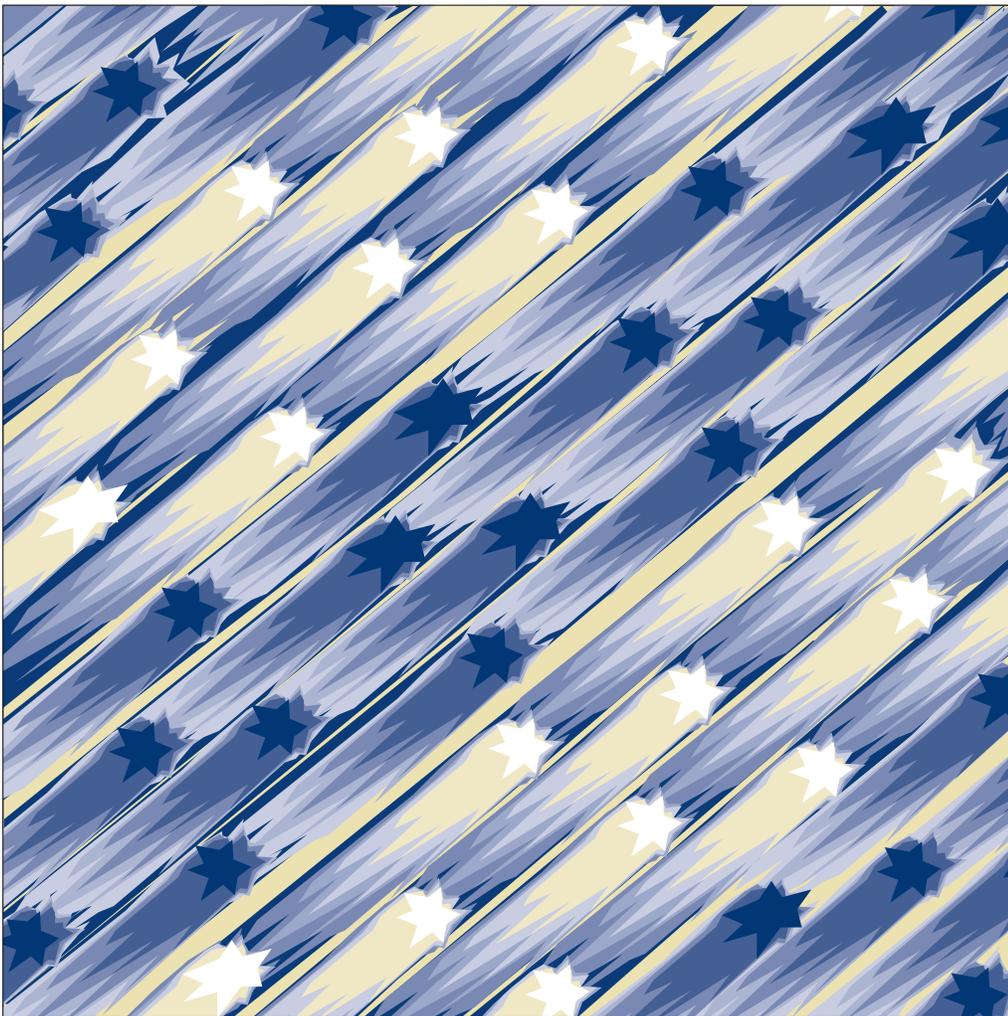


8265 Nways ATM Switch



Media Module Reference Guide



8265 Nways ATM Switch



Media Module Reference Guide

Note

Before using this information and the product it supports, be sure to read the general information under Appendix D, "Notices" on page 133.

Third Edition (September 1998)

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About This Book

This book describes how to install and configure ATM media modules in an IBM 8265 Nways ATM Switch.

Who Should Use This Book

This book is intended for the following people at your site:

- ATM network administrator
- ATM network operator
- Hardware installer.

How To Use This Book

1. Before installing a module, familiarize yourself with the basic installation and configuration procedures in "Common Procedures" on page 1.
2. Proceed to the section that covers the module you are installing.

Prerequisite Knowledge

To understand the information presented in this book, you should be familiar with:

- Features and characteristics of the IBM ATM Control Point and Switch module, as described in the *IBM 8265 Nways ATM Switch: Product Description*, GA33-0449 and the *IBM 8265 Nways ATM Switch: User's Guide*, SA33-0456.
- Principles of asynchronous transfer mode (ATM) technology
- ATM Forum UNI Specification V3.0, V3.1 and V4.0.
- ATM Forum PNNI Specification V1.0.

Where to Find More Information

Refer to the documentation listed in the "Bibliography" on page 135.

World Wide Web

You can access the latest news and information about IBM network products, customer service and support, and microcode upgrades via the Internet, at the URL:

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Common Procedures

Chapter 1. Basic Installation Procedures

Before installing an ATM media module, you should be familiar with the following basic installation procedures that you will use for all ATM media modules:

- Unpacking a module
- Inserting a module in the 8265 ATM Switch
- Cabling and connecting a module.

Unpacking a Module

This section provides guidelines for unpacking media modules and their associated components.

Precautions

Take the following precautions when unpacking:

- Do not remove a component from its anti-static shielding bag until you are ready to use it. This avoids the possibility of having electrostatic discharge damage static-sensitive devices on the component.
- When possible, handle the component by the faceplate.
- Always use a foot strap and grounded mat or wear a grounded static discharge wrist strap whenever you inspect or handle a component. Or else, be sure to touch a grounded rack or another source of ground **before** handling it.
- Ensure that you have a clean surface available on which to place the components.

Unpacking Module Components

To unpack module components, follow these steps:

- **1** Verify that you received the correct components by checking the model number listed on the side of the shipping cartons against the model numbers you ordered.
- **2** Remove the module and its components from their shipping cartons.
- **3** Remove the items from their anti-static bags and inspect them for damage. Always handle them by the faceplate being careful not to touch the internal elements.

If an item appears to be damaged:

- Put it back in the anti-static bag.
- Put the bag back into the shipping carton.
- Contact your local IBM dealer.

I/O Cards: Be sure to keep the screws that come with each I/O card in a safe place as you will need them later to install the cards on the motherboard.

Suggestions

- Keep the shipping carton and the anti-static shielding bags in which the components were delivered in case you later want to repackage them for storage or shipment.
- Record the serial numbers of the media module and components, and other information, in the ATM Cabling Charts in the *IBM 8265 Nways ATM Switch: Planning and Site Preparation Guide*.

Inserting a Module in the 8265 ATM Switch

This section describes how to insert a media module in the 8265 ATM Switch.

Notes:

1. All media modules are *hot-pluggable*; that is you can safely install a module even while the 8265 is running.
2. Before installing a media module, make sure that a CPSW module is installed in slots 9-10 or 11-12, and that a configuration console has already been attached and configured.
3. The following example describes the procedure for a single-slot media module. The procedure for 2-slot and 3-slot modules is identical.

To install a media module in an 8265, follow these steps:

- **1** Locate an empty slot in positions 1 to 8 or 12 to 17. If necessary, remove the slot cover panel to access the slot.

Note: When the CPSW2 module is installed, slot 12 is only available if the 8265 is equipped with the backplane Part Number 26L0112. Release 4 models of the 8265 are supplied with this backplane. Older versions of the 8265 are equipped with backplane Part Number 13J8689 and do not support media modules in slot 12. To check if your 8265 has the required backplane, either :

- Enter the the SHOW INVENTORY VERBOSE command to display the backplane part number
- Look for a "Release 4" label on the bottom left-hand front side of the chassis (just to the left of the left-most power supply bay).

- **2** Make sure that the slot to be used is in ISOLATED mode by entering the following command from the configuration console:

```
SET MODULE slot ISOLATED
```

where *slot* specifies the number of the slot to be used. For more information, see the *IBM 8265 Nways ATM Switch: User's Guide*.

- 3 Insert the module into the slot as shown in Figure 1, matching the top and bottom board guides as you slide the module cleanly into place (by pressing evenly on the top and bottom of the faceplate). Do not attempt to push the module all the way in until you have verified that the top and bottom module ejectors are OPEN (see Figure 2 on page 8.)

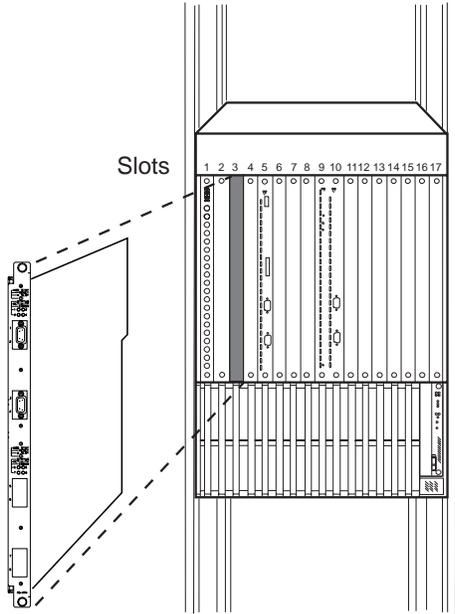


Figure 1. Inserting the Module in an 8265 ATM Switch

Common Procedures

- ___ **4** Close the top and bottom ejectors simultaneously. This secures the module.

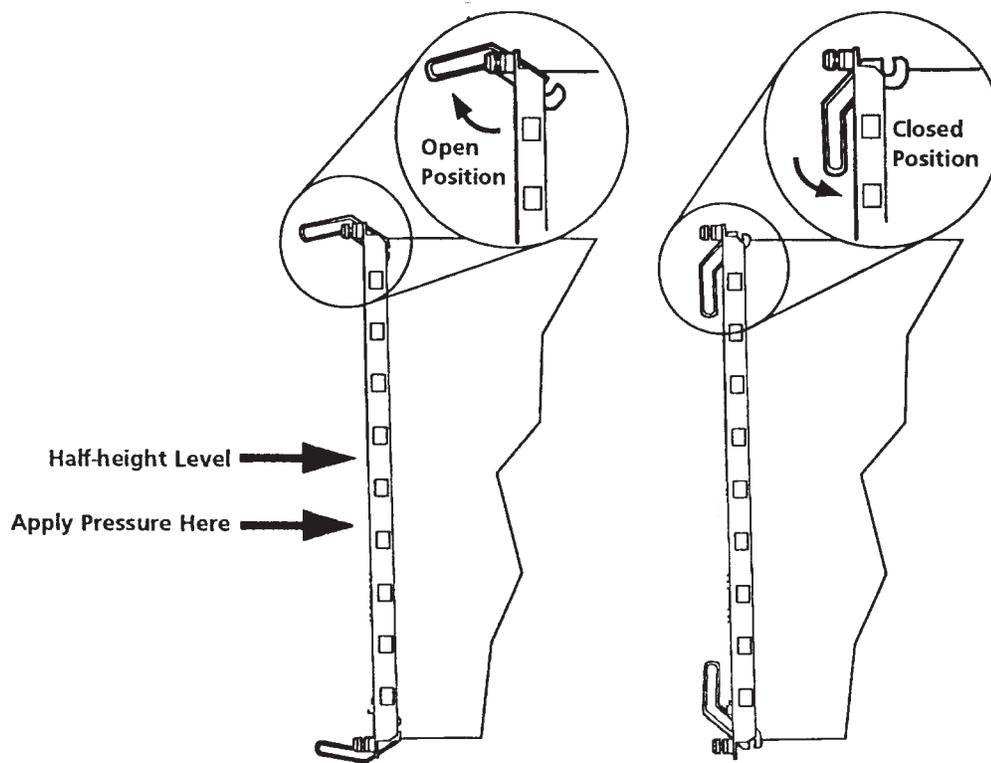


Figure 2. 8265 ATM Switch Module Ejectors

- ___ **5** The Module Status LED should light (Reset) briefly, and then turn off. After a few seconds, other LEDs may also light if the slot was previously configured for the same type of media module.
- ___ **6** Fasten the spring-loaded screws on the front panel of the module to the 8265, using your fingers. Do not overtighten.

Cabling and Connecting to Devices

This section provides instructions and guidelines for attaching cables between ATM ports and ATM devices (such as switches, servers, personal computers, and workstations).

Cabling Guidelines

Remember these tips when connecting cables:

- Avoid stretching and bending the cables too much.
- Avoid routing copper cables near potential sources of electromagnetic interference, such as motorized devices and fluorescent lights.
- Avoid bending fiber cabling tighter than the cable's specified bend radius (see cable specifications in the *8265 Planning and Site Preparation Guide*).
- Avoid trip hazards by routing the cables away from aisles and other areas where people walk. If such routes cannot be avoided, use floor cable covers or similar material to secure and protect the cables.
- Be sure that the cables connected to a media module are supported so that the cable connectors are not strained. The cable management tray (orderable separately) helps prevent strain on the cables.

Connecting Devices to ATM Ports

You can connect devices to the ATM ports either through the building wiring or by a direct connection.

Direct Cabling: To cable an ATM device directly to a media module, follow these steps:

- ___ **1** Look at the cabling chart provided by your network planner to determine how the user device should be connected to the network.
- ___ **2** Connect the cables between the media module and the user device as indicated on the cabling chart.
- ___ **3** Label the cables, following your company's conventions.

Common Procedures

Via Building Wiring: To connect an ATM device to a media module via building wiring, follow these steps:

- **1** Look at the cabling chart provided by your network planner to determine how the user device should be connected to the network.
- **2** In the work area, connect one end of the device cable to the ATM connector on the user device (see Figure 3).

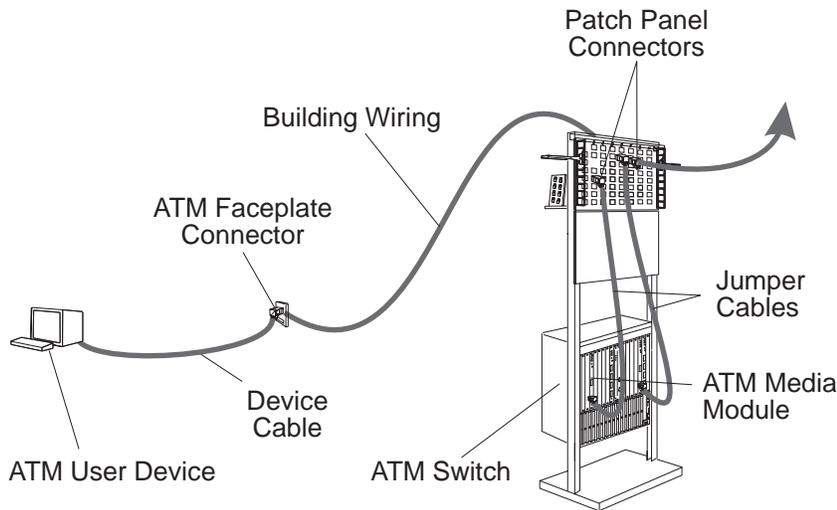


Figure 3. Connecting Devices Via Building Wiring

- **3** Connect the other end of the device cable to the ATM faceplate connector where the building wiring terminates.
- **4** Label the faceplate if it does not already have a cable label. Follow your company's conventions for cable labeling. If there is more than one wiring closet on a floor, record the wiring closet identifier or location and the cable identifier.
- **5** On the patch panel, connect a jumper cable to the appropriate connector on the patch panel (or other equipment where the building wiring terminates).
- **6** Connect the other end of the jumper cable to a port on the media module.
- **7** Label the connector on the patch panel (or other equipment where the building wiring terminates).

Chapter 2. Basic Configuration Procedures

Before following the specific configuration procedure for your module, you should be familiar with the basic configuration procedures used:

1. Connecting Modules to the Network
2. Enabling Ports
3. Defining Port Settings
4. Displaying and Saving Configuration Settings

Connecting Modules to the Network

When you install a media module, the module is set by default to ISOLATED and all of its ports are set to DISABLED. When a module is isolated, no network activity takes place on it and it cannot be accessed by the network. This is a security measure that protects your ATM network from unauthorized access and module malfunction.

To establish the module's connection to the network, enter the following command at the ATM console prompt:

```
8265ATM> SET MODULE slot CONNECTED
```

where `slot` specifies the slot number of the ATM media module.

This command does not enable the module's ports, allowing you to configure individual ports before enabling them.

Enabling Ports

Enabling Selected Ports

To enable *individual* ports using the current configuration values (either the default values if the module has not been used or the last values entered), enter the following command:

```
8265ATM> SET PORT slot.port ENABLE
```

Enabling All Ports

To enable *all* ports using the current configuration values (either the default values if the module has not been used or the last values entered), enter the following command:

```
8265ATM> SET MODULE slot CONNECTED ENABLE
```

Defining Port Settings

Port settings are configured by using the SET PORT command. The settings are specified after the ENABLE parameter.

Example

The following command configures a port 1 of a module in slot 3 as a UNI port with normal ILMI address registration.

```
8265ATM> set port 3.1 ENABLE UNI
```

Displaying and Saving Configuration Settings

Displaying Configuration Settings

To display status information about a media module, enter one of the following commands:

- SHOW MODULE
- SHOW MODULE VERBOSE
- SHOW PORT
- SHOW PORT VERBOSE

For example, to display configuration information about a media module in slot 2, you would enter the following command:

```
8265ATM> show module 2 verbose [ENTER]
```

To display detailed information about the ports of a media module in slot 1, you would enter the following command:

```
8265ATM> show port 1.all verbose
```

For more information on the SHOW MODULE and SHOW PORT commands, see the *8265 Command Reference Guide*.

Saving Configuration Settings

After configuring the module and port settings, save your configuration changes by entering the SAVE MODULE_PORT command.

```
8265ATM> save module_port
```

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Chapter 3. 4-Port 155 Mbps Modules

This chapter contains information relating to the following modules:

- 4-port 155 Mbps module (MMF), Feature Code 6540
- 4-port 155 Mbps module (Flex), Feature Code 6543.

Installing a 4-Port 155 Mbps Module

This section contains the procedures for installing and configuring a 4-port 155 Mbps module in an 8265 switch.

Module Front Panel

Refer to Figure 4 when installing and configuring a 155 Mbps module.

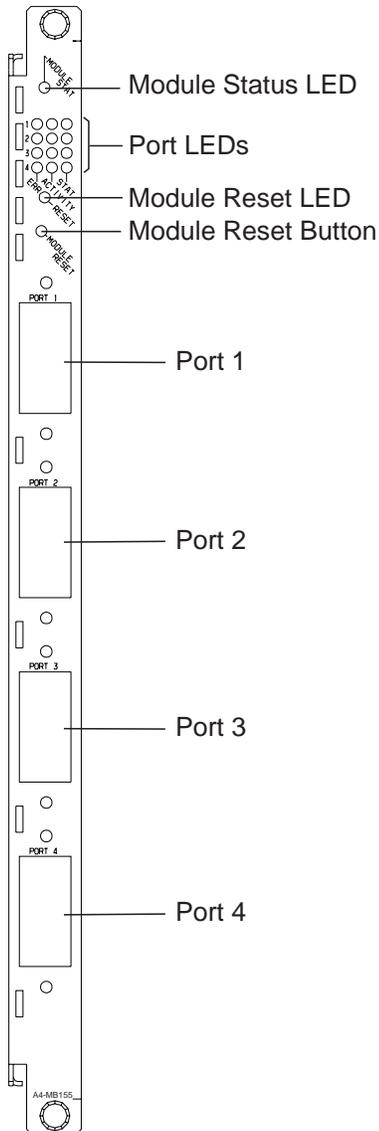


Figure 4. 155 Mbps Module Front Panel

Installation Procedure

To install a 155 Mbps module, follow these steps:

- 1 Unpack the module and any I/O cards you have received, as described in “Unpacking a Module” on page 4. The shipping group contains:

A4-MF155 (4-port MMF)	A4-MB155 (4-port Flex)
<ul style="list-style-type: none"> • One module. 	<ul style="list-style-type: none"> • One module motherboard. • Up to 4 I/O cards to be installed on the motherboard. <p>With each I/O card, you should also receive four screws to secure the I/O card to the motherboard.</p>

- 2 **(A4-MB155 module only)** Install your I/O cards on the module motherboard, as described in “Installing I/O Cards on the 4-Port 155 Mbps Flex Module” on page 23.

Using 8260 I/O Cards

8260 155 Mbps I/O cards (Feature Codes 8800, 8801, and 8802) may only be installed as ports 1, 2, and 3.

Only 8265 155 Mbps I/O cards (Feature Codes 6580, 6581, and 6582) can be installed as port 4.

- 3 Insert the module in the 8265 switch, as described in “Inserting a Module in the 8265 ATM Switch” on page 6. The 155 Mbps module can be inserted in slots 1-8 and 12-17.

Check that the Reset LED flashes on briefly and then turns off. If not, refer to “Module LED Error Diagnosis” on page 107 to diagnose and correct the problem before proceeding to the next step.

Important: The Port Error LED will remain lit when:

- No cables are attached to that port
 - No I/O card has been installed for that port (A4-MB155 Flex module only).
- 4 Attach the cables that connect the module to another ATM device, as described in “Cabling and Connecting to Devices” on page 9.
 - 5 Record the module's installation and cabling information in the ATM Cabling Charts provided in the *IBM 8265 Nways ATM Switch: Planning and Site Preparation Guide*.
 - 6 Continue with the “Configuration Procedure” on page 22.

