ADSL Modem

USER'S MANUAL

X5

zoom®

NOTICE

Contents

1

Installation Instructions

1.1 Important! Before you Begin

Before installing your X5 ADSL modem, you must have DSL service enabled on your telephone line. To do this, you need to sign up with a DSL service provider. They will arrange to have DSL enabled, and provide you with a User Name and Password (if required) and the Communications Settings necessary to log on to their network.

You will need your User Name and Password to complete the installation, so please make sure you have them at hand.

User Name _____

Password _____

The following table lists some DSL broadband communications settings. This table is intended for reference only. Typically you should not need to enter this information; it should be automatically supplied if needed as part of your service provider's installation procedure.

Service Provider	VPI	VCI	Encapsulation
Belgium—ADSL Office	8	35	Routed IP over ATM LLCSNAP (RFC 1483)
Belgium—Turboline	8	35	PPPoA LLCSNAP (RFC 2364)
Denmark—Cybercity, Tiscali	0	35	PPPoA VCMUX (RFC 2364)
France (1)	8	35	PPPoA LLCSNAP (RFC 2364)
France (2)	8	67	PPPoA (RFC 2364) or PPPoE (RFC 2516)
Iceland—Islandssimi	0	35	PPPoA VCMUX (RFC 2364)
Iceland—Siminn	8	48	PPPoA VCMUX (RFC 2364)
Italy	8	35	PPPoA VCMUX (RFC 2364)
Netherlands—MX Stream	8	48	PPPoA VCMUX (RFC 2364)
Portugal	0	35	PPPoE LLCSNAP (RFC 2516)
Saudi Arabia (1)	0	33	PPPoE LLCSNAP (RFC 2516)
Saudi Arabia (2)	0	35	PPPoE LLCSNAP (RFC 2516)
Saudi Arabia (3)	0	33	Bridged IP over ATM LLCSNAP (RFC 1483)
Saudi Arabia (4)	0	33	Routed IP over ATM LLCSNAP (RFC 1483)
Saudi Arabia (5)	0	35	Bridged IP over ATM LLCSNAP (RFC 1483)
Saudi Arabia (6)	0	35	Routed IP over ATM LLCSNAP (RFC 1483)
Spain—Albura, Tiscali	1	32	PPPoA VCMUX (RFC 2364)
Spain—Colt Telecom, Ola Internet	0	35	PPPoA VCMUX (RFC 2364)
Spain—EresMas, Retevision	8	35	PPPoA VCMUX (RFC 2364)
Spain—Telefonica (1)	8	32	PPPoE LLCSNAP (RFC 2516)
Spain—Telefonica (2), Terra	8	32	Routed IP over ATM LLCSNAP (RFC 1483)
Spain—Wanadoo (1)	8	35	PPPoA VCMUX (RFC 2364)
Spain—Wanadoo (2)	8	32	PPPoE LLCSNAP (RFC 2516)
Spain—Wanadoo (3)	8	32	Routed IP over ATM LLCSNAP (RFC 1483)
Sweden—Telia	8	35	Bridged IP over ATM VCMUX (RFC 1483)
Sweden—Telenordia	8	35	PPPoE (RFC 2516)
Switzerland	8	35	PPPoE LLCSNAP (RFC 2516)
UK (1)	0	38	PPPoA VCMUX (RFC 2364)
UK (2)	0	38	PPPoE LLCSNAP (RFC 2516)
USA	0	35	PPPoE LLCSNAP (RFC 2516)
Venezuela—CANTV	0	33	Routed IP over ATM LLCSNAP (RFC 1483)

The information in this table is subject to change. If necessary, check with your provider.

1.2 Package Contents

In addition to these installation instructions, your package includes the following items:

- X5 ADSL unit
- Power adapter and power cord
- Straight-through Ethernet cable
- USB cable
- RJ-11 phone cord
- RJ-11-to-wall-jack adapter (certain models only)
- CD-ROM, including installation software
- Warranty and Customer Support information (on CD-ROM)
- Phone filter(s) (certain models only).

If anything is missing or damaged, please contact your supplier.

You Will Also Need

- A Macintosh, Linux, or Windows 98/98SE/2000/Me/XP computer equipped with a Network Interface Card (NIC) or a Windows 98/98SE/2000/Me/XP computer equipped with a USB port.
- A telephone wall jack to plug the X5 unit into. The associated phone line must be DSL enabled.

1.3 Quick Start Instructions

Your computer should be on.

Windows users: You have the option of connecting your X5 unit to your computer's Ethernet port or its USB port.
Macintosh and Linux users: You must use the Ethernet option.
Depending on your operating system and preference, follow the appropriate instructions below.

Windows users:

Using any combination of Ethernet and USB jacks, you can connect multiple computers to your X5 unit and share Internet access.

Macintosh and Linux users:

You can use the X5's four Ethernet jacks to connect multiple computers and share Internet access.

To Connect via the Ethernet Option

1 **Macintosh and Linux Users:**
You do not need to run the CD-ROM software.
Skip to Step 2 below.

Windows 98/98SE, Me, 2000, and XP Users:
Install the software before connecting the hardware.

a Insert the supplied CD-ROM into your computer. The CD starts automatically and the **Main Menu** opens: (**Note:** If the CD does not start automatically, from the desktop, go to **Start | Run** and then type **D:\setup.exe**, where **D** is the letter of your CD-ROM drive.)

b Click the **ADSL Modem Installation Wizard** button, and then click the **Ethernet** option. The software installation proceeds automatically.

c When the process is complete, you will be prompted to click **Finish**. Your computer will shut down so you can connect the hardware.

2 All hardware connections originate from the modem's back panel. (For reference, we have included a table that defines these back panel ports, or jacks; see page 41.)

a Plug one end of the supplied phone cord into the unit's **DSL** jack and the other end into the ADSL wall jack.

b Plug one end of the straight-through Ethernet (10BaseT) cable into one of the modem's LAN jacks (**1**, **2**, **3**, or **4**) and plug the other end into your computer's Ethernet port.

c Plug one end of the included power adapter into the unit's **POWER** jack and the other end into a power strip or wall receptacle.

d Turn the unit on by pushing the **ON/OFF** switch. The **PWR** light on the unit's front panel turns on.

Note: You can also attach the X5 to an access point, switch, or network hub via its LAN jack(s) and thereby connect additional computers.
—If your hub has an uplink or daisy chain port, you can use the supplied straight-through Ethernet cable to connect the two.
—If your hub has a numbered port or if you are using an access point, you need a crossover Ethernet cable (sold separately).
Throughout this manual, when we refer to an X5 Ethernet connection, it should be understood that this connection may be to a computer, access point, or hub.

3 The unit performs a startup sequence—the front panel **LINK** light blinks. (For reference, we have included a table on page 42 that defines the X5's front panel lights.) When the **LINK** light changes from blinking to solid, turn your computer back on and proceed to **Establishing Communication with the X5** (page 10).

To Connect via the USB Option

1 **You must install the requisite USB software on your Windows computer before connecting the hardware.**

a Insert the supplied CD-ROM into your computer. The CD starts automatically and the **Main Menu** opens: (**Note:** If the CD does not start automatically, from the desktop, go to **Start | Run** and then type **D:\setup.exe**, where **D** is the letter of your CD-ROM drive.)

b Click the **ADSL Modem Installation Wizard** button and, if prompted, the **USB** option. The software installation proceeds automatically. When the process is complete, the Main Menu minimizes for future use and a Zoom Web Console icon resides on your desktop.

2 Now connect the hardware. All connections originate from the X5's back panel. (For reference, we have included a table that defines these back panel ports, or jacks; see page 41.)

a Plug one end of the included power adapter into the unit's **POWER** jack and the other end into a power strip or wall receptacle.

b Turn the unit on by pushing the **ON/OFF** switch. The **PWR** light on the unit's front panel turns on.

c Plug one end of the supplied phone cord into the unit's **DSL** jack and the other end into the ADSL wall jack.

d Plug one end of the USB cable into the modem's **USB** jack and plug the other end into your computer's corresponding USB port.

3 The unit performs a startup sequence—the front panel **LINK** light blinks. (For reference, we have included a table on page 42 that explains the meaning of the X5's front panel lights.)

Note: You may see a **Found New Hardware** box indicating the progression of the installation; typically no user action is necessary. If you are using Windows XP, however, you may be required to click **Next**.

