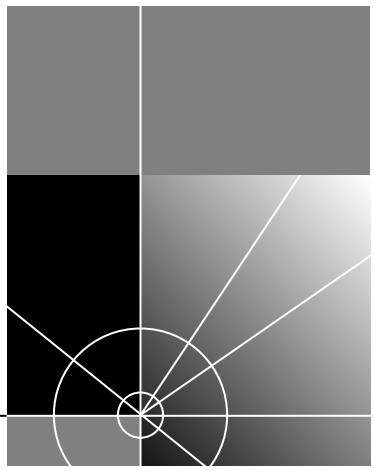
OfficeConnect®
56K LAN Modem

3C886

User Guide



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IMPORTANT SAFETY INFORMATION

WARNING: *Warnings contain directions that you must follow for your personal safety. Follow all instructions carefully.*

Please read the following information carefully and thoroughly before installing the unit:

- Take exceptional care during the installation and removal of the unit.
- Use the power adapter supplied with the unit to ensure compliance with national safety standards.
- Disconnect the power adapter before moving the unit. Power can only be disconnected from the unit by removing the power adapter from the unit or from the socket outlet.
- There are no user-replaceable fuses or user-serviceable parts inside the unit. If there is a physical problem with the unit that cannot be solved with problem solving actions in this guide, contact the 3Com reseller from whom the equipment was purchased.
- If the units are stackable, only stack similar units.

Additional Safety Information

- Only connect apparatus complying with the relevant interface requirements to the ports on this unit.
- Retain this user's guide for later use and pass it on in the event of change of ownership of the unit.
- Protect the unit from sudden, transient increases and decreases in electrical power by fitting an in-line surge suppressor or uninterruptable power supply. Products manufactured by us are safe and without risk provided they are installed, used and maintained in good working order in accordance with our instructions and recommendations.
- If any of the following conditions occur, isolate the electricity supply and refer to your 3Com reseller.
  - If the case or cover is not correctly fitted or if it is damaged.
  - If the unit begins to make an odd noise, smell or smoke.
  - If the unit shows signs of a distinct change in performance.
- Never install telephone wires during a lightning storm, or install telephone connection sockets in wet locations, unless the socket is specifically designed for wet locations.
- Do not touch uninstalled telephone wires or terminals unless the telephone line has been disconnected at the network interface. Always exercise caution when installing or modifying telephone lines.
- Do not use a telephone, which is connected to the unit, to report a gas leak in the vicinity of the leak.
- Do not spill food or liquids on the unit. If the unit gets wet, isolate the electrical supply and contact your 3Com reseller.
- Do not push any objects into the openings of the unit. Doing so can cause fire or electric shock by shorting out internal components.
- Only equipment approved for use by your telephone company can be connected to the telephone port.
- Avoid using a telephone, which is connected to the unit (other than a cordless type), during an electrical storm.
- Equipment connected to the telephone port must be located in the same building as the unit.

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- Be sure nothing rests on the unit's system cables and that the cables are not located where they can be stepped on and cause damage to the unit.
- Keep the unit away from radiators and heat sources. Allow 1 inch (25mm) around the unit to provide adequate air circulation.
- Install the unit in a clean area that is free from dust or extreme temperatures.
- Allow a clearance gap of at least a 6 inches (150 mm) from the rear panel of the unit, to allow for cable access.
- Interconnecting directly, or by way of other apparatus, to ports complying with SELV requirements may produce hazardous conditions on the network. Advice should be sought from a competent engineer before such a connection is made.

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3COM CORPORATION LIMITED WARRANTY

FCC CLASS B STATEMENT

FCC DECLARATION OF CONFORMITY

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ABOUT THIS GUIDE

About This Guide provides an overview of this guide, describes guide conventions, and tells you where to look for specific information.

Introduction

This guide describes how to install and configure the 56K LAN Modem and provides descriptions of key applications and networking concepts.

Audience Description

This guide is intended for end users with no presumed level of expertise.

How to Use This Guide

This table shows where to find specific information in this guide.

Table 1 Specific Information

If you are looking for...	Turn to...
An overview of the 56K LAN Modem	Chapter 1
An explanation of the 56K LAN Modem's key functionality	Chapter 2
A description of the 56K LAN Modem's hardware components	Chapter 3
Instructions on setting up TCP/IP	Chapter 4
Instructions for basic configuration of the 56K LAN Modem software	Chapter 5
Instructions for advanced configuration	Chapter 6
Information on placing, receiving and disconnecting calls	Chapter 7
Information on troubleshooting and maintenance	Chapter 8
Background information on networking	Appendix A
Information on using the custom browser	Appendix B
56K LAN Modem factory default settings	Appendix C
Technical specifications for the 56K LAN Modem	Appendix D
Glossary definitions for terms used in this guide	Glossary

Conventions

Table 2 and Table 3 list conventions that are used throughout this guide.

Table 2 Notice Icons

Icon	Notice Type	Alerts you to...
	Information note	Important features or instructions
	Caution	Risk of personal safety, system damage, or loss of data
	Warning	Risk of severe personal injury

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Table 3 Text Conventions

Convention	Description
Commands	The word "command" means you must enter the command exactly as shown in text and press the Return or Enter key. Example: To remove the IP address, enter the following command: **SETDefault!0 -IP NETaddr = 0.0.0.0** **NOTE:** *This guide always gives the full form of a command in uppercase and lowercase letters. However, you can abbreviate commands by entering only the uppercase letters and the appropriate value. Commands are not case-sensitive.*
The words "enter" and "type"	When you see the word "enter" in this guide, you must type something and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says "type."
[Key] names	Key names appear in text in one of two ways: ■ Referred to by their labels, such as "the Return key" or "the Escape key" ■ Written with brackets, such as [Return] or [Esc]. If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press [Ctrl]+[Alt]+[Del].
Menu commands and *buttons*	Menu commands or button names appear in italics. Example: From the *Help* menu, select *Contents*.
Words in *italicized* type	Italics emphasize a point or denote new terms at the place where they are defined in the text.
Words in **bold-face** type	Bold text denotes key features.

Year 2000 Compliance

The OfficeConnect LAN Modem is Year 2000 compliant. Specifically, its system clock is capable of accepting and storing dates including and beyond the year 2000. For information on Year 2000 compliance and 3Com products, visit the 3Com Year 2000 web page: **http://www.3com.com/products/yr2000.html**

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1 INTRODUCTION

This chapter provides an overview of the OfficeConnect® 56K LAN Modem, referred to throughout this document as the 56K LAN Modem or simply as the LAN Modem.

Introduction

The 56K LAN Modem is an easy to install, Local Area Network (LAN) to Wide Area Network (WAN) personal analog IP router. The LAN Modem provides four built-in 10BASE-T Ethernet connections for the LAN, while utilizing the V.90 ITU 56K standard for WAN access. Combining the 56K LAN Modem with an additional external hub allows total WAN connectivity for up to 25 users.

With the 56K LAN Modem, small office and home office users can share remote access to the Internet or to a corporate LAN while continuing to network locally.

56K Access

33.6 Kbps was once thought to be the practical limit for speed over standard analog phone lines. Now, the V.90 56K ITU standard provides download speeds of up to 56K.[1] And your 56K LAN Modem is software upgradable, allowing easy upgrades to new features and enhancements as they become available.

For further information, visit 3Com's 56K web site at **http://www.3com.com/56k**.

Applications

The primary applications for the 56K LAN Modem are:

- Local networking with shared access to the Internet
- Local networking with shared access to a remote office LAN

1.Capable of receiving at up to 56 Kbps and sending at up to 33.6 Kbps. Due to FCC regulations, receiving speeds are limited to 53 Kbps. Actual speeds may vary. Requires compatible phone line and server equipment. The 56K LAN Modem complies with the V.90 ITU standard and is backwards compatible with all US Robotics 56K standards. Standard officially determined in February, 1998; ratification expected in September, 1998.

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Local Networking with Access to the Internet

Users can share access to the Internet while continuing to network locally, as shown in Figure 1.

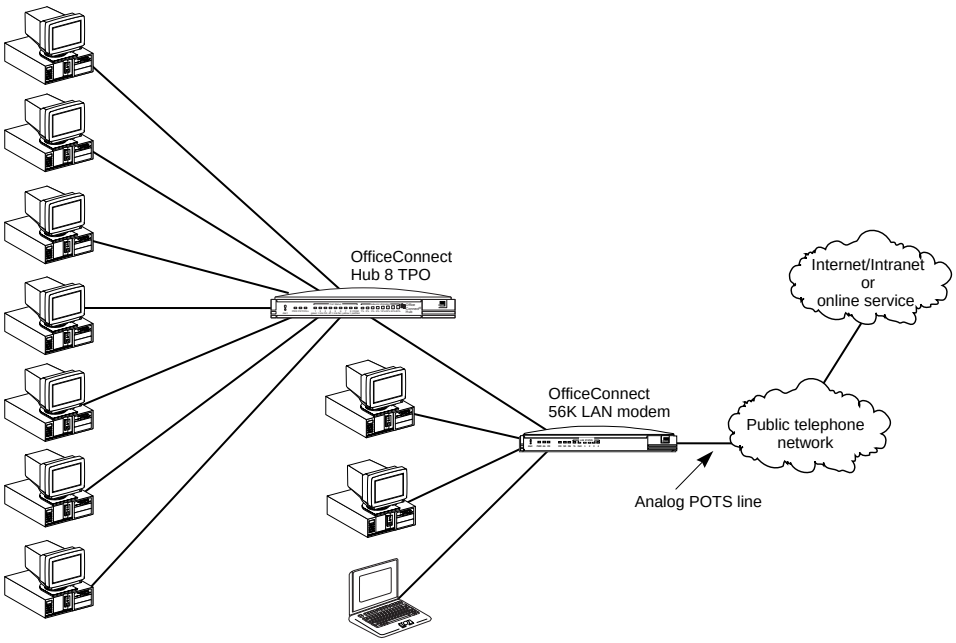

Figure 1 Local Networking with Internet Access

Local Networking with Access to a Remote Office

Users can share access to a remote office LAN while continuing to network locally, as shown in Figure 2.

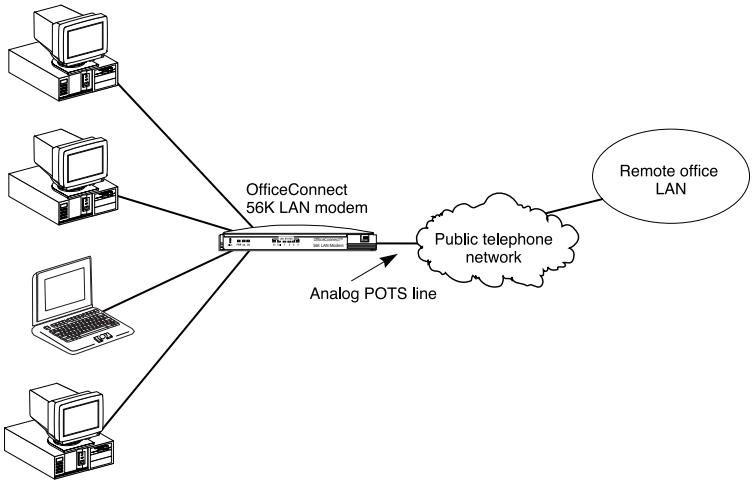

Figure 2 Local Networking with Access to a Remote Office LAN

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Features

Ease of Installation and Use

- Web-based, point-and-click user interface for easy configuration
- Automatic Internet configuration verification via your Internet Service Provider (ISP)
- Web-based, context-sensitive online help

High Performance

- Internal 56K modem, capable of transmitting at speeds up to 33.6 Kbps and downloading at speeds up to 56 Kbps[1] (without compression)
- V.42/MNP 2-4 error control and V.42 *bis*/MNP 5 data compression
- Hi/fn™ LZS® compression, which conforms to the following IETF RFCs: *The PPP Compression Control Protocol* (RFC 1962) and *PPP Stacker LZS Compression Protocol* (RFC 1974)

Connectivity

- One 56K integrated analog modem
- Built in four-port 10BASE-T, 10 Mbps Ethernet hub. Up to 25 users can be supported by connecting to an external eight port-hub
- One pass through analog voice port for connecting an external analog device

Routing

- IP Routing
- Dynamic or static IP addresses supplied by your service provider (WAN side)
- Dynamic Host Configuration Protocol (DHCP) server functionality on the LAN, which automatically assigns an IP address to a newly-attached PC on the IP network
- Domain Name Service (DNS) server functionality for the LAN, which translates the common, alphanumeric name of a device (for example, “www.3com.com”) to its numeric IP address
- Network Address Translation (NAT) between LAN and WAN, which allows multiple users on the LAN to share a single remote connection
- Multiplexing traffic from several computers to the same remote destination
- LAN access to the Internet using a single-user account

Bandwidth Management

- Dial on Demand (Automatic call connection)
- Automatic disconnection of idle calls after a user-specified length of time
- Manual call connection and disconnection

Remote Management

- Remote management via Web browser-based interface
- Remote firmware upgrades

1.Current FCC rules limit download speeds to 53Kbps.

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Protocols

- IETF PPP (RFC 1661, 1662, 1663)
- IETF Password Authentication Protocol (PAP) and Challenge Handshake Authentication Protocol (CHAP) security (RFC 1994)
- MS-CHAP support (as defined in *Network Working Group Information Memo: Microsoft PPP CHAP Extensions. S. Cob, Rev. 1.3 March 1997* including only the functionality that keeps with IETF 1994).
- IP address negotiation using IPCP (RFC 1332)
- Network Address Translation (NAT) between LAN and WAN (RFC 1631)
- Point-to-Point Tunneling Protocol (PPTP)

Error Control and Data Compression

- ITU-T V.42
- ITU-T V.42*bis*
- MNP 2-5

Modulation Schemes

- V.90
- Backwards compatible with all US Robotics 56K Standards
- ITU-T V.34+
- ITU-T V.34
- ITU-T V.32bis
- ITU-T V.32
- ITU-T V.22bis
- ITU-T V.22
- ITU-T V.23
- Bell 212A
- ITU-T V.21
- Bell 103

Security

- PAP CHAP and MS-CHAP support

Upgradability

- Flash memory for field firmware updates
- Firmware posted on 3Com's Web site
- Fully upgradable to future 56K standards

Diagnostics

- LED status display
- Statistics display

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Warranty

- 3Com Corporation Limited Warranty (refer to the end of this User Guide for details)

Support for Internet Applications

Your 56K LAN Modem supports applications that use the User Datagram Protocol (UDP) and the Transmission Control Protocol (TCP). This protocol is used primarily by Internet games.

Look for the latest list of Internet applications and games that interoperate with the LAN Modem at
http://www.remoteaccess.3com.com/support/docs/lanmodem/welcome.html

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2 56K LAN MODEM FUNCTIONALITY DESCRIPTION

This chapter provides a description of the 56K LAN Modem's key functionality, covering the following topics.

- Connection Types
- Call Routing Protocol and IP Address Translation
- Understanding PPTP

Connection Types

This section discusses LAN side and WAN side connections.

56K Technology

Your 56K LAN Modem utilizes the V.90 56K ITU standard, which is backward compatible with all US Robotics 56K standards, and is capable of download speeds of up to 56K[1]. V.90 technology takes advantage of the typical network configuration found when an analog modem dials into a digitally connected Internet Service Provider. Because it requires no analog-to-digital conversions in the downstream path (which can cause line noise), V.90 can use nearly all of the available 64K network bandwidth. (Upstream data, typically less speed sensitive, travels at the standard V.34 rate.)

Further information is available in Appendix A of this User Guide, or visit the 56K web site at **`http://www.3com.com/56k`**.

LAN Side Connection

On the LAN side, up to four users can connect to the 56K LAN Modem's built in Ethernet hub, or up to 25 users may connect to the 56K LAN Modem via an external user-supplied hub, enabling users to share files and printers and to use Internet email. An example of ten workstation connections is shown in Figure 3.

1.Capable of receiving at up to 56 Kbps and sending at up to 33.6 Kbps. Due to FCC regulations, receiving speeds limited to 53 Kbps. Actual speeds may vary. Requires compatible phone line and server equipment. The 56K LAN Modem complies with the V.90 ITU standard and is backwards compatible with all US Robotics 56K standards. Standard officially determined in February, 1998; ratification expected in September, 1998.

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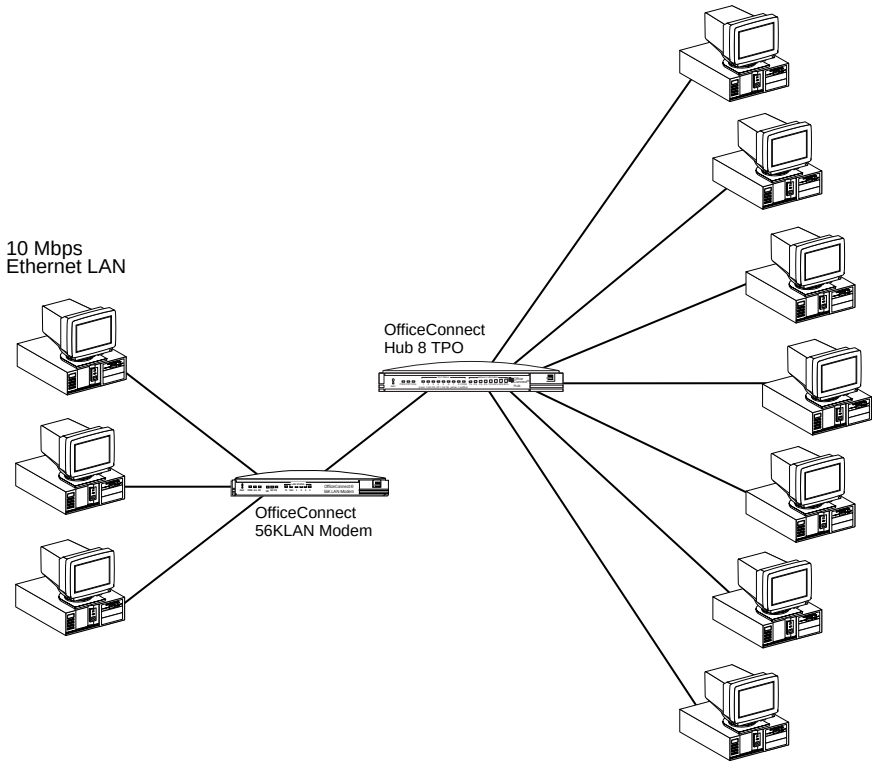

Figure 3 56K LAN Modem Ten Workstation Connection Example

An example of the minimum number of connections is shown in Figure 4.

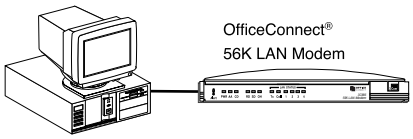

Figure 4 56K LAN Modem Minimum Connection Example

Application Sharing over the LAN

Most operating systems such as Windows 95, 98 and MacOS provide the capability for LAN users to share applications, files and printers between computers. For example, if only one computer has a Web browser, other LAN users may share the browser for accessing the Internet. Note that speed will likely be reduced when sharing applications. Refer to your operating system documentation for instructions on setting up sharing between users on a LAN.

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WAN Connection

The 56K LAN Modem allows up to 25 users to connect to a WAN using one analog connection to a single location.

One High Speed Connection

The WAN connection may be utilized by a single user to connect to a remote site such as a corporate LAN, as shown in Figure 5.

