

TURBOWAYS 622 PCI MMF ATM Adapter



# Installation and Using Guide

**Note**

Before using this information and the product it supports, be sure to read the general information under "Product Warranties and Notices" included with your system unit.

**First Edition (October, 2000)**

Before using this information and the product it supports, read the information in "Safety Information" on page v and "Appendix B. Notices" on page 29.

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# Contents

<b>Safety Information.</b>	v
Handling-Static Sensitive Devices	v
<b>About This Book.</b>	vii
Who Should Use This Book.	vii
Terms Used in this Book.	vii
ISO 9000.	vii
Related Publications	vii
Trademarks	vii
<b>Chapter 1. Overview</b>	1
Software Requirements	1
<b>Chapter 2. Preparing for Installation</b>	3
Installation Requirements.	3
Determining Your Cable Requirements	3
Determining Your Software Requirements	4
<b>Chapter 3. Installing Device Driver Software</b>	5
Verifying AIX Software Installation	6
<b>Chapter 4. Installing the Device Driver on the RS/6000 SP System.</b>	7
Checking System Prerequisites.	7
Installing Software on the Control Workstation	10
Installing Device Drivers on the SP Nodes.	10
<b>Chapter 5. Installing the TURBOWAYS 622 PCI MMF ATM Adapter</b>	13
Verifying Adapter Hardware Installation.	13
<b>Chapter 6. Configuring and Using ATM622 Software</b>	15
Configuring the Adapter	15
Setting the Host Name, Name Server, or Gateway	16
Configuring the Adapter to Use PVCs	16
ATM622 Software Removal Procedure	17
<b>Chapter 7. Managing the Network.</b>	19
ATM Connections	19
TCP/IP over ATM	19
Configuring with PVCs	20
Networking with ATM SVCs	20
Changing ATM Adapter Characteristics	20
<b>Chapter 8. Connecting the TURBOWAYS 622 PCI MMF ATM Adapter to the Network</b>	23
Connecting the Network Cables and Adapter.	23
Understanding the Adapter LEDs.	24

<b>Appendix A. Communications Statements</b> . . . . .	25
Federal Communications Commission (FCC) Statement . . . . .	25
European Union (EU) Statement . . . . .	26
International Electrotechnical Commission (IEC) Statement . . . . .	26
United Kingdom Telecommunications Safety Requirements . . . . .	26
Avis de conformité aux normes du ministère des Communications du Canada . . . . .	26
Canadian Department of Communications Compliance Statement . . . . .	26
VCCI Statement . . . . .	27
Radio Protection for Germany . . . . .	27
 <b>Appendix B. Notices</b> . . . . .	 29
 <b>Appendix C. Troubleshooting</b> . . . . .	 31
Diagnostics . . . . .	31
Other Troubleshooting Methods . . . . .	31
 <b>Reader's Comments — We'd Like to Hear From You</b> . . . . .	 33

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## Safety Information

### DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

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## Handling-Static Sensitive Devices

**Attention:** Static electricity can damage this device and your system unit. To avoid damage, keep this device in its anti-static protective bag until you are ready to install it. To reduce the possibility of electrostatic discharge, follow the precautions listed below:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the device is still in its anti-static package, touch it to an unpainted metal part of the system unit for at least two seconds. (This drains static electricity from the package and from your body.)
- Remove the device from its package and install it directly into your system unit without setting it down. If it is necessary to set the device down, place it on its static-protective package. (If your device is an adapter, place it component-side up.) Do not place the device on your system unit cover or on a metal table.
- Take additional care when handling devices during cold weather, as heating reduces indoor humidity and increases static electricity.



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## About This Book

This book describes the TURBOWAYS 622 PCI MMF ATM Adapter and its various features.

Use this information, along with your system unit documentation, to install the TURBOWAYS 622 PCI MMF ATM Adapter and associated device driver software.

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## Who Should Use This Book

This book is written for system administrators and for experienced computer users who have a general understanding of asynchronous transfer mode (ATM), networking, and AIX Version 4.3.3 or later.

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## Terms Used in this Book

- ATM: asynchronous transfer mode
- MMF: multimode fiber
- PCI: peripheral component interconnect
- VCI: virtual channel identifier
- VPI: virtual path identifier

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## ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

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## Related Publications

The following publications contain related information:

- System unit documentation for information specific to your hardware configuration
- Operating system documentation for information specific to your software configuration

This documentation is located on the AIX V4.3 documentation CD. The documentation information is made accessible by loading the documentation CD onto the hard disk or by mounting the CD in the CD-ROM drive.

- *PCI Adapter Placement Reference Guide* (for the latest version, you may need to contact your marketing representative)

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## Trademarks

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- AIX
- RS/6000

- SP
- TURBOWAYS

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## Chapter 1. Overview

The TURBOWAYS 622 PCI MMF ATM Adapter is a 64-bit, universal PCI adapter that provides direct access to ATM networks through a dedicated 622 Mbps full-duplex connection. It is a PCI short form factor adapter and connects to the 622 ATM network through an LED-driven, dual-SC type, multimode fiber optics cable. The 622 PCI MMF Adapter uses 16 MB of SDRAM (synchronous dynamic random access memory) for control and 16 MB of SDRAM for packet memory.

