly inserted circuit pack equalizes to the power level of the original APBE if the APBE bands are not put OOS. If the output power is higher, damage to downstream equipment can occur.

Ensure all APBE bands are placed OOS.

11	Put the ABPE circuit pack you are replacing out-of-service. Follow Procedure 3-8 "Taking a circuit pack or SFP out-of-service" in *Provisioning and Operating Procedures,* 323-1701-310.
12	Label the optical cables connected to the IN and OUT ports of the APBE circuit pack you are replacing. Disconnect the optical cables and put protective caps on both the APBE circuit pack connectors and the optical cables to protect them from contamination and damage
13	Release the locking latches at the top and bottom of the circuit pack.
14	Slide the circuit pack out of the guides and put the circuit pack on an antistatic surface.
15	Remove the replacement APBE circuit pack from the antistatic bag.
16	Align the replacement APBE circuit pack with the circuit pack guides.
17	Keep the lock latches flat against the faceplate (in the locked position) so the circuit pack does not seat into the backplane connector. Slide the circuit pack toward the back of the shelf until it stops.
18	Place the lock latches in the unlocked position.
19	Carefully seat the replacement APBE circuit pack in the backplane connector and place the lock latches in the locked position. ***Note:*** The APBE circuit pack autoprovisions immediately after it is seated in the backplane connector. Wait until the autoprovisioning is finished. This process takes approximately 30 seconds.

—continued—

Procedure 3-12 (continued)
Replacing an APBE circuit pack

Step	Action
20	Put the APBE circuit pack in-service. Follow Procedure 3-10 "Putting a circuit pack or SFP facility in-service" in *Provisioning and Operating Procedures,* 323-1701-310. ***Note:*** Do not put the other port facilities associated with signal-carrying bands in-service. This will be done in step 23.
21	Put port 5 of the APBE circuit pack in-service. Follow Procedure 3-7 "Putting a circuit pack or SFP in-service" in *Provisioning and Operating Procedures,* 323-1701-310.
22	Reconnect the optical cables removed in step 12 to the IN and OUT ports of the APBE circuit pack. You will need to remove the protective connector caps before reconnecting. Make sure all fibers are properly cleaned before reconnection. For cleaning procedures, refer to "Cleaning connectors" in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
23	Put the port facilities associated with signal-carrying bands in-service. Follow Procedure 3-10 "Putting a circuit pack or SFP facility in-service" in *Provisioning and Operating Procedures,* 323-1701-310.
24	**If** — **Then** at step 9, Procedure 4-7 was performed — re-route traffic to the original path. Follow Procedure 3-49 "Removing a manual, force, or lockout switch from a protection path" in *Provisioning and Operating Procedures* 323-1701-310, then go to step 25. otherwise — go to step 25
25	If intrasite fault sectionalization was enabled on your network, enable the feature. Follow Procedure 3-38 "Enabling intrasite fault sectionalization (IFS)"in *Provisioning and Operating Procedures,* 323-1701-310.
26	Enable both automatic laser shutdown (ALS) and automatic laser recovery (ALR) if they were disabled in step 7. Follow Procedure 1-43 "Enabling or disabling automatic laser shutdown" and Procedure 1-44 "Enabling or disabling automatic laser recovery" in *Provisioning and Operating Procedures,* 323-1701-310.
27	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all other active alarms on the system match the alarms noted in step 6. If they do not match, stop this procedure and contact your next level of support.
28	Re-install the front cover door on the shelf where the APBE circuit pack was replaced.

—end—

Procedure 3-13
Replacing an SP circuit pack

Follow this procedure to replace an SP circuit pack on an Optical Metro 5100/5200 system running Release 8.0.

For more information about SP circuit packs, refer to the "SP circuit packs" chapter in *Hardware Description,* 323-1701-102.

In this procedure, the symbol "↵" indicates that you must press the Enter key.

Requirements

Table 3-14 lists the tools and materials required to complete this procedure.

Table 3-14
Tools and materials for replacing an SP circuit pack with one of a different software load

Item	Quantity	Supplied
Replacement SP circuit pack (see Note)	1	no
ESD/antistatic protection equipment (wrist strap or foot strap)	1	no
Note: For the product engineering codes, refer to the "Optical Metro 5100/5200 ordering information" chapter of *Network Planning and Link Engineering*, 323-1701-110.		

If you are using a PC to upgrade the replacement SP, you must have installed the Optical Metro 5100/5200 Release 8.0 software on your PC from the CD and you must know the directory path where the System Manager was installed. The directory path is normally of the following format: <*drive*>*:\NortelNetworks\OPTeraMetro\Library*<*load number*> where <*drive*>: is the drive where the System Manager was installed, and <*load number*> is the number of the System Manager software load.

If you are using a Solaris workstation to upgrade the replacement SP circuit pack, you must have installed the Optical Metro 5100/5200 Release 8.0 software on your workstation from the CD and you must know the home directory for the non-root user ID on the Optical Network Manager workstation. In this procedure, the home directory is identified as <*homedir*>.

