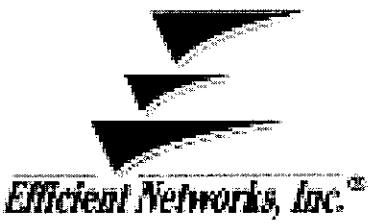
EXHIBIT C

User Manual

SpeedStream 3000 Series

ADSL Internal Modem Installation Guide



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Efficient Networks, Inc.
4201 Spring Valley Road, Suite 1200
Dallas, Texas 75244

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Introduction

Product Overview

The SpeedStream driver software provides high-speed connectivity using Asynchronous Transfer Mode (ATM) over an Asymmetric Digital Subscriber Line (ADSL). This software is designed to be installed on a 3000 series ADSL Internal Modem. Once it is installed, a modem icon is added to the taskbar and the status of the internal modem can be seen by clicking on the modem icon.

Before You Begin

The following sections contain information that is essential for you to know before you install the hardware and software for your 3000 series modem. Please read these sections carefully.

Checking the Operating System

Before beginning the installation, you must determine what operating system is installed on your machine:

1 From the **Start** menu, point to **Settings** and click **Control Panel**; then double-click the **System** icon.

2 In the System applet, click the **General** tab.

3 Note the type of Windows operating system (95, 95A, 95B, 98, or NT) and the version number.

Refer to Table 1 for installation requirements that are specific to your machine's operating system.

Table 1 System Requirements

Windows 95/95A/95B	• Minimum of 16 Mbytes RAM, 32 Mbytes recommended • Pentium-class processor required • The PCI bus must support bus mastering.

Table 1 System Requirements

Windows 98	• Minimum of 32 Mbytes recommended • Pentium-class processor required • The PCI bus must support bus mastering. • At least one Virtual Private Networking (**VPN**) Adapter must be installed.
Windows NT	• Minimum of 32 Mbytes recommended • Pentium-class processor required • The PCI bus must support bus mastering. • Service Pack 3 or greater must be installed.

NOTE: You may need the Windows (95, 98 or NT) operating system CD during installation. If you do not have this CD, contact your PC vendor for details on where the Windows files are stored on your machine.

Tools Needed for Hardware Installation

In order to properly install the modem hardware, you will need a few items:

- A Phillips-head screw driver and any other screw-drivers needed for your PC
- A cable with RJ11 (or RJ45 for 3010 only) connectors on each end
- An anti-static discharge protection device such as a wrist strap or a heel strap. The anti-static discharge protection device is required when handling the modem and prevents damage to the electronic components. Do not leave this to chance! Not using anti-static protection may result in serious damage to the hardware.

Hardware Installation

Unpacking and Inspection

The SpeedStream internal modem should arrive in good condition. Before unpacking the modem, check for any obvious damage to the packaging and notify your carrier immediately upon receipt.

WARNING! **To avoid possible damage to modem components or your system, use an anti-static grounding device when handling the modem.**

1. When handling the internal modem, if you do not have an anti-static wrist-strap or other device on, you can hold onto the metal chassis of the PC to provide anti-static grounding.

2. Remove the modem from the anti-static bag and check for any damage.

3. If there are any visible signs of damage, contact Efficient Networks Customer support for a Return Materials Authorization number. Please return the modem in the original anti-static bag and the original shipping container.

NOTE:

1. A suitable Electrical and Fire enclosure shall be provided in the end product.

2. This product is a modem card intended for installation in SELV circuits of personal computers or similar equipment.

3. After installation of this modem card in the end product, the end product should be in compliance with the enclosure, mounting, creepages and clearances, markings and segregation requirements of the end user application. Notably, the end products should provide installation instructions detailing how to install/remove card cage accessories.

Installing the Modem

1 Shut down the system and turn it off.

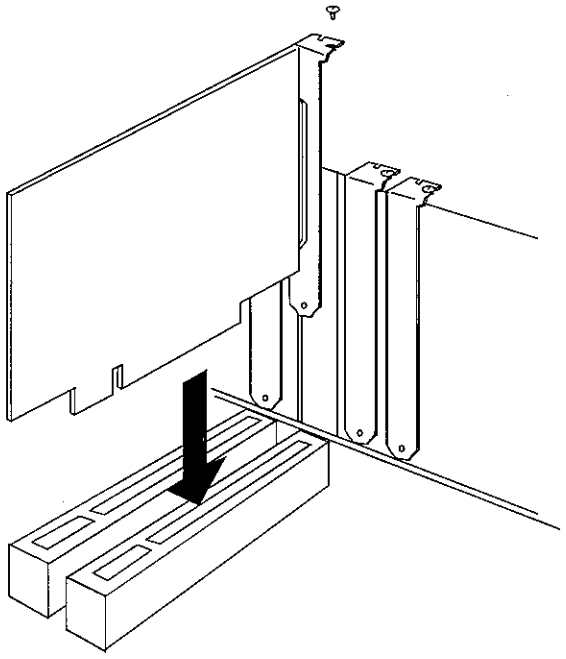
2 Unplug the system from the power source.

3 Remove the cover of the system chassis.

4 Touch the system chassis or connect the copper end of the anti–static wrist strap to a metal component of the chassis to provide grounding.

5 Insert the modem into an empty PCI slot after removing the slot cover, as shown in Figure 2. (The "slot cover" is the metal strip that covers the opening in the back of the computer chassis into which the host modem's external connector fits.)

Figure 2 Inserting the modem into the PCI Slot



6 Press the modem firmly into the slot to ensure that it is properly seated. Secure the modem's end bracket to the chassis with the bracket screw.

7 Replace the chassis cover and apply power to the machine.

Modem LEDs

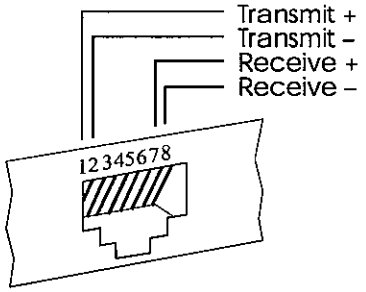
The modem is equipped with an LED that indicates proper cable connection. This LED is helpful when connecting cabling because it indicates when the cables have been hooked up correctly. The LED is illuminated when the modem is trained and is passing ATM data properly.

NOTE: The LED will be lit or will flash when the modem is in diagnostic loopback mode regardless of what is connected to it.

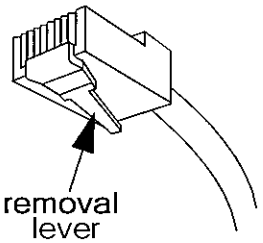
3010 Connector Information

The pinout of the modem's Category 3 and 5 UTP jack is different than a standard Ethernet UTP jack.

Ethernet loopback connectors will not work on the port and vice versa.



RJ45 Connector

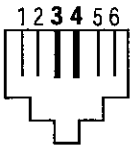


Once the connector is plugged into a board that is installed in a chassis, the removal lever on the connector may be hard to reach. Do not try to pull the connector out of the port without pushing up on the removal lever.

3020 and 3060 Connector Information

The modem comes with an RJ11 jack that uses pins 3 and 4. Optionally, the modem may be configured to use pins 2 and 5. If so, the modem markings will indicate this.

RJ11 Jack Pinout



Software Installation Overview

Two types of software drivers are provided on the installation CD: **PPP** and **CIP/1483**. Your service provider will tell you which of these two types of drivers you need to install.

Furthermore, the first chapter provides a procedure for determining which Windows operating system is installed on your computer to know which version of these drivers to install.

Follow the links below to guide you to the correct procedure for installing your 3000 series modem driver.

To install the PPP Software...

- **in Windows 95 or 95A** go to page **10**
- **in Windows 95B** ..... go to page **12**
- **in Windows 98** ..... go to page **16**
- **in Windows NT** ..... go to page **19**

To install the CIP/1483 Software...

- **in Windows 95 or 95A** go to page **23**
- **in Windows 95B** ..... go to page **24**
- **in Windows 98** ..... go to page **28**
- **in Windows NT** ..... go to page **31**

Installing PPP Software

The PPP driver uses Microsoft's Dial-Up Networking to create a connection. You must have Dial-Up Networking v1.2 or greater installed to properly install the PPP driver. Refer to the Introduction section of this manual for more detail.

Installation Requirements for PPP in Windows 95/98

Dial-Up Networking (DUN)

If you will be installing in Windows 95 or Windows 98, you will need the **Microsoft Dial-Up Networking** application installed. This applet is usually installed with Windows 98, but the person installing the OS may have chosen not to install it. Windows 95 operating systems will have to be upgraded to the correct version of DUN.

To determine if you have the DUN application installed, select **Start** > **Settings** > **Control Panel** and **Add/Remove Programs** to ensure that there is at least one Dial-Up Adapter installed. If there is not, *before installing the internal modem hardware*, refer to the procedures below to install DUN on your system:

1. Double-click the **My Computer** icon on your desktop.
2. Double-click:
   - Your CD-ROM drive letter.
   - Msdun13.exe
3. When you are asked **"Install MSDUN1.3, continue?"**, click **Next.**
4. When you are prompted to restart, click **Yes.**

Virtual Private Networking

The Microsoft Virtual Private Networking (**VPN**) adapter is required by the PPP driver. The VPN adapter is normally provided in Windows 98

installation. If it has not been installed or was removed, it must be re-installed.