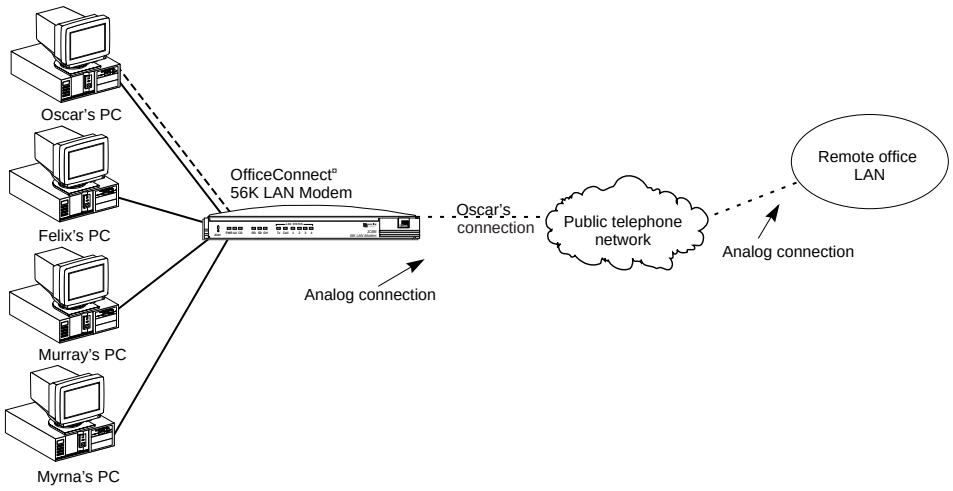

Figure 5 Single User Connecting to a Remote Site

Sharing the Connection

Once the call is established, up to four users may share the single connection created by the call over the LAN Modem's four-port built in hub. Or, up to 25 users may share this connection over an external hub. Figure 6 shows two users on the LAN accessing the Internet through the same Internet provider and over the same connection. If you desire, you may also restrict access to certain users. Note that speed may be affected with multiple users downloading simultaneously.

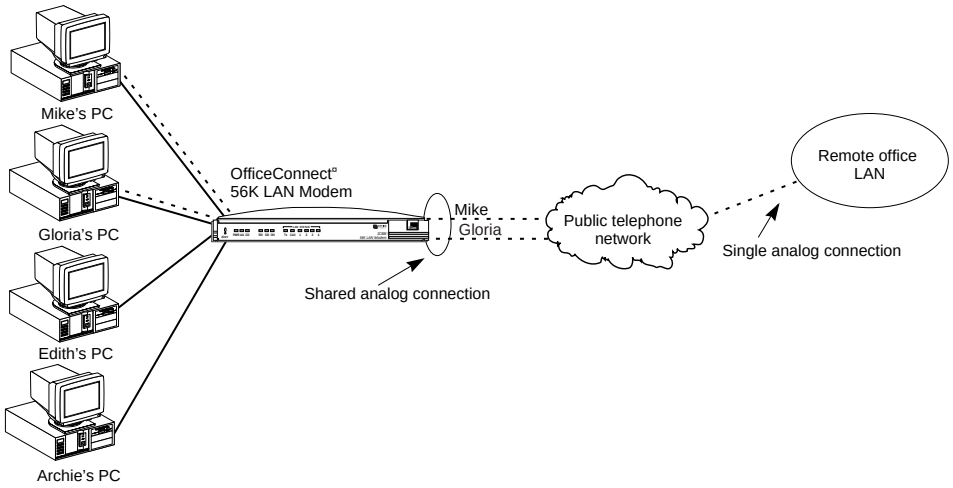

Figure 6 Shared Connection to a Remote Site

Your 56K LAN Modem is capable of supporting WAN access for up to 25 users. However, for improved performance it is recommended that no more than four users attempt to share a single connection at one time.

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Call Routing Protocol and IP Address Translation

This section describes the call routing protocol used by the 56K LAN Modem and explains how IP addresses are translated.

Placing a Call to a Previously Defined Destination

The 56K LAN Modem distinguishes between three types of destinations:

- A direct connection to an **Internet Service Provider**
- A direct connection to a **Remote Office LAN**
- A direct connection to a **Remote Office LAN with Internet Access**

If all of these connection types are configured on the 56K LAN Modem and are associated with your computer, the following algorithm is performed for each of the following scenarios.

Call Routing While No Other Calls are Connected

If the 56K LAN Modem has not established any calls to a remote destination and you want to access the Internet from your computer, you simply launch your Web browser (or whichever networking application you like). When the 56K LAN Modem receives the information packet requesting access to the WAN, it must determine which connection type to use. The LAN Modem looks at the destination Network ID (destination IP address and subnet mask) associated with the packet. If the Network ID of the packet matches the Network ID of the Remote Office LAN, with or without Internet access, then the call is placed to the remote LAN. If it does not match the Network ID of the remote LAN, with or without Internet access, then the call is routed to the direct ISP connection.

Once the connection is established, any authorized user on the LAN can use this connection. The 56K LAN Modem will translate each individual user's local IP address into a single, shared IP address (assigned by the remote location), allowing shared access to the remote location. The following example shows three users sharing a connection to the Internet and depicts the IP address translation as it occurs in the LAN Modem.

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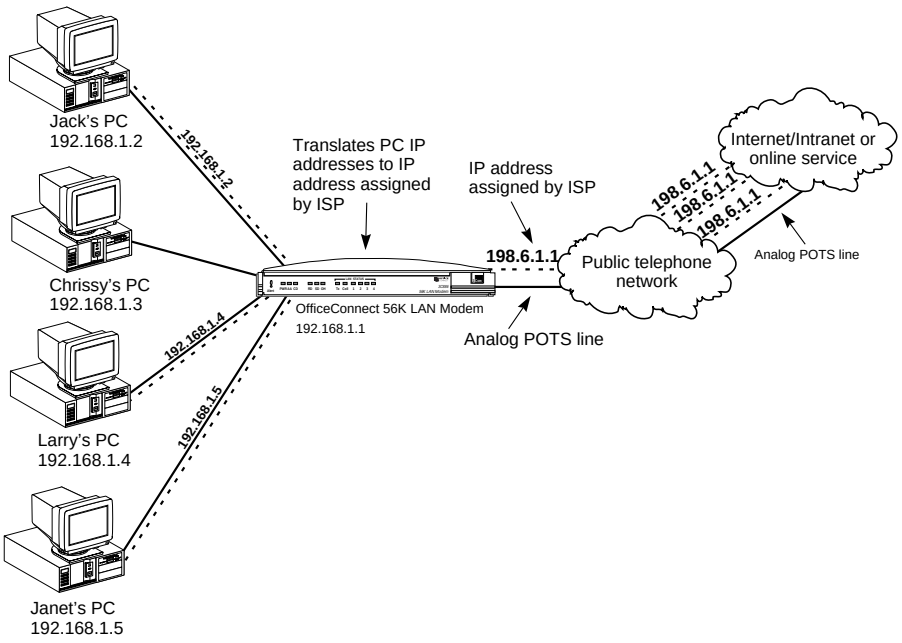

Figure 7 IP Address Translation

Understanding VPNs and PPTP

Virtual private networks (VPN) are private, secure networks created in public networks such as the Internet. A VPN is essentially a secure, private tunnel within the Internet. Since VPN calls are placed through a local ISP, they eliminate long distance charges that would occur from directly dialing to a remote private network.

One of the protocols which enables a VPN to be created is PPTP. The PPTP protocol allows for multiple workstations to establish a secure multi-protocol connection to a remote, private network via a single, locally-dialed ISP account as shown in Figure 8. Any networking protocols such as IP, IPX and NetBEUI can be supported transparently through the tunnel. While the LAN Modem supports PPTP, it does not play an active role in creating or terminating a tunnel.

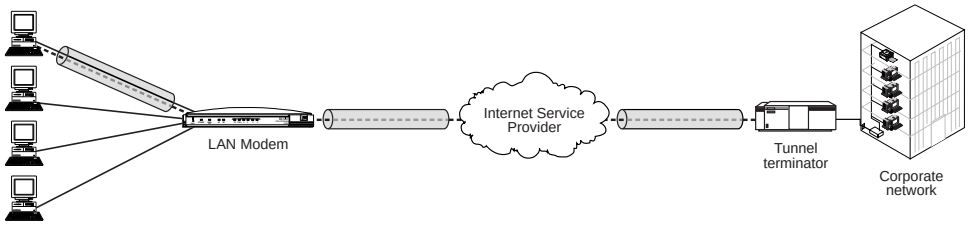

Figure 8 Connection to an Remote Private Network via an ISP

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The main steps for creating a VPN are as follows. Each step is explained in detail in subsequent sections.

- Set up the server side of the tunnel connection
- Set up the client side of the tunnel connection
- Initiate a tunnel between client and server using your client software

Setting Up the Server Side of the Tunnel

In order to establish a tunnel, the client side must be able to dial into a PPTP tunnel server on the remote private network such as a Windows NT server version 4.0 or later. If you use Windows NT 4.0, then Service Pack 3 or greater and RAS must be installed. Also, the protocols required for the private network must be installed on the PPTP tunnel server. It is recommended that an experienced network administrator set up the server side. Note that protocols required for the private network must be installed on each PPTP tunnel client as well as the PPTP tunnel server.

Setting Up the Client Side of the Tunnel

In order to establish a tunnel, the client side must have PPTP tunnel client software such as 3Com's NETBuilder, PathBuilder, Total Control Hub. An additional requirement is Microsoft's Windows Dial-Up Networking version 1.2 or higher which includes the required software VPN adapter, or Windows NT operating system with Service Pack 3, or Network TeleSystem's TunnelBuilder™ VPN software for Windows 3.11 and Macintosh operating systems. This software should reside on all workstations that wish to create a tunnel to the tunnel server. Follow instructions provided for installation and set up.

For Windows Dial-Up Networking Users

If you are using Windows Dial-Up Networking version 1.2 or higher, the basic set up steps are as follows. (Refer to Windows user documentation for details.)

- Install the PPTP protocol
- Create a RAS phone book entry for the VPN

  A RAS phone book entry is similar to other phone book entries with the exception of an IP address in the Phone number field. Once the Phone book entry is complete, you can double-click the icon to dial into a server that supports PPTP via any ISP.

Note that protocols required for the private network must be installed on each PPTP tunnel client as well as PPTP tunnel server.

Establishing a Tunnel via the LAN Modem

As with PPP, no configuration is required on the LAN Modem to use PPTP. However, you must have an ISP configured on the LAN Modem.

Once the client side and server side are configured, you are ready to create a tunnel. The steps required for creating a tunnel vary depending on which client software you are using. Refer to the user documentation provided with your PPTP software to determine how to establish a tunnel. For instance, if you are using Windows Dial-Up Networking version 1.2 or higher, double-click the phone book entry for the VPN.

Once you attempt to create a tunnel, the LAN Modem detects this attempt and automatically places a call to your ISP. Once the call is connected, a tunnel is established between your workstation and the tunnel server.

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You are ready to access a remote private network LAN as if you were connected locally. Each workstation that wishes to have access to the remote private LAN will need to create its own tunnel.

Refer to **http://www.remoteaccess.3com.com/support/docs/lanmodem** *for more information. For specific instructions on how to configure a VPN adapter in Windows 98, 95 or Windows NT, refer to Microsoft's Web site at* **http://www.microsoft.com**. *and then enter PPTP in the search field.*

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3 HARDWARE DESCRIPTION AND INSTALLATION

This chapter provides an overview of the hardware description and installation of the 56K LAN Modem.

Package Contents

The 56K LAN Modem package contents includes one of each:

- OfficeConnect 56K LAN Modem
- Power cable with an AC wall transformer
- Analog telephone cable
- 10BASE-T Ethernet cable
- *3Com Companion Programs* CD-ROM
- *OfficeConnect 56K LAN Modem Getting Started Guide*
- Rubber feet and stacking clips

Before You Install the 56K LAN Modem

To install, configure and use the 56K LAN Modem successfully, you must have the following:

- An available analog POTS (Plain Old Telephone Service) connection with an available RJ-11 outlet.
- A personal computer with TCP/IP and Ethernet connectivity that meets UL standards in the United States or is certified to CSA standards in Canada.
  - For a PC, a 386 or higher processor is recommended and a 10BASE-T Ethernet card is required.
  - For an Apple Macintosh computer, system 7.6 or later operating system and Open Transport (included in System 7.6 or later). Built-in Ethernet connectivity is provided through an Apple Ethernet port in all Power Macintosh computers.
- A frames-capable, JavaScript-enabled Web browser. A Web browser is required to access and configure your LAN Modem and to view the *OfficeConnect 56K LAN Modem User Guide*. You may use the customized browser provided on the *3Com Companion Programs CD-ROM,* or you may use any frames-capable Web browser, such as Netscape Navigator (3.0 and later) or Microsoft Internet Explorer (3.0 and later).

If you already have a version of Microsoft's Internet Explorer Web browser installed and would like to install a later version, you should first uninstall the older version. During installation, you may be asked to replace the older files. It is recommended that you do so.

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- TCP/IP software. TCP/IP is provided as part of the Windows 98, 95, NT and Macintosh System 7.6 and later operating systems. For Windows 3.11 users, TCP/IP software is provided on the *3Com Companion Programs* CD-ROM.

Available storage space on your computer's hard drive is not required because nothing is installed onto your computer as part of the 56K LAN Modem setup procedure. If you would like to copy any programs or documents from the included CD-ROMs, ensure that you have available hard disk space.

Front Panel LED Description

The front panel provides the following LEDs.

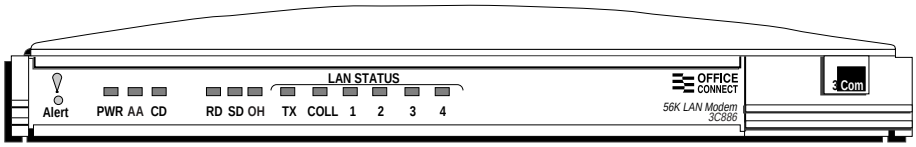

Figure 9 56K LAN Modem Front Panel

The functions of the front panel LEDs are described in Table 4. These front panel LEDs indicate proper operation and display 10BASE-T and analog port activity status.

Table 4 Front Panel LED Indicator Definitions

LED	Color	Description
Alert	Amber	**Operational Status.** Lit during power-on self-diagnostic test or after pressing the reset button.
		Off indicates the unit has passed the diagnostic test and is working properly.
		Flashes if one or more of the diagnostics have failed or after the unit is placed in firmware download mode and is awaiting firmware upgrade.
PWR	Green	**Power Indicator.** Remains lit as long as power is supplied to the unit.
AA	Green	**Auto Answer.** Indicates the 56K LAN Modem's answer mode.
		Flashes during an incoming call.
		Remains lit for the duration of the call.
		Off when the LAN Modem originates a call.
CD	Green	**Carrier Detect.** Remains lit if the 56K LAN Modem receives a valid data signal (carrier) from a remote modem (such as an ISP), indicating that data transmission is possible.
RD	Green	**Received Data**. Flashes when the LAN Modem receives data from a remote site.
SD	Green	**Send Data**. Flashes when the LAN Modem sends data to a remote site.
OH	Green	**Off Hook**. Remains lit when the modem has gone off hook.
TX	Green	**Ethernet Transmit Status.** Flashes green when data is being transmitted to the Ethernet LAN from the 56K LAN Modem .
		Off indicates that no data is being transmitted to the Ethernet LAN from the 56K LAN Modem.

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Table 4 Front Panel LED Indicator Definitions (continued)

LED	Color	Description
Coll	Amber	**Ethernet Collision Status.** Flashes amber when some collisions are taking place on the Ethernet LAN. Off indicates that no collisions are taking place on the Ethernet LAN.
Ports 1-4	Green	**Ethernet LAN Port Status.** On indicates that the unit detects the Ethernet link integrity signal from an attached computer and operation is normal. Flashes when the LAN Modem receives data on the associated port. Off indicates the unit does not detect the Ethernet link integrity signal. The Ethernet cable may not be properly connected or the cable may be the wrong polarity.

Back Panel Connector Description

The back panel provides the following components.

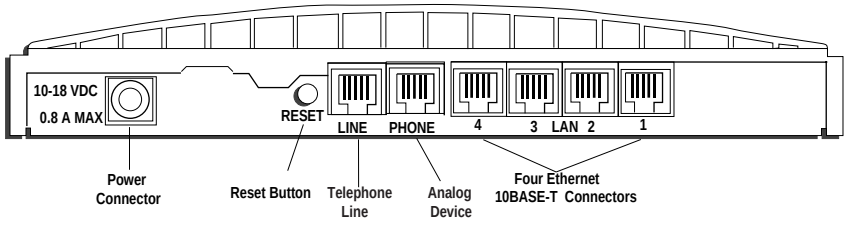

Figure 10 56K LAN Modem Back Panel

From left to right the back panel consists of the following.

- Power: Connect the power module cable to this port.
- Reset: Press this button to re-initialize the unit.
- Line: Connect the provided RJ-11 analog line from the wall outlet to this port.
- Phone: Connect an external analog device, such as a telephone or fax machine, to this port.
- Four 10BASE-T Ethernet Ports: Connect the computers on your LAN, or an external hub, to these ports.

Installing the 56K LAN Modem

This section describes how to do the following.

- Install the analog cable
- Connect to a 10BASE-T Ethernet LAN
- Install analog equipment
- Install the power cable

Before You Begin

Before you begin, you will need the following in addition to the 56K LAN Modem:

- RJ-11 (6-pin) to RJ-11 (6-pin) telephone cable which was provided in your modem package.

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- 10BASE-T Ethernet cable (8-pin to 8-pin connectors) labeled *Ethernet* which was provided in the package. It is recommended that you use the cable provided. However, if you choose to use another cable it must be a straight-through 10BASE-T Ethernet cable. A crossover cable may not be used to connect the LAN Modem to a workstation.
- Power adapter (you must use the power adapter provided in the package).

Installing the Analog Cable

To install the analog cable:

1. Connect one end of the RJ-11 analog cable to the RJ-11 analog port labeled *Line* on the 56K LAN Modem's back panel, as shown in Figure 11.

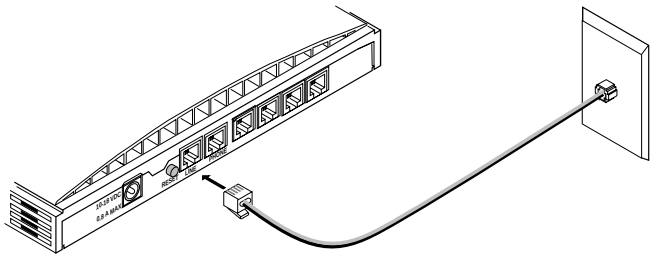

Figure 11 Analog Cable Connection

2. Connect the other end of the RJ-11 analog cable to a POTS analog wall jack.

Connecting to a 10BASE-T Ethernet Port

To connect a computer to the 56K LAN Modem, do the following.

1. Insert one end of the 10BASE-T Ethernet cable into one of the four LAN ports on the back of the 56K LAN Modem, as shown in Figure 12.

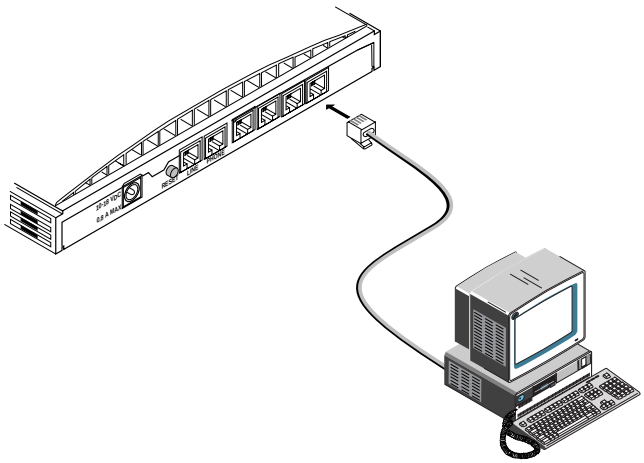

Figure 12 10BASE-T Ethernet LAN Connection

2. Insert the opposite end of the cable into your computer's 10BASE-T Ethernet port.

CAUTION: *Connect only one computer to the 56K LAN Modem for initial configuration. Once configuration is complete, you may connect the rest of the computers to the LAN.*

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Connecting to Another Ethernet Hub

You can connect to another Ethernet hub to allow up to 25 users to access the WAN. Instructions for adding another Ethernet hub to allow 10 users, a more common scenario, is as follows.

Before You Begin

In addition to an external 10BASE-T Ethernet hub, you will need a 10BASE-T Ethernet cable, which may have been provided with the additional hub. If the hub to which you are connecting your LAN Modem does not have an MDI/X switch, you must use a crossover cable.

1 Insert one end of the 10BASE-T Ethernet cable into one of the four LAN ports on the back of the LAN Modem, as shown in Figure 13.