The TURBOWAYS 622 PCI MMF ATM Adapter provides the following features:

- 33 Mhz and 66 Mhz operation
- Full-duplex operation
- SVC (switched virtual circuit) and PVC (permanent virtual circuit) support
- 16 MB of control memory and 16 MB of packet memory
- Fiber SC connector for multimode fiber cabling

**Note:** Instructions assume you are connecting the TURBOWAYS 622 PCI MMF ATM Adapter on AIX to an ATM switch or concentrator. If you have any problems installing or configuring your adapter, refer to “Appendix C. Troubleshooting” on page 31 for problem-solving information.

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## Software Requirements

The TURBOWAYS 622 PCI MMF ATM Adapter is supported on AIX Version 4.3.3 or later. The device driver for AIX 4.3.3 is shipped with the adapter and included in the “AIX 4.3.3 Additional Device Software” CD. If support is required on an earlier version of AIX release, ensure that this adapter is supported on that release prior to installation. Contact your support representative for assistance.



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## Chapter 2. Preparing for Installation

This chapter helps you to prepare to install the TURBOWAYS 622 PCI MMF ATM Adapter.

Installing the adapter consists of the following steps:

1. Taking an inventory of all pieces necessary for installation
2. Determining your cable requirements
3. Determining your software requirements
4. Installing device drivers and diagnostics
5. Installing the adapter

**Note:** If AIX is not installed on your system unit, install your adapter prior to installing your operating system. (See “Chapter 5. Installing the TURBOWAYS 622 PCI MMF ATM Adapter” on page 13.) If AIX is operating on your system, install your device software prior to installing your adapter. (See “Chapter 3. Installing Device Driver Software” on page 5.)

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### Installation Requirements

To install the TURBOWAYS 622 PCI MMF ATM Adapter, you need the following on hand:

- TURBOWAYS 622 PCI MMF ATM Adapter
- AIX Version 4.3.3 additional device driver CD
- Wrap plug, part number 04P9438 (if running diagnostics)
- A shortwave (850nm) 62.5 micron multimode fiber network attachment cable
- A flat-blade screwdriver
- Your system unit documentation, including any service documentation
- Your operating system documentation
- Registration card

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### Determining Your Cable Requirements

The following table shows the minimum and maximum allowable cable lengths from the adapter to the ATM 622Mbps switch, including patch cables:

Fiber Type	Modal Bandwidth (Mhz-km)	Minimum Length (meters)	Maximum Length (meters)
62.5 $\mu$ m MMF	160	2	220
62.5 $\mu$ m MMF	200	2	275

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## Determining Your Software Requirements

The ATM622 device driver for AIX Version 4.3.3 is shipped with this adapter and included in the *AIX 4.3.3 Additional Device Software CD*. Its package name is **devices.pci.14105e01**.

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## Chapter 3. Installing Device Driver Software

This section explains how to install the device driver software.

To install the device driver software on an AIX system, do the following:

1. Be sure you have read “Chapter 2. Preparing for Installation” on page 3 to determine:
  - If you should install your device driver software first, go to step 2 and continue with this section.
  - If you should install your ATM adapter hardware first, go to “Chapter 5. Installing the TURBOWAYS 622 PCI MMF ATM Adapter” on page 13.
2. Turn on the system unit power.
3. Log in as **root** user.
4. Insert the media containing the device driver software (example: CD-ROM) into the appropriate media device.
5. Type the following System Management Interface Tool (SMIT) fast path:  
smit devinst
6. Press Enter. The Install Additional Device Software screen highlights the **INPUT device/directory for software** option.
7. Select or type *your input device*:
  - Press F4 to display the input device list. Select the *name of the device* (example: CD-ROM) that you are using and press Enter.
  - OR
  - In the entry field, type the *name of the input device* you are using and press Enter. The Install Additional Device Software window highlights the **SOFTWARE to install** option.
8. Press F4 to display the SOFTWARE to install window.
9. Type the following to display the Find window:  
/  
/
10. Type the following for the TURBOWAYS 622 PCI MMF ATM Adapter:  
devices.pci.14105e01  
  
and press Enter. (The system finds and highlights this device driver software.)
11. Press F7 to select the highlighted device driver software and press Enter.
12. The Install Additional Device Software screen displays. Entry data fields are automatically updated. Press Enter to accept the data.
13. The ARE YOU SURE window displays. Press Enter to accept the data.
14. The COMMAND STATUS screen appears.
  - The term RUNNING is highlighted to indicate that the install and configure command is in progress.
  - When RUNNING changes to OK, scroll down to the bottom of the page and locate the Installation Summary.

- After a successful installation, SUCCESS will appear in the Result column of the summary at the bottom of the page.
15. Remove the installation media from the drive.
  16. Press F10 to exit SMIT.
  17. Refer to your system unit documentation to shut down your system unit.
  18. Go to the adapter hardware installation procedure, “Chapter 5. Installing the TURBOWAYS 622 PCI MMF ATM Adapter” on page 13.

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## Verifying AIX Software Installation

To verify that the device driver for the TURBOWAYS 622 PCI MMF ATM Adapter is installed, do the following:

1. If necessary, log in as **root** user.
2. At the command line, type:  

```
lslpp -l devices.pci.14105e01.rte
```
3. Press Enter.