To check whether VPN is installed:

1 Select **My Computer** > **Control Panel** > **Network.**

2 On the **Configuration** list, there should be a **Microsoft Virtual Private Networking Adapter** listed.

3 If not, select the **Add** button and double-click on **Adapter.**

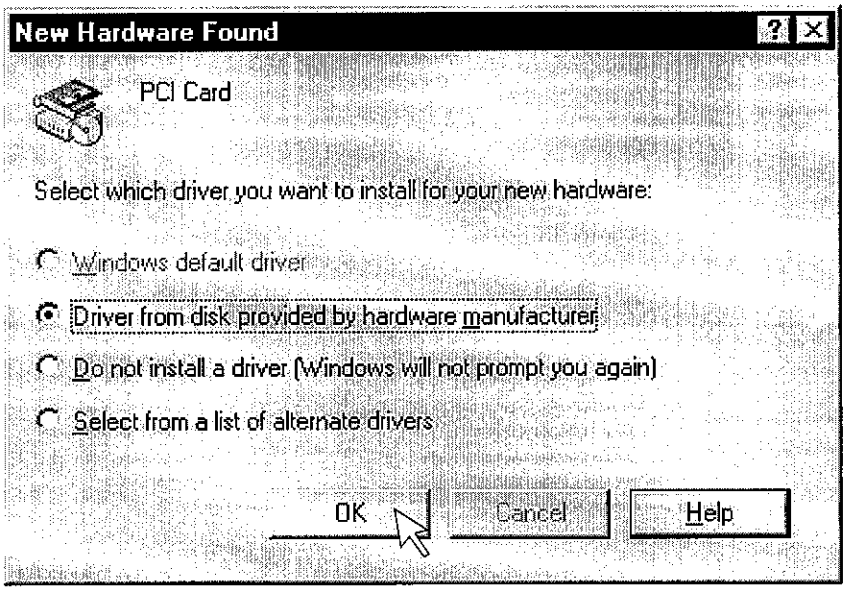
4 Scroll down in the **Manufacturers** list and select **Microsoft.**

5 Under **Network Adapters,** double-click on **Microsoft Virtual Private Networking Adapter.**

Installation in Windows 95 or Windows 95A

1 After installing the modem hardware, power on the system. When Windows comes up, insert the software installation CD in the CD-ROM drive.

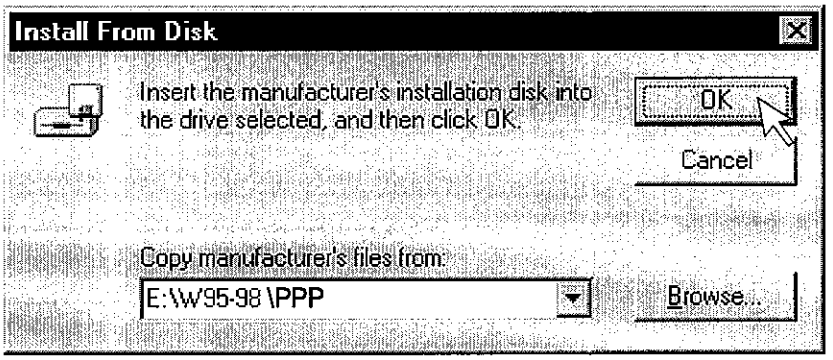
2 Windows will bring up the **New Hardware Found** dialog box. Be sure that **Driver from disk** is selected before you click **OK.**



3 Next, the **Install From Disk** dialog box will appear. Click **Browse** and select the CD-ROM drive from the **Drives** list.

4 Double-click **W95-98** and **Ppp** then click **OK**.

5 Click **OK** or **Next** on the **Install From Disk** dialog box.



6 Windows will then begin copying the driver files. After the files are copied, the installation is complete and Windows will be restarted. During this process you may be prompted for the Windows 95 OS installation CD-ROM. If so, insert the CD and enter the path to the requested files. Click **OK**.

7 At this point, if Dial-Up Networking (DUN) is not installed, a message is presented saying:

> An incorrect version of Dial-Up Networking is installed. Speedstream PPP requires Dial-Up Networking version 1.2 or better to run. Please consult the release notes regarding Dial-Up Networking 1.2 installation before you continue.

If this message appears, click **OK** and refer to the DUN installation instructions on page 9.

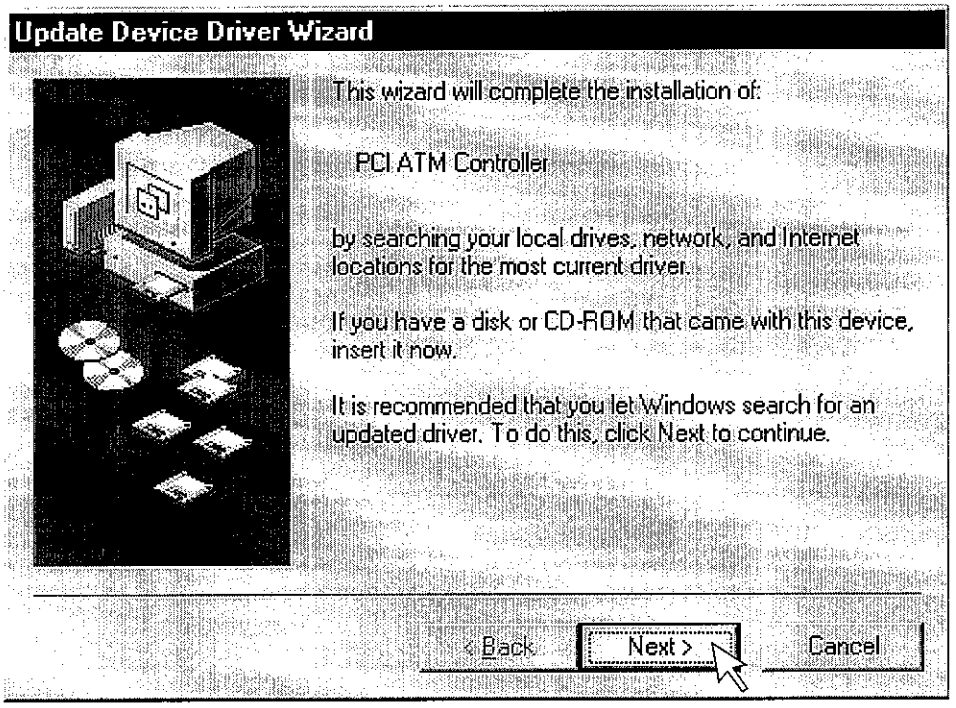
8 When the system comes back up, one or more configuration dialog boxes may or may not be presented, depending on your service provider. Configure the settings as directed by your network service provider. When configuration is complete, if prompted to restart Windows, click **Yes**.

9 When the system comes back up, you will need to set up your PPP dial-up connection as described on page 22.

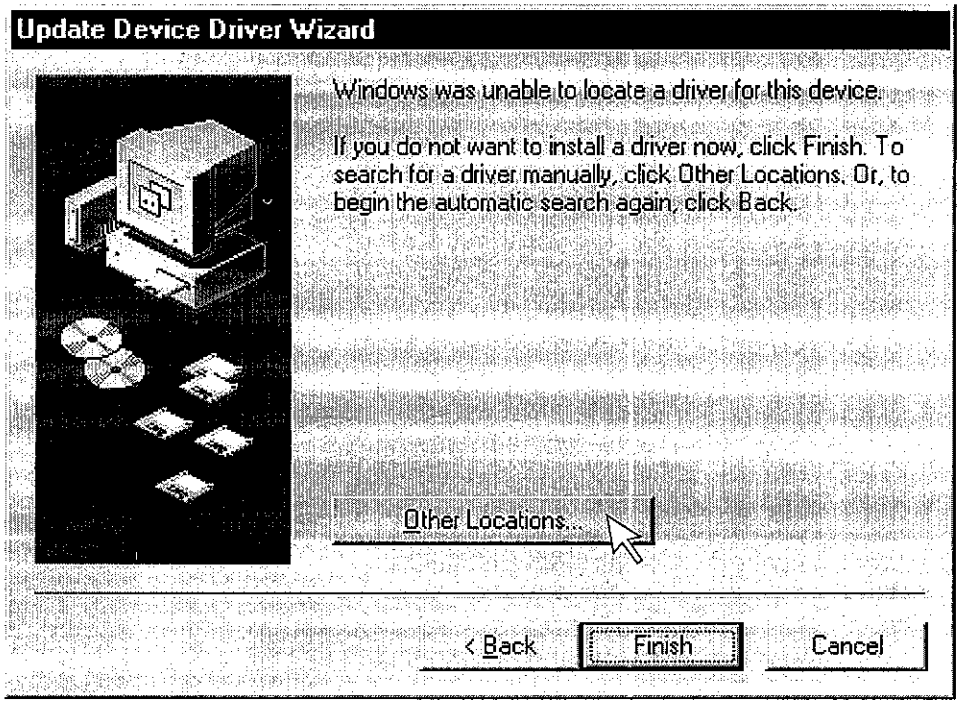
Installation in Windows 95B

1 After installing the modem hardware, power on the system. When Windows comes up, insert the software installation CD in the CD-ROM drive.