4 Depending on your operating system, you may see a **Hardware Installation** disclaimer box or a **Digital Signature Not Found** dialog box. You can safely ignore these messages and click **Yes** or **Continue Anyway**.

Windows XP Users: If prompted to do so, click **Finish.**

When the modem's startup sequence is complete, the **LINK** light will change from blinking to solid. Continue below with **Establishing Communication with the X5**.

Establishing Communication with the X5

1 Depending on your computer's operating system, you may have a Zoom Web Console icon on your desktop.

- If you do, double-click it to display the **Network Password** dialog box.
- If you do not have a Zoom Web Console icon on your desktop, open your Web browser, type **http://10.0.0.2** and press Enter to display the **Network Password** box.

Note: If your web browser doesn't open properly, it may be that your Internet settings need adjustment. Turn to page 46 for instructions.

Note: This User Name and Network Password are different from the ones that your service provider gave you. They provide an added level of security that protects your ADSL unit's settings.

Type the following letters, the X5's default User Name and Password.

- **User Name=admin**
- **Password=zoomadsl**

Remember: The **User Name** and **Password** letters are case-sensitive.

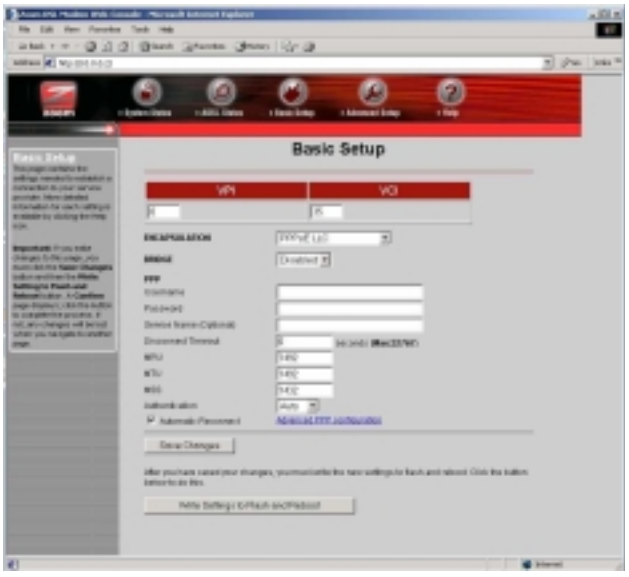
Tip: If the **Network Password** box doesn't display, perform the following in this order:

a Recheck all connections.

b Restart the modem and computer.

c Perform a "hard" reset. (See page 38.)

2 The **Basic Setup** page displays. You are now communicating with your X5. This page provides details about your Internet connection and includes information that the X5 uses to automatically connect to your service provider.



a Check that the VPI, VCI, and Encapsulation settings match those supplied by your service provider. (Refer to the table on page 5 if necessary or consult your provider.)

b Enter the login **User Name** and **Password** supplied by your service provider.

c Optional: Enter a **Service Name** if your service provider has given you one.

d Click **Save Changes** and then click **Write Settings to Flash and Reboot**. Once the reboot is complete and the unit has reset itself (when the front panel's **LINK** light remains on steady again), your X5 is ready to use. You can open another Web browser or use the one that is already open to access the Internet.

IMPORTANT:

Every time you make changes to the Basic Setup page, you must click the **Save Changes** button and then the **Write Settings to Flash and Reboot** button. A **Confirm** page displays; click the button to complete the process. If not, any changes will be lost when you navigate to another page.

Using Phone Filters

You should use a filter with each device—phone, fax machine, analog modem, etc.—that is sharing the DSL-enabled line, because this prevents the device from receiving noise when the DSL modem is on. For all other devices on the DSL-enabled line, plug the device's phone cord into the filter's **PHONE** end, and plug the filter's **LINE** end into the wall jack. Some X5 models come with filters, and more can be purchased from a retailer or service provider.

Now that your modem is installed and appropriate filters are attached, you're done. Enjoy using the X5.

The remainder of this manual contains information intended for those users looking for expanded capabilities or for future reference—for example, there are chapters on **Advanced Setup Options** and **System Administration**. Refer to the Table of Contents for guidance.

1.4 If You Need Help

- If you have hardware installation problems, our Technical Support Staff will be happy to assist you.

  Windows Users: Please see the Customer Support portion of the CD for contact information. You may also want to refer to the Frequently Asked Questions on the CD.

  Macintosh and Linux Users: You will find Customer Support information and Documentation in Adobe PDF format in the appropriately named folders in the CD-ROM's directory.

- If you have DSL service problems, you should contact your DSL service provider.

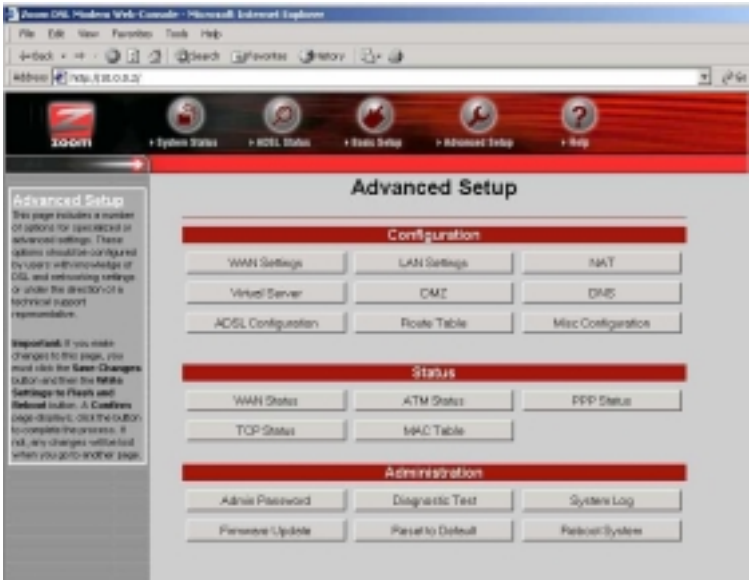
2

Advanced Setup Options

In addition to its basic setup options, the X5 unit includes options for specialized, or advanced, settings. If you are like most users, you will not need these options. The X5 is designed so that the basic setup settings are sufficient for most users. This chapter is applicable only if you need to perform sophisticated tasks.

2.1 How To Use the Advanced Options

All the Advanced Configuration settings are accessible from the **Advanced Setup** page. Click its icon at the top of the X5's main interface page. (If you have exited from the X5 and have forgotten how to establish communication with it, refer to page 10.)



IMPORTANT:

Every time you make changes to an Advanced Setup page, you must click the **Save Changes** button and then the **Write Settings to Flash and Reboot** button. A **Confirm** page displays; click the button to complete the process. If not, any changes will be lost when you navigate to another page.

2.2 WAN Settings

The WAN Settings page contains information pertaining to your Wide Area Network (WAN) ADSL setup and how you access the Internet. From the **Advanced Setup** page, click the **WAN Settings** button. A screen displays with several fields to fill in. For each field or category, we have included a table for reference.
Note: Any settings entered in the **Basic Setup** page will be reflected in the **WAN Settings** page.


zoom
WAN Configuration
Permanent VC Settings
Enabled?
VPI
VCI
Static IP Address
Subnet Mask
Yes
ATM
Service Category
UBR
Bandwidth
kbps
ENCAPSULATION
PPPoE LLC
BRIDGE
Disabled
Default Gateway
0.0.0.0
IGMP
Disabled
PPP
Username
Password
Service Name
Disconnect Timeout
seconds (Max:32767)
MRU
1492
MTU
1492
MSS
1432
Authentication
Auto
Automatic Reconnect
Advanced PPP configuration
DHCP
DHCP client enable
Host Name
Virtual Circuit:
Save Changes
After you have saved your changes, you must write the new settings to flash and reboot. Click the button below to do this.
Write Settings to Flash and Reboot

Permanent VC (Virtual Circuit) Settings

Your service provider will supply the Permanent Virtual Circuit (PVC) setting for your basic Internet connection. You can define additional PVCs for services such as telephony or to connect to a managed Virtual Private Network (VPN) if available in your area. Consult your service provider.

Enabled?	Enabled by default.
VPI	Supplied by your service provider (reference table appears on page 5).
VCI	Supplied by your service provider (reference table appears on page 5).
Static IP Address	Most providers use dynamic IP addressing; only providers using Bridged or Routed IP Encapsulation can use static IP addresses. If your provider has given you a static IP address, enter it here.
Subnet Mask	For static IP address users only (see above): Enter the subnet mask of the static IP address given to you by your service provider.
Virtual Circuits	No. of virtual circuits that can be set up: 1-7.

