ADSL **X5v**

USER'S GUIDE

zoom

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Overview

The X5v is an ADSL modem, a gateway/router, and a VoIP telephone adapter, all contained in one device. The ADSL modem gives you a connection to the Internet through your Internet service provider. The gateway/router provides an interface between the Internet and your own local network. It also includes an advanced firewall, which allows you to control Internet access from your local network, and which protects your local network from unwanted Internet traffic. The VoIP telephone adapter lets you make telephone calls over the Internet, using a normal telephone that you plug into the X5v.

Important! Before You Begin

Before installing your X5V, you must have DSL service enabled on your telephone line. To do this, you need to sign up with a DSL service provider.

This User Guide contains installation instructions and explains how to configure the X5v for some popular applications. Most users should go now to the next chapter, Installation Instructions.

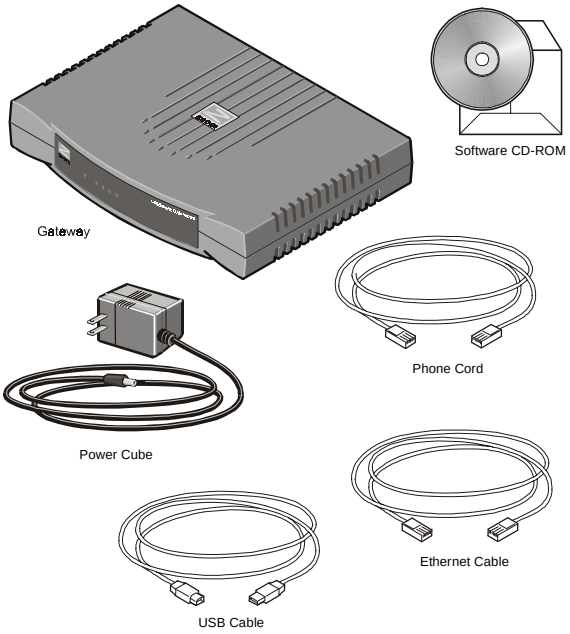
Note: If you are an Internet service provider, a VoIP service provider, or a system administrator, additional information is available in the X5v Technical Reference Manual at **www.zoom.com**
The Technical Reference manual includes information such as voice parameters, dialing plan configurations, DNS, and advanced DSL settings.

1

Installation Instructions

This chapter covers the basic instructions needed to install your X5v, connect to the Internet, and place VoIP calls. If you purchased an X5v Model 5565 and used its Quick Start for Windows, please go to Chapter 2. Otherwise please continue below.

What's in the Package



The CD contains the installation software, documentation, warranty, and Customer Support information.

If anything is missing or damaged, contact Zoom Customer Support or your retailer or distributor.

In addition, you may have:

- **Phone-jack adapter** to adapt the RJ-11 phone cord to a different phone jack (certain units only)
- **DSL line filter(s)** (certain units only).

What You Will Need

- **A Macintosh, Linux, or Windows computer** with an Ethernet port, a Windows computer with a USB port, or a network device like a wireless access point or hub.
- **An ADSL-enabled telephone wall jack** to plug the X5v unit into.
- **A telephone** to plug into the X5v if you plan to use VoIP.

Installing the X5v involves several steps: **Installing the Software**, **Installing the Hardware**, **Configuring Internet Explorer**, **Configuring ADSL**, and **Setting Up VoIP Service**.

1.1 Installing the Software

Installing the software is only required for people connecting a Windows computer directly to the X5v. All others should skip to Step 1.2 below.

Windows 98/98SE, Me, 2000, and XP Users:

If your computer has an available Ethernet jack, we recommend that you use that instead of the USB jack to simplify installation.

If you need to use the X5v's USB jack, you must remove any previously installed USB modem drivers on your computer *before* installing this software. To do this from your Windows desktop, click the **Start** button, point to **Settings**, and select **Control Panel**. In **Control Panel**, double-click **Add/Remove Programs**, on the **Install/Uninstall** tab, select your old USB modem from the list, and click **Remove**. Now continue below.

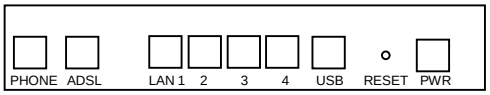
1. **Your computer must be on.** Insert the supplied CD into the CD-ROM drive. The CD starts automatically and the **Main Menu** opens. (Note: If the CD does not start automatically, on the desktop, click the **Start** button, click **Run**, and then type **D:\setup.exe**, where **D** is the letter of your CD-ROM drive.)
2. Select your language and click the **Installation Wizard** button. The software installation proceeds automatically.
3. When the process is complete, you will be prompted to click **Finish** and then **shut down** your computer so you can connect the hardware. After shutting down, be sure to remove the CD from your computer.

1.2 Installing the Hardware

Important! Unplug or turn off the power to your computer *before* proceeding. Remember, you must install the X5v software *before* installing the hardware.

Note: If you are replacing an older DSL modem with a X5v, you need to remove the old hardware now.

1. Connect the hardware from the X5v's back panel.



   a. Plug your phone into the **PHONE** jack.
   Tip: If you have a cordless phone with one or more handsets, plug the *base station* into the X5v's **PHONE** jack.
   Note: If RJ-11 phone jacks are not used in your country, you will need a phone adapter. Plug the adapter into the X5v's **PHONE** jack and plug your phone into the other end.

   b. Plug one end of the X5v's phone cord into the X5v's **ADSL** jack and the other end into the wall telephone jack (the jack on the wall where you would normally plug in a standard phone). This jack must be a jack that has been connected to ADSL service.

c **If you are connecting the X5v directly to a computer:**
If possible, use your computer's Ethernet port: Plug one end of the included Ethernet cable into one of the X5v's **LAN** jacks (**1**, **2**, **3**, or **4**) and plug the other end into the computer's Ethernet port. You can plug in one computer per LAN jack.
If your computer doesn't have an available Ethernet port, you can use a Windows computer's USB port: Plug one end of the USB cable into the X5v's **USB** jack and the other end into the computer's USB port.

Note: You can connect multiple computers to the X5v using a combination of ports and share Internet access.

d **If you are connecting the X5v directly to a hub, switch, wireless access point, or other network device:**
You can probably use the X5v's straight-through Ethernet cable to connect the X5v's **LAN** jack to the network device's Ethernet port, which is typically called an Uplink or Expansion port.
The X5v's cable may not work for some access points or other devices. In that case, you should purchase a Crossover Ethernet cable.

2 Plug the included power cube into a power outlet and then into the X5v's power (**PWR**) jack.

IMPORTANT:
Use only the power cube shipped with the X5v. Other power cubes may damage your hardware.

The front panel **LINK** light should blink during this step. When this physical connection step is complete, the **LINK** light should change from blinking to solid. If it doesn't, refer to page 77.

3 **Turn the computer on.**

If you are using the USB option, a **Found New Hardware** box should display, showing the progress of the installation. Follow the prompts.
Windows XP users: You may see **Hardware Installation** disclaimer boxes regarding Windows logo testing. You can safely disregard these messages and click **Continue Anyway**.

Windows 2000 users: You may see a **Digital Signature Not Found** dialog box. You can safely disregard this message and click **Yes**.
Windows 98/Me users: Restart your computer if you are prompted to do so.

4 Phone filters are not absolutely required, but **we HIGHLY RECOMMEND that you install a filter on EVERY phone that is sharing the DSL phone line.** (Do not plug a filter between the phone wall jack and the X5v.) Phone filters block the DSL frequencies so that someone making a normal phone call won't hear noise on the line. They also keep phone conversations from interfering with DSL performance.

The X5v phone jack has a filter built-in, so there is no need for a filter on that phone.

You may have received DSL phone filters with your X5v. If you did not, or need more filters, they are available at most retail stores that carry consumer electronics.

For each additional phone, plug the phone's cord into the filter's **PHONE** end and plug the filter's **LINE** end into the wall.

1.3 Configuring Internet Explorer

Macintosh and Linux users: Your Web browser is set up automatically, so you can skip this section. Turn to page 74 to make sure that your computer's TCP/IP settings are configured correctly.

Windows users: Your software that you use to make an Internet connection must be set for a **network connection,** not a **dial-up connection.** The instructions below are for Internet Explorer, the most popular Web browser. If you are using Netscape Navigator or another browser, set it up now to use a **network connection** (this might be called a "Local Area Network" or "broadband" connection).

If you use Internet Explorer, you need Version 5 or later. Most people have the right version. If you don't, we suggest you get a free upgrade. If you want to check your version number, open Internet Explorer, select **Help**, then **About Internet Explorer**.

Your version number is right under the Microsoft Internet Explorer logo. You can ignore all the numbers after the period following the first digit.

1. On the desktop, **right-click** (not left-click) the **Internet Explorer** icon, and select **Properties**.

   If you cannot access Internet Explorer:

   Windows XP users: From the desktop, click the **Start** button, then click **Control Panel**. In **Control Panel,** click **Network and Internet Options** and then click the **Internet Options** icon.

   Windows 98/Me/2000 users: From the desktop, click the S**tart** button, point to **Settings**, and then click **Control Panel**. In **Control Panel**, click the **Internet Options** icon.

2. In the **Internet Properties** dialog box, click the **Connections** tab.

3. On the **Connections** tab, click **Setup**.

4. Windows XP users: In the **Welcome to the New Connection Wizard** dialog box, click **Next**.

   If you see a **Location Information** dialog box, click **Cancel** to return to the **Welcome** dialog box, and click **Next** again.

   In the **Network Connection Type** dialog box, click **Connect to the Internet**.

   In the **Getting Ready** dialog box, click **"Set up my connection manually,"** and then click **Next**.

   In the **Internet Connection** dialog box, click **"Connect using a broadband connection that is always on,"** and click **Next**.

5. Windows 98/Me/2000 users: In the **Internet Connection Wizard** dialog box, select **"I want to set up my Internet connection manually, or I want to connect through a local area network (LAN)"**, and click **Next**.

   In the **Setting up your Internet connection** dialog box, change the selection to **"I connect through a local area network (LAN)"** and click **Next**.

In the **Local area network Internet configuration** dialog box, uncheck the box **"Automatic discovery of proxy server"**. Then click **Next**.

A dialog box asks if you want to set up an email account. Click **No** and then **Next**.

6 When the configuration process is done, you will see a **Completing the Internet Connection Wizard** dialog box.

Windows 98/Me/2000 users: Be sure to uncheck the box that says **"To connect to the Internet immediately, select this box…."**

7 Click **Finish**.

8 Windows XP users: Close **Control Panel**.

Windows 98/Me/2000 users: If Internet Explorer is open, close it before going to the next step of the installation, **Configuring ADSL**, below.

1.4 Configuring ADSL

1 If you have Windows, you should have a Zoom icon on your desktop that looks like this. You must double-click this icon to open up the **Zoom DSL VoIP Gateway Web-Console**. If you do not have an icon, open your Web browser, type **http://10.0.0.2** and press Enter.

2 Log in by typing the following information in lower-case letters. (Note: You will need this user name and password each time you want to open up the **Zoom DSL VoIP Gateway Web-Console**.)

User Name: **admin**

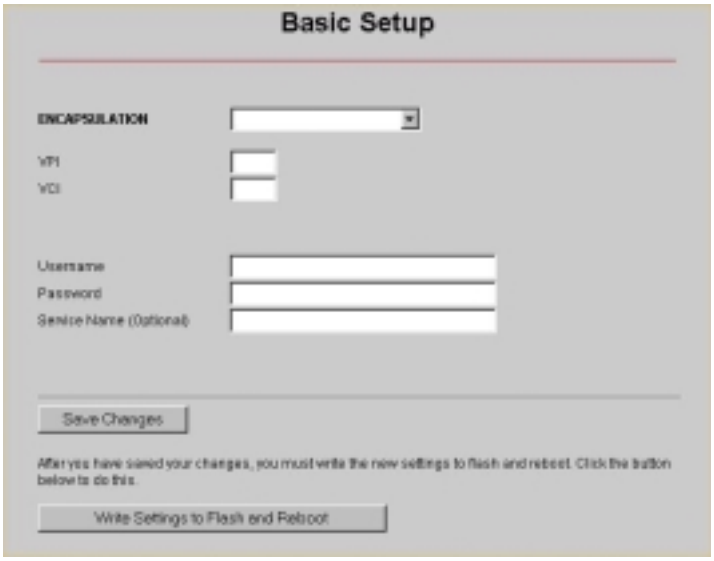
Password: **zoomvoip**

3 The **Basic Setup** page displays.

You need to fill in at least three of these boxes: VPI, VCI, and Encapsulation. Your service provider may have given you these settings, although most do not. If you have them, it will make installation a little faster and easier, but don't worry if you don't have them. We'll tell you how to figure them out.