Configuration Procedure

To configure a 155 Mbps module in an 8265 switch, follow these steps:

- 1 Connect the module to the ATM network with the command:

```
SET MODULE slot CONNECTED
```

as described in “Connecting Modules to the Network” on page 12.

Check that the module status LED comes on. If not, refer to “Module LED Error Diagnosis” on page 107 to diagnose and correct the problem before proceeding to the next step.
- 2 Set the characteristics of each port using the SET PORT command, as described in “Defining Port Settings” on page 14.

155 Mbps ports may be configured as UNI, IISP, PNNI, AUTO, or VOID ports. In addition to the standard ATM port parameters, the CLOCK and FRAME_FORMAT parameters may also be defined on 155 Mbps ports. For information on these parameters, see the “Port-Specific SET PORT Parameters” appendix in the *IBM 8265 Nways ATM Switch: Command Reference Guide*.

Note: To view the current port settings, use the SHOW PORT VERBOSE command (see “Displaying Configuration Settings” on page 15).
- 3 (Optional) Set up VPC links using the SET VPC_LINK command, as described in the *IBM 8265 Nways ATM Switch: User's Guide*.
- 4 (Optional) Set up PVCs using the SET PVC command, as described in the *IBM 8265 Nways ATM Switch: User's Guide*.
- 5 Enable the ports that you have configured, using either the SET PORT or the SET MODULE command, as described in “Enabling Ports” on page 13.
- 6 Check that all LEDs are functioning correctly:

 - The module status LED should be on.
 - The port status LED should be on.
 - The port activity LED should be on when there is ATM traffic.
 - The port error LED should be off unless there is no cable attached or no I/O card (A4-MB155 Flex module only) installed for that port.
 - All other LEDs on the module faceplate should be off.

If any LEDs are not functioning as indicated, refer to “Troubleshooting for 155 Mbps Modules” on page 25 to diagnose and correct the problem before proceeding to the next step.
- 7 Save the port and module configuration settings with the command:

```
SAVE MODULE_PORT
```

as described in “Saving Configuration Settings” on page 15.

For full information on all ATM commands, see the *8265 Command Reference Guide*.

Installing I/O Cards on the 4-Port 155 Mbps Flex Module

Installation Procedure

To install an I/O card on the A4-MB155 motherboard, follow these steps:

- ___ **1** If necessary, remove the two screws and faceplate that cover the port on the front panel of the motherboard. Put the screws and faceplate in a safe place.
- ___ **2** Loosen the two screws that attach the I/O card faceplate to the I/O card circuit board, so that you can move the faceplate while installing the I/O cards.
- ___ **3** Hold the I/O card so that its connector and screw holes are aligned over the connector and small metal posts on the motherboard (see Figure 5 on page 24). Then gently push the card forward (so that its port fits into the opening on the motherboard front panel) and down until you hear it click into the motherboard connector.
- ___ **4** Place two of the screws that come with the I/O card into the metal posts and tighten them with a screwdriver.
- ___ **5** Place the remaining two screws on the front panel and tighten them with a screwdriver.
- ___ **6** Retighten the two screws that attach the I/O card faceplate to the I/O card circuit board. This secures the I/O card on the motherboard.

Note: If you replace an I/O card after configuring the module has been configured (see “Configuration Procedure” on page 22) and then re-insert the module in the switch, the new I/O card is automatically configured with the settings of the previous card.

Using 8260 I/O Cards

8260 155 Mbps I/O cards (Feature Codes 8800, 8801, and 8802) may only be installed as ports 1, 2, and 3.

8265 155 Mbps I/O cards (FC 6580, 6581, and 6582) can be installed in any port position.

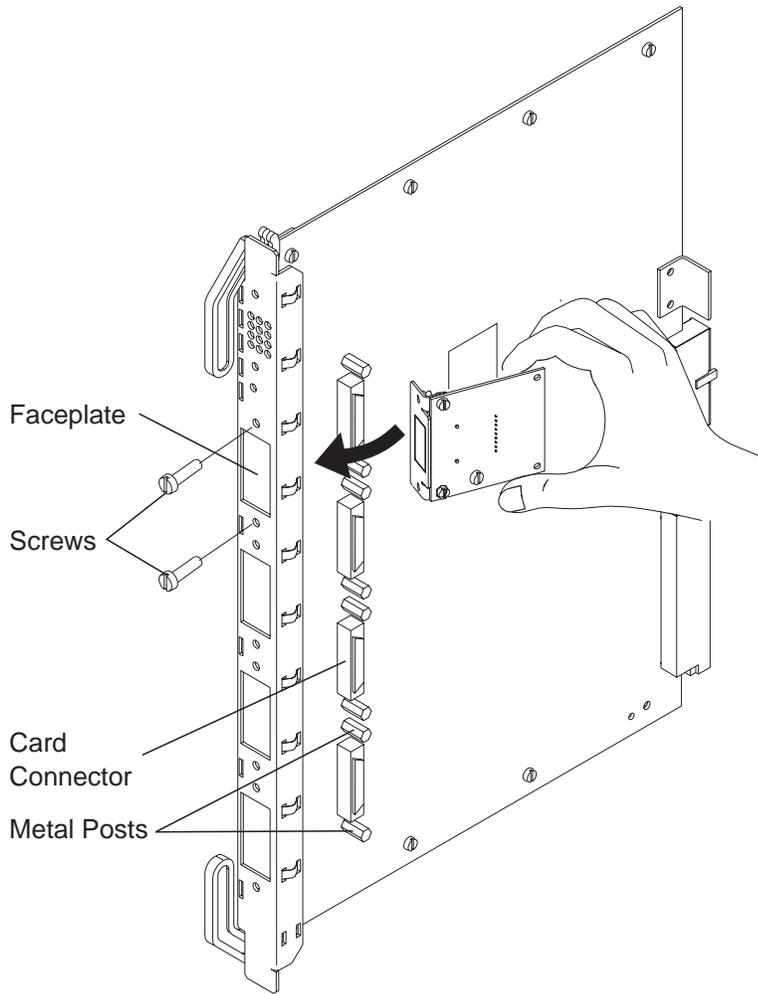


Figure 5. Installing an I/O Card on the 155 Mbps Module Motherboard

Attention: When installing an I/O card on the motherboard, be careful not to touch its components. Always hold the card by the faceplate or by its edges as shown in Figure 5.

Troubleshooting for 155 Mbps Modules

Troubleshooting for the 155 Mbps modules is done using:

- The port and module LEDs on the module faceplate (see Figure 4 on page 20)
- The results displayed by the SHOW MODULE VERBOSE, SHOW PORT VERBOSE, and SHOW VPC_LINK commands.

First Test the LEDs

Before you start troubleshooting, check that all LEDs are working by pressing the LED Test button on:

- the active Controller Module (if installed)
- the active CPSW2 module (when no Controller modules are installed).

All LEDs on the 155 Mbps module module should light. If not, refer to “Module LED Error Diagnosis” on page 107.

To diagnose problems with a 155 Mbps module:

- 1 Check whether the module LEDs indicate normal operation or not:

Table 1. A4-MF155 and A4-MB155 Module LED States

LED Name	Color	State	Meaning
MODULE STAT	Green	On	Normal when module is connected.
		Off	Normal when module is isolated. Otherwise, see “Module LED Error Diagnosis” on page 107.
RESET	Yellow	Off	Normal when module is not being reset.
		On	Normal when module is being reset. Otherwise, see “Module LED Error Diagnosis” on page 107.
		Blinking	See “Module LED Error Diagnosis” on page 107.

- 2 Enter the SHOW MODULE VERBOSE command from the configuration console and check that the status messages are:

- Connected
- Hardware Okay
- Enable or Disable
- Normal

If any other status is displayed, see “SHOW MODULE Error Diagnosis” on page 110.

3 Check whether the port LEDs indicate normal operation or not:

LED Name	Color	State	Meaning
STAT	Green	On	Normal when port is enabled.
		Off	Normal when port is disabled. Otherwise, see "Port LED Error Diagnosis" on page 112.
		Blinking	See "Port LED Error Diagnosis" on page 112.
ACTIVITY	Yellow	On	Normal when ATM cells are being transmitted over the port.
		Off	Normal when ATM cells are not being transmitted over the port. Otherwise, see "Port LED Error Diagnosis" on page 112.
ERR	Yellow	Off	Normal.
		On	Normal if no cable is attached or if the Flex module I/O card is missing. Otherwise, see "Port LED Error Diagnosis" on page 112.

4 Enter the SHOW PORT VERBOSE or SHOW VPC_LINK command from the configuration console and check that the status message for the port or VPC is one of the following:

- DOWN: Establishing *
- DOWN: Configuring *
- DOWN: Retrieving *
- UP: Registering *
- UP

If any other status is displayed, or if any of the transient statuses (marked *) are displayed continuously, see "SHOW PORT / SHOW VPC_LINK Error Diagnosis" on page 115.

USA and Canada: If the problem is not resolved after following the troubleshooting procedures outlined in this chapter, call toll-free 800-IBM-SERV for IBM support.

Replacing a 155 Mbps I/O Card

While diagnosing a problem on a 155 Mbps module, you may be directed to replace the I/O card. To replace an I/O card, follow these steps:

- **1** Enter `SET MODULE slot ISOLATED` where `slot` is the slot number of the A4-MB155 module containing the I/O card. Then press Enter.
- **2** Remove the module from the chassis.
- **3** Unscrew the I/O card from the motherboard.
- **4** Install a new I/O card on the motherboard as described in “Installing I/O Cards on the 4-Port 155 Mbps Flex Module” on page 23.
- **5** Re-insert the module into the chassis.
- **6** Enter `SET MODULE slot CONNECTED` where `slot` is the slot number of the module. Then press Enter.

Chapter 4. 622 Mbps Modules

This chapter contains information relating to the following modules:

- 1-port 622 Mbps module (MMF), Feature Code 6511
- 1-port 622 Mbps module (SMF), Feature Code 6512

Installing the 622 Mbps Module

This section contains the procedures for installing and configuring a 622 Mbps module.

Module Front Panel

Refer to Figure 6 when installing and configuring the 622 Mbps module.

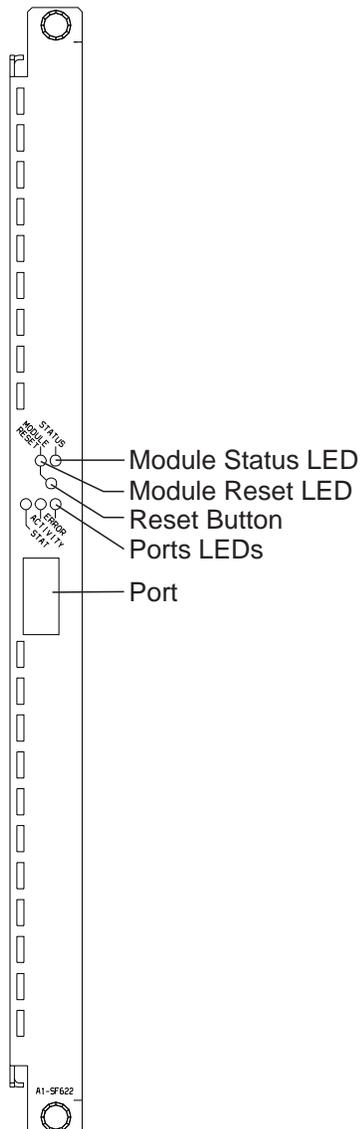


Figure 6. 622 Mbps Module Front Panel

Installation Procedure

To install a 622 Mbps module, follow these steps:

- ___ **1** Unpack the module as described in “Unpacking a Module” on page 4. The shipping group contains:
 - One A1-MF622 or A1-SF622 module.

- ___ **2** Insert the module in the 8265 switch as described in “Inserting a Module in the 8265 ATM Switch” on page 6. The 622 Mbps module can be inserted in slots 1-8 and 12-17.

Check that the Reset LED flashes on briefly and then turns off. If this does not happen, refer to “Module LED Error Diagnosis” on page 107 to diagnose and correct the problem before proceeding to the next step.

Important: It is normal for the port error LEDs to remain on until cables are attached to the port.

- ___ **3** Attach the cables that connect the module to another ATM device, as described in “Cabling and Connecting to Devices” on page 9.

- ___ **4** Record the module's installation and cabling information in the ATM Cabling Charts provided in the *IBM 8265 Nways ATM Switch: Planning and Site Preparation Guide*.

- ___ **5** Proceed with the steps in “Configuration Procedure” on page 31.

Configuration Procedure

To configure a 622 Mbps module, follow these steps:

- 1 Connect the module to the ATM network with the command:

```
SET MODULE slot CONNECTED
```

as described in “Connecting Modules to the Network” on page 12.

Check that the module status LED comes on. If not, refer to “Module LED Error Diagnosis” on page 107 to diagnose and correct the problem before proceeding to the next step.
- 2 Set the characteristics of each port using the SET PORT command, as described in “Defining Port Settings” on page 14.

622 Mbps ports may be configured as UNI, AUTO, or VOID ports. In addition to the standard ATM port parameters, the DESCRAMBLE_RCV_PAYLOAD and SCRAMBLE_XMT_PAYLOAD parameters may also be defined on 622 Mbps ports. For information on these parameters, see the “Port-Specific SET PORT Parameters” appendix in the *IBM 8265 Nways ATM Switch: Command Reference Guide*.

Note: To view the current port settings, use the SHOW PORT VERBOSE command (see “Displaying Configuration Settings” on page 15).
- 3 (Optional) Set up VPC links using the SET VPC_LINK command, as described in the *IBM 8265 Nways ATM Switch: User's Guide*.
- 4 (Optional) Set up PVCs using the SET PVC command, as described in the *IBM 8265 Nways ATM Switch: User's Guide*.
- 5 Enable the port using the SET PORT or the SET MODULE command, as described in “Enabling Ports” on page 13.
- 6 Check that all LEDs are functioning correctly:

 - The module status LED should be on.
 - The port status LED should be on.
 - The port activity LED should be on when there is ATM traffic.
 - The port error LED should be off unless there is no cable attached to the port.
 - All other LEDs on the module faceplate should be off.

If any LEDs are not functioning as indicated, refer to “Troubleshooting for 622 Mbps Modules” on page 32 to diagnose and correct the problem before proceeding to the next step.
- 7 Save the port and module configuration settings with the command:

```
SAVE MODULE_PORT
```

as described in “Saving Configuration Settings” on page 15.

For full information on all ATM commands, see the *8265 Command Reference Guide*.

Troubleshooting for 622 Mbps Modules

All troubleshooting for the 622 Mbps module is done using:

- The port and module LEDs on the module faceplate (see Figure 6 on page 29)
- The results displayed by the SHOW MODULE VERBOSE, SHOW PORT VERBOSE, and SHOW VPC_LINK commands.

First Test the LEDs

Before you start troubleshooting, check that all LEDs are working by pressing the LED Test button on:

- the active Controller Module (if installed)
- the active CPSW2 module (when no Controller modules are installed).

All LEDs on the 622 Mbps module module should light. If not, refer to “Module LED Error Diagnosis” on page 107.

To diagnose problems with a 622 Mbps module:

- 1 Check whether the module LEDs indicate normal operation or not:

LED Name	Color	State	Meaning
MODULE STAT	Green	On	Normal when module is connected.
		Off	Normal when module is isolated. Otherwise, see “Module LED Error Diagnosis” on page 107.
MODULE RESET	Yellow	Off	Normal when module is not being reset.
		On	Normal when module is being reset. Otherwise, see “Module LED Error Diagnosis” on page 107.
		Blinking	See “Module LED Error Diagnosis” on page 107.

- 2 Enter the SHOW MODULE VERBOSE command from the configuration console and check that the status messages are:

- Connected
- Hardware Okay
- Enable or Disable
- Normal

If any other status is displayed, see “SHOW MODULE Error Diagnosis” on page 110.

3 Check whether the port LEDs indicate normal operation or not:

LED Name	Color	State	Meaning
STAT	Green	On	Normal when port is enabled.
		Off	Normal when port is disabled. Otherwise, see "Port LED Error Diagnosis" on page 112.
		Blinking	See "Port LED Error Diagnosis" on page 112.
ACTIVITY	Yellow	On	Normal (ATM cells are being transmitted over the port).
		Off	See "Port LED Error Diagnosis" on page 112.
ERROR	Yellow	Off	Normal.
		On	Normal if no cable attached. Otherwise, see "Port LED Error Diagnosis" on page 112.

4 Enter the SHOW PORT VERBOSE or SHOW VPC_LINK command from the configuration console and check that the status message for the port or VPC is one of the following:

- DOWN: Establishing *
- DOWN: Configuring *
- DOWN: Retrieving *
- UP: Registering *
- UP

If any other status is displayed, or if any of the transient statuses (marked *) are displayed continuously, see "SHOW PORT / SHOW VPC_LINK Error Diagnosis" on page 115.

USA and Canada: If the problem is not resolved after following the troubleshooting procedures outlined in this chapter, call toll-free 800-IBM-SERV for IBM support.

Chapter 5. MSS Server 2.5 Module

This chapter contains guidelines for installing and configuring the MSS Server 2.5 Module, Feature Code 5401.

Note: Release 4 or higher CPSW code is required.

MSS Server Module Guidelines

For installation, configuration and troubleshooting instructions, refer to the MSS Server Module documentation:

- *Nways Multiprotocol Switched Services (MSS) Server Introduction and Planning Guide*, GC30-3820.
- *Nways Multiprotocol Switched Services (MSS) Server Module Installation and Initial Configuration Guide*, GA27-4141.
- *Nways Multiprotocol Switched Services Server: Interface Configuration and Software User's Guide*, SC30-3818.
- *Nways Multiprotocol Switched Services: Configuring Protocols and Features*, SC30-3819.
- *Multiprotocol Switched Services (MSS) Server Service and Maintenance Manual*, GY27-0354.
- *Nways MAS/MRS/MSS/MSSC Library, Configuration Program User's Guide for Nways Multiprotocol Access, Routing and Switched Services*, GC30-3830.
- *Nways Event Logging System Messages Guide*, SC30-3682.

Chapter 6. WAN 2.5 Module

This chapter contains information relating to the WAN 2.5 module, Feature Code 6561. The same procedures can be used for installing 8260 WAN 2 modules, providing the criteria specified in Chapter 8, "WAN 2 Modules" on page 79 is met. You must refer to that section before commencing the installation of an 8260 WAN 2 module.

Note: The WAN 2.5 module requires Release 4, or higher, of the Control Point microcode in order to operate.

Installing the WAN 2.5 Module

This section contains the procedures for installing and configuring a WAN 2.5 module.

Module Front Panel

Refer to Figure 7 when installing and configuring the WAN 2.5 module.

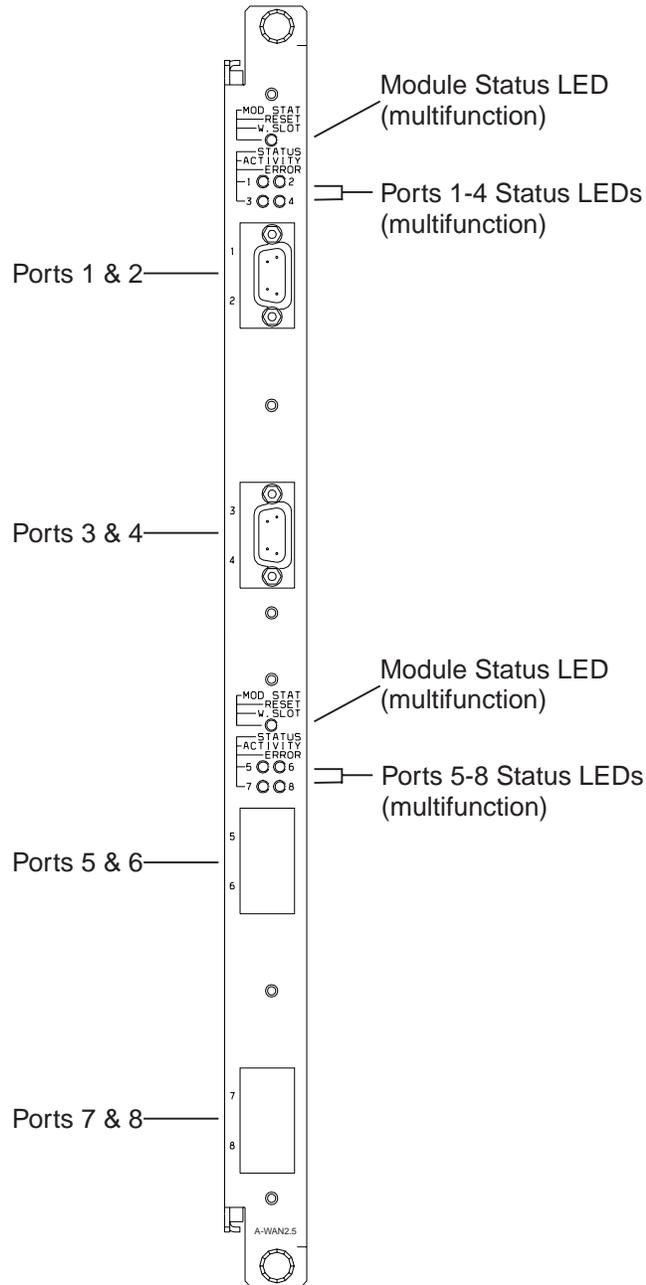


Figure 7. WAN 2.5 Module Front Panel

Installation Procedure

To install a WAN 2.5 module, follow these steps:

- 1 Unpack the module and any I/O cards you have received, as described in “Unpacking a Module” on page 4. For each module you ordered, the shipping group contains:
 - One module motherboard
 - Up to 2 I/O cards to be installed on the motherboard. With each I/O card, you should also receive:

E1/T1/J1 I/O Cards	E3, DS3, OC3, and STM1 I/O Cards
<ul style="list-style-type: none"> • One I/O card, to be installed on the module motherboard • One Vital Product Data (VPD) Programmable Read Only Memory (PROM) chip, to be installed on the motherboard • Six screws to secure the I/O card to the motherboard • Two screwlock kits, one for each port connection • One faceplate • Two 'Y' cables for connecting the ports to their cables 	<ul style="list-style-type: none"> • One I/O card, to be installed on the module motherboard • One Vital Product Data (VPD) Programmable Read Only Memory (PROM) chip, to be installed on the motherboard. • Four screws for attaching the I/O card to the motherboard. • One motherboard faceplate bracket • One dummy port cover with screw, for use when only one I/O card is installed on the motherboard.