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

If you are using a Optical Network Manager workstation to upgrade the replacement SP circuit pack, you must have installed the Optical Metro 5100/5200 Release 8.0 software on your workstation from the CD and you must know the IP address of the Optical Network Manager workstation. You must also know the IP address, the user ID and the password to log on to the Solaris workstation which runs the Optical Manager Element Adaptor (OMEA) application.

You must know the IP address, the admin-group user ID and the password to log on to the shelf where the SP circuit pack is to be replaced.

Optical Metro 5200

You must have at least one OCM circuit pack seated and provisioned in slot 9 or slot 10 of the Optical Metro 5200 shelf in order to replace the SP circuit pack. Also, make sure that the software load on the shelf is in a committed state.

Optical Metro 5100

You must have at least one non-SP circuit pack seated in the Optical Metro 5100 shelf in order to replace the SP circuit pack. Also, make sure that the shelf is commissioned.

SP replacement overview

There are five basic steps in replacing an SP circuit pack:

1 Prepare for replacement (step 2 to step 15)
   - — Note all active alarms, save event logs, disable IFS, disable Ethernet port 2 access control
   - — Directly connect to the shelf
   - — Ensure you have Release 8.0 load file and “SMI.bat” file

2 Replace the SP circuit pack (step 16 to step 22)

3 Determine the software version of the new SP (step 23 to step 27)

4 If necessary, transfer the Release 8.0 load to the replacement SP (step 28 to step 56)

5 Set the time on the SP and reset any parameters that were changed during the “Prepare for replacement” steps (step 57 to step 62)

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

Table 3-15 gives an overview of the "rules" for SP replacement. The System Manager (SMI) startup method and the actual SP upgrade method are all dependent on the software load of the replacement SP.

Table 3-15
SP replacement methods

SP version	Shelf Version	SMI startup method	SP upgrade method
2.1	8.0	2.1 on SP	Transfer and Cancel
3.0	8.0	3.0 on SP	Transfer and Cancel
3.1	8.0	3.1 on SP	Transfer and Cancel
3.2	8.0	3.2 on SP	Transfer and Cancel
4.0	8.0	8.0 via SMI.bat	Missing Library
4.1	8.0	8.0 via SMI.bat	Missing Library
5.0	8.0	8.0 via SMI.bat or 5.0 on SP	Missing Library
6.0 or later	8.0	8.0 via SMI.bat or 6.0 on SP	Missing Library

SMI.bat file

If you are using a PC to upgrade the replacement SP, you must have access to the load files on the PC to have access to the SMI.bat file. You may get these load files by one of two methods:

- download the Release 8.0 load files from another shelf
- installing the Optical Metro Release 8.0 software on your PC from the software CD, or

To get a local copy of the files from another shelf to your PC, use the "Backup Original Load" procedure. The default location for load files is *C:\NortelNetworks\OPTeraMetro\LoadBackups\<load number>*

For information on the "Backup Original Load" procedure, see Procedure 3-4 "Ensuring all circuit packs are running Release 8.0" in *Commissioning Procedures*, 323-1701-220.

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

If installing the load files from a CD, the load files from the software CD, the default location for the load files is
<*drive*>*:\NortelNetworks\OPTeraMetro\Library*<*load number*>, where
<*drive*> is C or D (as selected during installation), and
<*load number*> is the number of the Optical Metro 5100/5200 software load

Of these two methods, it is recommended to get the load files from the software CD. When installing the files (using either method), remember to note the directory in which you saved the files, as this location will be needed during SP replacement.

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

Precautions

CAUTION
Release 3.2 software baseline requirement
All circuit packs installed on an Optical Metro 5100 shelf must meet the release 3.2 software baseline requirement. Baseline Reports are available through Nortel Networks. Refer to the About this document chapter in this book for details.

CAUTION
Risk of losing visibility
If an OFA or Mixed shelf only has data communication visibility through an OSC circuit pack (such as an OFA shelf at a standalone OFA site), replacing the SP may cause remote loss of visibility if the SP being used as the replacement is running release 3.1 or a lower software load. If this is the case, you must connect a PC directly to the 10BASE-1X port in order to upgrade the SP circuit pack at that site.

CAUTION
Risk of losing visibility
During SP replacement, System Manager (SMI) sessions launched from SPs with a lower release version than 6.0 will have no visibility to Release 8.0 network elements in the system.

CAUTION
Software download warning
During any upgrade procedure, ensure that there is no maintenance activity being performed, such as the insertion of a new circuit pack.

CAUTION
Loss of OTR redundancy
If the SP has failed, restarted, or is missing, any protected OTR circuit packs in the shelf lose redundancy until a functioning SP has been inserted and is operating normally.

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

CAUTION
SNMP community name changes during SP replacement
During an SP circuit pack replacement, a community name change may cause a System Manager (SMI) loss of contact with all other shelves within the system. To avoid this loss of contact, change the community name to "admin" for user class "admin" on the Primary shelf before performing the SP replacement. For more information, see "Changing the community name" in *Provisioning and Operating Procedures*, 323-1701-310.

CAUTION
Electrostatic discharge
Observe all antistatic precautions when handling circuit packs. Refer to "Handling circuit packs" on page 3-3 in this book.

CAUTION
Risk of losing contact
Removing the SP circuit pack will cause a loss of contact if the user is logged into the ring through another node.