If Your Service Provider Gave You VPI, VCI, and Encapsulation Settings (Most Users Will Not Have These)

1 **If you have this information** (VPI, VCI, and Encapsulation), **enter it now in the appropriate boxes.** The screen may change slightly, depending on the Encapsulation you select. If you are using PPP, your service provider should also have given you a **username** (usually your email address or the characters preceding the @ sign in your email address) and a **password**. These are **NOT** the username and password that you used to get into the Basic Setup menu.) If you cannot remember or cannot find your username and password, call your service provider and tell them you have misplaced your username and password. Then enter them as well.



2 Click **Save Changes**.

3 **If the Encapsulation setting that you entered starts with either PPPoE or PPPoA:** Click **Write Settings to Flash and Reboot**, and **Confirm**. Once the process is complete, the X5v's **LINK** light remain on steady (this should take about 15 seconds). If it doesn't, go to the Connection Troubleshooting Tips on page 77.

If the Encapsulation setting that you entered starts with either 1483 Bridged or 1483 Routed: You must check now to make sure that your IP Addressing is correctly set. Go to page 15.

4 **Go to your Web Browser** (i.e., Internet Explorer or Netscape Navigator) and **try to connect** to a familiar Web address.

5 **If you connect successfully, your installation is complete and you're ready to browse the web!** Continue with Setting Up VoIP Service on page 16.
If you do not connect successfully, refer to the **Troubleshooting Appendix** on page 77.

If You DO NOT Have VPI, VCI, and Encapsulation Settings from Your Service Provider

If you do not have the settings from your service provider, the tables beginning on page 69 show the settings for the most commonly encountered service providers in the USA and many other countries. If there is more than one setting for your service provider, the most common is labeled (1), the next (2), and so on.

1. **Go to the Tables on page 69** and **find your service provider** on the list. If you are in the USA and your service provider is not on the list, follow the instructions using the settings for **Service Provider Not Shown** at the bottom of the table.

2. **Now enter the corresponding VPI, VCI, and Encapsulation settings** in the appropriate boxes in the **Basic Setup menu**. The screen may change slightly, depending on the Encapsulation you select.
   If you are using PPP, your service provider should have given you a **username** (usually your email address or the characters preceding the @ sign in your email address) and a **password**. These are **NOT** the username and password that you used to get into the **Basic Setup** menu.) If you cannot remember or cannot find your username and password, call your service provider and tell them you have misplaced your username and password. Then enter them as well.

3. Click **Save Changes**.

4. **If the Encapsulation setting that you entered was either PPPoE or PPPoA:** Click **Write Settings to Flash and Reboot** and **Confirm**. Once the process is complete, the X5's **LINK** light should remain on steady (this should take about 15 seconds). If it doesn't, go to the Connection Troubleshooting Tips on page 77.
   If the Encapsulation setting that you entered was either 1483 Bridged or 1483 Routed: You must check now to make sure that your IP Addressing is correctly set. Go to that section below

5 **Go to your Web Browser** (i.e., Internet Explorer or Netscape Navigator) and **try to connect** to a familiar Web address.

6 **If you connect successfully, your installation is complete and you're ready to browse the web!** Continue with Setting Up VoIP Service on page 16.
If you do not connect successfully, continue with the next step below.

7 **Go back to the tables on page 69 and enter the next most frequently used settings—**those labeled (2) if you just entered (1), or (3) if you just entered (2). Click **Save Changes**, **Write Settings to Flash and Reboot**, and **Confirm**. Once the process is complete, the X5's **LINK** light should remain on steady (this should take about 15 seconds). Remember, if you are entering either **1483 Bridged** or **1483 Routed** for your **Encapsulation** setting, you must check now to make sure that your IP Addressing is correctly set if you haven't already done so. See **Setting IP Addressing** below. If there are no more settings shown for your service provider, and you cannot connect, refer to **Troubleshooting** on page 77.

8 **Now jump back to Step 5.**

Setting IP Addressing

If the Encapsulation setting that you entered on the **Basic Setup** menu was either 1483 Bridged or 1483 Routed, the X5v can be set for DHCP (also known as a dynamic IP address) or for a static IP address. Most DSL service providers use DHCP. There is typically an extra charge for a static IP address, and you normally have to make a special request to get one.

1 **To set the X5vfor DHCP,** on the **Basic Setup menu,** check the **DHCP client enable** box. Leave the **Host Name** field blank.

To Set the X5v for Static IP Addressing, go to the X5v's **Advanced Settings** page and click **WAN Settings**. Enter the **static IP address** and **subnet mask** assigned to you by your service provider. **Do not change any other fields!**

2 Click **Save Changes**, then **Write Settings to Flash and Reboot**, and then **Confirm**.

3 **Resume where you left off (either Step 4 on page 13 or Step 5 on page 15).**

1.5 Setting up VoIP Service

If you purchased a X5v Model 5565, your unit has been set up for VoIP service, so continue at Section 1.6 Calling Tips below. If you purchased another Model X5v, please go to Chapter 2 on page 32.

1.6 Calling Tips

You can use phones plugged into the X5v to:

1) **Make or receive a VoIP call.** Your ADSL phone line will remain open for calls, so using VoIP gives you many of the benefits of having a second phone line.

- **Make a VoIP call to someone who is using the same VoIP service:** Pick up the telephone that you plugged into the X5v. Dial **#** and wait for the dial tone, and then dial the **VoIP phone number** you want to call. Note that this number is *not* the same as a phone number reached through the traditional public phone network. Your service provider's web site should include a directory of VoIP phone numbers.
- **Make VoIP calls to someone who is using a different VoIP service:** You must begin your call by dialing a code for that person's VoIP service. You will have to ask the person for the code, or check their service provider's web site for directions.
- **Receive incoming VoIP calls:** When VoIP users call into your VoIP number, you will hear a distinctive ring to alert you that you are receiving a VoIP call.
- **Call people who don't have VoIP:** You may use VoIP to call any phone that can be called through the traditional phone network. Your service provider may offer this as an additional feature. Check with your service provider.

2) **Make or receive "conventional" calls:** Pick up the telephone and dial as you normally would. As long as you don't dial **#** to

indicate that you are dialing a VoIP call, your calls will be routed and billed as if you didn't have VoIP, through your regular telephone service.

Note: In the event of a power failure, the X5v routes all calls as conventional calls.

Additional Features

Distinctive Ring and Dial Tone: The X5v's ring and dial tone sound different from your traditional phone service. This means that you can easily tell by the ring that you are receiving a VoIP call. Perhaps more important, when you dial **#** to make a VoIP call, you will hear a different dial tone than you hear on the public phone network so that you can be sure you are making a VoIP call.

Speed dialing: You may program your phone to speed-dial VoIP numbers. Just be sure to remember to start the VoIP numbers with **#**.

Redial: You may redial a VoIP number just as you would redial any other number, using a redial feature on your handset.

Hook Flash: If you receive a second VoIP call while already engaged in a VoIP call, you will hear a call waiting tone. Momentarily press the hook button on your phone to talk to the second caller, and press it again to go back to your first conversation. After you have completed a VoIP call, you can press the hook button to get a fresh VoIP dial tone and make another VoIP call without dialing **#**
Note that redial or speed dialing will not work in this case, however. You must hang up for at least one second if you need to make a conventional phone call.

VoIP only Mode: If you want to make only VoIP calls, you can set the X5v to **VoIP only Mode**. All calls that you make from the phone attached to the X5v will be VoIP calls so you do not have to dial # to make a call. **Note:** If you have unbundled DSL (DSL without PSTN), you must use **VoIP only Mode**. For additional information about this feature and how to use it, see **Voice over IP options** on page 36.

VoIP only Mode with PSTN: If you want to make only VoIP calls, but still receive PSTN calls from the phone plugged into the

X5v, you must switch the X5v to **VoIP-only Mod**e and set it to **receive PSTN** calls. All calls that you dial from the phone attached to the X5v will be VoIP calls so you do not need to dial **#** first. For additional information about this feature and how to use it, see **Voice over IP options** on page 36.

1.7 Playing Online Games Using Your X5v

Setting up the X5v for online gaming depends on what you want to do:

- If you have **Xbox Live**, go to page 27.
- If you have **PlayStation 2**, go to page 27.
- If you have **another online game**, continue below.

Do I Need To Do Anything?

There are only two cases where you need to set up your X5v for online gaming.

— If you are playing a "**peer-to-peer**" or "**head-to-head**" game over the Internet, you **always** have to set up the X5v **unless** you linked up to your partner by going to a web site. A peer-to-peer game is a game where two players are competing directly against one another. Popular peer-to-peer games include Age of Empires, Command and Conquer, Dark Reign 2, and Unreal Tournament. If you are unsure whether your game is a peer-to-peer game check the game instructions.

— If you want to play a **multiplayer game and you want to host the game.** Popular multiplayer games include Half Life, Diablo II, Delta Force, Hexen II, Myth, Quake II, and Warcraft II, III.

In both these cases you will need to open one or more ports in the X5v's built-in firewall as described below, so that the firewall doesn't block the other players. The two ways to accomplish this are to **Set up a Virtual Server** if you only need to open a few ports, or to **Set up a DMZ,** which opens all the X5v's ports.

Important! If your computer already has firewall software installed: If you have third-party firewall software installed on your computer, such as the Windows XP firewall, you may need to deactivate it before opening ports by setting up a virtual server or a DMZ. If you don't, your computer may block the ports you are trying to open.

Setting Up the X5v for Peer-to-Peer Gaming and Multiplayer Game Hosting (Setting Up a Virtual Server)

1 Find out which ports need to be opened for gaming.

Most peer-to-peer and multiplayer game manuals will tell you exactly which port or ports need to be opened. If yours didn't, you may be able to look up the information at:

www.practicallynetworked.com/sharing/app_port_list.htm

If you have found your games port settings, we recommend that you **print them out**, **write them down now**, or **keep the game manual handy**.

Different games require different numbers of ports to be open. This can be a single port, or it can be a hundred ports or more. **Each required port needs to be set individually, so the more ports that your game requires, the more time it will take to do the configuration.** Some games even use "dynamic" ports, meaning that the ports used by the game are constantly changing, so you can't set the ports.

There is a setting that opens all your ports for gaming, called a **DMZ**. If you can't find the port settings in your game manual or on the web site shown above, or if you have to open more than 20 ports (which is the maximum allowable), or if your game documentation says that the game uses dynamic ports, or if you don't want to spend the time to open multiple ports, refer to the DMZ instructions on page 47.

WARNING:

Every time you open an additional port, it decreases the effectiveness of your firewall, so the less ports you open the better.

2 Choose an IP address for Gaming.

Click on the **Zoom X5v icon** on your desktop (or type 10.0.0.2 in your Web browser just the way you would normally type a web address) to get to the X5v's **Main Page**. Click the **Advanced Setup** icon, then click **LAN Settings**. There you will see the starting and ending range of the X5v's dynamic (DHCP) LAN IP addresses. You need to choose an IP Address that is outside this range. Normally you should pick the next **higher** number. For example, if the range shown is 10.0.0.4 to 10.0.0.15, your Host IP Address should be the next IP address after 10.0.0.15, which would be 10.0.0.16. Unless you have changed the X5v's IP address settings, which is very unlikely, just use the number 10.0.0.16. Write down the number you choose for reference if you are not using 10.0.0.16. The rest of the instructions will assume that you are using 10.0.0.16.

Gaming IP Address: _____

Windows users continue below.

Macintosh users jump to Step 5 (page 22).

Linux users jump to Step 6 (page 24).

3 Windows Users: Open the TCP/IP Properties dialog box.

For Windows XP: From the desktop click the **Start** button, point to **Control Panel** and then **Network Connections**. Then right-click (NOT left-click) **Local Area Connection**, select **Properties**, highlight your NIC card's **TCP/IP** entry (it should start with **TCP/IP** and have the characters **10/100**, **NIC**, or **Ether** in it – and not have the words **AOL**, **Dial-up**, or **Adapter**). Click **Properties** to display the Windows **TCP/IP Properties** dialog box.

For Windows 2000: From the desktop click the **Start** button, point to **Settings** and then **Network and Dial-up Connections**. Then right-click (NOT left-click) **Local Area Connection**, select **Properties**, highlight your NIC card's **TCP/IP** entry (it should start with **TCP/IP** and have the characters **10/100**, **NIC**, or **Ether** in it – and not have the words **AOL**, **Dial-up**, or **Adapter**). Click

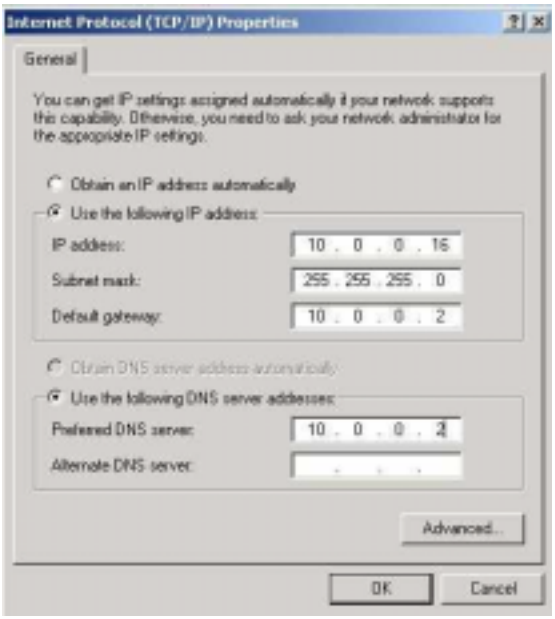
Properties to display the Windows **TCP/IP Properties** dialog box.