Note: You must scroll down to the bottom of the page to reach the **Virtual Circuit** field and select a number from the dropdown list to identify a PVC. The number 0 is reserved for the Basic Setup settings preconfigured for your provider. Be sure to click **Save Changes** and then **Write Settings to Flash and Reboot**. Once you have set up multiple PVCs, you can switch between them by selecting a different number from the **Virtual Circuit** dropdown list and clicking **Save Changes** and **Writing Settings to Flash and Reboot**.

ATM

ATM, or Asynchronous Transfer Mode, allows you to change the way in which your data is sent over the Internet.

ATM Service Category	Default is UBR (Unspecified Bit Rate). CBR (Constant Bit Rate) is optional. You can only use CBR if you have arranged to do so with your provider.
Bandwidth	Default is **0** (which equals UBR). Specifying bandwidth is only possible with CBR.

Encapsulation

The **Encapsulation** mode, like the VPI and VCI numbers, is specified by your service provider (see **Permanent VC Settings**, page 17).

Encapsulation	This mode is supplied by your service provider (reference table appears on page 5).

Bridge

The **Bridge** option is disabled by default. You should enable it only if your service provider instructs you to.

IGMP (Internet Group Management Protocol)

IGMP is the Internet standard for IP multicasting, or broadcasting a message to many recipients simultaneously. Your choices are **enabled** or **disabled**; the default is **disabled**.

IMPORTANT:

Before enabling IGMP, navigate to the Advanced Setup page, click **Misc Configuration**, select **Enabled** in the **IGMP Proxy** dropdown list, and click **Save Changes** and **Write Settings to Flash and Reboot**. If you don't perform this step first, enabling IGMP on this page will not have any effect.

Default Gateway

Normally, you would not enter anything into the **Default Gateway** field. You would do so only if you want to connect your modem to the Internet via a different Gateway Router, or if your service provider has instructed you to change it.

PPP (Point-to-Point Protocol)

PPP is the most widely used protocol for authenticating your connection to the Internet. Should you change service providers, you may need to change the data in these fields. **Note:** These settings also appear on your **Basic Settings** page.

User Name	Supplied by your service provider.
Password	Supplied by your service provider.
Service Name	Optional; supplied by your service provider.
Disconnect Time	ADSL connection will be dropped after the ADSL line is idle for a certain amount of time (measured in seconds). Select **0** to ensure that you won't be disconnected.
MRU*	Maximum Receive Unit. Largest physical packet size, in bytes, that a network can accept. Any messages larger must be fragmented. Default is 1492.
MTU*	Maximum Transmission Unit. Largest physical packet size, in bytes, that a network can send. Any messages larger must be fragmented. Default is 1492.
MSS*	Maximum Segment Size. Largest data segment, in bytes, allowed within each IP packet. Default is 1432.
Authentication	PPP user authentication method. Default is **Auto**; you can specify CHAP or PAP only.
Automatic Reconnect	Enabled by default. Check this box if you do not want to be reconnected automatically if the ADSL connection is terminated unexpectedly.

**You must enter your PPP User Name and Password before making changes to these fields; otherwise they will not take effect.*

DHCP (Dynamic Host Configuration Protocol)

DHCP is disabled by default. Typically, you should not need to change your DHCP setting. Do so only if your service provider requests it.

DHCP client enable	Check this box only if instructed to by your service provider.
Host Name	If necessary, supplied by your service provider.

2.3 LAN Settings

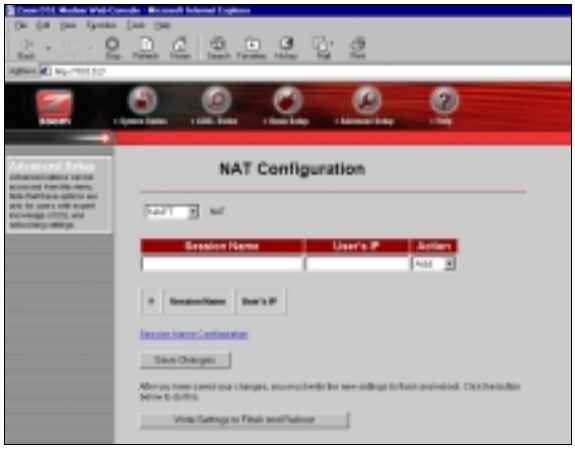
By modifying your LAN ADSL setup and DHCP settings, you can limit the number of DHCP addresses assigned by the X5. To change your settings, from the **Advanced Setup** page click the **LAN Settings** button.

LAN IP Address	X5's IP address. Default is 10.0.0.2.
Subnet Mask	X5's subnet mask address. Default is 255.255.255.0.
DHCP Server	Enabled by default.
DHCP Address Pool Selection	The DHCP Address Pool is based on the X5's LAN IP address plus 12 IP addresses; for ex., if you are using the X5's default LAN IP address of 10.0.0.2, the DHCP Address Pool would be 10.0.0.4-10.0.0.15. Default is System Allocated. A pool of 253 (max.) user-defined addresses is optional.
User Defined Start Address	Starting address of LAN IP address pool.
User Defined End Address	Ending address of LAN IP address pool.
Lease Time	Measured in days/hours/minutes/seconds. Default is 1 day: After 24 hours, lease expires if not renewed.
User Mode	Default is Multi-User.

2.4 NAT Firewall

The X5's built-in NAT (Network Address Translation) firewall provides a good level of protection from unauthorized access. NAT keeps private a network's internal IP addresses and presents to the Internet one public IP address. With NAT, only one LAN user can use the public IP address. NAT's more robust counterpart, NAPT (Network Address Port Translation), allows specified LAN users to share the one public IP address. Both NAPT and NAT are transparent to end users.

Your X5's NAT firewall is enabled by default; the default setting is **dynamic NAPT**—everything is automatic. With dynamic NAPT, anyone can use the public IP address (that is, the modem's WAN IP address). You shouldn't need to change this setting. However, if your service provider instructs you to disable it (or change it), go to the **Advanced Setup** page and click the **NAT** button.



NAT	Default is dynamic NAPT. Options are NAPT, NAT, and Disable. You should not need to change this setting, unless advised to do so by your provider. **Warning:** If you select Disable, all your modem's firewall capabilities are turned off.
Session Name	Only applicable to NAT and NAPT; user-definable name to differentiate between different NAT sessions, different PPP sessions, and different PVCs.
User's IP	IP address of the client computer you want to add.
Action	Choices are Add or Delete.

2.5 Virtual Server (Port Forwarding)

If you need to allow outside users access to a computer (or computers) on your LAN—for example, if you are hosting an Internet game—you have to open up an X5's inbound port. A port is an endpoint to a logical connection. The port number identifies the logical channel being used; for instance, port 21 is associated with FTP (File Transport Protocol). If a port is not opened, the X5 will block and discard the packets.

One way to open up a port is to implement a virtual server (sometimes referred to as port forwarding). Note that one virtual server entry opens up one port. It is possible to open multiple ports (for a maximum of 20), but you have to configure a virtual server entry for each one individually. In other cases, you might want to have all ports open and for this you need to set up a Demilitarized Zone (DMZ); see page 25 for instructions on configuring a DMZ.

An example will help to illustrate how to set up a virtual server. In our example, we will demonstrate how to use your computer as an FTP server.

Tip: We recommend that you visit the ports list section of Practically Networked's web site if you need help: **http://www.practicallynetworked.com/sharing/app_port_list.htm**.

1. First you need to specify a Host IP address. Navigate to the **LAN Settings** page by returning to the **Advanced Setup** page and clicking **LAN**. You'll see the defined starting and ending LAN IP address range; for example, 10.0.0.4 and 10.0.0.15. Your Host IP Address should be a static IP address outside of this range—say, 10.0.0.16.

   To set this static IP address, go to **Start | Settings | Network and Dial-up Connections**. Right-click **Local Area Connection**, select **Properties**, highlight your NIC card's **TCP/IP** entry and click **Properties**.

Note: These TCP/IP instructions and screenshot are typical of a computer using Windows 2000 or XP; if you are using Windows 98 or Me, yours may differ slightly. If you are a Macintosh or Linux user and need help with your TCP/IP settings, turn to the Appendix on page 50.

a Click the radio buttons **Use the following IP address** and **Use the following DNS server addresses**.