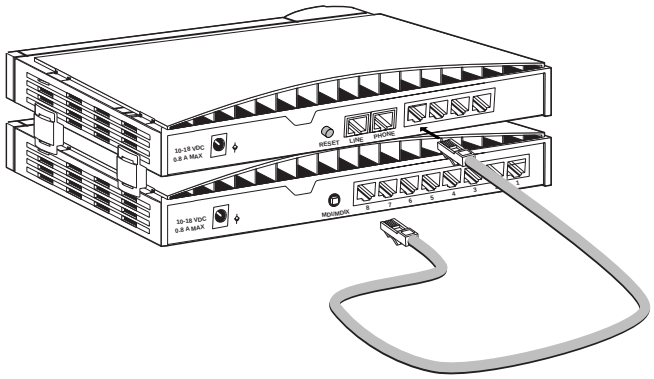

Figure 13 10BASE-T Hub-to-Hub Connection

2 Insert the opposite end of the cable into a 10 BASE-T Ethernet port on the other Ethernet hub.

If you are connecting to an OfficeConnect Hub 8/TPO, insert the opposite end of the Ethernet cable into port 8 and then set the MDI/X switch to MDI (that is, pressed in). Make sure that the LED associated with that Ethernet port is lit. If it is not, try changing the MDI/X switch setting.

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Installing Analog Equipment

You can connect an analog touch-tone telephone, answering machine, fax machine, or external analog modem to the 56K LAN Modem's pass-through Phone port.

You will need an RJ-11 to RJ-11 cable that came with the analog device for your analog phone port connection.

To install an analog device:

1 Insert one end of an RJ-11 cable into the port labeled *Phone* on the back of the 56K LAN Modem, as shown in Figure 14.

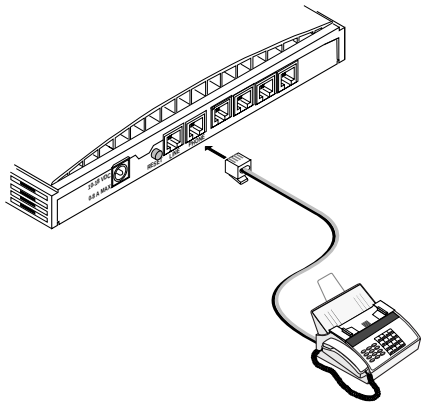

Figure 14 Analog Equipment Connection

2 Insert the other end of the RJ-11 cable into the appropriate RJ-11 port on the analog device.

Installing the Power Cable

To install the power cable:

1 Connect the 56K LAN Modem power module cable to the 10-18 VDC power connector on the back panel of the 56K LAN Modem, as shown in Figure 15.

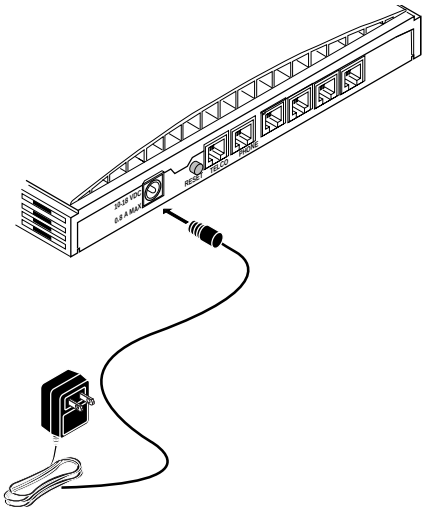

Figure 15 Power Cable Connection

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2 Plug the other end of the power module into a surge-protected standard 110 VAC wall outlet.

The PWR and AA indicator LEDs illuminate. The ALERT LED flashes momentarily as the unit undergoes a power-up self-test diagnostic. Once completed, only the PWR LED and LAN port LED remain lit.

This completes the 56K LAN Modem installation.

If you do not have TCP/IP installed and set up on your computer, refer to Chapter 4, "Setting Up TCP/IP for Windows and Macintosh." If you already have TCP/IP installed and set up on your computer, refer to Chapter 5, "Configuring the 56K LAN Modem."

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4 SETTING UP TCP/IP FOR WINDOWS AND MACINTOSH

This chapter describes how to set up the Windows and Macintosh operating system (OS) TCP/IP stack. Your computer must have a TCP/IP stack in order to use the 56K LAN Modem. If you already have TCP/IP installed and set up on your computer, then go on to Chapter 5. These instructions vary depending upon your particular operating system. Refer to the appropriate section.

- TCP/IP Setup Using Windows 95 and 98
- TCP/IP Setup Using Windows NT 4.0
- TCP/IP Setup Using Mac OS 7.6 or later
- TCP/IP Setup Using Windows 3.11

TCP/IP Setup Using Windows 95 and 98

Both Windows 95 and 98 provide TCP/IP as part of its standard operating system. To set up TCP/IP for the 56K LAN Modem, do the following.

You may be prompted for your Windows 95 or 98 installation disks or CD-ROM.

1 From the Control Panel, double click *Network*.

The Network dialog box appears.

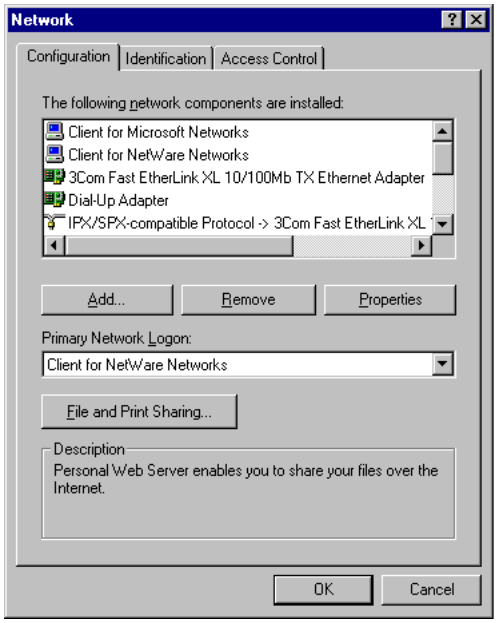

Figure 16 Network Dialog Box

2 Click *Add*.

The Select Network Component Type dialog box appears.

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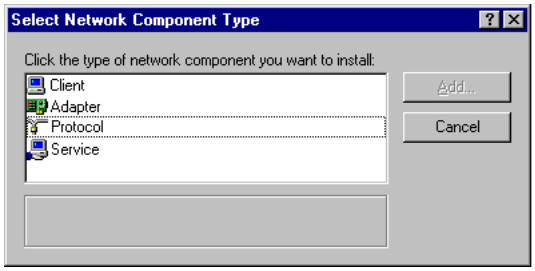

Figure 17 Select Network Component Type Dialog Box

3 Select *Protocol* and then click *Add*.

The Select Network Protocol dialog box appears.

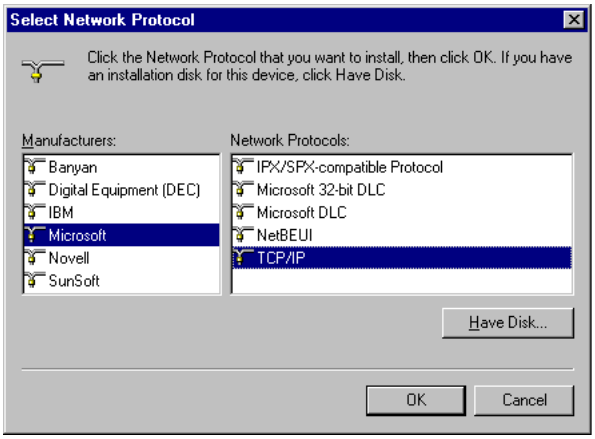

Figure 18 Select Network Protocol Dialog Box

4 From the Manufacturers list box, select *Microsoft*, and then from the Network Protocols list box, select *TCP/IP*.

5 Click *OK*.

6 From the Network Configuration list box, select *TCP/IP* and then click *Properties*.

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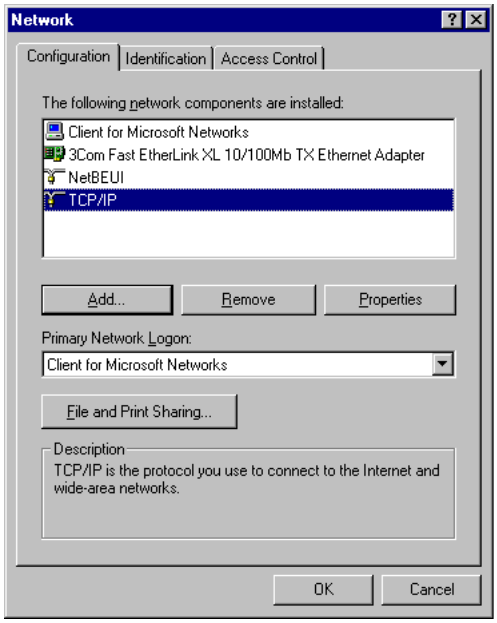

Figure 19 Network Dialog Box

7 Select *IP Address*.

The IP Address dialog box appears.

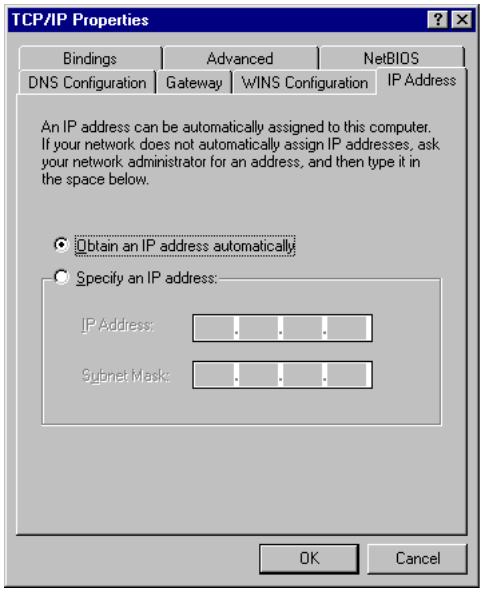

Figure 20 IP Address Dialog Box

8 Most users should select *Obtain an IP Address automatically* as most LANs utilize dynamic IP addresses. If this LAN uses static IP addressing, enter the IP address and subnet mask. (You can obtain this information from your system administrator or ISP.)

9 Select the *Advanced* tab.

The TCP/IP Properties Advanced screen opens.

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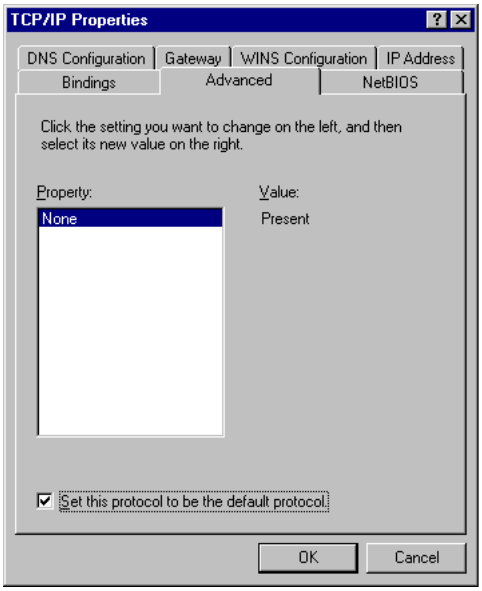

Figure 21 TCP/IP Properties Advanced Screen

10 Check the box to set TCP/IP as the default protocol.

11 Click *OK* to close the TCP/IP Properties dialog box.

12 Click *OK* to close the Network dialog box.

13 Restart Windows 98 or 95 to let these changes take effect.

TCP/IP Setup Using Windows NT 4.0

Windows NT 4.0 provides TCP/IP as part of its standard operating system. If you have not already set up TCP/IP, do the following.

You will need your Windows NT 4.0 installation CD-ROM.

1 From the Control Panel, double click *Network*.

The Network dialog box appears.

2 Select the *Protocols* tab, as shown in Figure 22.

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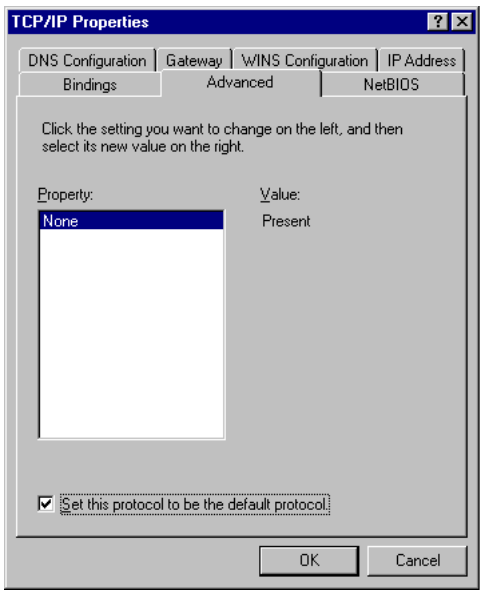

Figure 22 Windows NT Protocols Configuration Window

3 Click *Add*.

The Select Network Protocol window appears as shown in Figure 23.

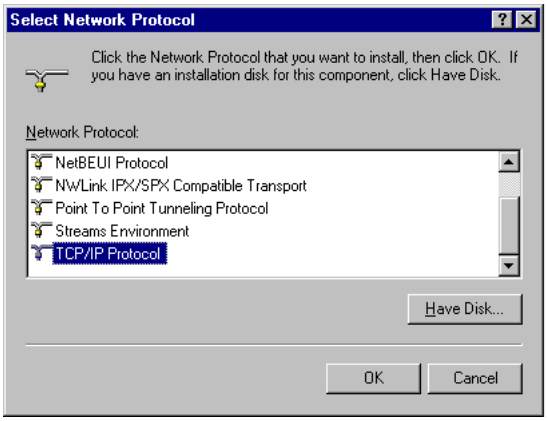

Figure 23 Select Network Protocol Window

4 Select *TCP/IP Protocol* and then click *OK*.

The following message appears.

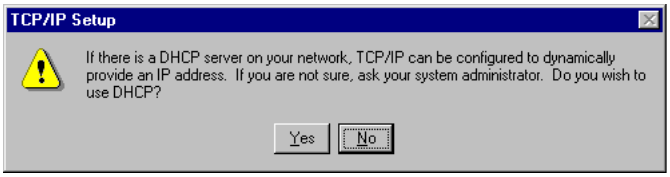

Figure 24 DHCP Message Box

5 Select the appropriate response for your network.

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If you are using dynamic IP addressing on your LAN and would like your LAN Modem to act as your DHCP server, select *Yes.* Note that you must select *Yes* if there is no other DHCP server on your LAN.

6 You are then prompted to insert your installation CD-ROM. Insert the Windows NT 4.0 CD ROM and then click *Continue*.

If you have Remote Access Service (RAS) installed on your PC after the appropriate files are copied to your PC, a message box asks whether or not you would like TCP/IP installed for RAS. If you select Yes*, you must select the device you want to access remotely and then click* Close*.*

7 After the appropriate files are copied to your PC, you will see TCP/IP Protocol listed in the Network Protocols group box, as shown in Figure 25.

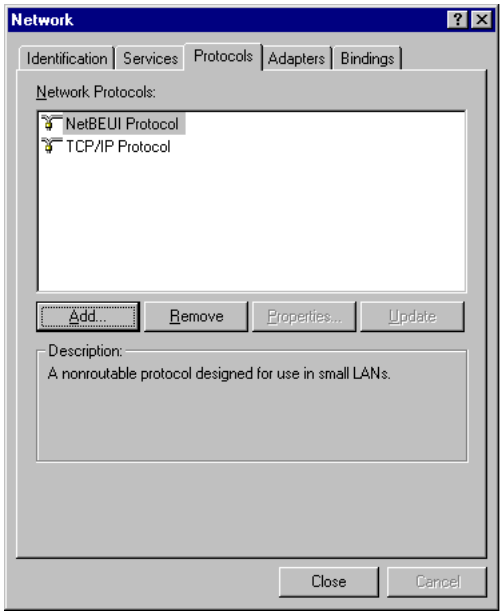

Figure 25 Network Protocols Window

8 Click *Close.*

The Microsoft TCP/IP Properties window appears, as shown in Figure 26.

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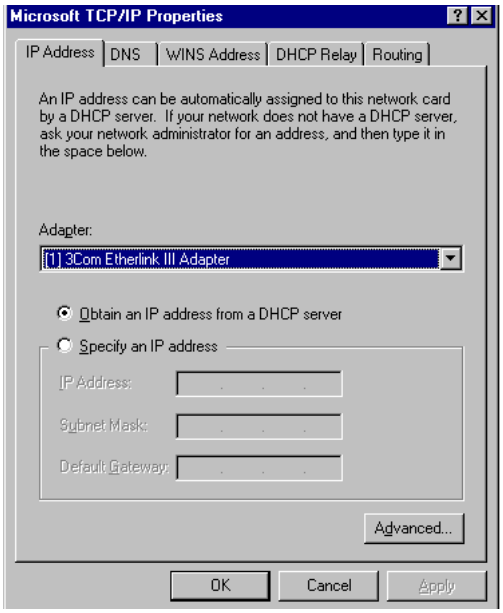

Figure 26 Microsoft TCP/IP Properties Window

9 From the Adapter drop down list box, select the Ethernet card that is connected to the 56K LAN Modem.

10 If this LAN uses dynamic IP addresses, select *Obtain an IP Address automatically*. If this LAN uses static IP addresses, enter the IP address and subnet mask.

11 Click *OK*.

12 Click *Yes* to restart your PC and allow the changes to take effect.

TCP/IP Setup Using Mac OS 7.6 or later

If you are using Macintosh operating system version 7.6 or later, Open Transport (OT) is provided and installed by default. If you did not install OT when first installing your system software, perform a custom installation of your system software to add OT version 1.1 or later.

To set up TCP/IP for Mac, do the following.

1 From the Apple menu, select *Control Panels* and then select *TCP/IP*.

The TCP/IP dialog box appears.

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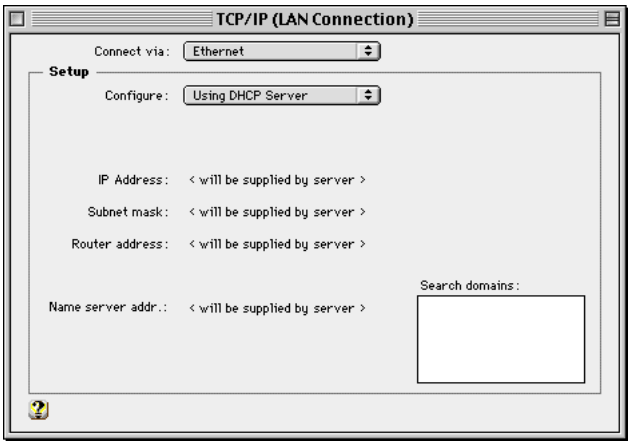

Figure 27 TCP/IP Dialog Box for Macintosh Computers

2 Select *Ethernet* from the *Connect via* drop down list box.

3 Most users should select *Using DHCP Server* from the *Configure* drop-down list box, as most LANs utilize dynamic IP addressing. If this LAN uses static IP addressing, select *Manually* and then enter the IP address.

TCP/IP Setup Using Windows 3.11

If you are using Windows 3.11, a TCP/IP stack may not be provided as part of the operating system. If you do not have a TCP/IP stack, you can use MS_TCP which is provided on the *3Com Companion Programs* CD-ROM.

Setting up TCP/IP using MS_TCP

To set up MS_TCP, do the following.

