8260/8285 ATM 25 Mbps Concentration Module

Installation and User's Guide

IBM

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How to Use This Guide

This guide presents information on how to install and configure the IBM ATM 25 Mbps Concentration Module (A12-TP25 module) in the IBM 8260 Nways* Multiprotocol Switching Hub or IBM 8285 Nways ATM Workgroup Switch expansion unit. It describes how to:

- Plan and set up valid links in an 8260 or 8285 based ATM subnetwork using the A12-TP25 module

- Install the A12-TP25 module

- Configure the A12-TP25 module

- Diagnose and solve problems associated with the operation of the A12-TP25 module.

Who Should Use This Guide

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

- ATM network administrator
- ATM network operator
- Hardware installer

Contents of This Guide

This guide contains five chapters and two appendixes:

Chapter 1, "Overview" on page 1 gives an overview of the main functions of the A12-TP25 module and the ATM interface used by ATM ports to interconnect user devices to an ATM campus network.

Chapter 2, "Installation" on page 5 describes how to install the A12-TP25 module in an 8260 hub and 8285 ATM Workgroup Switch expansion unit.

Chapter 3, "Configuration" on page 19 describes how to configure the A12-TP25 module.

Chapter 4, "Troubleshooting" on page 29 describes how to diagnose and solve problems associated with the operation of the A12-TP25 module.

Appendix A, "Technical Specifications" on page 35 describes the specifications for the A12-TP25 module.

Appendix B, "ATM Components" on page 37 lists the part numbers for the ATM components that you can order for use with the A12-TP25 module.

"Glossary" on page 39 describes the terms and abbreviations used in this manual.

"Index" on page 49 lists the concepts, terms, and tasks described in this manual and the page numbers on which you can find the information.

Terms Used in This Guide

The term *ATM Control Point* used in this guide refers to the ATM Control Point located in either the IBM 8260 Nways Multiprotocol Switching Hub A-CPSW module or IBM 8285 Nways ATM Workgroup Switch base unit.

The term *Command Reference Guide* used in this guide refers to the *IBM 8260 Nways Multiprotocol Switching Hub, IBM 8285 Nways ATM Workgroup Switch, ATM Command Reference Guide*, SA33-0385.

Related Information

To understand the information presented in this guide, refer to:

- *IBM 8260 Multiprotocol Intelligent Switching Hub Product Description* (GA33-0315) for more information on features and characteristics of the IBM 8260 Nways Multiprotocol Switching Hub.
- *IBM 8285 Nways ATM Workgroup Switch, Installation and User's Guide* (SA33-0381) for more information on features and characteristics of the IBM 8285 Nways ATM Workgroup Switch.
- *IBM 8250 Multiprotocol Hub, IBM 8260 Multiprotocol Intelligent Switching Hub, IBM 8285 Nways ATM Workgroup Switch, Planning and Site Preparation Guide* (GA33-0285) for more information regarding cabling and connectors.
- *IBM 8260 Nways Multiprotocol Switching Hub, IBM 8285 Nways ATM Workgroup Switch, ATM Command Reference Guide* (SA33-0385) for more information regarding ATM commands.
- Publications listed in the "Bibliography" on page 47 for information on the principles of asynchronous transfer mode (ATM) technology.
- ATM Forum UNI Specification V3.0 and V3.1.

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Conventions Used in This Guide

The following text conventions are used in this guide:

Text Convention	Meaning	Example
Bold	Text emphasis	**Selective backpressure** temporarily stops one virtual connection. **Global backpressure** temporarily stops an ATM link.
Italics	Special term	This is known as a *hot swap*.
	Document titles	Refer to the *ATM User-Network Interface Specification - Version 3.0* for more information.
Monospace	Command syntax (parameters and variables)	`SET PORT slot.port ENABLE`
	User input (including carriage return)	To display detailed information, enter the following command: `show port 4.2 verbose  [ENTER]`

	System messages and screen displays	`Port display for 8260 ATM 25 Mbps Module:`
		`Port   Type   Mode      Status`
		`--------------------------------------------`
		`4.02   NNI    enabled   UP-OKAY`

Chapter 1. Overview

This chapter presents an overview of the ATM 25 Mbps Concentration Module (A12-TP25 module). It describes the main functions of the module, and how the module operates as part of the ATM subsystem when installed in the IBM 8260 Nways Multiprotocol Switching Hub or IBM 8285 Nways ATM Workgroup Switch Expansion Unit.

A12-TP25 Module in the 8260 Hub or 8285 ATM Workgroup Switch

The A12-TP25 module is a single-slot module that functions as part of the IBM 8260 Nways Multiprotocol Switching Hub or IBM 8285 Nways ATM Workgroup Switch Expansion Unit.

A12-TP25 modules can be used in any of the following ways:

* To send and receive data from an ATM subsystem in another ATM 8260 hub or 8285 workgroup switch.
* To attach high capacity workstations and servers that function in ATM mode.

A12-TP25 modules interface to the 8260 hub or 8285 workgroup switch by means of the Control Point located in either the A-CPSW module or 8285 base unit. A12-TP25 modules process ATM cells of data by:

* Checking their validity
* Accessing the switching tables to locate the destination module
* Preparing the internal ATM format required by the Control Point
* Sending the cells to the Control Point.

A12-TP25 modules can be used in any vacant slot in the 8285 workgroup switch expansion unit, or any vacant slot in the 8260 hub except for slots 9, 10, and (for 17-slot models) 11 and 12. These slots are reserved for A-CPSW modules. In 17-slot 8260 models, although slot 12 is also reserved, you can insert an A12-TP25 module in slot 12 if no A-CPSW module is installed in slot 11.

Like other ATM media modules, such as the A4-FB100 module, the A12-TP25 module can be inserted while the hub or workgroup switch is operating without disturbing data traffic on other modules. Before removing the module however, you must first isolate it by using the SET MODULE command.

For more information on how to install and change modules, see the *IBM 8260 Multiprotocol Switching Hub Installation Guide*, SA33-0251 or *IBM 8285 Nways ATM Workgroup Switch Installation and User's Guide* SA33-0381, as appropriate.

Module Functions

The A12-TP25 module has the following characteristics:

- Twelve ports operating at up to 25 Mbps to connect stations or servers to the hub or workgroup switch. Each port may connect to:
  - An ATM or multimedia workstation that requires a high bit rate
  - A UNI device using a supported interface.
- Physical interface: copper cable with RJ45 connector.
- ATM connections: port-to-port, hub-to-server, and hub-to-workstation.
- Up to three A12-TP25 modules can be used in the 8285 ATM Workgroup Switch expansion unit, thereby providing up to 48 ATM ports.
- Up to fourteen A12-TP25 modules can be used in the 17-slot 8260 hub at the same time (8 in the 10-slot 8260 hub).

Interfaces Supported

The A12-TP25 module supports the following interface:

- User-to-network (UNI).

The UNI interface is defined in the following documents:

- ATM Forum UNI Specification V3.0 and V3.1
- ITU (ex-CCITT) SG13 as defined in the following standards:
  - I.413 (B_ISDN User-Network Interface)
  - I.432 (Physical Layer)
  - Q.2931 (Signaling).

Using the A12-TP25 Module for ATM Campus Networking

The A12-TP25 module can be used as a link to an ATM campus network by allowing workstations, servers, and other ATM devices to communicate with the network.
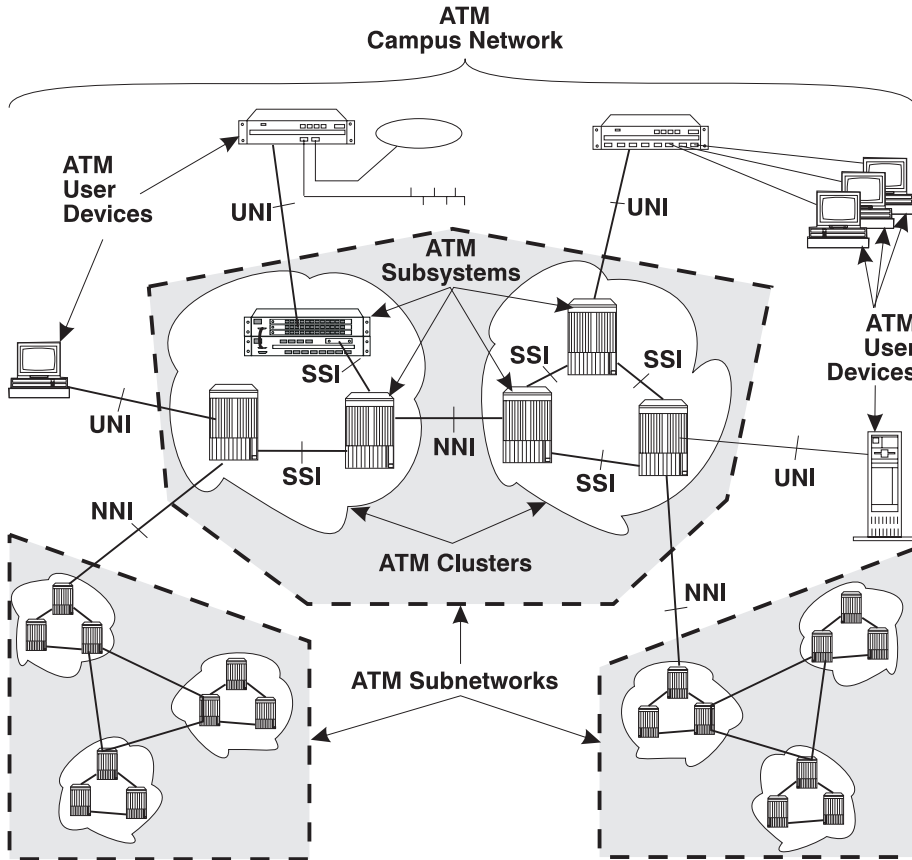
Figure 1. ATM Campus Networking

Chapter 2. Installation

This chapter describes how to unpack, install, and connect ATM devices to the A12-TP25 module.