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

ATTENTION
Alarms may be raised during the replacement procedure due to software variations in the SP circuit pack. Do not take any action. These alarms will clear once the procedure is completed.

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

Action

Step	Action
1	Stop the System Level Equalization Controller if it is running. See Procedure 2-13 to stop SLEC in *Testing and Equalization Procedures*, 323-1701-222.
2	Release the latches on the front of the shelf cover and remove the door.

DANGER
Risk of personal injury or equipment damage
Do not let go of the shelf cover when you open it. The shelf cover is not permanently attached to the shelf and you must remove the door completely. If you let go of the door when you open it, you can cause personal injury, damage to the equipment, or both.

3	Identify the circuit pack to be replaced. ***Note:*** The SP circuit pack is located in slot 5 of the Optical Metro 5100 shelf and slot 19 of the Optical Metro 5200 shelf.
4	Start (restart) the Web browser for the shelf where the SP circuit pack you are replacing is located.
5	Launch the System Manager.
6	Login with read and write access to all of the system. Follow Procedure 1-1 "Logging into the network" in *Provisioning and Operating Procedures,* 323-1701-310.
7	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab.
8	Save the event logs on your system. Follow Procedure 1-6 "Saving event logs" in *Provisioning and Operating Procedures,* 323-1701-310.
9	If intrasite fault sectionalization (IFS) is enabled on your network, disable this feature. Follow Procedure 3-39 "Disabling intrasite fault sectionalization (IFS)" in *Provisioning and Operating Procedures,* 323-1701-310.
10	If Ethernet port 2 access control is enabled for the hubbing group that includes the SP you are replacing, disable the Ethernet port 2 access control feature. Follow Procedure 1-27 "Provisioning Ethernet port 2 access control" in *Provisioning and Operating Procedures,* 323-1701-310.

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

Step	Action
11	Enable the 10BASE-T 2X port on the shelf where the SP circuit pack you are replacing is located. Follow Procedure 1-26 "Provisioning Ethernet and serial ports" in *Provisioning and Operating Procedures,* 323-1701-310.
12	Connect your PC directly to the 10BASE-T 2X port to communicate with the shelf. To establish a Dynamic Host Configuration Protocol (DHCP) connection with the shelf, see step 13. ***Note 1:*** If the 10BASE-T 2X port is already in use, unplug that cable and connect the PC into that port. ***Note 2:*** After the connection is made, the 10BASE-T 2X link LED lights up, indicating that the connection is good.

ATTENTION
This process must be done with a direct connection. The software library replacement cannot be done remotely.

13	Perform the following:
	a. From the Windows Start menu, select Run...
	b. In the Open field, type:
	`cmd ↵`
	A DOS prompt window opens.
	c. Type:
	`ipconfig /release ↵`
	d. Wait for the DOS prompt to appear, then type:
	`ipconfig /renew ↵`
	e. Close the DOS window

14	Go to step 15.
15	Exit the System Manager. Follow Procedure 1-48 "Exiting the System Manager" in *Provisioning and Operating Procedures,* 323-1701-310.
16	Slide the SP circuit pack out of the guides and put the circuit pack on an antistatic surface.
17	Remove the replacement SP circuit pack from the antistatic bag.

CAUTION
Risk of replacement SP locking up
Wait two minutes before inserting the replacement SP circuit pack. If a lockup occurs, reseat the SP.

18	Align the replacement SP circuit pack with the circuit pack guides.

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

Step	Action
19	Keep the lock latches flat against the faceplate (in the locked position) so the circuit pack does not seat into the backplane connector. Slide the circuit pack toward the back of the shelf until it stops.
20	Place the lock latches in the unlocked position.
21	Carefully seat the replacement SP circuit pack in the backplane connector and place the lock latches in the locked position. ***Note:*** The circuit pack autoprovisions immediately after it is seated in the backplane connector. Wait until the autoprovisioning is finished. This process takes approximately five minutes. If you do not wait for the autoprovisioning to finish, you can cause backup failures.
22	Wait for the SP circuit pack to complete the self-diagnostic check. The SP circuit pack status LED turns green when the check is completed.
23	Restart the Web browser for the shelf where the SP circuit pack was replaced. ***Note:*** The method of launching the System Manager (SMI) depends on the software load of the replacement SP.

Table 3-16
SMI launch methods

SP software version	Launch method
2.1, 3.0, 3.1, or 3.2	User a browser after inserting the new SP and waiting for it to boot up
4.0, 4.1, 5.0, or 6.0	Quick launch using SMI.bat (for information on SMI.bat file, see "SMI.bat file" on page 3-96)
greater than 6.1	User a browser after inserting the new SP and waiting for it to boot up **Note**: Your PC may require a newer version of Java to run with the software load on the replacement SP.