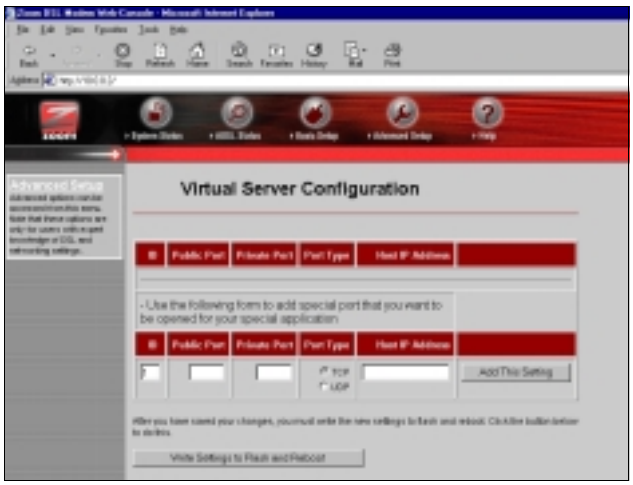
b Fill in the **Properties** dialog box by entering the following addresses.

IMPORTANT: You must complete all four fields.

IP address	10.0.0.16
Subnet mask	255.255.255.0
Default gateway (X5's LAN IP address)	10.0.0.2
Preferred DNS server	10.0.0.2

c Click **OK**.

2 Navigate back to the X5's **Advanced Setup** page and click the **Virtual Server** button.



ID	The ID number is a convenient way to refer to a particular computer.
Public Port	Inbound port from the Internet.
Private Port	Inbound port from the modem to the LAN.
Port Type	Default is TCP. UDP is optional.
Host IP Address	IP address of the host computer—i.e., on the LAN side.

a Select an ID number that you want to associate with this computer—1, for example.

b In this example, the public and private port numbers are the same: 21. Enter 21 in the **Public Port** and **Private Port** fields.

c Select the **Port Type**. For FTP, it is **TCP**, which is the default.

d Enter the **Host IP Address**. (This is the fixed IP address of the computer or device to which the virtual server is passing data.)

e Click **Add This Setting** (in this case, there is no **Save Changes** button), and then click **Write Settings to Flash and Reboot**.

IMPORTANT: Outside users who want to access the X5's virtual server need to use the X5's **WAN IP address** (supplied by your ISP), not the LAN IP address. If you don't know the WAN IP address, you can find it by clicking the **System Status** icon at the top of the X5's main interface page and scrolling down to the WAN Status section.

Note: To test the port forwarding feature, you must use another person's dial-up or Internet connection so that you are accessing the virtual server from outside the network.

2.6 DMZ

In certain instances, you may want to give outside users **unrestricted** access from the Internet to one computer on your LAN. For example, you may want to use an application such as NetMeeting that uses dynamic ports. Or you may want to use the computer to play games over the Internet, and you want others to be able to initiate games with you. Because of the X5's firewall, without a DMZ you would always have to be the one to initiate a game. A DMZ configuration bypasses the modem's NAT firewall and allows the computer to accept *all* incoming packets.

CAUTION! Use the **DMZ** feature with the utmost care. It exposes the DMZ computer's entire contents to the Internet; there is no firewall protection whatsoever.

To enable the X5's DMZ feature, follow these steps.

1. You need to specify the **DMZ Host IP address**. To obtain this address, navigate to the **LAN Settings** page by returning to the **Advanced Setup** page and clicking the **LAN Settings** button. You'll see the defined starting and ending LAN IP address range; for example, 10.0.0.34 and 10.0.0.15. Your DMZ Host IP Address should be a static IP address outside of this range—say, 10.0.0.16.

To set this static IP address, go to **Start | Settings | Network and Dial-up Connections**. Right-click **Local Area Connection** and select **Properties**. Click the **Install** button. Select the **Internet Protocol TCP/IP** option and click **Properties**.

Note: These TCP/IP instructions and screenshot are typical of a computer using Windows 2000 or XP; if you are using Windows 98 or Me, yours may differ slightly. If you are a Macintosh or Linux user and need help with your TCP/IP settings, turn to the Appendix on page 50.

a Click the radio buttons **Use the following IP address** and **Use the following DNS server addresses**.

b Fill in the **Properties** dialog box by entering the following addresses.

IMPORTANT: You must complete all four fields.

IP address	10.0.0.16
Subnet mask	255.255.255.0
Default gateway (X5's LAN IP address)	10.0.0.2
Preferred DNS server	10.0.0.2

c Click **OK**.

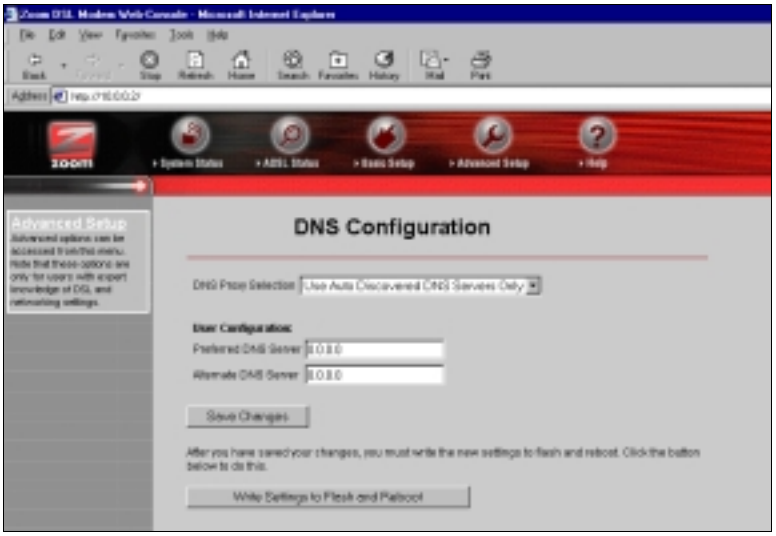
2 Return to the **Advanced Setup** page and click the **DMZ** button.

3 Select **Enable** from the **DMZ** dropdown list, and enter the static IP address 10.0.0.16 in the **DMZ Host IP** field. Then click **Save Changes** and **Write Settings to Flash and Reboot**.

IMPORTANT: Outside users who want to access the X5's DMZ need to use the X5's **WAN IP address** (supplied by your ISP), not the LAN IP address. If you don't know the WAN IP address, you can find it by clicking the **System Status** icon at the top of the X5's main interface page and scrolling down to the WAN Status section.

2.7 DNS

Typically, you should not need or want to change your DNS settings. Should your service provider instruct you to make changes, however, from the **Advanced Setup** page, click the **DNS** button.

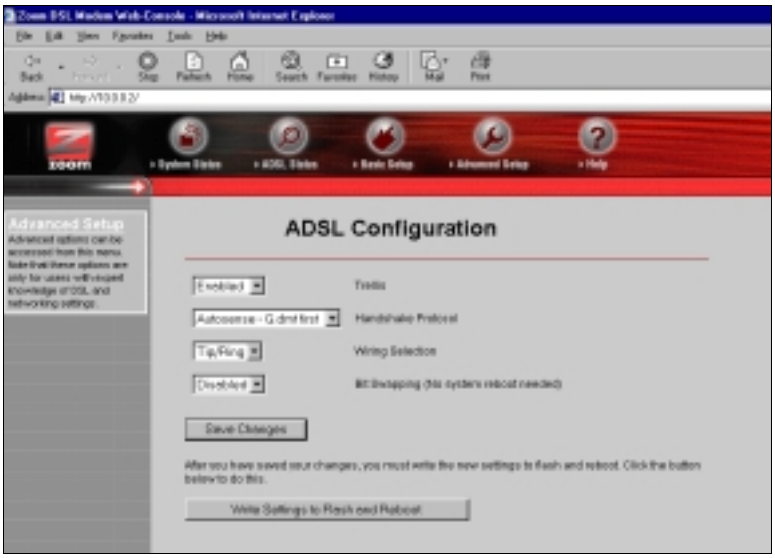


DNS Proxy Selection	Default is Use Auto Discovered DNS Servers Only. Options are: —Disable DNS Proxy —Use User-Configured DNS Servers Only —Auto Discovery + User Configured
User Configuration	IP address of the prime DNS server. IP address of the alternate DNS server.

- From the dropdown list, select the option you want using the table above for reference.
- If your provider instructed you to select **Use User-Configured DNS Servers Only** or **Auto Discovery + User Configured**, in the **User Configuration** field you need to type in the preferred and alternate DNS server IP addresses that your provider has given you.

