Important

Do not plug a phone jack (RJ-11) into any Ethernet (RJ-45) port on your device. Doing so may damage the device. You must use twisted pair cables with RJ-45 connectors that conform to FCC standards in the device's Ethernet ports.

Important

Ne branchez pas une ligne téléphonique dans aucuns des port de réseau (RJ45).

Caution

For use with UL Listed, CSA and GS approved personal computers.

Base Station: Only use AC Adapter provided with the unit, Model Number FA-4A110 (for U.S. and Canada).

Not intended for use in machinery, medical or industrial applications.

Do not use onboard an aircraft or in hazardous locations such as a gas station or other explosive environment.

For indoor use only.

Do not touch or re-orient the antenna while the device is transmitting

Device should be located at least 20 cm (8 inches) away from any human body in order to meet FCC exposure limits.

Avertissement

N'utilisez qu'avec des composantes homologuées UL, CSA ou TUV.

N'utilisez qu'avec le bloc d'alimentation fourni avec cet appareil No de modèle FA- FA-4A110

Ne pas utiliser ce dispositif dans une application industrielle ou médicale.

Ne pas utiliser dans un avion ou en présence de vapeur explosive (station-service).

N'utiliser qu'à l'intérieur.

Ne touchez pas à l'antenne lorsque l'appareil est en fonction

Ce dispositif doit être à plus de 20 cm (8 pouces) de toute personne sinon l'utilisateur devrait limiter le temps d'exposition..

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My Network Settings

Use this page to record your network settings.

Workgroup or domain name: _____

Base Station password: _____
(Default=**admin)**

Wireless Settings

Record the information used to configure a computer for wireless access to your network here. All computers accessing your network with a wireless connection need to use the same wireless settings.

Wireless network name (SSID): _____

WEP key or WPA passphrase: _____

Wireless channel (ad-hoc networks only): _____

Wide Area Network Settings

Complete this section only if your network has a base station (gateway or router). You can obtain this information from your Internet service provider (ISP). Your ISP may not require all of the settings listed below.

Dynamic IP (DHCP) Settings

Complete this section only if your ISP uses a DHCP connection.

Host name: _____

Adapter MAC address: _____

Static IP Address Settings

Complete this section only if your ISP has assigned you a specific IP address.

Static IP address: _____

Subnet mask: _____

IP gateway address: _____

Primary DNS server: _____

Secondary DNS server: _____

PPPoE Settings

Complete this section only if your ISP uses PPPoE.

User name: _____

Password: _____

Service name: _____

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1 introduction

Welcome to Wireless-G

Thank you for purchasing the Microsoft® Broadband Networking Wireless Base Station. This wireless base station is up to five times faster than 802.11b base stations. This chapter describes your wireless base station and explains wireless (radio) and wired (Ethernet) connections.

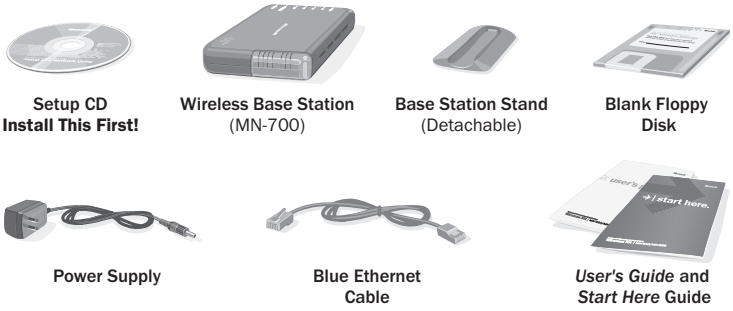
With your new wireless network, you can share an Internet connection, files, and printers. Besides adding computers to the network, you can add a variety of devices, provided each device has an available Ethernet port or a wireless adapter (that is compatible with 802.11b or 802.11g Wi-Fi® networks).

For example, you can connect a game console (such as a Microsoft Xbox® video game system), a Pocket PC, a home security or automation device, a digital audio controller, or even some newer televisions to your network.

Note **For more information about 802.11b and 802.11g, see "Understanding Wireless Transmission Standards" later in this chapter.**

About Your Wireless Base Station

The wireless base station comes with other components to help you set up and connect your wireless network. The box contents are shown in the following illustration.



The Microsoft Wireless Base Station is a multifunctional device:

- It enables you to share your broadband Internet connection with all the computers on the network.
- It helps provide a layer of security between your network and the Internet.
- It enables wireless connectivity for computers within its range.
- It helps provide security for your wireless transmissions, using Wired Equivalent Privacy (WEP) or Wi-Fi Protected Access (WPA).

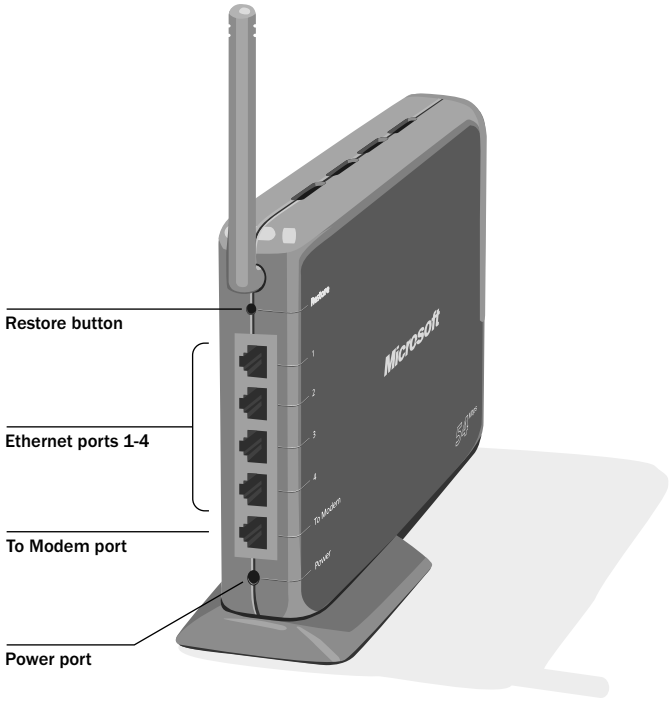
Most people enable all of this functionality, as described in Chapter 2.

UPnP Standards and Your Wireless Base Station

The Microsoft Wireless Base Station adheres to the UPnP™ standards that are defined by the Universal Plug and Play Forum. UPnP standards allow devices on the network to communicate their capabilities to the base station by using a common vocabulary. UPnP standards also allow you to use many programs (like instant messaging programs and multiplayer games) on your network without having to go through a complicated configuration process.

Base Station Ports, Status Lights, and the Restore Button

The following illustrations show the locations of the ports, status lights, and Restore button on the base station.



On the back of the base station, you will find a Power port, a To Modem port, four numbered Ethernet ports, and a Restore button.

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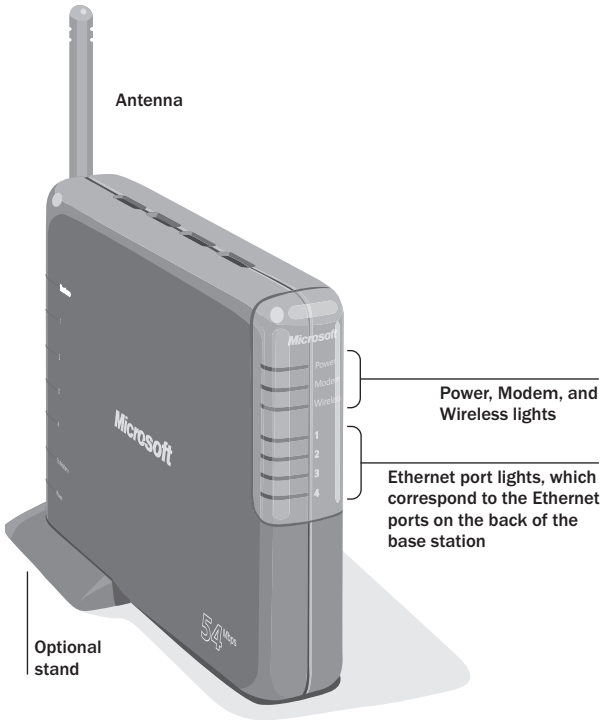

The front of the base station has seven status lights. The following table describes the behavior of each light.

Status light	On	Off	Blinking
Power	Green: Ready Orange: Resetting, restoring factory defaults, or upgrading firmware	Not receiving power	Error*
Modem	Modem connected and turned on	Modem off or not connected	Data being sent or received through the modem
Wireless	Radio enabled	Radio disabled	Data being sent or received wirelessly
Ethernet port (4)	Ethernet device connected and on	Ethernet device off or not connected	Data being sent or received over Ethernet connection

*If the Power light is blinking, reset the base station by using the procedure described later in this chapter.

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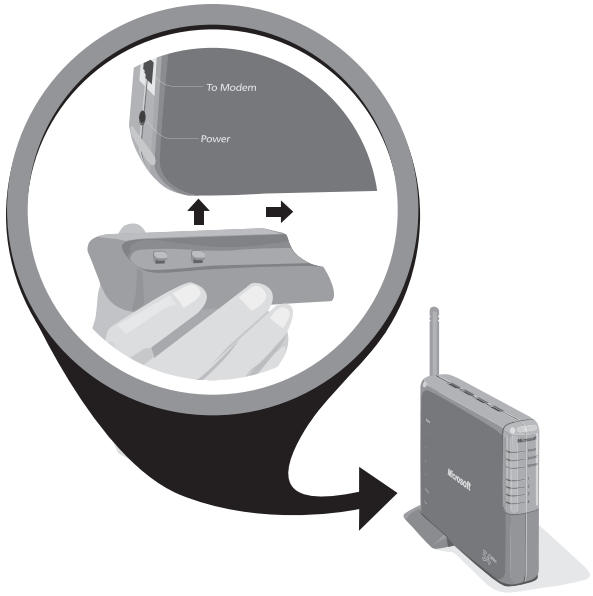
Using the Base Station Stand

You can position the base station horizontally or vertically. To position it vertically, use the detachable stand that is included in the box.

To attach the stand

1. Insert the two rectangular hooks on the stand into the two rectangular openings on the bottom of the base station.



2. Slide the stand toward the center of the base station.

To detach the stand

- Slide the stand away from the center of the base station.

Resetting the Base Station

You can reset the base station to correct connectivity problems. Simply unplug the base station power cord and then plug it back in again. The Power light will turn orange and then turn green when the reset is complete.

Restoring Factory Default Settings

You can restore the factory default settings to the base station if, for example, you forget your base station password. Restoring the base station erases all your current base station settings and returns the password to the default, **admin**. After you restore your base station, you will need to reconfigure the base station settings. You can do this by running the Setup Wizard and clicking **Set Up a Product**.

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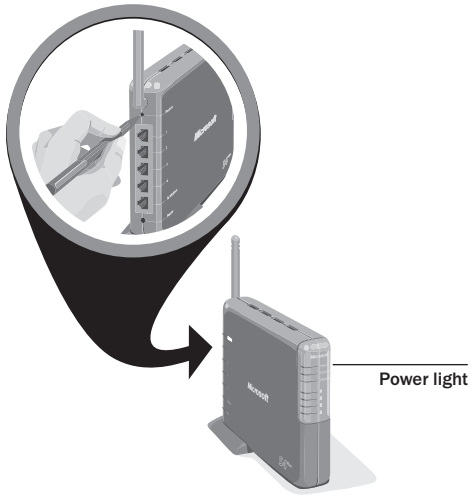
To restore the base station to factory default settings

- Use a pointed object to press and release the Restore button on the back of the base station.

  The Power light turns solid orange. When it turns solid green, the restoration is complete. This process takes about a minute.



About Wireless (Radio) Connections

Your base station communicates by radio transmission. Radio waves travel in all directions, and can be transmitted through walls and floors. This section on wireless connections provides important information about wireless performance.

Placement of Wireless Components

The following placement recommendations will help you achieve the best wireless range, coverage, security, and connection speed from your wireless devices:

- Place the base station near the center of your intended wireless network area. This will minimize the possibility of eavesdropping by neighboring wireless networks.
- Place wireless components in direct line of sight to one another, if possible.
- Place wireless components on desks or shelves when possible (instead of on the floor) to avoid obstacles and achieve better reception on the upper stories of buildings.
- Avoid placing wireless components in a way such that large, solid objects block the direct path between them. Building components, such as fireplaces, concrete or masonry walls and floors, metal framing, UV window film, and metallic paint will reduce radio signal strength.

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- Avoid placing wireless components next to large metal objects such as computer cases, monitors, and appliances. Metal objects reduce signal strength.
- Avoid placing wireless components close to electromagnetic devices, especially those with frequencies in the 2.4-gigahertz (GHz) range. Devices such as cordless phones, microwave ovens, radios, and televisions can interfere with wireless transmission.
- If you notice poor connection speed on an adapter, try moving your wireless components closer together. Connection speeds will be slower if your wireless components are very far apart from each other on the network.
- Be aware that wireless signal range, speed, and strength can be affected by interference from neighboring wireless networks and devices.

Adjusting the Antenna

To improve wireless reception, you can adjust the base station's external antenna.

Start with the antenna pointing straight up, and adjust the antenna if you get poor signal strength on an adapter. Certain areas, such as directly below the antenna, get relatively poor reception. Pointing the antenna toward another wireless component does not improve reception.

Understanding Wireless Transmission Standards

802.11 is a series of wireless transmission standards developed by the Institute of Electrical and Electronics Engineers (IEEE) for wireless local area networks. Currently, four specifications make up the 802.11 series: 802.11, 802.11a, 802.11b, and 802.11g. Your Microsoft Wireless Base Station conforms to the latest specification, 802.11g. The main features that distinguish these specifications are connection speed and radio frequency.

The following table summarizes the four specifications in the 802.11 series.

Specification	Connection speed	Radio frequency band
802.11	1 or 2 megabits per second (Mbps)	2.4 GHz
802.11a	Up to 54 Mbps	5 GHz
802.11b	5.5 and 11 Mbps	2.4 GHz
802.11g	Up to 54 Mbps	2.4 GHz

Note **The benefit of the 2.4-GHz radio frequency band is that it allows for greater range than the 5-GHz band. The drawback is that it is susceptible to interference from other devices, such as 2.4-GHz cordless telephones.**

Because 802.11b and 802.11g use the same radio frequency band, this wireless base station is compatible with 802.11b devices on your network. However, when you transfer data between 802.11b and 802.11g devices, the connection speed is limited to the 802.11b maximum of 11 Mbps.