For Windows 98 and Me: From the desktop click the **Start** button, then point to **Settings** and then **Control Panel.** Double-click the **Network** icon to display the **Network** configuration screen. Highlight your NIC card's **TCP/IP** entry (it should start with **TCP/IP** and have the characters **10/100**, **NIC**, or **Ether** in it – and not have the words **AOL**, **Dial-up**, or **Adapter**). Click **Properties** to display the Windows **TCP/IP Properties** dialog box.

4 Windows Users: Enter the IP Settings.

For Windows 2000 and XP:

Click the **Use the following IP address** and **Use the following DNS server addresses** buttons so that a black dot appears. Then enter the settings for **IP address**, **Subnet mask**, **Default gateway**, and **Preferred DNS server** as shown below.



Most users can copy the information exactly as it is shown above and in the chart below. However, **if you chose an IP address in Step 2 other than 10.0.0.16**, enter the number that you chose

instead of 10.0.0.16. When done, click **OK** and **continue with Step 7.**

IP address	**10.0.0.16**
Subnet mask	**255.255.255.0**
Default gateway (X5v's LAN IP address)	**10.0.0.2**
Preferred DNS server	**10.0.0.2**

For Windows 98 and Me:

Click **Specify an IP Address** and enter the settings for **IP Address** and **Subnet Mask** shown below, **unless you chose an IP address in Step 2 other than 10.0.0.16**, in which case you should enter the number that you chose instead of 10.0.0.16.

IP address	**10.0.0.16**
Subnet mask	**255.255.255.0**

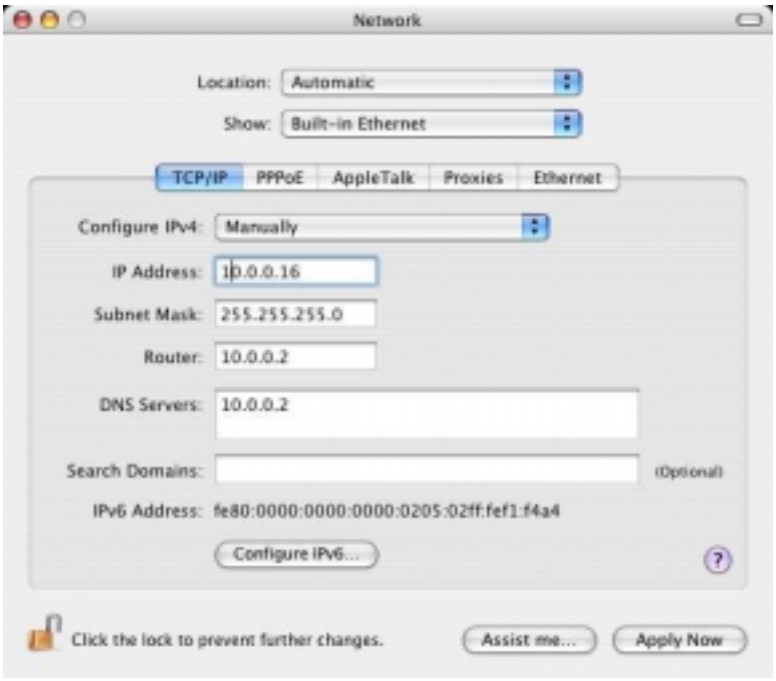
Now click the **DNS Configuration** tab at the top of the menu. Then click **Enable DNS.** Enter any name (i.e., your name, the words "My Computer", a favorite word, or any other letters or numbers) in the box labeled **Host:**. A **Host:** name is required.

Fill in the **DNS Server Search Order** box with the number **10.0.0.2**, click **Add,** and then click the **Gateway** tab near the top of the page. When the Gateway screen opens, fill in the **New gateway:** box with the number **10.0.0.2** and click **Add** and **OK**, and **continue with Step 7**.

5 Macintosh Users: Open the TCP/IP Pane or Window and enter the IP settings.

For Mac OS X:

From the **Dock**, choose **System Preferences** and then **Network** to display the **Network** pane. (For OS X 3, you also have to click the **Configure** button.)



Under the **TCP/IP** tab, highlight **Manually** in the **Configure:** list box and enter the settings for **IP Address, Subnet Mask, Router,** and **DNS Servers** shown below, **unless you chose an IP address in Step 1 other than 10.0.0.16**, in which case you should enter the number that you chose instead of 10.0.0.16. When done, click **Save** or **Apply Now**, and **continue with Step 7.**

IP Address	**10.0.0.16**
Subnet Mask	**255.255.255.0**
Router **(X5v's LAN IP address)**	**10.0.0.2**
DNS Servers	**10.0.0.2**

For Mac OS 7.6.1 – 9.2.2:

From the **Apple** menu, choose **Control Panels** and then **TCP/IP** to display the **TCP/IP** Window. Under the **TCP/IP** tab, highlight **Manually** in the **Configure:** list box and enter the settings for **IP Address, Subnet mask, Router address,** and **Name server addr.** shown below, **unless you chose an IP address in Step 1**

other than 10.0.0.16, in which case you should enter the number that you chose instead of 10.0.0.16. When done, close the Window and you will be prompted to click **Save**. Then **continue with Step 7.**

IP address	**10.0.0.16**
Subnet mask	**255.255.255.0**
Router address (X5v's LAN IP address)	**10.0.0.2**
Name server addr.	**10.0.0.2**

6 Red Hat Linux Users:

a Edit /etc/sysconfig/network-scripts/ifcfg-eth0 so that it contains the following lines:

DEVICE=eth0
ONBOOT=yes
BOOTPROTO=static
BROADCAST=10.0.0.255
NETMASK=255.255.255.0
IPADDR=10.0.0.16
GATEWAY=10.0.0.2
NETWORK=10.0.0.0

b Then edit or create /etc/resolv.conf so that it contains the following line:

NAMESERVER=10.0.0.2

Note: If you are using another version of Linux and you are unsure how to enter this information, consult the help file or documentation that came with your operating system.

c Continue with Step 7.

7 All Users: Go back to the X5v's Advanced Setup page and click the Virtual Server button.

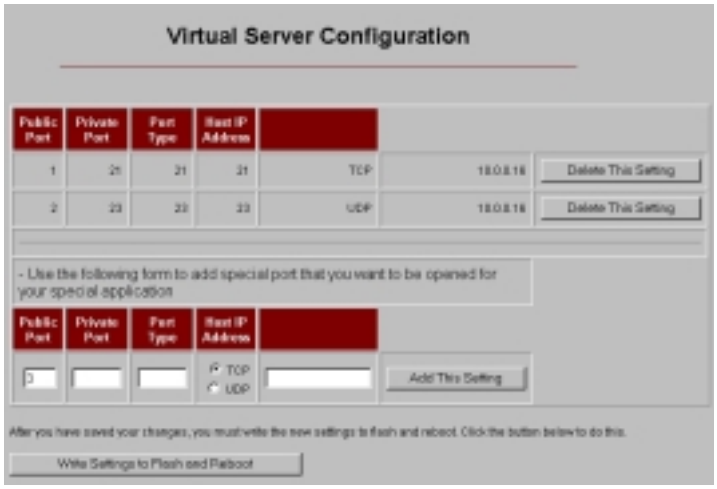
If you already closed the **Zoom DSL VoIP Gateway Web-Console**, click on the Zoom X5v icon on your desktop (or type 10.0.0.2 in your Web browser) and click the **Advanced Setup** icon.

8 Configure the Virtual Server.

This is where you'll need to enter the information that you got from your gaming manual or the **www.practicallynetworked.com** web site. **Unfortunately, you can only configure one port at a time**. Each time you configure a new port, your computer will reboot when you hit **Write Settings to Flash and Reboot**.

If you have more than a few ports, it could take a long time. That's why some people choose to set up a **DMZ, which opens all your ports at once.** If you'd like to set up a DMZ, refer to the DMZ instructions on page 47. Remember, a DMZ is easy and will work with any game, but it keeps the X5v's firewall from providing any security for your system.

If you want to continue, enter the information shown below now on the Virtual Server configuration screen.



Public Port	Inbound port from the Internet that you want to open. This is the port number, or one of the port numbers, that you got from your gaming manual or the web site at **www.practicallynetworked.com**
Private Port	Inbound port from the X5v that you want to open to the LAN side. This is the port number, or one of the port numbers, that you got from your gaming manual or the web site at **www.practicallynetworked.com** **This number and the public port number above should be the same for any individual port entry.**
Port Type	The default is TCP. Some games use both TCP and UDP. If your game uses both, you will have to fill out this table twice for each port, once using TCP and once using UDP.
Host IP Address	Fixed IP address of the host computer—**this is the same IP address that you chose in Step 2 and entered in Step 4,** probably 10.0.0.16.

9 **After entering the above information, click Add This Setting.**

10 Click **Write Settings to Flash and Reboot**.

Your computer will reboot. **If you need to open additional ports, go back to Step 3, 5, or 6 (**Window, Mac, Linux, respectively), and repeat.

IMPORTANT:

Outside game players will need to know the X5v's **WAN IP address**. To find this address, click the **System Status** icon at the top of the X5v's web page and scroll down to the **WAN Status** section.

Now please turn to Section 1.8 Front Panel Description on page 29.

Using Your X5v with Xbox® Live

No special settings are required to use Xbox Live. If you are using PPP encapsulation, just be sure to enter the login DSL User Name and Password supplied by your provider on the X5v'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 X5v and the Xbox:** Using an Ethernet cable, plug one end into the Xbox's jack and the other end into one of the X5v's Ethernet (**LAN**) jacks. Note: If you didn't use the Ethernet cable that came in your X5v package to connect the X5v to your computer, you can use that cable. Otherwise, you can buy one at your local electronics or computer store. 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! You can load one of the demo games included on your Xbox Live CD or use any other Xbox Live-enabled game to begin. Now please turn to Section 1.8 Front Panel Description on page 29.

Using Your X5v with PlayStation® 2

Your PlayStation 2 must be connected to your X5v: Using an Ethernet cable, plug one end into the PlayStation's **Network** jack and the other end into one of the X5v's Ethernet (**LAN**) jacks. Note: If you didn't use the Ethernet cable that came in your X5v package to connect the X5v to your computer, you can use that

cable. Otherwise, you can buy one at your local electronics or computer store. Then follow the steps below.

1. Load the PS2 **Network Adapter Start-up Disc** that was supplied with the PS2 network adapter into the PlayStation 2.

2. At the PlayStation's main menu, select **ISP Setup.**

3. If you have pre-existing network settings on your PlayStation 2, you will be prompted to select **New Network Setting** before selecting **Local Area Network (LAN)**. Otherwise, simply select **Local Area Network (LAN)**.

4. Select **Advanced Setup** and then **Set Manual IP**.

5. Fill out these fields:

IP Address	10.0.0.50
Subnet Mask	255.255.255.0
Default Gateway or Router	10.0.0.2

   Then select **Continue**.

6. Fill out these fields:

Primary DNS	10.0.0.2
Secondary DNS	10.0.0.2

   Then select **Continue**.

7. Select **Test Settings**. A connection test runs. You will then see the message, **"The test for connecting to your ISP was successful! Please save your network setting."** If you are unsuccessful, re-check the information you entered in Steps 5 and 6.
   Then select **Continue**.

8. Now enter a **Network Setting Name** (anything you choose) and then select **Save**. Your Service Provider setup is now complete. Follow the prompts for online registration.

9. Now, using the computer connected to the X5v, go to the X5v's **Advanced Setup** page and click the **DMZ** button. Then select **Enable** from the **DMZ** dropdown list, and enter the static IP address **10.0.0.50** in the **DMZ Host IP** field. Click

Save Changes, then **Write Settings to Flash and Reboot**, and then **Confirm** to complete the process.

IMPORTANT:
Outside game players need to know the X5v's **WAN IP address**. To find this address, click the **System Status** icon at the top of the X5v's web page and scroll down to the **WAN Status** section.

Now please continue at the next Section below.

1.8 Front Panel Description

Light	Description
PWR	Lights when the X5v is plugged into a power source.
LINK	Blinks when the X5v is performing its startup sequence; stays on solid when unit has synched up with its ADSL connection. Note: If the light fails to switch from blinking to steady after a minute or two, check with your DSL provider that the DSL connection is activated, or refer to the troubleshooting tips on page 77.
DATA	Blinks when data is being transferred through the ADSL line.
USB	Lights when the USB port of the X5v is plugged into a powered-up computer's USB port.
LAN 1-4	Lights when a LAN port of the X5v is plugged into the Ethernet port of a powered-up device.
VoIP	Lights when a Voice over IP call is taking place.