1 Install MS_TCP, located on the *3Com Companion Programs* CD-ROM, onto your hard drive.

2 From the Program manager, click *Network*.

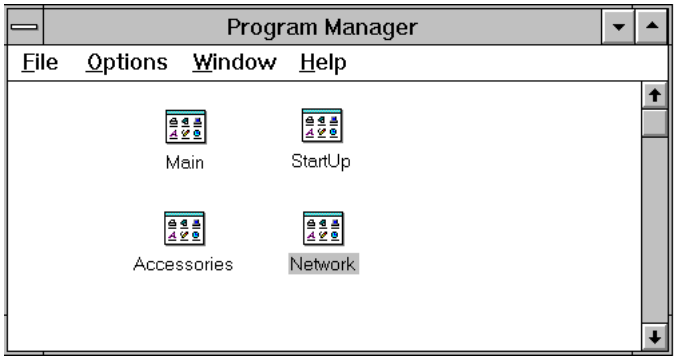

Figure 28 Program Manager Group Box

3 From the Network group box, click *Network Setup*.

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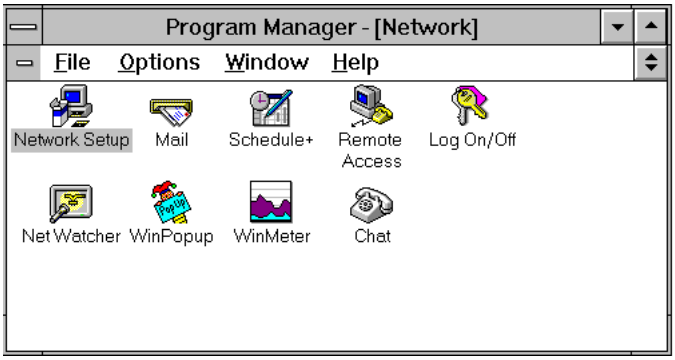

Figure 29 Network Group Box

4 From the Network Setup dialog box, click the *Drivers* button.

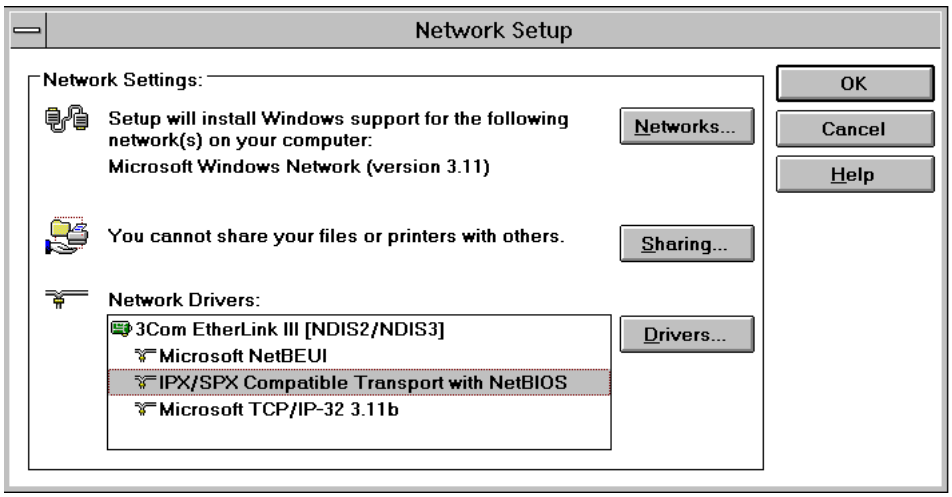

Figure 30 Network Setup Dialog Box

5 From the Network Drivers dialog box, click *Add Protocol*.

6 Select *Unlisted or Update Protocol* and then click *OK*.

7 From the Install Driver dialog box, enter the path to the MS _TCP directory.

For example, if you installed MS_TCP on your C: drive in a directory called MS_TCP, you would enter C:\MS_TCP.

8 Select *MS TCP/IP-32.X* and then click *OK* to install.

9 After the installation is complete, click *Close*.

10 Click *OK*.

11 From the MS TCP/IP Configuration dialog box, check the *Auto Configuration* check box and then click *OK*.

12 Restart your PC to allow the changes to take effect.

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5 CONFIGURING THE 56K LAN MODEM

This chapter describes the typical configuration procedure for your 56K LAN Modem. These steps include setting up your 56K LAN Modem and connecting to the Internet. If you have already followed the instructions provided in your *Getting Started Guide*, then you have already set up the typical configuration. Go to Chapter 6, "Advanced Configuration" to learn about additional configuration changes you might like to make.

The configuration windows shown in this chapter may differ slightly from what is displayed on your computer.

Typical Configuration

The typical configuration covers the following main steps.

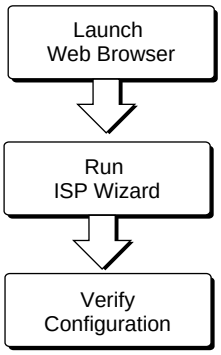

Figure 31 Main Steps for Typical Configuration

Before You Begin

Before you configure the 56K LAN Modem, you should have already completed the following:

- Installed the hardware as described in Chapter 3, "Hardware Description and Installation"
- Installed and set up TCP/IP on all the computers you intend to connect to the LAN Modem. If TCP/IP is not installed and set up, refer to Chapter 4.

CAUTION: *You should only have one computer physically connected to the 56K LAN Modem during configuration. Once you complete the initial configuration process, connect any additional computers you would like to have on the LAN.*

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You Should Have This Information

If you want to set up a connection to an ISP, you will need:

- Your ISP's telephone access number.
- Your user name, password and DNS address (if your service provider requires a specific DNS address).

Determine Whether You Use Dynamic or Static IP Addresses

Your setup procedure varies depending upon whether you are using a dynamic or a static IP address.

A static IP address is a permanent, manually-assigned address recognized by a remote server, such as a corporate LAN or an ISP. By default, your 56K LAN Modem dynamically assigns an IP address to each computer. If you have been accessing a remote server via a static IP address prior to installing your 56K LAN Modem, you may be required to perform additional configuration steps. The first step is to determine your static versus dynamic IP addressing scenario.

If you determine that your computer has a static IP address, refer to "Setting Up Your Computer If You Have a Static IP Address." If your computer has a dynamic IP address, you may begin configuring the 56K LAN Modem directly. Refer to "Configuring the 56K LAN Modem for the Typical Configuration".

Determine your IP address type as follows:

- **For Windows 95, 98 and NT 4.0 Users:** From the Start menu, select *Settings* and then *Control Panel*. Double-click *Network*. Select *TCP/IP* for the Ethernet card associated with your 56K LAN Modem and then click *Properties*. Select the *IP Address* tab.

  If the radio button labeled *Obtain an IP address automatically* (Windows 95 and 98) or *Obtain an IP address from a DHCP server* (Windows NT 4.0) is selected, then your computer has a dynamically assigned IP address. You are ready to continue directly with "Configuring the 56K LAN Modem for the Typical Configuration".

  If the radio button labeled *Specify an IP address* is selected, your computer has a static IP address.

- **For Mac Users:** From the Apple menu, select *Control Panels,* and double-click *TCP/IP*. Choose *Ethernet* from the Connect Via pop-up menu, if it is not already chosen.

  If the *Configure* pop-up menu is set to *Using DHCP Server,* then your computer has a dynamically assigned IP address. You are ready to continue directly with "Configuring the 56K LAN Modem for the Typical Configuration".

  If *Configure* is not set to *Using DHCP Server*, and you have specific values listed in any of the following fields: IP address, Subnet mask, Router address, or Name server address, then your computer has a static IP address.

- **For Windows 3.11 Users:** From the Program Manager, double-click the *Network* program group icon. Double-click the *Network Setup* icon. Click the *Drivers* button. Highlight the *MS TCP/IP - 32.X* entry and click *Setup*. If *Enable Automatic DHCP Configuration* is checked, then your computer has a dynamic IP address. You are ready to continue directly with "Configuring the 56K LAN Modem for the Typical Configuration". If an IP address is entered in the *IP Address* box, then your computer has a static IP address.

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Setting Up Your Computer If You Have a Static IP Address

If your computer has a static IP address, you must verify and possibly change some settings on your computer before you begin the LAN Modem configuration procedure. The 56K LAN Modem must be your gateway to get outside of your LAN as well as one of your DNS servers. Follow the procedure in the appropriate section to make sure that this is the case. Note that if your computer has a dynamic IP address, this configuration would occur automatically and you can go on to "Configuring the 56K LAN Modem for the Typical Configuration".

These instructions assume that the LAN Modem configuration is set the factory default. If you are moving the LAN Modem from a different LAN, reset the LAN Modem before you begin. To do so, refer to Chapter 8, "Resetting the 56K LAN Modem to a Factory Default Setting".

For Windows 98 and 95 Users

1. From the Start menu, select *Settings* and then *Control Panel*.
2. Double-click *Network* and then select *TCP/IP*.

If you have multiple TCP/IP entries, select TCP/IP for the Ethernet card associated with the 56K LAN Modem.

3. Click *Properties* and then select the *Gateway* tab and write down the first IP address in the Installed Gateways list.

If nothing is entered in the Installed Gateway list, enter an IP address that does not belong to any workstation on your LAN, but is in the subnet that you have chosen for your LAN. Write this IP address down for later use.

4. Click on the *DNS Configuration* tab.
5. In the DNS Server Search Order edit box, enter the Gateway IP address you wrote down as part of the previous step and then click *Add*.
6. Click *OK* to close the TCP/IP Properties box.
7. Click *OK* to close the Network control panel.

   You are asked to restart your computer.
8. Click *OK*.

For Windows NT 4.0 Users

1. From the Start menu, select *Settings* and then *Control Panel*.
2. Double-click *Network* and then select the *Protocols* tab.
3. Highlight *TCP/IP* and then click *Properties*.
4. Click the *IP Address* tab and then select the Ethernet card associated with the 56K LAN Modem from the Adapter drop-down list box.
5. Write down the IP address in the Installed Gateways box.

If nothing is entered in the Installed Gateway list, enter an IP address that does not belong to any workstation on your LAN, but is in the subnet that you have chosen for your LAN. Write this IP address down for later use.

6. Click on the *DNS* tab.
7. Click *Add*.

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8 In the TCP/IP DNS Server box, enter the Gateway IP address you wrote down as part of the previous step and then click *Add*.

9 Click *OK* to close the Microsoft TCP/IP Properties dialog box.

10 Click *OK* to close the Network Control Panel box.

You are asked to restart your computer.

11 Click *OK*.

For Macintosh Users

1 From the Apple menu, open *Control Panels*. Double-click *TCP/IP*.

2 Choose *Ethernet* from the Connect Via pop-up menu, if it is not already chosen.

The Configure drop-down list box should be set to *Manually* if you are on a static network.

3 Note the series of numbers entered in the Router address box. Write these numbers down.

4 Enter this series of numbers into the Name Server Address box. (If you already have existing address(es) listed, add the new address below the last entry.)

5 Choose *File* and *Close*.

6 When asked to save your changes, do so by choosing *Save*.

You may want to rename this configuration so that your previous configuration is not overwritten.

For Windows 3.11 Users

1 From the Program manager, click *Network*.

2 From the Network group box, click *Network Setup*.

3 From the Network Setup dialog box, click the *Drivers* button.

4 From the Network Drivers dialog box, double-click *Microsoft TCP/IP-32*.

5 Uncheck *Enable Automatic DHCP Configuration*.

6 Write down the number in the Default Gateway field.

7 Click *OK*.

8 Restart your PC to allow the changes to take effect.

You are now ready to install your 56K LAN Modem. Refer to "Configuring the 56K LAN Modem for the Typical Configuration" to continue.

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Configuring the 56K LAN Modem for the Typical Configuration

The following steps allow you to configure the 56K LAN Modem for the typical configuration. You may need the IP address which you recorded previously in the "Setting Up Your Computer If You Have a Static IP Address" section.

1 Launch your Web browser.

The LAN Modem attempts to use its default IP address (192.168.1.1) to communicate with the attached computer. If communication cannot be established, the LAN Modem will change its default IP address. If this occurs, the unit will reset itself and then function as described in this section.

Regardless of the start page to which your Web browser is set, your Web browser will go to the 56K LAN Modem configuration setup screen.

A welcome message appears, as shown in Figure 32.

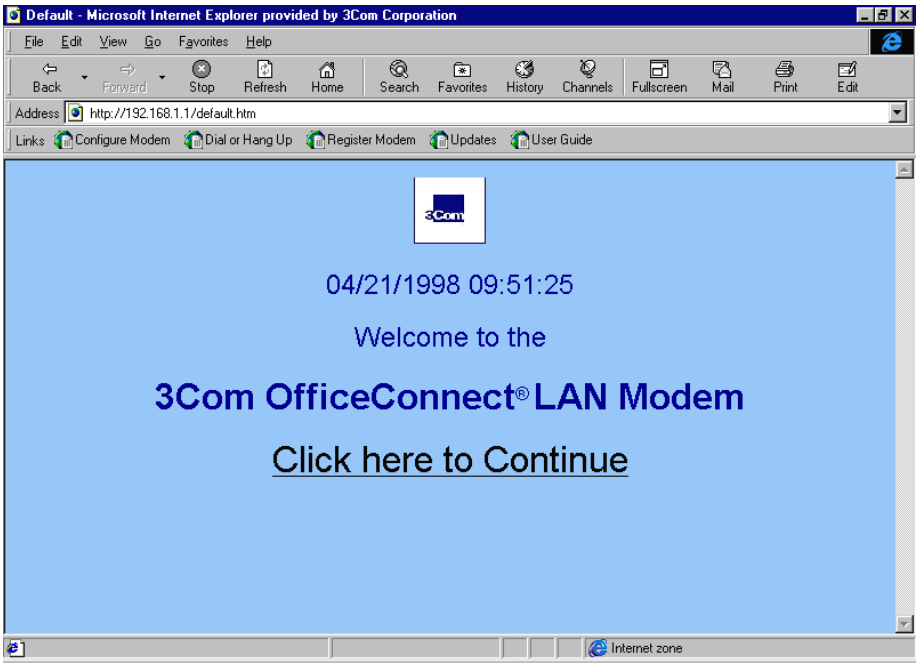

Figure 32 Initial Setup Welcome Window

2 Click *Continue*.

A message box appears indicating that the LAN Modem clock is being synchronized to the date and time on your PC.

The Set Password window appears. This password is used to guard access to the 56K LAN Modem's configuration program. If you would like to restrict access to the configuration settings, select a password and record it in a safe place.

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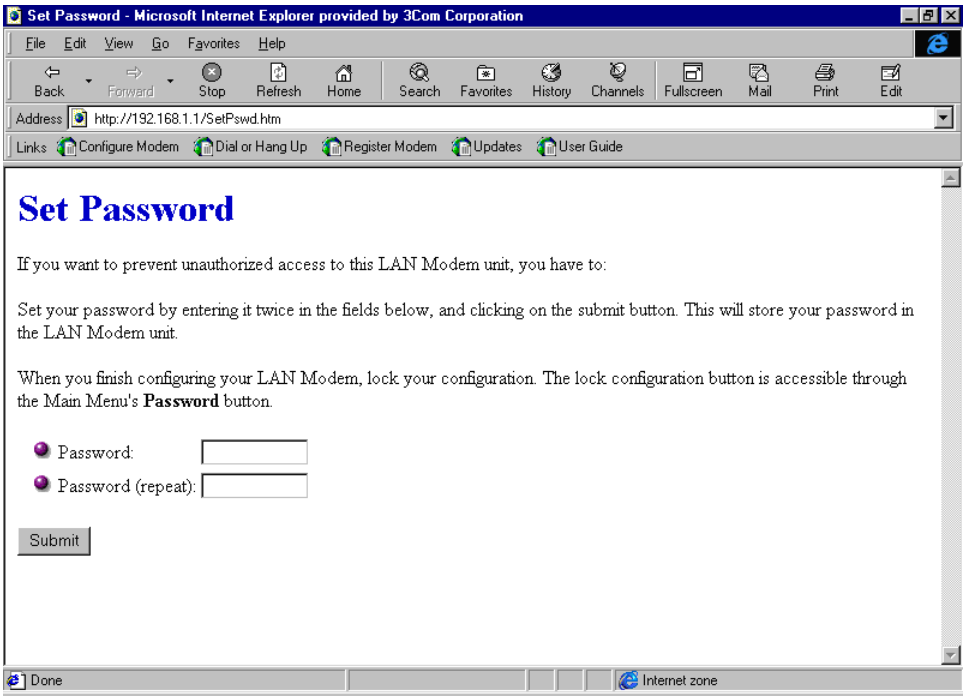

Figure 33 Set Password Window

3 Enter a password in the Password field and then enter the same password in the Password (repeat) field to confirm it.

If do not wish to enter a password, leave the fields empty.

4 Click *Submit*.

A message box indicates that your password has been set. The ISP Wizard appears.

If you do not want to use the ISP Wizard, click Abort *to reach the 56K LAN Modem main configuration page. Refer to* "Setting Up Additional Service Providers" *for instructions on configuring your ISP connection manually. Note that the ISP Wizard is a helpful step towards confirming the proper operation of your LAN Modem.*

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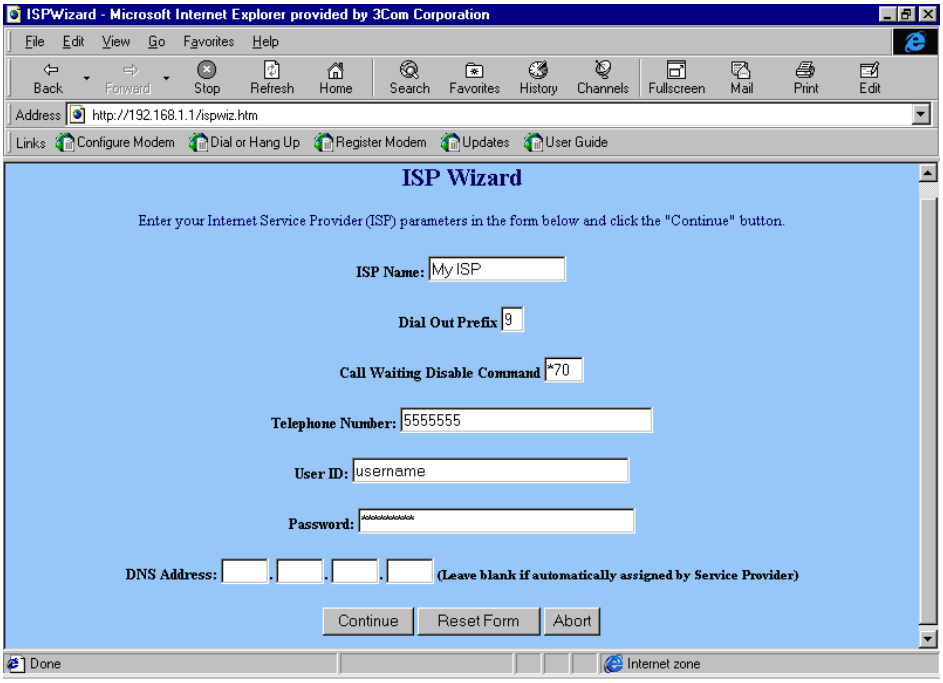

Figure 34 ISP Wizard Window

5 In the ISP Name field, enter a name that you wish to associate with your ISP.

6 In the Dial Out Prefix field, enter the number required to access an outside line. An example would be dialing "9" for use with a PBX. If not required, leave this field blank.

7 In the Call Waiting Disable Command field, enter the appropriate command to disable call waiting. Your telephone company should provide this value.

If you have Call Waiting enabled on your line, and you do not disable Call Waiting, then any incoming calls will disrupt your modem connection.

8 In the Telephone Number field, enter the telephone number of your ISP.

If you want to enter another telephone number to connect to your ISP, refer to "Editing Service Provider Profiles" after you have completed this typical installation procedure.

9 In the User ID and Password fields, enter your user ID and password for your ISP account.

10 If your ISP requires a DNS address, enter it in the DNS Address field. If you are not sure, leave this field blank.

11 Click *Continue*.

A call is launched to your ISP. The TX LED flashes, indicating data transmission from your 56K LAN Modem across your WAN. A successful connection to the Internet verifies the successful configuration of your 56K LAN Modem and ISP connection. A congratulations message appears.

12 Click *Continue* to exit the ISP Wizard and go directly to the LAN Modem's World Wide Web homepage.

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If you cannot access a Web site and your computer has a static IP address, refer to "Configuring a Static IP Address on the 56K LAN Modem". If you experience any other problems, refer to Chapter 7, "Placing, Receiving and Disconnecting Calls".

You will be connected to the LAN Modem Web site. This verifies the correct configuration of your ISP connection.

From here, you can read any new, up-to-date information, register your product, or perform firmware upgrades as they become available. If you have installed the Custom Browser from the *3Com Companion Programs* CD-ROM, access this page at any time by clicking the *Updates* button from your browser's *Links* menu bar. Otherwise, the latest information can be accessed directly at **`http://www.remoteaccess.3com.com/support/docs/lanmodem/welcome.html`**.