24	If	Then
	the System Manager session does not start, or you replaced an SP circuit pack on an OFA shelf at a standalone OFA site	connect your PC directly to the 10BASE-T 1X port to communicate with the shelf and go to step 25.
	otherwise	go to step 25

25	Note the running version of System Manager in the "***Release:***" field in the Optical Metro window.

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

Step	Action

26 **If** the version of System Manager is — **Then** go to

Release 4.0 or higher	step 28
otherwise	step 27

Upgrading the bootloader on the replacement SP circuit pack

27 **If** your System Manager session is running on a — **Then**

PC	perform Procedure 3-14 “Replacing an SP circuit pack - upgrading the bootloader on a PC”, then go to step 28.
Solaris workstation	perform Procedure 3-15 “Replacing an SP circuit pack - upgrading the bootloader on a Solaris workstation”, then go to step 28.
Optical Network Manager workstation	perform Procedure 3-16 “Replacing an SP circuit pack - upgrading the bootloader on a Optical Network Manager workstation”, then go to step 28.

Upgrading the software load on the replacement SP circuit pack

28

If	Then
at step 25, the version of System Manager you noted is Release 8.0	launch the System Manager, and go to step 56
at step 25, the version of System Manager you noted is Release 2.1, 3.0, 3.1, or 3.2	launch the System Manager, and go to step 30
at step 25, the version of System Manager you noted is Release 4.0, 4.1, 5.0, 6.0, 6.1, 7.0 or 7.01	go to step 29

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

Step	Action	
29	**If** your System Manager session is running on a	**Then**
	PC	perform Procedure 3-17 “Replacing an SP circuit pack - upgrading the software load on the replacement SP circuit pack on a PC”, then go to step 30.
	Solaris workstation	perform Procedure 3-18 “Replacing an SP circuit pack - upgrading the software load on the replacement SP circuit pack on a Solaris workstation”, then go to step 30.
	Optical Network Manager workstation	perform Procedure 3-19 “Replacing an SP circuit pack - upgrading the software load on the replacement SP circuit pack on a Optical Network Manager workstation”, then go to step 30.
30	Login with an Admin User ID and Password. Follow Procedure 1-1 “Logging into the network” in *Provisioning and Operating Procedures,* 323-1701-310.	
31	Click on the **OK** button. *The System Manager main window opens.* ***Note:*** A Warning dialog box may appear. If it does, click **Close** and go to step 32.	
32	Select the “Network Admin” or “Admin” tab on the System Manager main window, and then select the Software Upgrade tab. Go to step 33.	
33	**If**	**Then** go to
	at step 25, the version of System Manager you noted is Release 4.0, 4.1, 5.0, 6.0, 6.1, 7.0 or 7.01.	step 34
	at step 25, the version of System Manager you noted is Release 2.1	step 38
	at step 25, the version of System Manager you noted is Release 3.0, 3.1, or 3.2	step 44

Upgrade for Release 4.0, 4.1, 5.0, 6.0, 6.1, 7.0 or 7.01

34	Select the shelf where the SP circuit pack was replaced. Right-click on the highlighted line and select **Missing Library**. *The Confirm Missing Library Replacement dialog box appears.* ***Note:*** If the SP is running Release 4.x, the Missing Library step will only work if you are directly connected to the shelf. It cannot be done remotely.
35	Click **Yes**. *The Choose Load Library dialog box appears.*

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

Step	Action
36	Select the target Release 6.1 catalog file and click **Open**. ***Note:*** A catalog file (*.catalog) stores the software loads. You must select the correct catalog file, which includes the load ID and catalog file class. For example, 8.0.x.x_release.catalog. The load ID must be the same as the load that was running on the shelf before initiating the replacement SP.
37	Wait until the transfer is complete, then go to step 51.
Upgrade for Release 2.1	
38	Click the **...** button in the Choose Load Library section of the Software Upgrade window. *The Choose Load Library dialog box appears.*
39	Select the target Release 6.1 catalog file and click **Open**. ***Note:*** A catalog file (*.catalog) stores the software loads. You must select the correct catalog file, which includes the load ID and catalog file class. For example, 8.0.x.x_release.catalog. The load ID must be the same as the load that was running on the shelf before initiating the replacement SP.
40	Click the **Transfer to Shelf** button, then go to step 41.
41	Click the **Cancel Upgrade** button in the Upgrade Shelf section of the Software Upgrade window. *The Confirm Cancel dialog box appears.*
42	Click **Yes**. ***Note:*** During this step, the SP will restart and the System Manager will temporarily lose contact with the shelf.
43	Go to step 51.
Upgrade for Release 3.0. 3.1, or 3.2	
44	Select the shelf where the SP circuit pack was replaced. Right-click on the highlighted line and select **Transfer**.
45	**If** — **Then** go to: the Library Location Selection dialog box appears — step 46 otherwise — step 47