If you have followed the manual to this point, your ADSL gateway and VoIP should be working. Congratulations, you're ready to enjoy the X5v!

1.9 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 User Documentation in Adobe PDF format in the appropriately named folders in the directory of the CD-ROM that came with your X5v.

- From time to time, Zoom may release improved firmware. This is available at **www.zoom.com,** along with upgrade instructions. We recommend that you check this site periodically for updates.

1.10 Resetting the X5v to Its Default Settings

If you have changed the system settings on your X5v unit and for some reason 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.

If you can open your Web browser and access your X5v's user interface, here's how to perform 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, here's how to perform 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 restored to the unit's factory defaults.

1.11 Windows Users: Removing the X5v

If you have Windows and want to remove your X5v—for instance, if you move your computer to a location without ADSL service—you should remove the software before disconnecting the hardware.

1. From the desktop, select Start/Programs/Zoom VoIP/Gateway/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 X5v hardware.

2

Voice Over IP Settings

This chapter explains the VoIP settings on the Basic and Advanced VoIP pages of the Zoom Configuration Manager. You may need these settings if your Service Provider requires you to make changes or if you want to adjust your caller ID, VoIP ring and dial tone, or VoIP Only Mode.

2.1 How to Access the VoIP Options

To access the VoIP options, click the **Voice over IP** telephone icon at the top of the X5v's main interface page. (If you have exited from the X5v and have forgotten how to establish communication with it, refer to page 11.) This page shows the status of your VoIP connection and a few basic settings. If this page has a **User ID** filled in already, your settings are probably good, and you can go now to Section 1.6 Calling Tips on page 16. Otherwise continue in this section. Note that for some service providers, voice over IP settings are shown on their web site or in the VoIP section of **www.zoom.com**

The **Status** section of the **Voice over IP** page is display-only.

The following table explains the settings on the page:

Setting	Value
User ID	Number assigned to you by your VoIP service provider. Note: Most likely, it is identical to your VoIP phone number.
Auto-Configuration Status	Indicates whether your X5v has received automatic account configuration information from your VoIP service provider (if available).
World Wide Number	A DID (Direct Inward Dialing) number that people calling from a standard phone can use to call you on your VoIP connection. Note: You must sign up for this service, and not all service providers offer this feature.
Registration Status	Indicates whether the X5v is registered with your VoIP service provider, and if not, the last registration step that was completed.

The **Basic Setup** section of the **Voice over IP** page displays the settings described below.

Setting	Value
Auto Account Configuration	The Auto Account settings (server, filename, and encryption) are optional and need to be supported by your service provider. If your service provider supports this feature, you can automatically update your VoIP configuration by rebooting the X5v or clicking the **Download Configuration Now** button.
Server	The IP address of your VoIP service's TFTP server. If this address isn't preconfigured, you will have to enter the TFTP server's IP address that your service provider gives you.
Filename	The filename of the X5v's configuration file on the TFTP server. If this isn't preconfigured, use the filename your service provider gives you.
Encryption	Check this box if your service provider supports encryption of the downloaded configuration file.
Select Tone & Ring by Country/Region	Drop-down menu of countries and regions. For each country menu entry, there are two alternatives: standard or VoIP. The VoIP choice provides rings and tones that make it easy for you to differentiate between a VoIP and a PSTN call. If none of the drop-down choices seems appropriate, we recommend using ITU/Europe. However, if you wish, you can customize these settings by selecting **Add/Edit Country**.
Display Name	The name or ID you want to be displayed when you place a call. The person you are calling must have Caller ID for this feature to work. Note: Not all service providers support this feature.

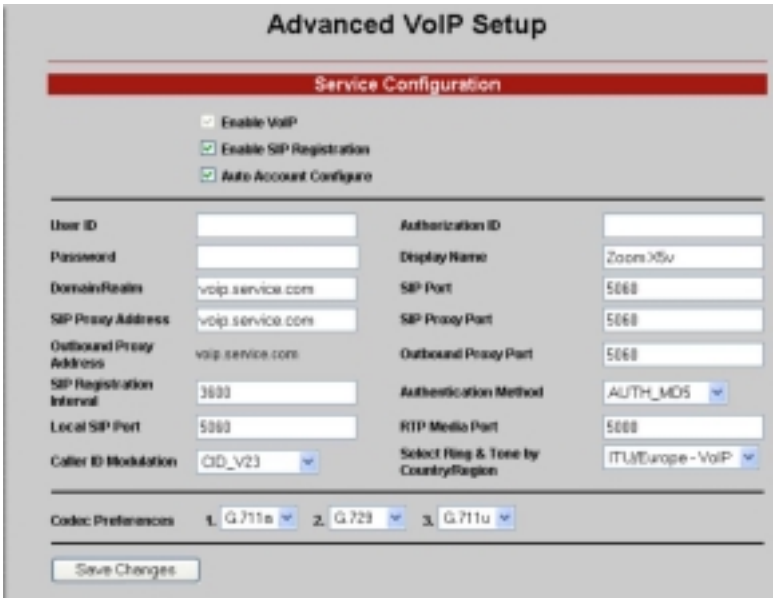
Setting	Value
VoIP only Mode	Disabled by default. Refer to the table on the next page for a description of this feature.
Allow incoming PSTN calls	Disabled by default. Refer to the table on the next page for a description of this feature.
Download Configuration Now	Click to initiate a download of an updated account configuration file from your service provider. **Note:** To use this feature, your service provider must support Auto Account Configuration.

The following table describes what you can do with the **Voice over IP** options — **VoIP only Mode** and **Allow incoming PSTN calls**:

VoIP Only Mode	Allow incoming PSTN calls	Use this setting if you:
☐	☐	Want to use the default X5v setting. You will be able to make and receive VoIP and PSTN calls on the phone connected to the X5v. You will have to dial # to make a VoIP call.
☑	☑	Want to make and receive VoIP calls as well as receive PSTN calls on the phone plugged into the X5v. You will not have to dial # to make a VoIP call. **Note:** If you use **both** settings, you must have PSTN on your DSL line, otherwise you will not be able to make VoIP calls.
☑	☐	Want to make and receive only VoIP calls on the phone plugged into the X5v. You will not have to dial # to make a VoIP call.
☑	☐	Have unbundled DSL (DSL service without PSTN). You will not have to dial # to make a VoIP call. **Note**: Be sure not to check **Allow incoming PSTN calls** if you have unbundled DSL.

2.2 Changing Your VoIP Settings

Click the **Advanced VoIP Setup** button on the bottom of the **Voice over IP** page. From this page, you can change the X5v's VoIP settings if you need to match those of your service provider.



Setting	Meaning
Enable or Disable VoIP	Default is Enable. Uncheck the box to deactivate the X5v's VoIP feature.
Enable SIP Registration	Default is Enable. Uncheck the box to set up calls directly to another VoIP device without registering with a VoIP service. The Technical Reference Manual contains SIP registration instructions; see the Technical Support section of **www.zoom.com**

Setting	Meaning
Auto Account Configure	Enabled by default. If your service provider uses automatic configuration downloads, this box will be checked. If you do not want automatic downloads, clear the check box. This will prevent information that you have entered in this page from being automatically overwritten. Note: If you want to configure your account manually, you will need information specific to your service provider to complete the fields in this page.
User ID	ID assigned to you by your VoIP service provider.
Password	Password assigned by your VoIP service provider.
Domain/ Realm	IP address of your service provider's Domain or Realm. You can enter this either as a numeric IP address or as a URL
SIP Proxy Address	IP address of your VoIP service provider's SIP proxy server. You can enter this either as a numeric IP address or as a URL.
Outbound Proxy Address	IP address of your VoIP service provider's outbound proxy server. You can enter this either as a numeric IP address or as a URL.
SIP Registration Interval	Time (measured in seconds) between registration requests to the VoIP service. Default is 3600 (1 hour).
Local SIP Port	The port that the X5v uses, vs. the SIP port that the service provider's equipment uses. Default is 5060.
Caller ID Modulation	The default is CID_Bell 202.
Authorization ID	ID to authorize your account and assigned by your VoIP service provider (not all service providers have this feature).
Display Name	The name or ID you want to be displayed when you place a call. The person you are calling must have Caller ID for this feature to work. Not all service providers support this feature.

Setting	Meaning
SIP Port	IP port of your VoIP service provider's SIP Domain/Realm. Default is 5060.
SIP Proxy Port	IP port of your VoIP service provider's SIP proxy server. Default is 5060.
Outbound Proxy Port	IP port of your VoIP service provider's outbound proxy server. Default is 5060.
Authentication Method	Security authentication method that your VoIP service provider uses. Default is MD5 (Message Digest 5), RSA-sanctioned cryptographic algorithm.
RTP Media Port	Base IP port that the X5v uses for RTP (Real-Time Transport Protocol, an Internet protocol for transmitting data such as audio and video in real time). Default is 5000.
Select Ring and Tone by Country/Region	Drop-down list of countries and regions. For each country, there are two choices: Standard and VoIP. The VoIP choice provides rings and tones that are different from conventional telephone service. If none of the choices seems appropriate, use ITU/Europe. You can also customize the settings by selecting **Add/Edit Country**.
Codec Preferences	You can prioritize the codecs (COde/DECode) from 1 to 3. The first priority default is G.711u (North America best voice quality). Other choices are G.711a (outside of North America) and G.729. G.729 uses less bandwidth and is a good choice if you have a connection below 160kbps and/or heavy data traffic. If you select G.729 for priority 1, leave priorities 2 and 3 blank.

2.3 Call Forwarding and Call Waiting

The **Supplementary Services** page displays the X5v's VoIP call management features such as call forwarding and call waiting. Click its button on the bottom of the **Voice over IP** page.

Important: The X5v's call forward capabilities are displayed on this page. However, **to activate these functions**, you must enter the X5v's VoIP call management commands using your telephone keypad. The section **Activating Call Management Features** immediately following the table explains how to do this.

Enabling Call Management Features

Setting	Meaning
Enable Call Forwarding	Click to turn on the call-forwarding feature. Then select (click) the options listed below that you want to use.
Forward Calls To	Enter the phone number of the location where you want to forward incoming VoIP calls. You must also enter the forwarding number using your telephone keypad, as explained below this table.
Forward All Calls	Enables the forwarding of all VoIP calls to the specified forwarding number.
Forward When Busy	Enables the forwarding of VoIP calls to the specified forwarding number when the X5v's phone is busy.
Forward When No Answer	Enables the forwarding of VoIP calls to the specified forwarding number when there is no answer.

Setting	Meaning
Enable Call Waiting	Enabled by default. Call waiting signals you with a tone when another caller tries to contact you while you are on the phone. Press the hook button on your phone to be connected to the second caller, and the person you were talking with will be placed on hold. Press it again to return to the first conversation. If you disable it, callers will either hear a busy signal or they will be given the option to leave a voice mail message; this depends on your service provider.
Enable Call Return	Enabled by default. Dial the call return number for your region, preceded by the # sign, if you want the X5v to dial the last number that attempted to call you. if you do not know the call return number or it does not work, dial # and then *** 6 9**

Activating Call Management Features

Note: Call forwarding works only for calls that arrive over VoIP. The X5v cannot forward calls from the PSTN. However, if you have VoIP to PSTN service, you can forward VoIP calls from the X5v to the PSTN.

The command sequence to control call management is simple. We have included a sample table below. On your telephone keypad, enter

 # <Forward code> <Forward Number> #

The X5v will attempt to place a call to the Forward Number.

If someone answers within 15 seconds, the forwarding feature will become active. If not, you need to re-enter the command:

 # <Forward code> <Forward Number> #

Then the forwarding feature you have selected will become active.

You will hear a stutter dial tone while call forwarding is active.

Sample Table of Enable / Disable Codes

Function	USA	UK
Forward All	* 7 2	* 2 1 *
Forward Busy	* 7 4	* 6 7 *
Forward No Ans	* 7 5	* 6 1 *
Forward Deactivate	* 7 3	# 2 1 *
Call Waiting Disable	*7 0	# 4 3 #

To deactivate Call Forwarding, enter

 # < Forward Deactivate code > #

Note: Deactivating call forward from the keypad only *deactivates* the last phone number programmed—that is, the currently active forwarding function. It does not turn off the X5v's call forwarding capability. This must be done from the X5v's **Supplementary Services** page or by your service provider.

To deactivate Call Waiting, enter

 # < Call Waiting Disable code > #

Now go to Section 1.6 Calling Tips on page 16.