- 2 Install your I/O cards on the module motherboard, as described in “Installing E1/T1/J1 I/O Cards on the WAN 2.5 Module” on page 41 or “Installing E3, DS3, OC3, and STM1 I/O Cards on the WAN 2.5 Module” on page 49.
- 3 Insert the module in the 8265 switch as described in “Inserting a Module in the 8265 ATM Switch” on page 6.

Check that the Reset LED flashes on briefly and then turns off. If this does not happen, refer to “Module LED Error Diagnosis” on page 107 to diagnose and correct the problem before proceeding to the next step.
- 4 Attach the cables that connect the module to another ATM device, as described in “Cabling and Connecting to Devices” on page 9.
- 5 Record the module's installation and cabling information in the ATM Cabling Charts provided in the *IBM 8265 Nways ATM Switch: Planning and Site Preparation Guide*.
- 6 Proceed with the steps in “Configuration Procedure” on page 40.

Configuration Procedure

To configure a WAN 2.5 module, follow these steps:

- **1** Connect the module to the ATM network with the command `SET MODULE slot CONNECTED` as described in “Connecting Modules to the Network” on page 12.
Check that the module status LED comes on. If not, refer to “Module LED Error Diagnosis” on page 107 to diagnose and correct the problem before proceeding to the next step.
- **2** Set the characteristics of each port using the `SET PORT` command, as described in “Defining Port Settings” on page 14.
WAN 2.5 ports may be configured as UNI, IISP, PNNI, AUTO, or VOID ports. In addition to the standard ATM port parameters, the port-specific parameters for the WAN 2.5 module are described in “Changing Default WAN 2.5 Port Settings” on page 70.
Note: To view the current port settings, use the `SHOW PORT VERBOSE` command (see “Displaying Configuration Settings” on page 15).
- **3** (Optional) Set the characteristics of any IMA groups that you wish to set up, as described in “Configuring IMA Groups” on page 55.
- **4** (Optional) Set up VPC links using the `SET VPC_LINK` command, as described in the *IBM 8265 Nways ATM Switch: User's Guide*.
- **5** (Optional) Set up PVCs using the `SET PVC` command, as described in the *IBM 8265 Nways ATM Switch: User's Guide*.
- **6** Enable the ports that you have configured, using either the `SET PORT` or the `SET MODULE` command, as described in “Enabling Ports” on page 13.
- **7** Check that all LEDs are functioning correctly:
 - The module status LED should be green.
 - The port status LEDs should be yellow (if ATM traffic is present) or green (if no ATM traffic is present).
 - All other LEDs on the module faceplate should be off.If any LEDs are not functioning as indicated, refer to “Troubleshooting for WAN 2.5 Modules” on page 57 to diagnose and correct the problem before proceeding to the next step.
- **8** Save the port and module configuration settings with the command `SAVE MODULE_PORT` as described in “Saving Configuration Settings” on page 15.
For full information on all ATM commands, see the *8265 Command Reference Guide*.

Installing E1/T1/J1 I/O Cards on the WAN 2.5 Module

The following procedure applies to both standard E1/T1/J1 and Inverse Multiplexing — ATM (IMA) E1/T1 I/O cards.

The IMA I/O cards, using ATM Forum specifications, provide a means of splitting up a high-speed stream of ATM cells, distributing the traffic across several E1, T1, or J1 links, and then recombine the cells at the other end.

Note: Release 4 or higher CPSW code is required to use the IMA I/O cards.

For more information, see the *Product Description*.

Installation Procedure

To install an I/O card on the WAN 2.5 module motherboard, follow these steps:

- **1** Adjust the port configuration jumpers on the I/O card so that they correspond to the type of connection you will be using (E1 Coaxial, E1 Twisted-Pair, T1/J1 Twisted-Pair) by following the instructions in “Configuring the Connection Type” on page 44.

Figure 8 on page 42 shows the location of the configuration jumpers on IMA E1/T1/J1 cards.

Figure 9 on page 43 shows the location of the configuration jumpers on non-IMA E1/T1/J1 cards.
- **2** Ensure that the configuration of the grounding jumpers on the E1/T1/J1 I/O card conforms to the type of port connection and to the specific grounding regulations in your country as described in “Grounding Considerations” on page 45.

Figure 8 on page 42 shows the location of the grounding jumpers on IMA E1/T1 cards.

Figure 9 on page 43 shows the location of the grounding jumpers on non-IMA E1/T1 cards.
- **3** Mount the I/O card on the module by following the instructions in “Installing the E1/T1/J1 I/O Card” on page 46.

Note: If you replace an I/O card after configuring the module (see “Configuration Procedure” on page 40) and then re-insert the module in the switch, the new I/O card is automatically configured with the basic port settings of the previous card. Port-specific parameters must be re-entered (see page “Changing Default WAN 2.5 Port Settings” on page 70).

Jumpers and Ports on the E1/T1/J1 I/O Cards

Figure 8 shows the location of the ports, configuration jumpers and grounding jumpers on the E1/T1/J1 I/O card.

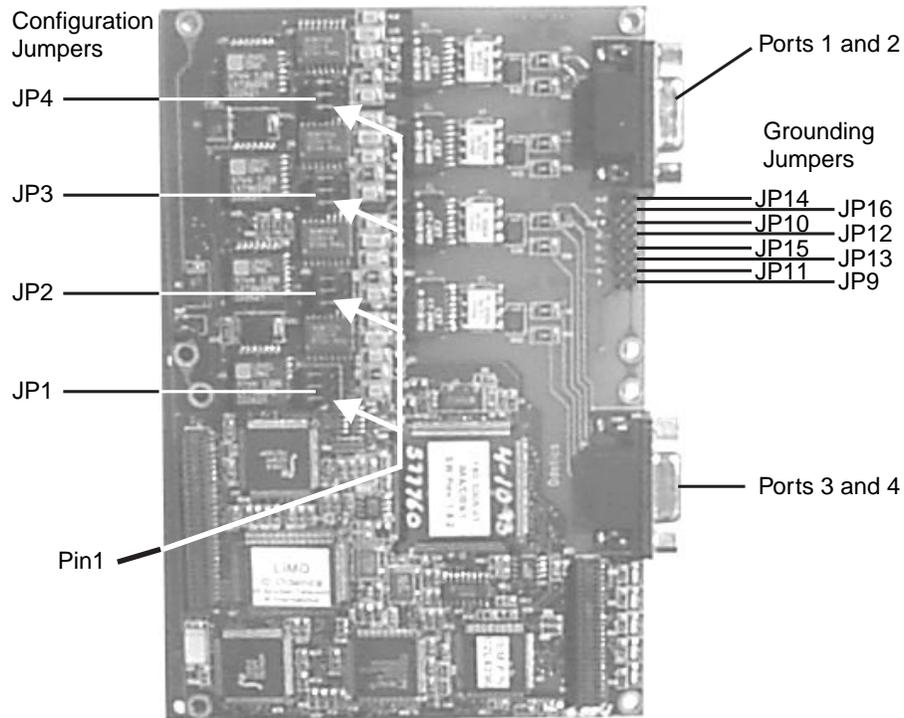


Figure 8. Jumper Locations on the IMA E1/T1/J1 I/O Card

Figure 9 shows the location of the ports, configuration jumpers and grounding jumpers on the non-IMA E1/T1/J1 I/O card.

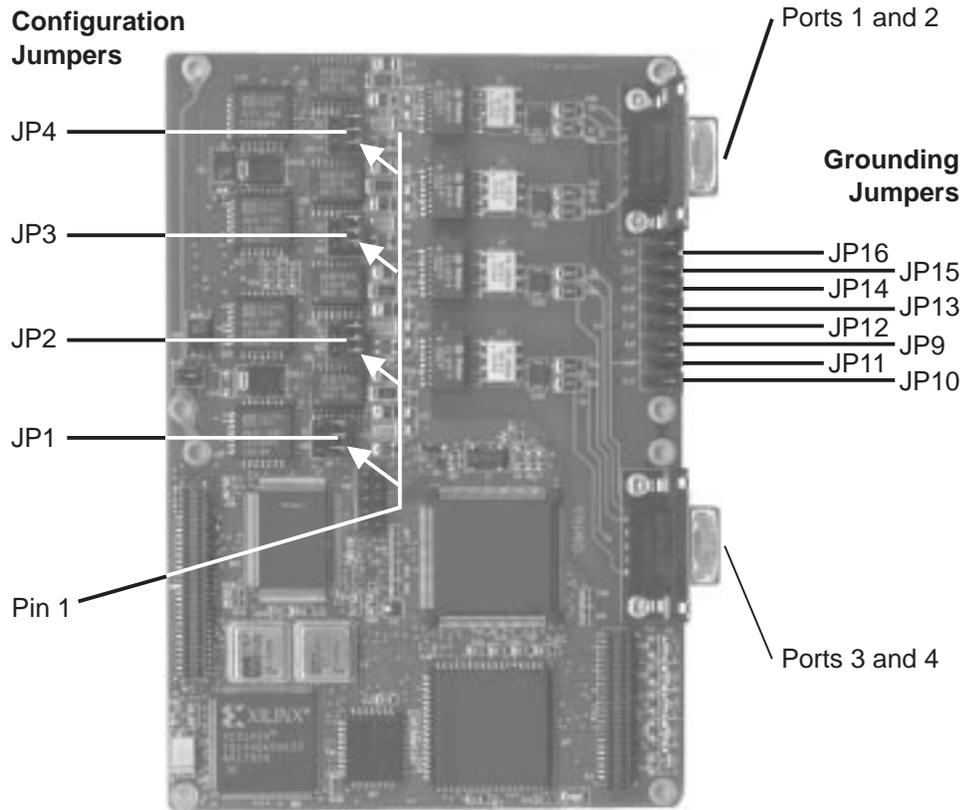


Figure 9. Jumper Locations on the non-IMA E1/T1/J1 I/O Card

Configuring the Connection Type

Each E1/T1/J1 I/O card has four Port Configuration jumpers (JP1-JP4) which determine the types of connection you can set up on the ports:

- E1 Coaxial Connection
- E1 Twisted-Pair Connection
- T1/J1 Twisted-Pair Connection

See Figure 8 on page 42 for the location of the configuration jumpers on IMA E1/T1/J1 cards.

See Figure 9 on page 43 for the location of the configuration jumpers on non-IMA E1/T1/J1 cards.

Note: You must configure the ports on the WAN 2.5 module in one of the following ways:

- All as T1/J1 connections (twisted-pair)
- All as E1 connections (coaxial or twisted-pair)

If you configure E1 and T1/J1 connections on the same module, a module error will be generated.

Figure 10 shows the correct position of the jumpers for each connection type (the settings apply to both IMA and non-IMA I/O cards).

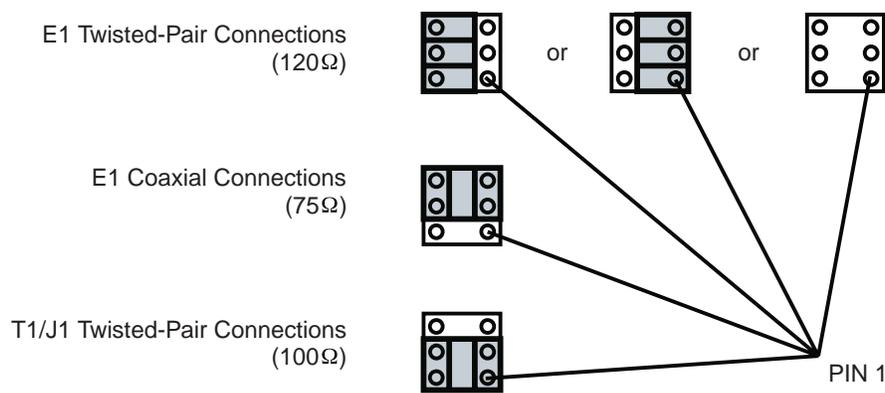


Figure 10. Port Connection Jumper Settings

Table 5. Port Connection Jumpers			
Port Number	Jumper Number	Port Number	Jumper Number
Port 1	JP4	Port 3	JP2
Port 2	JP3	Port 4	JP1

Grounding Considerations

E1, T1, and J1 Twisted-Pair Connections: Twisted-pair connections should not be grounded. You must remove the grounding jumpers from both the Transmit and the Receive jumper pins for each port that has a twisted-pair connection.

E1 Coaxial Connections: The shielding on the connector cables provided with the E1 coaxial I/O card (see the “Installation Procedure” on page 39) are connected directly to ground at the connector level, making the use of the grounding jumpers (JP9-JP14) unnecessary.

Users with specific grounding requirements may use their own cables, and set the grounding on a per-port basis. Eight jumpers (one for Transmit and one for Receive on each port) are provided on the rear of the I/O card (see Figure 9 on page 43) to control the grounding of port cables.

See Figure 8 on page 42 for the location of the grounding jumpers on IMA cards.

See Figure 9 on page 43 for the location of the grounding jumpers on non-IMA cards.

If a jumper is inserted over a pair of jumper pins, the outer connector of the corresponding port is grounded to the Frame Ground.

Table 6 shows the jumper settings for E1 coaxial connection (the settings apply to both IMA and non-IMA I/O cards).

<i>Table 6. Ground Jumper Settings for E1 Coaxial Connections</i>			
To Ground Outer of:	Place Jumper On:	To Ground Outer of:	Place Jumper On:
Port 1 Receive	JP9	Port 3 Receive	JP13
Port 1 Transmit	JP10	Port 3 Transmit	JP14
Port 2 Receive	JP11	Port 4 Receive	JP15
Port 2 Transmit	JP12	Port 4 Transmit	JP16

Note: Standard G.703 recommends that the outer conductor of the coaxial pair be connected to ground on the transmit port, and that the same provision be available for the receive port. Some countries however, have different rules, so the setting may not apply.

Installing the E1/T1/J1 I/O Card

Attention: When installing an I/O card on the motherboard, be careful not to touch its components. Always hold the card by its edges.

To install the E1/T1/J1 I/O card on the WAN 2.5 module motherboard, follow these steps:

- **1** Before installing the I/O card on the WAN 2.5 module, you must isolate and then remove the module from the 8265 switch. To isolate the module, enter the following command from the ATM console:

```
SET MODULE slot ISOLATED
```

where `slot` specifies the number of the slot to be used.
- **2** Detach the motherboard on which you want to install the I/O card by removing the four screws (**1** and **2** in Figure 11) that hold the motherboard to the module. Retain the screws for reattaching the motherboard.

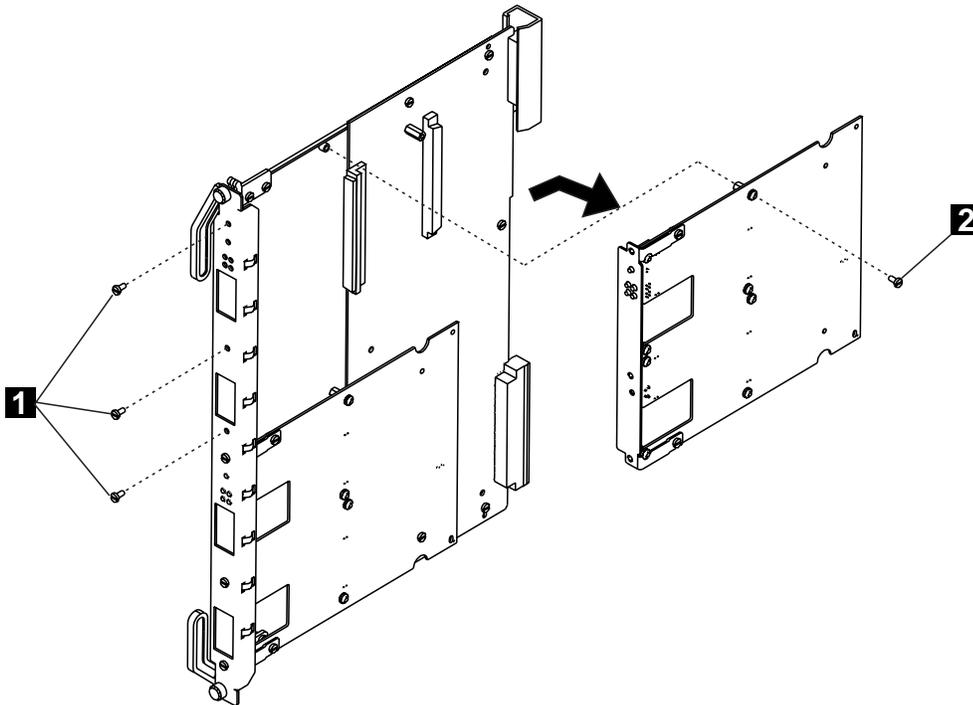


Figure 11. Removing the Motherboard

- **3** Disconnect the motherboard connectors and lift the motherboard out of the module.

- **4** Remove the dummy faceplate bracket from the motherboard (**3** in Figure 12), retaining the screws for the new bracket. Keep the dummy bracket in a safe place for future reuse.

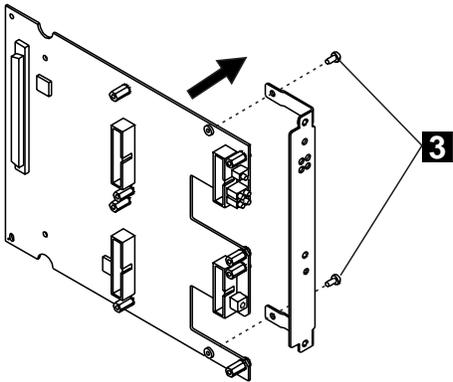


Figure 12. Removing the Dummy Faceplate Bracket

- **5** Attach the I/O card to the motherboard using the six screws provided (**4** in Figure 13).

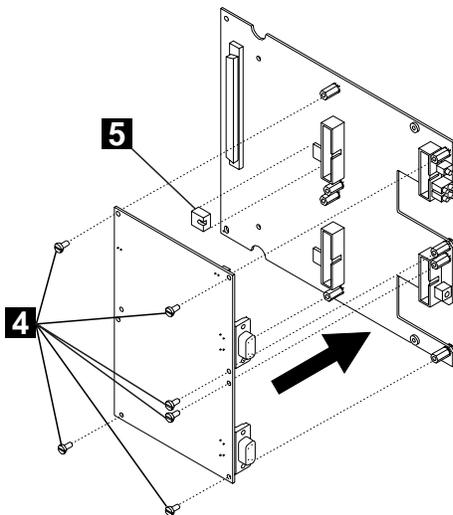


Figure 13. Attaching the I/O Card

- **6** Install the VPD PROM chip (**5**) on the motherboard, making sure that the notch is aligned with the front of the module.
- **7** Attach the faceplate bracket to the motherboard using the two screws (**6** in Figure 14 on page 48) from the dummy bracket.

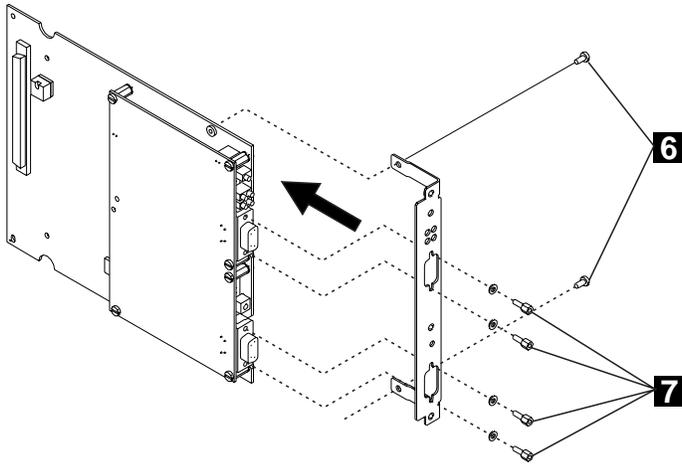


Figure 14. Attaching the Faceplate Bracket

- **8** Using a screwdriver, attach one post (**7**) onto each side of each of the two ports on the I/O card.
- **9** Hold the motherboard so that the connectors and screw holes are aligned correctly on the module. Then gently push the card downwards until you hear it click into the motherboard connectors.