2.8 ADSL Configuration

Normally, you should not need or want to change your ADSL configuration. Should your service provider instruct you to make changes, however, from the **Advanced Setup** page click the **ADSL Configuration** button to display the ADSL parameters.

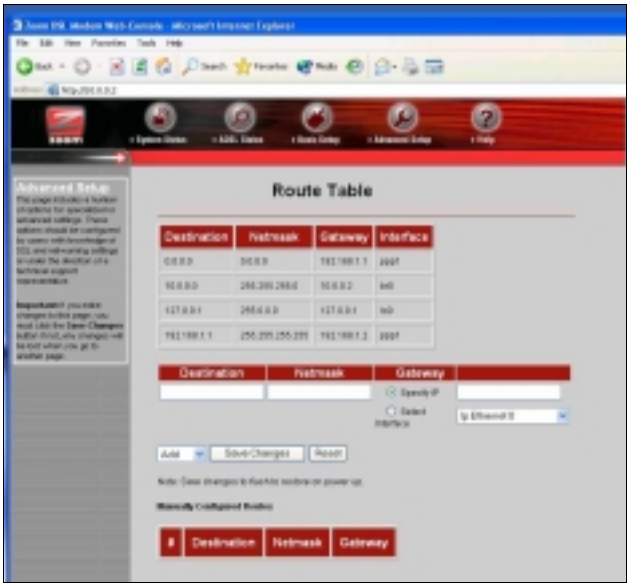


Trellis	Enabled by default.
Handshake Protocol	Default is Autosense - G.dmt first.
Wiring Selection	Default is Tip/Ring.
Bit Swapping	Disabled by default.

2.9 Route Table

The X5 includes a routing table function for users who want to set up an additional network (or networks) residing on a different subnet than the X5. Without a route table, any computer residing on an additional subnet would be invisible to the modem. The route table acts as a map for the modem, so that it directs traffic to the correct subnet location.

To access the route table function, click the **Route Table** button at the top of the **Advanced Setup** page. You will see at least three route table entries. (These entries are automatically displayed once you connect the X5.) Under **Destination**, you will see the IP address of the X5's LAN interface (for example, 10.0.0.0), the IP address of the local loopback test (127.0.0.1), and the IP address of the WAN interface (for example, 192.168.1.1). Under **Netmask**, you will see the corresponding subnet masks for these three Destinations. Under **Gateway**, you will see the corresponding Gateway IP addresses. The **Interface** field denotes the type of interface; for example, br0 denotes Ethernet, lo0 denotes loopback, and ppp1 denotes PPP (WAN).



Destination	IP address of the subnet.
Netmask	Subnet mask address that corresponds to the Destination's IP address.
Gateway	IP address of the Gateway that is on the same subnet as the modem.
—Specify IP **—Select Interface**	Choices are enter a static IP address or select an interface type from a dropdown list.
#	As you add entries to the Route Table, the X5 automatically assigns sequential ID numbers.

To manually configure entries for your X5's **Route Table**, follow these steps.

1. Enter the subnet's IP address in the **Destination** field.
2. Enter the matching subnet mask address in the **Netmask** field.
3. Click the **Specify IP** button and enter the Gateway's IP address. **Tip:** If you need help determining the Gateway's IP address, from the Command prompt of the computer acting as the Gateway, type **ipconfig /all**.
4. Select **Add** from the dropdown list and then click **Save Changes**. (If you want to delete your entry and begin again, click **Reset**.) When the **Route Table** page displays again, you will see your new entry in the **Manually Configured Routes** table at the bottom of the page, along with an ID number.

Should you ever want to remove an individual route table entry, follow these steps.

1. In the **Destination** and **Netmask** fields, enter the IP address information for the entry that you want to remove. (You do not have to enter the Gateway IP address.)
2. Select **Delete** from the dropdown list and then click **Save Changes**.

2.10 Miscellaneous

From the **Advanced Setup** page, click the **Miscellaneous Configuration** button. This page allows you to change your X5 configuration and set up an IGMP proxy, for example, or enable the X5's PPP Half Bridge feature.

HTTP server access	Default is Restricted LAN. Choices are All (WAN and LAN); Restricted WAN and/or LAN. If restricting WAN access, be sure to fill in the IP address and subnet mask address of the device that is communicating in from the Internet.
HTTP server port	Port number to use for Web access; for ex., if you change it to 1001, the modem's HTTP server address on either side would be http://10.0.0.2:1001.
FTP server	Disabled by default. Enabling this feature is useful strictly for Technical Support diagnostics.
DHCP Relay	Disabled by default. Enabling this feature forces all local PCs' DHCP requests to be forwarded to the WAN DHCP server. **Important:** Be sure to disable the LAN DHCP server (navigate back to the **Advanced Setup** page and **LAN Settings** to do so; see page 20 for instructions).
DHCP Target IP	IP address of the device that you want to function as the DHCP server.
IGMP Proxy	Disabled by default. Select enable, then navigate back to the **Advanced Setup** page and **WAN Settings** to set up your IGMP proxy. See page 18 for instructions.
PPP reconnect on WAN access	Disabled by default. Enabling this feature ensures that the PPP session is automatically established when a packet is ready to be transferred over to the WAN.
PPP Half Bridge	Disabled by default. Enabling this feature forces the DHCP server to duplicate the X5's WAN IP address to one local client computer; thus, only one computer on the LAN can access the Internet at a time.

3

System Administration

Using a computer attached to the X5 and a Web-based browser such as Netscape Communicator or Internet Explorer, you can administer your X5 unit and monitor your ADSL connection.

***Remember**: If you are using an access point or a network hub, you can administer your X5 from any of the computers that are connected to the access point or hub.*

3.1 Monitoring System Status

If you want to check the overall system status, click the **System Status** icon at the top of the X5's main interface page. (If you have exited from the X5 and have forgotten how to establish communication with it, refer to page 10.)

3.2 Monitoring ADSL Status

If you want to check the status of your ADSL connection, click the **ADSL Status** icon at the top of the X5's main interface page.

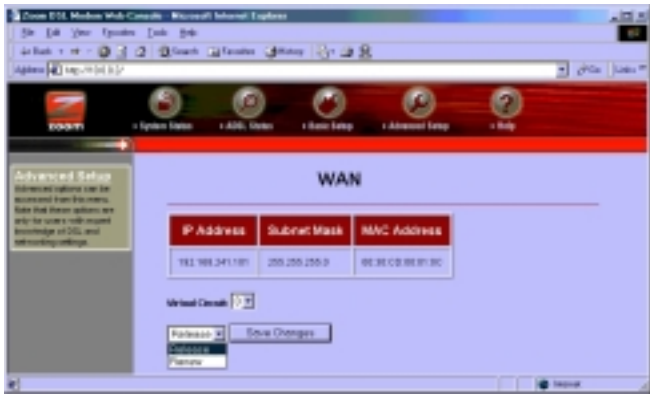
From here, you can verify whether your ADSL connection is active or not (**ADSL Line State Status** will read **SHOWTIME**). You can also monitor related ADSL parameters—for example, how fast the X5 is transferring data.

If you want to review other network settings, click the **Advanced Setup** icon at the top of the main interface page.

Under **Status**, you will see **WAN Status**, **ATM Status**, **PPP Status**, **TCP Status**, and **MAC Table Status** buttons. Clicking any of these buttons displays pertinent information. **Note:** You can't make changes to the ATM or TCP Status pages; you can make changes to the PPP and WAN Status pages.

If your provider is using Bridged or Routed IP Encapsulation, you may be instructed to perform a Release/Renew operation to gain a new, valid IP address. To do so, perform the following:

- Highlight **Release** in the pulldown menu, and then click **Save Changes**.
- Highlight **Renew** in the same pulldown menu, and then click **Save Changes**.



3.3 Performing System Administration Tasks

To change system administration-type settings, click the **Advanced Setup** icon at the top of the main user interface page. Under the **Administration** heading, you will see items such as **Admin Password** and **System Log**.

For example, you can

- Change the **Admin Password**:

  Type the new password, then retype it for verification purposes. **Note:** The password must be at least 8 characters. If you change your password and then forget it, your only recourse is to reset it to the default by performing a hardware system reset (see page 38).

- View **System Log**.

  Click this button to view a log of system activity.

- Perform a **Diagnostic Test**.

The X5's user interface uses a few basic buttons, which are listed in the table below.