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

Step	Action
46	Select **Primary** in the Library Location Selection dialog box and then click **OK**.
47	In the **Choose Load Library** dialog box, select the target Release 8.0 software catalog file and click **Open**. ***Note:*** A catalog file (*.catalog) stores the software loads. You must select the correct catalog file, which includes the load ID and catalog file class. For example, 8.0.x.x_release.catalog. The load ID must be the same as the load that was running on the shelf before initiating the replacement SP.
48	Wait until the transfer is complete, then go to step 49.
49	In the Software Upgrade window, select the shelf where you replaced the SP circuit pack. Right-click on the highlighted line. From the menu that appears, select Cancel. *The Confirm Cancel dialog box appears.*
50	Click **Yes**. ***Note:*** During this step, the SP will restart and the System Manager will temporarily lose contact with the shelf.
51	**If** — **Then** go to at step 25, the version of System Manager you noted is Release 4.0 — step 52 otherwise — step 53
52	The Missing Library Replacement dialog box appears to warn the user that the System Manager will now shut down. Click **Close** and go to step 54.
53	Exit the System Manager. Follow Procedure 1-48 “Exiting the System Manager” in *Provisioning and Operating Procedures,* 323-1701-310.
54	Wait for the SP circuit pack to restart. The green LED must be lit on the SP circuit pack. Then, restart the Web browser for the shelf where the SP circuit pack was replaced.
55	Make sure that the running version of System in the “**Release:**” field indicates Release 8.0.xx.x. If it is not Release 8.0.xx.x, stop this procedure and contact your next level of support.
56	Login with read and write access to all of the system. Follow Procedure 1-1 “Logging into the network” in *Provisioning and Operating Procedures,* 323-1701-310.

—continued—

Procedure 3-13 (continued)
Replacing an SP circuit pack

Step	Action
57	In System Manager, note all the active alarms in the system. To view alarms, select the Fault tab, then the Active Alarms tab. Make sure that all active alarms on the system match the alarms noted in step 7. If they do not match, stop this procedure and contact your next level of support.
58	Set the time on the SP circuit pack for the shelf to synchronize with the other shelves in the network. See Procedure 1-24 "Changing the date and time on a shelf" in *Provisioning and Operating Procedures,* 323-1701-310. ***Note:*** If you do not set the time on the SP circuit pack, the SP has an invalid time. Any alarms raised by the system will display an incorrect time stamp.
59	If intrasite fault sectionalization was enabled on your network, enable the feature. Follow Procedure 3-38 "Enabling intrasite fault sectionalization (IFS)" in *Provisioning and Operating Procedures*, 323-1701-310.
60	If Ethernet port 2 access control was enabled for the hubbing group that includes the SP circuit pack you replaced, enable the Ethernet port 2 access control feature. Follow Procedure 1-27 "Provisioning Ethernet port 2 access control" in *Provisioning and Operating Procedures,* 323-1701-310.
61	If you used the 10BASE-T 2X port on the shelf where the SP circuit pack was replaced to connect your PC directly to the shelf, return the 10BASE-T 2X port configuration to its original state. Follow Procedure 1-26 "Provisioning Ethernet and serial ports" in *Provisioning and Operating Procedures,* 323-1701-310.
62	Re-install the front cover door on the shelf where the SP circuit pack was replaced.
63	Restart the System Level Equalization Controller if it was stopped in step 1. See Procedure 2-13 to start SLEC in *Testing and Equalization Procedures*, 323-1701-222.

—end—

Procedure 3-14
Replacing an SP circuit pack - upgrading the bootloader on a PC

Follow this procedure to upgrade the bootloader on a PC platform. If you have been referenced to this procedure from the "Replacing an SP circuit pack" procedure, complete this procedure and return to step 28 of Procedure 3-13 of this book.

Requirements

To perform this procedure, you must be logged into the system with read and write privileges.

Precautions

CAUTION
Software download warning
During any upgrade procedure, ensure that there is no maintenance activity being performed, such as the insertion of a new circuit pack.

Action

Step	Action
1	On the PC, start Windows Explorer.
2	In Windows Explorer: **a.** Select the blue directory in the directory path where the System Manager was installed. The blue directory is normally located at: *<drive>:\NortelNetworks\OPTeraMetro\blue* where *<drive>*: is the drive where the System Manager was installed. **b.** Double-click on the blue directory. **c.** Double-click on the nelist.txt file. *The nelist.txt file opens.*

—continued—

Procedure 3-14 (continued)
Replacing an SP circuit pack - upgrading the bootloader on a PC

Step	Action
3	In the nelist.txt file: **a.** Place the cursor on the first blank line. **b.** Enter <IP address> <admin-group user ID> <password> of the shelf where the SP circuit is to be upgraded. **c.** Press Enter. **d.** Select the File menu. **e.** In the File menu, select **Save**. **f.** In the File menu, select **Exit**. *The nelist.txt file closes.*

4	In Windows Explorer, double-click on the blue.bat file
	An MS-DOS dialog opens and upgrades the bootloader for the shelf. One of the following messages appears:
	Message 1:
	`Bootloader upgrade process completed.`
	`The following NE was upgraded to bootloader version <2.0c>`
	`<47.135.57.110>`
	Message 2:
	`Bootloader upgrade process completed.`
	`The following NE was already upgraded to at least bootloader version <2.0c>`
	`<47.135.57.110>`
	Message 3:
	`The following NE COULD NOT be upgraded to bootloader version <2.0c>`
	`See the individual log files for more details.`
	`Telnet login or Communication failure - <Connection reset by peer: JVM_recv in socket input stream read>`

5	**If** at step 4, **Then** go to message 1 or message 2 appears — step 10 message 3 appears — step 6 otherwise — step 9
6	There was a temporary communication error. You must repeat the upgrade for the shelf.
7	Press any key to close the MS-DOS dialog. *The MS-DOS dialog closes.*
8	Go to step 4.
9	You cannot proceed with the upgrade. Call your next level of support.