Possible results are as follows:

- If the TURBOWAYS 622 PCI MMF ATM Adapter device driver is installed, the following is an example of the data that displays on your screen:

Fileset	Level	State	Description
-----			
Path: /usr/lib/objrepos devices.pci.14105e01.rte	4.3.3.25	COMMITTED	...ATM... Adapter Software
Path: /etc/objrepos devices.pci.14105e01.rte	4.3.3.25	COMMITTED	...ATM... Adapter Software

Verify that the fileset **devices.pci.14105e01.rte** is installed at the 4.3.3. level or higher.

If this information displays but you continue to have problems, go to “Chapter 5. Installing the TURBOWAYS 622 PCI MMF ATM Adapter” on page 13.

- If no data displays on your screen, the TURBOWAYS 622 PCI MMF ATM Adapter device driver did not install correctly. Return to “Chapter 3. Installing Device Driver Software” on page 5.

If you continue to experience problems, it may be necessary to call your system support organization. Refer to your operating system documentation for instructions.

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## Chapter 4. Installing the Device Driver on the RS/6000 SP System

For an SP system, the installation tasks must be performed on each node. You must make the installation files available and then install them on all the relevant nodes. This chapter explains the following tasks to enable you to install the device driver on the RS/6000 SP System:

- Checking System Prerequisites
- Installing Software on the Control Workstation (*if* the device driver is not in the `lppsource` directory)
- Installing Device Drivers on the SP Nodes (*if* the device driver and additional software are not already installed)

Perform the following tasks on the Control Workstation. If you are unfamiliar with the **dsh** command, refer to one of the following Parallel System Support Program (PSSP) publications:

- *Parallel System Support Program for AIX: Administration Guide*
- *Parallel System Support Program for AIX: Command and Technical Reference*

If you cannot use the **dsh** command because of the setup at your site, then use the **telnet** command to each node. Then perform the steps below, beginning with step 5, and omitting the `dsh` prefix.

---

### Checking System Prerequisites

Do the following to check system prerequisites:

- \_\_\_ 1. Log into the Control Workstation as a root user.
- \_\_\_ 2. Go to a temporary directory by typing the following at the system prompt:  

```
cd /tmp
```

Press Enter.
- \_\_\_ 3. Make a "working collective" file containing a list of the relevant nodes on which you want to perform the update. Type the following, pressing Enter after each line:  

```
cat > group1  
nodename1  
nodename2  
nodename3.....  
CTRL-D  
export WCOLL=/tmp/group1
```
- \_\_\_ 4. Test the working collective file by typing the following:  

```
dsh date
```

Press Enter. The results should look similar to the following:

```
nodename1: Wed Apr 10 10:37:46 EDT 1999
nodename2: Wed Apr 10 10:37:46 EDT 1999
nodename3: Wed Apr 10 10:37:47 EDT 1999
nodename4: Wed Apr 10 10:37:48 EDT 1999
```

If not, examine your nodelist file `/tmp/group1` to ensure that the node names are correct. Also ensure that the Kerberos ticket is current to permit `rsh` to be performed. If not, you may need to refresh it. Contact your system administrator for assistance with Kerberos initialization. If the system administrator is unable to help you, consult your support center.

An alternative way to specify a working collective is by using the `-w` flag with the `dsh` command. If you need to install only a few nodes, use the `dsh -w host1, host2, host3...command` format to explicitly reference groups of nodes.

- \_\_\_ 5. Determine if the AIX operating system on each relevant node is at the required level by typing the following at the prompt:

```
dsh oslevel
```

OR

```
dsh -w <host1,host2> oslevel
```

Press Enter. `<host1,host2>` is a list of the host names for the nodes on which the adapter will be installed. The required AIX level is: 4.3.3 or later.

If the nodes are *not* at a supported AIX level, upgrade the AIX level on the nodes. Contact the system administrator for assistance.

- \_\_\_ 6. Determine if the PSSP level on each node is at the required level by typing the following:

```
/usr/lpp/ssp/bin/sp1stdata -G -b
```

Press Enter. The results display for all nodes and are in a form similar to the following:

```
node#      hostname  hdw_enet_addr  srvr   response  install_disk
last_install_image  last_install_time  next_install_image  lppsource_name
                                                                pssp_ver
-----
1 eion01.ppd.pok.i  08005A75A6D4    0      disk      hdisk0
                    default Thu_Dec__4_09:07:23      default <lppsource>
                                                                <pssp level>
```

`<lppsource>` is the lppsource name for the node. `<pssp level>` is the PSSP level installed on the node. The required PSSP level is 3.1 or later.

If the nodes are *not* at a supported PSSP level, upgrade the PSSP level on the nodes. Contact the system administrator for assistance.

- \_\_\_ 7. Record the name that appears below `lppsource_name` for each node on which the adapters are being installed. You will use this information later.

- \_\_\_ 8. Verify that the device driver is installed in the lppsource directory by typing the following at the system prompt:

```
cd spdata/sys1/install/<lppsource_name>/lppsource
```

<lppsource\_name> was recorded in the previous step. Once you are in this directory, verify that the fileset is in the lppsource directory by typing the following at the prompt:

```
ls devices.pci.14105e01*
```

If the device driver is not in the lppsource directory, proceed to section "Installing Software on the Control Workstation" on page 10 to install the software.