Before You Unpack the Module

Take the following precautions before unpacking the A12-TP25 module:

- Do not remove the A12-TP25 module from its anti-static shielding bag until you are ready to install it. This avoids the possibility of having electrostatic discharge damage static-sensitive devices on the module.

- Always handle the module by the edges.

- Always use a foot strap and grounded mat or wear a grounded static discharge wrist strap whenever you inspect or install or remove the module. Or else, be sure to touch a grounded rack or another source of ground **before** handling it.

Unpacking the Module

To unpack the A12-TP25 module, follow these steps:

1. Verify that the A12-TP25 module is the correct model by matching the model number listed on the side of the shipping carton to the model number you ordered.

2. Remove the module from its shipping carton.

3. Remove the A12-TP25 module from its anti-static bags and inspect it for damage. Always handle it by the edges, being careful not to touch the internal components.

   If the module appears to be damaged, put it back in the anti-static bag, put the bag back into the shipping carton, then contact your local IBM dealer.

It is recommended to retain the shipping carton and the anti-static shielding bag in which the module was delivered. These can be reused later if you want to repackage the components for storage or shipment.

IBM also suggests that you record the serial number of the A12-TP25 module and other information about the modules in your 8260 hub in the Slot Usage chart in the binder of the *IBM 8260 Multiprotocol Intelligent Switching Hub Reference Library* (Part Number 59G0022) that is shipped with the 8260 hub.

Installation Summary

Table 1 lists the steps to follow to install the A12-TP25 module. Each step is described in detail in this chapter.

To record configuration information on your complete ATM network, use the ATM cabling charts in Appendix A of the *IBM 8250 Multiprotocol Intelligent Hub, IBM 8260 Multiprotocol Intelligent Switching Hub, IBM 8285 Nways ATM Workgroup Switch, Planning and Site Preparation Guide* (GA33-0285).

Note: Before installing an A12-TP25 module in an 8260 hub, make sure that an A-CPSW module is installed in slots 9 and 10 (or 11 and 12 in a 17 slot model), and that an A-CPSW console has already been configured. If an A-CPSW module is not installed, the Reset LED on the A12-TP25 module will start blinking when you insert the module.

Table 1. Installation Steps

Step	Refer to
1. Insert the A12-TP25 module into a vacant slot:	"Installing the Module in an 8260 Hub" on page 8 (8260)
8260: 1 to 8 on 10-slot models (or 1 to 8, 12 to 17 on 17-slot models).	
8285: Any vacant slot in the expansion unit.	"Installing the Module in an 8285 Expansion Unit" on page 10 (8285)
2. Set up connections between the ATM ports and other ATM devices using the appropriate Twisted Pair (TP) cables and connectors.	"Connecting ATM Devices" on page 13

Installation

You can install the A12-TP25 module while the 8260 hub or 8285 workgroup switch are running.

Installing the Module in an 8260 Hub

To install an A12-TP25 module in an 8260 hub, follow these steps:

1. Locate a vacant slot in positions 1 to 8 (or 12 to 17 in 17 slot models). (Slots 9 and 10 are reserved for the A-CPSW module. You cannot install the A12-TP25 module in slot 11.) If necessary, remove a panel on the hub to expose a blank slot.

2. Make sure that the slot to be used is in Isolated mode by entering the following command from the A-CPSW console:

   ```
   SET MODULE slot ISOLATED
   ```

   where slot specifies the number of the slot to be used. For more information, see the *IBM 8260 Multiprotocol Switching Hub Installation Guide*, SA33-0251.

3. Insert the A12-TP25 module into one of the free slots in the hub as shown in Figure 2, 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 into the hub until you have verified that the top and bottom module ejectors are OPEN (see Figure 3 on page 9.)
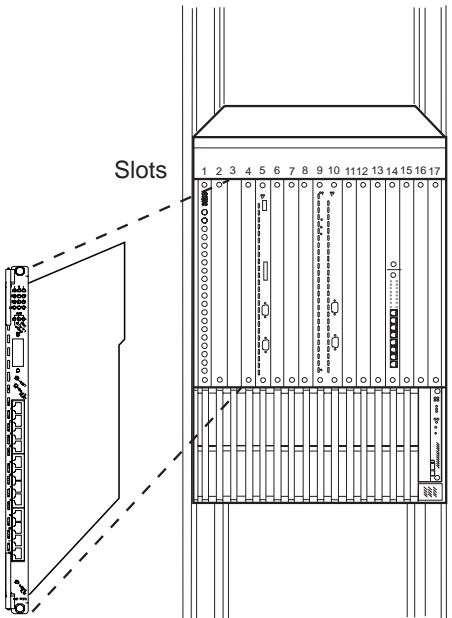
Figure 2. Installing the Module in an 8260 Hub

4. Close the top and bottom ejectors simultaneously.
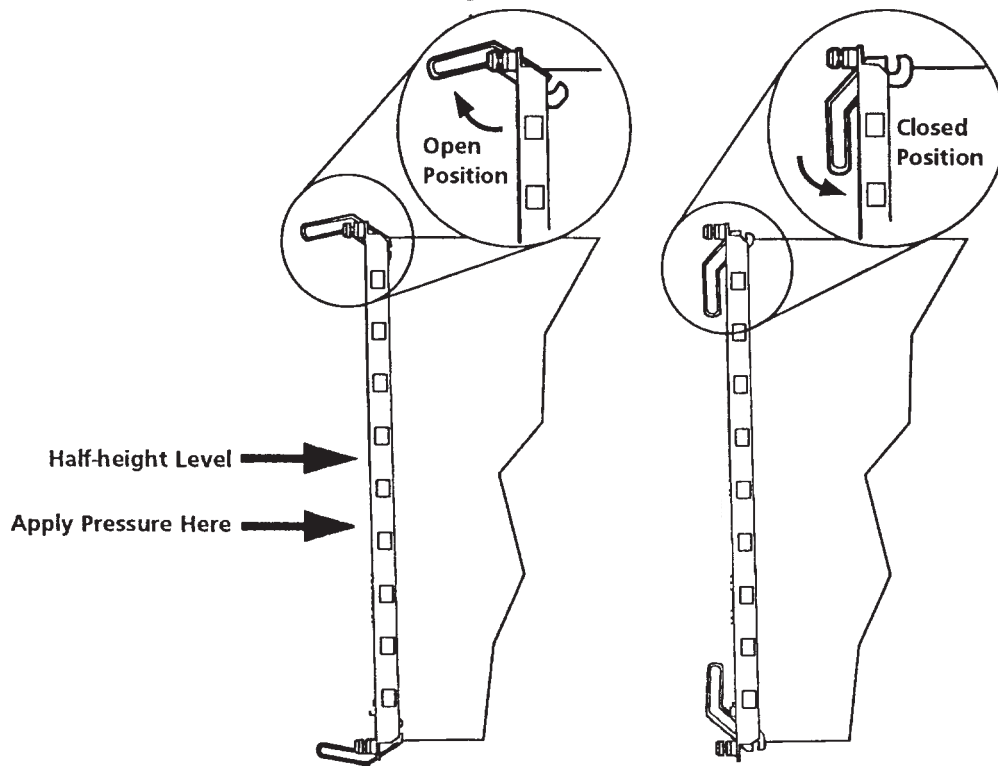
Figure 3. 8260 Module Ejectors

5. The Reset LED should light ON briefly, and then turn OFF. Other LEDs may also light ON if the slot was previously configured for an ATM 25 Mbps module.

6. Fasten the spring-loaded screws on the front panel of the module to the hub using your fingers. Do not overtighten.

Installing the Module in an 8285 Expansion Unit

To install an A12-TP25 module in an 8285 expansion unit, follow these steps:

1. Locate a vacant slot in the expansion unit. If the slot is filled with a dummy module, loosen the knurled screws on both sides of the cover and remove it from the front panel of the expansion unit.
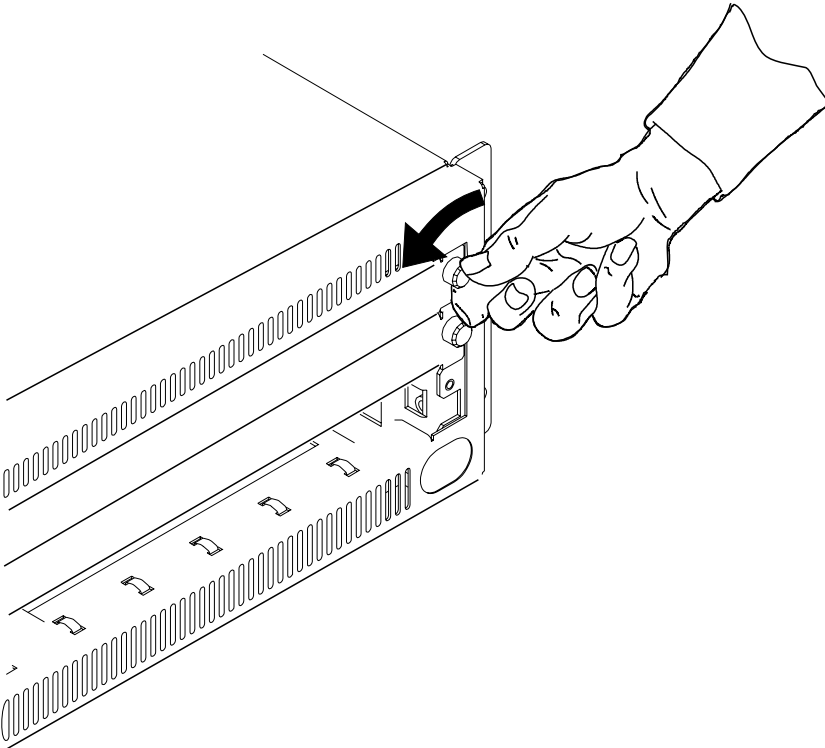
Figure 4. Removing a Dummy Module

Store the dummy module in a safe place in case the ATM media module needs to be removed in the future.