Button	Function
Save Changes	Clicking this button initiates new settings and changes.
Write Settings to Flash and Reboot	Clicking this button puts new settings and changes into effect—and restarts the unit. (Changes do not become effective until unit is restarted.)
Help	Clicking the **Help** icon at the top of any page displays context-sensitive help.

Note: We strongly recommend that you change the administrator password to safeguard the security of your network.

3.4 Resetting the Unit to Its Default Settings

If you have changed the system settings on your X5 unit and want to restore them to the factory default settings, you can do so in one of two ways: You can perform a software reset or a "hard" reset.

Note: The unit's default IP address is **http://10.0.0.2**.

If you can open your Web browser and access your X5's user interface, initiate a software reset:

- From the **Advanced Setup** page, under **Administration**, click **Reset to Default**. You will be prompted to click the **Write Settings to Flash and Reboot** button. Once this process is complete, your unit is reset to its factory settings. Click on any of the icons at the top of page to continue.

If you lose your link to the unit and cannot communicate with it via the Web browser, initiate a hard reset.

- Using a paper clip, press the **RESET** button on the unit's back panel. While holding in this button, count to five, and then release the button. The unit's **LINK** light will turn off and then it will blink slowly, about once per second. You are now guaranteed that all system settings are set to the unit's factory defaults.

3.5 Updating the Unit's Firmware

To upgrade the X5's firmware, click the **Advanced Setup** icon at the top of the main interface page and then follow these steps.

1. You must first download the upgrade file (for example, from our web site or a floppy disk). Save it under a filename with a .dlf extension.

2. Click the **Firmware Update** button and then click **Image Download**. The unit will restart itself and switch into download mode.

3. Click **Browse** and select the upgrade file.

4. Click **Upload**. The modem will restart itself when the upload is done. The front panel **LINK** light will go off during the rebooting process. Then it will blink and finally remain on steady; the process is now complete. **Note:** This process may take up to a minute.

   VERY IMPORTANT!
   Do not turn off the X5 or unplug it while you are upgrading the firmware or while the unit is in download mode.

5. Close and re-open your Web browser and resume your Internet session.

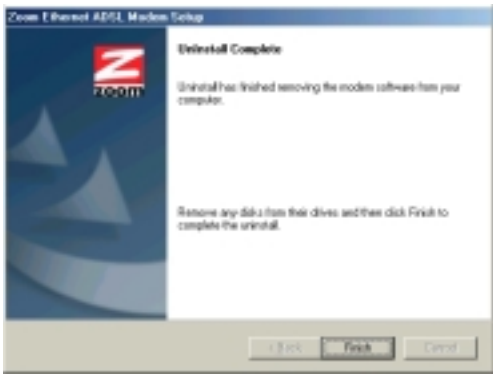
4

Removing the X5 Modem

If you ever want to remove your ADSL modem—for instance, if you move your computer to a location without ADSL service—you should remove the software before disconnecting the hardware. Follow the steps below.

1. From the desktop, select **Start | Programs | Zoom ADSL Modem | Uninstall**.
2. When prompted to confirm your choice, click **Yes**.

3. When the process is complete, you will be prompted to click **Finish**.



4. Unplug your modem hardware.

Appendix A
Front and Back Panel Data

Back Panel

The table below defines the purpose of the X5's back panel ports, or jacks.

Port	Description
DSL	Port to connect the unit to the ADSL telephone wall jack.
USB	Port to connect the unit to the USB port of a computer.
1	LAN port to connect the unit to an access point, network hub, network switch, or Ethernet (10/100BaseT) port of a computer. **Note:** The unit has four LAN ports.
2	See above definition.
3	See above definition.
4	See above definition.
RESET	Button to reset the unit to its system default settings.
POWER	Port to connect the unit to the power adapter.
ON/OFF	Pushbutton switch to turn the unit on or off.

Front Panel

The table below defines the X5's front panel lights and how to interpret them.

Light	Description
PWR	Lights when power switch on back panel is turned on.
LINK	Blinks when unit is performing its startup sequence; stays on solid when unit is connected to the ADSL line.
LAN 1	Lights when LAN port 1 connection is established; blinks when data is being transferred.
LAN 2	Lights when LAN connection 2 is established; blinks when data is being transferred.
LAN 3	Lights when LAN port connection 3 is active; blinks when data is being transferred.
LAN 4	Lights when LAN connection 4 is established; blinks when data is being transferred.

Appendix B
Online Gaming and the X5

Using Your X5 with Xbox® Live

You should have already completed the Quick Start Instructions on page 6. **Note:** Windows users connecting directly to the X5 should use the USB connection, not Ethernet. No special settings are required to use Xbox Live—just be sure to enter the login User Name and Password supplied by your ISP on the X5's **Basic Setup** page. Once installation is complete, follow these steps.

1. Update the Xbox Dashboard: Make sure you have your Xbox Live Starter Kit at hand. Insert the Xbox Live CD into your Xbox. Once the upgrade is complete, the main menu will include an **Xbox Live** entry.

2. Connect the X5 and the Xbox: Using the straight-through Ethernet cable that came with your X5 modem, plug one end into the X5's Ethernet jack and the other end into the Xbox's jack. Insert the Xbox Communicator module into the Xbox Controller expansion slot (top slot) and then insert the headset plug into the Communicator module.

3. Activate your Xbox Live account: The Xbox Live CD should still be in your Xbox. We recommend that you watch a video that explains the installation process: Select **Xbox Live** from the menu. Then, from the Dashboard, select **Xbox Live** and follow the prompts. **Note:** You will need your subscription code to activate your account—this number is located on the CD's sleeve. (If you require more detailed instructions, please refer to your Xbox Live documentation.)

That's it! Load one of the demo games included on your Xbox Live CD or use any other Xbox Live-enabled game to begin international online gaming.

Using Your X5 with PlayStation® 2

You should have already completed the Quick Start Instructions on page 6.

Note: You must plug the PlayStation unit into a computer to configure it and you must use the X5's Ethernet option. Be sure to enter the login User Name and Password supplied by your ISP on the X5's **Basic Setup** page.

1 Navigate to the **Advanced Setup** page and click the **Virtual Server** button. On the **Virtual Server** page, you need to specify 10 entries, one at a time. **Tip:** If you are unfamiliar with setting up a virtual server, please refer to page 22 of this manual.

a Fill out the following fields:

Public Port=10070

Private Port=10070

Port Type=TCP

Host IP Address=10.0.0.50

and then click **Add This Setting**.

b You have to perform this task for ports 70 to 80. That is, the next entry would be

Public Port=10071

Private Port=10071

Port Type=TCP

Host IP Address=10.0.0.50

and so on until you have entered **10080**.

Don't forget to click **Add This Setting** each time.

c When you have entered all 10 entries, click **Write Settings to Flash and Reboot** and then **Confirm**.

Important: Once you are done, you must run the PlayStation installation using the PS2 CD. Follow the prompts.

Then you must perform these steps.

1. Load the PS2 **Network Adapter Start-up Disc** that was supplied with the PS2 network adapter.
2. Select **Get Connected**.
3. Select **Advanced Options**.
4. Select **Edit Network Configuration**.
5. Select the memory card where you have saved your network configuration and select your network configuration profile.
6. Select **DHCP**, set it to **No**, and fill out these fields:

   IP address=10.0.0.50

   Subnet mask=255.255.255.0

   Gateway=10.0.0.2.
7. Set DNS to **No** and fill out these fields:

   Primary DNS=10.0.0.2

   Secondary DNS=10.0.0.2.
8. Save under a different profile name.
9. Select **Save all changes** and run the diagnostic test.

When running a network game, please select the new profile.

Note: Some online games require that you open up other, specific ports in your computer's firewall. Your game manual should list which ports must be opened. If you need additional guidance opening up ports, please refer to the **Virtual Server (Port Forwarding)** section of this manual on page 22.

Appendix C
Configuring Your Browser

An Internet browser is a program used to find and display Web pages. To find a page, the browser must connect to the Internet. This Appendix describes how to configure some of the most common Internet browsers. If you are using another browser, please consult the documentation that came with it.