—continued—

Procedure 3-14 (continued)
Replacing an SP circuit pack - upgrading the bootloader on a PC

Step	Action
10	Press any key to close the MS-DOS dialog. *The MS-DOS dialog closes.*
11	In the blue directory, open the nelist.txt file.
12	In the nelist.txt file: **a.** Delete the line you entered at step 3. **b.** Select the File menu. **c.** In the File menu, select **Save**. **d.** In the File menu, select **Exit**. *The nelist.txt file closes.*
13	In the blue directory, delete the log file for the shelf where the SP circuit pack was replaced. The log file name has the format “<NE IP address>.log”.
14	Close Windows Explorer.

—end—

Procedure 3-15
Replacing an SP circuit pack - upgrading the bootloader on a Solaris workstation

Follow this procedure to upgrade the bootloader on a Solaris workstation. If you have been referenced to this procedure from the "Replacing an SP circuit pack" procedure, complete this procedure and return to step 28 of Procedure 3-13 of this book.

Requirements

To perform this procedure, you must be logged into the system with read and write privileges.

Precautions

CAUTION
Software download warning
During any upgrade procedure, ensure that there is no maintenance activity being performed, such as the insertion of a new circuit pack.

Action

Step	Action
1	On the Solaris workstation, open a Terminal session.
2	Enter: *cd <homedir>* ↵
3	Enter: *mkdir blue* ↵
4	Enter: *cd blue* ↵
5	Enter: *cp /opt/OPTeraMetro/blue/* .* ↵
6	Enter: *chmod 644 nelist.txt* ↵
7	Start the File Manager.

—continued—

Procedure 3-15 (continued)
Replacing an SP circuit pack - upgrading the bootloader on a Solaris workstation

Step	Action
8	In the File Manager: **a.** Select the <homedir> directory path. **b.** Double-click on the blue directory. **c.** Double-click on the nelist.txt file. *The nelist.txt file opens.*
9	In the nelist.txt file: **a.** Place the cursor on the first blank line. **b.** Enter <IP address> <admin-group user ID> <password> of the shelf where the SP circuit pack is to be upgraded. **c.** Press Enter. **d.** Select the File menu. **e.** In the File menu, select **Save**. **f.** In the File menu, select **Close**. *The nelist.txt file closes.*

10	In the File Manager, double-click on blue.sh.
	A run dialog opens and upgrades the bootloader for each shelf. One of the following messages appears:
	Message 1:
	`Bootloader upgrade process completed.`
	`The following NE was upgraded to bootloader version <2.0c>`
	`<47.135.57.110>`
	Message 2:
	`Bootloader upgrade process completed.`
	`The following NE was already upgraded to at least bootloader version <2.0c>`
	`<47.135.57.110>`
	Message 3:
	`The following NE COULD NOT be upgraded to bootloader version <2.0c>`
	`See the individual log files for more details.`
	`Telnet login or Communication failure - <Connection reset by peer: JVM_recv in socket input stream read>`

11	**If** at step 10, **Then** go to message 1 or message 2 appears — step 16 message 3 appears — step 12 otherwise — step 15

—continued—

Procedure 3-15 (continued)
Replacing an SP circuit pack - upgrading the bootloader on a Solaris workstation

Step	Action
12	There was a temporary communication error. You must repeat the upgrade for the shelf.
13	Close the Run dialog box. *The Run dialog box closes.*
14	Go to step 10.
15	You cannot proceed with the upgrade. Call your next level of support.
16	Close the Run dialog box. *The Run dialog box closes.*
17	In the blue directory, open the nelist.txt file.
18	In the nelist.txt file: **a.** Delete the line you entered at step 9. **b.** Select the File menu. **c.** In the File menu, select **Save**. **d.** In the File menu, select **Exit**. *The nelist.txt file closes.*
19	In the blue directory, delete the log file for the shelf where the SP circuit pack was replaced. The log file name has the format “<NE IP address>.log”.
20	Close the File Manager.

—end—

Procedure 3-16
Replacing an SP circuit pack - upgrading the bootloader on a Optical Network Manager workstation

Follow this procedure to upgrade the bootloader on a Optical Network Manager workstation. If you have been referenced to this procedure from the "Replacing an SP circuit pack" procedure, complete this procedure and return to step 28 of Procedure 3-13 of this book.

In this procedure, the symbol "↵" indicates that you must press the Enter key.

Requirements

To perform this procedure, you must be logged into the system with read and write privileges.

Precautions

CAUTION
Software download warning
During any upgrade procedure, ensure that there is no maintenance activity being performed, such as the insertion of a new circuit pack.

Action

Step	Action
1	Log in to the Optical Network Manager server as admin.
2	Open the GNB.
3	Open a command line interface from the GNB by selecting the OMEA server and then clicking the **Login** menu in the GNB FCAPS menu bar.
4	The four login options, in order, are: • **Auto-login to NE: <name>** • **Login to NE: <name>** • **Auto-login to <name>** • **Login to <name>** where <name> is the host name or IP address of the OMEA server. Select the last option, **Login to <name>**. ***Note:*** The other three options will open the OMEA Desktop.
5	In the Controller Login window, click the **Login to Character Session** check box.