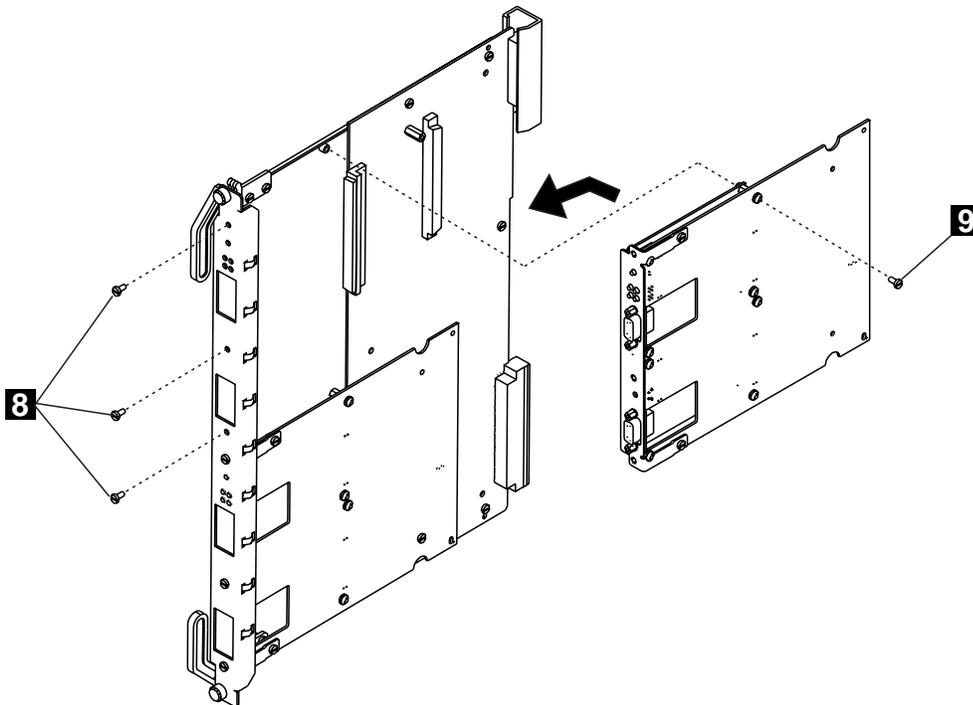


Figure 15. Reattaching the Motherboard

- **10** Reattach the motherboard to the module using the four screws (**8** and **9** in Figure 15) that originally held the motherboard.

Installing E3, DS3, OC3, and STM1 I/O Cards on the WAN 2.5 Module

Installation Procedure

To install an I/O card on the WAN 2.5 module motherboard, follow these steps:

- **1** (E3 and DS3 I/O cards only) Ensure that the configuration of the grounding jumpers on the I/O card conforms to the type of port connection and to the specific grounding regulations in your country by following the instructions in Figure 16 on page 50.
- **2** (OC3 and STM1 I/O cards only) If you are installing an I/O card previously used on a WAN 2 module, check that the I/O card is supported. Supported OC3 and STM1 cards are as follows:
 - OC3 singlemode fiber, Part Number 02L3269
 - OC3 multimode fiber, Part Number 02L3275
 - STM1 singlemode fiber, Part Number 02L3272
 - STM1 multimode fiber, Part Number 02L3278
- **3** Mount the I/O card on the module by following the instructions in “Installing the I/O Card” on page 52.

Note: If you replace an I/O card after configuring the module (see “Configuration Procedure” on page 40) and then re-insert the module in the switch, the new I/O card is automatically configured with the basic port settings of the previous card. Port-specific parameters must be re-entered (see page “Changing Default WAN 2.5 Port Settings” on page 70).

Jumpers and Ports on the I/O Cards

Figure 16 shows the location of the ports, configuration jumpers and grounding jumpers on the E3 and DS3 I/O cards.

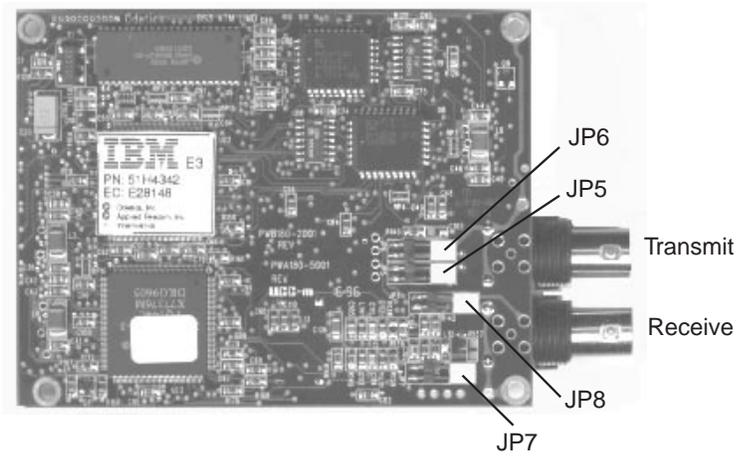


Figure 16. Port and Jumper Locations on the E3 and DS3 I/O Cards

Setting the Grounding on E3 and DS3 I/O Cards

To adhere to country specific regulations regarding the grounding of outer conductors on coaxial pairs (both receive and transmit ports), four jumpers are provided on the rear of the I/O cards. If the jumpers are not used, the outer connector is grounded through a 10 nF capacitor. Figure 16 on page 50 shows the location of the four jumpers.

- If a jumper is inserted over a pair of jumper pins, the outer connector of the corresponding port is grounded to the Frame Ground.
- If no jumper is inserted, the outer connector of that port is grounded through a 10 nF capacitor.

Normally, only the outer connector of the transmit port is to be grounded (not the receive port). This is dependent on individual country rulings.

Refer to Table 7 to determine the jumpers you require to meet your country's requirements. Remove any jumpers that are not required, by sliding them gently in the direction of the ports.

Attention: Some of the jumpers MUST be removed from E3 I/O cards.

Outer of:	Connected to:	JP5	JP6	JP7	JP8
Transmit	Ground		√		
Transmit	0 volt	√			
Receive	Ground				√
Receive	0 volt			√	
E3 (according to G.703)		√	√		
DS3 (recommended setting)		√	√	√	√

Note: Standard G.703 recommends that the outer conductor of the coaxial pair be connected to ground on the transmit port, and that the same provision be available for the receive port. Some countries however, have different rules, so the setting may not apply.

Installing the I/O Card

Before installing the I/O card on the WAN 2.5 module, you must isolate and then remove the module from the 8265 switch. To isolate the module, enter the following command from the ATM console:

```
SET MODULE slot ISOLATED
```

where `slot` specifies the number of the slot to be used.

Attention: When installing an I/O card on the motherboard, be careful not to touch its components. Always hold the card by its edges.

Note: Although the illustrations in this chapter show an E3 I/O card being installed, the steps are identical for the DS3, OC3, and STM1 I/O cards.

To install the I/O card on the WAN 2.5 module motherboard, follow these steps:

- 1 Detach the motherboard on which you want to install the I/O card by removing the four screws (1 and 2 in Figure 17) that hold the motherboard to the module. Retain the screws for reattaching the motherboard.

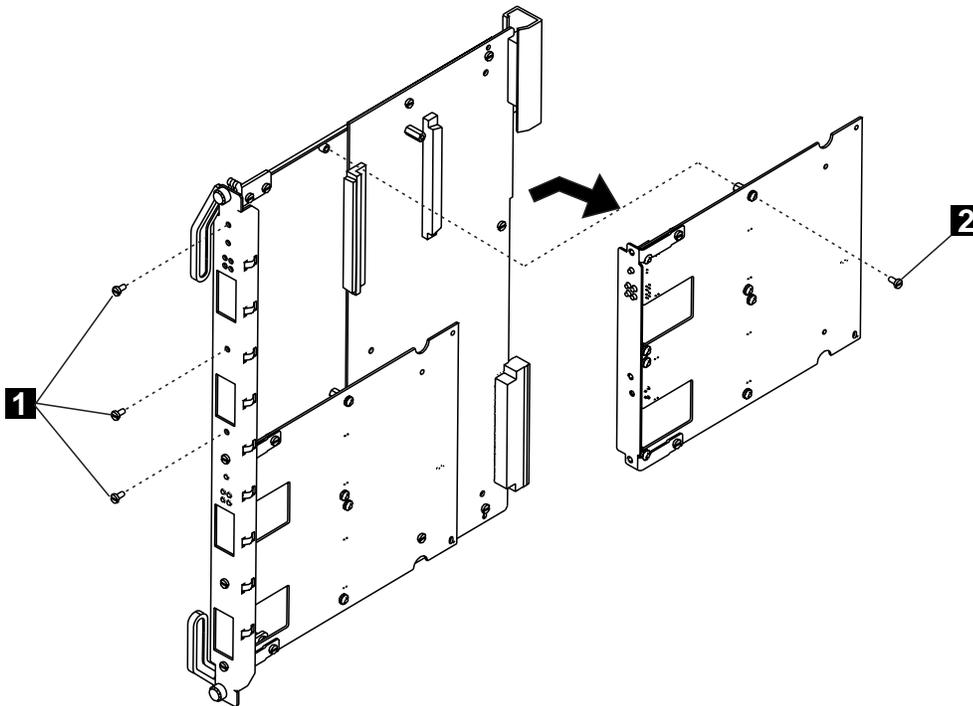


Figure 17. Removing the Motherboard

- 2 Disconnect the motherboard connectors and lift the motherboard out of the module.

- **3** Remove the dummy faceplate bracket from the motherboard (**3** in Figure 18), retaining the screws for the new bracket. Keep the dummy bracket in a safe place for future reuse.

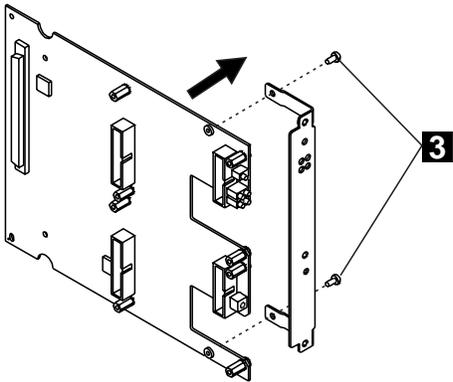


Figure 18. Removing the Dummy Faceplate Bracket

- **4** Attach the I/O card to the motherboard using the four screws provided (**4** in Figure 19).
Note: The I/O card must be installed in the **top position**.

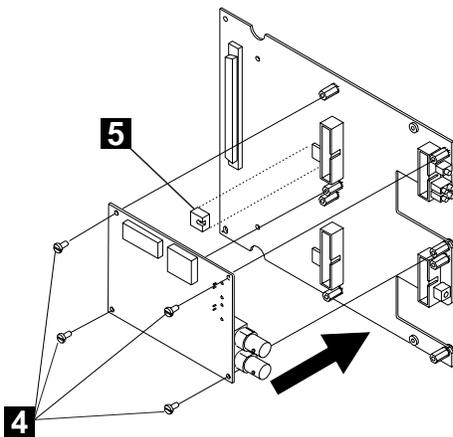


Figure 19. Attaching the I/O Card

- **5** Install the VPD PROM chip (**5**) on the motherboard, making sure that the notch is aligned with the front of the module.

- **6** Attach the faceplate bracket to the motherboard using the two screws (**6** in Figure 20) from the dummy bracket.

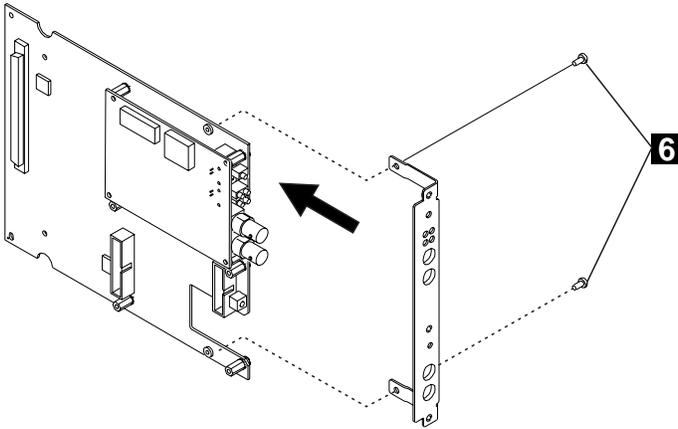


Figure 20. Attaching the Faceplate Bracket

- **7** Hold the motherboard so that the connectors and screw holes are aligned correctly on the module. Then gently push the card downwards until you hear it click into the motherboard connectors.
- **8** Reattach the motherboard to the module using the four screws (**7** and **8** in Figure 21) that originally held the motherboard.

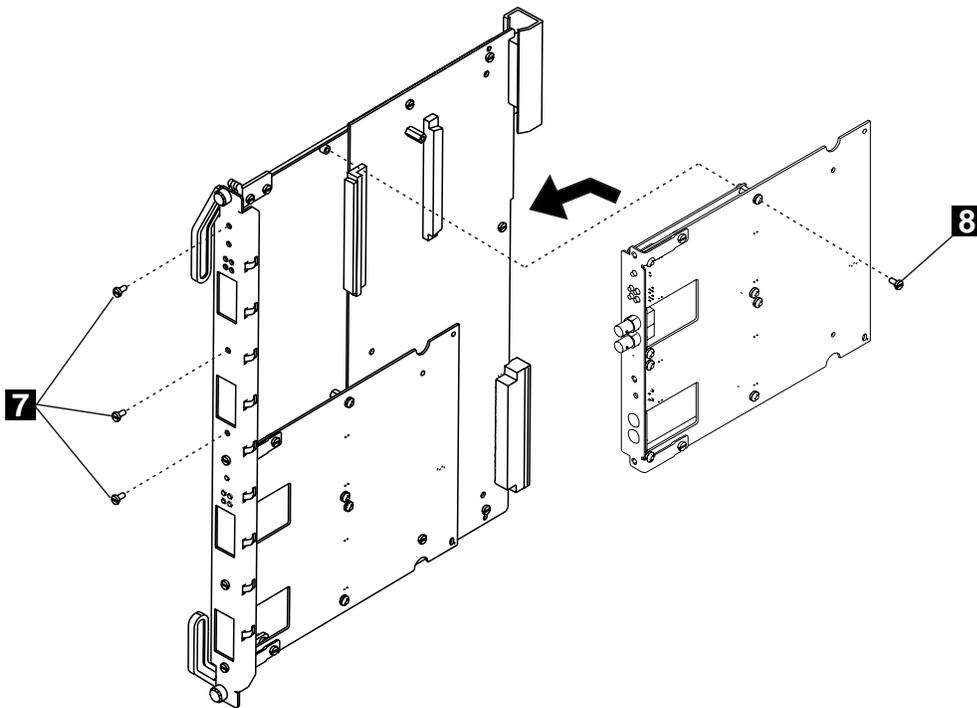


Figure 21. Reattaching the Motherboard

Inverse Multiplexing Over ATM (IMA)

The Inverse Multiplexing over ATM (IMA) ATM Forum specification was approved in July 1997. This specification defines a method of splitting up a single, high-speed stream of ATM cells, distributing the traffic across several E1/T1/J1 links on a cell-by-cell basis, and then recombining the cells at the remote end.

From the ATM device viewpoint, whether it is a UNI or PNNI device, everything appears as if there is a single UNI or PNNI port, but with a greater bandwidth. The IMA specification defines how to perform synchronization between links, how to remove or add a link dynamically, and how to handle errors and monitor the links.

A 4-port IMA daughter card that implements these specifications is available (for E1 or T1/J1) for the WAN 2.5 module (Feature Code 6561). Up to two IMA cards can be installed on each WAN 2.5 module.

The IMA cards support either T1/J1 with 100 ohm twisted pair cabling or E1 with either 120 ohm twisted pair or 75 ohm coaxial cabling and integrated Channel Service Unit.

The IMA cards comply with the following standards:

- ATM Forum: AF-PYH-0016.000, AF-PHY-0064.000, AF-PHY-0086.000d
- ITU-TS: G.704, G.706, G.804, G.823, G.826, G.832, I.431, I.432, I.610.

Two IMA groups (of E1, T1, or J1 ports) can be configured within an IMA card (up to 4 ports). Ports not configured as part of an IMA group can be used as normal E1, T1, or J1 ports. IMA groups can be configured as UNI, IISP, or PNNI ports, and all usual 8265 operations (such as management of quality of services or logical link definitions) are possible.

From the 8265 perspective, the group ports (IMA group) acts as a single, coherent ATM virtual connection that can be managed as one link. The aggregate bandwidth of this group of links determines the rate of the ATM connection. For example, a group of four E1 ports would offer a bandwidth of 8 Mbps.

The IMA cards offer flexible timing options (master, internal onboard crystal, slave, and loop-receive clock on other transmit ports) and performs alarm handling, performance monitoring, diagnostics, and loop-backs.

Configuring IMA Groups

The Inverse Multiplexing for ATM (IMA) I/O cards allow the grouping of ports to form a higher bandwidth logical link, whose rate is approximately the sum of the individual port rates.

If one of the ports within a logical link fails, the link remains active but with a reduced bandwidth. Once the failing port is corrected, the port once again functions as part of the logical link.

Setting Up IMA Groups: Before creating an IMA group, all ports that are to belong to that group must be disabled.

To configure a number of ports on an IMA I/O card into an IMA group, enter the SET MODULE *slot* IMA_GROUP command, where *slot* identifies the slot containing the module with the IMA I/O card installed.

When entering the SET MODULE *slot* IMA_GROUP command, you can specify:

- The first (lowest) port number to be included in the group. This number will become the group number.

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- Additional ports to be included in the group (maximum 4).
- The maximum number of milliseconds of differential delay that will be tolerated among the group's links (maximum 50ms).
- The timing source for transmission signals, or in CTC mode, for the generation of the IMA Data Clock Rate.

The following example configures an IMA group (1), consisting of 2 ports (1 and 4), on a module installed in slot 3. The maximum differential delay is set to 10 ms, and the timing source transmission set to external timing.

```
8265ATM> SET MODULE 3 IMA_GROUP 1 4 DIFF_DLY_MAX:10 TIMING_SOURCE EXTERNAL_TMGM
```

For details of the command parameters and syntax, refer to the *Command Reference Guide*.

Displaying IMA Group Information: To display basic information about IMA groups currently configured, you enter the `SHOW MODULE slot IMA_GROUP` command, specifying either the IMA group number (the lowest port number in the group) or *all* (for all IMA groups).

To display more detailed information, add the `VERBOSE` parameter.

To display the current performance monitoring statistics for the module, add the `CURRENT_PM` parameter.

For details of the command syntax, and examples of the resulting displays, refer to the *Command Reference Guide*.

Deleting IMA Groups: Before deleting an IMA group, the ports within that group must first be disabled.

To delete a group, enter the `SET MODULE slot IMA_GROUP GROUP n DELETE_GROUP` command, where *n* identifies the group to be deleted.

Adding or Removing Ports: Adding ports to, or removing ports from an existing IMA group can only be achieved by deleting the current group, and reconfiguring a new group containing the required ports.

All involved ports must be disabled before the group can be deleted or established.

Troubleshooting for WAN 2.5 Modules

Basic troubleshooting for the WAN 2.5 modules is done using:

- The port and module LEDs on the module faceplate (see Figure 7 on page 38)
- The results displayed by the SHOW MODULE VERBOSE, SHOW PORT VERBOSE, and SHOW VPC_LINK commands.

In addition, the WAN 2.5 module supports:

- WAN-specific diagnostic procedures, as described in “Using Diagnostic Functions” on page 62, and
- Monitoring of performance statistics, as described in “Monitoring Performance Statistics” on page 68.

Basic Troubleshooting for WAN Ports and Modules

First Test the LEDs

Before you start troubleshooting, check that all LEDs are working by pressing the LED Test button on:

- the active Controller Module (if installed)
- the active CPWS module (when no Controller modules are installed).

All LEDs on the WAN 2.5 module should light. If not, refer to “Module LED Error Diagnosis” on page 107.

To diagnose problems with a WAN 2.5 module:

- 1 Check whether the module LEDs indicate normal operation or not:

Color	Function	State	Meaning
Green	MOD STAT	On	Normal when module is connected.
		Off	Normal when module is isolated. Otherwise, see “Module LED Error Diagnosis” on page 107.
Yellow	RESET	On	Normal when module is being reset. Otherwise, see “Module LED Error Diagnosis” on page 107.
		Blinking	See “Module LED Error Diagnosis” on page 107.
Red	W. SLOT	On	See “Module LED Error Diagnosis” on page 107.

2 Enter the SHOW MODULE VERBOSE command from the configuration console and check that the status messages are:

- Connected
- Hardware Okay
- Enable or Disable
- Normal

If any other status is displayed, see “SHOW MODULE Error Diagnosis” on page 110.

3 Check whether the port LEDs indicate normal operation or not:

Table 9. Multifunction WAN Module Port LED States

Color	Function	State	Meaning
Green	STATUS	On	Normal when port is enabled.
		Off	Normal when port is disabled. Otherwise, see “Module LED Error Diagnosis” on page 107.
		Blinking	See “Module LED Error Diagnosis” on page 107.
Yellow	ACTIVITY	On	Normal (ATM cells are being transmitted),
Red	ERROR	On	See “Module LED Error Diagnosis” on page 107.