This configuration covers the typical parameters needed to connect to your ISP. There are additional parameters for this ISP connection which have been set to a typical default. These parameters include Domain Name, Compression, NAT, and WAN Link IP Address. In addition, you can enter a second telephone for connection to your ISP. For information on these parameters and instructions for changing their default values, refer to "Editing Service Provider Profiles."

To return to the LAN Modem's main configuration page, enter the following address in your Web browser's address window: **`http://lanmodem`**. Alternatively, if you are using the Custom Browser, clicking the *Configure Modem* link takes you directly to this main page.

The connection established as a result of the ISP Wizard will automatically disconnect after fifteen minutes of inactivity, by default.

To learn more about your LAN Modem's main page, or to configure additional parameters, go on to "56K LAN Modem Main Page". Otherwise, go on to Chapter 8, "Troubleshooting and Maintenance".

Configuring a Static IP Address on the 56K LAN Modem

If you followed the steps in "Configuring the 56K LAN Modem for the Typical Configuration" and were not able to connect to a Web site and your computer has a static IP address, there may be an incompatibility between the IP address on your computer and the IP address on the 56K LAN Modem. To correct this, do the following.

1. Enter the following URL in your Web browser: **http://lanmodem**. Alternatively, you can enter **http://3com.oc.lanmodem.**
2. From the 56K LAN Modem's main configuration page, click the icon representing the 56K LAN Modem from the center illustration.

   The LAN (Ethernet) Parameters page appears.
3. In the IP Address field, enter the default gateway address you recorded as described in "Setting Up Your Computer If You Have a Static IP Address".
4. Click *Submit*.

   The 56K LAN Modem resets.
5. Click *Refresh* from your Web browser's menu bar.

   The Enter Password window appears.

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6 Enter your password and then click *Submit*.

The 56K LAN Modem's main configuration page appears.

7 Click the *ISP Wizard* button.

You will see the information you entered previously.

8 Click *Continue*.

A call is launched to your ISP. A congratulations message appears when you successfully connect to your ISP.

This configuration covers the typical parameters needed to connect to your ISP. There are additional parameters for this ISP connection which have been set to a typical default. These parameters include Domain Name, Compression, NAT, and WAN Link IP Address. In addition, you can enter a second telephone number for the connection to your ISP. For information on these parameters and instructions for changing their default values, refer to "Editing Service Provider Profiles."

9 Click *Continue.*

You will be connected to the LAN Modem Web site. This verifies the correct configuration of your ISP connection.

From here, you can read any new, up-to-date information, register your product, or perform firmware upgrades as they become available. If you have installed the Custom Browser from the *3Com Companion Programs* CD-ROM, access this page at any time by clicking the *Updates* button from your browser's *Links* menu bar. Otherwise, visit the LAN Modem homepage directly at the following URL: **`http://www.remoteaccess.3com.com/support/docs/lanmodem/welcome.html`**.

Configure Additional Parameters

If you would like to configure another ISP or a connection to a remote office LAN, access the main configuration page via one of the following methods:

- If you are using the 56K LAN Modem custom Web browser, click *Configure Modem* to modify additional parameters.
- If you are not using the 56K LAN Modem Web browser, enter the following URL: **http://lanmodem**. This will take you to the main configuration page. Alternatively, you can enter **http://3com.oc.lanmodem**.

Once you have successfully completed the initial configuration, you may add any additional computers to your LAN. Refer to Chapter 6, "Advanced Configuration" for instructions.

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56K LAN Modem Main Page

The 56K LAN Modem main page is shown in Figure 35. From here you can access configuration parameters as well as place and disconnect manual calls.

Bookmark this page for easy access. Alternatively, if you are using the 56K LAN Modem Web browser, click Configure Modem *from the* Links *menu bar to go directly to your LAN Modem's main page.*

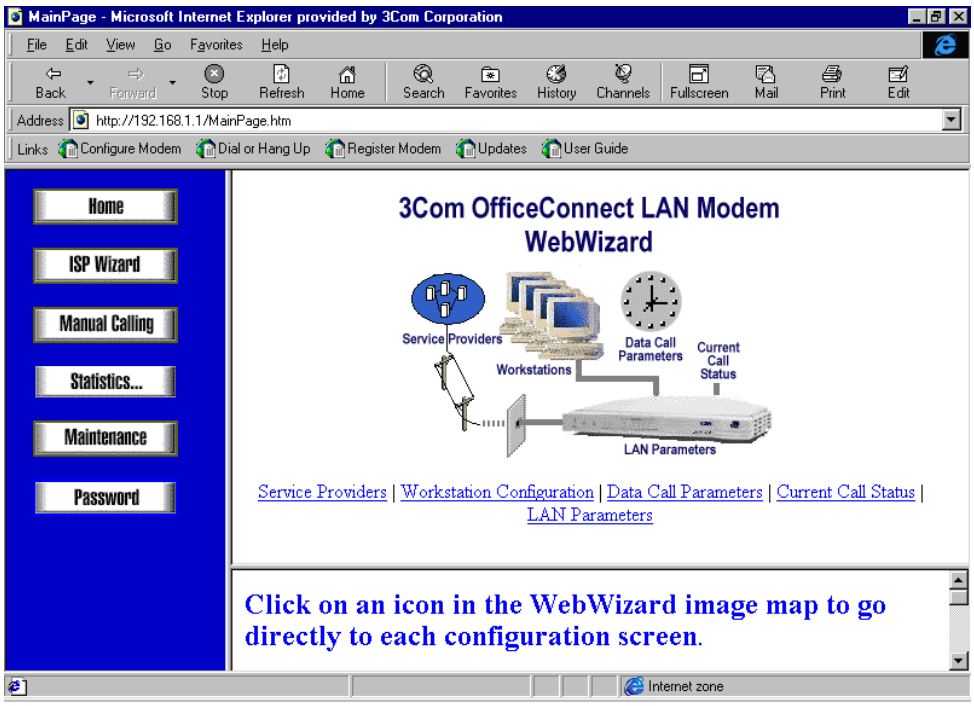

Figure 35 56K LAN Modem WebWizard Main Page

The 56K LAN Modem configuration home page, also called the WebWizard, provides links to configuration, dialing and statistics screens. There are links from the illustration's images, from the buttons listed in the left vertical frame as well as textual links from beneath the center graphic.

Links From the Illustration

By clicking on the icons shown in the illustration you may jump to the following locations.

- **Service Providers:** Jumps to the Service Providers page where you may configure connections to an ISP or a private network.
- **Workstations:** Jumps to the Workstation Selection page where you view the IP address of your computer as well as change workstation associations with service providers.
- **LAN Parameters:** Jumps to the LAN Parameters page where you may configure Ethernet parameters for your LAN.
- **Data Call Parameters:** Jumps to the data call timeout parameters page. From here you may set inactivity timers, which allow calls to be disconnected due to network inactivity, keeping telephone usage and Internet access costs down.

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- **Current Call Status:** Jumps to the call statistics page where the latest call information is displayed.

Links from the Buttons

- **Home:** Jumps to this main configuration page of the 56K LAN Modem.
- **ISP Wizard:** Allows you to configure an ISP profile. Note that if you have already configured an ISP using the ISP Wizard, invoking the ISP Wizard again will create a new profile and overwrite any previous settings. If you would like to add a second ISP profile, use the Service Providers icon to access the Service Providers configuration page.
- **Manual Calling:** Jumps to the Manual Calling page where you may manually place and disconnect calls.
- **Statistics:** Jumps to the Statistics page where you may view statistics such as system, current call, last call and service provider.
- **Maintenance:** Jumps to the Maintenance page. Here you can reset the 56K LAN Modem as well as enter firmware download mode, which allows you to easily download the latest firmware. You can also set the Auto Answer ring number from this page.
- **Password:** Jumps to the Password page where you may change or set your password, as well as establish lock configuration over your LAN Modem's parameter settings.

Context-sensitive help is available in the bottom frame of each configuration screen. To increase the size of the help frame, drag the pane separator up.

This chapter covers the typical configuration steps required for a basic understanding of your 56K LAN Modem functionality. For further configuration options, refer to Chapter 6, "Advanced Configuration".

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6 ADVANCED CONFIGURATION

This chapter describes the advanced configuration steps required for connecting to private networks such as a remote office LAN, and also provides instructions for changing your 56K LAN Modem's default settings. You should have first followed the typical configuration steps as detailed in the previous chapter before attempting to configure advanced parameters.

The configuration windows shown in this chapter may differ slightly from what is displayed on your computer.

Advanced Configuration

This section provides instructions for the following.

- Setting up additional service providers
- Associating service providers with computers
- Editing service provider profiles
- Configuring LAN parameters
- Configuring modem control parameters
- Changing data call parameters
- Changing your password
- Locking the configuration
- Disabling password protection for the Manual Calling screen
- Configuring the LAN Modem from a remote location

Setting Up Additional Service Providers

A service provider is a location outside of your LAN that you would like to access, such as an ISP for connecting to the Internet or a private network such as a remote office LAN. You can define up to four service providers (that is, remote destinations) on the 56K LAN Modem.

This section describes the following procedures.

- Setting up a connection to an ISP
- Setting up a connection to a private network
- Associating computers on the LAN with selected service providers
- Editing service provider profiles

If you have set up a connection to an ISP as part of the typical (that is, initial) setup procedure, then you have already defined one service provider. Because this is considered a typical configuration, some default values have been assumed. For example, an ISP connection is associated with all of the computers connected to

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your LAN; in other words, all (up to 25) computers on the LAN have access to and may connect to that ISP and therefore the Internet. You may wish to review the profile for this ISP connection to determine if you would like to make any changes. For instructions, refer to "Editing Service Provider Profiles."

ISP Versus Private Network

There are two types of service providers you may configure on your LAN Modem, an ISP and a Private Network. A description of each follows.

When to Select ISP

Choose ISP when you wish to set up a direct connection to the public Internet, via an Internet Service Provider.

When to Select Private Network

Select Private Network when you wish to connect directly to a remote, private LAN such as a corporate network. For instance, if you want to dial into your main office from home in order to access the servers at your office for email, printing, etc., then select private network as the type of additional service provider to configure. If the private network provides the option of accessing the Internet through their connection, and you want to reach the Internet through your corporate LAN (as opposed to a direct connection to an ISP), then choose that option when configuring your private network parameters.

Setting Up a Connection to an ISP

This section describes setting up your 56K LAN Modem for Internet access.

Before You Begin

Before you begin, you will need the following information from your ISP:

- Telephone number(s) you must dial to access this ISP
- User ID and password
- DNS IP address(es). This information is required only if your ISP does not provide an address dynamically.

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Setting Up a Connection to the Internet

To set up a connection to an ISP, do the following.

1 From the 56K LAN Modem main page, click the *Service Providers* image.

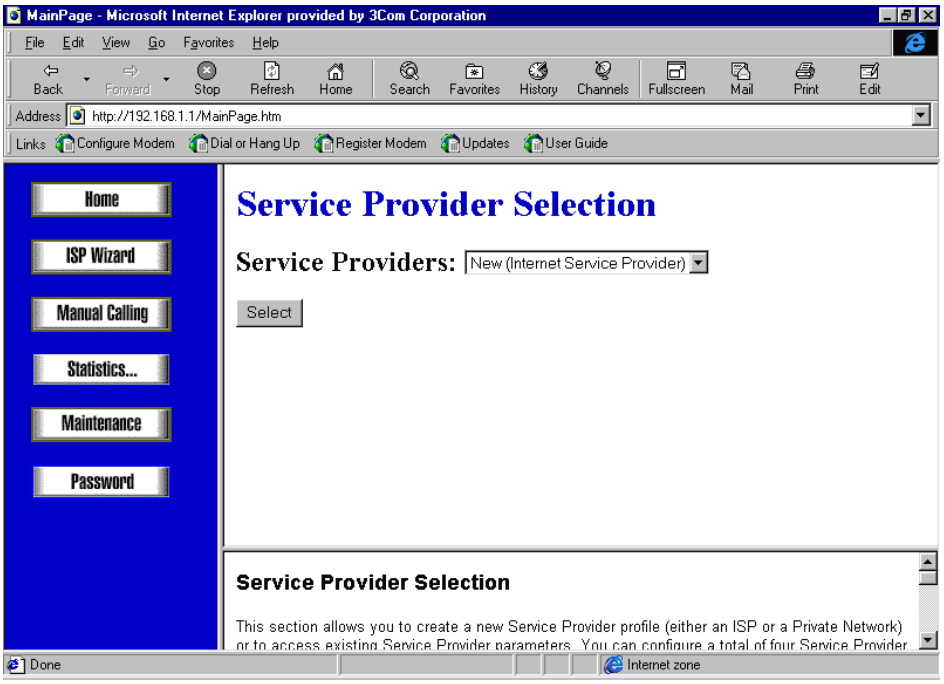

Figure 36 ISP Service Provider Selection Window

2 Select *New (Internet Service Provider)* from the drop down list box and then click *Select*.

The Internet Service Provider Parameters window appears.

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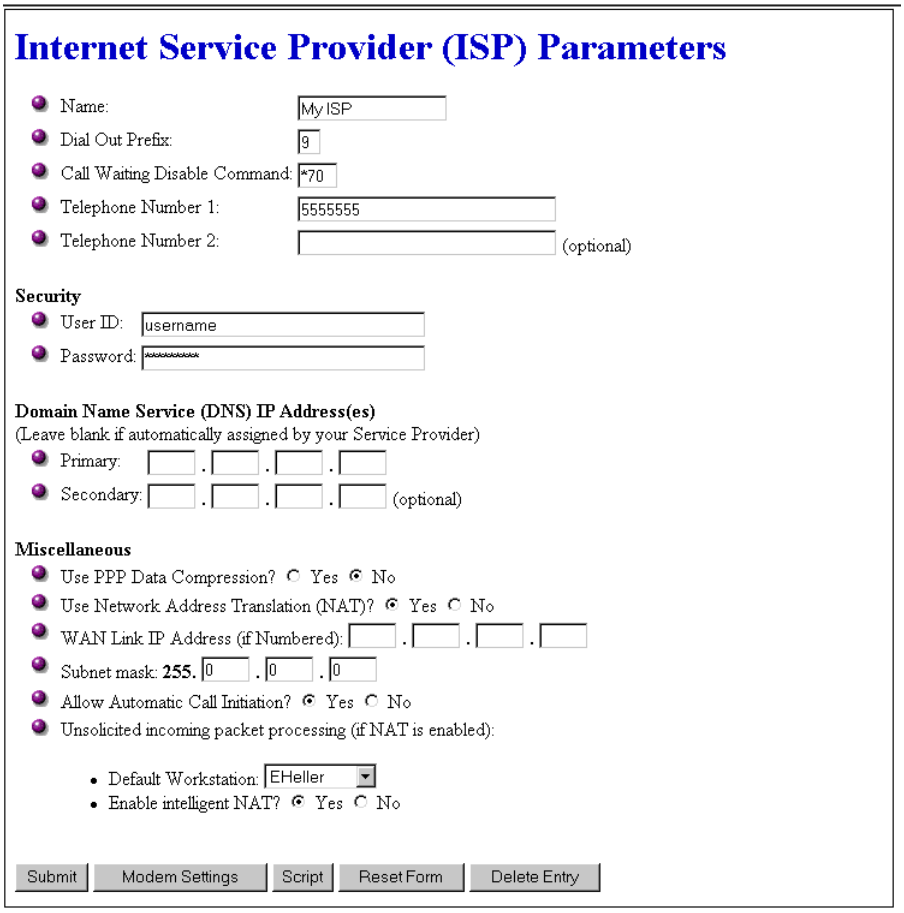

Figure 37 ISP Parameters Window

3 In the Name field, enter a name for this remote destination, such as the name of your ISP. If you have more than one account with this particular ISP, you may wish to enter a more descriptive name.

4 In the Dial Out Prefix field, enter the number required by your location to reach an outside line, if necessary. An example would be dialing "9" for use with a PBX switch. If not required, leave this field blank.

5 In the Call Waiting Disable Command field, enter the appropriate command to disable call waiting. Your telephone company should provide this value. Note that your telephone will be busy to incoming calls when Call Waiting is disabled.

The Dial Out Prefix and the Call Waiting Disable values will be automatically applied to both the Telephone Number 1 and Telephone Number 2 fields. If you would like to set up one telephone number which does not require a dial prefix, then add the appropriate prefix value to each Telephone Number field individually.

6 In the Telephone Number 1 field, enter the telephone number you must dial in order to reach your ISP.

7 In the Telephone Number 2 field, enter an alternate number to dial your ISP, to be used if the first number is unavailable.

8 Under Security, enter your user ID and password (these may be case sensitive).

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9 For DNS IP Address(es), enter the primary DNS address of your ISP in the Primary field, if required (that is, your ISP does not automatically supply these addresses upon establishing a connection). If there is a secondary address, enter it in the Secondary field.

10 Under Miscellaneous, indicate whether or not you would like to use compression when transferring data by selecting the appropriate radio button.

11 Under Miscellaneous, leave the default, NAT enabled, unless you are certain you want to disable it. With NAT enabled, the LAN Modem translates IP addresses between the computers on the LAN and the ISP, allowing all LAN users access to a single ISP. Only disable NAT when static IP addresses are provided by your ISP for users on the LAN.

12 Under Miscellaneous, if the ISP to which you wish to connect assigns you a static IP address and a subnet mask, enter the IP address and the subnet mask in the WAN link fields. Otherwise, leave these fields empty.

13 For Enable Intelligent NAT, it is recommended that you leave the default setting. Therefore, no further configuration is required.

Yes will allow an automatic connection to this service provider upon launching a related program, such as a Web browser to connect to an ISP.

Choose *No* if you would like to manually connect to this ISP via the Manual Calling screen in the WebWizard. You may want to choose this option if your calls are being connected unintentionally as a result of packets generated by your workstations.

14 For Enable Intelligent NAT, leave the default setting, which is *Yes,* in order for the LAN Modem to better support Internet applications and games.

The LAN Modem delivers all unsolicited TCP/UDP packets to the workstation that is currently communicating with the remote host that has generated these packets. If you set this field to *No*, all unsolicited TCP/UDP packets are delivered to the default workstation.

15 In the Default Workstation for Incoming Packets field, specify the workstation to which all unsolicited TCP/UDP packets should be delivered.

Note that if the Enable Intelligent NAT field is set to *Yes*, the LAN Modem first attempts to deliver the unsolicited TCP/UDP packets to the workstation that is currently communicating with the remote host that has generated these packets. Only if no such workstation is found are the packets delivered to the specified default workstation.

16 Advanced users can review or make changes to the modem settings associated with this service provider by clicking the *Modem Settings* button. To leave these values set to their defaults, click *Submit.* To change these settings, refer to *"Configuring Modem Control Parameters"*.

If your service provider requires that you create a connection script, refer to Chapter 7, "Using a Connection Script" for assistance.

If you would like to configure a connection to another ISP, repeat steps 1 through 16. You may configure up to a total of four remote destinations.

If you wish to password protect the configuration profile of the 56K LAN Modem, refer to "Locking and Unlocking the Configuration."

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Setting Up a Connection to a Private Network

This section describes your 56K LAN Modem setup procedures for accessing a private network, such as a remote office or corporate LAN.

Before You Begin

Before you begin, you will need the following information from your Network Administrator:

- Telephone number(s) you must dial to access this private network
- User ID and password
- WAN link IP address (if the private network to which you are connecting requires a static IP address and subnet mask).

In addition, you may need the following information, depending on your particular network setup. Check with your Network Administrator.

- IP address/subnet mask of the remote LAN you wish to access
- Domain name of the remote LAN
- DNS IP address(es)

Setting Up a Connection to a Remote LAN

The following steps allow you to set up a connection to a remote LAN.

1 From the 56K LAN Modem main page, click the *Service Providers* image.

The Service Provider Selection window appears.