3

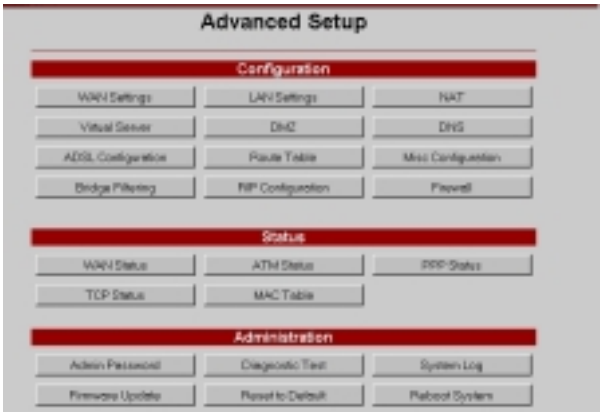
Advanced Setup Options

In addition to its basic setup options, the X5v unit includes options for advanced settings. The X5v is designed so that the basic setup settings are sufficient for most users. The information in this chapter applies to you if:

- *Your provider is using 1483 encapsulation. In that case, you might be instructed to set up your X5v to use a static IP address.*
- *You have a LAN and want to change your NAT settings.*
- *You need to set up a DMZ (demilitarized zone) to play an Internet game.*

3.1 How to Use the Advanced Options

The X5v's advanced configuration settings are accessible from the **Advanced Setup** page. Click its icon at the top of the X5v's web page. (If you have exited from the X5v and have forgotten how to establish communication with it, refer to page 11.)



3.2 How to Set Up Your X5v to Use a Static IP Address

Most DSL service providers use DHCP, also known as dynamic IP addressing, rather than static IP addresses. If your provider is using 1483 Bridged or Routed IP encapsulation, however, you have the option of using a static IP address. Typically, you must request (and pay extra) for a static IP address. To set up your X5v to use a static IP address, go to the **WAN Settings** page, and fill out these fields.

Encapsulation	Enter the encapsulation mode supplied by your provider. Remember, it must begin with either **1483 Bridged IP** or **1483 Routed IP**; otherwise, you cannot use a static IP address.
VPI	Supplied by your service provider. You can refer to the tables beginning on page 69 if you have misplaced or forgotten your VPI setting.
VCI	Supplied by your service provider. You can refer to the tables beginning on page 69 if you have misplaced or forgotten your VCI setting.
DHCP client enable	You must uncheck this box. It **must** be disabled.
Static IP Address	Enter the static IP address supplied by your service provider.
Subnet Mask	Enter the subnet mask of the static IP address given to you by your service provider.
Default Gateway	Enter the default gateway IP address given to you by your service provider.

Once you're done, be sure to click **Save Changes** and then **Write Settings to Flash and Reboot**.

Then go back to the **Advanced Settings** page and click **DNS**. Check the **User Configuration** box, enter the **DNS Server** IP address assigned to you by your service provider, and click **Add**. **Do not change any other fields!** Click **Save Changes** and then click **Write Settings to Flash and Reboot**.

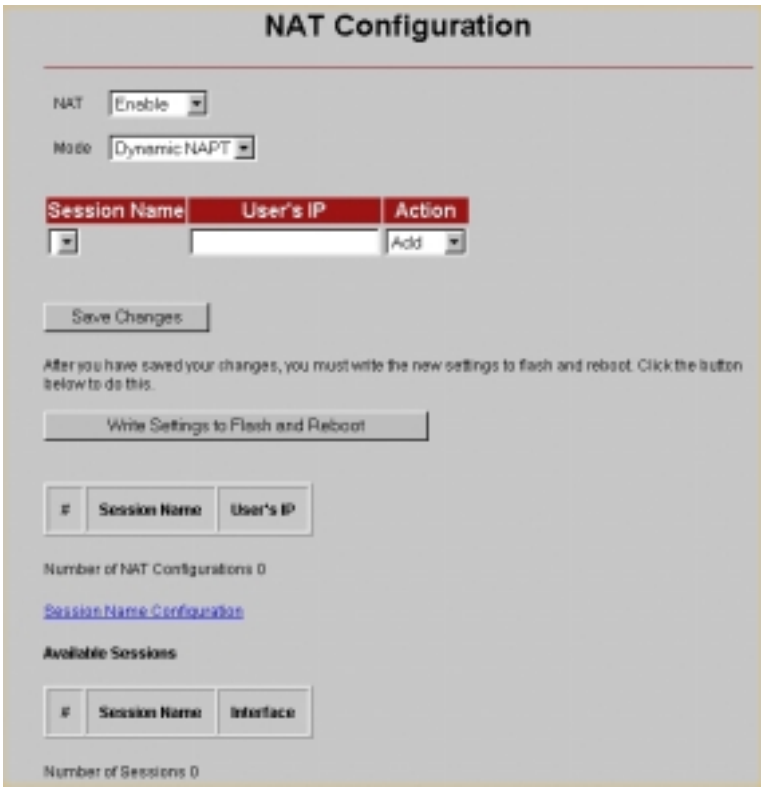
3.3 How to Change the X5v's NAT Setting

The X5v's NAT (Network Address Translation) capability provides a good level of protection from unauthorized access: It hides the IP addresses of the in-house computers connected to the X5v from other computers outside on the Internet.

In a typical computer setup using NAT, your service provider assigns one public IP address for your network. By virtue of the X5v's DHCP Server feature, private IP addresses are automatically assigned to the computers on your network. For any data that the computers on your network send to the Internet, NAT substitutes your private IP addresses with the public address supplied by your service provider. That way, it appears to other computers on the Internet that the data packets being sent out originated from your X5v's single WAN connection, not the computer or computers behind the X5v.

NAPT takes NAT one step further by disguising a computer's source port in the actual data packet, so that outside users cannot determine either the IP address or the port number of the computer sending the packet.

The X5v's default setting is **dynamic NAPT**—everything is automatic. With dynamic NAPT, any computer on your network can use the public IP address (that is, the gateway's WAN IP address). You shouldn't want or need to change the X5v's NAT setting unless you need each computer on your LAN to have its own public IP address. To change the NAT setting, click the **NAT** button on the **Advanced Setup** page.



NAT	Default is dynamic NAPT. Options are NAPT, NAT, and Disable. See descriptions above.
Session Name	Not applicable to dynamic 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 for the defined session.
Action	Choices are Add or Delete a session.

In addition to its built-in NAT security protection, the X5v includes advanced firewall protection; please see page 54.

3.4 How to Set Up a DMZ

If you are playing a game or using an application that requires a **specific port or ports to be open**, go to page 19 for instructions on setting up a Virtual Server. A virtual server can have a maximum of 20 ports open.

If you need more than 20 ports open, or you don't know which ports to open (some games or applications like NetMeeting use "dynamic" ports, meaning that the ports used by the game are constantly changing, so it is not possible to set specific ports), you have to set up what is called a DMZ (Demilitarized Zone).

To set up a DMZ, you need to make all four of the settings in the chart below. You make these settings on the computer where you set up the DMZ, no matter whether the computer is a Windows, Macintosh, or Linux computer.

Important! If your computer already has firewall software installed: If you have third-party firewall software installed on your computer, such as the Windows XP firewall, you may need to deactivate it before opening ports by setting up a virtual server or a DMZ. If you don't, your computer may block the ports you are trying to open.

IP address	**10.0.0.16 (see Step 1 below)**
Subnet mask	**255.255.255.0**
Default gateway or router (X5v's LAN IP address)	**10.0.0.2**
Preferred DNS server or Name server	**10.0.0.2**

1 Choose an IP address.

Click on the **Zoom X5v icon** on your desktop (or type 10.0.0.2 in your Web browser just the way you would normally type a web address) to get to the X5v's **Main Page**. Click the **Advanced Setup** icon, then click **LAN Settings**. There you will see the starting and ending range of the X5v's dynamic (DHCP) LAN IP

addresses. You need to choose an IP Address that is outside this range. Normally you should pick the next **higher** number. For example, if the range shown is 10.0.0.4 to 10.0.0.15, your Host IP Address should be the next IP address after 10.0.0.15, which would be 10.0.0.16. Unless you have changed the X5v's IP address settings, which is very unlikely, just use the number 10.0.0.16. Write down the number you choose for reference if you are not using 10.0.0.16. The rest of the instructions will assume that you are using 10.0.0.16.

DMZ IP Address: _____

Windows users continue below.

Mac users jump to Step 4 (page 50).

Linux users jump to Step 5 (page 52).

2 Windows Users: Open the TCP/IP Properties dialog box.

For Windows XP: From the desktop click the **Start** button, point to **Control Panel** and then **Network Connections**. Then right-click (NOT left-click) **Local Area Connection**, select **Properties**, highlight your NIC card's **TCP/IP** entry (it should start with **TCP/IP** and have the characters **10/100**, **NIC**, or **Ether** in it – and not have the words **AOL**, **Dial-up**, or **Adapter**). Click **Properties** to display the Windows **TCP/IP Properties** dialog box.

For Windows 2000: From the desktop click the **Start** button, point to **Settings** and then **Network and Dial-up Connections**. Then right-click (NOT left-click) **Local Area Connection**, select **Properties**, highlight your NIC card's **TCP/IP** entry (it should start with **TCP/IP** and have the characters **10/100**, **NIC**, or **Ether** in it – and not have the words **AOL**, **Dial-up**, or **Adapter**). Click **Properties** to display the Windows **TCP/IP Properties** dialog box.

For Windows 98 and Me: From the desktop click the **Start** button, then point to **Settings** and then **Control Panel.** Double-click the **Network** icon to display the **Network** configuration screen. Highlight your NIC card's **TCP/IP** entry (it should start with **TCP/IP** and have the characters **10/100**, **NIC**, or **Ether** in it

– and not have the words **AOL**, **Dial-up**, or **Adapter**). Click **Properties** to display the Windows **TCP/IP Properties** dialog box.

3 Windows Users: Enter the IP Settings.

For Windows 2000 and XP:

Click the **Use the following IP address** and **Use the following DNS server addresses** buttons so that a black dot appears. Then enter the settings for **IP address**, **Subnet mask**, **Default gateway**, and **Preferred DNS server** as shown below.

Most users can copy the information exactly as it is shown above and in the chart below. However, **if you chose an IP address in Step 1 other than 10.0.0.16**, enter the number that you chose instead of 10.0.0.16. When done, click **OK** and **continue with Step 6.**

IP address	**10.0.0.16**
Subnet mask	**255.255.255.0**
Default gateway (X5v's LAN IP address)	**10.0.0.2**
Preferred DNS server	**10.0.0.2**

For Windows 98 and Me:

Click **Specify an IP Address** and enter the settings for **IP Address** and **Subnet Mask** shown below, **unless you chose an IP address in Step 1 other than 10.0.0.16**, in which case you should enter the number that you chose instead of 10.0.0.16.

IP address	**10.0.0.16**
Subnet mask	**255.255.255.0**

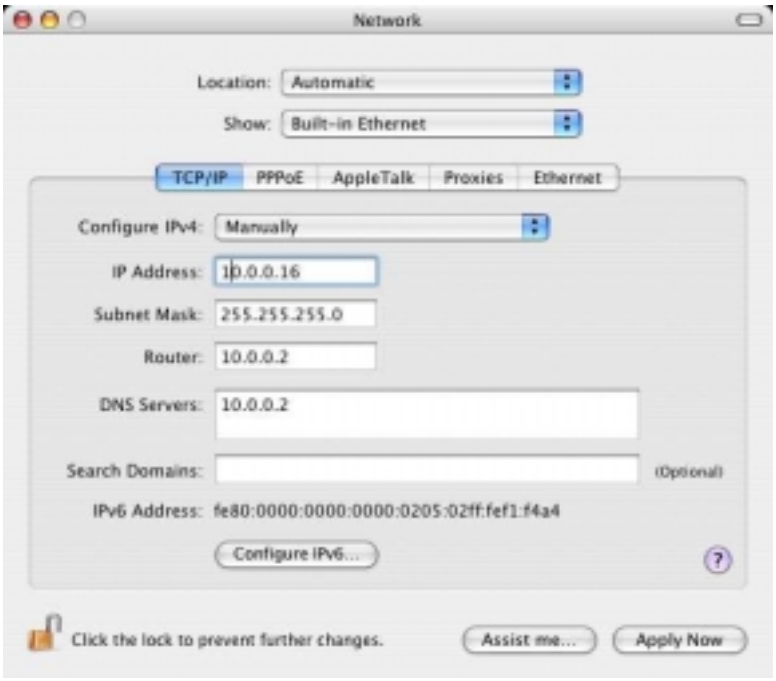
Now click the **DNS Configuration** tab at the top of the menu. Then click **Enable DNS.** Enter any name (i.e., your name, the words "My Computer", a favorite word, or any other letters or numbers) in the box labeled **Host:**. A **Host:** name is required.

Fill in the **DNS Server Search Order** box with the number **10.0.0.2**, click **Add,** and then click the **Gateway** tab near the top of the page. When the Gateway screen opens, fill in the **New gateway:** box with the number **10.0.0.2**, click **Add**, and **OK**, and **continue with Step 6.**

4 Macintosh Users: Open the TCP/IP Pane or Window and enter the IP settings.

For Mac OS X:

From the **Dock**, choose **System Preferences** and then **Network** to display the **Network** pane. (For OS X 3, you also have to click the **Configure** button.)