4 Enter the SHOW PORT VERBOSE or SHOW VPC_LINK command from the configuration console and check that the status message for the port or VPC is one of the following:

- DOWN: Establishing *
- DOWN: Configuring *
- DOWN: Retrieving *
- UP: Registering *
- UP

If any other status is displayed, or if any of the transient statuses (marked *) are displayed continuously, see “SHOW PORT / SHOW VPC_LINK Error Diagnosis” on page 115.

5 Check the port-specific values displayed with SHOW PORT VERBOSE:

- The DIAGNOSTICS fields are described in “On Demand Diagnostics” on page 65.
- If the EQUIPMENT TEST RESULT is not OK, additional fields are displayed (refer to “Power On Diagnostics” on page 63).
- The FAILURE STATUS fields are described in “Failure Status” on page 67.

USA and Canada: If the problem is not resolved after following the troubleshooting procedures this chapter, call toll-free 800-IBM-SERV for IBM support.

Replacing WAN 2.5 I/O Cards

As a result of diagnosing a problem on a WAN 2.5 module, you may be instructed to replace an I/O card. Follow the steps in this section that correspond to the type of the I/O card you want to replace.

Replacing E1/T1/J1 I/O Cards: You may need to replace an E1/T1 I/O card:

- After running a wrap test, when you find out that an E1/T1/J1 I/O card is faulty.
- When directed to do so when troubleshooting a problem.

Attention: When removing an I/O card from the motherboard, be careful not to touch its components. Always hold the card by its edges.

To replace the I/O card follow these steps:

- ___ **1** Enter `SET MODULE slot ISOLATED` where `slot` is the slot number of the module containing the I/O card. Then press Enter.
- ___ **2** Remove the module from the switch.
- ___ **3** Unscrew and remove the four screws that attach the motherboard to the module (**8** and **9** in Figure 15 on page 48). Gently pull the motherboard away from the module until the motherboard connectors are detached.
- ___ **4** Unscrew and remove the post from each side of each port (**7** in Figure 14 on page 48).
- ___ **5** Unscrew and remove the two screws that attach the faceplate bracket to the motherboard (**6** in Figure 14 on page 48) and remove the bracket.
- ___ **6** Unscrew and remove the four screws that attach the I/O card to the motherboard (**4** in Figure 13 on page 47) and remove the I/O card.
- ___ **7** Remove the VPD PROM chip for the I/O card being replaced. (**5** in Figure 13 on page 47).
- ___ **8** Install a new I/O card and VPD PROM chip on the motherboard as described in “Installing the E1/T1/J1 I/O Card” on page 46.
- ___ **9** Re-insert the module into the switch.
- ___ **10** Enter `SET MODULE slot CONNECTED` where `slot` is the slot number of the module. Then press Enter.

Replacing E3, DS3, OC3 and STM1 I/O Cards: After running a wrap test, you may find that the I/O card is faulty and you need to replace it. Also, while troubleshooting a problem with the module, you may be instructed to replace an I/O card.

Attention: When removing an I/O card from the motherboard, be careful not to touch its components. Always hold the card by its edges.

To replace an I/O card follow these steps:

- ___ **1** Enter SET MODULE slot ISOLATED where slot is the slot number of the module containing the I/O card. Then press Enter.
- ___ **2** Remove the module from the switch.
- ___ **3** Unscrew and remove the four screws that attach the motherboard to the module (**7** and **8** in Figure 21 on page 54). Gently pull the motherboard away from the module until the motherboard connectors are detached.
- ___ **4** Unscrew and remove the two screws that attach the faceplate bracket to the motherboard (**6** in Figure 20 on page 54) and remove the bracket.
- ___ **5** Unscrew and remove the four screws that attach the I/O card to the motherboard (**4** in Figure 19 on page 53) and remove the I/O card.
- ___ **6** Remove the VPD PROM chip for the I/O card being replaced. (**5** in Figure 19 on page 53).
- ___ **7** Install the new I/O card and VPD PROM chip on the motherboard as described in “Installing the I/O Card” on page 52.
- ___ **8** Re-insert the module into the switch.
- ___ **9** Enter SET MODULE slot CONNECTED where slot is the slot number of the module. Then press Enter.

Replacing Modules

While troubleshooting a problem, you may be instructed to replace a failing WAN 2.5 module.

To replace a faulty module, follow these steps:

- ___ **1** Enter SET MODULE slot ISOLATED where slot is the slot number of the failed module. Then press Enter.
- ___ **2** Remove the failed module and insert another WAN 2.5 module in its place.
- ___ **3** Enter SET MODULE slot CONNECTED where slot is the slot number of the failed module. Then press Enter.

The new WAN 2.5 module is automatically configured with the last settings configured for the slot number you entered.

Using Diagnostic Functions

There are three types of diagnostics:

Power On Diagnostics Run automatically after the module is reset. See “Power On Diagnostics” on page 63 for details.

Audit Diagnostics Run continuously when the module is operational. See “Audit Diagnostics” on page 64 for details.

On Demand Diagnostics Run on request, by entering the command: SET PORT slot.port PARM ADDRESS 70 value

See “On Demand Diagnostics” on page 65 for details.

Power On Diagnostics: The diagnostics are run each time the module is initialized, unless deactivated by the SET PORT command (SET PORT slot.port parm address 100 1).

To enable Power On diagnostics, enter the command SET PORT slot.port parm address 100 0.

The diagnostics test memory access, register access, data path continuity, and basic device functionality on the ports.

The results of the power on diagnostics are displayed in the EQUIPMENT_TEST_RESULT field displayed after entering the SHOW PORT VERBOSE command from the ATM console.

Example: The following examples shows the Equipment Test Results fields displayed after entering the SHOW PORT slot.port VERBOSE command.

```
8265ATM> show port 2.2 verbose      [ENTER]
:
EQUIPMENT TEST RESULT:
-----
Tests Results                      : OK
8265ATM>
```

The following table describes the fields displayed:

<i>Table 10. Power On Diagnostics</i>	
Field	Description
Test results	This field shows whether the diagnostics have completed successfully, failed, or are currently active.
Test number	Number of the failed test (1-200)
Test address	Address where test failed ;(412 = most significant, 415 = least significant)
Expected data	Data pattern expected by the test when the diagnostics failed.
Received data	Data pattern received by the test
Suspected part	This field indicates the part suspected of causing the diagnostics to fail: <ul style="list-style-type: none"> • Processor • Flash memory • Static RAM • Dual port RAM • S/UNI device • One FPGA • FPGA 1 • FPGA 2 • Write address FIFO
Interface error	This field indicates whether an interface error has caused the diagnostics to fail.

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Audit Diagnostics: Audit diagnostics run continuously and verify that telecom devices are accessible and properly configured. If an error is found, the error information is stored at address offset 420-421.

To display the Audit Diagnostics results, enter the command `SHOW PORT slot.port WAN ADDRESS 420`.

16 consecutive addresses from 420 are displayed. The results of the Audit diagnostics are shown in the first two bytes. Table 11 shows the possible values of the first two bytes and their meanings.

First two bytes (HEX)	Description
00 00	No error
00 01	Integration time failure
00 02	Decay time failure
00 03	Timing source failure
00 04	Unscramble received cell failure
00 05	Receive errors failure
00 06	Discard error cells failure
00 07	Discard idle cells failure
00 08	Scramble transmit cells failure
00 09	Generate transmit HEC failure
00 0A	Monitor signal label failure
00 0B	Monitor path trace failure
00 0C	Transmit path trace failure
00 0D	Expected receive path trace failure
00 0E	Coset polynomial failure
10 01	Terminal loopback
10 02	Facility loopback

Note: The value of the error result is reset to zero (00 00) 10 seconds after the error condition is resolved. (The default value of 10 seconds can be changed with the `SET PORT slot.port PARM FAILURE_DECAY_TIME` command.)

Example: The following example shows the value 00 01 in the first two bytes, indicating that the Audit diagnostics detected an integration time failure.

```
8265ATM> show port 2.2 wan address 420 [ENTER]
Actual value : 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00
8265ATM>
```

On Demand Diagnostics: On Demand diagnostics can be run from terminal dialog. The diagnostic selections are not stored in flash memory. Therefore, if the module is reset, the diagnostics settings will revert to the defaults.

A pattern of 8 bytes can be set to test the control interface between the ATM control point and the WAN 2.5 port. ATM control point software can read the diagnostic pattern and write it back again in order to test the data path without affecting the operation of the port. The pattern is stored at address offset 070 through 07F.

Displaying the Diagnostics Pattern: To display the current diagnostics pattern, enter the SHOW PORT VERBOSE command. The diagnostics pattern is displayed under the heading 'Diagnostics Control' in the output from the command, as shown in the following example:

```
8265ATM> show port 3.2 verbose
:
DIAGNOSTICS CONTROL:
-----
Common for the card:
=====
Diagnostic Pattern           : 00 00 00 00 00 00 00 00
Performance Monitoring      : enabled

Specific for this port:
=====
Internal Wrap                : disabled
Reply Mode Wrap              : disabled
Payload Wrap                  : disabled
```

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Setting a Diagnostics Pattern: A value of 00 to 0F can be set for each of the 8 bytes (default is 00).

To set a pattern, enter the following command:

```
SET PORT slot.port PARM ADDRESS xxx value [ENTER]
```

Where:

xxx Is the address of the byte to be set (070 through 07F). Only one byte may be set at a time. Repeat the command, changing the address to complete a pattern.

value Is the value to be applied to the setting. If no value is entered, the current setting is displayed and may be altered, if desired.

Example

```
8265ATM> set port 2.2 parm address 070 [ENTER]
Actual value : 01
Enter required value: 22 [ENTER]
8265ATM>
```

Clearing Diagnostic Results: To clear the results of the diagnostics, address 081 must be set to a value of 1. To do this, enter the following command:

```
SET PORT slot.port PARM ADDRESS 081 1 [ENTER]
```

Failure Status: The WAN 2.5 module software continually monitors the ports for failure.

The Failure Status for individual ports can be displayed by entering the `SHOW PORT VERBOSE` command. When active is shown for an item, a failure was detected. If inactive is shown, no error was detected.

Examples: The following is an example of the Failure Status fields for an E1 port.

```
8265ATM> show port 3.2 verbose
:
FAILURE STATUS:
-----
Equipment Failure           : inactive
Loss of Signal              : inactive
E1 Alarm Indication Signal (AIS) : inactive
Loss of Frame                : inactive
E1 Red CFA Failure          : inactive
E1 Remote Alarm Indication (RAI) : inactive
Loss of Cell Delineation    : inactive
Loss of Synchronization     : inactive

FAILURE SUMMARY STATUS:
-----
                        No Failure
```

The following is an example of the Failure Status fields for a T1 port.

```
8265ATM> show port 4.2 verbose
:
FAILURE STATUS:
-----
Equipment Failure           : inactive
Loss of Signal              : inactive
T1 Alarm Indication Signal (AIS) : inactive
Loss of Frame                : inactive
T1 Red CFA Failure          : inactive
T1 Yellow CFA Failure       : inactive
T1 Remote Alarm Indication (RAI) : inactive
Loss of Cell Delineation    : inactive
Loss of Synchronization     : inactive

FAILURE SUMMARY STATUS:
-----
                        No Failure
```

Monitoring Performance Statistics

When monitoring of performance statistics is enabled on a WAN port, the counter for each statistic type begins to be incremented. After each interval of 15 minutes, the total from each counter is moved to a historical total field and the current counter is reset to 0.

The WAN 2.5 module maintains historical totals for the last four 15-minute intervals for each statistic type.

Enabling Performance Monitoring: To enable monitoring of performance statistics on a WAN 2.5 port (for example, port 1 on slot 5), enter the following command:

```
8265ATM> set port 5.1 parm performance_monitoring enable
```

Viewing Current Statistics: To view the current performance values for a WAN 2.5 port (for example, port 1 on slot 5), enter the following command:

```
8265ATM> show port 5.1 wan current_pm_counters

Time                               = 19 s
Line Code Violations                = 0
Line Errored Seconds                = 0
Line Severely Errored Seconds       = 0
Line Far End Errored Seconds        = 0
Path Failure Count                  = 10
Loss of Frame Count                 = 0
Path Code Violations                = 0
Path Errored Seconds                = 1
Path Bursty Errored Seconds         = 1
Path SEF/AIS Errored Seconds        = 1
Path Severely Errored Seconds       = 1
Path Unavailable Seconds            = 1
Far End Path Invalid Data Flag      = 0
Far End Path Failure Count          = 0
Far End Path Code Violations        = 22
Far End Path Errored Seconds        = 0
Far End Path Bursty Errored Secs    = 0
Far End Path Severely Errored Secs  = 0
Far End Path Severe Errd Frm Secs   = 0
Far End Path Unavailable Seconds    = 0
Far End Path Background Block Errs  = 0
Uncorrectable HEC Errors            = 0
Received ATM Cells                  = 25252
Transmitted ATM Cells               = 55541
```

The time shown is the elapsed time of the current interval.

Viewing Historical Statistics: To view the performance values for a WAN 2.5 port (for example, port 1 on slot 5) over the last 60-minute period, enter the following command:

```
8265ATM> show port 5.1 verbose
:
Performance Monitoring Counters Historic (one capture every 15mn):
-----

```

	(15mn)	(30mn)	(45mn)	(60mn)
Line Code Violations	= 0	0	0	0
Line Errored Seconds	= 0	0	0	0
Line Severely Errored Seconds	= 0	0	0	0
Line Far End Errored Seconds	= 0	0	0	0
Path Failure Count	= 0	0	0	0
Loss of Frame Count	= 0	0	0	0
Path Code Violations	= 0	0	0	0
Path Errored Seconds	= 0	0	0	0
Path Bursty Errored Seconds	= 0	0	0	0
Path SEF/AIS Seconds	= 0	0	0	0
Path Severely Errored Seconds	= 0	0	0	0
Path Unavailable Seconds	= 0	0	0	0
Far End Path Invalid Data Flag	= 0	0	0	0
Far End Path Failure Count	= 0	0	0	0
Far End Path Code Violations	= 0	0	0	0
Far End Path Errored Seconds	= 0	0	0	0
Far End Path Bursty Errored Secs	= 0	0	0	0
Far End Path Severely Errored Secs	= 0	0	0	0
Far End Path Severe Errd Frm Secs	= 0	0	0	0
Far End Path Unavailable Seconds	= 0	0	0	0
Uncorrectable HEC Errors	= 0	0	0	0

Changing Default WAN 2.5 Port Settings

The default values for WAN 2.5-specific port settings can be changed by entering the SET PORT command from the configuration console. This section describes how to display and change the default settings.

Changing WAN 2.5-Specific Settings

WAN 2.5-specific settings are divided into two general groups, depending on whether the SET PORT command uses Parameter Names or Parameter Addresses to enter the value of the setting.

Using Parameter Names: The following settings are changed using parameter names, with the general syntax:

SET PORT with Parameter Names

```
▶▶ SET PORT slot.port PARM parm_name value ▶▶
```

Setting	E1	T1	E3	DS3	OC3	STM1
Failure_Integration_Time	√	√	√	√	√	√
Failure_Decay_Time	√	√	√	√	√	√
Timing_Source	√	√	√	√	√	√
Descramble_Rcv_Cells	√	√	√	√	√	√
Discard_Idle_Cells	√	√	√	√	√	√
Scramble_Xmt_Cells	√	√	√	√	√	√
Correct_Rcv_Errors	√	√	√	√	√	√
T1_LBO		√				
T1_Format		√				

For a full description of these WAN-specific port settings, see the appendix “Port-Specific SET PORT Parameters” in the *IBM 8265 Nways ATM Switch: Command Reference Guide*.

Example: The following command sets the timing source to external timing on port 2 of slot 4.

```
8265ATM> set port 4.2 parm timing_source 0 [ENTER]
```

Port set.

```
8265ATM> show port 4.2 verbose [ENTER]
```

```

:
CONFIGURATION CONTROL:
-----
Common for the card:
=====
  Failure Integration Time      : 2500 ms
  Failure Decay Time          : 10 s

Specific for this port:
=====
  Timing Source                : PARM_EXTERNAL_TMGM
  Descramble Received Cells    : Yes
  Discard Idle Cells          : Yes
:

```

```
8265ATM>
```

Displaying Current Port Settings: To display the current values for these settings use:

<p>SHOW PORT for Named Settings</p> <p>▶▶—SHOW PORT—<i>slot.port</i>—VERBOSE—▶▶</p>
--

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Using Parameter Addresses Settings: The following settings are changed using parameter addresses with the general syntax:

SET PORT with Addressed Settings

▶▶ SET PORT *slot.port* PARM ADDRESS *parm_address* value ▶▶

Setting	E1	T1	E3	DS3	OC3	STM1
Enable Power On Diagnostics	√	√	√	√	√	√
Generate Header Error Control (HEC) Field	√	√	√	√	√	√
Add Coset Polynomial in ATM Cell Headers	√	√	√	√		√
Set SA4 - SA8 Bits in Transmit E1	√					
Set T1 Termination Location		√				
Correct Header Errors			√	√	√	√
Discard ATM Cells with Uncorrectable Header			√	√	√	√
Select E3 Framing Format			√			
Select E3 Transmit Timing Marker			√			
Monitor Payload Type			√			
Monitor Trail Mismatch Failures			√			
Set Trail Trace Format			√			
Transmit Trail Trace			√			
Set Expected Trail Trace			√			
Generate of RDI Signal			√			
Select DS3 Framing Format				√		
Set DS3 Line Buildout				√		
Set PLCP Framing				√		
Set PLCP Timing Source				√		
Set Transmitting of Z Bytes				√		
Monitor Signal Label Mismatch Failures					√	√
Set Path Trace Format						√
Monitor Path Trace Mismatch Failures					√	√
Set Transmitted Path Trace					√	√
Set Expected Received Path Trace					√	√

For a full description of the addresses and values that correspond to these WAN2-specific port settings, see the appendix “Port-Specific SET PORT Parameters” in the *IBM 8265 Nways ATM Switch: Command Reference Guide*.

Displaying Current Port Settings: To display the current values for these settings use:

SHOW PORT for Addressed Settings

▶▶ SHOW PORT *slot.port* WAN ADDRESS *parm_address* ▶▶

Example: This example shows how to enable power on diagnostics:

```
8265ATM> set port 4.2 parm address 100 1
```

```
8265ATM> show port 4.2 wan address 100
```

```
Actual value: 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  
8265ATM>
```

Note that 16 bytes are displayed, starting with address 100. The value **01** in the first byte (address 100), indicates that the diagnostics are enabled.

Chapter 7. ATM Carrier Modules

The ATM Carrier modules are part of the IBM ATM Kit Development Program that provides companies and developers with a simple and inexpensive way to add their ATM technology to the 8265. This program allows you to build ATM functions and modules for the 8265, and develop new ATM applications.

The Carrier module inserts into the 8265 switch and acts as a generic motherboard that accepts a feature daughter board. The Carrier module uses the well-known standard interface UTOPIA 2 for communication with 1 or 2 daughter cards that contain the developer's function or application. Functions built on the daughter board benefit from the advanced features of the 8265 and the Carrier module. Two types of UTOPIA 2 interface are supported

By using the UTOPIA interface on the ATM Carrier motherboard, the PHY-specific functions are separated from the standard ATM functions that are common to all ATM applications:

- multi-phy 8-bit interface, with up to 160 Mbps of throughput
- multi-phy 16-bit interface, with up to 800 Mbps of throughput
- Standard ATM functions are located on the Carrier module motherboard
- All PHY-specific functions are concentrated on custom-designed daughter cards that are mounted on the Carrier module.

The daughter cards access all necessary ATM functions via the UTOPIA interface.

There are three types of 8265 Carrier module available:

- A generic version with symmetric connectors (both connectors are on the side of the Carrier module) that supports the UTOPIA 2 8-bit interface, Feature Code 6559.
- A generic version with asymmetric connectors (one connector is on the side of the carrier module, the other one is on the edge) that supports the UTOPIA 2 8-bit interface, Feature Code 6560.
- A generic version that supports the UTOPIA 2 16-bit interface, allowing up to 622 Mbps throughput (non-blocking), Feature Code 6558.

Note: The Carrier modules require Release 4, or higher, of the Control Point microcode in order to operate.

IBM's current partners in the IBM ATMKit Development program include:

- *Bus-Tech Inc.*, who have developed a S/390 ESCON (Enterprise System Connection) attachment daughter card for the symmetric carrier module. This card can be used with Feature Code 6559.
- *Odetics Telecom*, who have developed a Frame Relay/ATM daughter card for the symmetric carrier module. This card can be used with Feature Code 6559.
- *Fibercom*, a division of Litton Systems Inc., who have developed an ATM Circuit Emulation (ACE) daughter card for the asymmetric carrier module. This daughter card connects and transports circuit emulation (PBX) traffic over an ATM campus backbone. This card can be used with Feature Code 6560.

Up to fourteen modules can be used in the 8265.

For more information, refer to the *IBM 8260/8265 Nways ATM Kit Development Program, We Carry your Creativity to ATM*, GA33-0371.

Supported 8260 Media Modules

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Chapter 8. WAN 2 Modules

The procedures for installing and configuring 8260 WAN 2 modules (Feature Codes 5602 and 5612) in an 8265 switch are the same as for the WAN 2.5 Module (see page 37).