2 The **Update Device Driver Wizard** dialog (shown on the next page) will appear. Click **Next.**



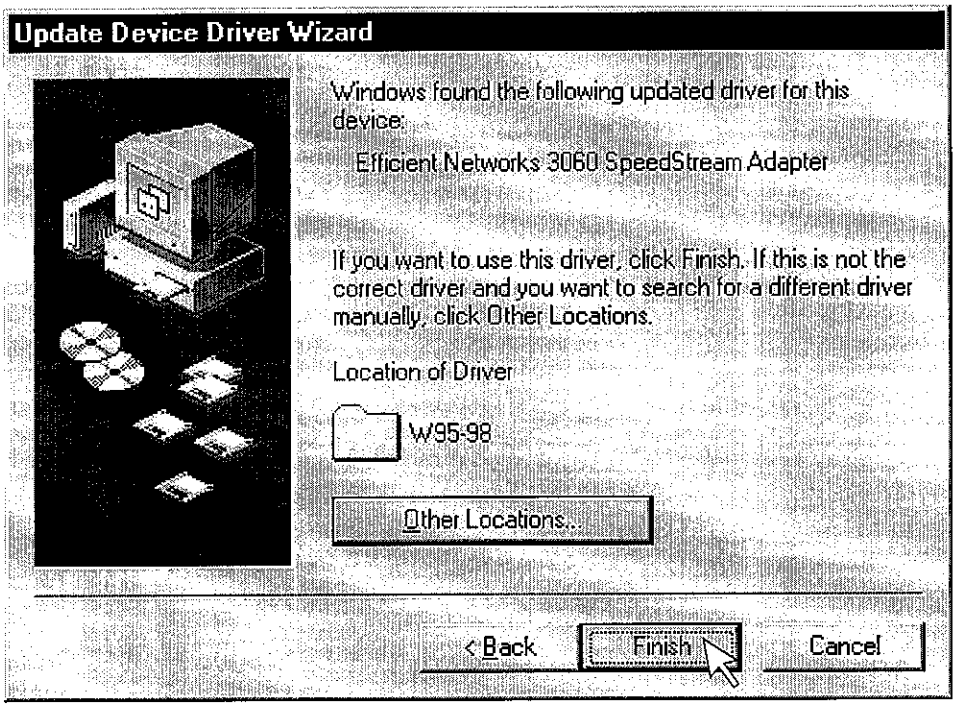
3 On the next dialog box, click the **Other Locations** button.



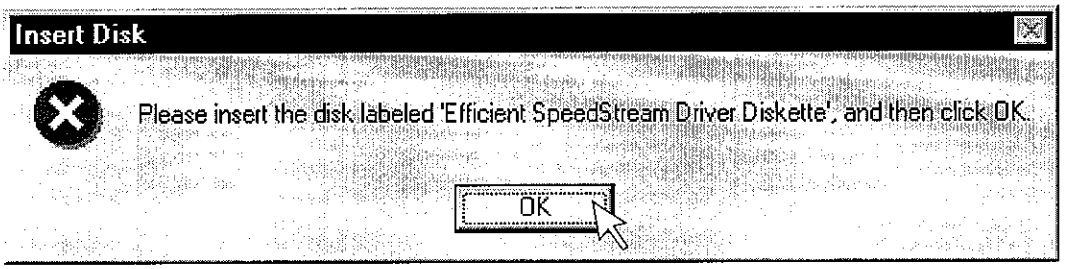
3-a On the **Select Other Locations** dialog, select **Browse**.

3-b Click on the CD-ROM drive in the list, select **W95-98** and **Ppp** then click **OK**. On the **Select Other Location** dialog, click **OK**.

4 On the **Update Device Driver Wizard**, click **Finish.**



5 Next, the **Insert Disk** dialog may appear. Click **OK.**



Windows will then begin copying the driver files. During this process you may be prompted for the Windows 95 OS installation CD-ROM. If so, insert the CD and enter the path to the requested files. Click **OK.**

6 At this point, if Dial-Up Networking (DUN) is required (for PPP drivers only) but it is not installed, a message is presented saying:

> An incorrect version of Dial-Up Networking is installed. Speedstream PPP requires Dial-Up Networking version 1.2 or better to run. Please consult the release notes regarding Dial-Up Networking 1.2 installation before you continue.

If this message appears, click **OK** and refer to the DUN installation instructions on page 9.

7 When the system comes back up, one or more configuration dialog boxes may or may not be presented, depending on your service provider. Configure the settings as directed by your network service provider. When configuration is complete, if prompted to restart Windows, click **Yes**.

8 When the system comes back up, you will need to set up your PPP dial-up connection as described on page 22.

Troubleshooting Windows 95 Installation

Recovery from Canceling Installation

An incomplete installation may occur if:

- In Windows 95 or 95A, if you select **Do not install a driver** on the **New Hardware Found** dialog box
- In Windows 95B, if you click **Finish** on the **Update Device Driver Wizard** dialog box without inserting the SpeedStream installation CD

Use the following procedure to clear the partial install from the system.

1 Click **Start** and point to **Settings**; then click **Control Panel**. Double-click **System** and click the **Device Manager** tab. Select the ENI card under "*** Other devices**".

2 Click **Remove**. Exit the Device Manager and reboot the machine.

3 Shut down and restart the system; then perform the software installation procedure again.

PPP Driver Installation without Dial-Up Networking

If the drivers are installed on a system that does not have the latest version of DUN installed, the installation procedure describes what will occur. If the system is not restarted as required during DUN installation, the installation software will not be able to create address book entries. To recover from this situation, use the following procedure to update the service profile:

1 Click **Start** > **Settings** > **Control Panel** > **Network** and click the **Adapters** tab (if not already selected). Select the Efficient client and click the **Properties** button.

2 Click **Update.**

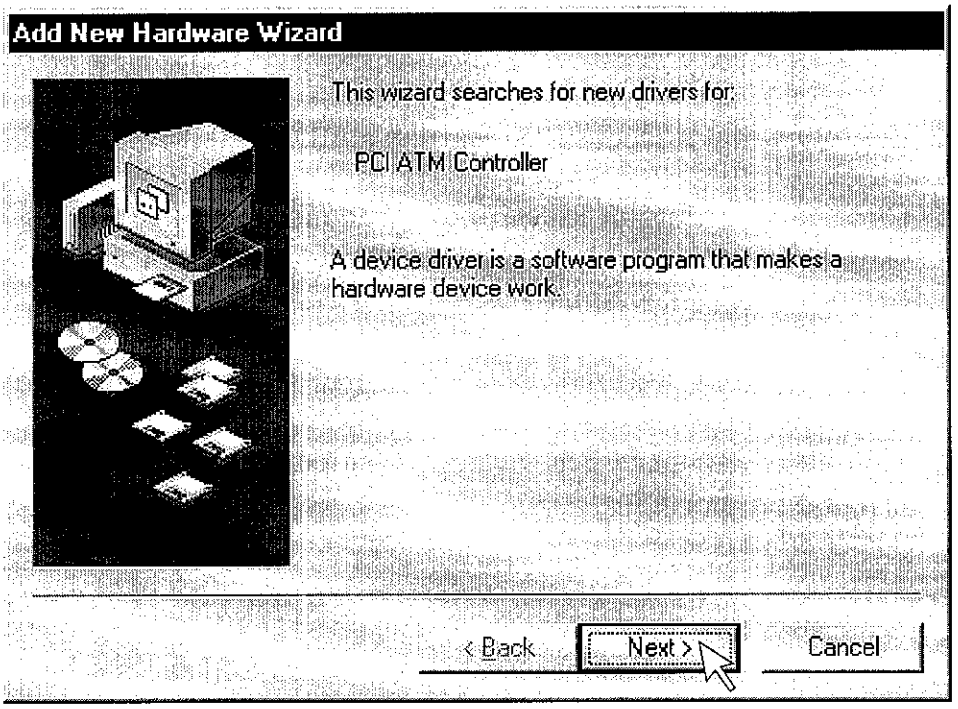
3 Find the profile (.acf file) on the SpeedStream installation CD using the standard **Open** dialog box provided.

4 SpeedStream configuration dialog boxes will be presented and the necessary address book entries will be created. Restart Windows.