- \_\_\_ 9. Update the SPOT (Shared Product Object Tree) by doing the following:

- \_\_\_ a. Type the following at the system prompt:

```
smitty nim_res_op
```

The Resource Name screen displays with the following highlighted:

```
boot          resources    boot
```

- \_\_\_ b. Move the cursor down until the *SPOT resource* is highlighted. The *SPOT resource* should look similar to:

```
spot_AIX433   resources    spot
```

The format of the spot name is: spot\_<lppsource\_name>. <lppsource\_name> was the name you recorded in a previous step.

- \_\_\_ c. When the *SPOT resource* is highlighted, press Enter to select this option. The Network Install Operation to Perform screen displays with the **reset** option highlighted for selection.

- \_\_\_ d. Move the cursor until the **cust** option is highlighted and press Enter to select this option. The Customize a SPOT screen displays with the **Source of Install Images** highlighted for selection.

- \_\_\_ e. Press F4 to display the list of installation images and select the appropriate lppsource.

- \_\_\_ f. Move the cursor until the appropriate lppsource is displayed. For example:

```
lppsource_AIX433   resources    lpp_source
```

Press Enter.

- \_\_\_ g. Move the cursor until *Fileset Names* is highlighted. Type the following fileset name:

```
devices.pci.14105e01*
```

- \_\_\_ h. Press Enter to start the SPOT update. This operation can take up to 15 minutes.

- \_\_\_ 10. Verify that the device driver is already installed by typing the following at the system prompt:

```
dsh "ls1pp -l devices.pci.14105e01* 2>&1" |more
```

- \_\_ 11. If the device driver is already installed on the node, contact your service provider to have the adapter installed.

OR

If the device driver is not installed on the node, proceed to section “Installing Device Drivers on the SP Nodes”.

---

## Installing Software on the Control Workstation

**Note:** If your system is *partitioned*; that is, there are more than one operating system among the nodes, you may *only* install this adapter in nodes that have AIX 4.3.3 or later.

- \_\_ 1. If you are not logged into the Control Workstation as a root user, log in now. You may also need to export the working collective. Refer to “Checking System Prerequisites” on page 7.
- \_\_ 2. Select the appropriate CD-ROM for the operating system, as follows:
- AIX 4.3.3 - Additional Device Software
- \_\_ 3. Insert the installation media into the drive of the Control Workstation.
- \_\_ 4. Transfer the files to the Control Workstation's lppsource, as follows:
- a. Type the following, and then press Enter.  

```
smitty bffcreate
```
  - b. Select the input device/directory. Press F4. Then move the cursor to the appropriate input device and press Enter.
  - c. Move the cursor to the **SOFTWARE package to copy** option and press F4 to select the software to be installed. Use the F7 key to select the following device driver(s) at the system prompt:  

```
devices.pci.14105e01
```

Press Enter.
  - d. Move the cursor down to **DIRECTORY for storing software package** and enter the appropriate lppsource destination directory:  

```
/spdata/sys1/install/<lppsource_name>/lppsource
```

Use the <lppsource\_name> you recorded earlier.
  - e. Press Enter to begin copying the files.
- Note:** This step may take several minutes while the directory table of contents is updated.
- \_\_ 5. Proceed to 10 on page 9.

---

## Installing Device Drivers on the SP Nodes

Do the following to install device drivers on the SP nodes:

- \_\_\_ 1. Make sure that the lppsource directory is exported to the nodes by typing the following at the system prompt:

```
showmount -e
```

If the directory is exported to the nodes, the result should look similar to the following:

```
/spdata/sys1/install/AIX433/lppsource (everyone)
```

- \_\_\_ 2. If the directory is not exported, you may temporarily export the directory by typing the following:

```
exportfs -i /spdata/sys1/install/<lppsource_name>/lppsource
```

- \_\_\_ 3. Perform an NFS mount of the lppsource directory by typing the following:

```
dsh mount <controlwks>:  
/spdata/sys1/install/<lppsource_name>/lppsource /mnt
```

<controlwks> is the name of the Control Workstation recognized by the nodes.  
<lppsource\_name> is the name you recorded earlier in “Checking System Prerequisites” on page 7.

- \_\_\_ 4. Perform a preview of the files to be installed on the nodes by typing the following at the system prompt:

```
dsh "installp -p -acqXd /mnt device driver 2>&1" | more
```

*device driver* is the fileset that must be installed for the adapter. The list includes:

- devices.pci.14105e01

- \_\_\_ 5. Install the device driver by typing the following at the system prompt:

```
dsh "installp -acqXd /mnt device driver 2>&1" | more
```

*device driver* is defined in the previous step.

After the device driver is installed on the node, contact your service provider to have the adapter installed.



---

## Chapter 5. Installing the TURBOWAYS 622 PCI MMF ATM Adapter

This chapter provides instructions for installing the TURBOWAYS 622 PCI MMF ATM Adapter.