Important!

8260 WAN 2 modules may only be installed in **slots 1, 3, 5, and 7**.

8260 WAN2 modules require the standard CPSW module (Feature Code 6501) to be installed in the 8265. They cannot be used in conjunction with the enhanced CPSW2 module (Feature Code 6502).

Using 8260 Modules in the 8265

See Appendix C, "Backward Compatibility with 8260 Modules" on page 131 before installing an 8260 WAN 2 module in the 8265 switch.

Chapter 9. 4-Port 100 Mbps Module

This chapter contains guidelines for installing and configuring the 4-port 100 Mbps module, Feature Code 5104.

Installing the 100 Mbps Module

This section describes the procedures for installing and configuring a 100 Mbps module in an 8265 switch.

Important!

8260 100 Mbps modules may only be installed in **slots 1, 3, 5, and 7**.

8260 100 Mbps modules require the standard CPSW module (Feature Code 6501) to be installed in the 8265. They cannot be used in conjunction with the enhanced CPSW2 module (Feature Code 6502).

Using 8260 Modules in the 8265

See Appendix C, "Backward Compatibility with 8260 Modules" on page 131 before installing an 8260 100 Mbps module in the 8265 switch.

Module Front Panel

Refer to Figure 22 when installing and configuring the 100 Mbps module.

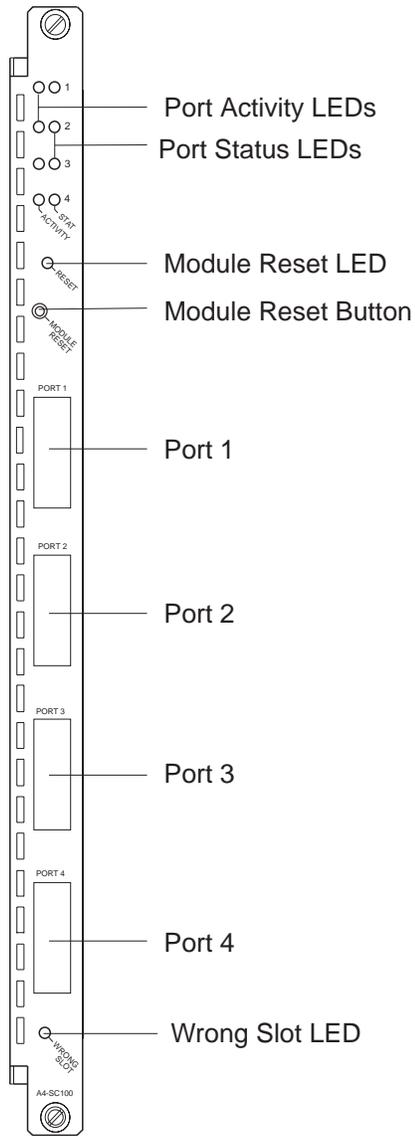


Figure 22. 100 Mbps Module Front Panel

Installation Procedure

To install a 100 Mbps module, follow these steps:

- ___ **1** Unpack the module as described in “Unpacking a Module” on page 4. The shipping group contains:
 - One 4–port 100 Mbps module.

- ___ **2** Insert the module as described in “Inserting a Module in the 8265 ATM Switch” on page 6. **The 100 Mbps module can only be inserted in slots 1, 3, 5, and 7.**

Check that the Reset LED flashes on briefly and then turns off. If this does not happen, refer to “Module LED Error Diagnosis” on page 107 to diagnose and correct the problem before proceeding to the next step.

- ___ **3** Attach the cables that connect the module to another ATM device, as described in “Cabling and Connecting to Devices” on page 9.

- ___ **4** Record the module's installation and cabling information in the ATM Cabling Charts provided in the *IBM 8265 Nways ATM Switch: Planning and Site Preparation Guide*.

- ___ **5** Proceed with the steps in “Configuration Procedure” on page 84.

Configuration Procedure

To configure a 100 Mbps module, follow these steps:

- ___ **1** Connect the module to the ATM network with the command:
SET MODULE slot CONNECTED
as described in “Connecting Modules to the Network” on page 12.
- ___ **2** Set the characteristics of each port using the **SET PORT** command, as described in “Defining Port Settings” on page 14.
100 Mbps ports may be configured as UNI, IISP, PNNI, AUTO, or VOID ports.
Notes:
 - a. Do not define more than 2 PNNI ports on the 100 Mbps module.
 - b. To view the current port settings, use the **SHOW PORT VERBOSE** command (see “Displaying Configuration Settings” on page 15).
- ___ **3 (optional)** Set up VPC links using the **SET VPC_LINK** command, as described in the *IBM 8265 Nways ATM Switch: User's Guide*.
- ___ **4 (optional)** Set up PVCs using the **SET PVC** command, as described in the *IBM 8265 Nways ATM Switch: User's Guide*.
- ___ **5** Enable the ports that you have configured, using either the **SET PORT** or the **SET MODULE** command, as described in “Enabling Ports” on page 13.
- ___ **6** Check that all LEDs are functioning correctly:
 - The port status LED should be on.
 - The port activity LED should be on when there is ATM traffic.
 - All other LEDs on the module faceplate should be off.If any LEDs are not functioning correctly, refer to “Troubleshooting for 100 Mbps Modules” on page 85 to diagnose and correct the problem before proceeding to the next step.
- ___ **7** Save the port and module configuration settings with the command:
SAVE MODULE_PORT
as described in “Saving Configuration Settings” on page 15.
For full information on all ATM commands, see the *8265 Command Reference Guide*.

Troubleshooting for 100 Mbps Modules

All troubleshooting for the 100 Mbps module is done using:

- The port and module LEDs on the module faceplate (see Figure 22 on page 82)
- The results displayed by the SHOW MODULE VERBOSE, SHOW PORT VERBOSE, and SHOW VPC_LINK commands.

First Test the LEDs

Before you start troubleshooting, check that all LEDs are working by pressing the LED Test button on:

- the active Controller Module (if installed)
- the active CPWS module (when no Controller modules are installed).

All LEDs on the 100 Mbps module should illuminate. If not, refer to “Module LED Error Diagnosis” on page 107.

To diagnose problems with a 100 Mbps module:

- 1 Check whether the module LEDs indicate normal operation or not:

Table 12. 100 Mbps Module LED States

LED Name	Color	State	Meaning
RESET	Yellow	Off	Normal when module is not being reset.
		On	Normal when module is being reset. Otherwise, see “Module LED Error Diagnosis” on page 107.
		Blinking	See “Module LED Error Diagnosis” on page 107.
WRONG SLOT	Yellow	Off	Normal.
		On	The module is installed in an incorrect slot (a slot other than the allowed 1, 3, 5, 7).

- 2 Enter the SHOW MODULE VERBOSE command from the configuration console and check that the status messages are:

- Connected
- Hardware Okay
- Enable or Disable
- Normal

If any other status is displayed, see “SHOW MODULE Error Diagnosis” on page 110.

3 Check whether the port LEDs indicate normal operation or not:

<i>Table 13. 100 Mbps Module Port LED States</i>			
LED Name	Color	State	Meaning
STAT	Green	On	Normal when port is enabled.
		Off	Normal when port is disabled. Otherwise, see "Port LED Error Diagnosis" on page 112.
		Blinking	See "Port LED Error Diagnosis" on page 112.
ACTIVITY	Yellow	On	Normal (ATM cells are being transmitted over the port).
		Off	See "Port LED Error Diagnosis" on page 112.

4 Enter the SHOW PORT VERBOSE or SHOW VPC_LINK command from the configuration console and check that the status message for the port or VPC is one of the following:

- DOWN: Establishing *
- DOWN: Configuring *
- DOWN: Retrieving *
- UP: Registering *
- UP

If any other status is displayed, or if any of the transient statuses (marked *) are displayed continuously, see "SHOW PORT / SHOW VPC_LINK Error Diagnosis" on page 115.

USA and Canada: If the problem is not resolved after following the troubleshooting procedures outlined in this chapter, call toll-free 800-IBM-SERV for IBM support.

Chapter 10. 12-Port 25 Mbps Module

This chapter contains guidelines for installing and configuring the 12-port 25 Mbps module, Feature Code 5012.

Installing the 25 Mbps Module

This section describes the procedures for installing and configuring a 25 Mbps module in an 8265 switch.

Important!

8260 25 Mbps modules may only be installed in **slots 1, 3, 5, and 7**.

8260 25 Mbps modules require the standard CPSW module (Feature Code 6501) to be installed in the 8265. They cannot be used in conjunction with the enhanced CPSW2 module (Feature Code 6502).

Using 8260 Modules in the 8265

See Appendix C, "Backward Compatibility with 8260 Modules" on page 131 before installing an 8260 25 Mbps module in the 8265 switch.

Module Front Panel

Refer to Figure 23 when installing and configuring the 25 Mbps module.

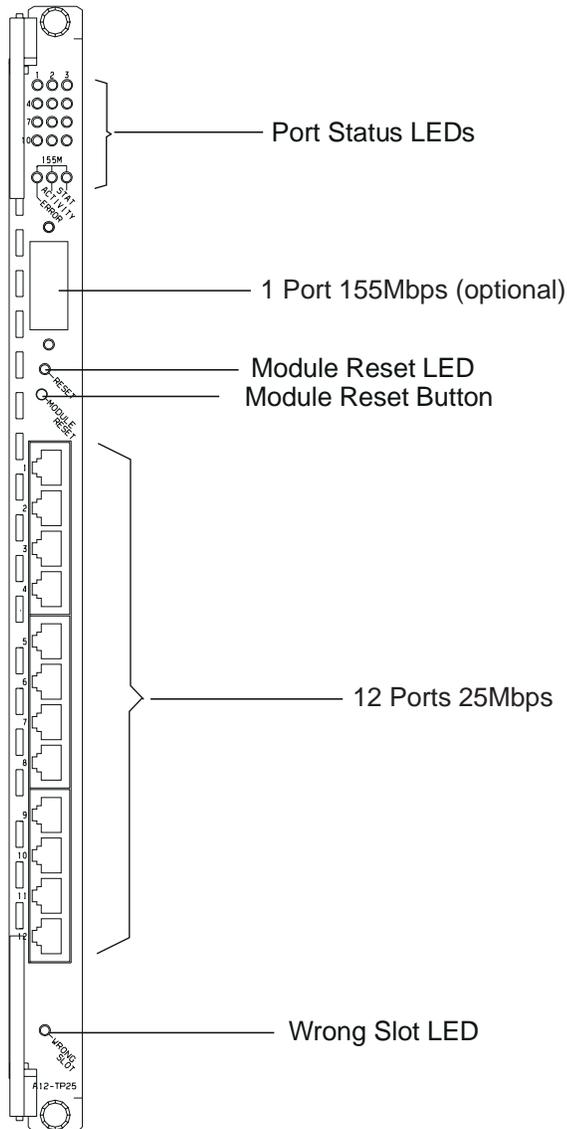


Figure 23. 25 Mbps Module Front Panel

Installation Procedure

To install an 8260 25 Mbps module, follow these steps:

- **1** Unpack the module (and the 155 Mbps I/O card, if you ordered one), as described in “Unpacking a Module” on page 4. The shipping group should contain:

A12-TP25	A12-TP25 with 155 Mbps I/O Card
<ul style="list-style-type: none"> • One module. 	<ul style="list-style-type: none"> • One module motherboard • One I/O card to be installed on the motherboard.

- **2 (155 Mbps I/O Card only)** Install the I/O card on the module motherboard, as described in “Installing a 155 Mbps I/O Card on a 25 Mbps Module” on page 91.

- **3** Insert the module as described in “Inserting a Module in the 8265 ATM Switch” on page 6. **The 25 Mbps module can only be inserted in slots 1, 3, 5, and 7.**

Check that the Module Reset LED flashes on briefly and then turns off. If this does not happen, refer to “Module LED Error Diagnosis” on page 107 to diagnose and correct the problem before proceeding to the next step.

- **4** Attach the cables that connect the module to another ATM device, as described in “Cabling and Connecting to Devices” on page 9.

- **5** Record the module's installation and cabling information in the ATM Cabling Charts provided in the *IBM 8265 Nways ATM Switch: Planning and Site Preparation Guide*.

- **6** Proceed with the steps in “Configuration Procedure” on page 90.

Configuration Procedure

To configure an 8260 25 Mbps module, follow these steps:

- ___ **1** Connect the module to the ATM network with the command:
SET MODULE slot CONNECTED
as described in “Connecting Modules to the Network” on page 12.

- ___ **2** Set the characteristics of each port using the **SET PORT** command, as described in “Defining Port Settings” on page 14.

12 Mbps ports may be configured as UNI, IISP, PNNI, AUTO, or VOID ports. In addition to the standard ATM port parameters, the **CLOCK**, **FRAME_FORMAT**, and **FLOW_CONTROL** parameters may also be defined on 12 Mbps ports.

Note: To view the current port settings, use the **SHOW PORT VERBOSE** command (see “Displaying Configuration Settings” on page 15).

- ___ **3 (Optional)** Set up VPC links using the **SET VPC_LINK** command, as described in the *IBM 8265 Nways ATM Switch: User's Guide*.

- ___ **4 (Optional)** Set up PVCs using the **SET PVC** command, as described in the *IBM 8265 Nways ATM Switch: User's Guide*.

- ___ **5** Enable the ports that you have configured, using either the **SET PORT** or the **SET MODULE** command, as described in “Enabling Ports” on page 13.

- ___ **6** Check that all LEDs are functioning correctly:
 - The port status LEDs should be green (if ATM traffic is present) or yellow (if no ATM traffic is present).
 - The 155 Mbps port status LED should be on.
 - The 155 Mbps port activity LED should be on when there is ATM traffic.
 - All other LEDs on the module faceplate should be off.
If any LEDs are not functioning correctly, refer to “Troubleshooting for 25 Mbps Modules” on page 93 to diagnose and correct the problem before proceeding to the next step.

- ___ **7** Save the port and module configuration settings with the command:
SAVE MODULE_PORT
as described in “Saving Configuration Settings” on page 15.

For full information on all ATM commands, see the *8265 Command Reference Guide*.

Installing a 155 Mbps I/O Card on a 25 Mbps Module

Installation Procedure

CAUTION:

When installing an I/O card on the motherboard, be careful not to touch its components. Always hold the card by the faceplate or by its edges as shown in Figure 24 on page 92.

To install an 155 Mbps I/O card on the 25 Mbps module motherboard, follow these steps:

- **1** Remove the cover plate from the port opening on the module faceplate by removing the two screws (**A** in Figure 24 on page 92). Keep the screws in a safe place.
- **2** Remove the cover plate from the inside of the faceplate.
- **3** Loosen the two screws (**B**) on the I/O card that attach the faceplate bracket to the circuit board. Do not remove the screws completely.
- **4** Insert the I/O card behind the module faceplate, aligning the port connectors between the two springs (**C**).
- **5** Push the I/O card toward the front until it touches the faceplate.
- **6** Hold the I/O card so that its connectors are aligned over the connectors on the motherboard. Then gently push the card downwards until you hear it click into the motherboard connectors.
- **7** Insert the two screws (**A**) that attach the I/O card faceplate bracket to the faceplate, and tighten them with a screwdriver.
- **8** Using a screwdriver, tighten the two screws (**B**) that attach the faceplate bracket to the I/O card circuit board.

Note: If you replace an I/O card after configuring the module (see “Configuration Procedure” on page 90) and then re-insert the module in the switch, the new I/O card is automatically configured with the settings of the previous card.

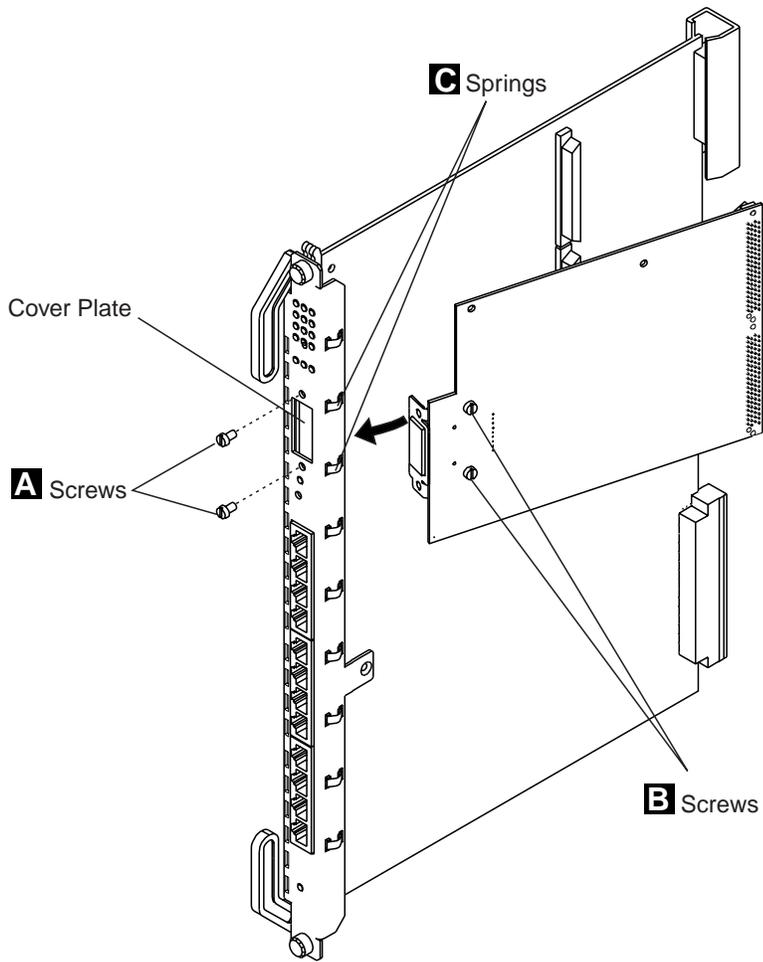


Figure 24. Installing a 155 Mbps I/O Card on the 25 Mbps Module Motherboard

Troubleshooting for 25 Mbps Modules

All troubleshooting for the 25 Mbps module is done using:

- The port and module LEDs on the module faceplate (see Figure 23 on page 88)
- The results displayed by the SHOW MODULE VERBOSE, SHOW PORT VERBOSE, and SHOW VPC_LINK commands.

First Test the LEDs

Before you start troubleshooting, check that all LEDs are working by pressing the LED Test button on:

- the active Controller Module (if installed)
- the active CPWS module (when no Controller modules are installed).

All LEDs on the 25 Mbps module illuminate. If not, refer to “Module LED Error Diagnosis” on page 107.

To diagnose problems with a 25 Mbps module:

- 1 Check whether the module LEDs indicate normal operation or not:

Table 14. A12-TP25 Module LED States

LED Name	Color	State	Meaning
RESET	Yellow	Off	Normal when module is not being reset.
		On	Normal when module is being reset. Otherwise see “Module LED Error Diagnosis” on page 107.
		Blinking	See “Module LED Error Diagnosis” on page 107.
WRONG SLOT	Yellow	Off	Normal.
		On	The module is installed in an incorrect slot (a slot other than the allowed 1, 3, 5, 7).

- 2 Enter the SHOW MODULE VERBOSE command from the configuration console and check that the status messages are:

- Connected
- Hardware Okay
- Enable or Disable
- Normal

If any other status is displayed, see “SHOW MODULE Error Diagnosis” on page 110.

3 Check whether the 25 Mbps port LEDs indicate normal operation or not:

<i>Table 15. 25 Mbps Port LED States for A12-TP25</i>			
Color	Function	State	Meaning
Green	Port Status	On	Normal when port is enabled.
		Off	Normal when port is disabled. Otherwise, see "Port LED Error Diagnosis" on page 112.
		Blinking	See "Port LED Error Diagnosis" on page 112.
Yellow	Port Activity	On or Blinking	Normal (ATM cells are being transmitted over the port).

4 (155 Mbps I/O Card only) Check whether the 155 Mbps port LEDs indicate normal operation or not:

<i>Table 16. 155 Mbps I/O card Port LED States on the A12-TP25</i>			
LED Name	Color	State	Meaning
STAT	Green	On	Normal when port is enabled.
		Off	Normal when port is disabled. Otherwise, see "Port LED Error Diagnosis" on page 112.
		Blinking	See "Port LED Error Diagnosis" on page 112.
ACTIVITY	Yellow	On	Normal (ATM cells are being transmitted over the port).
		Off	See "Port LED Error Diagnosis" on page 112.
ERROR	Yellow	Off	Normal.
		On	See "Port LED Error Diagnosis" on page 112.

5 Enter the SHOW PORT VERBOSE or SHOW VPC_LINK command from the configuration console and check that the status message for the port or VPC is one of the following:

- DOWN: Establishing *
- DOWN: Configuring *
- DOWN: Retrieving *
- UP: Registering *
- UP

If any other status is displayed, or if any of the transient statuses (marked *) are displayed continuously, see "SHOW PORT / SHOW VPC_LINK Error Diagnosis" on page 115.

USA and Canada: If the problem is not resolved after following the troubleshooting procedures in this chapter, call toll-free 800-IBM-SERV for IBM support.