Under the **TCP/IP** tab, highlight **Manually** in the **Configure:** list box and enter the settings for **IP Address, Subnet Mask, Router,** and **DNS Servers** shown below, **unless you chose an IP address in Step 1 other than 10.0.0.16**, in which case you should enter the number that you chose instead of 10.0.0.16. When done, click **Save** or **Apply Now**, and **continue with Step 6.**

IP Address	**10.0.0.16**
Subnet Mask	**255.255.255.0**
Router **(X5v's LAN IP address)**	**10.0.0.2**
DNS Servers	**10.0.0.2**

For Mac OS 7.6.1 – 9.2.2:

From the **Apple** menu, choose **Control Panels** and then **TCP/IP** to display the **TCP/IP** Window. Under the **TCP/IP** tab, highlight **Manually** in the **Configure:** list box and enter the settings for **IP Address, Subnet mask, Router address,** and **Name server addr.** shown below, **unless you chose an IP address in Step 1**

other than 10.0.0.16, in which case you should enter the number that you chose instead of 10.0.0.16. When done, close the Window and you will be prompted to click **Save**. Then **continue with Step 6.**

IP address	**10.0.0.16**
Subnet mask	**255.255.255.0**
Router address (X5v's LAN IP address)	**10.0.0.2**
Name server addr.	**10.0.0.2**

5 Red Hat Linux Users:

a Edit /etc/sysconfig/network-scripts/ifcfg-eth0 so that it contains the following lines:

DEVICE=eth0
ONBOOT=yes
BOOTPROTO=static
BROADCAST=10.0.0.255
NETMASK=255.255.255.0
IPADDR=10.0.0.16
GATEWAY=10.0.0.2
NETWORK=10.0.0.0

b Then edit or create /etc/resolv.conf so that it contains the following line:

NAMESERVER=10.0.0.2

Note: If you are using another version of Linux and you are unsure how to enter this information, consult the help file or documentation that came with your operating system.

c Continue with Step 6.

6 <u>All Users:</u> Go back to the X5v's Advanced Setup page and click the DMZ button.

If you already closed the **Zoom DSL VoIP Gateway Web-Console**, click on the Zoom X5v icon on your desktop (or type 10.0.0.2 in your Web browser) and click the **Advanced Setup** icon.

7 Configure the DMZ.

Select **Enable** from the **DMZ** list, and enter **10.0.0.16** in the **DMZ Host IP** box. Click **Save Changes** and then click **Write Settings to Flash and Reboot**. You're done!

IMPORTANT:

Outside users will need to know the X5v's **WAN IP address**. To find this address, click the **System Status** icon at the top of the X5v's web page and scroll down to the **WAN Status** section.

4

Using the X5v's Advanced Firewall

In addition to the security provided by NAT, the X5v includes an advanced firewall. This chapter describes the firewall and the types of protection it offers. If you are like most users, you probably will not need to modify your firewall settings. If, however, you are an administrator or an expert user who wants to customize the firewall to protect a network against specific threats, you should refer to this chapter.

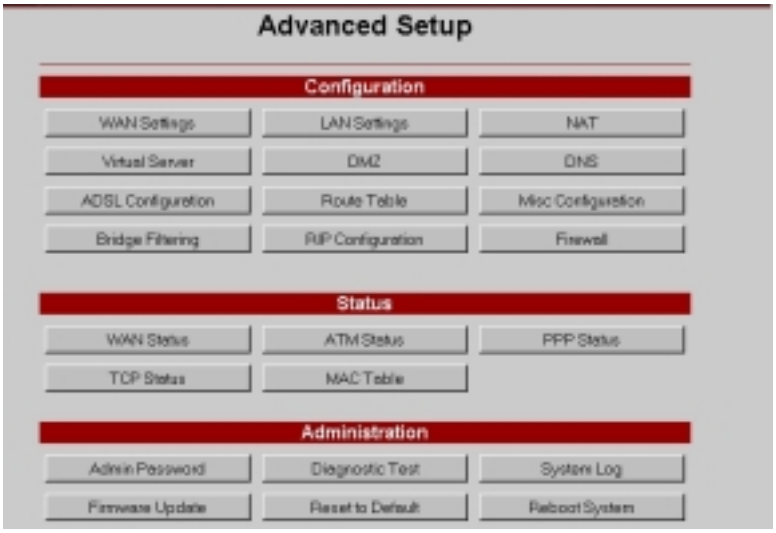
You can think of the firewall as playing a role like that of a guard at the gate of an ancient walled city. The guard has a great scroll, which lists allowed and proscribed traffic. In one possible set of rules, visitors may enter only if they show an invitation from a citizen of the city. Children may not leave the city. The guard may allow entry of carts of flour, but only for delivery to the bakery. Any messenger who doesn't know the password to the city is thrown in the moat, and can't pass through the gate.

You may set the policies of your firewall, which is like writing the rules on the great scroll in the example. The firewall will then follow the rules, acting like the guard. Instead of controlling entry and exit of goods and people, you control entry and exit of particular types of IP packets. In general, you will want to do this to prevent unwanted packets from entering your network (this is the purpose of the wall in the first place).

By default, the firewall will allow only those packets to enter that you are likely to need; for example, in response to a request for a web page, or as part of a VoIP call you make. You may want to accept other, specific packets, perhaps to facilitate Internet gaming, or because you want people outside your network to access a server

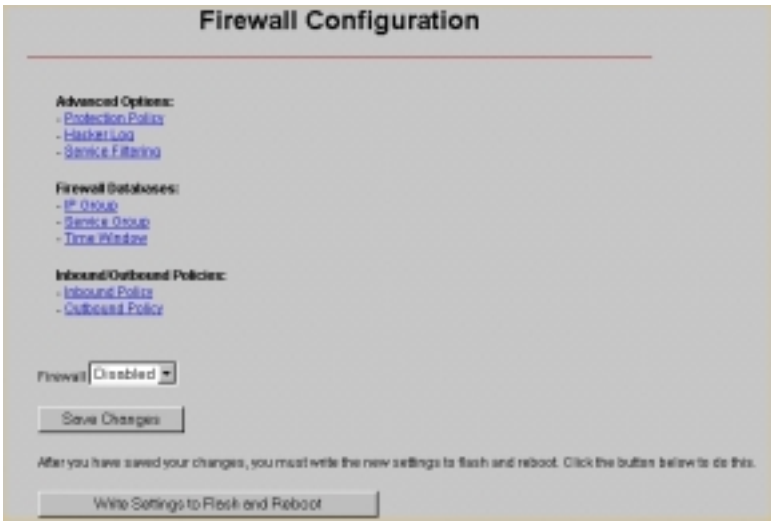
you have set up. You may want to deny some users from accessing the Internet at all.

To access the X5v's firewall settings, from the **Advanced Setup** page, click the **Firewall** button. (If you have exited from the X5v and have forgotten how to establish communication with it, refer to page 11.)



The main Firewall page displays.

Note: If you ever want to disable the advanced firewall, there is an option to do so at the bottom of the page.



4.1 Main Firewall Features

The X5v's (DoS) Denial of Service firewall features are grouped together in the top section, under **Advanced Options**. These DoS features mean that the X5v provides protection from a potentially devastating attack on your computer. Such attacks can overwhelm and shut down a computer or a server. The X5v's DoS features are grouped together as follows:

- Protection Policy
- Hacker Log
- Service Filtering.

Protection Policy

Click the **Protection Policy** link to display the basic and advanced protections. Protection policies provide a defense from the most common methods of tampering with the security of a network. All the defense mechanisms listed below are enabled by default.

IP Spoof checking	Inspects so-called “trusted” IP addresses to ensure legitimacy.
Ping of Death checking	Prevents oversized ping packet fragments (totaling more than 65,536 bytes) from getting through—which cause the computer to hang or crash.
Land Attack checking	Guards against attackers who mimic source and destination ports and IP addresses, causing infinite loops and system crashes.
Reassembly checking	Ensures correct reassembly of datagrams—prevents attackers from sending a continuous stream of identical, invalid datagram fragments that can cause system state problems.
SYN (synchronize) Flooding checking	Prevents attackers from flooding the system with incomplete synchronization connection requests, which can exhaust server resources and cause operating system crashes.
ICMP Redirection checking	Keeps route information hidden, ensuring that ICMP messages cannot be compromised, or forged, and redirected to the attacker’s destination of choice.
Source Routing checking	Prevents attackers from illegally obtaining network data by stipulating that data packets must follow strict source routing.
Winnuke checking	Only applicable to Windows 95, NT, and 3.11 systems. Prevents OOB (out of band) data from reaching an IP address, which can cause lost connections and system crashes.

Hacker Log

Whenever the firewall prevents a packet from being delivered because of a perceived security threat, the **Hacker Log** feature keeps track. You have the option of specifying which types of messages are logged in and displayed. **Note:** These options are directly related to the **Protection Policy** page described above.

Alert Log	Click to add any of these types of attacks—SYN Flooding, Ping of Death, IP Spoofing, Win Nuke—to the log entries in the system log of policy violations. (To view the log, go to the **Advanced Setup** page and click **System Log.**)
Log Database Properties Log Frequency	You have the option of selecting how often a particular type of hacker event can occur before the X5v generates a system log entry. The default is every 100 records or events. Available range is 1-65535 records/events.
General Log	Click to add General Attacks, Deny Policies, or Allow Policies to the log entries in the system log of policy violations. (To view the log, go to the **Advanced Setup** page and click **System Log**.) General Attacks are those most likely to occur—Land Attack, Reassembly Attack, ICMP Redirection, and Source Routing. Deny Policy and Allow Policy are tied to inbound and outbound firewall policies (see page 60).

Once you've made your selections, click **Save Changes** and **Write Settings to Flash and Reboot**.

Service Filtering

The Service Filtering feature lets you give certain users permission to access the X5v from outside the network—that is, over the Internet. If you enable one of the services listed on this page, the X5v's firewall will open up the appropriate port to allow the service to work.

PING from External Network	Disabled by default. Enable it to allow an external user to ping your X5v. This can be useful if you need to troubleshoot your unit.
FTP from External Network*	Disabled by default. Enable it to allow an external user to ftp into your X5v. Typically, you would do this if you wanted someone to check the X5v's configuration.
DNS from External Network	Disabled by default. Enable it to allow your X5v to accept DNS requests from an external source.
IKE from External Network	Disabled by default. Enable it to allow a VPN (virtual private network) connection to your network.
RIP from External Network	Disabled by default. Enable it to allow your X5v to receive RIP (Routing Information Protocol) requests from an external source. The Technical Reference Manual contains details about RIP; go to **www.zoom.com**
DHCP from External Network	Disabled by default. Enable it to allow your X5v to receive DHCP requests from an external source.

***Important:** To complete the step of allowing remote users to FTP into the X5v, you must go to the X5v's **Advanced Setup**

page, click the **Misc. Config.** button, and do the following: Enable FTP Server in the dropdown list and **uncheck** the box "**Disable WAN side FTP access**." FTP must be enabled in both places for this feature to work.

Once you've made your selections, click **Save Changes** and **Write Settings to Flash and Reboot**.

4.2 Creating Inbound/Outbound Policies

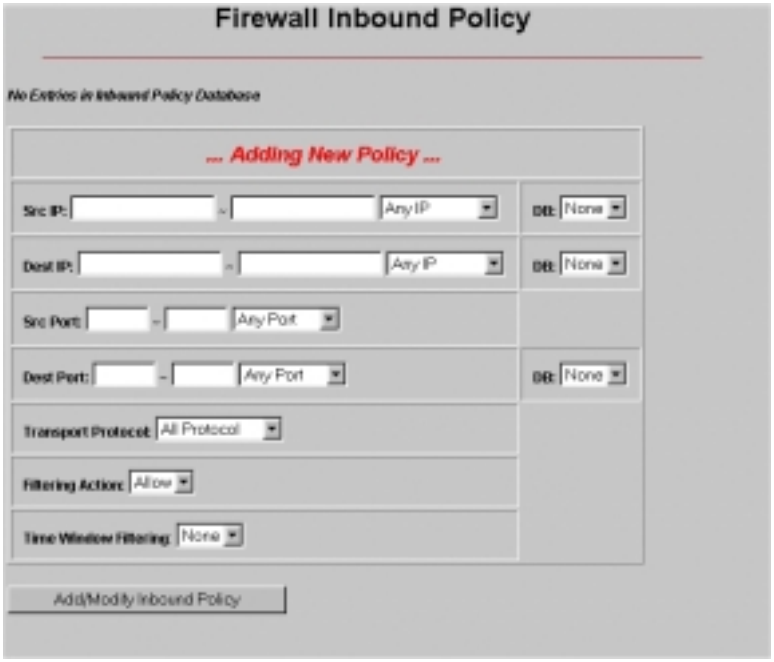
The X5v offers ways to tailor, or restrict, incoming and outgoing Internet traffic to increase security. Your X5v comes with three inbound/outbound policies preconfigured for VoIP: 1) SIP Port 5060; 2) RTP Media Base 5000; 3) TFTP Port 60.