Note **Your Microsoft Wireless base station is not compatible with 802.11a-only devices.**

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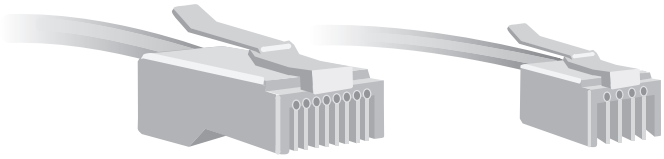
About Wired (Ethernet) Connections

Ethernet is the most commonly used wired network protocol, with data transfer rates of 10 Mbps, 100 Mbps, or higher. The base station's auto-negotiation feature automatically determines the rate of your network connections and uses the fastest speed available.

You will probably use Ethernet cables to connect some devices in your network, for example to connect your base station to a modem and to one or more computers. Each device that makes a wired connection to your base station must have an Ethernet adapter, which provides an Ethernet port. A modem and up to four other Ethernet devices can connect to the base station. By using hubs or switches, you can connect more Ethernet devices to your base station.

Ethernet Cables

An Ethernet cable resembles a phone cord, but has wider connectors at each end. You can distinguish Ethernet cable from phone cable by the larger connector size and, often, by the number of gold pins (or contacts) visible in the connector. Ethernet connectors (RJ-45) commonly contain eight contacts, whereas phone connectors (RJ-11) contain either two or four, as shown in the following illustration.



RJ-45 Ethernet (8 pins) **RJ-11 Telephone (4 pins)**

Note **There are two types of Ethernet cable, "straight-through" and "crossover". You can use either type when you connect devices to the Microsoft base station. For other Ethernet connections that you establish on your network, a specific type of Ethernet cable might be required. For more information about the types of Ethernet cable, see the Broadband Network Utility Help.**

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2 setup

Using the Setup Wizard

This chapter will guide you through the setup process for your Microsoft® Broadband Networking Wireless Base Station. The procedures described in the Typical Setup section of this chapter will help you set up your base station by using the wizard on the Setup CD. Typical Setup is recommended because the Setup Wizard identifies and configures a variety of Internet and wireless network settings.

To use the Typical Setup steps, you will need:

- A computer that has an Ethernet port and is running Microsoft Windows® XP, Windows Millennium Edition, Windows 2000 Professional, Windows 98, or Windows 98 SE.
- An external broadband modem with an Ethernet port.

You should not use the Typical Setup steps if any of the following apply to you.

- You don't have a computer with an Ethernet port. See "Setting Up the Base Station Wirelessly" later in this chapter.
- You have an existing network with a base station, gateway, or router and you want to use this wireless base station to add wireless connectivity or extend your network's wireless range. See "Access Point Setup" in Chapter 3.
- You want to set up the base station from a computer that isn't running Windows. See Chapter 3.
- You don't want to run the Setup Wizard to set up the base station. See Chapter 3.

Typical Setup

The steps in this section correspond to the steps that you will go through in the Setup Wizard on the Setup CD. If possible, you should use the Setup Wizard whenever you set up a Microsoft Broadband Networking product on your network.

Note **You can use the Setup and Network Utility (v.2.0) CD that comes with this base station to install all current and previous versions of Microsoft Broadband Networking products. If you have other Microsoft Broadband Networking products on your network, you do not need to keep multiple copies of this CD and you can discard earlier versions of this CD.**

Step 1: Gather Components, Tools, and Information

1. Check if any of the following special situations apply to you.

If...	Do this first...
You haven't yet set up your broadband Internet connection	Set up your broadband Internet connection and make sure that it works. The Setup Wizard will look for it and gather all of your Internet settings so that you don't have to locate and enter them manually.
You are using this base station to replace an existing base station, gateway, or router	Record your current Internet settings. For information about how to locate them, see Appendix A, "Determining Your Network Settings." Do not disconnect your existing network devices until instructed to do so by the Setup Wizard.
Your computer currently connects to your broadband modem with USB cable	Replace the USB cable with the Ethernet cable that came with your modem. Make sure that your Internet connection is working through the Ethernet cable before proceeding.
Your computer is running Windows XP or Windows 2000	Log on as a member of the Administrator group on the computer you will use to set up the base station and on the computer you will use to set up the adapter. If you are not logged on as an administrator, click **Start**, click **Log Off**, and then press CTRL+ALT+DELETE. Log on again with an administrator's name and password.
Your computer is running firewall or Internet connection sharing software	Disable or uninstall any firewall or Internet connection sharing software on your computers. Your base station will replace these functions, and the Setup Wizard cannot proceed if they are enabled.
You have a Point-to-Point Protocol over Ethernet (PPPoE) Internet connection	Make sure that you know your user name, password, and service name. The Setup Wizard will prompt you to enter this information. For information about how to determine your Internet settings, see Appendix A, "Determining Your Network Settings."

2. Take the following items to the computer that is currently connected to your broadband modem. If this computer does not meet the base station setup requirements, you can use any other computer that does. However, you will need to enter your Internet settings manually.

- Setup and Network Utility CD
- Microsoft Wireless Base Station
- Blue Ethernet cable included in the box
- Power supply (Use only the AC adapter included in the box.)
- Blank floppy disk included in the box
- This *User's Guide*
- Installation CD for your Windows operating system if your computer is running Windows Me, Windows 98, or Windows 98 SE

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Step 2: Run the Setup Wizard

1. Insert the Setup CD into the CD drive. If the Setup Wizard does not start automatically after a few seconds, open **My Computer**, double-click the CD icon, and then double-click **Setup** or **Setup.exe**.

   Note **During setup, you may be prompted to restart your computer or insert your Windows operating system CD. You may also need to specify the location of the required setup files on the Windows CD. Do this by typing the drive letter of your CD drive and the appropriate directory (for example, D:\win98).**

2. On the first screen that appears, click **Set Up a Product**.

   The wizard will detect any components that are missing on your computer and specify which of these components are required for setup and which are optional.

3. Continue following the instructions in the wizard to install missing components (as necessary).

4. When the wizard asks whether you are setting up a base station or an adapter, click **Base station**.

5. When the wizard asks which base station you are setting up, click **Wireless-G Base Station (MN-700, MN-820)**.

6. Continue following the instructions in the Setup Wizard. If you have a question, click a Help link on the screen for more information.

   If you need to cancel setup before it is complete, you can rerun the Setup Wizard. When the Setup Wizard restarts, click **Set Up a Product**.

Step 3: Connect the Base Station

1. When the Setup Wizard prompts you to connect your base station, place the base station close to your modem and computer, and near the center of your intended network. If you want to position the base station vertically, attach the provided stand. For more information about optimal placement of your base station, see "Placement of Wireless Components" in Chapter 1.

   Note **Do not turn off your computer while you connect your base station.**

2. Disconnect the modem Ethernet cable from the back of your computer, and then connect it to the To Modem port on the back of the base station.

3. Connect one end of the blue Ethernet cable that came with your base station to one of the Ethernet ports on the back of the base station, and then connect the other end to an Ethernet port on your computer.

4. Plug one end of the power supply that came with your base station into the Power port on the back of the base station, and then plug the other end into an electrical outlet. The Power light on the front of the base station will turn orange, and then green.

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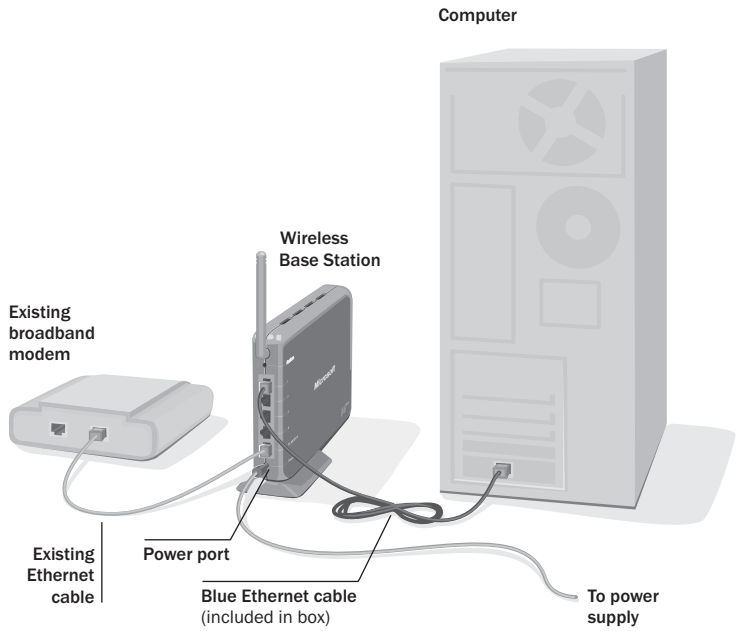
Your connections should now resemble those in the following illustration.



5. Return to the Setup Wizard and click **Next**.

Step 4: Configure the Base Station

1. Continue following the instructions in the Setup Wizard to:

- Select wireless security options. For more information about wireless security, see "Making Your Network More Secure" in Chapter 5.
- Save your wireless network settings. You can use the provided floppy disk for this.
- Set up file and printer sharing on your computer.

  Note **If your computer is a member of a domain, the Setup Wizard detects this and skips the file and printer sharing part of setup. You will not be able to share files and printers with other computers on your network. For information about switching between a workgroup and a domain, see Broadband Network Utility Help.**

2. When you reach the end of the Setup Wizard, click **Finish**. By default, the Broadband Network Utility starts automatically.

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3. Remove the Setup CD from the CD drive and the floppy disk (if used) from the floppy disk drive. Keep your network settings handy to set up additional computers on your network.

   It is recommended that you install the software on all computers on your network, so that you can use the Broadband Network Utility from all of your computers. If you want to do this, run the Setup Wizard on each of your computers and when the Setup Wizard starts, click **Install Software Only**. (If the computer already has a version of this software installed, this option is called **Update Software Only** or **Reinstall Software Only**.)

Step 5: Test Your Network

1. View the status of your network in the Broadband Network Utility. Make sure that the other computers on your network appear under **Network Devices**. For more information about using the Broadband Network Utility, see Chapter 4.
2. From a computer with a wireless adapter, open your Web browser and try accessing a Web site such as www.microsoft.com. If your network is working properly, you will be able to access the Internet from the computer you just set up.

What's Next?

Your base station setup is now complete.

- If your network is working properly, you can proceed to Chapter 4, "Network Activities."
- If you are having network problems or you cannot connect to the Internet, see "Network and Internet Problems" in Chapter 6.

Setting Up the Base Station Wirelessly

It is possible to set up the base station wirelessly by using a Microsoft wireless adapter. Use this setup method only if none of your computers has an Ethernet port.

To set up the base station wirelessly

1. Locate and write down your Internet settings. For instructions, see Appendix A, "Determining Your Network Settings." For most Internet connections, you will need your host name and media access control (MAC) address. For a PPPoE connection, you will need your user name, password, and service name. For a static Internet protocol (IP) address, you will need your IP, subnet mask, and default gateway addresses.
2. Disconnect your modem from your computer, and turn off the modem (or unplug it).
3. On the computer that was connected to your modem, run the Setup Wizard.
4. On the first screen that appears, click **Set Up a Product**.

   The wizard will detect missing components and help you install them.

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5. When the wizard asks what you want to install, click **Base station**.

   If you have not yet installed your Microsoft wireless adapter, the wizard will alert you that you need to install an adapter. Continue following the steps in the wizard to set up the wireless adapter.

6. When the wizard asks which base station you are setting up, click **Wireless-G Base Station (MN-700, MN-820)**.

7. When the wizard asks what type of modem you have, click **External broadband modem, connected with Ethernet cable**. (Select this option even if your modem made a USB connection to your computer before you disconnected it in step 2.)

   Because your modem is no longer connected to your computer, the Setup Wizard will alert you that it cannot detect your Internet connection.

8. Click **Next** to proceed without an Internet connection. Later, you will be able to enter the Internet settings you saved in step 1 of this procedure.

9. When the Setup Wizard prompts you to connect your base station, connect an Ethernet cable from your modem to the To Modem port of the base station, and then plug in the base station power cord. Your modem is now connected to the base station. Do not connect your computer to the base station.

10. Plug in and turn on your modem.

11. When the Setup Wizard asks you for your Internet settings, enter the Internet settings that you recorded in step 1 of this procedure.

12. Continue following the steps in the Setup Wizard to set up wireless security, to enable file and printer sharing, and to save your network settings.

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3 custom setup

Configuring the Base Station Manually

The Base Station Management Tool is a Web-based utility that you can use to configure your base station for initial setup.

You should use the Base Station Management Tool to configure your base station for setup only in the following situations:

- Your computer is not running Microsoft® Windows®.
- You want to use the base station as an access point only.
- You are an advanced user and you do not want to use the Setup Wizard.

In all other situations, you should run the Setup Wizard to configure your base station. The Setup Wizard automatically configures the base station with your Internet and other network settings. For information about configuring the base station by using the Setup Wizard, see Chapter 2, “Setup.”

There are two options for configuring your base station from the Base Station Management Tool.

Follow the Base Station Setup if you want to share a broadband Internet connection on your network by using the wireless base station in this kit.

Follow the Access Point Setup if you already have a network with a base station, router, or gateway, and you want to add wireless connectivity or extend the wireless range of your network.

In addition to configuring your base station for initial setup, you can also use the Base Station Management Tool to manage your network settings, customize security options, and establish special network requirements such as a Web server. For information about these options, see the *MN-700: Base Station Configuration Guide*. You can find this guide on the Setup CD that came with your network products.

Base Station Setup

To complete this setup procedure, you must have a computer with an Ethernet port and an external, broadband modem with an Ethernet port.

Step 1: Connect the Base Station

1. Position the base station close to your modem and computer, and then turn off your modem.
2. Disconnect your modem cable from the Ethernet port on the back of your computer. Leave the other end of the cable connected to the modem. Connect the cable to the port labeled To Modem on the back of the base station.
3. Connect one end of the blue Ethernet cable that came with your base station to the Ethernet port labeled 1 on the back of the base station and connect the other end to the Ethernet port on the back of your computer.
4. Plug one end of the power supply that came with your base station into the Power port on the back of the base station, and plug the other end into an electrical outlet. The Power light on the front of the base station should turn orange, and then turn green.

Step 2: Open the Base Station Management Tool

You can open the Base Station Management Tool directly from a Web browser, such as Microsoft Internet Explorer 5 or later, or Netscape Navigator 6.0 or later.

1. From the computer connected to the base station, open your Web browser, and then type the Internet protocol (IP) address of the base station in the address field. By default, this address is http://192.168.2.1. However, you can change this address in the Base Station Management Tool.
2. To log on, type the default base station password, *admin*.

Step 3: Establish the Base Station Password

Access to the Base Station Management Tool is password protected to help ensure that only users who know the base station password can change your network configuration. You can use the default password, *admin*, to access the base station the first time. You should, however, create a new password at the earliest opportunity.