Replacing a 155 Mbps I/O Card

As a result of diagnosing a problem on a 25 Mbps module, you may be directed to replace an I/O card. To replace an I/O card follow these steps:

- ___ **1** Enter SET MODULE slot ISOLATED where slot is the slot number of the A12-TP25 module containing the I/O card. Then press Enter.
- ___ **2** Remove the module from the chassis.
- ___ **3** Unscrew the I/O card from the motherboard.
- ___ **4** Install a new I/O card on the motherboard as described in “Installing a 155 Mbps I/O Card on a 25 Mbps Module” on page 91.
- ___ **5** Re-insert the module into the chassis.
- ___ **6** Enter SET MODULE slot CONNECTED where slot is the slot number of the module. Then press Enter.

Chapter 11. Video Distribution Module

This chapter contains guidelines for installing and configuring the Video Distribution module, Feature Code 5308.

Video Distribution Module Guidelines

Installation

Important!

8260 Video Distribution modules may only be installed in **slots 1, 3, 5, and 7**.

8260 Video Distribution modules require the standard CPSW module (Feature Code 6501) to be installed in the 8265. They cannot be used in conjunction with the enhanced CPSW2 module (Feature Code 6502).

Using 8260 Modules in the 8265

See Appendix C, "Backward Compatibility with 8260 Modules" on page 131 before installing an 8260 Video Distribution Module in the 8265 switch.

Documentation

For installation, configuration and troubleshooting instructions, refer to the Video Distribution Module documentation:

- *IBM Video Distribution Module: User's Guide GA27-4173*

Note: At the time of publication of this guide, the documentation for the Video Distribution Module describes its use in an IBM 8260 Hub, but has not been updated to describe its use in the 8265 switch.

Chapter 12. 8210 MSS Module

8210 MSS Server Module Guidelines

Installation

Important!

8210 MSS Server modules may only be installed in **slots 1, 3, 5, and 7**.

8210 MSS Server modules require the standard CPSW module (Feature Code 6501) to be installed in the 8265. They cannot be used in conjunction with the enhanced CPSW2 module (Feature Code 6502).

Using 8260 Modules in the 8265

See Appendix C, "Backward Compatibility with 8260 Modules" on page 131 before installing an 8210 MSS Server Module in the 8265 switch.

Documentation

For installation, configuration and troubleshooting instructions, refer to the MSS Server Module documentation:

- *Nways Multiprotocol Switched Services (MSS) Server Introduction and Planning Guide*, GC30-3820.
- *Nways Multiprotocol Switched Services (MSS) Server Module Setup and Problem Determination Guide*, GA27-4141.
- *Multiprotocol Switched Services (MSS) Server Setup and Problem Determination Guide*, GA27-4140.
- *Nways Multiprotocol Switched Services Server: Interface Configuration and Software User's Guide*, SC30-3818.
- *Nways Multiprotocol Switched Services Server: Configuring Protocols and Features*, SC30-3819.
- *Multiprotocol Switched Services (MSS) Server Service Manual*, GY27-0354.
- *Nways MAS/MRS/MSS/MSSC Library, Configuration Program User's Guide for Nways Multiprotocol Access, Routing and Switched Services*, GC30-3830.
- *Nways Event Logging System Messages Guide*, SC30-3682.

Chapter 13. 8271 and 8272 LAN Switch Modules

8271 LAN Switch Module Guidelines

Installation

Important!

The 8271 LAN Switch Modules are 2-slot (A-TR8LS2 - FC 6212) and 3-slot (A-TR8LS4 - FC 6312) media modules that can be installed on the 8265 switch, providing the following requirements are met:

1. The 2-slot and 3-slot modules may **only** be installed in slots **1, 3, 5, and 7**.
2. The 3-slot module may **only** be installed in slot **7** when slot 9 is unoccupied (CPSW module is installed in slot 11).
3. 8271 modules require the standard CPSW module (Feature Code 6501) to be installed in the 8265. They cannot be used in conjunction with the enhanced CPSW2 module (Feature Code 6502).

Using 8260 Modules in the 8265

See Appendix C, "Backward Compatibility with 8260 Modules" on page 131 before installing an 8271 LAN Switch Module in the 8265 switch.

Documentation

For installation, configuration and troubleshooting instructions, refer to the 8271 LAN Switch Module documentation:

- *8271 LAN Switch Module: Planning and Installation Guide GA27-4162*
- *4-Port 10BASE-T and 3-Port 10BASE-FL Universal Feature Cards: Planning and Installation Guide, GA27-4120*
- *100BASE-TX and 100BASE-FX Universal Feature Card: Planning and Installation Guide, GA27-4096*
- *ATM 155-Mbps Multimode Fiber Universal Feature Card: Planning and Installation Guide, GA27-4156*

8272 LAN Switch Module Guidelines

Installation

Important!

The 8272 LAN Switch Modules are 2-slot (A-E12LS2 - FC 6208) and 3-slot (A-E12LS4 - FC 6308) media modules that can be installed on the 8265 switch, providing the following requirements are met:

1. The 2-slot and 3-slot modules may **only** be installed in slots **1, 3, 5, and 7**.
2. The 3-slot module may **only** be installed in slot **7** when slot 9 is unoccupied (CPSW module is installed in slot 11).
3. 8272 modules require the standard CPSW module (Feature Code 6501) to be installed in the 8265. They cannot be used in conjunction with the enhanced CPSW2 module (Feature Code 6502).

Using 8260 Modules in the 8265

See Appendix C, "Backward Compatibility with 8260 Modules" on page 131 before installing an 8272 LAN Switch Module in the 8265 switch.

Documentation

For installation, configuration and troubleshooting instructions, refer to the 8272 LAN Switch Module documentation:

- *8272 LAN Switch Module: Planning and Installation Guide GA27-4163*
- *2-Port Fiber and 4-Port UTP/STP Enhanced Token-Ring Universal Feature Cards: Planning and Installation Guide, GA27-4168*
- *ATM 155-Mbps Multimode Fiber Universal Feature Card: Planning and Installation Guide, GA27-4156*

Appendix A. Problem Determination

This chapter describes troubleshooting procedures associated with ATM media modules and their ports.

Troubleshooting procedures for the CPSW module, PVCs, VPC links, and security settings are described in the *IBM 8265 Nways ATM Switch: User's Guide*.

Diagnosing ATM Media Module and ATM Port Problems

Troubleshooting procedures are grouped into four sections:

Module LED Error Diagnosis (on page 107)

For problems indicated by the module LEDs (Module Reset and Module Status) on the module's faceplate.

SHOW MODULE Error Diagnosis (on page 110)

For problems indicated by module status messages displayed with the SHOW MODULE command.

Port LED Error Diagnosis (on page 112)

For problems indicated by the port LEDs (Port Status, Port Activity, and Port Error) on the module's faceplate.

SHOW PORT / SHOW VPC_LINK Error Diagnosis (on page 115)

For problems displayed by port status messages displayed with the SHOW MODULE VERBOSE or SHOW PORT commands.

Module LED Error Diagnosis

First Test the LEDs

Before you start diagnosing LED errors, check that all LEDs are working by pressing the LED Test button on:

- the active Controller module (if Controller modules are being used for power management), or
- the active enhanced CPSW2 module (if the integrated power control functions are being used).

To check what module is being used for power management, enter the `SHOW POWER ALL` command.

For more information on how to enable/disable the integrated power control functions of the enhanced CPSW2 module (Feature Code 6502), refer to the *IBM 8265 Nways ATM Switch: Installation Guide*.

All LEDs on the module should illuminate. If not:

1. Check that there is sufficient power for the installed modules using the `SHOW POWER BUDGET` command.
2. Check the power supply LEDs on the active Controller module (if installed) or active CPSW2 module to be sure the power supplies are active.
3. If you are using the enhanced CPSW2 module, check that the FORCE RCTL jumper is correctly set. (Refer to the *IBM 8265 Nways ATM Switch: Installation Guide*).

If the LEDs still do not illuminate, replace the module (see “Replacing an ATM Media Module” on page 128).

The possible LED states for the Module Reset and Module Status LEDs are shown in Table 17 and Table 18.

Procedures for diagnosing each of the LED error conditions are given below.

For the location of the Module Reset and Status LEDs on a specific module, see the installation chapter for that module.

Table 17. States of Module LEDs (All Modules Except WAN 2/2.5)

Normal Operation	Error Conditions
<ul style="list-style-type: none"> • Module Reset LED: Off • Module Status LED: On • Wrong Slot LED: Off 	<ul style="list-style-type: none"> • Module Reset LED: On • Module Reset LED: Blinking • Module Reset LED: Does not flash on after module inserted in slot • Module Status LED: Off • Wrong Slot LED: On

Table 18. States of Multifunction Module LEDs (WAN 2/2.5 Modules only)

Normal Operation	Error Conditions
<ul style="list-style-type: none"> • Module Status LED: Green-On 	<ul style="list-style-type: none"> • Module Status LED: Off • Module Status LED: Yellow-On • Module Status LED: Red-On

Correcting Module LED Errors

Module Reset LED: On [WAN 2/2.5: Yellow-On]

Possible Explanations:

- Bad connection to the ATM backplane
- Faulty module motherboard.

Steps to Take:

1. Check the module's connection to the backplane:
 - Remove the module and re-insert it in the same slot.
 - Insert the module in another slot.
 2. Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in "Wrap Tests" on page 120.
-

Module Reset LED: Blinking

Possible Explanations:

- No CPSW module is installed
- Bad connection between the media module or the CPSW module and the ATM backplane
- Faulty module motherboard.

Steps to Take:

1. Install a CPSW module in slots 9-10 or 11-12.
 2. Check the module's connection to the backplane:
 - Remove the module and re-insert it in the same slot.
 - Insert the module in another slot.
 3. Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in "Wrap Tests" on page 120.
-

Module Reset LED: Does not flash on after module inserted in slot

Possible Explanations:

- Not enough power
- Bad connection to the ATM backplane
- Faulty module motherboard.

Steps to Take:

1. Check that there are enough power supplies installed.
2. Check the module's connection to the backplane:
 - Remove the module and re-insert it in the same slot.
 - Insert the module in another slot.
3. Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in "Wrap Tests" on page 120.

Module Status LED: Off [WAN2/2.5: OFF]**Possible Explanations:**

- Module is isolated from the network
- Module is not receiving power.
- Module cannot connect to CPSW.
- Module is faulty.

Steps to Take:

1. Connect the module to the network by entering the command `SET MODULE slot CONNECTED` from the configuration console.
2. Check that the module is receiving power:
 - Check the Power Supply LEDs on the active Controller module (if installed) or active CPSW module.
 - Check the power budget by entering `SHOW POWER` from the configuration console.
3. Check the module's connection to the backplane:
 - Remove and re-insert the module in its slot.
 - Check that the CPSW is correctly plugged into the slot.
4. Replace the module.

Wrong Slot LED: On [WAN2/2.5: Red-On]**Possible Explanations:**

- Module is not correctly inserted into the backplane
- Module is not installed in the correct slot.

Steps to Take:

1. Remove and re-insert the module in the same slot.
2. Remove the module from the switch and re-insert it into any other blank slot in positions 1-8 or 12-17 (for 8265 modules) or 1, 3, 5, 7 (for 8260 modules).

SHOW MODULE Error Diagnosis

The possible module statuses of an ATM media module that can be displayed with the SHOW MODULE command are:

Normal Operation	Error Conditions
<ul style="list-style-type: none">• Connected• Hardware OK• Enable or Disable• Normal	<ul style="list-style-type: none">• Not Connected• Pending• Hardware KO• Under Recovery• Permanent Failure• Power Failure

Procedures for diagnosing each of the module status error conditions are given below.

The use of the SHOW MODULE command is described in “Displaying Configuration Settings” on page 15.

Correcting Module Status Errors

Module Status: Not Connected

Explanation: Module is not connected to the CPSW module.

Steps to Take:

1. Connect the module to the network by entering the command `SET MODULE slot CONNECTED` from the configuration console.
2. Check that the module is receiving power:
 - Check the Power Supply LEDs on the 8265 Switch active Controller module (if installed) or active CPSW module.
 - Check the power budget by entering `SHOW POWER` from the configuration console.
3. Check the module's connection to the backplane:
 - Remove and re-insert the module in its slot.
 - Check that the CPSW is correctly plugged into the slot.
4. Replace the module.

Module Status: Pending

Explanation: The module that was previously inserted in this slot and connected to the network was removed.

Steps to Take:

1. Re-insert the module.

Module Status: Hardware KO

Explanation: The CPSW module cannot communicate properly with the ATM media module.

Steps to Take:

1. Check that the CPSW module and the ATM media module are both properly inserted into the backplane.
2. Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in “Wrap Tests” on page 120.

Module Status: Under Recovery

Explanation: The CPSW module is continuing to try to communicate with the ATM media module.

Steps to Take:

1. Check that the ATM media module is properly inserted into the backplane.
2. Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in "Wrap Tests" on page 120.

Module Status: Permanent Failure

Explanation: The CPSW module failed to establish communication with the ATM media module after trying for approximately one minute.

Steps to Take:

1. Check that the CPSW module and the ATM media module are both properly inserted into the backplane, and then RESET the media module.
2. Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in "Wrap Tests" on page 120.

Port LED Error Diagnosis

Note: Before diagnosing a Port LED error, ensure that the module LEDs indicate normal module operation, as described in “Module LED Error Diagnosis” on page 107.

The possible LED states for the Port Status, Port Activity, and Port Error LEDs are shown in Table 20 and Table 21.

Procedures for diagnosing each of the LED error conditions are given below.

For the location of the Port Status, Activity, and Error LEDs on a specific module, see the installation chapter for that module.

Table 20. States of Port LEDs (All Modules Except WAN 2/2.5 Modules and 25 Mbps Module)

Normal Operation	Error Conditions
<ul style="list-style-type: none">• Port Status LED: On• Port Activity LED: On/Off• Port Error LED: Off	<ul style="list-style-type: none">• Port Status LED: Off• Port Status LED: Blinking• Port Error LED: On• Port Error LED: Blinking

Table 21. States of Multifunction Port LEDs (WAN 2/2.5 Modules and 25 Mbps Module Only)

Normal Operation	Error Conditions
<ul style="list-style-type: none">• Port Status LED: Green-On, Yellow-On, or Yellow-Blinking	<ul style="list-style-type: none">• Port Status LED: Red-On (WAN 2/2.5 only)• Port Status LED: Green-Blinking

Correcting Port LED Errors

Port Status LED: Off [WAN 2/2.5 & 25Mbps: OFF]

Explanation: Port is DISABLED.

Steps to Take: Enable the port with the SET PORT command.

Port Status LED: Blinking [WAN 2/2.5 & 25Mbps: Green-Blinking]

Possible Explanations:

- Cable attached to the port is faulty.
- The transmit and receive connectors of a fiber cable are swapped.
- The remote ATM device attached to the port is either turned off or not operating.
- Maximum link distance exceeded.

Steps to Take:

1. Check the cable attached to the port:
 - Check that the cable is the correct type.
 - Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in “Wrap Tests” on page 120.
2. Check that the transmit and receive connectors (on fiber cables) are correctly attached.
3. Check the remote device:
 - If the device is turned off, turn on the device.

- If the device is not operating, restart the application running on it.
4. See the *IBM 8265 Nways ATM Switch: Planning and Site Preparation Guide* for the maximum distances for valid connections.

Port Activity LED: OFF**Possible Explanations:**

- Port is DISABLED.
- UNI port is enabled but not in service.
- Port is faulty.

Steps to Take:

1. Enable the port with the SET PORT command.
2. From the ATM host, make sure that the remote device has been assigned an ATM address and that the address is unique within the network.
3. Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in “Wrap Tests” on page 120.

Port Error LED: On [WAN2/2.5: Red-On]**Possible Explanations:**

- Port is faulty.
- Cable attached to the port is faulty.
- The remote ATM device attached to the port is either turned off or not operating.
- **(4-port 155 Mbps module only)** Bad signal (out of frame) or frame not recognized.
- **(4-port 155 Mbps module only)** The fiber cable was removed from the port, the connection has been broken, or no I/O card has been installed on the module.
- **(1-slot 622 Mbps module only)** The fiber cable was removed from the port, the connection has been broken.

Steps to Take:

1. Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in “Wrap Tests” on page 120.
2. Check the cable attached to the port:
 - Check that the cable is the correct type.
 - Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in “Wrap Tests” on page 120.
3. Check the remote device:
 - If the device is turned off, turn on the device.
 - If the device is not operating, restart the application running on it.
 - See the *IBM 8265 Nways ATM Switch: Planning and Site Preparation Guide* for the maximum distances for valid connections.
4. **(4-port 155 Mbps module and 1-slot 622 Mbps module only)** Reconnect the cable to the port, correct the broken connection, or install an I/O card on the module.
5. **(155Mbps port only)** Identify the faulty component by performing the wrap test for 155 Mbps modules, as described in “Wrap Tests” on page 120.

Port Error LED: Blinking**Possible Explanations:**

- Cable attached to the port is faulty.
- The remote ATM device attached to the port is either turned off or not operating.
- **(622Mbps module only)** Bad signal (out of frame) or frame not recognized.

Steps to Take:

1. Check the cable attached to the port:
 - Check that the cable is correct for the port type you are testing, as described in “Wrap Tests” on page 120. If the cable is faulty, replace it.
2. Check the remote device:
 - If the device is turned off, turn on the device.
 - If the device is not operating, restart the application running on it.
 - See the *IBM 8265 Nways ATM Switch: Planning and Site Preparation Guide* for the maximum distances for valid connections.
3. **(622 Mbps port only)** Identify the faulty component by performing the wrap test for 622 Mbps modules, as described in “Wrap Tests” on page 120.

SHOW PORT / SHOW VPC_LINK Error Diagnosis

Note: Before diagnosing a SHOW PORT or SHOW VPC_LINK error, ensure that the SHOW MODULE command indicates normal module operation, as described in “SHOW MODULE Error Diagnosis” on page 110.

SHOW PORT

The possible port statuses of an ATM port that can be displayed with the SHOW PORT or SHOW MODULE VERBOSE commands are:

<i>Table 22. Port Status Messages from SHOW PORT or SHOW MODULE VERBOSE</i>	
Normal Operation	Error Conditions
<ul style="list-style-type: none"> • DOWN: Establishing (<i>transient</i>) • DOWN: Configuring (<i>transient</i>) • DOWN: Retrieving (<i>transient</i>) • UP: Registering (<i>transient</i>) • UP 	<ul style="list-style-type: none"> • DOWN: Bad FPGA level • DOWN: Connection limit reached • DOWN: Duplicate VPC • DOWN: Error detected • DOWN: Hardware error • DOWN: Inconsistency in bandwidth • DOWN: Internal error • DOWN: Invalid VPI-VCI range • DOWN: Module not operational • DOWN: Not in service • DOWN: Signalling version missing • DOWN: VPC limit reached • DOWN: Establishing (<i>continual</i>) • DOWN: Configuring (<i>continual</i>) • No activity • Security violation

SHOW VPC_LINK

Possible statuses for a VPC that can be displayed with the SHOW VPC_LINK command are:

<i>Table 23. Port Status Messages from SHOW VPC_LINK</i>	
Normal Operation	Error Conditions
<ul style="list-style-type: none"> • DOWN: Establishing (<i>transient</i>) • DOWN: Configuring (<i>transient</i>) • DOWN: Retrieving (<i>transient</i>) • UP: Registering (<i>transient</i>) • UP 	<ul style="list-style-type: none"> • DOWN: Connection limit reached • DOWN: Duplicate VPC • DOWN: Error detected • DOWN: Inconsistency in bandwidth • DOWN: Internal error • DOWN: Invalid VPI-VCI range • DOWN: Signalling version missing • DOWN: VPC limit reached • DOWN: Establishing (<i>continual</i>) • DOWN: Configuring (<i>continual</i>) • Port not ready • Invalid VP range

Procedures for diagnosing each of the port/VPC status error conditions are given below.

The use of the SHOW PORT and SHOW MODULE VERBOSE commands is described in “Displaying Configuration Settings” on page 15.

Correcting Port / VPC Status Errors

Port Status: DOWN: Bad FPGA level

Explanation: The FPGA of the media module is not compatible with the FPGA of the ATM Control Point. Check the prerequisites in the Release Notes.

Steps to Take:

1. Upgrade the FPGA of the media module.

Port / VPC Status: DOWN: Connection limit reached

Explanation: The maximum number of connections allowed (including point-to-point and point-to-multipoint) has been reached, either at the port level or module level. The maximum number allowed is 4032 (if accounting enabled) or 8160 (if accounting disabled).

Port / VPC Status: DOWN: Duplicate VPC

Explanation: When a port is enabled, it is enabled with its associated VPI. The VPI is already in use for this port.

Steps to Take:

1. Delete the existing VPC, and disable/enable the port.
2. Disable the port, then re-enable it with a different VPI value.

Port / VPC Status: DOWN: Error detected

Explanation: This indicates an ILMI protocol error. This status may be a result of a security violation on the port.

Steps to Take:

1. Enter the SHOW SECURITY PORT command to check that security is enabled for this port.
2. Enter the SHOW SECURITY LAST_VIOLATION command to check if an address registration has been rejected on the port.
3. Check that the attached device supports ILMI.
4. Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in “Wrap Tests” on page 120.
5. Re-enable the port.

Port Status: DOWN: Hardware error

Explanation: The microcode encountered an error when setting the hardware.