2. Make sure that the slot to be used is in Isolated mode by entering the following command from the ATM console:

```
SET MODULE slot ISOLATED
```

where `slot` specifies the number of the slot to be used. For more information, see the *IBM 8285 Nways ATM Workgroup Switch Installation and User's Guide*.

3. Make sure that the two module ejectors (left and right) are OPEN (see Figure 5 on page 11.)
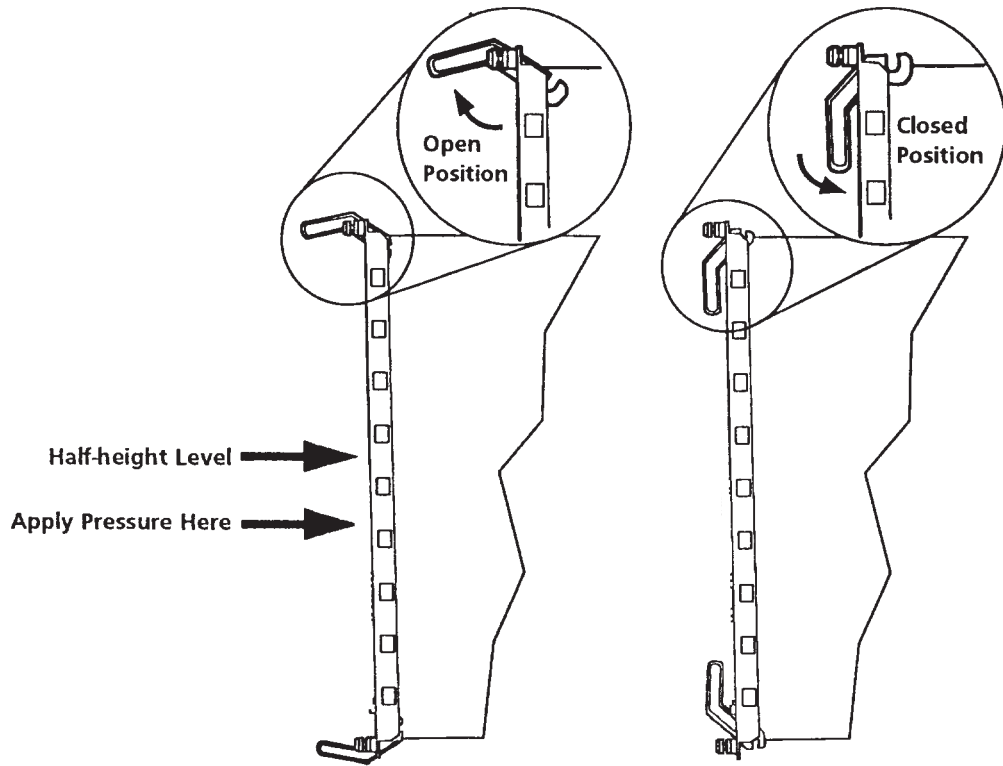
Figure 5. 8285 Module Ejectors

4. Insert the A12-TP25 module into one of the free slots in the expansion unit as shown in Figure 6 on page 12, matching the left and right board guides as you slide the module cleanly into place (by pressing evenly on the top and bottom of the faceplate).
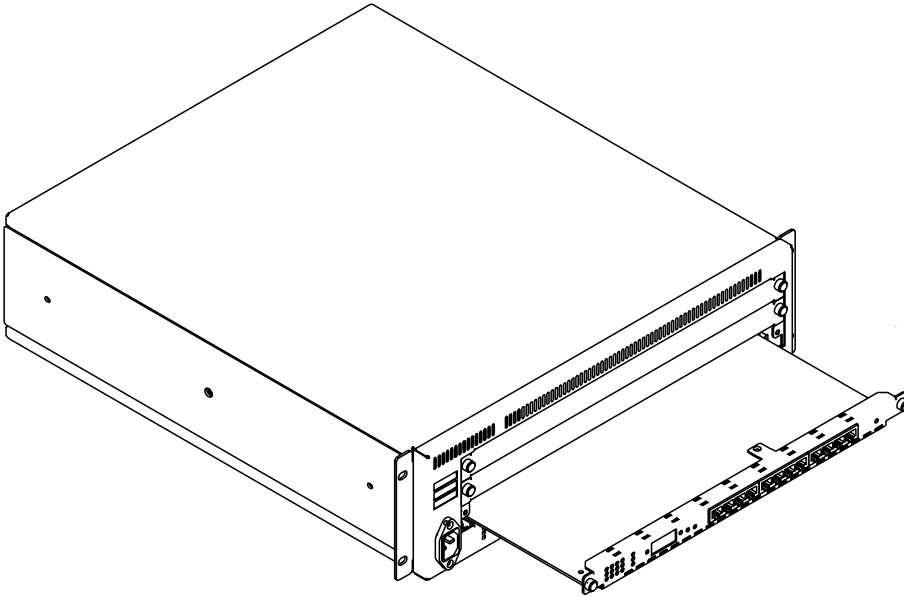
Figure 6. Installing the Module in an 8285 Expansion Unit

5. Close the left and right ejectors simultaneously. This secures the module.

6. The Reset LED should light ON briefly, and then turn OFF. Other LEDs may also light ON if the slot was previously configured for an A12-TP25 module.

7. Fasten the spring-loaded screws on the front panel of the module to the expansion unit using your fingers. Do not overtighten.

Connecting ATM Devices

After inserting the module, attach the cables to the ATM ports that will connect to ATM devices.

Cabling Up

The following sections provide instructions and guidelines for connecting ATM devices (such as switches, servers, personal computers, and workstations). Remember these tips when connecting cables:

- Avoid stretching and bending the cables too much.
- Avoid routing the cables near potential sources of electromagnetic interference, such as motorized devices and fluorescent lights.
- 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 the A12-TP25 module are supported so that the cable connectors are not excessively strained. The cable management bracket shipped with the 8260 hub or expansion unit helps prevent strain on the cables.
- Use a Category 3 or better UTP cable or a 150-ohm STP cable for each of the ATM ports.

UTP/FTP/STP Cabling Information: Table 2 details the accepted UTP/FTP/STP cables for the 25.6 Mbps ATM ports.

Table 2. UTP/FTP/STP Cabling Details

Cable Type	Impedance	Category	Trunk Attenuation @ 100 MHz	Patch Attenuation @ 100 MHz	RFI Class
UTP-5	100 ohm	5 / Class D	22db MAX / 100m	33db MAX / 100m	A
FTP/SFTP	100 ohm	5 / Class D	22db MAX / 100m	33db MAX / 100m	B
FTP/SFTP	120 ohm	5 / Class D	17db MAX / 100m	25db MAX / 100m	B
STP	150 ohm	IBM Cabling	IBM type 1/1A 12.3db MAX / 130m	IBM type 6/6A 18.4db MAX / 130m	B

Legend:

UTP-5   Unshielded Twisted Pair (Category 5)
FTP   Foiled Twisted Pair
SFTP   Screened and Foiled Twisted Pair
STP   Shielded Twisted Pair
TRUNK rigid cable
PATCH flexible cable

For more information, refer to the *IBM 8250 Multiprotocol Switching Hub, IBM 8260 Multiprotocol Intelligent Switching Hub, IBM 8285 Nways ATM Workgroup Switch, Planning and Site Preparation Guide*, GA33-0285.

Cabling Distances: Table 3 lists the maximum cabling distances for devices attached to the 25.6-Mbps ATM ports.

Table 3. ATM Device Cabling Distances

Cable Type	Maximum Allowable Distance (m)
UTP Category 3	100 (330 ft)
UTP Category 4	150 (495 ft)
UTP Category 5	160 (528 ft)
STP	300 (990 ft)

Note: The minimum UTP cable quality must meet EIA/TIA-568 specification for Category 3 or equivalent UTP wiring.

Connecting Devices to the ATM Ports

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

Via Building Wiring: To connect an ATM device via building wiring, follow the steps listed below.

Note: This procedure begins with the cabling of the ATM device (such as a 25.6-Mbps ATM adapter installed in a workstation) to the building faceplate; then it describes connecting the 8260 hub or workgroup switch to the patch panel in the wiring closet.