Installation in Windows 98

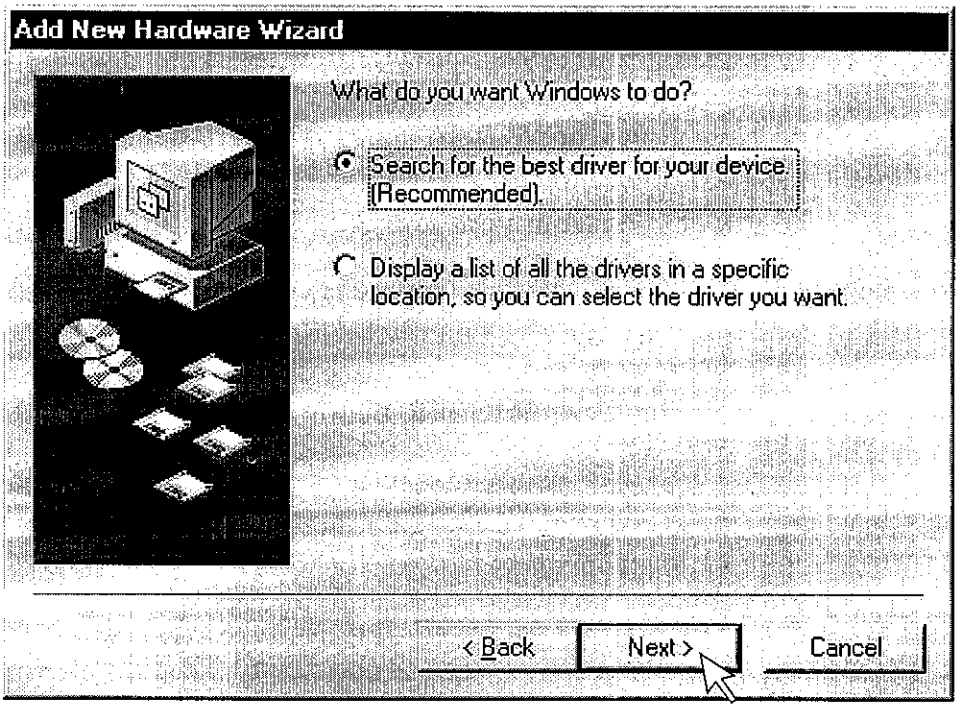
1 After installing the modem hardware, power on the system.

2 When the system comes up, the **Add New Hardware Wizard** will appear indicating that the modem was discovered.

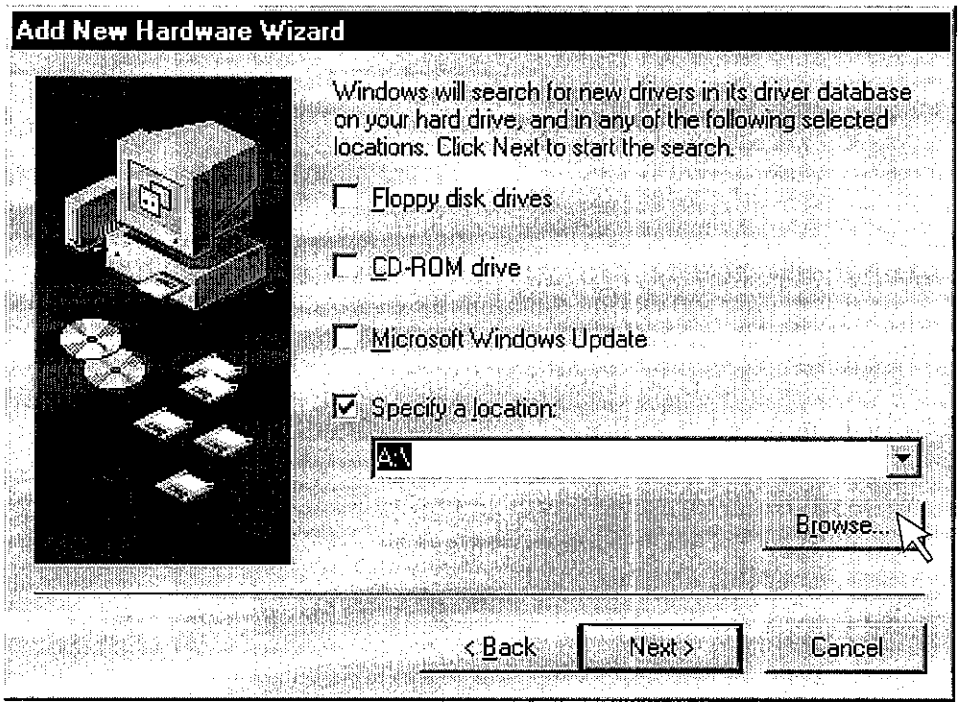


3 Insert the installation CD-ROM and click **Next.**

4 On the next dialog, the first option **Search for the best driver for your device (Recommended)** should be selected.



5 On the next dialog, select only the checkbox labeled **Specify a location**. Then click the **Browse** button.



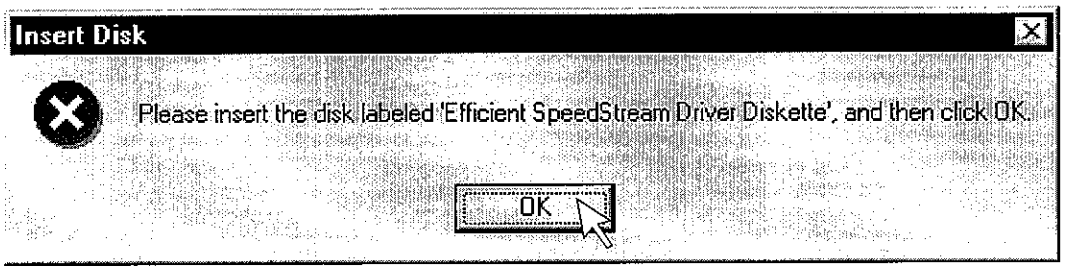
5-a In the browse list, locate your CD-ROM drive letter and highlight it, then select the **W95-98** folder and **Ppp** then click **OK**.

5-b Click **Next** on the Add New Hardware Wizard dialog box.

6 The Add New Hardware Wizard states that "Windows is now ready to install the best driver for this device." Click **Next**. Windows will then copy the driver files from your CD-ROM.

As the files are being copied, you may be prompted for the Windows 98 CD. If so, insert the CD and click **OK**.

7 Next you may see the **Insert Disk** dialog box. Click **OK**.



8 On the **Copying Files** dialog box, pull down the **"Copy files from:"** list and select **<drive>: W95-98\Ppp**. Click **OK**.

9 Click **Finish** on the Add New Hardware Wizard.

10 When the driver installation is complete, you will be prompted to restart Windows. Click **Yes**.

11 When the system comes back up, one or more configuration dialog boxes may or may not be presented, depending on your service provider. Configure the settings as directed by your network service provider.

12 Click the **Finish** button to complete the configuration.

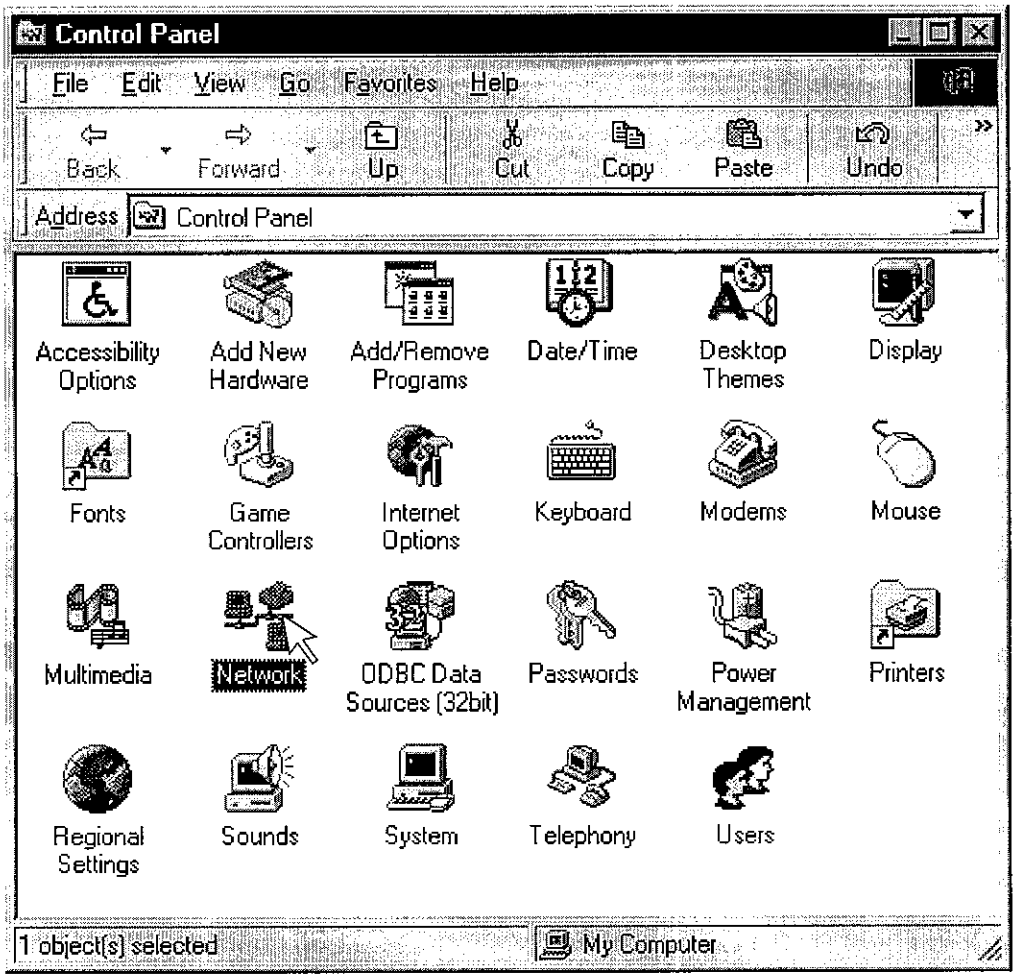
13 When the driver installation is complete, set up your dial-up connection as described on page 22.