To install the adapter, do the following:

1. Be sure you have read “Chapter 2. Preparing for Installation” on page 3 to determine:
  - If you should install your adapter hardware first, go to step 2 and continue with this section.
  - If you should install your device driver software first, go back to “Chapter 3. Installing Device Driver Software” on page 5. Return here to install your hardware.
2. If your system supports hot-pluggable PCI adapters, return to “Verifying Adapter Hardware Installation” and refer to your system documentation to install the adapter. If your system does not support hot-plugging, continue with the next step.
3. Log in as a **root** user and, at the system prompt, type:  
shutdown

then press Enter. When halt completed displays, turn off the system unit power and unplug the power cord from the wall outlet.

**Note:** Refer to your system unit documentation for further shutdown information.

4. Remove the covers of your system unit. Follow the instructions provided in your system unit documentation.
5. Install the adapter into an available PCI slot in your system unit. See the instructions in your system unit documentation for installing PCI adapters. Refer to your *PCI Adapter Placement Reference* guide for slot locations.
6. Follow the directions provided in your system unit documentation to reinstall the covers of your system unit.
7. Plug the power cord back into the wall outlet.
8. Turn on the power to your system unit.

---

### Verifying Adapter Hardware Installation

To verify that your system unit recognizes the PCI adapter, do the following:

1. If necessary, log in as **root** user.
2. At the command line, type:  
lsdev -Cs pci | grep atm
3. Press Enter.

A list of PCI devices displays. If the TURBOWAYS 622 PCI MMF ATM Adapter did install correctly, an Available status indicates that the adapter is installed and ready to use.

If the message on your screen indicates your adapter is DEFINED instead of AVAILABLE, shut down your machine. Verify that the adapter was installed correctly by repeating the steps in this chapter.

**Note:** If the message on your screen indicates your adapter is DEFINED a second time, it may be necessary to contact your service representative.

If the installed adapter does not appear, continue with “Verifying AIX Software Installation” on page 6.

---

## Chapter 6. Configuring and Using ATM622 Software

This chapter explains how to configure and use ATM622 software for AIX. Included guidelines show you how to configure an ATM Address Resolution Protocol (ARP) server. Before you perform these tasks, read “Chapter 7. Managing the Network” on page 19.

---

### Configuring the Adapter

To configure the TURBOWAYS 622 PCI MMF ATM Adapter:

1. Turn on your system unit power.
2. Log in to the AIX operating system as **root** user.
3. At the AIX command prompt, type `smitty inet` and press Enter.

**Note:** The `ifconfig` command is not compatible with the ATM Network Interface Driver (NID). Use only the SMITTY application when configuring the ATM NID.

4. From the Network Interface Selection menu, select **Add a Network Interface**.
5. From the Add a Network Interface menu, select **Add an ATM Network Interface**.
6. Set the values in the Add an ATM Network Interface screen using these instructions:

- **INTERNET ADDRESS**

Type the dotted decimal Internet Protocol (IP) address assigned to your workstation (for example, 10.125.26.89) and press Enter.

- **Network MASK**

Type the dotted decimal IP network mask for your workstation (for example, 255.255.255.0) and press Enter.

**Note:** To obtain the address and network mask information, see your system administrator.

- **Network Interface**

Type `at0` and press Enter.

- **Connection Type**

Press F4 and select one of the following types:

**svc\_s** Switched Virtual Channel (SVC) ARP Server

**svc\_c** SVC ATM Client

**pvc** SVCs disabled. Only permanent virtual channels (PVCs) are used.

– **ATM Server Address**

- For client connections **svc\_c**, type the 20-byte hexadecimal ARP server ATM address for your system unit and press Enter. (For example, 39.99.99.99.99.99.00.00.99.99.02.02.00.00.8d.44.a3.02.03).

- To obtain your ATM server address, type `arp -t atm -a` on the ARP server machine at the command prompt and press Enter.

- For server connections **svc\_s**, no address is required. Leave this field blank.
  - Alternate Devices
    - Data not required; leave field blank.
  - Idle Timer
    - Data not required; leave field blank.
  - ACTIVATE the interface after creating it?
    - To activate the interface, select the default, **yes**.
7. When the command status in the Command Status screen changes from running to OK, press F10 to exit SMITTY.

To set the host name, a name server, or a gateway, continue with the next section.

To use permanent virtual channels (PVCs), go to “Configuring the Adapter to Use PVCs”.

---

## Setting the Host Name, Name Server, or Gateway

To set the host name, name server, or gateway, do the following:

1. At the AIX command prompt, type `smitty tcpip` and press Enter.
2. From the TCP/IP menu, select **Minimum Configuration and Startup**.
3. From the list of Available Network Interfaces, select **at0**.
4. The Minimum Configuration and Startup screen displays.
5. Type the information for the host name, name server, or gateway in the Minimum Configuration and Startup screen and press Enter.

**Note:** See your system administrator for the required addresses.

6. When the Command status in the Command Status screen changes from running to OK, press F10 to exit SMITTY.

---

## Configuring the Adapter to Use PVCs

**Note:** You can configure the TURBOWAYS 622 PCI MMF ATM Adapter to use PVCs with or without configuring SVCs.

To configure the TURBOWAYS 622 PCI MMF ATM Adapter to use PVCs, do the following:

1. At the command prompt, type `smitty atmpvc` and press Enter.
2. To add PVCs for internet protocol (IP) on an ATM network, select **Add a PVC for IP over an ATM Network**.
3. If you want to change a value in the Add a PVC for IP over an ATM Network screen, find the appropriate instruction below and implement the relevant steps:
  - PVC Description
    - The PVC Description is an optional field.