To create additional policies, from the main **Firewall** page, click the **Inbound Policy** or **Outbound Policy** link, depending on what you want to do.

Tip: When setting up policies, it may help to think of inbound and outbound policies as mirror images of each other. In each case, the source and destination IP addresses, subnet masks, and ports are reversed. That is, for an inbound policy, the source address appears on the WAN side, and the destination appears on the LAN side; for an outbound policy, the source is on the LAN side and the destination is on the WAN side.

Inbound Policies

Inbound firewall policies allow you to filter the traffic that arrives over the Internet—from the WAN side to the X5v LAN side—based on rules that you set up.



Src IP	Source IP address to which this rule should apply.*
Dest IP	Destination IP address to which this rule should apply.*
Src Port	Source Port number to which this rule should apply.*
Dest Port	Destination Port number to which this rule should apply.*
Transport Protocol	Protocol to be used. Choices are All, TCP, UDP, ICMP, AH, ESP, GRE.
Filtering Action	Choices are Allow or Deny.
Time Window Filtering	Default is none. If you set up Time Groups (see page 68), they appear in this list as options.
DB	Short for Database. Default is none. If you set up IP Groups or Service Groups (see page 64 and 67), they appear in this list as options.

**For each of these fields, choices are any IP address, a single IP address, an IP range, or a mask range.*

Once you have entered all applicable information, click **Add Inbound Policy**. From the subsequent page that displays, you can move or edit this policy using the **Up**, **Dn** (short for Down), **Edit**, and **Delete** buttons. **Important:** The firewall applies all inbound policies in a top-down order according to their location in the policy table. Once you have completed the creation of your rules, use the **Up** and **Dn** buttons to put them in order in the table from top to bottom. You can always add an **All** policy at the bottom of the list, so that if there are any packets that don't match any of the above policies in the list, they will be denied (if you set up **Deny All**), or permitted (if you set up **Allow All**).

Outbound Policies

Outbound firewall policies allow you to filter the traffic that users inside the firewall—on the X5v's LAN side—are allowed to send out over the Internet—to the WAN side.

Src IP	Source IP address to which this rule should apply.*
Dest IP	Destination IP address to which this rule should apply.*
Src Port	Source Port number to which this rule should apply.*
Dest Port	Destination Port number to which this rule should apply.*
Transport Protocol	Protocol to be used. Choices are All, TCP, UDP, ICMP, AH, ESP, GRE.
Filtering Action	Choices are Allow or Deny.
Time Window Filtering	Default is none. If you set up Time Groups (see page 68), they would appear in this list as options.
DB	Short for Database. Default is none. If you set up IP Groups or Service Groups (see page 64 and 67), they would appear in this list as options.

**For each of these fields, choices are any IP address, a single IP address, an IP range, or a mask range.*

Once you have entered all applicable information, click **Add Outbound Policy**. From the subsequent page that displays, you can move or edit this policy using the **Up**, **Dn** (short for Down), **Edit**, and **Delete** buttons. **Important:** The firewall applies outbound policies in a top-down order according to their location in the policy table page. Once you have created all your rules, or policies, use the **Up** and **Dn** buttons to put them in order in the table from top to bottom. You can always add an **All** policy at the bottom of the list, so that if there are any packets that don't match any of the above policies in the list, they will be denied (if you set up **Deny All**), or permitted (if you set up **Allow All**).

4.3 Setting Up Firewall Databases

The X5v includes options to set up databases of user information, so you can create different combinations of user groups. Drawing from these groups, or databases, you can then create and apply certain inbound and outbound policies and restrict Internet traffic. For example, if you don't want your children accessing the Internet during the day, you can set up a time group that blocks access from 8am to 5pm. For instructions on how to create inbound and outbound policies, refer to the section above.

- IP Group
- Service Group
- Time Group.

IP Group

The **IP Group** page lets you specify IP addresses and subnet masks and assign a group name to them. That way, you can create a set of inbound and outbound firewall policies pertaining to multiple individuals simultaneously. For example, if you have a small office and you don't want certain computers (or users) to have Internet access, you can set up an IP group that includes those computers and then set up an outbound policy that blocks Internet access for that IP group.

IP/Mask	There are three ways to use this database. Choices are **Single IP**, **IP Range**, or **Subnet Mask**. Your selection depends on whether you want to specify one IP address for an entire group, a range of IP addresses for a group, or a range of subnet masks for a group.
IP Entry Name	Name of your choosing. Purpose is to identify the IP group you want to set up. Maximum field length=19 characters.
IP addr.1	IP address that you want to assign to a group. If you selected **Single IP**, enter that IP address here. If you selected the **IP Range** option because you want to designate a range of addresses, enter the beginning of the range here and enter the ending range in the **IP addr.2** field. If you selected the **Subnet Mask** option, enter the desired IP address here and enter the subnet mask in the **IP addr.2** field. All addresses falling within that subnet will be included in the group you set up.

IP addr.2	If you are using the **Single IP** option, this field is not applicable. If you are using the **IP Range** option, enter the end of the IP address range here. Note: **IP addr.1** has to contain the beginning of the range. If you are using the **Subnet Mask** option, enter the subnet mask here. The subnet mask divides IP addresses into groups. In the **IP addr.1** field, you must enter an IP address of the group that you want in the database. All IP addresses within the same group as the address in the **IP addr.1** field will be affected. For example, if you enter the IP address 192.168.0.1 in the **ip addr.1** field and the subnet mask 255.255.255.0 in the **ip addr.2** field, the group will include the addresses 192.168.0.1 to 192.168.0.255 (for a total of 255 addresses). If you enter the IP address 192.168.0.1 in the **ip addr.1** field, and the subnet mask 255.255.255.240 in the **ip addr.2** field, the group will include the addresses 192.168.0.1 to 192.168.0.15 (a total of 15 addresses).

Once you have filled in these fields, click **Add/Modify this entry**. A new page displays, showing the new entry at the top, with two buttons **Modify** and **Delete**. You can change or delete this entry at any time. From this page, you can also add new entries.

Service Group

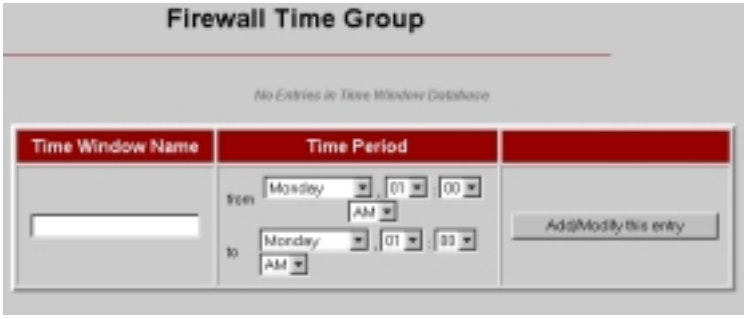
The Service Group page lets you specify a port and assign a group name to it. This is useful if you want to identify a group by a particular port. You can then use that service group when creating an inbound or outbound policy.

Service Entry Name	Name of your choosing. Purpose is to identify the group that you want to assign to a particular port. Maximum field length=19 characters.
TCP/UDP	Specify which protocol this group should use, TCP (Transmission Control Protocol) or UDP (User Datagram Protocol).
Port #	Port number of your choosing that should be associated with this group.

Once you have filled in these fields, click **Add/Modify this entry**. A new page displays, showing the new entry at the top, with two buttons **Modify** and **Delete**. You can change or delete this entry at any time. From this page, you can also add new entries.

Time Group

The **Time Group**, or **Time Window**, page lets you specify a particular time period and assign a group name to it. For example, if you don't want your children accessing the Internet during the day, you can set up a time group that blocks Internet access from 8am to 5pm. Time windows are useful when configuring inbound and outbound firewall policies for a particular group of individuals.



Time Window Name	Name of your choosing. Purpose is to identify the group that you want to associate with a given time period. Maximum length=19 characters.
Time Period	Starting and ending time window—day, hour, minute, and AM or PM.

Once you have filled in these fields, click **Add/Modify this entry**. A new page displays, showing the new entry at the top, with two buttons **Modify** and **Delete**. You can change or delete this entry at any time. From this page, you can also add new entries.

Appendix A
DSL Internet Settings Tables

These tables are for customers whose service providers do not supply them with the DSL settings to connect to the Internet. We post updated tables on our web site. If your country isn't listed, please consult ***www.zoom.com***

Note to USA customers

If your DSL service provider is not shown below, first use the settings for **Service Provider Not Shown** at the bottom of the table. If those settings don't work, use the settings for the company that provides local telephone service in your area. (Refer to page 14 for more detailed installation instructions on entering the settings.)

Table A: USA

Service Provider	VPI	VCI	Encapsulation
AllTel (1)	0	35	PPPoE LLC
AllTel (2)	0	35	1483 Bridged IP LLC
August.net (1)	0	35	1483 Bridged IP LLC
August.net (2)	8	35	1483 Bridged IP LLC
BellSouth	8	35	PPPoE LLC
CenturyTel (1)	8	35	PPPoE LLC
CenturyTel (2)	8	35	1483 Bridged IP LLC
Covad	0	35	PPPoE LLC
Earthlink (1)	0	35	PPPoE LLC
Earthlink (2)	8	35	PPPoE LLC
GWI	0	35	1483 Bridged IP LLC
Qwest (1)	0	32	PPPoA LLC
Qwest (2)	0	32	PPPoA VC-MUX
SBC (1)	0	35	PPPoE LLC
SBC (2)	0	35	1483 Bridged IP LLC
SBC (3)	8	35	1483 Bridged IP LLC
Sprint (1)	0	35	PPPoA LLC
Sprint (2)	8	35	PPPoE LLC
Verizon (1)	0	35	PPPoE LLC
Verizon (2)	0	35	1483 Bridged IP LLC
Service Provider Not Shown	0	35	PPPoE LLC

(If the settings for **Service Provider Not Shown** do not work, try the settings for the company that provides local phone service in your area.)

Table B: Other Countries

Service Provider	VPI	VCI	Encapsulation
Belgium-ADSL Office	8	35	1483 Routed IP LLC
Belgium-Turboline	8	35	PPPoA LLC
Denmark-Cybercity, Tiscali	0	35	PPPoA VC-MUX
France (1)	8	35	PPPoE LLC
France (2)	8	67	PPPoA LLC
France (3)	8	35	PPPoA VC-MUX
Germany	1	32	PPPoE LLC
Iceland-Islandssimi	0	35	PPPoA VC-MUX
Iceland-Siminn	8	48	PPPoA VC-MUX
Italy	8	35	PPPoA VC-MUX
Netherlands-MX Stream	8	48	PPPoA VC-MUX
Portugal	0	35	PPPoE LLC
Saudi Arabia (1)	0	33	PPPoE LLC
Saudi Arabia (2)	0	35	PPPoE LLC
Saudi Arabia (3)	0	33	1483 Bridged IP LLC
Saudi Arabia (4)	0	33	1483 Routed IP LLC
Saudi Arabia (5)	0	35	1483 Bridged IP LLC
Saudi Arabia (6)	0	35	1483 Routed IP LLC
Spain-Albura, Tiscali	1	32	PPPoA VC-MUX
Spain-Colt Telecom, Ola Internet	0	35	PPPoA VC-MUX
Spain-EresMas, Retevision	8	35	PPPoA VC-MUX
Spain-Telefonica (1)	8	32	PPPoE LLC
Spain-Telefonica (2), Terra	8	32	1483 Routed IP LLC
Spain-Wanadoo (1)	8	35	PPPoA VC-MUX
Spain-Wanadoo (2)	8	32	PPPoE LLC
Spain-Wanadoo (3)	8	32	1483 Routed IP LLC
Sweden-Telenordia	8	35	PPPoE
Sweden-Telia	8	35	1483 Bridged IP LLC
Switzerland	8	35	PPPoE LLC
Turkey(1)	8	35	PPPoE LLC
Turkey(2)	8	35	PPPoA VC-MUX
UK (1)	0	38	PPPoA VC-MUX
UK (2)	0	38	PPPoE LLC
Venezuela-CANTV	0	33	1483 Routed IP LLC
Vietnam	0	35	PPPoE LLC

Appendix B
VoIP Phone Installation Options

Your X5v gateway makes it easy to make both VoIP calls over the Internet and regular phone calls using your standard phone service. You can plug a single telephone into the X5v's ***PHONE*** *jack. You may prefer to connect more than one phone to the X5v so that you can make VoIP calls from other rooms. You have a choice of several ways to accomplish this without running wires.*

- ***Plug Multiple Phones Directly into the X5v***
- ***Use Cordless Phones to Link to the X5v***
- ***Install the X5v Where Your Phone Line Enters Your Home (USA Only)***

The first two ways are very easy and virtually foolproof. The third requires more effort.