Note **It is a good idea to change your password every two to three months, or more frequently if you are concerned that an unauthorized person has administrative access to the base station.**

1. From the **Home** page of the Base Station Management Tool, click **Management**, and then click **Change Password**.
2. In the **Current password** box, type your current password.
3. In the **New password** box, type a new password. Use a minimum of 3 characters, but no more than 16 characters. The base station password is case sensitive.

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4. In the **Confirm new password** box, retype the new password.
5. To save the new password, click **Apply**.

Be sure to store your password in a safe place. If you forget or misplace your password and cannot log on to the Base Station Management Tool, you can restore the base station to the factory default settings from the base station itself, and then use the default password *admin* to open the Base Station Management Tool. For more information about restoring factory default settings to the base station, see Chapter 1, "Introduction."

Step 4: Establish Your Internet Settings

On the Wide Area Network page of the Base Station Management Tool, you must specify whether you have a dynamic, static or Point-to-Point Protocol over Ethernet (PPPoE) Internet connection. Depending upon the type of Internet connection you have and your ISP account, you will be required to specify additional Internet settings information, such as your host name, subnet mask, or domain name server (DNS) address. This information is typically provided by your Internet Service Provider (ISP).

If you need assistance determining your Internet settings, see Appendix A, "Locating Your Internet and Network Settings."

1. From the Base Station Management Tool, click **Wide Area Network**. On the **Wide Area Network** page, under **Internet Connection Type**, select the type of Internet connection provided by your ISP.
2. Enter the information required for your specific Internet connection type.
   - If you selected **Dynamic**, under **Dynamic Connection**, specify a host name if your ISP requires it. Specify the DNS primary and secondary addresses, if your ISP provided you with this information. If you are replacing an existing base station, router, or gateway with the Microsoft base station, specify the media access control (MAC) address of that device in the **MAC Address** box, and then click **Clone MAC Address**. Otherwise, specify the MAC address of the adapter that was connected to the modem in the **MAC Address** box, and then click **Clone MAC Address**. For information about MAC addresses, see Broadband Network Utility Help or the Advanced Network Guide.
   - If you selected **Static**, under **Static Connection**, type the IP address, subnet mask, default gateway IP address, and DNS addresses provided by your ISP.
   - If you selected **PPPoE,** under **Point-to-Point Protocol over Ethernet (PPPoE),** type your user name and password, the service name if your ISP provided it, and the maximum idle time, if your ISP instructed you to do so. You will be disconnected from the Internet if the time that you specify elapses without activity. Select the **Auto-reconnect** check box to reestablish the connection automatically after a disconnect.
3. To save the wide area network (WAN) settings you have entered, click **Apply**.

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Step 5: Establish Your Wireless Settings

The wireless settings of all the devices on your network must match the wireless settings you provide for the base station. Be sure to note the settings you enter on this page so you can establish the same settings when you configure wireless adapters or other network devices.

1. From the Base Station Management Tool menu, click **Wireless**.
2. Type the wireless network name in the **Wireless network name (SSID)** box. The wireless network name, also known as the Service Set Identifier (SSID), identifies your network. The network name is case sensitive and cannot exceed 32 characters.
3. From the **Wireless mode** drop-down list box, select the wireless mode for your network.
   - Select **g performance (fastest)** if all of your network devices use the IEEE 802.11g protocol.
   - Select **mixed b compatible (fast)** if all of your network devices use either IEEE 802.11g or IEEE 802.11b protocol.
   - Select **disabled** only when you want to turn off your base station radio. If you select this option, none of the wireless devices on your network will be able to communicate with the base station.
4. To apply these wireless settings, click **Apply**.

Step 6: Establish Your Wireless Security Settings

The base station uses Wired Equivalent Privacy (WEP) or Wi-Fi Protected Access™ (WPA) to help prevent unauthorized users from joining your network or accessing data that is being transmitted over the network. You cannot enable both types of wireless security; you must choose to enable either WEP or WPA.

To use WPA, all the computers on your network must be running Windows XP with Service Pack 1 and the WPA Support Patch installed. Computers that do not meet these system requirements will not be able to connect to your network. For more information about enabling WPA on your base station, see Broadband Network Utility Help.

The following procedure describes how to enable 128-bit WEP encryption. Any computer that meets the system requirements for Microsoft Broadband Networking products can use WEP.

1. From the Base Station Management Tool **Security** menu, click **Wireless Security**.
2. In the **Encryption strength** drop-down list, select **128-bit WEP (strong)**.
3. Type a WEP key in the **WEP Key** box. For 128-bit encryption, the WEP key must be 26 characters in length. WEP keys can contain numbers and the letters A through F.
4. To enable your wireless security settings, click **Apply**.

Note **The wireless security settings of all the devices on your network must match the wireless security settings you provide for the base station. Be sure to note the settings you enter on this page so you can establish the same settings when you configure wireless adapters or other network devices.**

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Step 7: Customize Network Settings

You can customize network settings from the Base Station Management Tool. For example, you can perform the following tasks:

- Block or permit specific Web sites or Web content by using parental controls.
- Establish a Web or mail server on your network by using persistent port forwarding.
- Control access to your network by using MAC filtering.
- Control what computers on your network can access the Internet by using client filtering.
- Map ports for specific Internet games by using application-triggered port forwarding.

For information about these options, consult Broadband Network Utility Help or the *MN-700: Base Station Configuration Guide*. You can find this guide on the Setup CD that came with your network products.

Step 8: Configure Your Computer

When you set up the base station by using the Base Station Management Tool, you must configure the TCP/IP properties of each computer that you connect to your network. If you are using a Microsoft adapter, the correct settings are established automatically when you run the Setup Wizard. If you are using a non-Microsoft adapter, or if you do not want to run the Setup Wizard, you can configure the TCP/IP properties from Windows.

In general, you should configure the computer to use the TCP/IP protocol and to obtain an IP address automatically. However, if you disable the DHCP server on the base station or if you want one or more of your networked computers to use a static IP address, you must configure the computer to use a static IP address. For information about how to establish a static IP address for a computer on your network, see Broadband Network Utility Help.

Note **The TCP/IP properties you set are stored on the adapter connected to your networked computer. If you change adapters, you must reconfigure these settings for the computer.**

To configure the TCP/IP properties of a computer running Windows 98, Windows 2000, or Windows Me operating system

1. Click **Start**, point to **Settings**, and then click **Control Panel**.
2. Double-click the **Network** icon.
3. In the **Configuration** dialog box, select the **TCP/IP protocol** line that is associated with your network adapter.
4. Click the **Properties** button, click the **IP Address** tab, and then select **Obtain an IP address automatically**.
5. Click the **Gateway** tab and make sure that all fields are empty, and then click **OK**. When the **Network Properties** dialog box appears, click **OK** again.
6. If you are prompted to supply the original Windows installation files, insert your Windows CD-ROM into the CD-ROM drive, and then browse to the location of your CD-ROM drive.
7. When you are prompted to restart your computer, click **OK**.

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To configure the TCP/IP properties on a computer running Windows XP operating system

1. Click **Start**, click **Control Panel**, and then double-click **Network Connections**.
2. Double-click the icon for the connection you want to configure, and then, in the **Connection Status** dialog box, click **Properties**.
3. On the **General** tab, under **This connection uses the following items**, click **Internet Protocol (TCP/IP)**, and then click **Properties**.
4. Click **Obtain IP address automatically**, and then click **Obtain DNS server address automatically**.
5. Click **OK** to close the **TCP/IP Properties** dialog box, and then click **OK** to close the **Connection Properties** dialog box.

Step 9: Test your Internet Connection

1. Turn on your broadband modem.
2. From the **Home** page of the Base Station Management Tool, under **Wide Area Network (WAN) settings**, check the status of the Broadband connection.
3. If the status is **Connected**, your setup is complete. If the status is **Disconnected**, click **Renew** if you have a dynamic or static IP connection, or **Connect** if you have a PPPoE connection. If the status is still **Disconnected**, confirm your Internet settings with your ISP, and then try to configure the base station again.

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Access Point Setup

When you set up the base station as an access point, you disable its router capabilities, including network address translation (NAT). With the router capabilities disabled, you cannot use the base station to share one Internet connection with multiple computers.

You should only set up the base station as an access point if you already have a base station, gateway, or router connected to an existing network, and this device provides NAT and a DHCP server.

Step 1: Connect the Base Station to a Computer

To set up the base station as an access point, you must connect it directly to the computer where you will configure it, and this computer must be disconnected from your existing network. The following procedure describes how to configure the base station from the computer that is connected to your current base station, router, or gateway.

1. Disconnect the Ethernet cable from the Ethernet port on your existing base station, gateway, or router, and connect it to the Ethernet port on the base station that you want to use as an access point.

   Note If your current base station, router, or gateway provides wireless connectivity, be sure to write down its IP address and wireless settings, including the wireless network name (SSID), WEP or WPA settings, and wireless channel, before you disconnect it. You will need these settings when you establish the wireless settings for your access point.

2. Plug one end of the power supply that came with your base station into the Power port on the back of the base station, and plug the other end into an electrical outlet. The Power light on the front of the base station should turn orange, and then turn green.

Step 2: Open the Base Station Management Tool

You can open the Base Station Management Tool directly from a Web browser, such as Microsoft Internet Explorer 5 or later, or Netscape Navigator 6.0 or later.

1. From the computer to which the base station is connected, open your Web browser, and then type the IP address of the base station in the address field. By default, this address is http://192.168.2.1. However, you can change this address in the Base Station Management Tool.
2. To log on, type the default base station password, *admin*.

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Step 3: Establish the Base Station Password

Access to the Base Station Management Tool is password protected to help ensure that only users who know the base station password can change your network configuration. You can use the default password, *admin*, to access the base station the first time, but you should create a new password at the earliest opportunity.

Note **It is a good idea to change your password every two to three months, or more frequently if you are concerned that an unauthorized person has administrative access to the base station.**

1. From the **Home** page of the Base Station Management Tool, click **Management**, and then click **Change Password**.
2. In the **Current password** box, type your current password.
3. In the **New password** box, type a new password. Use a minimum of 3 characters, but no more than 16 characters. The base station password is case sensitive.
4. In the **Confirm new password** box, retype the new password.
5. To save the new password, click **Apply**.

Be sure to store your password in a safe place. If you forget or misplace your password and cannot log on to the Base Station Management Tool, you can restore the base station to the factory default settings from the base station itself, and then use the default password *admin* to open the Base Station Management Tool. For more information about restoring factory default settings to the base station, see Chapter 1, "Introduction."

Step 4: Establish Your Wireless Settings

1. From the Base Station Management Tool menu, click **Wireless**.
2. Type the wireless network name in the **Wireless network name (SSID)** box. The wireless network name, also known as the Service Set Identifier (SSID), identifies your network. The network name is case sensitive and cannot exceed 32 characters.

   Note **If your existing base station provides wireless connectivity, be sure to establish the same wireless network name for the access point that you have established on the base station.**

3. From the **Wireless mode** drop-down list box, select the wireless mode for your network.
   - Select **g performance (fastest)** if all of your network devices use the IEEE 802.11g protocol.
   - Select **mixed b compatible (fast)** if all of your network devices use either IEEE 802.11g or IEEE 802.11b protocol.
   - Select **disabled** only when you want to turn off the base station radio. When you select this option, none of the wireless devices on your network will be able to communicate with the access point.
4. From the **Wireless channel number** drop-down list, select a wireless channel. Be sure to select a different wireless channel from the one your existing base station, router, or gateway is using.
5. To apply these wireless settings, click **Apply**.

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Step 5: Establish Your Wireless Security Settings

The base station uses Wired Equivalent Privacy (WEP) or Wi-Fi Protected Access™ (WPA) to help prevent unauthorized users from joining your network or accessing data that is being transmitted over the network. You cannot enable both types of wireless security; you must choose to enable either WEP or WPA.

To use WPA, all the computers on your network must be running Windows XP with Service Pack 1 and the WPA Support Patch installed. Computers that do not meet these system requirements will not be able to connect to your network. For more information about enabling WPA on your base station, see Broadband Network Utility Help.

The following procedure describes how to enable 128-bit WEP encryption. Any computer that meets the system requirements for Microsoft Broadband Networking products can use WEP.

1. From the Base Station Management Tool **Security** menu, click **Wireless Security**.
2. In the **Encryption strength** drop-down list, select **128-bit WEP (strong)**.
3. Type a WEP key in the **WEP Key** box. For 128-bit encryption, the WEP key must be 26 characters in length. WEP keys can contain numbers and the letters A through F.
4. To enable your wireless security settings, click **Apply**.

Note The wireless security settings of all the devices on your network must match the wireless security settings you provide for the base station. Be sure to note the settings you enter on this page so you can establish the same settings when you configure wireless adapters or other network devices.

Step 6: Set the Base Station to Access Point Mode

1. On the **Security** menu, click **Base Station Mode**.
2. Click the **Access Point** radio button, and then click **Yes** to confirm your selection.
3. If you have not already established a name for your base station, type a name in the **Base station name** text box. Do not use the default name of MN-700.

   Note Be sure to write down the name you establish for this base station. When you set the base station to access point mode, it becomes a client on your network and it obtains its IP address automatically by DHCP. You must, therefore, type the base station name in the address field of your Web browser to open the Base Station Management Tool for this base station. You can no longer communicate with this base station by using the IP address of 192.168.2.1.
4. Click **Apply**. When you switch from router mode to access point mode, the base station resets. While the reset is in progress, the Power light on the base station turns orange. When the light is solid green, the reset is complete.
5. After the reset is complete, turn off the computer and the base station.

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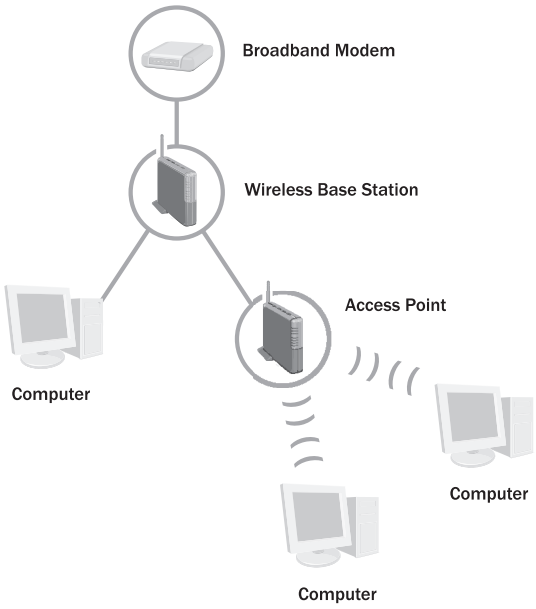
6. Disconnect the Ethernet cable from the base station port, and reconnect it to your existing base station, router, or gateway.
7. Connect one end of the blue Ethernet cable that came with your base station to one of the ports of your existing base station, router, or gateway. Connect the other end to one of the ports of the base station you set to access point mode.