- VPI:VCI
  - Type 0:x, where x equals a number from 0 to 1023 and press Enter.

**Note:** The virtual path identifier (VPI) must be 0. The valid range for the virtual channel identifier (VCI) is determined by the number of virtual channels (VCs) supported by the switch and the number of VCs reserved for PVC connection.

- Network Interface  
Type `at0` and press Enter.
  - Destination IP Address  
If you set the Automatically Discover Destination IP Address field to no, type the dotted decimal IP address (for example, 162.62.41.96) of the destination end station (ATM-attached host or gateway) and press Enter.
  - Automatically Discover Destination IP Address  
Select **yes** or **no** and press Enter.
  - LLC Encapsulation  
LLC Encapsulation determines whether Logical Link Control / Subnetwork Access Protocol (LLC/SNAP) or null encapsulation is used on the PVC. Select **yes** or **no** and press Enter.
4. When the Command status in the Command Status screen changes from running to 0K, press F3 to return to the PVCs for IP over an ATM Network menu.
  5. To verify that the configuration is correct, select **List All PVCs for IP over an ATM Network**.
  6. When the Command status in the Command Status screen changes from running to 0K, press F3 to return to the PVCs for IP over an ATM Network menu.
  7. If you need to make changes, continue with the next step; otherwise, press F10 to exit SMITTY.
  8. From the PVCs for IP over an ATM Network menu, select **Change / Show Characteristics of a PVC for IP over an ATM Network**.
  9. From the list of Available Interfaces, select **at0**.
  10. If necessary, change values in the Change / Show Characteristics of a PVC for IP over an ATM Network screen and press Enter.
  11. When the Command status in the Command Status screen changes from running to 0K, press F10 to exit SMITTY.

---

## ATM622 Software Removal Procedure

To remove the ATM622 software, do the following:

1. Log in to the AIX operating system as **root**.
2. At the AIX command prompt, type `smitty inet` and press Enter.
3. From the Network Interface Selection Menu, select **Remove a Network Interface**.
4. From the Available Network Interfaces list, select **at0**.
5. When the Command status in the Command Status screen changes from running to 0K, press F10 to exit SMITTY.

6. At the AIX command prompt, type `smitty atm_adpt` and press Enter.
7. From the Adapter menu, select **Remove an ATM Adapter**.
8. From the ATM Adapter list, select **at0**.
9. In the Remove an ATM Adapter screen, set the KEEP definition in the database to **no** and press Enter.
10. When removal is complete and the Command status changes from running to OK, press F10 to exit SMITTY.
11. At the AIX command line prompt, type `rmdev -d1 atm0` and press Enter.
12. At the AIX command line prompt, type `smitty install` and press Enter.
13. From the Software Installation and Maintenance menu, select **Maintain Installed Software**.
14. From the Maintain Installed Software menu, select **Remove Software Products**.
15. In the Remove Software Products screen, do the following:
  - Type the SOFTWARE name: **devices.pci.14105e01**
  - To PREVIEW only, select **no**.
  - To REMOVE dependent software, select **yes**.
  - For DETAILED output? Select **yes** or **no**.
16. The ARE YOU SURE? screen appears.
  - To continue to remove the software, press Enter.
  - To cancel the uninstallation process, press F3.
17. When removal is complete and the Command status in the Command Status screen changes from running to OK, press F10 to exit SMITTY.

---

## Chapter 7. Managing the Network

This chapter provides information to assist in maintaining ATM networks.

---

### ATM Connections

ATM networks use a virtual path identifier (VPI) and a virtual channel identifier (VCI). VPI and VCI together identify connections in the ATM network. A VPI:VCI pair defines a path between two nodes in an ATM network. The VPI field occupies 1 byte and the VCI field occupies 2 bytes in the ATM cell's 5-byte header.

For the TURBOWAYS 622 PCI MMF ATM Adapter, the value of VPI must be 0. The value of VCI can be between 0 and 1024 decimal.

Although not required, VPI:VCI values are typically assigned symmetrically; the same values are reserved in both directions across the link. A link is the physical medium of transmission. For example, telephone wires or microwave beams are considered links. A link connection includes the following:

- Physical medium for transmission
- Protocol
- Associated devices
- Programming

A link connection is both logical and physical.

You can set up more than one virtual channel (VC) on the same link, but the VPI:VCI must be different for each connection on the link. A permanent virtual channel (PVC) is a static connection between two end stations and the ATM network. The PVC is created by selecting a physical path from the end station through the switches to the other end station. VPI:VCIs are assigned to establish the connection between the two end stations. The PVC must be configured in each end station and in all switches included in the connection.

An ATM switch performs the following functions automatically:

- Recognizes the source of the cell
- Changes VPI:VCI
- Determines the destination of the cell
- Transmits the cell to its destination

---

### TCP/IP over ATM

Each ATM network interface can have an assigned IP (internet protocol) address. This assigned network interface can have VPI:VCIs associated with it. This allows a TCP/IP host, identified by its IP address, to communicate with multiple TCP/IP hosts on the ATM network.

If your host has more than one IP address, (for example, one ATM interface and one Token-Ring interface), you must add one network interface for each IP address. The TURBOWAYS 622 PCI MMF ATM Adapter supports multiple network interfaces.