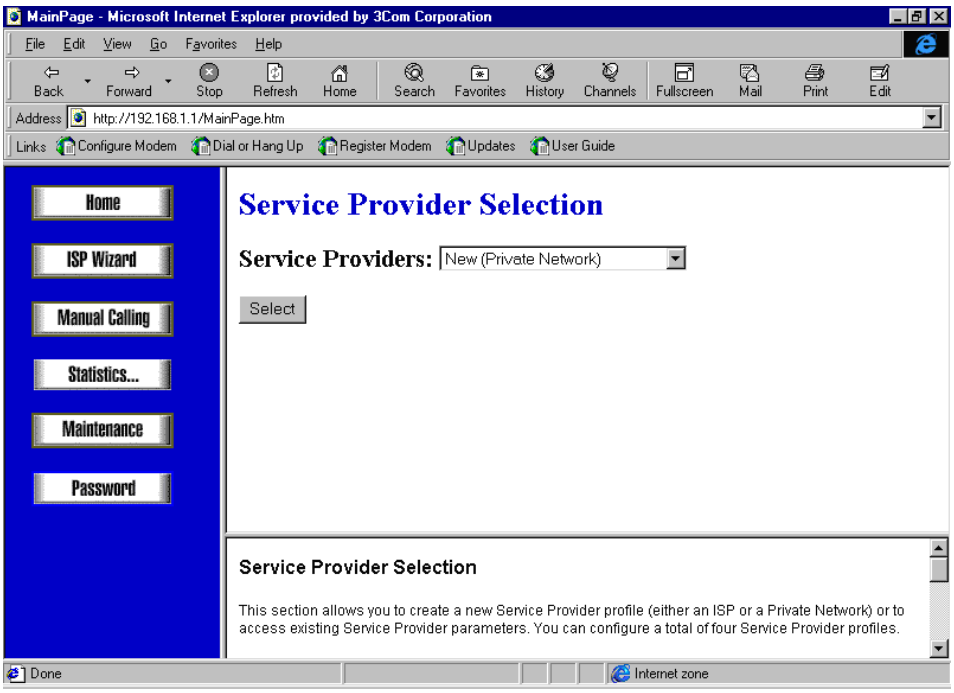

Figure 38 Private Network Service Provider Selection Window

2 Select *New Private Network* from the drop-down list box and click *Select*.

The Private Network Parameters window appears.

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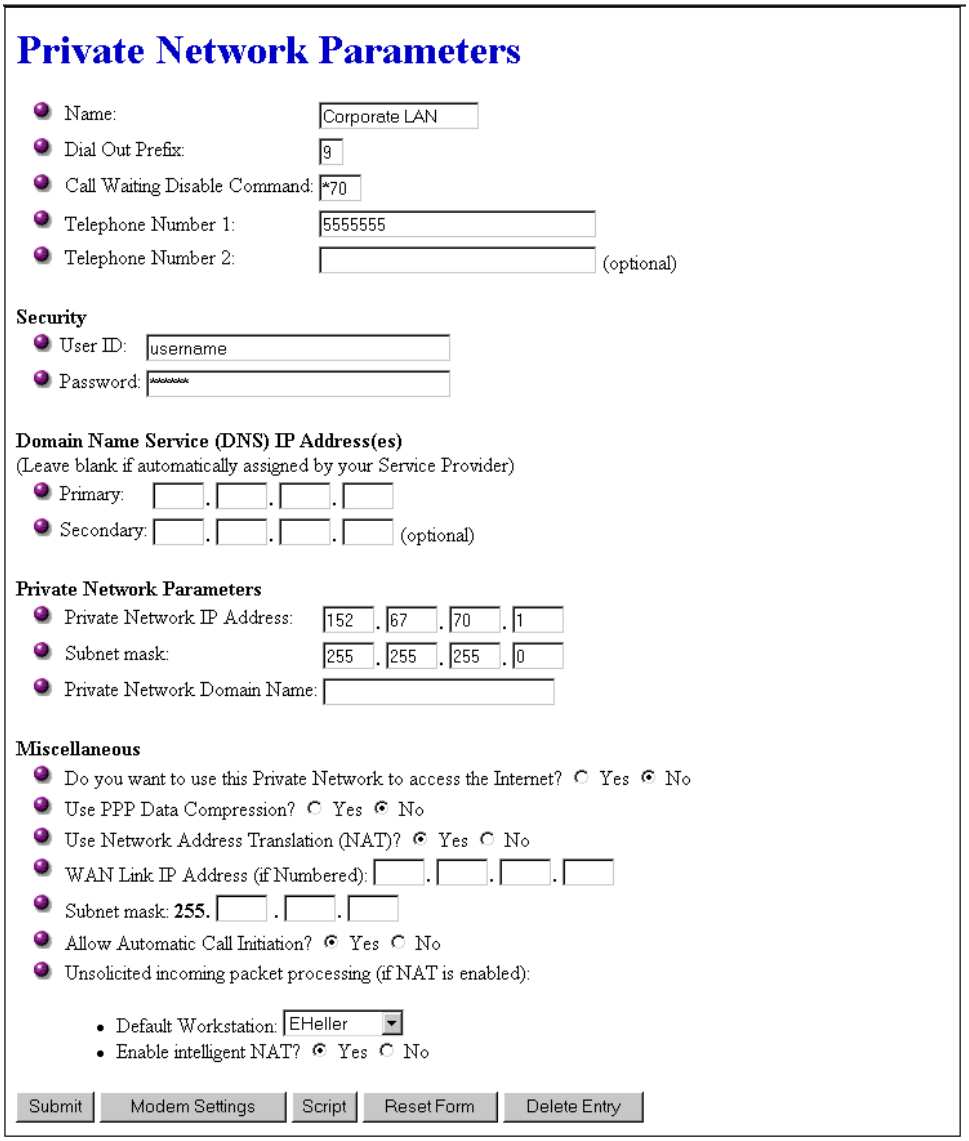

Figure 39 Private Network Parameters Window

3 In the Name field, enter a name for this remote destination, such as the location of the remote office. You may wish to use a more descriptive name if you have more than one account with this private network.

4 In the Dial Out Prefix field, enter the number required by your location to reach an outside line, if necessary. An example would be dialing "9" for use with a PBX. If not required, leave this field blank.

5 In the Call Waiting Disable Command field, enter the appropriate command to disable call waiting. Your telephone company should provide this value.

The Dial Out Prefix and the Call Waiting Disable values will be automatically applied to both the Telephone Number 1 and Telephone Number 2 fields. If you would like to set up one telephone number which does not require a dial prefix, then add the appropriate prefix value to each Telephone Number field individually.

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6 In the Telephone Number 1 field, enter the telephone number you must dial in order to reach your ISP.

7 In the Telephone Number 2 field, enter an alternate number to dial your ISP, to be used if the first number is unavailable.

8 Under Security, enter your user ID and password (these may be case sensitive).

9 For DNS IP Address(es), enter the primary DNS address of your private network in the Primary field, if required (that is, your private network does not automatically supply these addresses upon establishing a connection). If there is a secondary address, enter it in the Secondary field.

10 Under Private Network Parameters, enter the IP address, subnet mask and domain name of the private network.

The IP address and subnet mask fields are mandatory.

11 Under Miscellaneous, you may choose to allow or prevent Internet access from this private network by selecting either the *Yes* or *No* radio button.

12 Under Miscellaneous, indicate whether or not you would like to use data compression when transferring data by selecting the appropriate radio button.

13 Under Miscellaneous, leave the default, NAT enabled, unless you are certain you want to disable it. With NAT enabled, the LAN Modem translates IP addresses between the computers on the LAN and the ISP, allowing all LAN users access to a single ISP. Only disable NAT when static IP addresses are provided by your ISP for users on the LAN.

If the private network to which you connect has assigned a static IP address to each computer on your LAN, then disable NAT.

14 Under Miscellaneous, if the private network to which you wish to connect requires a static IP address and a subnet mask, enter the IP address and the subnet mask in the WAN link fields. Otherwise, leave these fields empty.

15 For Allow Automatic Call Initiation, leave the default setting which is *Yes*.

If you select *No*, you will have to manually launch a call to this service provider every time you want to connect. You may want to set this field to *No* if your calls are being connected unintentionally as a result of packets generated by your workstations.

16 For Enable Intelligent NAT, leave the default setting, which is *Yes,* in order for the LAN Modem to better support Internet applications and games.

The LAN Modem delivers all unsolicited TCP/UDP packets to the workstation that is currently communicating with the remote host that has generated these packets. If you set this field to *No*, all unsolicited TCP/UDP packets are delivered to the default workstation.

17 In the Default Workstation for Incoming Packets field, specify the workstation to which all unsolicited TCP/UDP packets should be delivered.

Note that if the Enable Intelligent NAT field is set to *Yes*, the LAN Modem first attempts to deliver the unsolicited TCP/UDP packets to the workstation that is currently communicating with the remote host that has generated these packets. Only if no such workstation is found are the packets delivered to the specified default workstation.

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18 Advanced users can review or make changes to the modem settings associated with this service provider by clicking the *Modem Settings* button. To leave these values set to their defaults, click *Submit.* To change these settings, refer to *"Configuring Modem Control Parameters"*.

If your service provider requires that you create a connection script, refer to Chapter 7, "Using a Connection Script" for assistance.

If you would like to configure a connection to another private network, repeat steps 1 through 17. You may configure up to a total of four remote destinations.

If you wish to password protect the configuration profile of the 56K LAN Modem, refer to "Locking and Unlocking the Configuration."

Associating Service Providers with Computers on the LAN

Once you have configured the service providers to which you would like to connect, they will be associated with all (up to ten) of the computers on your LAN. You may choose to change these associations if desired. For example, if you would like only one computer on the LAN to have Internet access, you can associate that ISP connection with one computer exclusively. This would prevent all other computers on the LAN from accessing the Internet.

To change the association between service provider connections and a particular computer on the LAN, do the following.

1 From the 56K LAN Modem main page, click the *Workstations* image.

The Workstation Selection window appears.

2 From the Workstation drop down list box, select the workstation for which you would like to change the accessible service providers.

You can modify the associations for your workstation via the following fields:

- Name: This field contains the name of the selected computer. If you have a Macintosh computer on your LAN, the name of the Mac computer does not automatically appear in the Name field. You should enter the name of the Mac in the Name field.
- IP Address: This field contains the IP address of the selected computer. You should not have to make any changes to this field unless you are using static IP addressing on your LAN (that is, IP addresses which are not dynamically assigned by the 56K LAN Modem).
- IP Address Statically Configured on Workstation: Check this box to reserve the IP address assigned for this particular workstation. This option allows a statically assigned workstation to coexist on a dynamically assigned LAN.
- Service Provider Usage: Under *Enable the use of the following Service Providers*, you can see the service providers which are accessible from this computer.

If you have more than one ISP configured, all calls will be routed to the first ISP listed. To connect to another ISP that you have configured, uncheck the box(es) of the ISP(s) that you do not wish to use at this time.

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To change the associations of this particular workstation, do the following.

1. Check or clear the boxes of the service providers you would like to associate or disassociate.
2. Click *Submit*.

If you wish to password protect the configuration profile of the 56K LAN Modem, refer to "Locking and Unlocking the Configuration."

Editing Service Provider Profiles

The following steps allow you to edit a previously configured service provider connection.

1. From the 56K LAN Modem main page, click the *Service Providers* image.

   A drop-down list box appears which contains the names of your configured service providers.
2. Select the name of the service provider connection profile you wish to edit.

   The connection profile page appears.
3. Edit the fields as desired.

   For more information on the particular fields, refer to the appropriate section, "Setting Up a Connection to an ISP" or "Setting Up a Connection to a Private Network", or refer to the online help located in the web page's bottom frame.
4. When finished, click *Submit*.

Restricting Access to Service Providers

If you wish to restrict a computer(s) on the LAN from accessing a service providers(s), do the following.

1. Click *Workstation Parameters* from the 56K LAN Modem home page.
2. Select the workstation for which you wish to limit access.
3. Clear the check boxes located next to the names of the computer(s) from which you want to restrict service provider access.
4. When finished, click *Submit*.
5. Repeat steps 1 through 4 for additional service provider access restrictions.

If you wish to password protect the configuration profile of the 56K LAN Modem, refer to "Locking and Unlocking the Configuration."

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Configuring LAN Parameters

This section describes how to configure the parameters of your LAN. (LAN refers to that section of the network comprising your 56K LAN Modem and all of the computers or devices attached to it by means of Ethernet cabling.) This section describes the LAN parameters and then provides steps for their configuration.

Understanding LAN Parameters

The LAN (Ethernet) Parameters window, shown in Figure 40, contains the following fields.

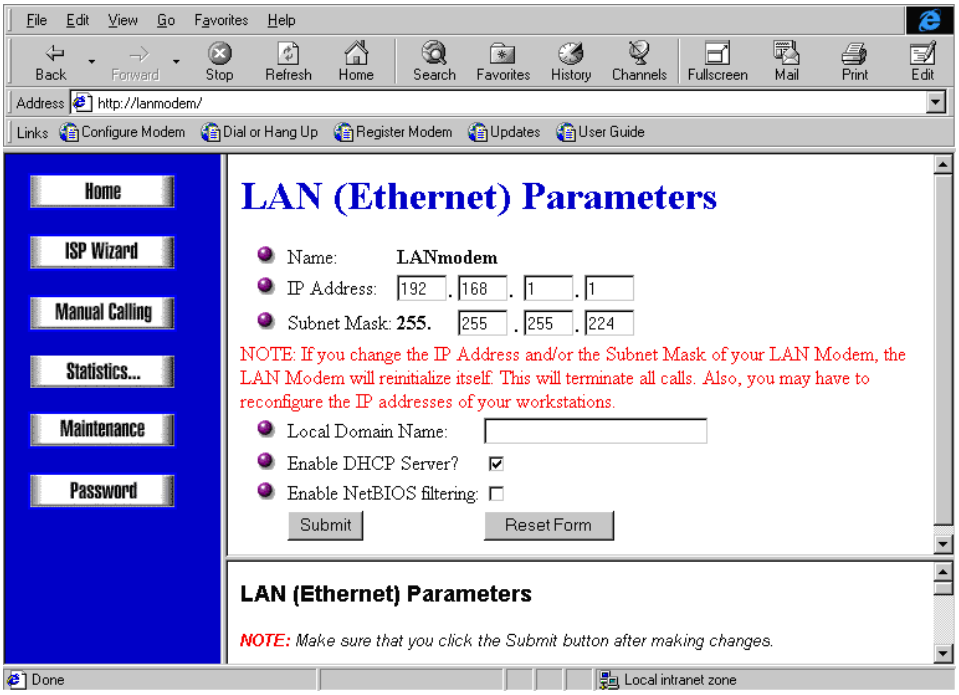

Figure 40 LAN Parameters Window

Name

Displays the name for the 56K LAN Modem. This name is used for DNS. For example, the name *LANmodem* is translated to the IP address 192.168.1.1.

IP Address and Subnet Mask

The IP address is a unique address which identifies the 56K LAN Modem on a network. The default address (192.168.1.1) is a private IP address which will be translated automatically by the 56K LAN Modem for Internet access. You should leave the default unless you are certain that this value must be changed.

The 56K LAN Modem attempts to use its default IP address to communicate with the computer. If communication cannot be established, the 56K LAN Modem will change its default IP address. If this occurs, the IP address shown in Figure 40 will be different.

The subnet mask identifies the subnetwork to which your computer is connected. You should leave the default unless you are certain that this value must be changed.

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WARNING: *If you change the IP address and/or the subnet mask, the 56K LAN Modem will re-initialize itself to work with the new settings. All calls will be terminated and you may need to reconfigure the IP address(es) of the computer(s) connected to your 56K LAN Modem. For a LAN using static IP addresses, you must manually reconfigure the PC's IP addresses via the PC Parameters window. For a LAN using dynamic IP addresses, if you have Windows 95 or 98, launch Winipcfg.exe (probably located in your Windows directory), click* Release All *and then click* Renew All*.*

Local Domain Name

The local domain name identifies your LAN. LAN refers to the network created by the 56K LAN Modem and the devices attached to it.

Enable DHCP Server

The 56K LAN Modem provides DHCP server functionality for the LAN which automatically assigns a network or IP address to a newly attached PC on your IP network. If another device on your LAN is providing this functionality, or if you are using static IP addresses, then you should disable the DHCP server.

Enable NetBIOS Filtering

For Windows Users: NetBIOS is primarily used by Windows 98, 95, and NT for local file and printer sharing, although it may also be used on other operating systems. This protocol can make spurious DNS requests which can inadvertently cause the LAN Modem to establish unwanted calls to your Service Provider, resulting in subsequent charges to your phone bill. When this box is checked, NetBIOS packets are prevented from initiating an outgoing call, but they will be passed if the call is already established. If you have no need to perform file or printer sharing over your WAN connection, you should enable NetBIOS filtering by checking the box. Note that enabling the NetBIOS filter will not affect your ability to share files and printers over your LAN. NetBIOS filtering is disabled by default.

Configuring the LAN Parameters

To configure LAN parameters, do the following.

1. From the 56K LAN Modem main page, click the *LAN Parameters* image.
2. In the IP Address field, review the default and enter a different IP address if required.
3. In the Subnet Mask field, review the default and enter a different subnet mask if required.
4. In the Local Domain Name field, you may choose to enter a name to identify this particular LAN on a network. Note that this field is not required. Leave blank if you are unsure about how to configure a local domain name.
5. Check the *Enable DHCP server* box to enable it or clear the box to disable it.

WARNING: *If you change the IP address and/or the subnet mask of your 56K LAN Modem, the 56K LAN Modem will re-initialize itself when you submit the changes by clicking* Submit*. When the re-initialization occurs, all calls are terminated, and you may have to reconfigure the IP addresses on the computers on the LAN.*

6. In the Enable NetBIOS filtering field, if desired, check the box to enable filtering.
7. Click *Submit*.

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If you wish to password protect the configuration profile of the 56K LAN Modem, refer to "Locking and Unlocking the Configuration."

Configuring Modem Control Parameters

Most users will be able to safely leave the modem control parameters set to their default values. However, advanced users may wish to further define the manner in which the LAN Modem operates. This section describes modem control parameters, and explains modem control configurations.

Understanding Modem Controls

Each service provider that you configure (up to four) is automatically associated with its own corresponding modem control profile. If you would like to further define your modem's performance, you may do so as described in this section. A description of the modem control parameters is provided followed by instructions for changing these parameters.

Connection Controls

Connection Controls allow you to define the manner in which your modem connects to a remote site. The following options are provided.

Table 5 Connection Controls

Connection Control	Description
US/ITU-T answer sequence	Allows you to set your answer sequence.
Guard Tone	Allows you to specify the guard tone for your geographical region.
56K	If enabled: Sets the minimum CONNECT rate.
	If disabled: Sets the ceiling CONNECT rate to 33600.
Pulse (rotary) dial make/break ratio	Sets the make/break ratio for pulse dialing.
Minimum Connect Speed	Sets the minimum speed at which the modem is allowed to connect.

Mode Controls

Mode Controls allow you to define your LAN Modem's operating conditions. The following options are provided.

Table 6 Mode Controls

Mode Control	Description
Speaker Operations	Allows you to change your LAN Modem's speaker settings.
Dialing	Specifies either pulse or tone dialing.
Advanced init string	Reserved for future implementation

Protocol Controls

Protocol Controls allow you to set data correction and error control values. The following options are provided.

Table 7 Protocol Controls

Protocol	Description
Data Compression	Sets your data compression preference
Error Control	Sets your error control preference

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Changing Modem Controls

To access and make changes to the Modem Control parameters, do the following.

1. Click the *Service Providers* icon from the LAN Modem's main page.
2. Choose the service provider whose associated modem parameters you want to change and click *Select*.

The procedure for accessing the Modem Settings profile is the same for both an ISP and a Private Network.

The selected Service Provider page opens.

3. Click the *Modem Settings* button located at the bottom of the Service Provider's page.

Note that each service provider (up to four) has its own associated Modem Settings profile. Therefore, changes made to one service provider affect only that particular service provider.

The Modem Controls page opens as shown in Figure 41.