Steps to Take:

1. RESET the module.
2. Check that the CPSW module and the ATM media module are both properly inserted into the backplane.
3. Move the media module to another slot.
4. Call your IBM service representative.

Port / VPC Status: DOWN: Inconsistency in bandwidth

Explanation: The bandwidth specifications are different at each end of a connection.

Steps to Take:

1. Use the SHOW PORT command to display the bandwidth specifications for each port.
2. Use the SET PORT command to ensure that the values match.

Port / VPC Status: DOWN: Internal error

Explanation: An internal error is detected on the port. This can also indicate that there is a bandwidth specification problem, especially with shaping parameters (a mismatch between RB bandwidth and connection_shaping bandwidth, for example).

Steps to Take:

1. If applicable, check the bandwidth settings for the port.
2. Reset the module using the RESET MODULE command.
3. If the problem persists, call your IBM service representative.

Port / VPC Status: DOWN: Invalid VPI-VCI range

Explanation: The VPI-VCI range entered for a given port is invalid.

Steps to Take:

1. Make sure that the range specified for the port is valid, and that the same range is applied at the other end of the connection. See the *IBM 8265 Nways ATM Switch: Command Reference Guide* for valid settings.

Port Status: DOWN: Module not operational

Explanation: The module cannot be made operational.

Steps to Take:

1. Use the SHOW MODULE VERBOSE command to display more information.
2. Check that the module is correctly installed.
3. Check that the module is connected to the network using the SET MODULE CONNECTED command.
4. Check that the module is receiving power using the SHOW HUB command.
5. Check that the FPGA level of the module is supported.
6. If the problem persists, replace the module.

Port Status: DOWN: Not In Service

Explanation: Physical layer activity is detected (there is a receive signal on the Receive fiber/cable) but the remote device is not responding to ILMI polling.

Steps to Take:

1. Use the command SHOW PORT slot.port VERBOSE command to determine the problem.
2. Check that the remote device is operational and that its adapter is securely plugged in.
3. Make sure that the fiber/cable is securely plugged on the 8265 switch.
4. Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in "Wrap Tests" on page 120.
5. The peer device does not support ILMI. Change the UNI port configuration to suppress ILMI.
6. A PVC with VPI=0 is or was defined on that port. Release the PVC and disable/enable the port.
7. The transmit wire/fiber of the cable is defective. Replace the cable.

8. **(UNI only)** Some devices have restricted ILMI implementation and cannot access address registration if an LECS is defined in the 8265 switch.

Check that you have an LECS address configured in your 8265 switch with the command `SHOW LAN_EMUL CONFIGURATION_SERVER` command. If there should not be any LECS address defined, clear it with the `CLEAR LAN_EMUL CONFIGURATION_SERVER ALL` command.

9. Take traces from both the 8265 switch and the remote device for an IBM service engineer.
-

Port / VPC Status: DOWN: Signalling version missing

Explanation: The signalling version must be specified if the interface does not support ILMI. The signalling version was not specified for a UNI or IISP port or VPCs.

Steps to Take:

1. Disable the port
 2. Redefine the port specifying the signalling version for the attached device
 3. Re-enable the port.
-

Port / VPC Status: DOWN: VPC limit reached

Explanation: The maximum number of VPCs (512) has been reached.

Steps to Take:

1. Delete an existing VPC to allow the creation of a new one.
-

Port Status: DOWN: Establishing

Explanation: Physical layer activity is detected (there is a receive signal on the Receive fiber/cable) but the remote device is not responding to ILMI polling.

Steps to Take:

1. Use the command `SHOW PORT slot.port VERBOSE` command to determine the problem.
2. Check that the remote device is operational and that its adapter is securely plugged in.
3. Make sure that the fiber/cable is securely plugged on the 8265 switch.
4. Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in "Wrap Tests" on page 120.
5. The peer device does not support ILMI. Change the UNI port configuration to suppress ILMI.
6. A PVC with VPI=0 is or was defined on that port. Release the PVC and disable/enable the port.
7. The transmit wire/fiber of the cable is defective. Replace the cable.
8. **(UNI only)** Some devices have restricted ILMI implementation and cannot access address registration if an LECS is defined in the 8265 switch.

Check that you have an LECS address configured in your 8265 switch with the command `SHOW LAN_EMUL CONFIGURATION_SERVER` command. If there should not be any LECS address defined, clear it with the `CLEAR LAN_EMUL CONFIGURATION_SERVER ALL` command.

9. Take traces from both the 8265 switch and the remote device for an IBM service engineer.
-

Port / VPC Status: DOWN: Configuring

Explanation: When interface type is AUTO, indicates that the remote ILMI does not support full ILMI 4.0. Automatic configuration is not possible. An "Auto-configuration impossible" message is logged in the error log.

Steps to Take: Re-enable the port or VPC and specify the interface type as UNI, IISP, or PNNI.

Port Status: No activity

Explanation: No physical layer activity is detected (either there is no cable/fiber attached, or there is no signal on the Receive cable/fiber).

Steps to Take:

1. See if the port is enabled by entering the SHOW PORT command.
2. If the port is not enabled, use the SET PORT command to set the mode parameter to enable.
3. If the port is enabled, make sure that the remote device is operational and that its adapter is securely plugged in.
4. Make sure that the fiber/cable is securely plugged on the module.
5. Identify the faulty component by performing the wrap test that corresponds to the port type you are testing, as described in "Wrap Tests" on page 120.
6. For SC-type connectors, check that the receive and transmit cables/fibers are not swapped.
7. For 25Mbps PNNI ports, make sure that cables used to interconnect switches have their receive and transmit signals swapped.

Port Status: Security violation

Explanation: A security violation was detected on the port.

Steps to Take:

1. Enter the SHOW SECURITY PORT command to check that security is enabled for this port.
2. Enter the SHOW SECURITY LAST_VIOLATION command to check if an address registration has been rejected on the port.

Wrap Tests

Note: Before performing any wrap test ensure that the module you are testing is connected and the port you are testing is disabled.

The wrap tests that can be performed on an ATM port depend on the port type:

To test port type:	Perform this wrap test:
100, 155, 622 Mbps, E3, OC3, STM1	“Standard Wrap Tests” on page 121
25 Mbps	“Wrap Test for 25 Mbps Ports” on page 122
E1	“Wrap Tests for E1 Ports” on page 123
T1, J1	“Wrap Tests for T1 and J1 Ports” on page 124
DS3	“Wrap Test for DS3 Ports” on page 125

Viewing Wrap Settings

To view the current wrap settings for a port, enter the **SHOW PORT VERBOSE** command.

The settings displayed depend on the port type. The following example shows the display returned for an E3 port.

```
8265ATM> show port 3.2 verbose
:
Specific for this port:
=====
Internal Wrap           : disabled
Reply Mode Wrap        : disabled
```

Standard Wrap Tests

Note: Before performing the standard wrap tests, ensure that the module you are testing is connected and the port you are testing is disabled.

Wrap Test	Test Result: OK Test Successful	Test Result: KO Test Failed
1. INTERNAL: Perform the procedure under “Internal Wrap Test” on page 126.	Proceed to step 2.	The motherboard of the module is faulty. Replace the module.
2. EXTERNAL: Perform the procedure under “External Wrap Test” on page 126.	Connection to an ATM switch: Proceed to step 3. Connection to a user device: The problem is not in the ATM media module. Return to the troubleshooting procedure or call your IBM service representative.	The I/O card or port is faulty. Replace the I/O card or module.
3. REPLY_MODE: Perform the procedure under “Reply_Mode Wrap Test” on page 126.	The problem is on the remote switch. Perform the INTERNAL and EXTERNAL wrap tests on the remote port to identify the faulty component.	The cabling is faulty. Replace the faulty cable.

Wrap Test for 25 Mbps Ports

Note: Before performing the wrap test ensure that the module you are testing is connected and the port you are testing is disabled.

Wrap Test	Test Result: OK Test Successful	Test Result: KO Test Failed
1. EXTERNAL: Perform the procedure under “External Wrap Test” on page 126.	The problem is not in the ATM media module. Return to the troubleshooting procedure or call your IBM service representative.	The I/O card or port is faulty. Replace the I/O card or module.

Wrap Tests for E1 Ports

Note: Before performing a wrap test ensure that the module you are testing is connected and the port you are testing is disabled.

Wrap Test	Test Result: OK Test Successful	Test Result: KO Test Failed
1. INTERNAL: Perform the procedure in "Internal Wrap Test" on page 126.	Proceed to step 2.	The motherboard of the module is faulty. Replace the module.
2. EXTERNAL: Perform the procedure in "External Wrap Test" on page 126.	Proceed to step 3.	The I/O card or port is faulty. Replace the I/O card or module.
3. REPLY_MODE: Perform the procedure in "Reply_Mode Wrap Test" on page 126.	The problem is on the remote switch. Proceed to step 4.	The cabling is faulty. Replace the faulty cable.
4. PAYLOAD: Perform the procedure in "Payload Wrap Test" on page 127.	The problem is on the remote switch.	Either the cabling is faulty, and should be replaced, or the transceiver on the remote switch is faulty.

Wrap Tests for T1 and J1 Ports

Note: Before performing the wrap test ensure that the module you are testing is connected and the port you are testing is disabled.

Wrap Test	Test Result: OK Test Successful	Test Result: KO Test Failed
1. INTERNAL: Perform the procedure in "Internal Wrap Test" on page 126.	Proceed to step 2.	The motherboard of the module is faulty. Replace the module.
2. EXTERNAL: Perform the procedure in "External Wrap Test" on page 126.	Proceed to step 3.	The I/O card or port is faulty. Replace the I/O card or module.
3. REPLY_MODE: Perform the procedure in "Reply_Mode Wrap Test" on page 126.	The problem is on the remote switch. Proceed to step 4.	The cabling is faulty. Replace the faulty cable.
4. PAYLOAD: Perform the procedure in "Payload Wrap Test" on page 127.	The problem is on the remote switch. Proceed to step 5.	Either the cabling is faulty, and should be replaced, or the transceiver on the remote switch is faulty.
5. FAR_END_MODE: Perform the procedure in "Far_End_Mode Wrap Test" on page 127.	The problem is on the remote switch. Proceed to step 6.	The cabling is faulty, and should be replaced.
6. FAR_END_PAY_LOAD: Perform the procedure in "Far_End_Payload Wrap Test" on page 127.	The problem is on the remote switch.	??The cabling is faulty, and should be replaced.

Wrap Test for DS3 Ports

Note: Before performing the wrap test, ensure that the module you are testing is connected, and the port you are testing is disabled.

Wrap Test	Test Result: OK Test Successful	Test Result: KO Test Failed
1. INTERNAL: Perform the procedure in "Internal Wrap Test" on page 126.	Proceed to step 2.	The motherboard of the module is faulty. Replace the module.
2. EXTERNAL: Perform the procedure in "External Wrap Test" on page 126.	Proceed to step 3.	The I/O card or port is faulty. Replace the I/O card or module.
3. REPLY_MODE: Perform the procedure in "Reply_Mode Wrap Test" on page 126.	The problem is on the remote switch. Proceed to step 4.	The cabling is faulty. Replace the faulty cable.
4. FAR_END_MODE: Perform the procedure in "Far_End_Mode Wrap Test" on page 127.	The problem is on the remote switch.	The cabling is faulty, and should be replaced.

Wrap Test Procedures

Note: Before performing the wrap test, ensure that the module you are testing is connected, and the port you are testing is disabled.

Internal Wrap Test

- ___ **1** Disconnect the cable from the port.
- ___ **2** Enter the command `WRAP slot.port INTERNAL`.
- ___ **3** Note the test result that appears on the local configuration console.

External Wrap Test

- ___ **1** Insert the appropriate wrap plug in the port.
- ___ **2** Enter the command `WRAP slot.port EXTERNAL`.
- ___ **3** Note the test result that appears on the local configuration console.

Reply_Mode Wrap Test

Note: Before performing the wrap test, ensure that the module you are testing is connected, and the port you are testing is disabled.

- ___ **1** Remove the wrap plug and reattach the cable to the port.
- ___ **2** Disable the remote port by entering the command `SET PORT slot.port DISABLE` from the remote switch's configuration console.
- ___ **3** Enable the wrap procedure on the remote port by entering the command `WRAP slot.port REPLY_MODE ENABLE` from the remote switch's configuration console.
- ___ **4** From the local configuration console, enter the command `WRAP slot.port EXTERNAL`. This command sends a signal across the connection to the remote (wrapped) port.
- ___ **5** Note the test result that appears on the local configuration console.
- ___ **6** Disable the wrap procedure on the remote port by entering the command `WRAP slot.port REPLY_MODE DISABLE` from the remote switch's configuration console.

Payload Wrap Test

- ___ **1** Enable the wrap procedure on the remote port by entering the command `WRAP slot.port PAYLOAD ENABLE` on the remote switch's configuration console.
- ___ **2** From the local configuration console, enter the command `WRAP slot.port EXTERNAL`. This command sends a signal across the connection to the remote (wrapped) port. The test result appears on the local configuration console.
- ___ **3** Note the test result that appears on the local configuration console.
- ___ **4** Disable the wrap procedure on the remote port by entering `WRAP slot.port PAYLOAD DISABLE` from the remote switch's configuration console.

Far_End_Mode Wrap Test

- ___ **1** Enter the command `WRAP slot.port FAR_END_MODE ENABLE`.
- ___ **2** Enter the command `WRAP slot.port FAR_END_TEST`. The test result appears on the local configuration console.
- ___ **3** Note the test result that appears on the local configuration console.
- ___ **4** Enter the command `WRAP slot.port FAR_END_MODE DISABLE`.

Far_End_Payload Wrap Test

- ___ **1** Enter the command `WRAP slot.port FAR_END_PAYLOAD ENABLE`.
- ___ **2** Enter the command `WRAP slot.port FAR_END_TEST`. The test result appears on the local configuration console.
- ___ **3** Note the test result that appears on the local configuration console.
- ___ **4** Enter the command `WRAP slot.port FAR_END_PAYLOAD DISABLE`.

Replacing an ATM Media Module

Troubleshooting procedures sometimes instruct you to replace a faulty ATM media module. To do so, follow these steps:

- **1** Enter SET MODULE slot ISOLATED where slot is the slot number of the failed module. Then press Enter.
- **2** Remove the failed module and insert another ATM media module of the same type in its slot.
- **3** Enter SET MODULE slot CONNECTED where slot is the slot number of the new module. Then press Enter.

The new module is automatically configured with the last settings configured for the slot number you entered.

Resetting a Module

By pressing the Module Reset button, you interrupt and reset the operation of an ATM media module. All ATM data traffic and connections that are being transmitted are stopped. The change in status of the module (from normal operation to reset status) is reported to the CPSW.

Pressing the Module Reset Button has the same effect as entering the command RESET MODULE.

Appendix B. Upgrading Microcode

Updates for ATM media module modules and I/O cards may be downloaded via the Internet, using the World Wide Web at URL:

WWW: <http://www.networking.ibm.com/>

This is the IBM Networking home page. From here, you can access product announcements, publications information, and information regarding hardware and software updates.

Updating Module FPGA Picocode

After locating the directory where the FPGA updates are stored, log on to the 8265, using the administrator password, and enter the following commands:

1. SET TFTP SERVER_IP_ADDRESS (to define the server where the microcode is stored)
2. SET TFTP FILE_NAME (to define the pathname of the file on the server)
3. SET TFTP FILE_TYPE FPGA
4. SET TFTP TARGET_MODULE slot (where slot identifies the location of the module)
5. DOWNLOAD (to load the microcode).

For more information, refer to the *IBM 8265 Nways ATM Switch: User's Guide*.

Updating Daughter Card Microcode

After locating the directory where the microcode updates are stored, log on using the administrator password, and enter the following ATM commands:

1. SET TFTP SERVER_IP_ADDRESS (to define the server where the microcode is stored)
2. SET TFTP FILE_NAME (to define the pathname of the file on the server)
3. SET TFTP FILE_TYPE DAUGHTER_CODE
4. SET TFTP TARGET_PORT slot.port (where slot identifies the location of the module, and port identifies the port to be updated)
5. DOWNLOAD (to load the microcode).

For more information, refer to the *IBM 8265 Nways ATM Switch: User's Guide*.

Upgrading Microcode

Appendix C. Backward Compatibility with 8260 Modules

The 8260 ATM media modules listed in Table 24 can be installed in the 8265 switch providing their FPGA code has been upgraded to the code level indicated for each module.

Module	Faceplate	FPGA Code Level
3-Port 155 Mbps Flex Module	A3-MB155	C31
2-Port 155 Mbps Flex Module	A2-MB155	B50
4-Port 100 Mbps Module	A4-SC100	B50
MSS Server Module	A-MSS	B50
8281 ATM LAN Bridge	A04MB-BRG	B50
12-Port 25 Mbps Module	A12-TP25	C30
ATM WAN 2 Module	A8-WAN	C32
ATM WAN Module	A2-WAN	B50

Attention: The microcode for these modules must be upgraded on the 8260 hub *before* installing them in an 8265 switch.

Appendix D. Notices

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Industry Standards Reflected in This Product

IBM ATM media modules and I/O cards comply with the following ATM standards:

- ATM User-Network Interface (UNI) Specification V3.0, V3.1, and 4.0 ATM Forum
- ATM Private Network-Network Interface (PNNI) Phase 1 Specification V1.0, ATM Forum
- LAN Emulation Over ATM Specifications V1.0, ATM Forum
- Q.2110 Service Specific Connection-Oriented Protocol (SSCOP), ITU, March 17, 1994
- Q.2130 Service Specific Coordination Function (SSCF) for support of signaling at the user-network interface, March 17, 1994.

ATM media modules are designed according to the specifications of the following industry standards as understood and interpreted by IBM as of September 1994:

- RFC854 - TELNET protocol
- RFC1350 - Trivial File Transfer Protocol (TFTP)
- RFC1577 - Classical IP and ARP (Address Resolution Protocol) over ATM
- SNMP:
 - RFC1155 - Structure and Identification of Management Information (SMI) for TCP/IP based Internet.
 - RFC1156 - Management Information Base (MIB) for network management of TCP/IP based Internets (MIB-I)
 - RFC1157 - Simple Network Management Protocol (SNMP)
 - RFC1212 - Concise MIB definitions
 - RFC1213 - Management Information Base (MIB) for network management of TCP/IP based Internets (MIB-II)
 - RFC1215 - Convention for defining traps for use with SNMP.

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Bibliography

8265 Documentation

For additional information on the IBM 8265 Nways ATM Switch, please refer to the following documents. The documents are included on the *IBM 8265 Nways ATM Switch Documentation Library* CD, SA33-0454.

IBM 8265 Nways ATM Switch Product Description, GA33-0449.

IBM 8265 Nways ATM Switch User's Guide, SA33-0456.

IBM 8265 Nways ATM Switch Command Reference Guide, SA33-0458.

IBM 8265 Nways ATM Switch Installation Guide, SA33-0441.

IBM 8265 Nways ATM Switch Planning and Site Preparation Guide, GA33-0460.

IBM 8265 Nways ATM Switch Media Module Reference Guide, SA33-0459.

IBM 8265 Nways ATM Switch Problem Determination and Service Guide, SY33-2128.

These documents are also available via the Internet:
<http://www.networking.ibm.com/did/8265bks.html>

Related Documentation

The following related publications are included on the *IBM 8265 Nways ATM Switch Documentation Library* CD, SA33-0454.

Multiprotocol Switched Services (MSS) Server Introduction and Planning Guide, GC30-3820.

A-MSS 2.5 Server Module / A-MSS Server Module Quick Reference Card, GX27-4018.

Nways Multiprotocol Switched Services Server Interface Configuration and Software User's Guide, SC30-3818.

Nways Multiprotocol Switched Services Configuring Protocols and Features, SC30-3819.

Multiprotocol Switched Services (MSS) Server Service and Maintenance Manual, GY27-0354.

Nways Multiprotocol Switched Services (MSS) Server Module Installation and Initial Configuration Guide, GA27-4141.

Nways MAS/MRS/MSS/MSSC Library, Configuration Program User's Guide for Nways Multiprotocol Access, Routing and Switched Services, GC30-3830.

Nways Event Logging System Messages Guide, SC30-3682.

8271 LAN Switch Module Planning and Installation Guide, GA27-4162.

8272 LAN Switch Module Planning and Installation Guide, GA27-4163.

4-Port 10BASE-T & 3-Port 10BASE-FL UFCs Planning and Installation Guide, GA27-4120.

100BASE-TX and 100BASE-FX Universal Feature Cards Planning and Installation Guide, GA27-4096.

ATM 155 Mbps Multimode Fiber Universal Feature Card Planning and Installation Guide, GA27-4156.

2-Port Fiber and 4-Port UTP/STP Token-Ring Enhanced Universal Feature Card Planning and Installation Guide, GA27-4168.

IBM Video Distribution Module User's Guide, GA27-4173.

The 8260 Nways ATM Kit Development Program, We Carry Your Creativity to ATM, GA33-0371.

ATM Forum

For more information on ATM Forum specifications, refer to the following:

- *UNI Specification – Versions 3.0, 3.1, and 4.0*
- *P-NNI Specification Version 1.0*
- *ILMI Specification Version 4.0*
- *UNI Traffic Management Version 4.0*

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