Internet Explorer 4.0

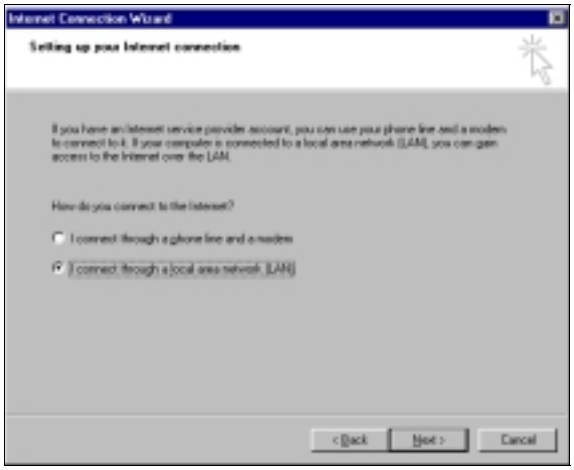
1. Start **Internet Explorer**.
2. Open the **View** menu and select **Internet Options**.
3. In the **Internet Properties** dialog box, click the **Connections** tab.
4. Click **Connect to the Internet using local area network**, and click **OK**.

Internet Explorer 5.x or Later

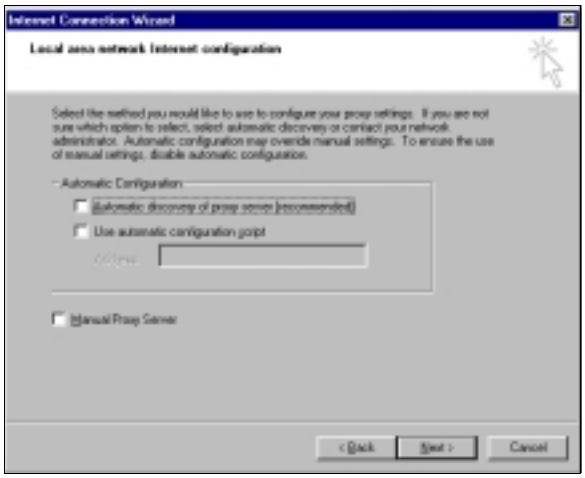
1. On the desktop, click the **Internet Explorer** icon.
   If you cannot access the Internet Explorer menu, follow these steps:
   - Click **Start | Settings | Control Panel**.
   - Click the **Internet Options** icon, and go to Step 3.
2. Click the **Tools** menu, and then **Internet Options**.
3. In the **Internet Properties** dialog box, click the **Connections** tab.
4. On the **Connections** tab, click the **Setup** button.

5 You will see the following dialog box. Make sure that **I want to set up my Internet connection manually, or I want to connect through a local area network (LAN)** is selected, and click **OK**.

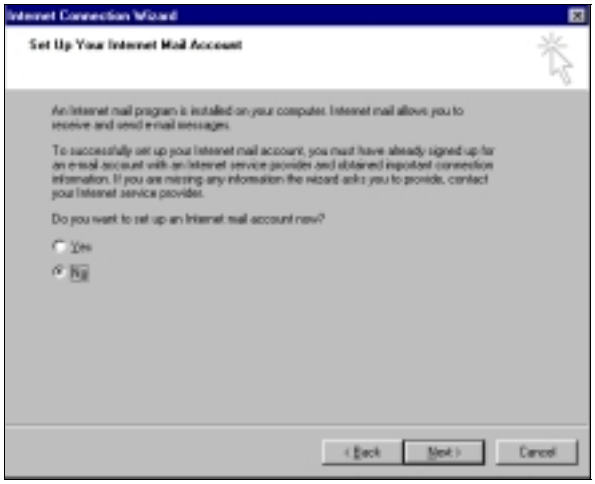
6 When the next dialog box appears, change the selection to **I connect through a local area network (LAN)** and click **Next**.



7 A dialog box describing your LAN Internet configuration displays. Uncheck the box **Automatic discovery of proxy server** and click **Next**.



8 You will be prompted whether you want to set up an email account. Check **No** and click **Next**.

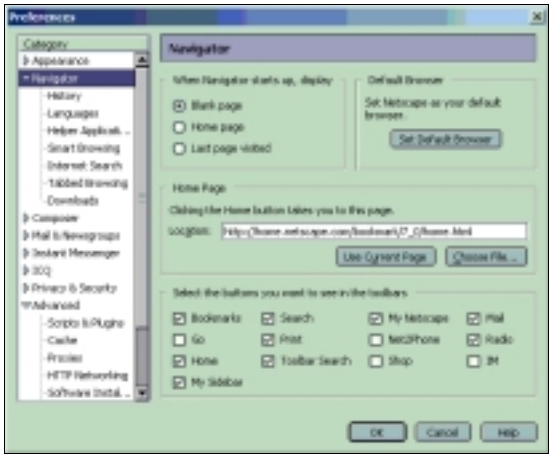


9 When the process is complete, you will be prompted to click **Finish**.

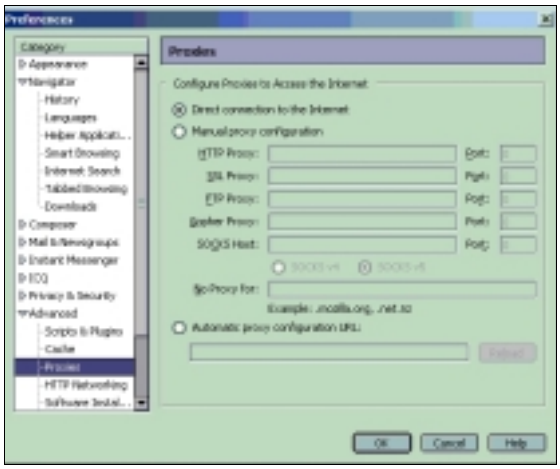
Netscape Navigator

1 On the desktop, click the **Netscape Navigator** icon, and then from the **Edit** menu, select **Preferences**.

2 In the **Preferences** dialog box, click the **Advanced** option, and then click **Proxies**.



3 Select the option **Direct connection to the Internet** and click **OK**.



Appendix D

Macintosh and Linux Users: Configuring TCP/IP Settings

If you are using the Linux operating system, or if you are using a Macintosh computer, you must ensure that your computer's network, or TCP/IP, settings are configured correctly. Otherwise, you will not be able to connect to the Internet. Windows automatically configures your network settings, so you don't have to perform this additional task.

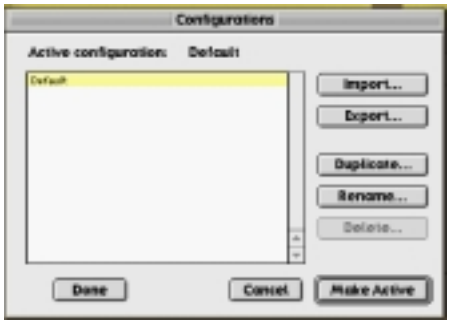
Macintosh TCP/IP Settings

Depending on your Mac OS, the directions to configure your Macintosh's network settings will differ. For OS X, follow the instructions on page 52. Otherwise, continue directly below.

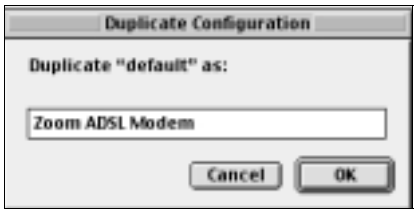
For Mac OS 7.6.1 - 9.2.2 and Above but not OS X

1. From the **Apple** menu, choose **Control Panels** and then **TCP/IP** to display the **TCP/IP** dialog box (you will use this dialog box in Step 6).
2. On the main toolbar, from the **File** menu, choose **Configurations**.

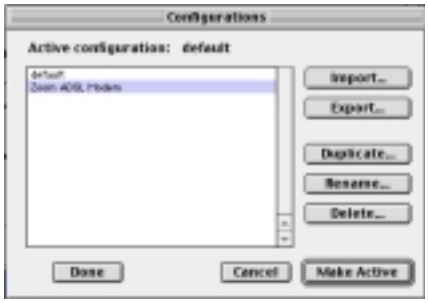
3 In the **Configurations** dialog box, click **Duplicate**.



4 The **Duplicate Configuration** dialog box appears. Type a name, such as "**Zoom ADSL Modem**," and click **OK**.



5 The **Configurations** dialog box appears again. Highlight your new configuration—in our example, **Zoom ADSL Modem**—and click **Make Active**.



6 In the **TCP/IP** dialog box, under **Connect via:**, select **Ethernet**. Under **Configure:**, select **Using DHCP Server**. Do not enter anything in the **DHCP Client ID** field.