___ **1** Look at the cabling chart, which your network planner provided, to determine how the 8260 hub or workgroup switch should be connected to the network.

___ **2** In the work area, connect one end of a straight-through cable (with ATM-compliant pin assigments) to the ATM connector on the device and the other end to the ATM connector on the faceplate where the building wiring terminates.

___ **3** Label the faceplate if it does not already have a cable label. Follow your enterprise's procedures for cable labeling. If there is more than one wiring closet on a floor, record, on the same line, the wiring closet identifier or location and the cable identifier.

___ **4** In the wiring closet, connect the cable that originated at the ATM device to the appropriate connector on the patch panel or other equipment where the building wiring terminates. Connect the other end of the cable to an ATM port on the A12-TP25 module.

___ **5** Label the connector on the patch panel (or other equipment used to terminate the building wiring).

Direct Cabling: To cable an ATM device directly to the A12-TP25 module:

___ **1** Look at the cabling chart, which your network planner provided, to determine how the 8260 hub or workgroup switch should be connected to the network.

___ **2** Connect the cables between the A12-TP25 module and other devices as indicated by the connections in the cabling chart.

___ **3** Label the cables, following your enterprise's procedures for cable labeling.

Cables, Pins and Connectors

Each of the ATM ports on the A12-TP25 module connects to other ATM devices via an 8-pin female RJ-45 connector. The sections below describe the male RJ-45 plug and the twisted-pair cables that attach to this connector.

RJ-45 Connector: The RJ-45 connector is the 8-pin female connector on the workgroup switch that attaches to UTP Category 3, 4, or 5 cable or STP category 1, 1A, 9, or 9A cable. Table 4 on page 16 lists the signal name associated with each pin on this connector, and Figure 7 on page 16 shows how the pins are numbered.

Table 4. RJ-45 Connector-Pin Signal Assignments

Pin Number	Signal Name
1	RD+
2	RD-
3-4-5-6	Frame Ground
7	TD+
8	TD-
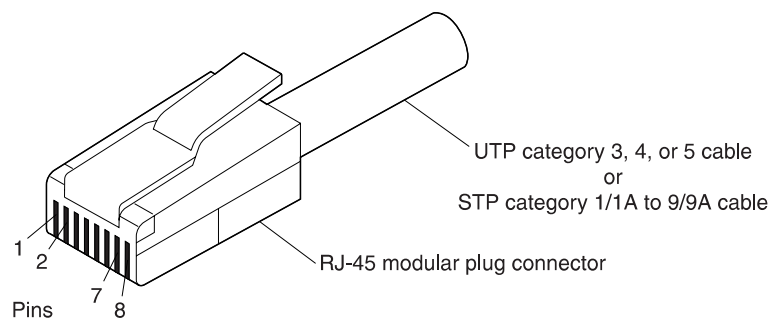
Figure 7. RJ-45 Connector

Twisted-Pair Cable: Figure 8 below shows the pin-outs for the straight-through cable required for connecting ATM Forum compliant devices via UNI interface to the ports on the A12-TP25 module.

Note: Pins 3, 4, 5, and 6 are *not used*.
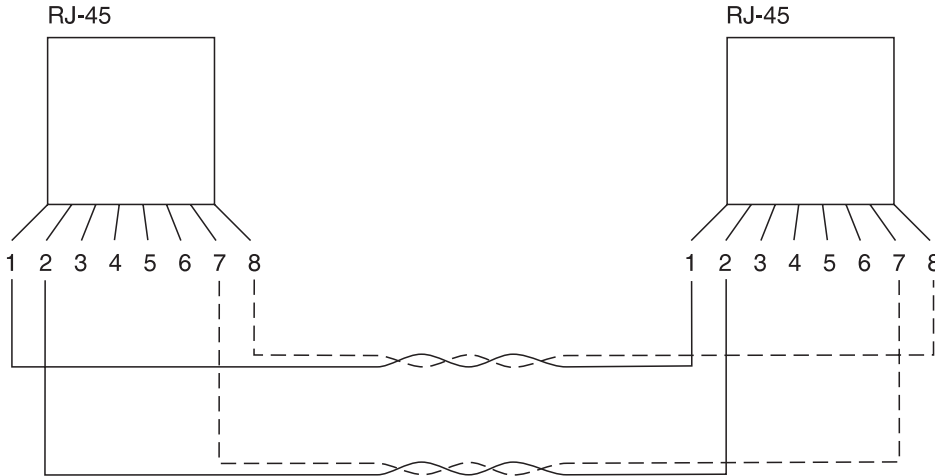
Figure 8. Straight-Through UTP Cable. Note that one cable connects pins 1 and 2 and the other cable connects pins 7 and 8. You will cause an error if you cable any other active pins together, such as 1 and 7, 1 and 8, 7 and 2, or 8 and 2.

Non-ATM Forum Compliant (UNI) Devices: To connect non-ATM Forum compliant devices to the A12-TP25 module you must build a twisted-pair cable that connects the pins as listed in Table 5.

Table 5. Pin Assignments for Cabling Non-ATM Forum Compliant Devices

A12-TP25 Module Port		Non-Compliant 25.6-Mbps Device	
1	RD+	3	TD+
2	RD-	6	TD-
7	TD+	4	RD+
8	TD-	5	RD-
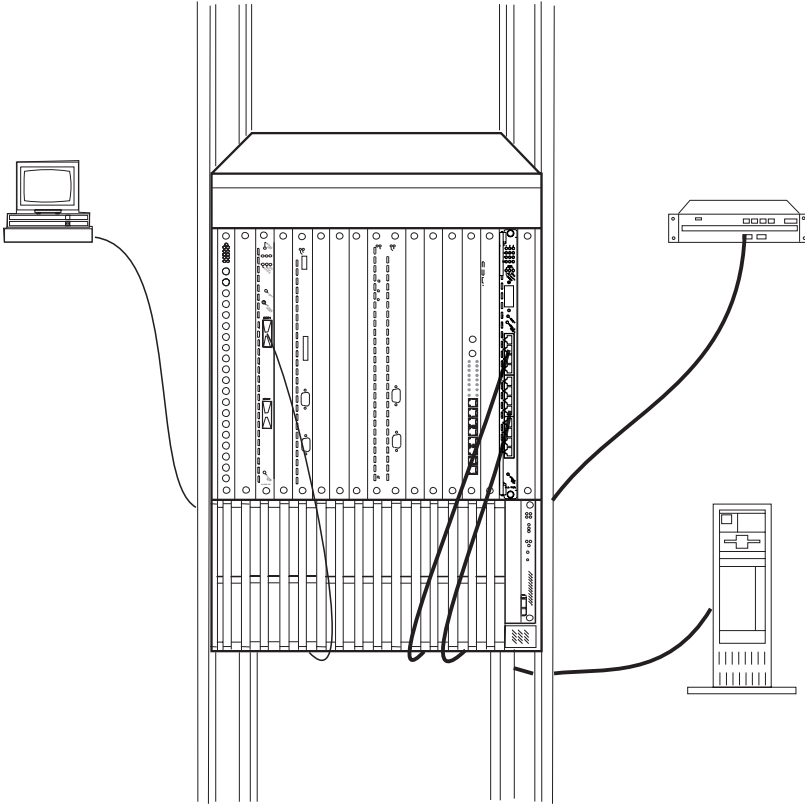
Figure 9. Attaching ATM Devices

Chapter 3. Configuration

After installing the A12-TP25 module and attaching media cables to ATM devices, you must enter configuration commands from the ATM console to:

- Configure the ports parameters.
- Connect the module to the network.
- Enable the ports.

This section describes the ATM commands you need to enter to configure each A12-TP25 module in the ways described above. For a complete description of all ATM commands, see the *Command Reference Guide*.

Configuring Port Parameters

The A12-TP25 module uses the user-to-network (UNI) interface. A UNI interface defines the interface between an ATM user device (such as a router, bridge, server, workstation, or concentrator equipped with an ATM adapter) and the ATM network.

Before you connect an A12-TP25 module to the ATM network (as described in "Connecting the Module to the Network" on page 24) and enable its ports, you must first set the type of ATM interface used on each port (UNI).

In addition, you can switch ILMI flow control on or off, and specify the ILMI characteristics.

When a port is enabled, it can transmit and receive cells in the ATM network. The port's parameters should be configured **before** the port is enabled.

To set individual port parameters, enter the following command at the ATM console prompt:

```
SET PORT slot.port mode type flow_control ilmi
```

slot   Slot number of the A12-TP25 module.

port   ATM port number.

mode   enable or disable. Enter disable until the port has been configured.

type   Type of interface used: UNI (user-to-network interface). Default: Last value entered.

flow_control Used to activate or deactivate the ILMI flow control for this port:

                FLOW_CONTROL:ON   activates ILMI flow control (GFC field of the cell header)

                FLOW_CONTROL:OFF   deactivates ILMI flow control.

                Default: Last value entered.

ilmi   Specifies the ILMI characteristics for this port:

                ILMI:NORMAL   ILMI active with automatic detection of the signalling protocol version (UNI 3.0 or UNI 3.1). ILMI address registration is normally performed.

                ILMI:FORCED_SIG_3.0   UNI 3.0 signalling is forced, and ILMI address registration active.

                ILMI:FORCED_SIG_3.1   UNI 3.1 signalling is forced, and ILMI address registration active.