—continued—

Procedure 3-16 (continued)
Replacing an SP circuit pack - upgrading the bootloader on a Optical Network Manager workstation

Step	Action
6	Click **Login**. *A terminal window opens with a command line prompt. Log in with a Unix ID and password.*
7	Enter: *cd <homedir>* ↵
8	Enter: *mkdir blue* ↵
9	Enter: *cd blue* ↵
10	Enter: *cp /opt/OPTeraMetro/blue/* .* ↵
11	Enter: *chmod 644 nelist.txt* ↵
12	Enter: *exit*↵ *This message appears: "*`Connection closed by foreign host`*".*
13	In the Terminal session, enter: *cd <homedir>* ↵
14	Establish an ftp session with the OMEA server by entering: *ftp <host_name>* where <host_name> is the host name or IP address of the OMEA server.
15	Log in to the OMEA server.
16	Set the transfer mode to binary format by entering: *binary*
17	Enter: *cd <homedir>/blue* ↵ *This message appears:* `250 CWD command successful.`

—continued—

Procedure 3-16 (continued)
Replacing an SP circuit pack - upgrading the bootloader on a Optical Network Manager workstation

Step	Action

18	Enter:
	get nelist.txt ↵
	A similar message appears:
	`<200 PORT command successful.`
	`150 Binary data connection for nelist.txt`
	`(<47.114.241.156,65156>)`
	`(<263> bytes).`
	`226 Binary Transfer complete.`
	`<263> bytes received in <0.00> seconds (<1183.58> Kbytes/s)>`

19	Enter: *quit* ↵ *This message appears:* `221 Goodbye.`
20	Enter: *chmod 644 nelist.txt* ↵
21	On the Optical Network Manager workstation, start the File Manager.
22	In the File Manager: **a.** Select the <homedir> directory path. **b.** Double-click on the nelist.txt file. *The nelist.txt file opens.*
23	In the nelist.txt file: **a.** Place the cursor on the first blank line. **b.** Enter <IP address> <admin-group user ID> <password> of the shelf where the SP circuit pack is to be upgraded. **c.** Press Enter. **d.** Select the File menu. **e.** In the File menu, select **Save**. **f.** In the File menu, select **Close**. *The nelist.txt file closes.*
24	Close the File Manager.
25	Establish an ftp session with the OMEA server by entering: *ftp <host_name>* where <host_name> is the host name or IP address of the OMEA server.
26	Log in to the OMEA server.

—continued—

Procedure 3-16 (continued)
Replacing an SP circuit pack - upgrading the bootloader on a Optical Network Manager workstation

Step	Action
27	Set the transfer mode to binary format by entering: *binary*↵
28	Enter: *cd <homedir>/blue* ↵ *This message appears:* `250 CWD command successful.`

29	Enter:
	put nelist.txt ↵
	A similar message appears:
	`<200 PORT command successful.`
	`150 Binary data connection for nelist.txt`
	`(<47.114.241.156,65156>)`
	`226 Binary Transfer complete.`
	`<263> bytes received in <0.00> seconds (<1183.58> Kbytes/s)>`

30	Enter: *quit* ↵ *This message appears:* `221 Goodbye.`
31	Log in to the Optical Network Manager server as admin.
32	Open the GNB.
33	Open a command line interface from the GNB by selecting the OMEA server and then clicking the **Login** menu in the GNB FCAPS menu bar.
34	The four login options, in order, are: • **Auto-login to NE: <name>** • **Login to NE: <name>** • **Auto-login to <name>** • **Login to <name>** where <name> is the host name or IP address of the OMEA server. Select the last option, **Login to <name>**. ***Note:*** The other three options will open the OMEA Desktop.
35	In the Controller Login window, click the **Login to Character Session** check box.
36	Click **Login**. *A terminal window opens with a command line prompt. Log in with a Unix ID and password.*

—continued—

Procedure 3-16 (continued)
Replacing an SP circuit pack - upgrading the bootloader on a Optical Network Manager workstation

Step	Action
37	Enter: *cd <homedir>/blue* ↵

38	Enter:
	./blue.sh ↵
	A Run dialog opens and upgrades the bootloader for the shelf. One of the following messages appears:
	Message 1:
	`Bootloader upgrade process completed.`
	`The following NE was upgraded to bootloader version <2.0c>`
	`<47.135.57.110>`
	Message 2:
	`Bootloader upgrade process completed.`
	`The following NE was already upgraded to at least bootloader version <2.0c>`
	`<47.135.57.110>`
	Message 3:
	`The following NE COULD NOT be upgraded to bootloader version <2.0c>`
	`See the individual log files for more details.`
	`Telnet login or Communication failure - <Connection reset by peer: JVM_recv in socket input stream read>`

39	**If** at step 38, **Then** go to message 1 or message 2 appears — step 43 message 3 appears — step 40 otherwise — step 42
40	There was a temporary communication error. You must repeat the upgrade for the shelf.
41	Go to step 38.
42	You cannot proceed with the upgrade. Call your next level of support.
43	Enter: *rm -f *.log* ↵
44	Enter: *exit* ↵ *This message appears:* `Connection closed by foreign host.`
45	On the Optical Network Manager workstation, start File Manager.