Installation in Windows NT 4.0

NOTE: The user must have Administrator rights on the system in which the modem is being installed.

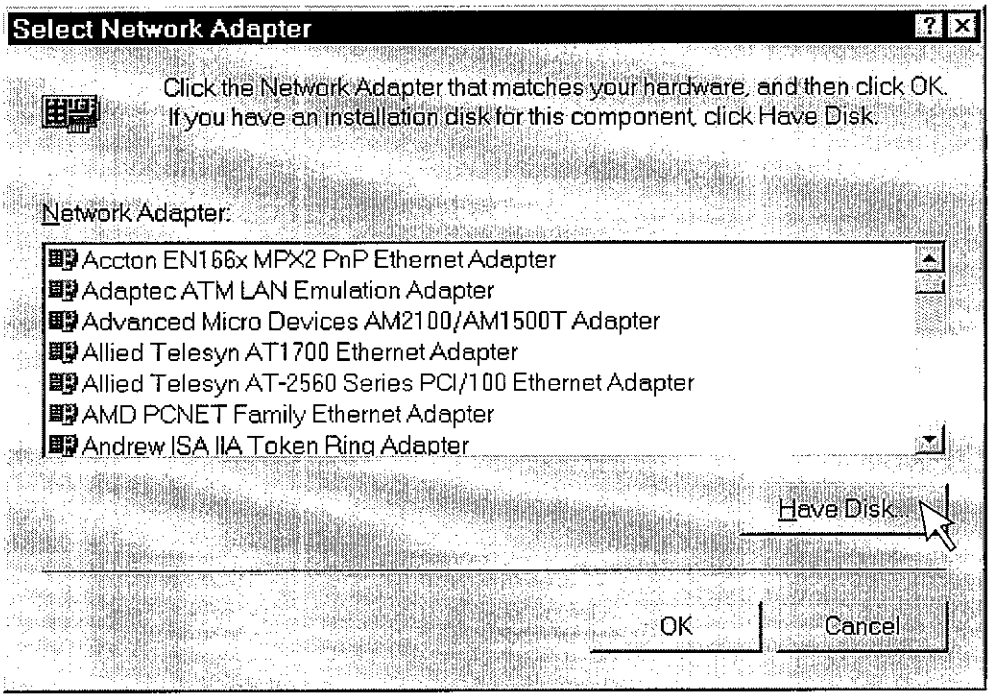
1 After installing the modem hardware, power on the system. When Windows NT comes up, log in and insert the SpeedStream installation CD in a CD-ROM drive.

2 Click the **Start** button and point to **Settings**; click **Control Panel**. Double-click the **Network** icon.



3 When the Network window appears, click the **Adapters** tab and then click the **Add** button.

4 On the **Select Network Adapter** dialog box, click the button labeled **Have Disk.**



5 In the **Insert Disk** dialog box, you must specify the CD file path. (If you do not know the CD-ROM drive letter, then look on the **My Computer** dialog box.)

- Enter the following: **<drive:>\NT\Ppp** and click **OK.**

6 On the **Select OEM Option** dialog box, you will see the driver highlighted. Click **OK.** The **Windows NT Setup** dialog box will show the files being copied.

7 If a **Remote Access Services Installation** dialog box appears, this indicates that RAS has not been installed previously on your system. You will need the Windows NT 4.0 Installation CD to install RAS.

7-a Insert the Windows NT CD.

7-b The dialog box will prompt you to enter the directory path where the RAS services are installed (enter **<drive>:\i386** where *<drive>* is the CD drive letter). You must enter the correct path name to the RAS service.

If the path is entered wrong, cancel the RAS installation. Go to your Network settings by clicking on the **Start** button and

selecting **Settings**; click on **Control Panel**. Double-click on the **Network** icon and then click **Services** and **Add**. Select **Remote Access Services** from the list and click **OK**.

8 Next, the **Remote Access Services** configuration dialog box is presented, and then the **Add RAS Device** dialog box appears.

8-a Select the entry labeled **ISDN_n ENx0P** and click **OK**.

8-b Click the **Configure** button.

8-c On the **Configure Port Usage** dialog box, select **Dial Out Only** and click **OK**.

8-d Click **Network** and make sure **TCP/IP** is checked. Click **OK**.

8-e Click **Continue** when all configuration is complete.

8-f Exit the Network Control Panel by clicking **Close**.

8-g When prompted to, restart the system.

If you have more than one client connection, repeat the following procedure for each client:

8-h Click the **Start** button and select **Settings**; click **Control Panel.**

8-i Double-click the **Network** icon and click the **Services** tab.

8-j Select **Remote Access Services** from the list and click the **Properties** button.

8-k Click the **Add** button in the **Remote Access Setup** dialog box to add your additional client connection. Click **OK**.

8-l Repeat steps **8-b** through **8-g** above.

NOTE: Microsoft recommends that you re-install the latest Service Pack for your system after installing RAS. Refer to instructions in the Release Notes for installing the latest service pack.

9 When the system comes back up, one or more configuration dialog boxes may or may not be presented, depending on your service provider. Configure the settings as directed by your network service provider.

10 Click the **Finish** button to complete the configuration.

Setting up a PPP Connection

After installing the PPP software, you may be required by your service provider to configure the IP address before you connect using Dial-Up Networking. If so, following your service provider's instructions to configure your IP address, then follow the procedure below to create a connection.

Creating a PPP Connection

1 Double-click the **My Computer** icon on your desktop; then double-click the **Dial-Up Networking** icon.

2 You will see an icon for the ADSL PPP connection that was defined when you installed the driver. Double-click on the connection icon.

3 Enter a password.

4 Select the **Connect** button to create the connection.

5 A modem icon will then appear on the taskbar when the connection has been established.

Using SpeedStream with Multiple User Profiles

If your system was configured with multiple user profiles before the modem was installed, the SpeedStream connection will only be visible to the user who installed it. To copy the connection to other users profiles, copy all files in your Dial-Up Networking folder with a .dun extension to **c:**. Then login as each individual user and copy the .dun files to the Dial-Up Networking folder.

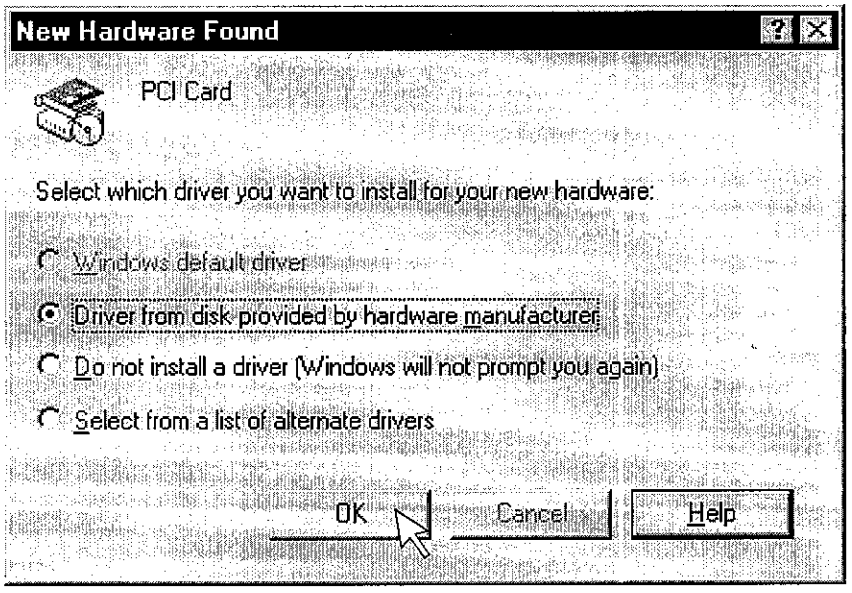
CIP/1483 Driver Installation

The Classical IP/RFC 1483 Driver differs from the PPP driver because it provides an "always-on" network connection. The CIP/1483 driver does not use Dial-Up Networking.

Installation in Windows 95 or 95A

1 After installing the modem hardware, power on the system. When Windows comes up, insert the software installation CD in the CD-ROM drive.