   Your network should now resemble the following illustration:



8. Turn on the base station.

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4 network activities

Sharing and Accessing Network Resources

After setting up your wireless network, you can perform common network tasks, such as making files and printers available to other computers (a process called “sharing”), and then accessing these shared resources. You can also use the same Internet connection from multiple computers on your network.

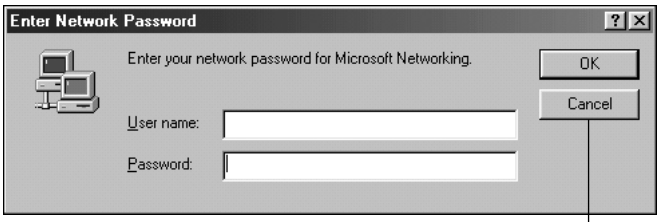
This chapter describes how to:

- Log on to your network.
- Use the same Internet connection from multiple computers on your network.
- Start the Broadband Network Utility (to view shared resources and access Help to troubleshoot problems).
- Share files and folders from one computer and then access them from other computers.
- Share a printer that is connected to one computer and then print to it from other computers.
- Make other peripheral devices available to computers on your network.
- Read e-mail messages on your network.
- Play games on your network and on the Internet.

Logging on to Your Network

After starting your computer, you must always log on to your network to access files, printers, and other resources that have been shared.

If you have Microsoft® Windows® 98 or Windows Millennium Edition operating system, do not click **Cancel** during the logon process, even if you decide to leave your password blank. Type your user name, type your password (or leave it blank), and then click **OK**.



If you are already using Windows, and you haven't yet logged on to your network, you can log off from Windows and then log back on.

To log off and log back on to your network

1. Click **Start**.
2. Click **Log Off**. (If **Log Off** does not appear on your **Start** menu, click **Shut Down**, make sure that **Log Off** is selected in the drop-down box, and then click **OK**.)
3. Log on to your network.

After you log on to your network, you can perform certain network functions, such as opening shared files.

Using an Internet Connection over a Network

Now that you've installed the base station, all of the computers on your network can use one Internet connection. Multiple computers can even use the Internet connection at the same time, without making the Internet connection speed noticeably slower for each person.

You can access the Internet from each computer in the way you are used to, for example, by simply starting your Web browser and visiting a Web site. Note that, to browse the Web, each computer must have its own Web browser (such as Microsoft Internet Explorer) installed.

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Using the Broadband Network Utility

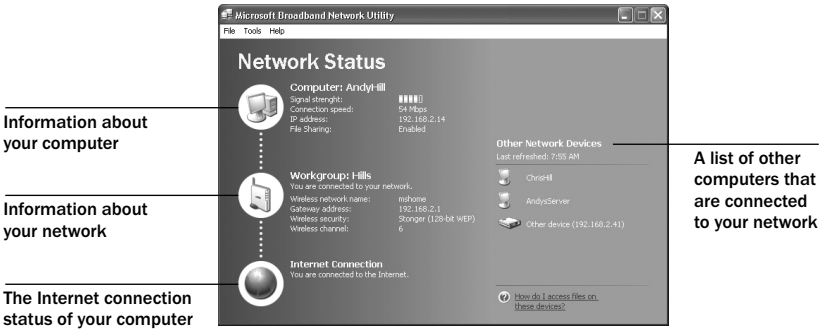
The Microsoft Broadband Network Utility is automatically installed on your computer when you run the Setup Wizard. You can use the Broadband Network Utility to view other computers on the network and access shared files on those computers.

The Help system in the Broadband Network Utility provides additional information about Microsoft Broadband Networking products, using the Broadband Network Utility, performing common tasks on your network, and troubleshooting network problems. The Help system, the Network Troubleshooter, and Web Help are all available on the Help menu.

Note **For information about using the Broadband Network Utility to change wireless settings or update software, see Chapter 5.**

To start the Broadband Network Utility

- Click **Start**, point to **Programs**, and then click **Microsoft Broadband Network Utility**.
  -or-
- Double-click the Broadband Network Utility icon in the notification area at the far right of the Windows taskbar.



The right pane of the Broadband Network Utility displays information about the computers connected to your network. This information automatically refreshes at regularly scheduled intervals. You can also manually refresh the list.

Note **To see the full computer name and Internet protocol (IP) address of a computer in the Network Devices list, hold the mouse pointer over the computer in the list.**

To refresh the Network Devices list

- Right-click the icon for an active device, and then click **Refresh**.

To remove an inactive device from the Network Devices list

- Right-click the dimmed icon for the device, and then click **Remove from List**.

In the sections that follow you will read about how to use the Broadband Network Utility to access shared files on network computers and to join other networks.

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Using Files and Folders over a Network

This section explains how you can make files and folders available on one computer (a process called "file and folder sharing") and then access those files and folders from other computers on your network.

To make using files and folders over a network easy, you should assign all computers on your network to the same workgroup if you haven't done so already. For information about how to do this, look up "workgroup" in Windows Help.

Important **Do not assign a computer (such as a work laptop) to your workgroup if the computer is already a member of a domain, and you intend to reconnect to the domain later.**

Step 1: Make your files and folders available to the network

You may have set up file sharing on your computers when you set up the base station and adapter. If you did not set up file sharing when you set up your hardware, you can enable it by using the Windows operating system. You can also use Windows to change or further refine the settings you selected during Setup. For more detailed instructions and information about sharing files and folders, see Windows Help.

Note **If you have Windows 2000 or Windows XP, you need to have sufficient privileges (or be the network administrator) to share folders with others. For more information, look up "administrator" in Windows Help.**

File and folder sharing is configured from the computer that contains the files and folders you wish to share. You can share an entire drive with the network, or you can share specific folders. For example, if you store photographs of your children in a folder named "Kids" on your computer, and you want to make the photographs available to your network, you can choose to share only the Kids folder.

Important **Although you can share files, printers, and other devices on your network, you cannot share software programs, such as Microsoft Word or Microsoft Excel.**

To share a folder or drive on your computer (in Windows XP)

1. Enable file sharing on your computer if you have not already done so. You need to do this only once. For information about how to enable file sharing, see Windows Help.
2. Open **My Computer**.
3. Browse to the drive or folder that you want to make available to other computers on your network, and then select it.
4. On the **File** menu, click **Sharing and Security**.
5. Click **Share this folder on the network**. By default, the folder is made available to all of the other computers on your network, and everyone has read-only access. To give everyone read-write access, check the **Allow Network Users to Change My Files** check box.
6. Click **OK**.

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To share a folder or drive on your computer (in Windows 2000)

1. Enable file sharing on your computer if you have not already done so. You need to do this only once. For information about how to enable file sharing, see Windows Help.
2. Open **My Computer**.
3. Browse to the drive or folder that you want to make available to other computers on your network, and then select it.
4. On the **File** menu, click **Sharing**.
5. Click **Share this folder**. By default, the folder is made available to all of the other computers on your network, and everyone has read-write access. To change the access level, click **Permissions**.
6. Click **OK**.

To share a folder or drive on your computer (in Windows 98, Windows 98 SE, and Windows Me)

1. Enable file sharing on your computer if you have not already done so. You need to do this only once. For information about how to enable file sharing, see Windows Help.
2. Open **My Computer**.
3. Select the file or folder that you want to make available to other computers on your network.
4. On the **File** menu, click **Sharing**.
5. Click **Shared as**. Change the level of access if you want, and then click **OK**.

Only the computer users on your network will have access to the files you share. At times, you may want to prevent certain users, such as your children, from accessing particular folders and the files they contain. If you want to increase the security of your shared files, you can assign permissions and passwords to your files and folders. For more information, look up “permission” and “access control” in Windows Help. (In Windows Millennium Edition, look up “controlling access.”)

Note **For a computer’s files and folders to be available to the network, the computer must be turned on and logged on to the network. Also, if the computer is turned on but in sleep mode, it will not be accessible from the network. For more information, look up “power options” in Windows XP Help, or “power management” in Windows Me, Windows 2000, and Windows 98 Help.**

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Step 2: Access shared files

To access shared files and folders, you can use the Broadband Network Utility and My Computer.

Note If you want to work with shared files on a computer that does not have the Broadband Network Utility installed, you can use Network Neighborhood or My Network Places in Windows instead. For more information, see Windows Help.

To access shared files on other computers

1. Start the Broadband Network Utility.
2. In the **Network Devices** list, double-click the computer that stores the file you want to access.
3. Use the window that appears to browse the shared folders on that computer and locate the file.

   Note If the shared files on the other computer do not appear, you might need to restart the computer you are using.

To copy a file or folder from a network computer to your local computer

1. Use the preceding steps to browse to the shared file or folder that you want to copy.
2. On the **File** menu, point to **Explorer Bar**, and then click **Folders**. The Folders bar appears in the left pane.

   You can now see the hierarchical structure of drives, folders, and files on your computer and on the other computers that are part of your network.
3. Drag the file or folder that you want to copy from the right pane to a local drive or folder in the Folders bar.

   Note If the shared network folder has read-write access, you can also copy files from your local computer into this shared folder.

Using a Printer over a Network

Before you can use a printer that is attached to another computer on your network, you will need to do the following:

- Make the printer available to other computers (this is also known as “sharing” a printer). Sharing must be configured on the computer to which the printer is attached.
- Run the Add Printer Wizard to install printer drivers on each computer that you want to print from.

  Note Some printer drivers are not designed for sharing printers. For more information, see the documentation that came with your printer, or see if additional drivers are available on the printer manufacturer’s Web site.

The procedures for sharing a printer and installing drivers differ depending on your version of the Windows operating system. For more detailed instructions, look up “sharing printers” in Windows Help.

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To access a shared printer from another computer on the network, use the following procedure.

To print to a shared printer that is attached to another computer on the network

1. Open the document that you want to print, such as a document in Microsoft Word.
2. On the **File** menu, click **Print**.
3. In the **Print** dialog box, select the shared printer from the list of printers, and then click **OK**.

Note **The computer that is connected to the printer must be turned on for the other computers on the network to use the printer.**

Using Other Peripheral Devices over a Network

In addition to using most printers over a network, you can use other peripheral devices—such as hard drives, CD drives, and Zip drives—over your network. Some peripheral devices (such as some scanners) cannot be shared with other computers on your network.

Before you can use a device that is attached to another computer on your network, you will need to do the following:

- Make the device available to the network (this is also known as sharing the device). This is configured from the computer to which the device is attached.
- Install any necessary drivers or utilities on each computer from which you want to use the device. For more information, see the documentation that came with the device.

About Reading E-Mail Messages on a Network

You can access your e-mail messages from each networked computer in the same way that you would access e-mail messages without a local area network (assuming that you have an Internet connection). Open your e-mail program, or, if you have a Web-based e-mail account, sign in to your account through your Web browser.

Keep in mind the following: If you download e-mail messages from your e-mail account to your computer, those messages will not be accessible from the other computers on your network. Similarly, if you share an account with another person, and he or she downloads e-mail messages from the shared account to one computer on the network, you will not see those messages when you access the account from another computer.

If you want your e-mail messages to remain available to all users of your network at any time, you should not download the messages to one computer. (However, you should delete old messages from your e-mail account on a regular basis, so that you don't exceed the storage space given to you by your e-mail provider.)

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Playing Games on Your Network and on the Internet

Many of the most popular games now have multiplayer capability, allowing two or more players to compete by using a local network. With network-enabled games, you can use your networked computers to play games with friends and family members.

Most games come with documentation that explains all you need to know to configure your network for multiplayer gaming. However, the following steps might help you prepare for playing games over the network:

- If you have purchased a multiplayer game, be sure to install it on each computer on the network that will be used for playing games.
- Make sure that the network protocols necessary to run the games that you want are installed on each computer on your network. For more information, see the documentation that came with your games.
- If you are playing an Internet-based game, you might also be required to pay user fees or download game files to your computer. Be sure to follow the directions provided on the game's Web site.
- If you have problems connecting to an Internet-based game, you might need to configure your base station to work with your game. For instructions on how to do this, see the *MN-700: Base Station Configuration Guide* on the Setup CD.

For information about playing games on the Internet, and for other game-related information, visit: www.microsoft.com/broadbandnetworking.

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5 network management

Understanding Network Maintenance and Security

Now that you have a wireless network, it is a good idea to familiarize yourself with some important network management tasks.

This chapter describes how to monitor network performance, update network software, and improve network security.

Monitoring Your Network

The Microsoft® Broadband Network Utility is your principal tool for viewing the status of your network and connected devices.

Note **For information about starting the Broadband Network Utility and using it to access shared files or to join other networks, see Chapter 4.**

View Status

You can view information about the status of your computer, your workgroup or domain, and your Internet connection in the left pane of the Broadband Network Utility. If there is a problem with your network or Internet connection, the Broadband Network Utility displays a link to the Network Troubleshooter, which you can use to help resolve the problem.

Note **You can also view information about the status of your network connection by resting the pointer on the Broadband Network Utility icon** **in the notification area at the far right of the Microsoft Windows® taskbar.**

View Network Devices

The right pane of the Broadband Network Utility displays information about the computers, base stations, and other devices connected to your network. This information automatically refreshes at regularly scheduled intervals. You can manually refresh the list.

To refresh the network device list

- Right-click the icon for an active device in the network device list, and then click **Refresh**.

Updating Software, Drivers, and Firmware

Occasionally, Microsoft may provide upgrades to the Broadband Network Utility software, network drivers, or firmware. When an upgrade is available on the Microsoft Broadband Networking Web site, the Broadband Network Utility Update Service will automatically notify you, unless you turn the update service off. After you log on to a networked computer, a message will appear in the notification area of the Windows taskbar with a link to the Microsoft Broadband Networking Web site.

If you turn the update service off, you can check for upgrades on the Web site from the Broadband Network Utility.

To upgrade software, drivers, or firmware

1. Start the Broadband Network Utility.
2. On the **Help** menu, click **Check for Updates Online**.
3. Follow the instructions on the Microsoft Broadband Networking Web site to download the latest software, drivers, and firmware.

Making Your Network More Secure

Protecting the data and programs on your network computers from security threats, such as computer viruses and hackers, is very important. The following sections provide general information about steps you can take to protect your network.