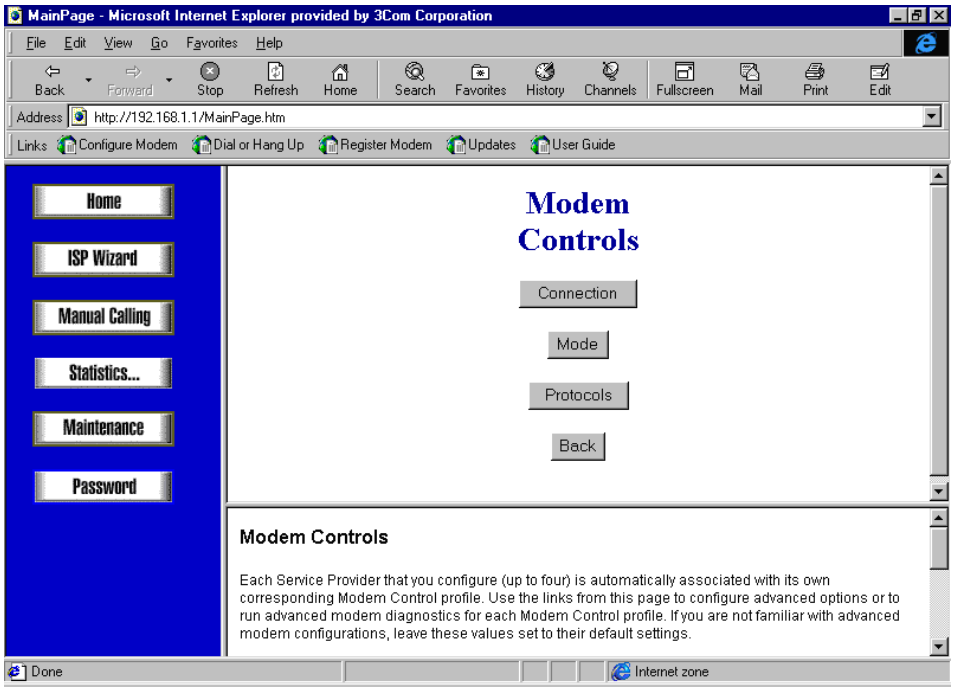

Figure 41 Modem Controls Page

4. Choose the modem control page you want to access by clicking the appropriate button.

   The desired page opens.

5. Review the parameters or make changes by selecting the appropriate option from each drop-down list box.
6. Click *Save* when finished.

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Changing Data Call Parameters

This section describes changing the data call parameter default settings. The data call parameters consist of timeout values for both automatic calls and manual calls.

The timeout values are a useful means of controlling bandwidth efficiently while keeping telephone usage and Internet access costs down. If there is no network activity on a call for a specified amount of time, then that call is automatically disconnected.

Understanding Data Call Parameters

The Data Call Parameters window, shown in Figure 42, contains the following fields.

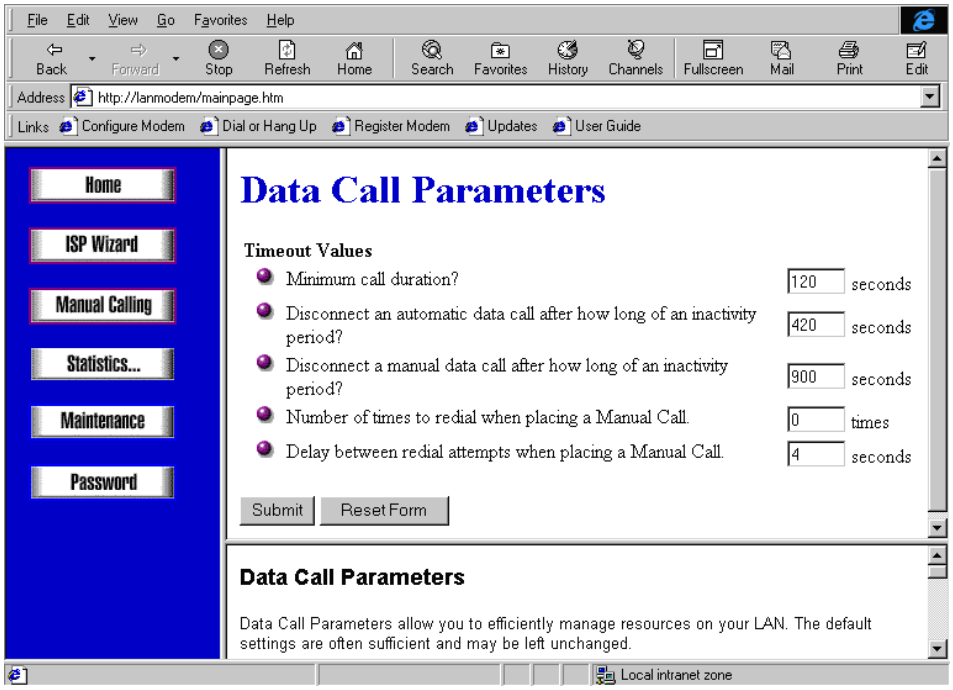

Figure 42 Data Call Parameters Window

Minimum Call Duration

The minimum call duration is the minimum length of a call that must be satisfied before an inactivity timer can begin. The default for the minimum call duration is two minutes.

Disconnecting an Automatic Data Call

An automatic data call is made by the LAN Modem automatically due to activity on the LAN; an example would be a user launching his or her Web browser. Because the parameters for the call, such as the telephone number and user name, have been previously defined, a call to an ISP, for example, may be automatically and transparently launched with a click of your Web browser.

You can define the amount of time the LAN Modem should wait before disconnecting this type of data call due to inactivity. The inactivity timer runs

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simultaneously with the minimum call duration. For example, if the minimum call duration is set to two minutes, and the inactivity timer is set to 30 seconds, the call will be connected for at least two minutes even if there has been no activity for 30 seconds or more. To prevent a data call from being disconnected due to inactivity, enter 0 (note that you must then manually disconnect the call via the Manual Calling screen). The default is seven minutes.

Disconnecting a Manual Data Call

A manual call is established using the *Manual Calling* option from the LAN Modem's main page. You can define the amount of time the LAN Modem should wait before disconnecting this type of data call due to inactivity. This inactivity timer is activated once the minimum call duration is satisfied and no further activity is detected. For example, if the minimum call duration is set to two minutes and the inactivity timer is set to 15 minutes, the call will be connected for at least 15 minutes. To prevent a manual call from being disconnected due to inactivity, enter 0. The default is 15 minutes.

Number of Times to Redial for a Manual Call

This field designates the number of times the LAN Modem will redial a call that is placed using the Manual Call Control screen. Acceptable values are between 0 and 255 times.

Delay Between Redial Attempts When Placing a Manual Call

This field designates the length of time in seconds to wait before redialing a manual call. Acceptable values are between 4 and 240 seconds.

Configuring the Data Call Parameters

To configure data call parameters, do the following.

1. From the 56K LAN Modem main page, click the *Clock* image.
2. Specify the minimum call duration.
3. Specify the inactivity period for an automatic data call.
4. Specify the inactivity period for a manual data call.
5. Specify the number of times to redial when placing a manual call.
6. Specify the delay between redial attempts when placing a manual call.
7. Click *Submit*.

If you wish to password protect the configuration profile of the 56K LAN Modem, refer to "Locking and Unlocking the Configuration."

Selective Password Protection

You can set up partial password protection so that workstations may access only the manual calling page allowing them to place and receive calls. All other WebWizard pages remain inaccessible.

Note that enabling selective password protection also allows all users access to the LAN Modem main page so that they can navigate to the Manual Calling page. If users attempt to access any other page except Manual Calling or online help, the LAN Modem prompts the user to enter a password.

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To set up selective password protection, do the following.

1 From the LAN Modem main page, click the *Password* button.

2 Check the box labeled *Disable password protection for Manual Calling screen.*

3 Click *Submit*.

All workstations are now able to access the Manual calling screen by clicking the Manual Calling button from the main configuration screen. For instructions about placing manual calls, refer to Chapter 7, "Placing, Receiving and Disconnecting Calls"

Changing Your Password

A password allows you to restrict access to the 56K LAN Modem's configuration parameters. To change the password which was defined as part of the initial setup, or to set a password for the first time, do the following.

1 From the 56K LAN Modem main page, click the *Password* button.

2 Enter your new password in the Password field.

3 Enter your new password in the Password (repeat) field to verify.

4 Click *Submit*.

Once you have set a password on your LAN Modem, and the unit remains idle for five minutes or longer, you may be "locked out" of the WebWizard screen. If this occurs, you will be prompted to enter your password in order to gain access to the WebWizard.

What If I Forget My Password?

If you forget your password, you must reset the 56K LAN Modem to the factory default settings, which will allow you to enter a new password. Note that when the 56K LAN Modem is restored to the factory default settings, all configuration changes are lost, including your service provider profiles. For instructions, refer to "Resetting the 56K LAN Modem to a Factory Default Setting".

Locking and Unlocking the Configuration

Once you have completed the configuration of your 56K LAN Modem, you can establish password protection over your LAN Modem's configuration parameters.

To lock the configuration, do the following.

1 Click *Password* from the 56K LAN Modem's main page.

2 Under the Lock Configuration section, click the *Lock Configuration* button.

You many need to scroll down to see the Lock Configuration section. A message indicates that the configuration is locked.

To unlock the configuration, do the following.

1 Click *Continue*.

The Enter Password window appears.

2 Enter your password to access the 56K LAN Modem configuration program.

3 Click *Submit*.

The 56K LAN Modem main configuration page appears.

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Configuring the LAN Modem from a Remote Location

This section provides instructions for accessing and making configuration changes to your LAN Modem remotely using either another LAN Modem or an analog modem. In addition you will need a Web browser, and any PPP dialer software, such as Windows 98/95's Dial-Up Networking, installed on your local computer.

Configuring the LAN Modem Remotely via Another LAN Modem

To dial into a LAN Modem from a remote location using another LAN Modem, do the following:

1. Ensure that the two LAN Modems are on different networks.

   For instance, one LAN Modem can be on the 192.168.1.x network, and the other one can be on the 192.168.2.x network.

2. Create a Private Network entry for the remote router.

   No user name or password is needed. You must use an arbitrary numbered WAN link that is different from the two networks.

3. Run your web browser, and enter the IP address of the remote LAN Modem as the URL.

   A connection will be established

   The LAN Modem main configuration page appears. You now have full access and can make any configuration changes as if you were connected via your local LAN.

You are not able to browse the Internet when remotely accessing your LAN Modem. During a remote configuration of the ISP Wizard, clicking the Continue button will not place a call to your ISP to confirm a successful configuration. You must close and then re-open your Web browser to regain access to the LAN Modem's main configuration page, if you wish to perform further remote configuration procedures.

Configuring the LAN Modem Remotely via an Analog Modem

To dial into a LAN Modem from a remote location using an analog modem and Windows 98/95 Dial-Up Networking, do the following:

1. Click *Start*, *Programs*, *Accessories*, (Windows 98 users select *Communications*) and select *Dial-Up Networking*.
2. Double-click *Make New Connection*.

   The Make New Connection window opens.
3. Enter a name to designate this dial-up profile, such as *LAN Modem*.
4. Select the modem attached to your local PC from the drop down list box and click *Next*.

   The Make New Connection phone number window will open.
5. Enter the phone number of the remote LAN Modem to which you wish to connect and click *Next*.
6. Click *Finish* to complete the Make New Connection setup.

   You will now have a new icon for the connection just created.
7. Right click this new icon with your right mouse button and choose *Properties*.
8. Click the *Server Type* tab.

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For Windows 95 users: *PPP, Windows 95, Windows NT 3.5, Internet* should be chosen in the Type of Dial-Up Server list box.

For Windows 98 users: *PPP, Internet, Windows NT Server, Windows 98,* should be chosen in the Type of Dial-Up Server list box.

9 Under *Advanced Options*, uncheck all boxes.

10 Choose the TCP/IP check box for *Allowed Network Protocols*. Uncheck the boxes for *NetBEUI* and *IPX/SPX Compatible*.

11 Click *TCP/IP Settings*.

The TCP/IP Settings window opens.

12 Click *Specify an IP address* and enter an IP address for your computer. Enter *192.168.2.1* if you are not sure.

13 Leave the other options for this window at their default settings, including the radio button for *Server assigned name server addresses*.

14 Click *OK* to close the TCP/IP Settings window.

15 Click *OK* to close the Server Types window.

16 Click *OK* to close your connection window.

17 Double-click your new connection icon created via Dial-Up Networking.

The Connect To window will open. You may choose to leave the Username and Password fields blank at this time.

18 Click *Connect*.

Your local computer will dial and establish a connection with your remote LAN Modem.

19 Once your call has been established, launch a Web browser on your local computer.

The Web browser attempts to load its default Start Page. Click *Stop* to cancel this procedure.

20 Enter the following address in your Web browser's address bar: **`http://192.168.1.1`** to go to the remote LAN Modem's main configuration page.

If you previously set your LAN Modem's IP address to something other than the factory default address, enter this IP address in your Web browser's address bar in place of the address shown in the URL above.

21 Enter your password if required and then click *Submit*.

The LAN Modem main configuration page appears. You now have full access and can make any configuration changes as if you were connected via your local LAN.

You are not able to browse the Internet when remotely accessing your LAN Modem. During a remote configuration of the ISP Wizard, clicking the Continue button will not place a call to your ISP to confirm a successful configuration. You must close and then re-open your Web browser to regain access to the LAN Modem's main configuration page, if you wish to perform further remote configuration procedures.

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7 PLACING, RECEIVING AND DISCONNECTING CALLS

This chapter covers the following main topics:

- Placing calls
- Receiving calls
- Disconnecting calls
- Using a connection script

Placing Calls

Your 56K LAN Modem allows you to place calls to a remote location in one of two ways: either automatically via a pre-defined service provider, or manually by entering the telephone number of the destination on a call-by-call basis.

3Com assumes no liability for phone charges or other expenses incurred in connection with the use of this product.

Placing a Call Automatically

To place a call using one of your four pre-defined service provider profiles, simply launch your application. For example, should you have an ISP configured as one of your service providers, opening a Web browser such as Netscape or Internet Explorer will cause the LAN Modem to automatically dial and connect to your pre-configured ISP.

Windows 98 and 95 users may need to disable "Connect to the Internet as needed" *in order to bypass the Dial-Up Networking* "Connect To" window. *Refer to Chapter 8, "Evaluating Symptoms and Solutions" for further information*.

Call Routing Among Service Providers

The 56K LAN Modem automatically calls the first configured service provider. If you configure a second remote connection, such as an additional ISP, and want to use that second profile for an automatic data call, do the following.

1. Access the 56K LAN Modem's configuration home page.
2. Choose the *Workstation* graphic.
3. Select your computer.
4. Check only the service provider that you want to use.

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Placing a Call Manually

You can also choose to manually place a call to either an existing service provider or to a destination that has not been defined.

To place a call manually to an existing service provider (that is, one that is already configured), do the following.

1. From the 56K LAN Modem home page, click the *Manual Calling* button.

   The Manual Call Control window appears.

2. In the table, locate the name of the service provider to which you wish to connect. Verify that a call is not already connected to that or another destination by looking under the *Status of Call* column.

3. Click *Place Call*.

   A message indicates that the call is being placed. The LAN Modem's OH LED illuminates green, indicating a call in progress. Once connected, the CD LED illuminates, indicating a successful connection to the remote server. You may then run any program appropriate for that location, such as ftp to transfer files or a Web browser to access the Internet.

Placing a Call Manually to a Temporary Service Provider

To place a call manually to a service provider that has not been previously configured, do the following. Note that for this type of manual call, the service provider must supply a dynamic IP address.

This call profile will remain under TempSvcProvider *until you change the settings of these fields.*

1. From the LAN Modem's home page, click *Manual Calling*.

   The Manual Call Control window appears.

2. In the table, locate *TempSvcProvider*.

3. Click *Place Call*.

4. Enter the telephone number of the destination in the Telephone Number field.

5. Enter your User ID for the remote destination.

6. Enter your Password for the remote destination.

7. Enter the DNS address if the remote destination does not automatically provide an IP address. Otherwise, leave this field empty.

8. Click *Make Call*.

   A message indicates that the call is being placed. The LAN Modem's OH LED illuminates green, indicating a call in progress. Once connected, the CD LED will illuminate, indicating a successful connection. Once connected, you are ready to run any desired application appropriate for that location, such as ftp to transfer files, or you may enter a different URL in your Web browser to access the Internet.

Once a temporary call is established, other workstations may also connect to this service provider by clicking TempSvcProvider*. Note that if multiple parties are connected to* TempSvcProvider*, the call is disconnected as soon as one party hangs up.*

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Receiving Calls

The 56K LAN Modem can receive both voice and data calls, as follows.

Receiving Voice Calls

Voice calls received by the 56K LAN Modem will be routed to any analog equipment connected to the Phone port, by default, assuming that a data call is not currently connected. For assistance with installing an external analog device, refer to chapter 3, "Installing Analog Equipment".

Receiving Data Calls

The 56K LAN Modem can receive incoming data calls for the following purposes:

- Making changes to the previously defined service providers.

  Refer to Chapter 6, "Configuring the LAN Modem from a Remote Location," for instructions.

- Downloading the latest firmware

  Refer to Chapter 8, "Downloading Firmware to Your 56K LAN Modem," for instructions.

- Reviewing 56K LAN Modem statistics

  Refer to Chapter 8, "Reviewing Statistics," for instructions.

Auto Answer must be enabled for your LAN Modem to receive an incoming data call. Note that Auto Answer is disabled by default.

Auto Answer

The Auto Answer feature allows your LAN Modem to automatically answer an incoming call after a user-specified number of rings. By default, Auto Answer is disabled. In this case, all incoming calls are routed to any analog equipment connected to the Phone port.

You can choose to have your LAN Modem automatically answer incoming calls, or you can leave Auto Answer disabled (the default). To set or change this value, do the following.

1. From the LAN Modem's main page, click the *Maintenance* button from the left frame.

   The Maintenance page opens.

2. From the "Auto Answer on ring number" drop down list, choose the number of rings before your LAN Modem automatically answers an incoming call. To set your LAN Modem to never answer incoming calls, choose "Disable."

3. Click *Submit*.

Incoming calls for data transfer are not supported. For example, you cannot call into the 56K LAN Modem to use a computer as a server that others would dial into and use for accessing information.

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Disconnecting Calls

You can disconnect calls manually or utilize timers to disconnect calls automatically.

Disconnecting Calls Manually

To disconnect calls manually, do the following:

1. From the 56K LAN Modem home page, click *Manual Calling*.

   The Manual Call Control window appears.

2. In the table, locate the name of the service provider from which you wish to disconnect and then verify that the call is active under the *Status of Call* column.

3. Click *Hangup Call*.

   A message indicates that the call is being disconnected.

Disconnecting Calls Automatically Using Timers

Disconnect timers are set via the Data Call Parameters window. Specifically, the parameters you can set are as follows.

Minimum Call Duration

Enter the minimum length of a call that must be reached before the 56K LAN Modem detects inactivity on the connection and then starts an inactivity timer. The default is two minutes, which is also the lowest value allowed for this field.

Idle Timeout

In the field *Disconnect a data call after how long of an inactivity period?*, enter the number of seconds after which a call should be disconnected due to inactivity. This timer is initiated once the minimum call duration is satisfied and no further activity is detected. To prevent a data call from being disconnected due to inactivity, enter 0. The default for an automatic call is seven minutes. The default for a manual call is 15 minutes.

Using a Connection Script

Some service providers, such as CompuServe®, require the use of a connection script to successfully log on to their remote servers. You can create and associate specific connection scripts with each of the LAN Modem's four service provider profiles.

Note that this option is provided only for those remote sites which do not offer automatic PPP negotiation. You may not be required to create a script for every service provider profile that you want to access from your LAN Modem.

Before You Begin

To create a connection script, you will need the following information from your service provider.

- Your user name and password.
- The Data Bits required by the remote server (either seven or eight).
- The Parity setting for the remote server (either none, even or odd).
- The number of Stop Bits required by the remote server (either one or two).

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Accessing the Script Configuration Page

You can associate a unique connection script for each of your four service provider profiles. You enter the script via the LAN Modem's Script Configuration page.

To access the Script Configuration page, do the following.

1. From the LAN Modem main page, click the Service Providers icon.

   The Service Provider Selection page opens.

2. Choose the service provider for which you want to create or edit an existing connection script and click *Select*. If you are creating a new service provider, choose *New (Internet Service Provider)* or *New (Private Network)* and click *Select*.

   For instructions on creating or editing service provider profiles, refer to Chapter 6, "Setting Up Additional Service Providers."