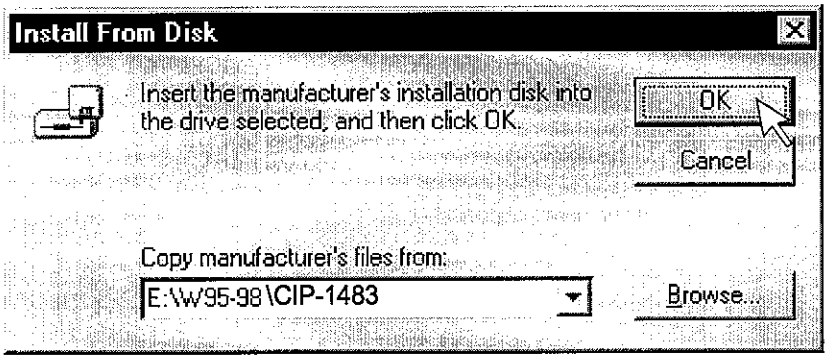
2 Windows will bring up the **New Hardware Found** dialog box. Be sure that **Driver from disk** is selected before you click **OK.**



3 Next, the **Install From Disk** dialog box will appear. Click **Browse** and select the CD-ROM drive from the **Drives** list.

4 Double-click **W95-98** and **Cip-1483,** then click **OK.**

5 Click **OK** on the **Install From Disk** dialog box.



6 One or more configuration dialog boxes will be presented, depending on your service provider. Configure the settings as directed by your network service provider.When you click **Finish**, Windows will then begin copying the driver files.

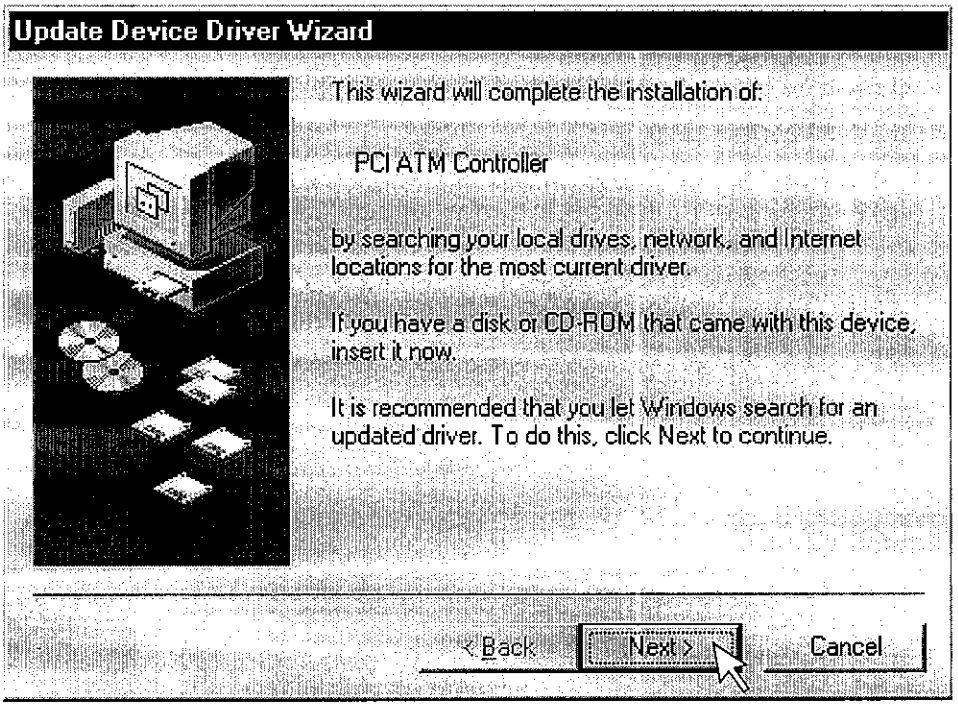
During this process you may be prompted for the Windows 95 installation CD-ROM. If so, insert the Windows 95 CD-ROM and click **OK**.

7 When Windows comes up, you may need to configure the Internet Protocol (IP) address for your connection. Refer to the procedure on 30.

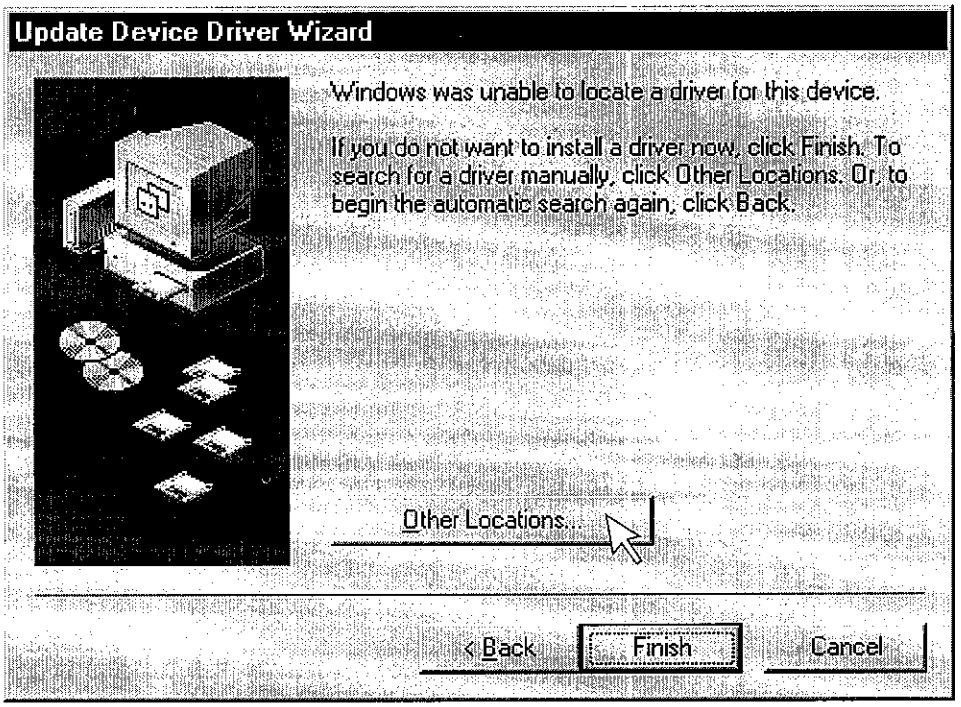
Installation in Windows 95B

1 After installing the modem hardware, power on the system. When Windows comes up, insert the SpeedStream installation CD in the CD-ROM drive.

2 The **Update Device Driver Wizard** dialog (shown on the next page) will appear. Click **Next**.



3 On the next dialog box, click the **Other Locations** button.

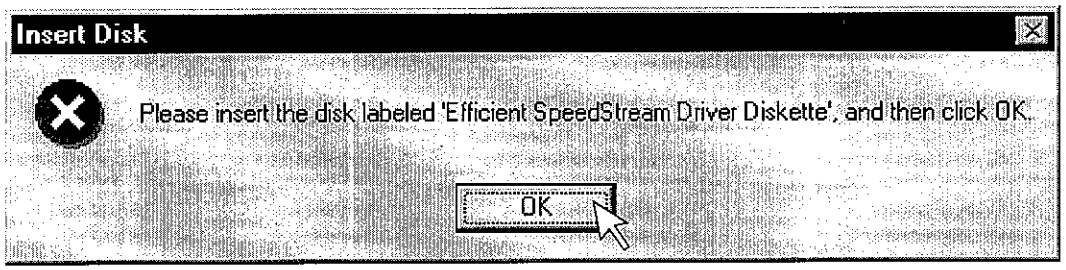


3-a On the **Select Other Locations** dialog, select **Browse.**

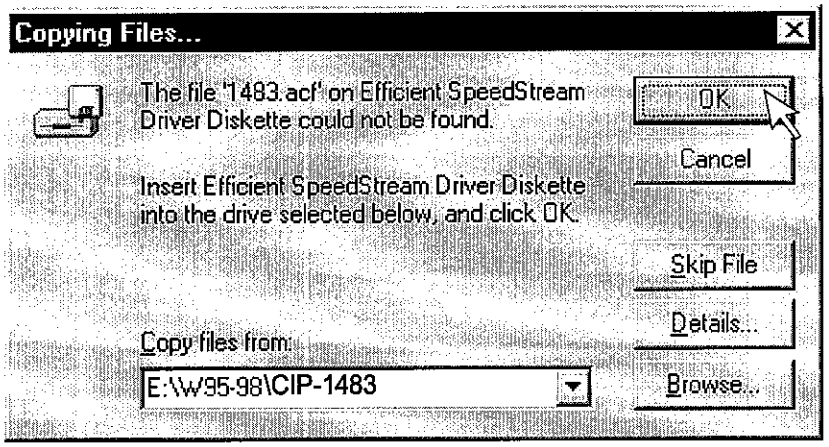
3-b Click on the CD drive in the list, double-click on **W95-98** then **CIP-1483** and click **OK**. On the **Select Other Location** dialog, click **OK**.

4 On the **Update Device Driver Wizard**, click **Finish**.

5 Next, the **Insert Disk** dialog may appear. Click **OK**.



6 On the **Copying files** dialog box, click **Browse** and then select **W95-98** and **Cip-1483**. Click **OK**.



Windows will then begin copying the driver files.