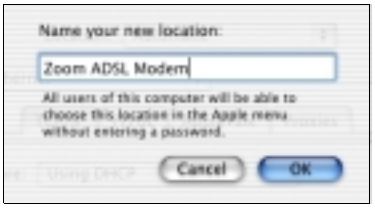
Note: If you want to use a static IP address—for example, if you were setting up a virtual server (page 22) or a DMZ (page 25)—you would highlight **Manually** from the **Configure:** list and then enter the static IP address, subnet mask, etc.

7 Close the **TCP/IP** dialog box. You will be asked if you want to save the changes. Click **Save**.

For Mac OS X

1 From the **Dock**, choose **System Preferences** and then **Network**. The **Network** pane appears.

2 From the **Location:** drop-down list box, select **New Location…**. In the box, type a name of your choosing, such as "**Zoom ADSL Modem**," and click **OK**.

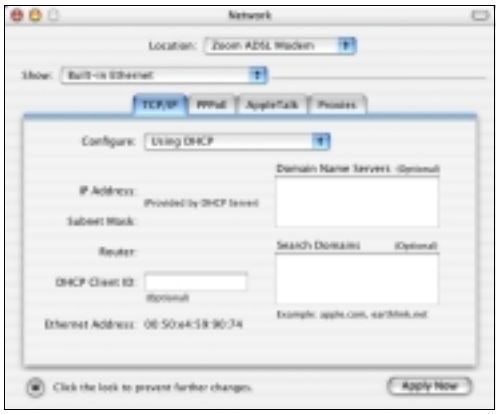


3 Under the **Configure** drop-down tab, choose **Built-in Ethernet** or **Ethernet**.

4 Make sure that the **TCP/IP** tab is foremost.

Make sure that **Using DHCP** is highlighted in its **Configure:** dropdown list box. Do not enter anything into the **DHCP Client ID** field.

Note: If you want to use a static IP address—for example, if you were setting up a virtual server (page 22) or a DMZ (page 25)—you would highlight **Manually** in the **Configure:** menu and then enter the static IP address, subnet mask, etc.



5 Click **Save** and close the **Network** pane.

Linux TCP/IP Settings

The instructions for setting up boot-time DHCP vary dramatically by distribution, so you may want to refer to your particular version's documentation.

Note: If you have other network cards installed, you will need to pick distinct Ethernet identifiers for each (eth0, eth1, eth2, etc.). If you select an identifier other than eth0 for your ADSL modem, use that identifier throughout.

For RedHat

Edit or create **/etc/sysconfig/network-scripts/ifcfg-eth0** so that it contains the following three lines:

DEVICE=eth0
ONBOOT=yes
BOOTPROTO=dhcp

If you want to use a static IP address—for example, if you were setting up a virtual server (page 22) or a DMZ (page 25)—you would edit or create **/etc/sysconfig/network-scripts/ifcfg-eth0** so that it contains the following lines:

DEVICE=eth0
ONBOOT=yes
BOOTPROTO=static

BROADCAST=172.16.31.255
IPADDR=172.16.16.55
NETMASK=255.25.240.0
NETWORK=172.16.16.0

Note: If your computer won't always be on a network with working DNS at boot-time, set ONBOOT=no. If you don't, RedHat 6.2 (and possibly other versions) might hang. To activate the card by hand when you have attached your computer to the network, at root, run the command: **/sbin/ifup eth0**.

For SuSE

Edit the file **/etc/rc.config**; search for the variables **NETCONFIG, NETDEV_0, and IFCONFIG_0.**

Set them as follows (see the instructions in **rc.config**):

NETCONFIG="_0"
NETDEV_0="eth0"
IFCONFIG_0="dhcpclient"

Reboot with this command: **/sbin/shutdown -r now**.

If you want to use a static IP address—for example, when setting up a virtual server (page 22) or a DMZ (page 25)—consult the help file or documentation that came with your operating system.

For Debian

Add this line to the file **/etc/network/interfaces: iface eth0 inet dhcp**. Reboot with this command: **/sbin/shutdown -r now**.

If you want to use a static IP address—for example, when setting up a virtual server (page 22) or a DMZ (page 25)—consult the help file or documentation that came with your operating system.

Appendix E
Troubleshooting

*Our Technical Support staff is ready to help you with any questions you may have about your DSL modem or Internet connection options. You may, however, find an easy solution to your problem by referring to these troubleshooting tips. You should also refer to the Frequently Asked Questions (FAQs) on the CD (click on **Support**), and visit our web site for the latest tips: www.zoom.com.*

PROBLEM: I installed the software and connected the X5 modem to my phone line, but I cannot connect to the Internet.

SOLUTION: Make sure you've securely connected the RJ-11 phone cord from the wall jack to the DSL modem connector on the back of your computer.

SOLUTION: Make sure you've connected the RJ-11 phone cord to a DSL line, not a standard telephone jack. You cannot use a standard telephone jack for DSL service *unless* that phone line has been enabled for DSL by your phone service provider.

SOLUTION: If you are using the modem's USB option, make sure the unit's USB cord is securely plugged into your computer's USB port.

SOLUTION: Make sure, if you are using phone filters, that they are installed correctly (see page 13).

SOLUTION: Make sure you have typed your Username and Password correctly.

SOLUTION: Contact your service provider to ensure that the DSL connection is functioning properly.

SOLUTION: Your computer's TCP/IP properties might not be set correctly. Both the Default Gateway IP address and the DNS server IP address must match the LAN IP address of the modem. (See page 23 for an illustration of the Windows TCP/IP dialog box.)

PROBLEM: Why do I hear static or noise when I'm using my telephone?

SOLUTION: If that phone does not have its own filter, you may hear static or high-pitched noise if you make a phone call while your ADSL modem is on. A filter also prevents a phone from interfering with, or dropping, your DSL connection.

PROBLEM: I accidentally unplugged the USB cable while using my modem. This resulted in a general protection fault (GPF) error message. What should I do?

SOLUTION: You must plug the modem back in and restart your computer to rectify this problem.

Appendix F
Regulatory Information

U.S. FCC Part 68 Statement

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. The unit bears a label on the back which contains among other information a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

This equipment uses the following standard jack types for network connection: RJ11C.

This equipment contains an FCC compliant modular jack. It is designed to be connected to the telephone network or premises wiring using compatible modular plugs and cabling which comply with the requirements of FCC Part 68 rules.

The Ringer Equivalence Number, or REN, is used to determine the number of devices which may be connected to the telephone line. An excessive REN may cause the equipment to not ring in response to an incoming call. In most areas, the sum of the RENs of all equipment on a line should not exceed five (5.0).

In the unlikely event that this equipment causes harm to the telephone network, the telephone company can temporarily disconnect your service. The telephone company will try to warn you in advance of any such disconnection, but if advance notice isn't practical, it may disconnect the service first and notify you as soon as possible afterwards. In the event such a disconnection is deemed necessary, you will be advised of your right to file a complaint with the FCC.

From time to time, the telephone company may make changes in its facilities, equipment, or operations which could affect the operation of this equipment. If this occurs, the telephone company is required to provide you with advance notice so you can make the modifications necessary to obtain uninterrupted service.

There are no user serviceable components within this equipment. See Warranty flyer for repair or warrantee information

It shall be unlawful for any person within the United States to use a computer or other electronic device to send any message via a telephone facsimile unless such message clearly contains, in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent and an identification of the business, other entity, or individual sending the message and the telephone number of the sending machine or of such business, other entity, or individual. The telephone number provided may not be a 900 number or any other number for which charges exceed local or long distance transmission charges. Telephone facsimile machines manufactured on and after December 20, 1992, must clearly mark such identifying information on each transmitted

message. Facsimile modem boards manufactured on and after December 13, 1995, must comply with the requirements of this section.

This equipment cannot be used on public coin phone service provided by the telephone company. Connection to Party Line Service is subject to state tariffs. Contact your state public utility commission, public service commission, or corporation commission for more information.

U.S. FCC Part 15 Emissions Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Declaration of Conformity

The manufacturer declares under sole responsibility that this equipment is compliant to Directive 1999/5/EC (R&TTE Directive) via the following:

Directive	Standard	Test Report
73/23/EEC-Low Voltage	IEC 60950: 3rd ed. 1999	electrical safety
89/336/EEC-EMC	EN 55024: 1998ed	EMC-immunity
89/336/EEC-EMC	EN 55022 : 1998ed ; EN 61000-3-2:1998 ed; A1, A2; EN 61000-3-3: 1995 ed	EMC-emissions

This product is CE Marked.

Electrostatic Discharge Statement

The unit may require resetting after a severe electrostatic discharge event.

Additional compliance information is located on the CD.