—continued—

Procedure 3-16 (continued)
Replacing an SP circuit pack - upgrading the bootloader on a Optical Network Manager workstation

Step	Action
46	In the nelist.txt file: **a.** Delete the line you entered at step 23. **b.** Select the File menu. **c.** In the File menu, select **Save**. **d.** In the File menu, select **Exit**. *The nelist.txt file closes.*
47	Close the File Manager.
48	Establish an ftp session with the OMEA server by entering: *ftp <host_name>* where <host_name> is the host name or IP address of the OMEA server.
49	Log in to the OMEA server.
50	Set the transfer mode to binary format by entering: *binary*
51	Enter: *cd <homedir>/blue* ↵ *This message appears:* `250 CWD command successful.`

52	Enter:
	put nelist.txt ↵
	A similar message appears:
	`<200 PORT command successful.`
	`150 Binary data connection for nelist.txt`
	`(<47.114.241.156,65156>)`
	`226 Binary Transfer complete.`
	`<263> bytes received in <0.00> seconds (<1183.58> Kbytes/s)>`

53	Enter: *quit* ↵ *This message appears:* `221 Goodbye.`
54	Close the Terminal session.

—end—

Procedure 3-17
Replacing an SP circuit pack - upgrading the software load on the replacement SP circuit pack on a PC

Use this procedure to upgrade the software load on the replacement Shelf Processor (SP) circuit pack on a PC. If you have been referenced to this procedure from the "Replacing an SP circuit pack" procedure, complete this procedure and return to step 30 of Procedure 3-13 of this book.

Requirements

To perform this procedure, you must be logged into the system with read and write privileges.

Precautions

CAUTION
Software download warning
During any upgrade procedure, ensure that there is no maintenance activity being performed, such as the insertion of a new circuit pack.

Action

Step	Action
1	On the PC, start **Windows Explorer**.
2	In Windows Explorer: **a.** select the directory path *<drive>:\NortelNetworks\OPTeraMetro* ↵ where <drive> is the drive where the system Manager was installed **b.** double click on the **Library** directory **c.** double-click on the **8.0.xy.z** directory **d.** double-click on the **smi.bat** file *The IP Address Not Specified dialog opens.*

—continued—

Procedure 3-17 (continued)
Replacing an SP circuit pack - upgrading the software load on the replacement SP circuit pack on a PC

Step	Action
3	In the IP Address Not Specified dialog: **a.** enter the IP address of the shelf where the SP was replaced **b.** click the **OK** button *The System Manager Login dialog opens.*
4	Go to step 30 of "Replacing an SP circuit pack".

—end—

Procedure 3-18
Replacing an SP circuit pack - upgrading the software load on the replacement SP circuit pack on a Solaris workstation

Use this procedure to upgrade the software load on the replacement Shelf Processor (SP) circuit pack on a Solaris workstation. If you have been referenced to this procedure from the "Replacing an SP circuit pack" procedure, complete this procedure and return to step 30 of Procedure 3-13 of this book.

Requirements

To perform this procedure, you must be logged into the system with read and write privileges.

Precautions

CAUTION
Software download warning
During any upgrade procedure, ensure that there is no maintenance activity being performed, such as the insertion of a new circuit pack.

Action

Step	Action
1	On the Solaris workstation, start the File Manager.
2	In the File Manager: **a.** select the **/etc/om5000/smilaunch** directory path **b.** double-click on the **8.0_smi** file *The IP Address Not Specified dialog opens.*
3	In the IP Address Not Specified dialog: **a.** enter the IP address of the shelf where the SP was replaced **b.** click the **OK** button *The System Manager Login dialog opens.*
4	Go to step 30 of "Replacing an SP circuit pack".

—end—

Procedure 3-19
Replacing an SP circuit pack - upgrading the software load on the replacement SP circuit pack on a Optical Network Manager workstation

Use this procedure to upgrade the software load on the replacement Shelf Processor (SP) circuit pack on a Optical Network Manager workstation. If you have been referenced to this procedure from the "Replacing an SP circuit pack" procedure, complete this procedure and return to step 30 of Procedure 3-13 of this book.

Requirements

To perform this procedure, you must be logged into the system with read and write privileges.

Precautions

CAUTION
Software download warning
During any upgrade procedure, ensure that there is no maintenance activity being performed, such as the insertion of a new circuit pack.

Action

Step	Action
1	Log in to the Optical Network Manager server as admin.
2	Open the GNB.
3	Open an SMI session from the GNB for the required NE by selecting the NE on the GNB window and then clicking the **Login** menu in the GNB FCAPS menu bar.
4	The two login options, in order, are: • **Auto-login to NE: <name>** • **Login to NE: <name>** where <name> is the name of the Optical Metro 5100/5200 NE. Select the first option, **Auto-login to NE: <name>**. *An SMI session opens. Log in with a user ID and password.* ***Note:*** The other option will open the SMI.
5	Go to step 30 of "Replacing an SP circuit pack".

—end—

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