7 One or more configuration dialog boxes will be presented, depending on your service provider. Configure the settings as directed by your network service provider.

8 You may be prompted for the Windows 95 installation CD. If so, insert the CD and click **OK**

9 When the system comes back up, you may need to configure the Internet Protocol (IP) address for your connection. Refer to the procedure on 30.

Troubleshooting Windows 95 Installation

Recovery from Canceling Installation

An incomplete installation may occur if:

- In Windows 95 or 95A, if you select **Do not install a driver** on the **New Hardware Found** dialog box
- In Windows 95B, if you click **Finish** on the **Update Device Driver Wizard** dialog box without inserting the SpeedStream installation CD

Use the following procedure to clear the partial install from the system.

1. Click **Start** and point to **Settings**; click **Control Panel** and double-click **System**. Then click the **Device Manager** panel and select the ENI card under *** Other devices**.

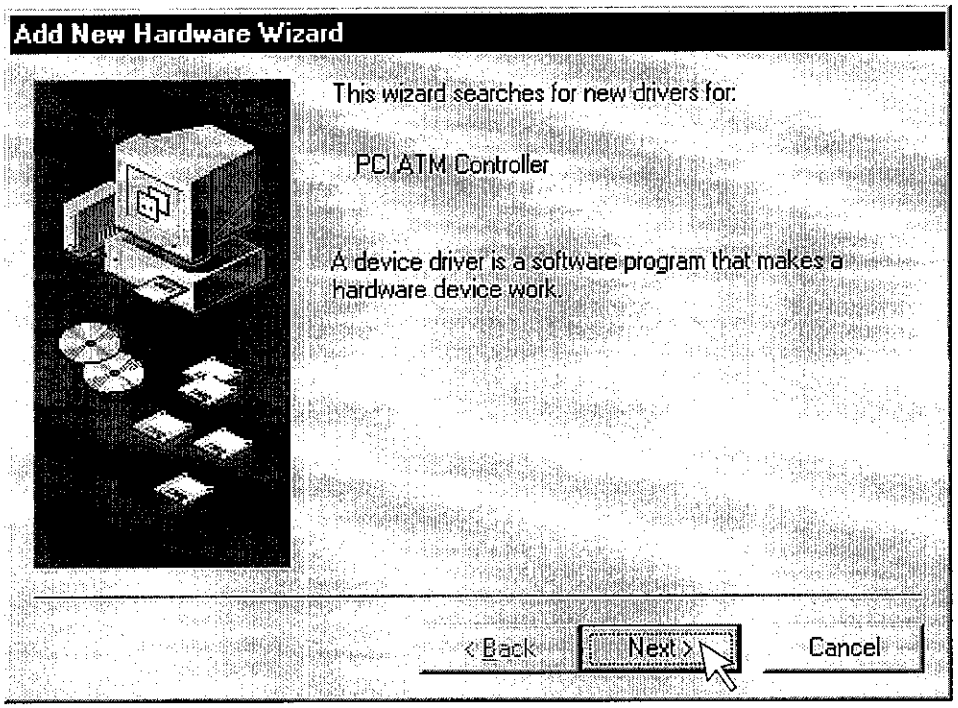
2. Click **Remove**. Exit the Device Manager and reboot the machine.

3. Shutdown and restart the system, then perform the software installation procedure again.

Installation in Windows 98

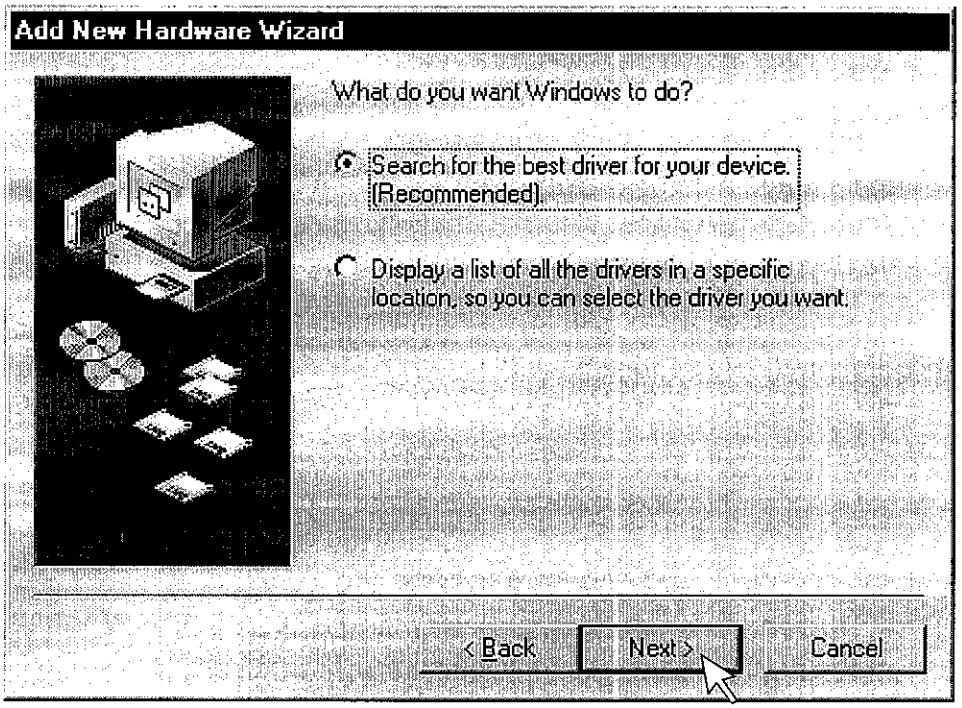
1 After installing the modem hardware, power on the system.

2 When the system comes up, the **Add New Hardware Wizard** will appear indicating that the modem was discovered.

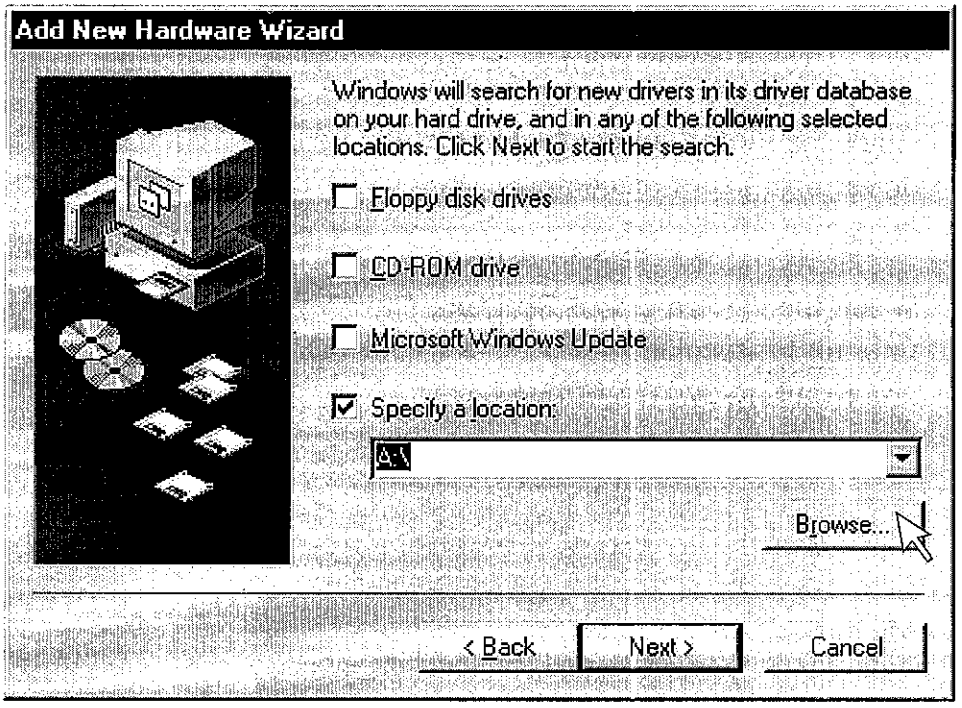


3 Insert the installation CD-ROM and click **Next.**

4 On the next dialog, the first option **Search for the best driver for your device (Recommended)** should be selected. Click **Next.**



5 On the next dialog, select only the checkbox labeled **Specify a location.** Then click the **Browse** button.

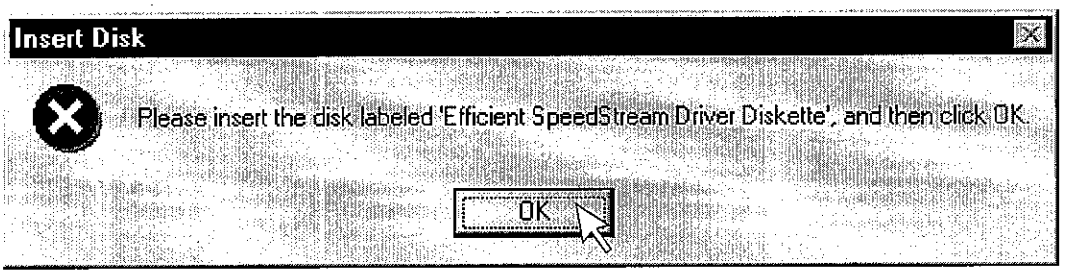


5-a In the browse list, double-click on the CD-ROM drive letter, then select the **W95-98** folder and **Cip-1483** and click **OK**.