                ILMI:OFF_SIG_3.0   UNI 3.0 signalling is forced, and ILMI address registration inactive.

                ILMI:OFF_SIG_3.1   UNI 3.1 signalling is forced, and ILMI address registration inactive.

                Default: Last value entered.

The parameters may be entered in any order.

Example: The following example configures port 2 of the A12-TP25 module installed in slot 1.

```
ATMPROMPT> set port 1.2 uni          [ENTER]

ATMPROMPT> Port set.
ATMPROMPT> show port 1.2 verbose          [ENTER]

     Type   Mode      Status
-------------------------------------------------------------------------------
 1.02:SSI   enabled   UP-OKAY

Connector            : RJ-45
Media                : Twisted Pair (UTP/STP)
Port speed           : 25600 Kbps
Remote device is active
IX status            : IX OK

ATMPROMPT>
```

Displaying Configuration Settings

The following sections describes how to display information about the module and its port configurations. By displaying this information, you can check that the module is properly configured before connecting it to the network.

Module Information

To display status information about an A12-TP25 module, use the SHOW MODULE command.

For example, to display configuration information about the A12-TP25 module in slot 2, you would enter the following command:

```
ATMPROMPT> show module 2 verbose     [ENTER]

Slot Install Connect Operation General Information
------------------------------------------------------------------
 2      Y       Y        Y      8285 ATM Streamer

status: connected / hardware okay
        enable  / Normal
P/N:51H3635 EC level:E28056 Manufacturer:VIME
Operational FPGA version : 7
     Backup FPGA version : 7

     Type   Mode     Status
------------------------------------------------------------------
 2.01:UNI   enabled  UP-OKAY
 2.02:UNI   enabled  UP-NO ACTIVITY
 2.03:UNI   enabled  UP-NO ACTIVITY
 2.04:UNI   enabled  UP-OKAY
 2.05:UNI   enabled  UP-OKAY
 2.06:UNI   enabled  UP-OKAY
 2.07:UNI   enabled  UP-NO ACTIVITY
 2.08:UNI   enabled  UP-NO ACTIVITY
 2.09:UNI   enabled  UP-NO ACTIVITY
 2.10:UNI   enabled  UP-NO ACTIVITY
 2.11:UNI   enabled  UP-NO ACTIVITY
 2.12:UNI   enabled  UP-NO ACTIVITY
 2.13:NOT INSTALLED

ATMPROMPT>
```

If the value for port status indicates that the port is inoperational or not functioning properly (for example, NOT IN SERVICE or NO ACTIVITY), refer to "Troubleshooting", in the *IBM 8260 Nways Multiprotocol Switching Hub, ATM Control Point and Switch Module Installation and User's Guide*, SA33-0326 or *IBM 8285 Nways ATM Workgroup Switch, Instllation and User's Guide*, SA33-0381.

For more information on the SHOW MODULE command, see the *Command Reference Guide*.

Port Information

To display status information about the ports of an A12-TP25 module, use the SHOW PORT command.

The following example shows how to display detailed information about port 1 of the A12-TP25 module in slot 1:

```
ATMPROMPT> show port 1.all verbose

Port display for 8285 ATM Streamer

Type  Mode     Status
--------------------------------------------------------------------------
 1.01:NNI enabled  UP-NO ACTIVITY

Connector           : RJ45
Media               : Twisted Pair (UTP/STP)
Port speed          : 25600 Kbps
Remote device is inactive
IX status           : IX OK

ATMPROMPT>
```

For more information on the SHOW PORT command, see the *Command Reference Guide*.

Saving Configuration Settings

After configuring the A12-TP25 module and port settings, save the settings by entering the SAVE MODULE_PORT command.

Connecting the Module to the Network

When you install an A12-TP25 module, it is by default set to Isolated mode and all of its ports are 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 disfunction.

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

```
SET MODULE slot CONNECTED
```

where slot specifies the slot number of the ATM 25 Mbps module.

The module's ports will not be enabled. This allows you to configure individual ports before enabling them. If you wish to enable **all** ports using the current values (either the default values if the module has not been used, or the previous values entered), enter the following command:

```
SET MODULE slot CONNECTED ENABLE
```

If you wish to enable **individual** ports using the current values (either the default values if the module has not been used, or the previous values entered), enter the following command:

```
SET PORT slot.port ENABLE
```

Verifying Module Operation

After configuring and saving A12-TP25 module and port settings, you can verify that the module is operating correctly by viewing the LEDs on the front panel:

- The Port Status light should be lit (Green if no traffic, Yellow when traffic is present)

- The Module Reset LED should be off.

- The Wrong Slot LED should be off.

Table 6 on page 26 provides a full description of the front panel LEDs.

Note: The 155M LEDs are reserved for future use.

Front Panel

ATM connections are made through the A12-TP25 module by means of the ports on its front panel and its backplane interfaces. The front panel is shown in Figure 10 on page 27. The meaning of each LED is shown in Table 6.

By pressing the Module Reset button, you interrupt and reset the operation of the A12-TP25 module. All ATM data traffic and connections that are being transmitted are stopped, and the Reset LED lights while the reset is performed. The change in status of the A12-TP25 module (from normal operation to reset status) is reported to the ATM Control Point.

Table 6. Meaning of the Front Panel LEDs

LED Name	Color	State	Meaning
Port Status	None	OFF	Port is disabled or there is no traffic.
	Green	ON	Port is enabled and there is a connection.
		Blinking	Port is enabled, but either no cable is connected or the cable is damaged, or there is no station at the other end of the connection.
	Yellow	ON	Normal operation (traffic detected).
Module Reset	Yellow	OFF	Normal operation. Module is not being reset.
		ON	Module is being reset; data traffic is interrupted.
		Blinking	Module is not receiving its clock because no A-CPSW module has been installed.
Wrong Slot	Yellow	OFF	Normal operation.
		ON (8260 only)	Module is installed in an incorrect slot and no power is reaching the module. Check that the module is installed in the correct slot (1 to 8 on 10-slot models, 1 to 8 and 12 to 17 on 17-slot models).

See Chapter 4, "Troubleshooting" on page 29 if:

- A Port Status LED does not light or is blinking.
- The Reset LED is ON or is blinking.
- The Wrong Slot LED is ON.

Port Status LEDs

Module Reset LED

Module Reset Button

ATM Ports

Wrong Slot LED
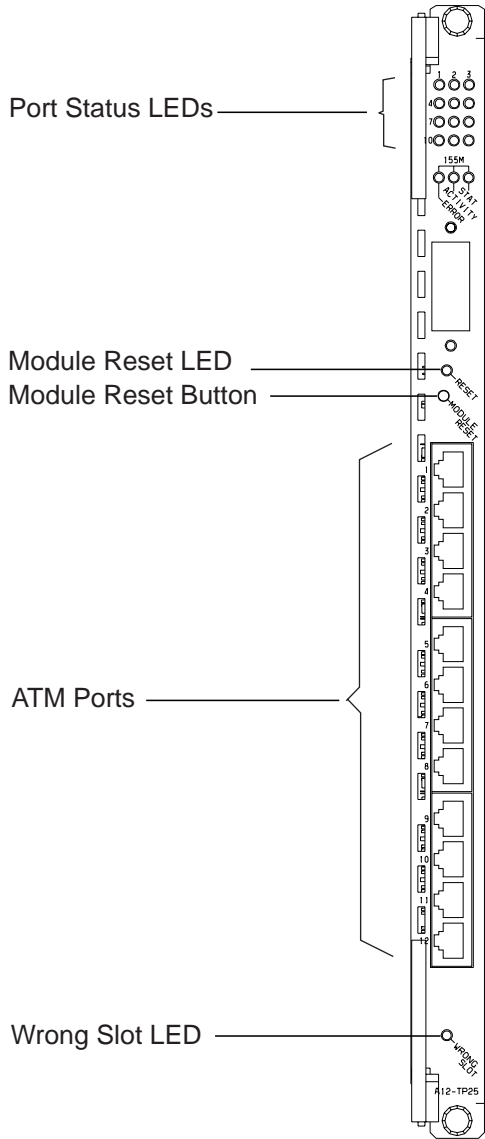
Figure 10. Front Panel

Chapter 4. Troubleshooting

This chapter describes how to diagnose and solve problems that may arise with the operation of an A12-TP25 module. These problems are signaled by the following conditions:

- The Port Status LED of a port does not light green, or is blinking, when idle (connected and enabled but no traffic).

- The Port Status LED of a port does not light yellow during data transmission.

- The Reset LED is either ON or blinking.

- The Wrong Slot LED is ON.

Before you start troubleshooting, be sure to carry out the procedure described in "Verifying LED Operation."

When instructed to replace an A12-TP25 module, proceed as described in "Replacing A12-TP25 Modules" on page 34.

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.

Verifying LED Operation

Before troubleshooting an A12-TP25 module, verify that all LEDs on the module are functioning properly:

8260   Press the LED Test button on the Fault-Tolerant Controller module in the 8260 hub.

8285   Press the RESET button on the base unit. Note that this action will interrupt all traffic and reset the 8285.

All LEDs on the module should light ON. If not, replace the module (see page 34).

Note: The 155M LEDs will not light. These LEDs are reserved for future use.

Port Status LED Does Not Light Green or Is Blinking When Idle

During normal operation, the Port Status LED of an A12-TP25 module should light GREEN if the port is enabled and a connection present. (The LED will light YELLOW during traffic.)