---

## Configuring with PVCs

Users must configure PVCs in ATM-attached hosts, gateways, and switches. For environments requiring the transfer of several protocols over the same VCI or support for inverse ARP (address resolution protocol) requests, LLC (logical link control) encapsulation is provided. If LLC support is enabled, the system issues inverse ARP requests on the VPI:VCI connection to automatically discover the destination's IP address.

This request is issued every minute until the destination IP address is found. After the destination IP address is found, inverse ARP requests are issued every 15 minutes to verify that the connection has not changed. If automatic destination address discovery by inverse ARP is either declined or not supported at the destination, the destination IP address must be specified.

---

## Networking with ATM SVCs

Networking with ATM SVCs (switched virtual circuits) is different from networking with ATM PVCs. PVCs are created by users during configuration of ATM-attached hosts, gateways, and switches. These static connections remain established until they are removed by configuration changes. To establish complete connectivity, a connection must be configured and maintained from each node to every other node. This process can become labor-intensive as the number of connections grows rapidly with the addition of nodes. Using SVCs avoids this complexity.

An IP subnet using SVCs consists of an ATM switch, an ARP server, and ARP clients. During network initialization, endpoints automatically open signaling channels to obtain their 20-byte ATM address from the switch. Using the ARP server and ATM address provided by the user at the time of configuration, clients open a connection with the subnet's ARP server and register both their IP and ATM addresses.

**Note:** Each subnet requires one ATM ARP server. When a client station needs to transmit to another station, the ARP server is called. If the destination's IP address is registered with the server, the destination's ATM address is resolved. The caller now has the destination ATM address and requests a connection to that station through the ATM switch. The switch creates a VPI:VCI connection from the caller to the destination.

---

## Changing ATM Adapter Characteristics

The TURBOWAYS 622 PCI MMF ATM Adapter's characteristics are automatically set during system boot, and these settings are designed to provide optimum performance. If you are an experienced user and want to change the adapter characteristics, use the instructions in this section.

To change the default ATM adapter characteristics, do the following:

1. At the AIX command prompt, type:

```
smitty atm_adpt
```

and press Enter.

2. From the Adapter menu, select **Change / Show Characteristics of an ATM Adapter**.
3. From the ATM Adapter list, select **atm0**.
4. Change any values in the Change / Show Characteristics of an ATM Adapter screen and press Enter.
  - Device name
    - atm0 (read-only)
  - Description
    - ATM 622 Mbit Adapter (read-only)
  - Status
    - Defined (read-only)
  - Location
    - 00-01 (read-only)
  - Enable ALTERNATE ATM MAC address
    - Set this characteristic to **yes** to enable the ATM media access control (MAC) address you specify in the ALTERNATE ATM MAC address field.
  - ALTERNATE ATM MAC address
    - Type the MAC address in hexadecimal format (for example: 0x0000D10008ED).

**Note:** To facilitate an easy swap of ARP servers and/or server adapters, the option of a user-specified alternate MAC address is provided. Because an endpoint's ATM address is partially derived from the adapter's MAC address, changing an adapter in an endpoint changes that station's ATM address.

If an ARP server adapter is changed, it is not necessary to change the ARP server ATM address in each ARP client. The MAC address of the previous configuration can be entered as the alternate MAC address of the new adapter. Each MAC addresses within a network, however, must be unique.

- ATM Adapter PDU Size
    - ATM Adapter PDU (Protocol Data Unit) Size field specifies the maximum packet size that the IP stack generates for the ATM interface.
    - Do not change the default value of 9180 unless another PDU size has been configured and is used by all other hosts and routers in the IP subnet.  
To see the range of valid values for this setting press F4.
5. When the Command status in the Command Status screen changes from running to OK, press F3.
  6. To exit SMITTY, press F10.



---

## Chapter 8. Connecting the TURBOWAYS 622 PCI MMF ATM Adapter to the Network

This chapter provides instructions for connecting the network cables and the adapter.

Refer to your local procedures for information about connecting the TURBOWAYS 622 PCI MMF ATM Adapter to your ATM network.

**Note:** The connector on the adapter conforms with the ATM Forum standard. If your switch connector pinout is not compatible with this standard, obtain or create a cable that conforms to this standard.

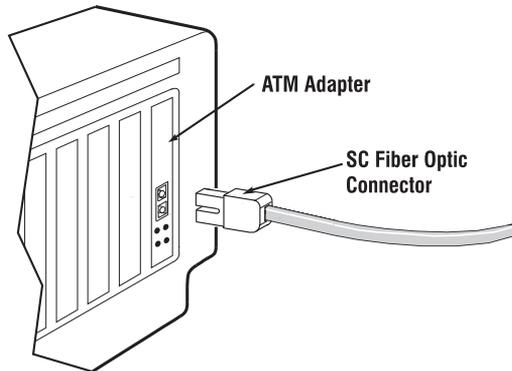
---

### Connecting the Network Cables and Adapter

Make sure you have read “Chapter 2. Preparing for Installation” on page 3 before you begin connecting the adapter.