Help Protect Your Network from Computer Viruses

To avoid having a problem with viruses on your network, consider the following suggestions:

- Install an antivirus program on each computer on your network and use it regularly to check your computers for viruses. Remember to update the antivirus program on a regular basis.
- Learn the common signs of viruses: unusual messages that appear on your screen, decreased system performance, missing data, and inability to access your hard drive. If you notice any of these problems on your computer, run your antivirus program immediately to minimize the chances of losing data.
- Educate yourself about how viruses are commonly spread so that you do not spread one yourself:
  - Do not load a program from an untrusted source onto one of your network computers. Files from the Internet or online bulletin boards are particularly risky.
  - Never open attachments to e-mail messages that you are not expecting.
  - Use your antivirus software to scan all floppy disks before copying or opening files from them, or before starting your computer from them.

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Help Protect Your Network from Hackers

The Microsoft Wireless Base Station provides network address translation (NAT) and a firewall to help secure your system from hacker attacks over the Internet.

NAT hides the Internet protocol (IP) addresses of the computers on a network from the Internet so that only the base station IP address is visible. Without the IP address, it is more difficult for hackers to access the computers on your network.

The firewall specifies what information can be communicated from the computers on your network to the Internet, and from the Internet to the computers on your network. Like an actual firewall built to prevent fire from spreading between adjoining buildings, computer firewalls help prevent the spread of unauthorized communication between an individual computer or group of networked computers and the Internet.

If you are using the base station as an access point only, NAT and the firewall are disabled. In this case, you should make sure that another device on your network provides a firewall and NAT for your network.

Help Protect Your Network from Unauthorized Access

Because wireless networks use radio signals, it is possible for other wireless network devices outside your immediate area to pick up the signals and either connect to your network or capture the network traffic. To help prevent unauthorized connections or the possibility of eavesdroppers listening in on your network traffic, do the following:

- Place the base station toward the center of your home. This decreases the strength of the signal outside your home.
- Use media access control (MAC) filtering. You can use MAC filtering to grant or deny users the ability to connect to your network based on the MAC addresses of the adapters they are using. For information about MAC filtering, see Broadband Network Utility Help.
- Enable wireless security on your network. You can enable two types of wireless security on your base station:
  - Wired Equivalent Privacy (WEP). WEP provides 64-bit or 128-bit encryption. When you enable WEP, you establish a WEP key that scrambles or “encrypts” the data being transmitted between wireless nodes so that it is decipherable only by computers that have the WEP key. In addition, only users who know the network WEP key can join your network and use your Internet connection.
  - Wi-Fi Protected Access™ (WPA). Like WEP, WPA provides data encryption and enforces user authentication. When you enable WPA, however, you establish a WPA passphrase instead of a key. Although WPA is a more sophisticated form of encryption than WEP, you can only enable it on computers running Windows XP operating system with Service Pack 1 installed and the WPA Support Patch. You can download the Windows XP Support Patch for WPA at www.support.microsoft.com.

    Note **You cannot enable both types of wireless security on your network. You must choose either WEP or WPA. If you decide to enable WPA, make sure all the clients on your network meet the specified system requirements.**

For more information about WEP and WPA, see Broadband Network Utility Help.

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6 troubleshooting

Finding Answers to Common Problems

This chapter will help you solve the most common installation and setup problems that you may have with your Microsoft® Broadband Networking components. The following types of issues are covered:

- Setup and Hardware Problems
- Network and Internet Problems
- File and Printer Sharing Problems

If the problem you are experiencing is not covered in this chapter, you can find more troubleshooting information in Broadband Network Utility Help, or on the Microsoft Hardware Web site at www.microsoft.com/hardware. If you have finished Setup, you can start the Broadband Network Utility by double-clicking the icon in your Microsoft Windows® taskbar.

Setup and Hardware Problems

This section will help you solve problems that you might encounter while running the Setup Wizard or connecting your Microsoft Broadband Networking device to your network for the first time.

Note **Run the Setup Wizard before connecting your new hardware or disconnecting your existing Internet connection. This is important because the Setup Wizard will help detect your current Internet settings and configure your new Microsoft Broadband Networking hardware.**

The Setup Wizard will not start or locks up when I run it on my computer.

The following troubleshooting steps will help you track down and solve the problem.

- **Verify that your computer conforms to the minimum system requirements.** The packaging lists system requirements for your Microsoft Broadband Networking hardware and software. If your computer does not meet the minimum requirements, the Setup Wizard might not function correctly or might not start at all.
- **Your hard disk might be full.** Make sure that you have enough free hard disk space to install the network drivers and Broadband Network Utility. You can check the amount of free hard drive space by opening My Computer and selecting your hard drive in the main window.
- **Verify that your CD drive is functioning correctly.** Try launching the Setup Wizard by double-clicking the **CD** icon in My Computer. If it still does not start correctly, try inserting another CD. If the other CD works correctly, you may have a bad CD. Contact Technical Support for more information about replacing a defective CD.

Setup does not recognize my wireless base station.

The following troubleshooting steps will help you track down and solve this problem.

- **Verify that all status lights are illuminated.** Make sure that the Power light on your wireless base station is illuminated to indicate that the base station is receiving power.

  If the Power light is flashing, you may need to reset the base station. To reset the Microsoft base station, unplug the power adapter from the base station and then plug it back in.

- **If enabled, turn off Network Address Translation (NAT) on the modem.** Some broadband modems have built-in NAT security features. This can be a problem because other components of your network, such as the Microsoft base station, may also be running NAT. It is recommended that you use the NAT features of the Microsoft base station to help protect your network. For instructions about how to turn off NAT on your modem, see the modem documentation. Not all broadband modems have NAT capability.

If your base station is connected with an Ethernet cable:

- **Make sure that all cables are securely connected.** Check that the cables in your network are securely connected to the correct ports. Check all of the following connections: all power cables, the Ethernet cables between the broadband modem and the base station, and any Ethernet cables attaching computers to the base station.

  Check the setup instructions for your broadband modem to make sure that you are using the correct type of Ethernet cable to connect to your modem, either straight-through or crossover.

If your base station is connected wirelessly:

- **Check the distance to your base station.** If you are setting up the base station indoors over a wireless connection, make sure that your base station is near your computer.

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Setup can't detect the Internet after I connect my new base station to a broadband modem.

The following troubleshooting steps will help you track down and solve the problem.

- **Make sure that all cables are securely connected.** Check that the cables in your network are securely connected to the correct ports.

  Check all power cables, the Ethernet cables between the broadband modem and your base station, and any Ethernet cables between the base station and the computer where you are running the Setup Wizard.

- **Verify that all status lights are illuminated.** Make sure that the status lights are illuminated on your network devices, especially on your base station and modem, to indicate that each connected Ethernet port is working properly. If these lights are not illuminated, try a different network port.

  If the status light is not illuminated between your base station and broadband modem, check the setup instructions for your broadband modem to make sure that you are using the correct type of Ethernet cable to connect to your modem, either straight-through or crossover. See the modem documentation for more information about which cable type to use.

- **Reset your broadband modem**. This process will involve turning your broadband modem off and back on again. Follow the instructions from your broadband modem documentation or Internet service provider (ISP). After the broadband modem finishes resetting itself and connects to your ISP, try the Setup Wizard again.

- **Setup needs an active Internet connection to detect your Internet settings.** Before you install your new base station, make sure that your existing Internet connection is working correctly from your computer. If you do not have an active Internet connection, Setup cannot determine your ISP settings, and you must set up the base station by manually entering your ISP settings.

  If you have already disconnected your existing Internet connection during Setup, try reconnecting your original Internet connection and verify that you have Internet access. You can then run the Setup Wizard again from your Broadband Networking CD to install your new hardware.

- **Reset your base station.** To reset the Microsoft base station, unplug the power adapter from the base station and then plug it back in. After the Microsoft base station has initialized completely and the lights are green, have the Setup Wizard try detecting the Internet again.

If you are still having problems connecting to the Internet, you may need to clone the media access control (MAC) address from your previous networking hardware. For more information, see the next topic, below.

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After I install a new base station on my network, my Internet connection no longer works.

Some ISPs record the MAC address of the network adapter, modem, or router that you used when you first connected to the Internet. If you have added or replaced a base station in your network configuration, your ISP might not recognize the new base station's default MAC address and will deny you access to the Internet.

To solve the problem, you need to clone, or copy, the MAC address from your original device to the new base station. Each network adapter or router that you use has a MAC address that is assigned at the time of manufacture and is printed on a label attached to the back of the device. After you have written down the MAC address from your original adapter or router, you can clone the address to the new base station.

To clone a MAC address

1. Start the Broadband Network Utility.
2. From the **Tools** menu, click **Base Station Management Tool**.
3. Enter your administrator password.
4. Click **Wide Area Network**.
5. In the **MAC address** boxes, type the MAC address of the original adapter or base station that was connected to the Internet before you connected your new base station. The MAC address normally appears on the label on the underside of the device.
6. Click **Clone MAC address**.

Note **It is a good idea to record the MAC address of the adapter or router in your notes, so that if you lose your settings or no longer have the device, you do not lose your ability to connect to the Internet.**

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I am having problems upgrading or restoring my base station firmware.

Firmware is the software that is loaded into your base station to control its basic operations. If you have a problem upgrading or restoring your base station firmware, try the following troubleshooting steps to track down and solve the problem.

- **Reset the base station.** Resetting the base station is similar to restarting your computer, allowing it to clear its memory and reestablish connections with your ISP.

  To reset the Microsoft base station, unplug the power adapter from the base station and then plug it back in. After the Microsoft base station Power light turns green, you can try again to upgrade or restore firmware by using the Broadband Network Utility.

- **Restore the base station to its factory default settings.** To return the base station to its factory default settings (for example, if you forget your base station password), you can use the button on the back of the base station to clear all current base station settings. Before you restore your base station, make a backup copy of your base station configuration by using the Broadband Networking Utility. For more information, see Chapter 5, "Network Management."

  Note **Restoring the base station is different from resetting the base station. When you reset the base station, your current network and Internet connections are reestablished without modifying any settings. When you restore the base station, your current settings are erased and the base station is restored to the factory default settings.**

  To restore the base station to factory default settings

  - Use a pointed object to press and release the Restore button on the back of the base station.

    The Power light first blinks green and orange, and then turns solid orange. When it turns solid green, the restoration is complete. This process takes about a minute.

- **Try a different copy of the firmware.** Download a new copy of the firmware from www.microsoft.com/broadbandnetworking, and try upgrading the base station with the new file. The file you originally used might be corrupted or incomplete.

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Network and Internet Problems

This section will help you solve common problems that might occur while you are using your local area network (LAN) or Internet connection.

I can't stay connected to my wireless network.

If you are running the Windows XP operating system with Service Pack 1 (SP1), you might lose connection to your wireless network every 3 to 5 minutes. This can be caused by incorrect wireless network security settings. To solve this problem, you need to disable 802.1x authentication on your wireless network, as described below.

To disable 802.1x authentication in Windows XP

1. Click **Start**, point to **Connect To**, click **Show all connections**, and then double-click your wireless network.
2. On the **General** tab, click **Properties**.
3. Click the **Wireless Networks** tab.
4. Under **Preferred Networks**, click your home network, and then click **Properties**.
5. Click the **Authentication** tab, and then click to clear the **Enable IEEE 802.1x authentication for this network** check box, if it is selected.
6. If you cannot click this check box, then you are not using 802.1x authentication or wireless security.

Note **The security setting (such as a WEP key) that is used by your network adapter must match the security setting that is used by your base station, router, or gateway.**

I can't access the Internet from a computer on my wireless network.

The following troubleshooting steps will help you track down and solve the problem.

- **Make sure that the rest of your network is functioning correctly.** Verify that you can access the Internet from other wireless and Ethernet computers on your network. If other computers also cannot access the Internet, the problem might be with your base station, modem, or ISP.

  One other common cause of Internet connection problems is disconnected cabling. If the rest of your network is having problems, first check the cables between your computers and the base station or modem for loose connections or disconnected wires. Check the cables between the base station and the broadband modem. Verify that you are using the correct cables, that all cables are firmly attached, and that all status lights on the network devices indicate that your connections are functioning properly.
- **Check for range or interference issues.** You might be out of range of the wireless base station or access point. Place the computer with the wireless adapter in the same room as your base station and try connecting again.

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Interference can also cause Internet connection problems. Signals that are transmitted between the base station and a wireless adapter can be affected by interference from other wireless devices—including 2.4 gigahertz (GHz) cordless phones, microwave ovens, and neighboring wireless networks. Move the other devices further from your wireless networking hardware as needed, and refrain from using them while you are using the network. To minimize interference from another wireless network, try changing channels. For more information about configuring your wireless settings, see Chapter 5, "Network Management."

For more information about range issues, see Chapter 1, "Introduction."

- **Verify that you are using the correct wireless settings.** You might have incomplete or incorrect wireless settings for your adapter. To connect successfully, the wireless adapter on your computer must have the same network name (SSID), wireless channel, and wireless security (such as Wireless Equivalent Privacy [WEP]) information as your base station. To check the wireless settings on your Microsoft base station, open the Base Station Management Tool from the Broadband Network Utility. You can also access the base station directly through your Internet browser by going to the address http://192.168.1.2. Then you can view and, if necessary, correct your Microsoft wireless adapter settings by opening **Computer Settings** from the **Tools** menu of the Broadband Network Utility.
- **Reset your broadband modem.** Turn off the modem for 5 to 10 seconds. Restart the modem, and wait for it to connect to your ISP. After the status lights on your modem indicate that it is connected, and the status lights on your base station show that you have a working Internet connection, try accessing the Internet from your computer again.
- **Reset your base station.** Unplug the base station, wait at least 10 seconds, and plug it back in again. After the Power light turns green, try accessing the Internet again.
- **Update your base station firmware.** Firmware is the software that is loaded into your base station to provide network functions. You can update your base station firmware by downloading it from the Internet and installing it on your base station. If you are using a Microsoft base station, make sure that you are using the latest firmware version.

  To update Microsoft base station firmware

  1. Double-click the **Broadband Network Utility** icon on your taskbar to start the utility.
  2. On the **Help** menu, click **Check for Updates Online**.
  3. If there is a newer version of the firmware available, follow the instructions on the Web page to download the new software, firmware, or drivers.

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I can't access the Internet from a computer connected to my network with an Ethernet cable.

If this is the first time you have used this adapter, you should follow the instructions in the *User's Guide* to run the Setup Wizard. The wizard is designed to walk you through the installation and configuration of your Ethernet adapter.

The following troubleshooting steps will help you track down and solve the problem.

- **Make sure that the rest of your network is functioning correctly.** Verify that you can access the Internet from other computers on your network. If other computers also cannot access the Internet, the problem might be with your base station, modem, or ISP.
- **Make sure that all cables are securely connected.** Check that the cables in your network are securely connected to the correct ports.