If the Port Status LED does not light GREEN or is blinking when there is no traffic, refer to Table 7 to diagnose and solve the problem.

Table 7. Problem Determination Using Port Status LEDs

Status LED	Port Status	Possible Cause	Corrective Action
OFF	Disabled	Port is disabled.	Enable port.
	Enabled	A12-TP25 module is not powered ON.	1) Check that the 8260 or 8285 is connected to a power supply. 2) Check the power supply LED by following the instructions in "Verifying LED Operation" on page 29. 3) Re-insert the A12-TP25 module in the hub.
		Status LED is burned out.	1) Check the Status LED by following the instructions in "Verifying LED Operation" on page 29. 2) If the Port Status does not light, replace the module.
		A12-TP25 module is faulty.	Perform the wrap tests described in "Determining the Failing Component Using a Wrap Test" on page 33.
Blinking	Enabled	No connector is attached to the port, or there is no device at the end of the connection.	Attach a connector to the port, or ensure that there is a device at the end of the connection.
		Cable attached to the port is faulty.	1) Change the cable. 2) Perform wrap tests to determine the failing component. 3) Check the cable type.
		Remote station attached to the port is either turned OFF or inoperational.	Check the remote station. If the station is turned OFF, turn ON the station. If the station is inoperational, restart the application that is running on it.
		Maximum link distance exceeded.	See Table 3 on page 14 for the maximum distances for valid connections.

Port Status LED Does Not Light Yellow During Traffic

If during continous traffic the Status LED of a port does not light YELLOW, refer to Table 8 to diagnose and solve the problem.

Table 8. Problem Determination Using Port Status LEDs during Traffic

Status LED	Possible Cause	Corrective Action
OFF	Port is disabled.	Enter the SHOW PORT command at the ATM console to see if port is enabled.
	A12-TP25 module is not powered ON.	1) Check the Port Status LED and the power supply LEDs by following the instructions in "Verifying LED Operation" on page 29. 2) Re-insert the A12-TP25 module in the hub.
	Status LED is burned out.	1) Check the Status LED by following the instructions in "Verifying LED Operation" on page 29. 2) If necessary, replace the module.
	A12-TP25 module port is faulty.	Perform the wrap tests described in "Determining the Failing Component Using a Wrap Test" on page 33.
	There is a bad connection on the ATM backplane.	1) Remove the A12-TP25 module and re-insert it in the same slot. 2) If the problem persists, insert the module in another slot.
	UNI port is enabled but not in service.	From the ATM host, make sure that the station attached to the port has been assigned an ATM address and that the address is unique within the network.

When the Reset LED Is ON or Starts Blinking

When the Reset LED of an A12-TP25 module is ON or starts blinking, the module has entered into an error condition. Table 9 describes the possible problems that may occur and the corrective action to take for each problem.

Table 9. Problem Determination Using the Module Reset LED

Reset LED	Meaning	Possible Cause	Corrective Action
ON	A12-TP25 module error condition	Module is faulty.	Perform the wrap tests described in "Determining the Failing Component Using a Wrap Test" on page 33.
		There is a bad connection on the ATM backplane.	1) Remove the module and re-insert it in the same slot. 2) If the problem persists, insert the module in another slot.
Blinking	A12-TP25 module error condition	(8260 only) A-CPSW module is not installed.	Install an A-CPSW module in slots 9 to 10 (or 11 to 12 in 17-slot model).
		Module is either faulty or not securely plugged into the ATM backplane.	1) Remove the module and re-insert it. 2) If the problem persists, replace the module.
		There is a bad connection on the ATM backplane.	1) Remove the module and re-insert it in the same slot. 2) If the problem persists, insert the module in another slot.

When the Wrong Slot LED Is ON (8260 only)

When the Wrong Slot LED of an A12-TP25 module is ON, the module is not installed in the correct slot. Remove the module from the hub and re-insert it into any blank slot in positions 1 to 8 (or 12 to 17 in A17 model). (Slots 9 to 10, and 11 in a 17-slot model are reserved for the A-CPSW module). Slot 12 in 17 slot models cannot be used if an A-CPSW module is installed in slot 11.

Determining the Failing Component Using a Wrap Test

In the troubleshooting procedures in this chapter, you are sometimes instructed to perform a wrap test in order to determine the failing component that caused the problem.

To run a wrap test, follow these steps:

1. Enter the `SET PORT slot.port DISABLE` command, where `slot` is the slot number of the A12-TP25 module and `port` is the number of the port (1 through 12). Then press Enter.

2. Insert a wrap plug in the port.

3. Enter `WRAP slot.port EXTERNAL` where `slot` is the slot number of the module and `port` is the number of the port. Then press Enter.

   If you receive a return code of `KO Test Failed`, the port is faulty and the module motherboard should be replaced. Contact your IBM Service Representative.

   If you receive a return code of `OK Test Successful`, test the line connected to the port.

Replacing A12-TP25 Modules

The troubleshooting procedures in this chapter sometimes instruct you to replace a failing A12-TP25 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 A12-TP25 module in its slot.

3. Enter `SET MODULE slot CONNECTED` where `slot` is the slot number of the failed module. Then press Enter.

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

Appendix A. Technical Specifications

General Specifications

Feature Code	5012
Face Plate Marking	A12-TP25
Number of Ports	12
Connectors	RJ-45 copper

Electrical Specifications

Power Requirement	25 Watts
	1.2 Watts for +12V
Power Consumption	6 Amps for +5V
	0.10 Amps for +12V
Fuses	7 Amps for +5V
	1 Amp for +12V

Environmental Specifications

Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	–10°C to +60°C (14°F to 140°F)
Humidity	0 to 95 % RH

Mechanical Specifications

Dimensions	2.5 cm. (1.0 in) Width
	27 cm. (10.7 in) Length
	38.5 cm. (15.25 in) Height
Weight	3.3 lbs (1.5 kg)

Appendix B. ATM Components

Table 10 lists the part numbers of ATM components that can be ordered for use with the A12-TP25 module.

Table 10. Part Numbers of ATM Components

ATM Component	IBM Part Number
RJ45 wrap plug	42H0540
Cable with RJ45 connector and IBM data connector	42H0544

Glossary

This glossary defines terms and abbreviations used in this manual. It includes terms and definitions from the *IBM Dictionary of Computing* (New York; McGraw-Hill, Inc., 1994).

(A) Identifies definitions from the *American National Standard Dictionary for Information Systems*, ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI). Copies can be purchased from the American National Standards Institute, 1430 Broadway, New York, New York 10018.

(E) Identifies definitions from the *ANSI/EIA Standard - 440A: Fiber Optic Terminology*, copyright 1989 by the Electronics Industries Association (EIA). Copies can be purchased from the Electronic Industries Association, 2001 Pennsylvania Avenue N.W., Washington, DC 20006.

(I) Identifies definitions from the *Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC1/SC1).

(T) Identifies definitions from draft international standards, committee drafts, and working papers being developed by ISO/IEC JTC1/SC1.

The following cross-references are used in this glossary:

Contrast with
This refers to a term that has an opposed or substantively different meaning.

See
This refers the reader to multiple-word terms in which this term appears.

See also
This refers the reader to terms that have a related, but not synonymous, meaning.

Synonym for
This indicates that the term has the same meaning as a preferred term, which is defined in the glossary.

If you do not find the term you are looking for, refer to the index or to the *IBM Dictionary of Computing*.

A

A. Ampere.

ac. Alternating current.

active. (1) Able to communicate on the network. A token-ring network adapter is active if it is able to transmit and receive on the network. (2) Operational. (3) Pertaining to a node or device that is connected or is available for connection to another node or device. (4) Currently transmitting or receiving.

address. (1) In data communication, the IEEE-assigned unique code or the unique locally administered code assigned to each device or workstation connected to a network. (2) To refer to a device or an item of data by its address (A).

American National Standard Code for Information Interchange (ASCII). The standard code, using a coded character set consisting of 7-bit coded characters (8 bits including parity check), used for information interchange among data processing systems, data communication systems, and associated equipment. The ASCII set consists of control characters and graphics characters. (A)

ASCII. American National Standard Code for Information Interchange.

Asynchronous Transfer Mode (ATM). A transfer mode in which the information is organized into cells. It is asynchronous in the sense that the recurrence of cells containing information from an individual user is not necessarily periodic.

ATM. Asynchronous Transfer Mode.

ATM campus network. A union of privately-owned ATM subnetworks interconnected by network node interfaces (NNIs). See also *network node interface (NNI)*.

ATM device. An end system that encapsulates data into ATM cells and forwards them to the ATM subsystem in the 8260 hub across a UNI interface.

ATM subnetwork. A set of ATM subsystems interconnected by ATM interfaces (UNI, SSI, NNI).

ATM subsystem.   The ATM components in an ATM hub or switch.

attach.   To make a device a part of a network logically. Contrast with *connect*, which implies physically connecting a device to a network.

B

bandwidth.   The difference, expressed in hertz, between the highest and the lowest frequencies of a range of frequencies.   For example, analog transmission by recognizable voice telephone requires a bandwidth of about 3000 hertz (3 kHz).

baud.   The rate at which signal conditions are transmitted per second.   Contrast with *bits per second (bps)*.