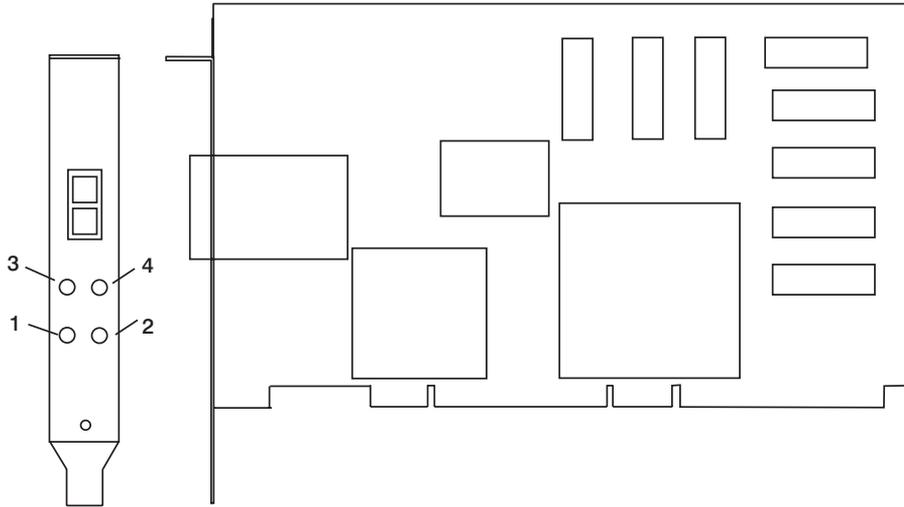
To connect the adapter to a multimode fiber network, do the following:

1. Insert the male SC Fiber Optic connector on the fiber cable into the adapter SC connector.
2. Insert the male SC Fiber Optic connector on the other end of the cable into the network switch.



---

## Understanding the Adapter LEDs



The LEDs on the TURBOWAYS 622 PCI MMF ATM Adapter provide information about the adapter's operation status. The LEDs are visible through the adapter's mounting bracket and, when lit, indicate the following conditions:

Light	State	Description
1	On	Signal Detect
2 (Reserved)	Not Applicable	Not Applicable
3 (Reserved)	Not Applicable	Not Applicable
4 (Reserved)	Not Applicable	Not Applicable

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## Appendix A. Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

---

### Federal Communications Commission (FCC) Statement

**Note:** The TURBOWAYS 622 PCI MMF ATM Adapter has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from authorized dealers. Neither the provider nor the manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

International Business Machines Corporation  
New Orchard Road  
Armonk, New York  
10504 Telephone: (919) 543-2193



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## European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

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## International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

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## United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

---

## Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

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## Canadian Department of Communications Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

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## VCCI Statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。  
取扱説明書に従って正しい取り扱いをして下さい。

The following is a summary of the VCCI Japanese statement in the box above.

This product is a Class B Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). This product is aimed to be used in a domestic environment. When used near a radio or TV receiver, it may become the cause of radio interference. Read the instructions for correct handling.

---

## Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG-Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.



---

## Appendix B. Notices

This information was developed for products and services offered in the U.S.A.

The manufacturer may not offer the products, services, or features discussed in this document in other countries. Consult the manufacturer's representative for information on the products and services currently available in your area. Any reference to the manufacturer's product, program, or service is not intended to state or imply that only that product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any intellectual property right of the manufacturer may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any product, program, or service.

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## Appendix C. Troubleshooting

Use this appendix to assist you if your TURBOWAYS 622 PCI MMF ATM Adapter is not functioning correctly. Use the following steps:

1. Run the diagnostics utility outlined in "Diagnostics."
2. Attempt to resolve problem using the steps in "Other Troubleshooting Methods"
3. Contact your service representative.

---

### Diagnostics

To run the TURBOWAYS 622 PCI MMF ATM Adapter diagnostics utility, do the following:

1. Start AIX, and log in as **root** user.
2. At the AIX command prompt, type the following and press Enter.  

```
diag -d atm0
```
3. From the DIAGNOSTIC MODE SELECTION screen, select **System Verification** and press Enter.
4. Follow the instructions on the screen.

---

### Other Troubleshooting Methods

If diagnostics pass and your TURBOWAYS 622 PCI MMF ATM Adapter is not functioning, do the following:

1. Disconnect and reconnect all TURBOWAYS 622 PCI MMF ATM Adapter cables.
2. Reread the software instructions. Be sure software settings are correct.
3. Refer to your system unit documentation to disconnect power cables and remove covers.
4. Remove and reseal the adapter.
5. Install the TURBOWAYS 622 PCI MMF ATM Adapter in a different slot if one is available.
6. Refer to your system unit documentation to reassemble your system unit and connect the power cord.
7. If your TURBOWAYS 622 PCI MMF ATM Adapter still does not function, call your service representative.



---

## Reader's Comments — We'd Like to Hear From You

**TURBOWAYS 622 PCI MMF ATM Adapter**

**Form Number:** SA23-1232-00

**Overall how satisfied are you with the information in this book?**

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Overall Satisfaction	<input type="checkbox"/>				

**How satisfied are you that the information in this book is:**

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Accurate	<input type="checkbox"/>				
Complete	<input type="checkbox"/>				
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**Please tell us how we can improve this book:**

Thank you for your response. May we contact you?  Yes  No

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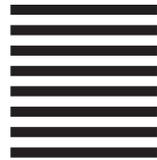
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