  Check all power cables and the cables between the broadband modem and the base station. Also check the Ethernet cable connecting the base station to the computer that is having connectivity problems.

  In most cases, you will need a straight-through type of Ethernet cable to connect your adapter to a base station or router. However, if you are connecting directly to another computer or to a device other than a base station, you might need to use a crossover cable.
- **Verify that all status lights are illuminated.** Make sure that the status lights on your network devices are illuminated to indicate that each Ethernet port is working properly.

  If these lights are not illuminated, try a different type of Ethernet cable (straight-through or crossover) or a different network port, if possible. Check the setup instructions for your base station and your broadband modem to make sure that you do not need to use a different type of Ethernet cable (straight-through or crossover).

  Check the base station to make sure that it is receiving power by inspecting the appropriate status lights. If the power light is flashing, you may need to reset the base station. To reset the Microsoft base station, unplug the power adapter from the base station and then plug it back in.
- **Check your Ethernet adapter network settings.** If other computers on your network are working correctly, you might have incorrect network settings on the computer that is experiencing problems. Make sure that the Ethernet adapter for that computer has been correctly configured to work with your ISP's connection settings. Compare the settings of a working computer on the existing network with those of the computer that is not connecting to the Internet. Verify that both adapters are using similar network settings in Network Properties.

  You can check your network settings by clicking the **Network** icon in Control Panel. Verify that you are using the same settings for Gateway Address, Subnet Mask, and DNS address. Verify that all computers connected with Ethernet cables are using different IP addresses.

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For example, if your base station is configured to use a Dynamic IP (DHCP) connection, make sure that all computers on your network are set to "Obtain an IP address Automatically" under the TCP/IP settings in the **Network** section of Control Panel.

You can also check your network settings for each computer by using the Broadband Networking Utility, if it is installed on this computer:

To check your Ethernet settings by using the Broadband Network Utility

1. Double-click the **Broadband Network Utility** icon on your taskbar to start the utility.
2. On the **Tools** menu, click **Computer Settings**.
3. Compare the computer settings with another computer on your network.

   The IP address should be different on each computer, but other settings should be the same.

- **Reset your broadband modem.** Turn off or unplug the modem for 5 to 10 seconds. Restart the modem, and wait for it to connect to your ISP. After the status lights on your modem indicate that it is functioning, and the status lights on your base station show that you have an Internet connection, try accessing the Internet from your computer again.
- **Reset your base station.** To reset the Microsoft base station, unplug the power adapter from the base station and then plug it back in. When the status lights show that the base station is functioning, try accessing the Internet from the computer again.
- **Update your base station firmware.** Firmware is the software that is loaded into your base station to provide network functions. You can update your base station firmware by downloading it from the Internet and installing it on your base station. If you are using a Microsoft base station, make sure that you are using the latest firmware version.

  To update Microsoft base station firmware

  1. Double-click the **Broadband Network Utility** icon on your taskbar to start the utility.
  2. On the **Help** menu, click **Check for Updates Online**.
  3. If there is a newer version of the firmware available, follow the instructions on the Web page to download the new software, firmware, or drivers.

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My network is slow.

If networked programs are running slowly, or you are experiencing large slowdowns in your Internet connection speed, try decreasing the number of computers or programs that are simultaneously accessing your network.

Note **Programs that do not use network resources, for example Microsoft Word when it is editing a local document, will not interfere with the speed of your network. Only programs that must constantly use your network connection to function will be affected. Examples can include music sharing software and instant messenger programs.**

Your network has a limited amount of bandwidth for transmitting data. As more computers access your network at the same time, the bandwidth must be divided between all computers. By reducing the number of programs accessing your network at the same time, you can increase the speed at which data is transmitted across your network.

You might find that you need more bandwidth to use all of your computers at the same time on the network. If your connection is still too slow, contact your ISP to verify that there are no problems with your connection, such as scheduled maintenance, line issues, or other problems. If you are still not satisfied with your connection speed, you might want to inquire about upgrading to a faster connection.

I am having problems running a networked program or multiplayer game on my network or the Internet.

Some networked applications might not be working as expected on your local area network (LAN). Symptoms of the problems vary and can include the following:

- Problems connecting to an application after the base station is installed.
- Disconnections while using an application.
- Problems sending or receiving audio and video.
- Problems connecting more than one computer to an online application simultaneously.
- Delays, or lag, while running a multiplayer game on several computers at once.
- Game crashes.
- Delays, or lag, while playing a game over the Internet.

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Several troubleshooting steps addressing these issues are listed below, with solutions to the most common problems listed first.

- **Make sure that the rest of your network is functioning correctly.** Verify that you can access the Internet from other computers on your network. If other computers also cannot access the Internet, the problem might be with your base station, modem, or Internet service provider (ISP). See the following troubleshooting steps for more information.

  If this network does not have an Internet connection, verify that all computers are in the same workgroup and can see each other on the network. You can use the Broadband Network Utility to view all the computers in your workgroup and check your workgroup name. For more information about the Broadband Network Utility, see Chapter 4, "Network Activities."

  If there are problems accessing the Internet or other computers on your network, check the cables between your computers and the base station or modem for loose or disconnected wires. Check the cables between the base station and the broadband modem. Verify that you are using the correct cables, that all cables are firmly attached, and that all status lights on the other network devices are functioning correctly.

  If you are still having network problems, you should troubleshoot that issue before configuring a multiplayer network game.

- **Check your base station network settings.** If other computers on your network are also having problems accessing the network and the Internet, you might have incorrect base station network settings. Verify that you are using the correct Internet settings required by your ISP, and that any wireless settings are correctly configured to allow all wireless computers to communicate.

  If you are using a Microsoft base station, you can use the Broadband Network Utility and the Base Station Management Tool to check and manually configure your network settings. For more information, see Chapter 5, "Network Management." If you are using a base station or router from another manufacturer, see the documentation for that device.

- **Check if your game or application has any special network requirements for multiplayer play.** Some programs communicate between computers by using specific network ports. Most base stations include a firewall that prevents unauthorized communication on nearly all ports.

  If your application or game requires special settings on your base station, such as forwarding a port for multiplayer play or setting up a virtual DMZ (demilitarized zone) to host a game server, you will be able to find this information in the program manual or on the software publisher's Web site.

  For a list of specific programs and the ports necessary to run them, see the Support section of the Broadband Networking Web site at www.microsoft.com/hardware.

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- **If you are using a wireless connection, check for range and interference issues.** You might be out of range of the wireless base station, gateway, or router. Position the computer with the wireless adapter in the same room as your base station and try connecting again. If you can connect to the wireless network and run applications and games without a problem, you might have been previously out of range.

  Another cause of problems is that signals transmitted between the base station and a wireless adapter can be affected by interference from other wireless devices—including 2.4 GHz cordless phones, microwave ovens, and neighboring wireless networks. Move the other devices as needed, and refrain from using them while you are using the network. To minimize interference from another wireless network, try changing the wireless channel. For information about how to change your wireless settings, see "Changing your Wireless Settings" in Broadband Network Utility Help.

- **Check for duplicate NAT features, DHCP servers, or firewalls.** Network Address Translation (NAT) and Dynamic Host Configuration Protocol (DHCP) are security features of the Microsoft base station and some other devices. If two devices, such as a base station and modem, are running NAT and/or DHCP servers at the same time, the devices can interfere with each other and cause intermittent failures. If you are running a Microsoft base station, for example, its firewall and NAT features could conflict with other network hardware and software. Verify that you have disabled NAT functionality and DHCP servers on other devices in your network. To determine if a device has one of these features, check the documentation for that device. Some other common network devices that could contain these features include routers, broadband modems, or wireless access points.

  Software firewalls can also cause conflicts. Make sure that you turn off any personal firewall software, such as Internet Connection Firewall, when trying to run a game.

- **Update your base station firmware.** Firmware is the software that is loaded into your base station to provide network functions. You can update your base station firmware by downloading it from the Internet and installing it on your base station. If you are using a Microsoft base station, make sure that you are using the latest firmware version.

  To update Microsoft base station firmware

  1. Double-click the **Broadband Network Utility** icon on your taskbar to start the utility.
  2. On the **Help** menu, click **Check for Updates Online**.
  3. If there is a newer version of the firmware available, follow the instructions on the Web page to download the new software, firmware, or drivers.

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Printing and File Sharing Issues

This section will help you solve problems you might encounter while printing over your network or accessing shared files and folders.

I can't print to a networked printer.

The following troubleshooting steps will help you track down and solve the problem.

- **Make sure that the printer is functioning properly.** There could be a problem with the printer itself. Verify that the printer is on and working correctly by using the printer's self-test functions. See your printer documentation for specific instructions.

  If the printer fails the self test, try turning the printer off and back on again. Make sure that the printer has ink and paper. If the printer is still not working, see the printer documentation.

- **Make sure that you can print from your main computer.** If the printer passes the self test, try printing from the computer that is connected directly to the printer. If this computer will not print successfully, you may need to install printer drivers or check the cable connecting the printer to your computer. See the following troubleshooting steps for more information.

- **Make sure that all cables are securely connected.** Check that the cables in your network are securely connected to the correct ports. Check all power cables and the cables between the printer and the host computer or network. Make sure that the status lights on the base station and each network adapter are illuminated to indicate that each connected Ethernet port is working properly. If the status lights are not illuminated, try a different type of Ethernet cable (straight-through or crossover) or a different network port.

- **Ensure that the printer is shared over your network.** If your printer is connected to a computer, which is then connected to your network, you must make that printer available to other computers. This process is known as "sharing" a printer over the network.

  To make a printer available to the network, go to the computer that is connected directly to the printer. Follow instructions for printer sharing for that computer's operating system. For more information about sharing a printer over the network, see Windows Help.

- **Check if the correct printer driver is installed.** Every computer that will use a shared printer on your network must have that printer's driver installed. You can make sure that the driver for the networked printer has been installed on a computer by checking the **Printers** item in Control Panel. If it is installed, you will see your shared printer listed in the **Printers** section. After you have verified that the printer driver is installed, try printing a test page from the computer.

  You can install the printer driver by opening **Printers and Faxes** through Control Panel in Windows XP, or through the **Add Printer** feature in Control Panel on other Windows operating systems. If Windows prompts you for a driver disk, use the driver disk that came with your printer.

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I cannot access a shared file or folder from a computer on my network.

Files and folders are “shared” when they are made available to other users on your network from the computer on which they reside.

The following troubleshooting steps will help you track down and solve the problem.

- **Make sure that your network is functioning correctly.** By checking the status of your network, you can determine if the problem is due to a connectivity issue with your network or due to your shared file configuration. One easy way to check the status of your network is to use the Broadband Network Utility, which gives the status of your local and Internet network connections. Verify that all of the computers can access the Internet. If you are having problems accessing the Internet (possibly caused by loose or incorrect cables), fix those problems before proceeding with other troubleshooting methods listed here.
- **Try accessing a different shared file or folder.** If there are other shared resources on your network, try accessing those resources instead. If you can access other shared files but not the one you want, you might not have permission to access the file. For more information about permissions, see the troubleshooting topics below.
- **Ensure that all computers are in the same workgroup.** You will need to look at each computer to check its workgroup and, if necessary, change the workgroup name.

  Note **If one of your computers is a laptop that is used on a domain at work, you must leave the domain to join a workgroup at home and share files. To rejoin the domain at work, you will need administrative privileges on your computer. For more information, see Windows Help.**

  If the computer is using a Microsoft Broadband Networking adapter, you can check which workgroup your computer belongs to on the main screen of the Broadband Networking Utility. Alternatively, you can check and modify the workgroup names on each computer by using the following instructions, specific to the Windows operating system:

  Windows XP

  1. Click **Start**, and then click **Control Panel**.
  2. Double-click **System**, and then click the **Computer Name** tab. If you need to modify the workgroup name, click **Change**.

  Windows 2000

  1. Click **Start**, point to **Settings**, and then click **Control Panel**.
  2. Double-click **System**.
  3. Click the **Network Identification** tab. If you need to modify the workgroup name, click **Change**.

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Windows 98, Windows 98 SE, and Windows Me

1. Click **Start**, point to **Settings**, and then click **Control Panel**.
2. Double-click **Network**, and then click the **Identification** tab. If you need to modify the workgroup name, click **Change**.

When all computers are members of the same workgroup, try sharing or accessing shared files again.

- **Turn on file and printer sharing on the computer that contains the file you want to share.** The computer that you are trying to access must have file and printer sharing enabled for sharing to work correctly. When you run the Setup Wizard, you have the option of enabling file and printer sharing, but that option applies only to the computer running Setup. If a different computer contains the file that you want to share, you also must enable sharing on that second computer.

  File and printer sharing is enabled differently on each operating version of Windows operating system. For more information about enabling file and printer sharing on your computer, see Chapter 4, “Network Activities.”

- **Verify that the file or folder’s permissions have been configured for access over the network.** When files or folders are shared over the network, they still may not be accessible by everyone. Their owner may configure permissions that limit which users can read, write to, or delete the shared resources. If you are having difficulty accessing a file or folder on another computer, it may be because the permissions for that file limit your ability to see it over the network. You may receive an “access denied” error message, or have problems locating the shared files on your network.

  To check the permissions for shared files or folders, go to the computer containing those files or folders. In Windows XP, right-click the folder containing the information you want to access and choose **Properties**. Click the **Sharing** tab to see if file sharing has been enabled. If the computer is using Simple File Sharing in Windows XP, files are either shared to everyone or not shared at all, and permissions cannot be modified. In other words, a shared file should be accessible from another computer. If the computer is not using Simple File Sharing (recommended), click the **Security** tab to check and modify permissions for each user accessing the folder.

  Note Microsoft Windows XP Home Edition uses only Simple File Sharing. Microsoft Windows XP Professional Edition uses both Simple File Sharing and standard, permissions-based file sharing.

  To check permissions in Windows 2000, Windows 98, Windows 98 SE, and Windows Me operating systems, right-click the file or folder whose permissions you want to check and choose **Sharing**.

  For more information, search for “file and folder permissions” and “simple file sharing” in Windows Help.

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I can open shared files or folders, but cannot write to or delete them.

The following troubleshooting steps will help you track down and solve the problem.

- **Check to see if the file is read-only.** "Read-only" is a file attribute that prevents anyone from writing to the file or otherwise making alterations. To check the attributes of a file, locate the file in its folder, right-click the file, and choose **Properties**. Attributes can be changed only by a user who has administrative privileges on the computer where the file is located.
- **Check to see if you have permission to change the shared file or folder.** When files or folders are shared over the network, they still might not be accessible by everyone. Their owner can configure permissions that limit which users can read, write to, or delete the shared resources. If you are having difficulty accessing a file or folder on another computer, it might be because the permissions for that file limit your ability to share it. You might receive an "access denied" error message, or have problems locating the shared files on your network.