Plug Multiple Phones Directly into the X5v

If you want more than one phone near the X5v—in a small office, for example—you can use standard telephone adapters to connect multiple phones. These adapters are called T-adapters or 2-jack modular adapters; many people use them to plug in their answering machines. You can plug in as many phones as you'd like. (If you plug multiple phones directly into the X5v, just be sure that when you add up all their Ringer Equivalence Numbers (RENs), the total is 5 or lower. Virtually all phones show the REN somewhere. Most phones have a REN that's 1 or lower.)

Use Cordless Phones to Link to the X5v

If you have a cordless phone that has more than one handset, simply plug the base station into the X5v—you can then make

VoIP and regular calls using all the handsets.
Note: If you have a wireless network that operates over the typical 2.4GHz frequency and you want to use cordless phones, it is best if you use 900MHz or 5GHz phones; that way, you will minimize any chance of interference.

Install the X5v Where Your Phone Line Enters Your Home (USA Only)

In many homes, there is a telephone jack where the phone line enters the house. This box is called the "demarcation point." It marks the point where the Phone Company's wiring ends and your wiring begins. This is an excellent place to install your X5v and connect it so that it provides VoIP capability to all the phones in your home.

There is a catch. To use the ADSL line, you need to connect your X5v gateway to the demarcation point's jack and to either a wired or wireless network. If you have a wired network, you simply run a network cable to the gateway as you would in a typical installation scenario. If you don't have a wired network, plugging the gateway into an 802.11 wireless access point is a fast, inexpensive, and convenient way to deliver your ADSL connection to one or more computers without running wires.

To connect your phones, disconnect the modular plug at the demarcation point and plug it into the X5v's jack marked **PHONE**. (If the demarcation point doesn't have a modular plug, you will need to unwrap the wire that is providing the connection. You may have to call a technician if you do not have a modular plug.) Then connect one end of the phone cord that came with the X5v into its **ADSL** jack and the other end into the jack on the demarcation point. With the computer's power off, check that your phones work normally.

Important:

If you install the X5v where your phone line enters your home, be sure to connect an answering machine between the X5v and the demarcation point. If you don't, and someone calls you over the regular phone network while you are on a VoIP call, the call will not go through. No phone will ring at your end. If you attach an answering machine to the X5v, regular phone callers can leave a message if you are on a VoIP call.

Appendix C
Mac and Linux Users: Setting TCP/IP Network 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 task.
Linux users: Turn to page 75.
Macintosh users: Continue below.

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 74. Otherwise go to page 75.

For Mac OS X

1. From the **Dock**, choose **System Preferences** and then **Network** to display the **Network** pane. (For OS X 3, you also have to click the **Configure** button.)
2. From the **Location:** list box, make sure **Automatic** is selected.
3. Under the **Show** drop-down tab, choose **Built-in Ethernet**.
4. Under the **TCP/IP** tab, make sure that **Using DHCP** is highlighted in the **Configure:** list box. Do not enter anything into the **DHCP Client ID** field.
5. Click **Apply Now** (or **Save** if prompted) and close the **Network** pane.
6. For Mac OS X, you're done with your network settings. Now return to **Configuring ADSL** on page 11.

For Mac OS 7.6.1 - 9.2.2

1. From the **Apple** menu, choose **Control Panels** and then **TCP/IP** to display the **TCP/IP** Window.
2. Under **Connect via:**, select **Ethernet built-in**.

   Under **Configure:**, select **Using DHCP Server**.

   Do not enter anything in the **DHCP Client ID** field.
3. Close the **TCP/IP** Window. You will be asked if you want to save the changes. Click **Save**.
4. Now return to **Configuring ADSL** on page 11.

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 more than one network card 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
```

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**.

For Debian

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

Now return to **Configuring ADSL** on page 11

Appendix D
Troubleshooting

*Our Technical Support staff is ready to help you with any questions you may have. However, if you are having trouble, you may find an easy solution below. Otherwise, refer to the Frequently Asked Questions (FAQs) on the CD (click **Support**), or visit our web site for the latest tips: **www.zoom.com***

Connection Troubleshooting Tips

I installed the software and connected the X5v gateway to my phone line, but I cannot connect to the Internet.

If the X5v's **LINK** light continually blinks and does not stay solidly lit, make sure that:

- The RJ-11 phone cord is firmly plugged into the wall jack and the **ADSL** port on the back of the X5v (*not* the **PHONE** port).
- The RJ-11 phone cord is connected to a DSL-enabled phone jack. You cannot use a standard telephone jack for DSL service unless your service provider has activated it for DSL.
- Your RJ-11 phone cord may be defective. Replace the phone cord with a known good one.
- Your Ethernet or USB are okay. Check that the correct X5v front panel light is lit (**LAN** or **USB**). This will confirm that the connection is good.
- You have installed phone filters on all the phones and fax machines using the same DSL line as the X5v. These devices can produce noise and interfere with your DSL connection.
- You may have inadvertently changed your X5v's DSL configuration values. If you think this may be the case, using a paper clip, press the **RESET** button on the X5v's back panel. While holding in this button, count to five, and then release the button. The front panel **LINK** light will turn off and then blink slowly, about once per second. You are now guaranteed

that all system settings are restored to the unit's factory defaults. (Note: If you had changed your VPI, VCI, or encapsulation settings since purchasing the X5v, you need to re-enter this information; refer to page 11 if you need help).

- The X5v's ADSL Handshake Protocol setting may need to be changed. The X5v uses a **MultiMode** setting to automatically connect to most types of DSL service providers' equipment. You may want to try forcing the different protocols to try to connect. In the **Advanced Setup** page, click **ADSL Configuration** to view the Handshake Protocol. One at a time, try each of the other settings, clicking **Save Changes and Reboot**.

If the X5v's **LINK** light is solidly lit but you can't connect to the Internet, make sure that:

- Your computer's TCP/IP properties are correct.

  Windows users:

  Open the Windows **TCP/IP Properties** dialog box (double-click the **My Computer** icon on your desktop and select **Help** if you don't know how to locate the **TCP/IP Properties** box).

  If you are using DHCP (dynamic IP addressing): Make sure that **"Obtain an IP address automatically"** and **"Obtain a DNS server address automatically"** are selected. All other fields should be blank.
  If you are using a static IP address: Make sure that both the Default Gateway IP address and the DNS server IP address match the LAN IP address of the X5v. (See page 21 for an illustration of the Windows XP and 2000 **TCP/IP Properties** dialog box.)

  Macintosh users: TCP/IP instructions are on page 74.

  Linux users: TCP/IP instructions are on page 75.

- You have entered the proper VPI, VCI, and Encapsulation Mode settings for your DSL service provider. Refer to the tables beginning on page 69.
- You have typed your DSL Username and Password correctly.
- Your service provider's DSL connection is functioning properly by placing a call to customer support.

I type http://10.0.0.2 into my Web browser's address bar, but the X5v's Network Password box won't open so I can't communicate with the X5v.

- If you are using a Macintosh or Linux computer, your Internet settings may need adjustment; turn to page 74 for instructions.
- If you are using Mac OS X 10.3 and above, renew your IP address: Go to **System Preferences | Network**. Click the **Configure** button and then the **Renew DHCP Lease** button.
- If you are using a Windows computer, perform a Release/Renew operation.

  For Windows 2000/XP: From the desktop, click **Start |(All) Programs | Accessories | Command Prompt**. Then type **ipconfig /all** and press Enter. In the subsequent dialog box, make sure the NIC adapter is highlighted in the dropdown list, click **Renew** and then click **Release**. Then type 10.0.0.2 into your browser's address bar, and the Network Password box should display.

  For Windows 95/98/Me: From the desktop, click **Start | Run**, type **winipcfg**, and click **OK**. In the subsequent dialog box, make sure the NIC adapter is highlighted in the dropdown list, click **Renew** and then click **Release**. Then type 10.0.02 into your browser's address bar, and the Network Password box should display.

VoIP and Phone Troubleshooting Tips

When I pick up the phone, I don't hear a dial tone.

The dial tone you hear when you first pick up your phone comes from the local Phone Company. Check that:

- You have installed any phone adapters required for your country.
- Your DSL line is firmly plugged into the telephone wall jack.

If you have another phone jack for the same phone line, plug your phone into that jack, and make sure you hear a dial tone. If you don't, contact your local phone service provider. If you do, then check that:

- Your phone company has provisioned your DSL line to support phone calls made over the PSTN. If you do not know the answer, you will have to contact the company's customer support department.
  If your phone service provider does not or cannot support a PSTN connection, you will need to go to the X5v's **VoIP** page and select **VoIP only** mode. Then pick up the phone, and you should get a dial tone.

When I pick up the phone and press #, I don't get a VoIP dial tone.

Your X5v may be in VoIP only mode. If so, you shouldn't press **#** to begin a call.

Your Internet Protocol connectivity may not be working. Try browsing the Internet. If you can't, refer to the **Connection Troubleshooting Tips** above.

Check that your VoIP service is properly configured.

- If your service supports automatic configuration downloads, go to the X5v's **VoIP** page to see if the X5v has received a configuration download. If not, press the **Download Configuration Now** button, or reboot the X5v.
- If your service doesn't support automatic configuration downloads, double-check all the settings for your account and service provider on the **VoIP page**.

If none of the above helps, contact your VoIP service provider

When I try to make a VoIP call to another VoIP phone, the call doesn't go through.

The person or persons you are calling may not be available. Try again later. Or, if there is a chance you may have the wrong number, go to the provider's web site and check the directory.

Check if the person you are trying to call uses the same VoIP service as you. If not:

- You will have to precede your call by dialing a code for that person's VoIP service. Ask the person you are attempting to call for the code, or check the service provider's web site for a list.
- In some cases, there may not be a way to make direct VoIP calls from your service to people subscribing to another VoIP service. Check the web site, or email your provider.

When I try to make a VoIP call to a standard PSTN number, the call doesn't go through.

Make sure that:

- You have signed up for PSTN service with your VoIP service provider. Contact your provider's customer support department if necessary.

- You are dialing according to the guidelines your service provider gave you. Your provider's web site should provide instructions and examples. For instance, you may need to dial local calls as though they were long distance. Or, you may need to dial a call within your country as though you were calling from outside the country—beginning with an international prefix such as 00, followed by the country code, city code or area code, and local number.
- You aren't taking too long between digits when you dial a number. If you take a very long time, the X5v may register that you have completed dialing before you are through. If this is a possibility, hang up and try again.

When some people call me, my Caller ID display doesn't work.

Some phones that display caller ID are very sensitive to ring type. If you are using the VoIP version of the ring and tone sounds but find that the Caller ID display on your phone is unreliable, try switching back to the standard ring and tone configuration. See page 34 for instructions.

The Caller ID setting may not be set to the right value for your phone. You have one of two choices, Bell 202 or V.23. Go to the X5v's **Voice over IP** page and click the **Advanced VoIP Setup button** to check your setting.

Your service provider may not pass through caller information for all calls, in particular, DID calls to your VoIP connection that come from the PSTN. Check with your provider's customer support.

My phone's ring sounds strange.

If you don't like the ring, you can change it. Go to the X5v's **VoIP** page and click **Select Tone & Ring by Country/Region** (see page 34 for instructions on changing your ring). **Note:** Some country selections include two choices, one of which is a special VoIP ring. This ring sounds a little different from the standard ring for that country or region.

When I start to dial, I sometimes forget whether I'm dialing over the PSTN or over the Internet (VoIP).

The X5v has a distinctive, lower-pitched dial tone when it is in VoIP mode, compared to the standard phone dial tone for your country. If you do not notice the X5v's change in dial tone after you press **#** to begin a VoIP call, we recommend that you change your VoIP dial tone to make it more easily recognizable. See page 34 for help changing your ring tones.

Sometimes it's hard to understand people on VoIP calls.

If you are making or receiving VoIP calls during a period when there is very heavy Internet traffic, you may notice an effect on voice quality. For example, you may encounter a delay in hearing the other person talk, or there may be brief intervals where it's difficult to understand what the other person is saying. Sometimes this is unavoidable. Your service or some other connecting link between you and the person you are calling may become congested. If someone is using the ADSL line to download or upload large files—music or video files, for example—while you are on the phone, it may affect voice quality. You may want to avoid this situation.

Appendix E
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 warranty 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.

Industry Canada Emissions Statement

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Industry Canada CS03 Statement

Notice: The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing the equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of concern. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas. Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Notice: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

European 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. This product is CE Marked.

CE

Directive	Standard	Test Report
73/23/EEC-Low Voltage	EN 60950 : 2000 IEC 60950 : 3e éd. 1999	electrical safety
89/336/EEC-EMC	EN 55024 : 1998 EN 55022 : 1998	EMC-immunity EMC-emissions

Electrostatic Discharge Statement

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

Note: If you do not use the supplied phone cord, use an equivalent of minimum AWG 26 line cord.

CAUTION: To reduce the risk of fire, use only No. 26 AWG or larger UL Listed or CSA Certified Telecommunication Line Cord.

Additional compliance information is located on the CD.