5-b Click **Next** on the Add New Hardware Wizard dialog box.

6 The Add New Hardware Wizard states that "Windows is now ready to install the best driver for this device." Click **Next**. Windows will then copy the driver files from your CD-ROM.

7 Next you may see the **Insert Disk** dialog box. Click **OK**.



8 On the **Copying Files** dialog box, pull down the **"Copy files from:"** list and select **<drive>: W95-98\Cip-1483**. Click **OK**.

9 Next, configuration dialog boxes will be presented. Use your service provider's instructions to set the parameters. Click the **Finish** button to complete the configuration.

As the files are being copied, you may be prompted for the Windows 98 CD. If so, insert the CD and click **OK**.

10 Click the **Finish** button to complete the configuration. When the driver installation is complete, you will be prompted to restart Windows. Click **Yes**.

11 When the system comes back up, you may need to configure the Internet Protocol (IP) address for your connection. Refer to the procedure below.

Configuring the IP Address in Windows 95/98

When using the CIP/1483 driver, you may need to configure an Internet Protocol (IP) address that will be used to identify your computer on the network.

1 Double-click the **My Computer** icon on your desktop and then double-click **Control Panel** followed by **Network**.

2 Select the **TCP/IP** entry for the SpeedStream device and click then **Properties** button.

3 Follow your service provider's instructions to configure the IP address of your system.

4 When configuration is complete, click **OK**. You may be prompted to reboot the computer. If so, select **Yes**.

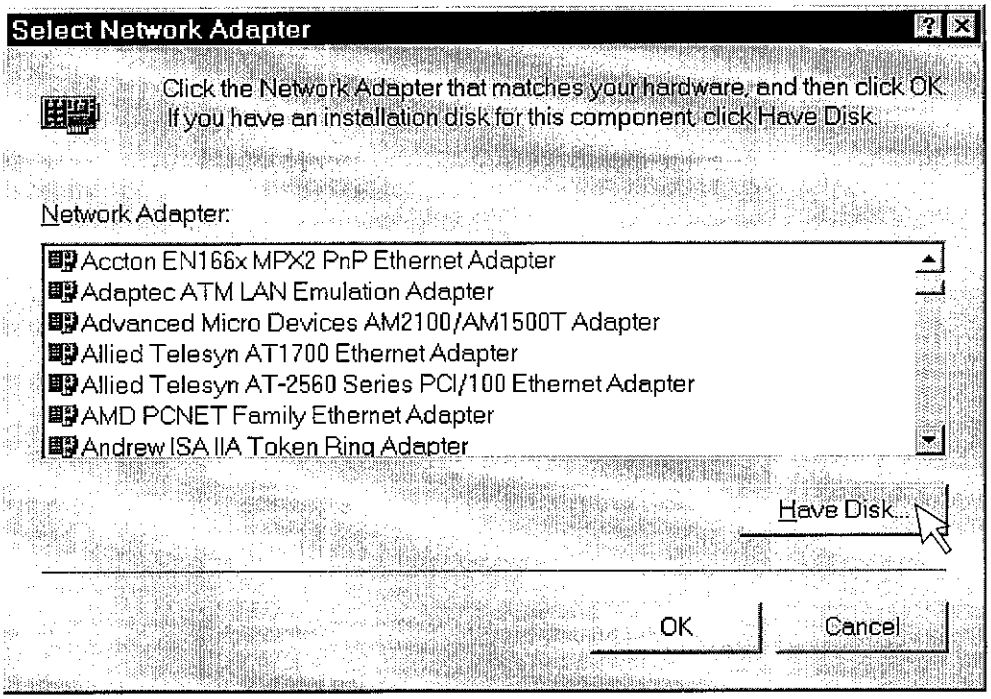
Installation in Windows NT 4.0

1 After installing the modem hardware, power on the system. When Windows NT comes up, log in and insert the driver installation CD in a CD-ROM drive.

2 Click **Start** and point to **Settings**; then click **Control Panel**. Double-click the **Network** icon.

3 When the Network window appears, click the **Adapters** tab and then click the **Add** button.

4 On the **Select Network Adapter** dialog box, click the button labeled **Have Disk.**



5 On the **Insert Disk** dialog box, you must specify the CD file path.

- If you do not know the CD-ROM drive letter, then click on **My Computer** and look for the CD-ROM drive letter.
- Enter the following: **<drive:>\NT\Cip-1483** and click **OK.**

6 On the **Select OEM Option** dialog box, you will see the driver highlighted. Click **OK.** The **Windows NT Setup** dialog box will show the files being copied.

7 Next, a series of configuration dialog boxes will be presented. Configure the settings as directed by your network service provider. Click the **Finish** button to complete the configuration.

8 Select **Close** on the **Network** dialog.

9 Next, the **Microsoft TCP/IP Properties** dialog is presented. Pull down the **Adapter** list and select the SpeedStream client.

10 Follow your service provider's instructions to configure the IP address of your system. Click **OK.** This completes the configuration of the modem.

SpeedStream Status

After the modem and driver are properly installed, you will see the following icons on the taskbar:

Indicates that the modem has an active connection. The lights will blink when the modem is transmitting.

Indicates that the modem is not connected or configured properly.

Right-clicking on the taskbar icon provides a menu of detailed status and on-line help.

The taskbar icon can be turned off by going to the **Control Panel** and double-clicking the **SpeedStream Status** icon. This will bring up the **SpeedStream Status** dialog box. The icon is displayed when the **Show Icon on Taskbar** checkbox is checked.

Software Removal

Removing the Driver Software - Windows 95/98

1 Select **Start** then **Settings** and open the **Control Panel.**

2 From the Control Panel, select **Network.**

3 Select the **Configuration** tab and select the SpeedStream product from the list.

4 Click on the **Remove** button and select **OK** to close the **Network** dialog.

5 When prompted to restart the system, select **No.**

6 Shut down Windows and turn off the machine.

7 Remove the adapter from the machine and turn the system back on.

Removing the Driver Software - Windows NT

1 Select **Start,** then **Settings** and open the **Control Panel.**

2 From the Control Panel, select **Network.**

3 Select the **Adapters** tab and select our product from the list.

4 Click on the **Remove** button and then click **Yes.**

5 Select **Close** on the Network dialog.

6 When prompted to restart the system, select **No.**

7 Shut down Windows and turn off the machine.

8 Remove the adapter from the machine and turn the system back on.

Technical Reference

SpeedStream 3010 Adapter Specifications

Size	2.5 in. x 5.0 in. (6.3 cm x 12.7 cm)
Weight	3 oz. (85.04 grams)
Power	Max 1.5 amps @ +5V ± 5% Max 0.2 amps @ ±12V ± 5%
Temperature	Operating: 0 to 70° C Non-Operating, storage: -10 to 85° C
Humidity	10% to 90% noncondensing
PCI Frequency	0 to 33MHz
Bus Master	32 bit, 33 Mhz PCI bus version 2.1 Bus Master capability with DMA bursting
Unshielded Twisted Pair Interface	
Cabling	Unshielded Twisted Pair (UTP) Category 3, 4, or 5
Connector	Eight-contact, shielded RJ45
Operating distance	0 m to 100 m
Line code	4B/5B and NRZ
Line rate	32 Mbaud, 25.6 Mbits per second
Rate tolerance	±100 ppm
Transmitter type	Transformer-coupled differential line driver
Differential Signal Level	2.7 — 3.4 V peak-to-peak
Rise/Fall time	1.5 ns to 3.5 ns
Receiver	Transformer-coupled differential line receiver with adaptive equalization

SpeedStream 3020/3060 Adapter Specifications

Size	6.85 in. x 4.2 in. (17.39 cm x 10.66 cm)
Weight	3 oz. (85.04 grams)
Power	Max 1.5 amps @ +5V ± 5% Max 0.2 amps @ ±12V ± 5%

Temperature	Operating: 0 to 70° C Non-Operating, storage: -10 to 85° C
Humidity	10% to 90% noncondensing
PCI Frequency	0 to 33MHz
Bus Master	32 bit, 33 Mhz PCI bus version 2.1 Bus Master capability with DMA bursting
Cabling	Unshielded Twisted Pair
Connector	RJ11
Operating distance	up to 15 Kft AWG 26, 18 Kft AWG 24
Line code	DMT, FDM, ADSL
Line rate	Up to 640 Kbps upstream, up to 6.1 Mbps downstream
Bit Error Rate	10^{-7} using a 6 dB margin
Transmitter type	Transformer-coupled differential line driver
Line Power	PSDM per T1E1.413
POTS Splitter	Equipped with a high pass filter
Receiver	Transformer-coupled differential line receiver with adaptive equalization