  For more information about checking and setting permissions, see Broadband Network Utility Help.

  Note **Windows XP Home Edition uses only Simple File Sharing. Windows XP Professional Edition uses both Simple File Sharing and standard, permissions-based file sharing.**

I can only access shared resources from certain computers or user accounts on my network.

When you are able to access shared files from certain computers or user accounts on your network, but not others, it may be because the file's owner has limited the access to certain users. To check the user permissions on a file, you must go to the computer on which the file is located.

To check user permissions on a computer running the Windows XP operating system

1. Right-click the file you wish to check and click **Sharing and Security**.
2. Click the **Security** tab.
3. Users who have permissions for this shared resource are listed in the **Group or user names** list box. You can use the **Add** and **Remove** buttons to modify the list, and use the **Permissions for** section to change specific tasks available to each user.
4. Click **OK** to save the changes.

To check permissions in Windows 2000, Windows 98, Windows 98 SE, and Windows Me, right-click the file or folder in question and choose **Sharing**.

For more information, search for "file and folder permissions" in Windows Help.

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appendixes

Appendix A:
Locating Your Internet and Network Settings

If the Setup Wizard cannot detect your settings, or if you are setting up a product without using the Setup Wizard, you will need to enter your Internet and local area network (LAN) settings manually. The following instructions will help you locate the settings that you need. You can record this information on the inside back cover of this *User's Guide* for future reference.

Internet Connection Type

You connect to your Internet service provider (ISP) by using one of three connection types:

- Dynamic (by using Dynamic Host Configuration Protocol, or DHCP)
- Static
- Point-to-Point Protocol over Ethernet (PPPoE)

Each type of Internet connection requires different settings when you set up a network device.

To determine which connection type your ISP provides

- See the documentation provided by your Internet service provider or contact your ISP.
- If you have a Microsoft® base station set up on your network, you can use the Base Station Management Tool. Click **Wide Area Network** and view the settings under **Internet Connection Type**.
- If you have a broadband modem that came with a configuration utility, try using this utility.
- If you have a non-Microsoft base station, gateway, or router, try using the utility that came with your base station.

General Internet Settings

If you have not set up a base station, gateway, or router, and you have an adapter that is currently configured correctly for your ISP, you can use the following procedure to locate most of the Internet settings you need.

To locate your Internet settings

1. On the **Start** menu, click **Run**.
2. Do one of the following:
   - If you have Microsoft Windows® XP or Windows 2000, type **cmd**
   - If you have Windows Me, Windows 98, or Windows 98 SE, type **command**
3. At the command prompt, type **ipconfig /all**

Dynamic IP (DHCP) Settings

When you set up a base station to have a dynamic IP address, the ISP will sometimes require a host name or a MAC address.

Host name

Some ISPs record your computer name (also known as your host name) when you set up your ISP account. You might need to find your computer's name when you set up a base station.

Note **For information about changing your computer name, see Help in the Broadband Network Utility.**

To determine your computer name in Windows XP or Windows 2000

1. Click **Start**, click **Control Panel**, and then double-click **System**.
2. Do one of the following:
   - If you have Windows XP, click the **Computer Name** tab.
   - If you have Windows 2000, click the **Network Identification** tab.

To determine your computer name in Windows Me, Windows 98, and Windows 98 SE.

1. Click **Start**, point to **Settings**, and then click **Control Panel**.
2. Double-click **Network**, and then click the **Identification** tab. Your computer name appears in the **Computer name** box.

MAC Address

A media access control (MAC) address is a unique alphanumeric identifier that is printed or stamped on every networking device by the manufacturer. A MAC address looks something like the following: 0050F2731958. Some Internet service providers record the MAC address of the modem or adapter you're using when you sign up for the service. To determine whether your Internet connection requires a MAC address, see the information provided by your ISP.

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You can find the MAC address for your Microsoft adapters printed on the label. You can find the base station MAC address on the side of the base station (or on the underside if the base station is positioned vertically).

Note **For information about cloning a MAC address, so that the setting conforms to the MAC address on record with your ISP, see Help in the Broadband Network Utility.**

Static IP Settings

When you set up the base station to use a static IP address, you will need the IP address, subnet mask, and default gateway. You might also need primary and secondary Domain Name Server (DNS) settings.

Use any of the following methods to determine these settings:

- See the documentation provided by your Internet service provider or contact your ISP.
- Use one of the following procedures, depending on your version of the Windows operating system.

Note **For information about configuring a static IP address on an adapter, see Help in the Broadband Network Utility.**

To locate your static IP address settings (Windows XP)

1. Do one of the following:
   - Click **Start**, click **Control Panel**, click **Network and Internet Connections**, and then double-click **Network Connections**.
   - Click **Start**, click **Control Panel**, and then double-click **Network Connections**.
2. In the Network Connections window, right-click your Internet connection, and then click **Properties**.
3. Select **Internet Protocol (TCP/IP)**, and then click **Properties**.
4. Under **Use the following IP Address**, note the settings for IP address, subnet mask, and default gateway name.
5. Note whether your connection obtains a DNS server address automatically, or whether it uses a specific address or addresses.

To locate your static IP address settings (Windows 2000)

1. Click **Start**, point to **Settings**, click **Control Panel**, and then double-click **Network and Dial-Up Connections**.
2. In the **Network and Dial-Up Connections** window, right-click your Internet connection, and then click **Properties**.
3. On the **General** tab, select **Internet Protocol (TCP/IP)**, and then click **Properties**.
4. On the **General** tab, under **Use the following IP address**, note the IP addresses.
5. Click **Advanced** to see the gateway information.
6. On the **DNS Configuration** tab, note the DNS addresses.

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To locate your static IP address settings (Windows Me, Windows 98, and Windows 98 SE)

1. Click **Start**, point to **Settings**, click **Control Panel**, and then double-click **Network**.

   Note If you do not see the **Network** item in **Control Panel**, click **View all control panel options** on the left side of the screen.

2. On the **Configuration** tab, select **TCP/IP**, and then click **Properties**.

   Note If there is more than one TCP/IP option listed, select the option for your Ethernet adapter, not your dial-up adapter.

3. On the **IP Address** tab, under **Specify an IP Address**, note the IP addresses.
4. On the **Gateway** tab, note the gateway information.
5. On the **DNS Configuration** tab, note the DNS addresses.

PPPoE Settings

To find your user name, password, and service name (if needed)

- See the documentation provided by your Internet service provider or contact your ISP.
- If your computer is running Windows XP, double-click the **Network Connections** icon in Control Panel. A PPPoE Internet connection typically appears under **Broadband** and includes the descriptor **WAN Miniport (PPPOE)**. Double-click this icon for more information.
- If your computer is running Windows 2000, Windows Me, Windows 98, or Windows 98 SE, you installed access software when you set up the Internet connection. You can check this software for more information.
- If you have an existing base station, gateway, or router and are replacing it with a Microsoft base station, you can use your existing network configuration utility.
- If you are replacing an existing Microsoft base station, you can use the Base Station Management Tool. Click **Wide Area Network**.

Workgroup Name

If you want to add a computer to your workgroup, you need to know the workgroup name.

Note For information about changing your workgroup name, see Help in the Broadband Network Utility.

To determine your workgroup name in Windows XP or Windows 2000

1. Click **Start**, click **Control Panel**, and then double-click **System**.
2. Do one of the following:
   - If you have Windows XP, click the **Computer Name** tab.
   - If you have Windows 2000, click the **Network Identification** tab.

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To determine your workgroup name in Windows Me and Windows 98

1. Click **Start**, point to **Settings**, and then click **Control Panel**.
2. Double-click **Network**, and then click the **Identification** tab. Your workgroup name appears in the **Workgroup** box.

Wireless Network Name

Your wireless network name, or SSID, uniquely identifies your wireless network and is case sensitive.

- If you have the Broadband Network Utility installed on a computer on your network, you can use it to identify your wireless network name.
- If you have a Microsoft wireless base station, you can use the Base Station Management Tool. On the home page, click **Wireless**.
- If you have a non-Microsoft base station, gateway, or router, use the network utility that came with your base station.

Wireless Security Settings

Use these methods to locate your Wired Equivalent Privacy (WEP) key or Wi-Fi Protected Access™ (WPA) passphrase.

- If you have a Microsoft wireless base station, you can use the Base Station Management Tool. On the **Security** menu, click **Wireless Security**.
- If you have a non-Microsoft base station, gateway, or router, use the network utility that came with your base station.
- If you are connecting to a corporate network, ask your network administrator.

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Appendix B:
Support and Technical Information

This appendix contains the following reference information for your Broadband Networking products:

- Getting Help
- Regulatory Information
- Technical Specifications
- System Requirements
- Limited Warranty

Getting Help

If you have a question about your Microsoft® Broadband Networking products, the following resources on the Web, in Help, and from Technical Support may help you find the answer.

Visit Us on the Web

Please visit the Microsoft Broadband Networking Web site at www.microsoft.com/broadbandnetworking for the most up-to-date information about our products. The Microsoft Broadband Networking Web site also contains many articles on diagnosing network problems, setting up new features, and installing new networking hardware.

Click Help in the Broadband Network Utility

Go to the **Help** menu in the Microsoft Broadband Network Utility for extensive information about our products and for detailed troubleshooting information to help you identify and solve common networking problems.

Technical Support Options

Product Name: Microsoft Broadband Networking Wireless Base Station (MN-700)

Support Info Online:	For all of our support offerings, visit http://support.microsoft.com In Canada, visit www.microsoft.ca/support
Phone Support:	Toll-free support for U.S. customers: (800) 936-3900. For customers in Canada: (800) 668-7975. These numbers are only for support of Microsoft Broadband Networking products.
TTY Users:	Text phone (TTY/TDD) services are available at (425) 635-4948 in Washington state or (800) 892-5234 in the U.S. Call (905) 568-9641 in Canada.
Worldwide:	Support outside the U.S. and Canada may vary. For regional contact details, visit http://support.microsoft.com/international.aspx. If there is no Microsoft subsidiary office in your country or region, please contact the establishment from which you obtained your Microsoft product.
Conditions:	Microsoft's support services are subject to then-current prices, terms, and conditions, which are subject to change without notice.

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Regulatory Information

United States Radio and TV Interference Regulations

This device complies with Part 15 of the U.S. Federal Communications Commission (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.

The Microsoft hardware device(s) that accompanies this software can radiate radio frequency (RF) energy. If not installed and used in strict accordance with the instructions given in this *User's Guide*, the device may cause harmful interference with other radio-communications devices (for example AM/FM radios, televisions, baby monitors, cordless phones, etc.). Any cable that is connected to the device must be a shielded cable that is properly grounded. There is, however, no guarantee that RF interference will not occur in a particular installation.

Your Microsoft hardware device has been tested, and it complies with the limits for a Class B digital device in accordance with the specifications in Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful RF interference in a residential installation.

To determine if your hardware device is causing interference to other radio-communications devices, disconnect the device from your computer. If the interference stops, it was probably caused by the device. If the interference continues after you disconnect the hardware device, turn the computer off and then on again. If the interference stopped when the computer was off, check to see if one of the input/output (I/O) devices or one of the computer's internal accessory boards is causing the problem. Disconnect the I/O devices one at a time and see if the interference stops.

If this hardware device does cause interference, try the following measures to correct it:

- Relocate the antenna of the other radio-communications device (for example AM/FM Radios, televisions, baby monitors, cordless phones, etc.) until the interference stops.
- Move the hardware device farther away from the radio or TV, or move it to one side or the other of the radio or TV.
- Plug the computer into a different power outlet so that the hardware device and radio or TV are on different circuits controlled by different circuit breakers or fuses.
- If necessary, ask your computer dealer or an experienced radio-TV technician for more suggestions. You may find helpful information about interference issues at the following FCC Web site: http://www.fcc.gov/cgb/consumerfacts/interference.html, or call the FCC at 1-888-CALL FCC to request from the operator "Interference and Telephone Interference" fax sheets.

Note

Any changes or modifications not expressly approved by Microsoft could void the user's authority to operate this device.

For use with UL Listed and GS approved personal computers.

Not intended for use in machinery or industrial applications.

Tested to comply with FCC Standards. For home and office use.

Device should be located at least 20 cm (8 inches) away from any human body in order to meet FCC exposure limits. Exposure time should be limited if the distance is less.

Model Numbers: MN-100, MN-110, MN-120, MN-130, MN-150, MN-500, MN-510, MN-520, MN-700, MN-720, MN-730

In addition, the following model numbers have been approved under FCC certification rather than under the FCC Declaration of Conformity Process:

MN-500, FCC ID: HEDACC300568; MN-510, FCC ID: HEDACCWN330168; MN-520, FCC ID: HEDACC3501D68; MN-700, FCC ID: C3KMN700; MN-720, FCC ID: C3KMN720; MN-730, FCC ID: C3KMN730

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399.
(800) 426-9400 (United States)
(800) 933-4750 (Canada)

Canadian Radiocommunication Regulations

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

The term "IC:" before the certification/registration number only signifies that the Industry Canada technical specifications were met.

Cet appareil numérique de la classe B est conforme aux normes NMB-003 du Canada.

L'expression «IC:» avant le numéro d'homologation/enregistrement signifie seulement que les spécifications techniques d'Industrie Canada ont été respectées.