BER.   Bit error rate.

bit error rate (BER).   The ratio of the number of bits experiencing error on a telecommunications link divided by the number of bits sent over the link.

bits per second (bps).   The rate at which bits are transmitted per second.   Contrast with *baud*.

bridge.   (1) An attaching device that connects two LAN segments to allow the transfer of information from one LAN segment to another. A bridge may attach the LAN segments directly by network adapters and software in a single device, or may connect network adapters in two separate devices through software and use of a telecommunications link between the two adapters. (2) A functional unit that connects two LANs that use the same logical link control (LLC) procedures but may use the same or different medium access control (MAC) procedures. (T) Contrast with *gateway* and *router*.

broadband.   A frequency band divisible into several narrower bands so that different kinds of transmissions such as voice, video, and data transmission can occur at the same time.   Synonymous with *wideband*.

buffer.   (1) A portion of storage used to hold input or output data temporarily. (2) A routine or storage used to compensate for differences in data rate or time of occurrence of events, when transferring data from one device to another. (A)

bus.   (1) In a processor, a physical facility on which data is transferred to all destinations, but from which only addressed destinations may read in accordance

with appropriate conventions. (I) (2) A network configuration in which nodes are interconnected through a bidirectional transmission medium. (3) One or more conductors used for transmitting signals or power. (A)

byte.   (1) A string that consists of a number of bits, treated as a unit, and representing a character. (T) (2) A binary character operated upon as a unit and usually shorter than a computer word. (A) (3) A string that consists of a particular number of bits, usually 8, that is treated as a unit, and that represents a character. (4) A group of 8 adjacent binary digits that represent one extended binary-coded decimal interchange code (EBCDIC) character.

C

C.   Celsius.

CBR.   Constant bit rate.

CCITT.   Comité Consultatif International Télégraphique et Téléphonique.   The International Telegraph and Telephone Consultative Committee.

CLP.   Cell loss priority.

configuration.   (1) The arrangement of a computer system or network as defined by the nature, number, and chief characteristics of its functional units.   More specifically, the term may refer to a hardware configuration or a software configuration. (I) (A) (2) The devices and programs that make up a system, subsystem, or network.

connect.   In a LAN, to physically join a cable from a station to an access unit or network connection point. Contrast with *attach*.

connection.   (1) In data communication, an association established between functional units for conveying information. (I) (A) (2) In Open Systems Interconnection architecture, an association established by a given layer between two or more entities of the next higher layer for the purpose of data transfer. (T) (3) In TCP/IP, the path between two protocol applications that provides reliable data stream delivery service. In Internet, a connection that extends from a TCP application on one system to a TCP application on another system. (4) The path between two protocol functions, usually located in different machines, that provides reliable data delivery service. (5) A logical association between a call participant (party) and a switch. A party's connection represents that party's participation in a telephone call.

D

data communication.   (1) Transfer of information between functional units by means of data transmission according to a protocol. (T) (2) The transmission, reception, and validation of data. (A)

data transfer rate.   The average number of bits, characters, or blocks per unit of time passing between equipment in a data-transmission system. (I) The rate is expressed in bits, characters, or blocks per second, minute, or hour.

data transmission.   The conveying of data from one place to another for reception by telecommunication means. (I)

dB.   Decibel.

dBm.   Decibels based on 1 milliwatt.

dc.   Direct current.

decibel (dB).   (1) One tenth of a bel. (2) A unit that expresses the ratio of two power levels on a logarithmic scale. (3) A unit for measuring relative power. The number of decibels is 10 times the logarithm (base 10) of the ratio of the measured power levels. If the measured levels are voltages (across the same or equal resistance), the number of decibels is 20 times the log of the ratio.

decibels based on 1 milliwatt (dBm).   A unit of absolute power measurement that is scaled such that 0 dBm equals 1 milliwatt.

default.   Pertaining to an attribute, condition, value, or option that is assumed when none is explicitly specified. (I)

destination.   Any point or location, such as a node, station, or particular terminal, to which information is to be sent.

device.   (1) A mechanical, electrical, or electronic contrivance with a specific purpose. (2) An input/output unit such as a terminal, display, or printer.

diagnostics.   Modules or tests used by computer users and service personnel to diagnose hardware problems.

DMM.   Distributed Management Module.

dump.   (1) To record, at a particular instant, the contents of all or part of one storage device in another storage device. Dumping is usually for the purpose of debugging. (T)   (2) Data that has been dumped. (T) (3) To copy data in a readable format from main or auxiliary storage onto an external medium such as tape, diskette, or printer. (4) To copy the contents of all or part of virtual storage for the purpose of collecting error information.

E

EIA.   Electronic Industries Association.

EEPROM.   Electrically erasable programmable read-only memory.

electrically erasable programmable read-only memory (EEPROM).   A PROM that can be erased by a special process and reused. (T)

Electronic Industries Association (EIA).   An organization of electronics manufacturers that advances the technological growth of the industry, represents the views of its members, and develops industry standards.

equipment rack.   Synonym for *rack*.

F

F.   Fahrenheit.

FCC.   Federal Communications Commission (USA).

field.   On a data medium or a storage medium, a specified area used for a particular category of data; for example, a group of character positions used to enter or display wage rates on a panel. (T)

file.   A named set of records stored or processed as a unit. (T)

File Transfer Protocol (FTP).   (1) In TCP/IP, an application protocol used for transferring files to and from host computers. FTP requires a user ID and possibly a password to allow access to files on a remote host system. FTP assumes that the Transmission Control Protocol is the underlying protocol. (2) In the Internet suite of protocols, an application layer protocol that uses TCP and Telnet services to transfer bulk-data files between machines or hosts. See also *TFTP*.

FTP.   (1) File Transfer Protocol. (2) Foiled twisted pair.

G

gateway. A device and its associated software that interconnect networks or systems of different architectures. The connection is usually made above the reference model network layer. Contrast with *bridge* and *router*.

GFC. Generic Flow Control.

H

hardware. Physical equipment as opposed to programs, procedures, rules, and associated documentation. (I) (A)

header. The portion of a message that contains control information for the message such as one or more destination fields, name of the originating station, input sequence number, character string indicating the type of message, and priority level for the message.

host computer. (1) The primary or controlling computer in a multi-computer installation or network. (2) In a network, a processing unit in which resides a network access method. Synonymous with *host processor*.

Hz. Hertz; frequence in cycles/second.

I

I/O. Input/output.

ILMI. Interim Local Management Interface.

input/output (I/O). (1) Pertaining to input, output, or both (A). (2) Pertaining to a device, process, or channel involved in data input, data output, or both.

interface. (1) A shared boundary between two functional units, defined by functional characteristics, signal characteristics, or other characteristics, as appropriate. The concept includes the specification of the connection of two devices having different functions. (T)   (2) Hardware, software, or both, that links systems, programs, or devices.

International Organization for Standardization (ISO). An organization of national standards bodies from various countries established to promote development of standards to facilitate international exchange of goods

and services, and develop cooperation in intellectual, scientific, technological, and economic activity.

internet. A collection of networks interconnected by a set of routers that allow them to function as a single, large network. See also *Internet*

Internet. The internet administered by the Internet Architecture Board (IAB), consisting of large national backbone networks and many regional and campus networks all over the world. The Internet uses the Internet suite of protocols.

Internet address. See *IP address*.

Internet Protocol (IP). (1) A protocol that routes data through a network or interconnected networks. IP acts as an interface between the higher logical layers and the physical network. This protocol, however, does not provide error recovery, flow control, or guarantee the reliability of the physical network. IP is a connectionless protocol. (2) A protocol used to route data from its source to its destination in an Internet environment.

interoperability. The capability to communicate, execute programs, or transfer data among various functional units in a way that requires the user to have little or no knowledge of the unique characteristics of those units. (T)

IP. Internet Protocol.

IP address. The 32-bit address defined by the Internet Protocol, standard 5, Request for Comment (RFC) 791. It is usually represented in dotted decimal notation.

ISO. International Organization for Standardization.

ITU. International Telecommunication Union.

J

jumper cable. Synonym for *patch cable*.

K

Kbps. Kilobits per second.

kilobit (Kb). (1) For processor storage, real and virtual storage, and channel volume, 2^{10} or 1024 bits. (2) For disk storage capacity and communications volume, 1000 bits.

kilobyte (KB). (1) For processor storage, real and virtual storage, and channel volume, 2^{10} or 1024 bytes. (2) For disk storage capacity and communications volume, 1000 bytes.

L

LAN. Local area network.

LED. Light-emitting diode.

local. (1) Pertaining to a device accessed directly without use of a telecommunication line. (2) Contrast with *remote*.

local area network (LAN). (1) A computer network located on a user's premises within a limited geographical area. Communication within a local area network is not subject to external regulations; however, communication across the LAN boundary may be subject to some form of regulation. (T) (2) A network in which a set of devices are connected to one another for communication and that can be connected to a larger network. (3) See also *Ethernet* and *token ring*. (4) Contrast with *metropolitan area network (MAN)* and *wide area network (WAN)*.

M

m. Meter, meters.

MAN. Metropolitan area network.

Management Information Base (MIB). A tree-like data structure for the definition and use of information.

Mb. Megabit; 1 048 576 bits.

Mbps. One million bits per second.

MB. Megabyte; 1 048 576 bytes.

megabyte. (1) For processor storage and real and virtual memory, 2^{20} or 1 048 576 bytes. (2) For disk storage capacity and transmission rates, 1 000 000 bytes.