MN-500, IC: 3857A-300568; MN-510, IC: 3857A-330168; MN-520, IC: 3857A-350168;
MN-700, IC: 3048A-MN700; MN-720, IC: 3048A-MN720; MN-730, IC: 3048A-MN730

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Technical Specifications

Base Station

Standards	IEEE 802.11b, 802.11g, Wi-Fi certified, TCP/IP, NAT, DHCP, UDP, FTP, PPPoE, PPTP, L2TP, HTTP, DNS, IPSec/VPN Pass through, WPA
Ports	**LAN:** ▫ Four 10/100 Mbps Switched Ethernet/IEEE 802.3 ports, Auto MDI/MDI-X Crossover ▫ RJ-45 Connectors ▫ UTP/STP CAT 3 or better cabling required for 10 Base-T operation ▫ UTP/STP CAT 5 or better required for 100 Base-TX operation **WAN:** ▫ One 10/100 Mbps Ethernet/IEEE 802.3 port, Auto MDI/MDI-X Crossover ▫ RJ-45 Connector ▫ UTP/STP CAT 3 or better cabling required for 10 Base-T operation ▫ UTP/STP CAT 5 or better required for 100 Base-TX operation
Data Rate	1, 2, 5.5, 6, 11, 12, 18, 24, 36, 48, 54 Mbps with Auto-fallback support
Modulation	CCK, DBPSK, DQPSK, OFDM
Range	**In g performance mode:** **Data Rate — Open Environment — Closed Environment** 54 Mbps — up to 100 feet — up to 75 feet 48 Mbps — up to 170 feet — up to 100 feet 36 Mbps — up to 320 feet — up to 180 feet 18 Mbps — up to 670 feet — up to 350 feet 12 Mbps — up to 1900 feet — up to 350 feet 6 Mbps — up to 2200 feet — up to 350 feet **In mixed b compatibility mode, also capable of the following:** **Data Rate — Open Environment — Closed Environment** 11 Mbps — up to 2000 feet — up to 350 feet 5.5 Mbps — up to 2200 feet — up to 350 feet 2 or 1 Mbps — up to 2300 feet — up to 350 feet Please see the Microsoft Broadband Networking Web site for the latest data: www.microsoft.com/broadbandnetworking.
Frequency Range	ISM Band (2.400 to 2.4835 GHz)
Channels	1-11 United States, Canada Approved for use only in the United States and Canada.
Wireless Security	WEP: Off, 64-bit, and 128-bit WPA: 256-bit

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Indicators	**LAN (1-4)**: Link/Activity LED for each port **To Modem**: Link/Activity LED **Wireless**: Status LED including Activity indication **Power**: Power/Reset Dual Color LED
Transmit Power	Greater than +13 dBm; less than +20dBm
Operating Temperature	0 to +40 deg C
Storage Temperature	-20 to +60 deg C
Humidity	10 to 85 percent non-condensing
Emissions	FCC Part 15 Class B; Canada RSS-210
Safety	UL
Physical Dimensions	1.2" x 5.3" x 6.8" (30.5 X 134.6 X 172.7 mm)
Weight	10.97 oz (311 g) without power adapter

System Requirements

To use the Microsoft Broadband Networking Wireless Base Station (MN-700), you need:

- Computer to configure base station
- External broadband modem (DSL, cable, or other) with Ethernet-to-computer capability
- Microsoft Internet Explorer version 5.0 or Netscape Navigator version 6.0, or later; to view and use base station HTML configuration screens
- Available AC power outlet

To use the Microsoft Broadband Networking Setup Wizard and Broadband Network Utility, you need:

- PC running Microsoft Windows 98®, Windows 98 SE, Windows Millennium Edition (Windows Me), Windows 2000 Professional, Windows XP Professional, or Windows XP Home Edition operating system
- Microsoft Internet Explorer version 5.0 or later; setup will install Internet Explorer 6.0 browser components if needed, but will not displace your primary browser
- 132 MB of available hard-disk space if you are installing Internet Explorer for the first time; 40 MB of available hard-disk space if you already have Internet Explorer 5.5 or 6.0 installed
- 4x CD-ROM drive
- VGA or higher resolution monitor; Super VGA recommended

Recommended:

- Personal computer with Ethernet network adapter for easiest base station setup
- Microsoft Mouse or compatible pointing device
- 3.5" high-density disk drive or other removable media to share network settings between PCs

Not all ISPs allow you to share a broadband connection. Please check with your ISP.

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glossary

This glossary contains common terms for wired and wireless networking. There is a more complete list of terms in Broadband Network Utility Help.

802.11b A wireless networking standard that transmits wireless data at speeds up to 11 megabits per second (Mbps).

802.11g A wireless networking standard that transmits wireless data at speeds up to 54 megabits per second (Mbps).

access point See “wireless access point.”

ad hoc network A wireless network in which computers connect to each other directly. Contrast with “infrastructure network.”

adapter See “network adapter.”

bandwidth The rate at which data can be transmitted through a network connection.

base station A device (also known as a gateway or router) that acts as a central point for networked devices, receiving and forwarding data between them. A base station typically is a point of connection that sends data between several networks. It often can be programmed with rules about what data is acceptable to send and receive.

bridge A networking device that exchanges data from one segment of a network to another. See “wireless access point.”

broadband connection A high-speed Internet connection, typically 256 kilobits per second (Kbps) or faster. Broadband services are usually provided over digital cable lines or digital telephone lines (DSL).

CardBus A credit card-sized device that is inserted into a slot on a computer, usually a notebook computer. 32-bit CardBus PC Cards look similar to the older 16-bit PC Cards, but are approximately four to six times faster and include a new power-saving design.

channel In reference to a “wireless channel,” a channel is a path or link through which information passes between two wireless devices. In radio transmission, these different channels are of different radio frequencies.

client A computer or software program that relies on another computer or program to act as a server. See “server.”

client/server network A network of two or more computers that rely on a central server to mediate the connections or provide additional system resources. Contrast with “computer-to-computer network.”

computer name A name that uniquely identifies a computer on a network. One computer name cannot be the same as any other computer name or domain name on the network.

computer-to-computer network A network configuration in which any computer can connect directly to any other computer on the network. Contrast with “client/server network.”

crossover cable See “Ethernet cable.”

DHCP Acronym for “Dynamic Host Configuration Protocol.” DHCP is an Internet protocol that automatically assigns temporary Internet Protocol (IP) addresses to computers.

DMZ See “virtual DMZ.”

DNS Acronym for “Domain Name System.” A data query service used on the Internet for translating host names, such as www.microsoft.com, into Internet addresses that can be understood by computers.

domain A collection of computers on a network that share a common user database and security policy. A domain is administered as a unit with common rules and procedures by the domain administrator. Each domain has a unique name.

DSL Acronym for “Digital Subscriber Line.” A constant, high-speed digital connection to the Internet that uses a dedicated telephone line.

dynamic IP address A dynamic Internet Protocol (IP) address is a unique identifier that is assigned temporarily (by using the Dynamic Host Configuration Protocol, or DHCP) to a device that requires it. IP addresses are required for computers to find one another and communicate over the Internet. Contrast with “static IP address.”

Ethernet A networking standard that uses cables to transmit data between computers. Also known as the IEEE 802.3 standard.

Ethernet cable A type of cable that transmits data between computers. A widely used network technology. There are two types of Ethernet cables, straight-through and crossover, that differ in how the connectors on each end of the cable are wired. Ethernet cables can support speeds of 10 megabits per second (Mbps), 100 Mbps, and higher.

file sharing See “sharing.”

firewall A security system that helps protect a network from hacker attacks and other threats that originate outside the network. A hardware firewall is a device at the entrance to a network that has specific data-checking settings and that helps protect all of the devices connected to it. A software firewall resides on a single computer, helping to protect that computer from external threats.

firmware Software information loaded in permanent memory on a device.

gateway See “base station.”

host name The Domain Name System (DNS) name of a device on a network, a name such as www.microsoft.com.

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hub A device that has multiple ports and that serves as a connection point for Ethernet cables on a network. When data arrives at the hub from one computer, it is copied to the other ports to be transmitted to other computers. Unlike the more "intelligent" switch and router, the hub does not direct or control data flow.

infrastructure network A wireless network in which devices connect to each other through an access point, or use a more sophisticated intermediary such as a base station (gateway or router). Contrast with "ad hoc network."

intranet A network within an organization, also called a private network, that is available only to certain people, such as employees of a company. Some intranets offer access to the Internet.

IP Acronym for "Internet Protocol." The set of rules that describe how to send data between computers over the Internet. More specifically, this protocol governs the routing of data messages, which are transmitted in smaller components called packets.

IP address Acronym for "Internet Protocol" address. An IP address is an assigned number used to identify a computer that is connected to a network or the Internet through the Transmission Control Protocol/Internet Protocol (TCP/IP). An IP address consists of four numbers (each of which can be no greater than 255) separated by periods, such as 192.168.1.1.

ISP Acronym for "Internet service provider." A company that provides access to the Internet.

Kbps Abbreviation of "kilobits per second." A measure of data transfer speed through a modem or on a network.

LAN Acronym for "local area network." A group of computers and other devices dispersed over a relatively limited area (for example, a building) and connected by a communications link that enables any device to interact with any other on the network.

MAC address Acronym for "media access control" address. Each network adapter and other network hardware device is manufactured with its own unique MAC address. Networking standards and technologies use MAC addresses to pass information between network devices.

Mbps Abbreviation of "megabits per second." A measure of data transfer speed. Do not confuse with megabytes per second, or MBps.

NAT Acronym for "network address translation." NAT is a base station feature and software feature that allows all of the computers on a network to access the Internet through one Internet Protocol (IP) address, and helps ensure the computers' security by hiding their individual IP addresses.

network A group of computers and associated devices that are connected by communications paths. Networks can interconnect with other networks and contain sub-networks. A network can be permanent or temporary, small or large, and connect with cables and/or wirelessly.

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network adapter A computer circuit board, card, or other device used to provide network access from a computer to other parts of the network – for example, to another computer, a printer, or a base station (gateway or router). Adapters can be installed inside a computer, inserted into a computer's expansion slots, or connected to a computer's ports.

NIC Acronym for "Network Interface Card." A circuit board, expansion card, or other device used to provide network access to a computer or other network component, such as a printer. Network interface cards do the actual sending and receiving of data.

packet A unit of information transmitted as a whole from one device to another on a network. This is often a piece of a file that has been divided up for efficient transmission over the Internet.

PC Card A credit card-sized device that is inserted into a slot on a computer, usually a notebook computer. It was previously called a PCMCIA card. There is a newer card standard, the 32-bit Cardbus PC Card.

PCI Acronym for "Peripheral Component Interconnect." A specific local bus type that allows up to 10 PCI-compliant expansion cards to be installed in a computer. This architecture is designed to speed up system performance by allowing some expansion boards to communicate directly with the microprocessor.

PCMCIA Acronym for "Personal Computer Memory Card International Association." This group defined the standards for the PC Card, a type of expansion card designed for notebook computers.

peer-to-peer network A network of two or more computers that connect directly with one another.

Plug and Play Sometimes abbreviated "PnP." A set of specifications that allow a computer to automatically detect and configure various peripheral devices, such as monitors, modems, and printers. See "UPnP."

port This term has several meanings: (1) A physical connection through which data is transferred between a computer and another computer, a network, and other devices (such as a monitor, modem, or printer). (2) A software channel for network communications. When a client computer communicates through a network with a server, it sends its request over a certain numbered channel, called a "port."

port forwarding When a base station, gateway, or router passes information between your network and the Internet, it filters the information based on which software (virtual) ports are being used and how those ports are configured. For example, Internet (HTTP) communication, by default, travels over port 80. To help ensure security, all other ports are blocked from transferring data unless you specifically configure those ports to "forward" incoming data to other locations.

PPP Acronym for "Point-to-Point Protocol." A widely used data link protocol for transmitting data packets over dial-up telephone connections, such as between a computer and the Internet.

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PPPoE Acronym for “Point-to-Point Protocol over Ethernet.” A specification for connecting users on a network to the Internet by using a broadband connection (typically through a DSL modem).

protocol A set of rules and conventions for sending information over a network. These rules govern the content, format, timing, sequencing, and error control of messages exchanged among network devices. For example, your computer connects to the Internet using the Transmission Control Protocol/Internet Protocol (TCP/IP).

resource In reference to a “network resource,” a resource is any type of hardware (such as a modem or printer) or software (such as an application, file, or game) that users can share on a network.

router See “base station.”

server A computer or software program that mediates the connections between client computers or programs on a network. The server also responds to requests and provides shared resources, such as storage space or processing power, to clients on the network.

sharing To make the files, folders, or printers that are on one computer (or connected to one computer) available to other computers on a network.

SSID Acronym for “Service Set Identifier,” also known as a “wireless network name.” An SSID value uniquely identifies your wireless network and is case sensitive.

static IP address A static Internet Protocol (IP) address is a unique identifier that is assigned permanently to a computer by a network administrator or an Internet service provider (ISP). IP addresses are required in order for computers to find one another and communicate over the Internet. Contrast with “dynamic IP address.”

straight-through cable See “Ethernet cable.”

subnet A distinct network that forms part of a larger computer network. Subnets are connected through routers and can use a shared network address to connect to the Internet.

subnet mask Similar in form to an Internet Protocol (IP) address, a subnet mask is provided by your Internet service provider (ISP) and used to configure a networked computer for proper communication with a network. An example of a subnet mask value is 255.255.0.0.

switch Like a hub, a switch is a device that has multiple ports and that serves as a connection point for Ethernet cables on a network. But a switch only forwards data packets to the computer that has requested them. A router is a specialized kind of switch.

TCP/IP Acronym for “Transmission Control Protocol/Internet Protocol.” A networking protocol that allows computers to communicate across interconnected networks and the Internet. Every computer on the Internet communicates by using TCP/IP.

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UPnP UPnP™ standards are defined by the Universal Plug and Play Forum. They extend conventional Plug and Play (PnP) standards. When a UPnP device is plugged into a network, the other devices on the network automatically detect the new device.

USB Acronym for "universal serial bus." A hardware standard for easily connecting peripherals to a computer system. USB supports Plug and Play and UPnP installation, so devices can be connected and disconnected without shutting down and restarting your computer.

USB port A rectangular slot in a computer or computer peripheral into which a USB connector is inserted. USB ports can be high-powered or low-powered. USB ports that are connected directly to your computer are normally high-powered; USB ports that are on peripherals (such as a keyboard or monitor) are normally low-powered. Some USB devices, such as the Microsoft wireless adapter, require high-powered ports to function correctly.

virtual DMZ The Microsoft base stations support a variation of DMZ hosting capabilities, called a "virtual DMZ." DMZ is an acronym for "demilitarized zone," which refers to an area of your network that is outside of the firewall, and so is exposed to direct access from the Internet.

VPN Acronym for "virtual private network." A set of computers on a public network, such as the Internet, that communicate among themselves by using encryption technology.

WAN Acronym for "wide area network." A geographically widespread network that might include many linked local area networks (LANs).

WEP Acronym for "Wired Equivalent Privacy." An encryption mechanism that helps protect data transmitted over wireless networks. If you are operating a wireless network, it is strongly recommended that you enable WEP. See "WPA."

Wi-Fi Wi-Fi® is a popular term for certain wireless networks.

wireless access point A device that exchanges data wirelessly as an intermediary between computers on a network, especially between wireless and wired components of a network. An access point is not as sophisticated a device as a base station (gateway or router). See "base station."

WLAN Acronym for "wireless local area network." A network that exclusively relies on wireless technology for device connections.

workgroup A group of computers connected to each other over a network and sharing computer files, printers, and other resources. All computers on a network that wish to share resources must be members of the same workgroup.

WPA Acronym for "Wi-Fi Protected Access™." A wireless security standard that improves upon its predecessor, Wired Equivalent Privacy (WEP), by providing stronger encryption, making a network harder to access without proper authentication.

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