MIB. Management Information Base.

mm. Millimeter.

N

network. (1) A configuration of data processing devices and software connected for information interchange. (2) An arrangement of nodes and connecting branches. Connections are made between data stations. (T)

network administrator. A person who manages the use and maintenance of a network.

network node interface (NNI). The interface between two network nodes.

NNI. Network node interface.

O

OSPF. Open Shortest Path First

output device. A device in a data processing system by which data can be received from the system. (I) (A) Synonymous with *output unit*.

output unit. Synonym for *output device*.

P

parameter. (1) A variable that is given a constant value for a specified application and that may denote the application. (I) (A) (2) An item in a menu or for which the user specifies a value or for which the system provides a value when the menu is interpreted. (3) Data passed between programs or procedures.

parity. (1) A transmission error-checking scheme in which an extra bit is added to some unit of data, usually a byte, in order to make the total number of one bits even or odd. No-parity means that no parity bit is sent or expected. Mark and space mean that the parity position is always set to one or zero, respectively, and that received parity is not checked. (2) The state of being either even-numbered or odd-numbered.

parity (even). A condition when the sum of all of the digits in an array of binary digits is even.

parity (odd). A condition when the sum of all of the digits in an array of binary digits is odd.

patch cable. A length of cable with data connectors at both ends that is normally used to interconnect two

sections of building cable at a patch panel or to connect a product to the building cable. Synonymous with *jumper cable*.

patch panel. An organized concentration of cable terminations, usually mounted in a flat panel, that facilitates the interconnection of communication cables.

path. (1) In a network, any route between any two nodes. (T) (2) The route traversed by the information exchanged between two attaching devices in a network.

port. (1) An access point for data entry or exit. (2) A connector on a device to which cables for other devices such as display stations and printers are attached. Synonymous with *socket*. (3) A PHY entity and a PMD entity in a node, together creating a PHY/PMD pair, that may connect to the fiber media and provide one end of a physical connection with another node.

protocol. (1) A set of semantic and syntactic rules that determines the behavior of functional units in achieving communication. (I) (2) In SNA, the meanings of and the sequencing rules for requests and responses used for managing the network, transferring data, and synchronizing the states of network components. (3) A specification for the format and relative timing of information exchanged between communicating parties.

Q

QOS. Quality of service

quality of service (QOS). A set of communication characteristics required by an application. Each QOS defines a specific transmission priority, level of route reliability, and security level. Each QOS also defines whether the sessions are interactive.

R

rack. Synonym for *equipment rack*.

RAM. Random access memory.

random access memory (RAM). A computer's or adapter's volatile storage area into which data may be entered and retrieved in a nonsequential manner.

remote. (1) Pertaining to a system, program, or device that is accessed through a telecommunication line. (2) Contrast with *local*.

router. An attaching device that connects two LAN segments, which use similar or different architectures, at the reference model network layer. Contrast with *bridge* and *gateway*.

routing. (1) The assignment of the path by which a message will reach its destination. (2) In SNA, the forwarding of a message unit along a particular path through a network, as determined by the parameters carried in the message unit, such as the destination network address in a transmission header.

RS-232. In data communications, a specification of the Electronic Industries Association (EIA) that defines the interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE), using serial binary data interchange.

RX. Receive.

S

server. (1) A device, program, or code module on a network dedicated to providing a specific service to a network. (2) On a LAN, a data station that provides facilities to other data stations. Examples are a file server, print server, and mail server.

session. (1) In network architecture, for the purpose of data communication between functional units, all the activities which take place during the establishment, maintenance, and release of the connection. (T) (2) The period of time during which a user of a terminal can communicate with an interactive system, usually, elapsed time between logon and logoff.

SFTP. Screened and foiled twisted pair.

signaling. Establishment of an ATM connection from a call set up by an end device.

SLIP. Serial Line Internet Protocol.

station. (1) A communication device attached to a network. The term most often used in LANs is an *attaching device* or *workstation*. (2) An input or output point of a system that uses telecommunication facilities. (3) An addressable node on an FDDI network capable of transmitting, repeating, and receiving information. A station has exactly one SMT, at least one MAC, at least one PHY, and at least one PMD.

STP. Shielded twisted pair.

subnet. (1) In TCP/IP, a part of a network that is identified by a portion of the IP address. (2) Synonym for *subnetwork*.

subnet address. In Internet communications, an extension of the basic IP addressing scheme where a portion of the host address is interpreted as the local network address.

subnet mask. Synonym for *address mask*.

subnetwork. (1) A group of nodes that have a set of common characteristics, such as the same network ID. (2) Synonymous with *subnet*.

SVC. Switched virtual connection.

T

TCP/IP. Transmission Control Protocol/Internet Protocol.

Telnet. In TCP/IP, an application protocol that allows a user at one site to access a remote system as if the user's display station were locally attached. Telnet uses the Transmission Control Protocol as the underlying protocol.

TFTP. Trivial File Transfer Protocol.

topology. The physical or logical arrangement of nodes in a computer network. Examples include ring topology and bus topology.

trace. (1) A record of the execution of a computer program. It exhibits the sequences in which the instructions were executed. (A) (2) A record of the frames and bytes transmitted on a network.

transceiver. Any terminal that can transmit and receive data.

Transmission Control Protocol (TCP). A communications protocol used in the Internet. TCP provides a reliable host-to-host protocol between hosts in packet-switched communications networks and in interconnected systems of such networks. It uses the Internet Protocol (IP) as the underlying protocol.

Transmission Control Protocol/Internet Protocol (TCP/IP). A set of communications protocols that support peer-to-peer connectivity functions for both local and wide area networks.

transmission medium. (1) A physical carrier of electrical energy or electromagnetic radiation. (2) The physical medium that conveys data between data stations; for example, twisted-pair wire, optical fiber, coaxial cable. (T)

transmit. (1) The action of a station in generating a token, frame, or other symbol sequence and placing it on the outgoing medium. (2) The action of a station that consists of generating a frame, token, or control sequence, and placing it on the medium to the next station.

trap. Trajectory analysis program.

TRS. Topology Routing Service.

twisted pair. A transmission medium that consists of two insulated conductors twisted together to reduce noise. (T)

TX. Transmit.

U

UNI. User-network interface.

unshielded twisted pair (UTP). One or more twisted pairs of copper wire in the unshielded voice-grade cable commonly used to connect a telephone to its wall jack. Synonym for *telephone twisted pair*.

user-network interface (UNI). Physical and logical definition of the interface between an ATM user device and the ATM network.

UTP. Unshielded twisted pair.

V

V. Volt.

V ac. Volts alternating current.

variable. (1) In computer programming, a character or group of characters that refers to a value and, in the execution of a computer program, corresponds to an address. (2) A quantity that can assume any of a given set of values. (A)

VBR. Variable bit rate.

VCC. Virtual channel connection.

VCI. Virtual channel identifier (in ATM cell header).

VPI. Virtual path identifier (in ATM cell header).

W

WAN. Wide area network.

wide area network (WAN). (1) A network that provides communication services to a geographic area larger than that served by a local area network or a metropolitan area network, and that may use or provide public communication facilities. (T) (2) A data communications network designed to serve an area of hundreds or thousands of miles; for example, public and private packet-switching networks and national telephone networks. (3) Contrast with *local area network (LAN)* and *metropolitan area network (MAN)*.

wiring closet. A room that contains one or more distribution panels and equipment racks that are used to interconnect cables. Sometimes called a *network wiring closet* to distinguish it from a telephone wiring closet.

workstation. (1) A functional unit at which a user works. A workstation often has some processing capability. (T) (2) One or more programmable or nonprogrammable devices that allow a user to do work. (3) A terminal or microcomputer, usually one that is connected to a mainframe or to a network, at which a user can perform applications.

Bibliography

For supplementary information on the functions and technology in the ATM 25 Mbps Module, please refer to the following documents:

IBM 8260 Nways Multiprotocol Switching Hub ATM Control Point and Switch Module, Installation and User's Guide, SA33-0326.

IBM 8260 Multiprotocol Intelligent Switching Hub Installation Guide, SA33-0251.

IBM 8250 Multiprotocol Switching Hub, IBM 8260 Multiprotocol Intelligent Switching Hub, IBM 8285 Nways ATM Workgroup Switch, Planning and Site Preparation Guide, GA33-0285.

IBM 8285 Nways ATM Workgroup Switch Installation and User's Guide, SA33-0381.

IBM 8260 Nways Multiprotocol Switching Hub, IBM 8285 Nways ATM Workgroup Switch, ATM Command Reference Guide, SA33-0385.

IBM 8260 Multiprotocol Intelligent Switching Hub, Distributed Management Module User's Guide, SA33-0259.

IBM 8260 Multiprotocol Intelligent Switching Hub, Distributed Management Module Commands Guide, SA33-0275.

Case, J., Fedor, M., Scoffstall, M., and Davin, J., *The Simple Network Managemnet Protocol*, University of Tennessee at Knoxville, Performance Systems International and the MIT Laboratory for Computer Science, May 1990.

De Prycker, M., *Asynchronous Transfer Mode – Solution for Broadband ISDN*, Ellis Horwood, 1991.

Handel, R. and Huber, M.N., *Integrated Broadband Networks – An Introduction to ATM-Based Networks*, Addison-Wesley, 1991.

The ATM Forum, *ATM User-Network Interface Specification – Version 3.0 & V3.1*.

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