   The Service Provider Parameters page opens. Review your parameters and make changes if desired.

3. Click the *Script* button located at the bottom of the Service Provider Parameters page to access the Script Configuration page.

   A dialog box opens.

4. Click *OK* to enter the Script Configuration page.

   The Script Configuration page opens, as shown in Figure 43.

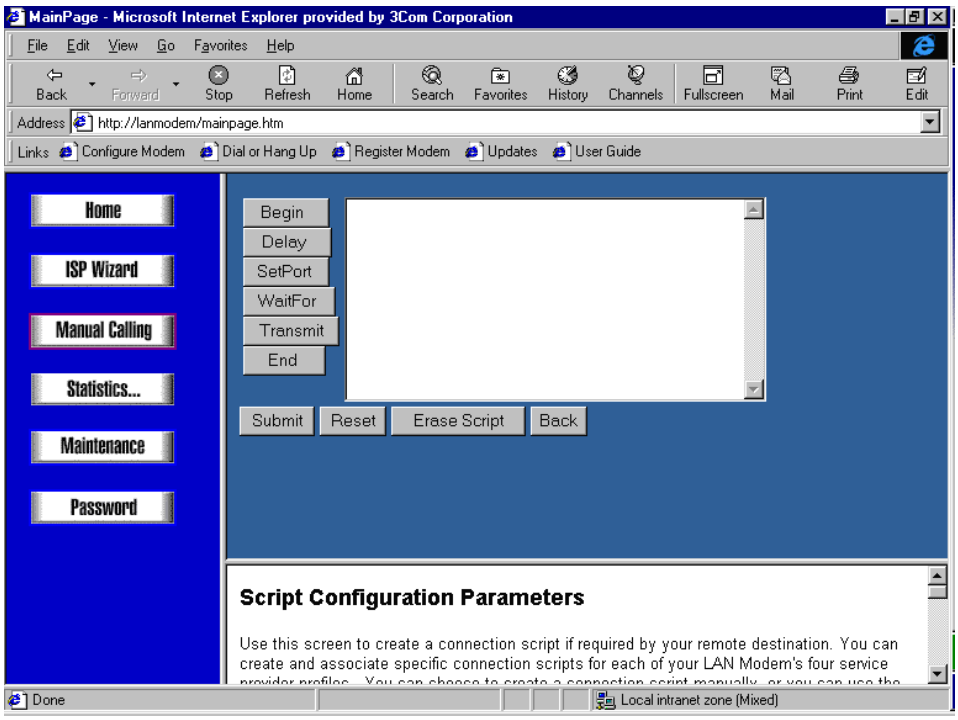

Figure 43 Script Configuration Page

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Creating a Connection Script

You can choose to manually create a script from within a text editor of your choice and copy and paste the script directly into the Script Configuration text box. Or you may use the buttons located along the left side of the script window to guide you through the scripting process.

Connection Script Command Syntax

The following section explains the valid script command syntax.

- The Begin command (**begin**) initiates the script. The first line of the script must start with **begin**.
- The Delay command (**delay *second)*** designates a length of time to wait before sending the next command in the script. The acceptable values are between 1-60 seconds.
- The SetPort command (**setport *databit, parity, stopbit)*** allows you to match the script to the communication port settings of the remote server. The valid *databit* is **8** or **7**. The valid *parity* is **none**, **even**, or **odd**. The valid *stopbit* is either **1** or **2**.
- The Transmit command (**transmit *"text string"***) sends a text string to the remote server. An example of a transmit string might be your account username or password. This text must be included between the quotation marks. A carriage return is simulated by the characters **^M** within the quotation marks. The maximum length for this string is 64 characters.
- The WaitFor command (**waitfor *"string, second"***) allows you to designate the text that the script will wait for before proceeding. An example of text that you might wait for is the string Username, for which you would send your username as a reply. If the timeout period elapses before a matching string is received, the script execution will abort. The maximum **string** length is 64 characters, and the acceptable **second** is between 1-60.
- The End command completes your script. The last line of your script must conclude with **end**.

Using the Configuration Buttons

To create a connection script using the configuration buttons, do the following.

1. From the Script Configuration page, click *Begin*.

   The text *begin* is entered as the first line in the script window.

2. Click *Delay* to set a delay interval before executing the next line of the script.

   The Delay dialog box opens.

3. Enter the amount of time in seconds that your script will wait before proceeding. This delay interval is used to allow the remote server time to process your request. Click *OK* when finished.

   The text *delay xx* is entered in the script window.

4. Click *Set Port*.

   The Data Bits dialog box opens.

5. Enter the number of Data Bits required by your service provider. Click *OK* when finished.

   The Parity dialog box opens.

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6 Enter the Parity setting required by your service provider. Enter *e* if the remote server requires Even parity, *o* if the remote server requires Odd parity, or *n* if the remote server requires that parity be set to *None*. Click *OK* when finished.

The Stop Bits dialog box opens.

7 Enter *1* to set the stop bits to one, or enter *2* to set the stop bits to two, and then click *OK*.

Note the results in the script window. For example, if you chose the default values for the Begin, Delay and SetPort parameters, the following text will have been automatically entered:

```
begin
delay 1
setport 8 n 1.
```

8 Click *WaitFor*.

The WaitFor dialog box opens.

9 Enter the string that the remote server will send as a request. An example might be the word `Login`: Click *OK* when finished.

10 Enter the maximum number of seconds to wait for the remote server to send the connection request. Click *OK* when finished.

11 Click *Transmit*.

The Transmit dialog box opens.

Enter the text that you want to transmit to the remote server. An example might be your username or password. Click *OK* when finished.

Add any additional *Transmit* or *WaitFor* text as required. Note that a carriage return is simulated by including **`^M`** within the quotation marks of your transmitted text. For example: **`transmit "mypassword^M"`** will send your password along with a carriage return.

12 Click *End* when your script is complete. The last line of text in your script must conclude with *end.*

An example of a completed script is shown in Figure 44.

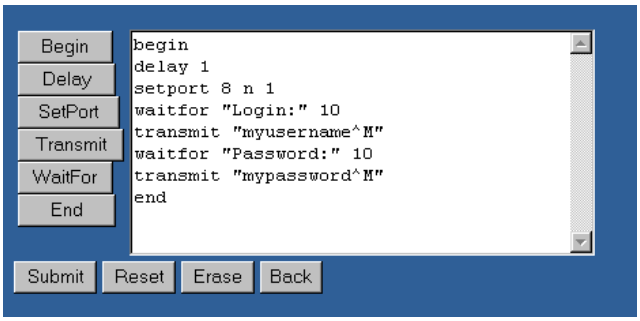

Figure 44 Connection Script Example

13 Click *Submit* to save your script and return the Service Provider Page.

All commands are automatically changed to lower case when the script is submitted.

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Once completed, your script will be automatically invoked each time you launch a call to your service provider.

Additional Configuration Buttons

The Script Configuration page provides the following configuration buttons, located along the bottom of the script text entry window.

- The Submit button saves your script and returns to the Service Provider Parameters page.
- The Reset button restores the last saved version of your connection script.
- The Erase button clears the script window of all text.
- The Back button returns you to the Service Provider Parameters page without saving any changes made to your script.

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8 TROUBLESHOOTING AND MAINTENANCE

This chapter explains how to isolate and solve problems encountered with the 56K LAN Modem. Problems may stem from incorrect option settings or improper installation.

This chapter covers the following main topics.

- Checking the basics
- Monitoring the LEDs
- Evaluating symptoms and solutions
- Finding more information
- Contacting technical support
- Downloading firmware
- Resetting the 56K LAN Modem
- Reviewing statistics

CAUTION: *There are no user-serviceable parts inside your 56K LAN Modem. Unauthorized opening of the unit will void the warranty.*

Checking the Basics

Before you monitor the LEDs or refer to the symptoms and solutions section, check the following:

- Verify that the cables are not physically damaged. If damage is apparent, replace the cable.
- Verify that the power cord is connected to the 56K LAN Modem and an electrical outlet.
- Verify that the analog telephone cable is properly connected to the 56K LAN Modem and the telephone wall outlet.

Monitoring LEDs

If you are experiencing operational inconsistencies, you can monitor the ALERT and LAN port status LEDs to isolate problems.

Monitoring the ALERT LED

Power cycle the 56K LAN Modem and observe the ALERT LED. During the power-up self-test, the ALERT LED will remain lit.

- If the ALERT LED turns off, the test has been successful.
- If the ALERT LED flashes for more than several seconds, it is either in firmware download mode or there is an internal failure. If the 56K LAN Modem is not in firmware download mode, notify your reseller that the 56K LAN Modem has failed the self-test and order a replacement.

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- A fast flash of the ALERT LED indicates that the DHCP server has issued all of the available IP addresses, and is unable to fulfill a request for a new IP address. Refer to "ALERT LED continues to flash" for more information.

Monitoring the LAN Port Status LEDs

Observe the LAN port status LED labeled 1, 2, 3, or 4, depending on the port number to which your computer is attached. If the LED port status is lit, the 56K LAN Modem detects the Ethernet link signal and operation is normal. When the computer attached to that port is transmitting data to the LAN, this LED flashes.

If the port status LED is Off, the 56K LAN Modem does not detect the Ethernet link integrity signal. Refer to the "Evaluating Symptoms and Solutions" section.

The Ethernet cable may not be properly connected or the cable may be the wrong polarity.

Evaluating Symptoms and Solutions

Table 8 lists symptoms of common problems, possible causes, and possible solutions.

Table 8 Symptoms, Causes, and Solutions

Symptom	Possible Cause	Solution
LAN port status LED is off (that is, not illuminated)	Ethernet cable is not securely connected.	Check the Ethernet cable connection and make sure it is inserted properly in a port labeled 1,2,3, or 4 on the back of the 56K LAN Modem and in the Ethernet port on the back of your computer.
	Ethernet card is not set up properly.	Make sure your Ethernet card is set up properly (for example, proper drivers are loaded). Refer to the documentation provided with your Ethernet card for instructions.
Upon initial set up, communication between the 56K LAN Modem and an attached computer cannot be established	Incompatible IP address on your computer	Reset the IP address on your computer. For Windows 95 and 98 users, run Winipcfg.exe. Select the Ethernet adapter connected to the 56K LAN Modem. Click *Release All* and then click *Renew All*. For Windows NT 4.0 users, run *ipconfig /release* and then *ipconfig /renew*. For Mac users, from the Apple menu, select *Control Panels* and then select *TCP/IP*. Make sure *Ethernet* is selected in the Connect via field. From the Configure field, select *Using BootP Server* to clear the fields, then close and save changes to the Control panel. Open the TCP/IP control panel and select *Using DHCP Server*. The fields should now read `<will be supplied by server>`. Select *File* and then *Close* and save changes when prompted.
	Your Web browser needs the IP address of the 56K LAN Modem.	Enter the following URL in your Web browser: **`http://192.168.1.1/`**. Alternatively, you can enter **`http://3Com.oc.lanmodem`**.

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Table 8 Symptoms, Causes, and Solutions

Symptom	Possible Cause	Solution
	Your Web browser may be configured to use a proxy server.	Set your browser to use the LAN Modem. For internet Explorer: **1** From within Explorer, choose *View* and *Internet Options*. **2** Select the *Connection* tab. **3** Under the *Proxy Server* header, uncheck the box labeled *Accessing the Internet using a proxy server.* For Netscape: **1** From within Netscape, choose *Edit* and select *Preferences.* **2** Double click *Advanced* and click *Proxies*. **3** Check the box labeled *Direct connection to the Internet.*
	There is a configuration problem.	Reset the 56K LAN Modem to the factory default setting. Refer to "Resetting the 56K LAN Modem to a Factory Default Setting" for assistance.
	The wrong cable may be connected to the LAN port on the 56K modem and your PC.	Make sure you are using the 8-pin to 8-pin cable labeled Ethernet that was provided with your 56K LAN Modem. If you are using another 10BASE-T Ethernet cable, it must be a straight-through cable.
	Web browser may not be set to a default start page	Enter a default URL from within your Web browser. If you are using Internet Explorer, launch your Web browser. From the *View* menu, select *Internet Options*. Enter an address in the Home page address field, such as **`http://www.3com.com.`** If you are using Netscape, launch your Web browser. From the *Options* menu, select *General Preferences*. From Browser Starts With, select *Home Page Location* and then enter a URL such as **`http://www.3com.com`**.
	A statically configured workstation has caused the LAN Modem to change its factory default IP address to match the gateway of the workstation.	You must use the new LAN Modem IP address to access the LAN Modem. For Windows 95/98/NT: **1** Open the Network control panel. **2** Select *TCP/IP* and click on *Properties.* **3** Note the IP address of the first Gateway entry. Make sure that the first DNS entry matches this IP address. **4** Enter this IP address as the URL in your Web browser. Make sure that the Gateway and DNS server configured on all of your LAN's workstations match this IP address.
Clicking "submit" in the LAN Modem's configuration pages does not take you to the next screen	JavaScript may not be enabled in your Web browser.	Enable JavaScript via your Web browser's configuration options.

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Table 8 Symptoms, Causes, and Solutions

Symptom	Possible Cause	Solution
Sending SMTP mail is slow.	Only one workstation to one server is supported at one time for SMTP mail.	If more than one workstation starts an SMTP mail session to the same remote server at the same time, the mail transfer rate for each additional workstation will be slowed.
Although multiple service providers are configured, all calls are going to the same service provider which is a private network	You may not have configured the IP address and the subnet mask in the Private Network Parameters window.	From the 56K LAN Modem's home page, click *Service Providers* and then select the private network profile you already configured. Enter the IP address and the subnet mask for the private network.
The Windows 95 "Connect To" window opens upon launching a Web browser.	Dial-Up Networking is setup for use with a serial port modem.	To bypass the "Connect To" window: **1** Double-click the *Internet* control panel. **2** Click the *Connection* tab. **3** Check the "Connect to the Internet using a local area network" radio button. **4** Click *OK*. This allows all outgoing connections to run directly through your LAN Modem.
ALERT LED remains lit	An internal failure.	Notify your reseller or technical support that the 56K LAN Modem has failed the self-test.
ALERT LED continues to flash	Self test failure or LAN Modem is in firmware download mode	Power cycle the LAN Modem. If the ALERT LED continues to flash, the ISDN LAN Modem has failed the self test. Contact your network supplier. If the ALERT LED is not flashing, then the LAN Modem is now operating correctly.
ALERT LED continues to fast flash. This may occur as a result of replacing a workstation on the LAN with a new computer.	The DHCP server has issued all of the available IP addresses, and is unable to fulfill a request for a new IP address.	From another computer attached to the LAN Modem, go to the LAN Modem's main configuration page. Click *Workstations* . Select the name of computer you removed and then click *Select* . Click *Release Workstation Entry* . Reboot the workstation. The newly-added workstation can now be assigned an IP address.
When the handset of a telephone attached to the 56K LAN Modem is lifted, a dial tone cannot be heard.	The telephone line cable, power cable and/or phone cable may not be firmly connected.	Check all cables and connectors to ensure that they are inserted securely.
	Telephone cable may not be inserted into the correct port.	Ensure that the incoming analog telephone line has been connected the port labeled "LINE" on the LAN Modem's back panel.
	A data call may be in progress.	Disconnect any data calls currently in progress.
CD LED does not remain green.	The user name and/or password for this service provider may not be entered properly.	Make sure that the user name and password for this service provider are entered accurately on the Service Provider page.
A connection has been established (CD LED remains lit) but data cannot be sent.	There is an interoperability mismatch between the local and remote applications.	Make sure that the local and remote data applications have communications capability and are properly configured.

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Table 8 Symptoms, Causes, and Solutions

Symptom	Possible Cause	Solution
Calls continue to reconnect or calls do not timeout and disconnect.	An application or LAN device is sending IP packets.	Enable NetBIOS filtering. To do so, access the LAN Parameters screen and click the box to enable NetBIOS filtering. When this box is checked, NetBIOS packets are prevented from initiating an outgoing call, but they will be passed if the call is already established. NetBIOS filtering is disabled by default. Set the workgroup of all attached PCs to *WORKGROUP* in the Network control panel. Or, turn off Microsoft's print/file sharing or use NetBEUI for local service (that is, within the LAN). To turn off print/file sharing, from *Control Panel* select *Network* and then the *Configuration* tab. Click the *File and Print Sharing* button. Clear both check boxes and then click *OK*. Make sure that the timeout value is not set to "0". Check the timeouts configured for the 56K LAN Modem as explained in "Changing Data Call Parameters" in Chapter 5. Drop the call via the Manual Calling screen, wait for the spurious call to be re-connected, and check the *Current Call Information* from the Statistics page for the *Reason for call coming up* . If the situation persists, disconnect each attached LAN device to locate the source of the IP packet generation. Or you can turn off Automatic Call Initiation, located on each service provider parameter page.
Some application software does not work properly	The application may have an embedded IP address, which causes a problem when NAT is enabled on the LAN Modem.	If you have a static network, disable NAT and try the application again. A complete list of applications tested for use with the LAN Modem is located at **http://www.remoteaccess.3com.com/support/docs/lanmodem/documentation/interop.html**
Unable to connect at 56Kbps	56K may not be supported by your remote server	In order to take advantage of 56K-based analog connections, your remote server (such as an ISP) must support 56K technology. To locate a 56K-enabled ISP in your area, visit **http://www.3com.com/56K**.
	FCC limitations	Current FCC rules restrict the power output of a Service Provider's modems, limiting download speeds to 53Kbps.
	Poor line conditions	Check with your telephone company to ensure maximum clarity exists for your telephone line.

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Finding More Information

For more information about the 56K LAN Modem, such as frequently asked questions and specific technical notes, go to the following URL, **http://www.remoteaccess.3com.com/support/docs/lanmodem/welcome.html** nd then bookmark this site for quick and easy access. If you are using the 56K LAN Modem custom browser, click *Updates* from the menu bar.

Contacting Technical Support

Refer to the technical support card that was included with your LAN Modem to locate the technical support telephone number for your location.

Downloading Firmware to Your 56K LAN Modem

Your 56K LAN Modem has been designed to be user-upgradable. The latest firmware for your 56K LAN Modem is available at **http://www.remoteaccess.3com.com/support/docs/lanmodem/welcome.html.** Refer to the Readme file at the same location for instructions about how to download firmware.

Resetting the 56K LAN Modem to a Factory Default Setting

There are two types of resets you can perform, a normal reset and a factory reset.

- A normal reset will leave all user-entered configuration parameters unchanged. Any active calls, however, will be terminated.
- A factory reset restores the 56K LAN Modem configuration to the factory default settings listed in Appendix C. All user-entered parameters are lost.

To reset the 56K LAN Modem, do the following.

1. From the 56K LAN Modem's home page, select *Maintenance*.
2. Select the type of reset you would like to perform, normal or factory.

Resetting the 56K LAN Modem to the Factory Defaults

If you are unable to access the LAN Modem's main page because your computer cannot communicate with the LAN Modem, you can restore the LAN Modem to the factory default settings using the reset switch located on the unit's back panel. To reset the LAN Modem using the reset switch, do the following.

- Press and continue to hold in the reset button located on the back of the unit. (You must continuously hold the reset button through three cycles of LED flashing: Reset, Firmware Download mode, and Factory Default Reset.)
- After approximately ten seconds, the ALERT LED will begin to flash. This first cycle indicates that the unit has been reset. This first reset is similar to a power-cycle of the unit. In this case all user-entered information is maintained.
- The second cycle of ALERT LED flashing indicates that the unit has entered firmware download mode.
- After the ALERT LED has flashed for the third cycle, you have successfully reset the LAN Modem back to factory defaults.
- Release the reset button.

  The LAN Modem reinitializes itself, and is reset back to the factory defaults. All user-entered information will be erased.
- Restart your computer.
- Launch your Web browser.

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Reviewing Statistics

Various statistics about LAN and WAN parameters are stored and available for review.

To view statistics, do the following.

1 From the 56K LAN Modem's home page, select *Statistics.*

2 Select the type of statistics you would like to review.

You can view the following types of statistics.

- System
- Current Call
- Last Call
- Service Provider

Refer to the appropriate section for a list and description of the information provided.

Understanding System Statistics

The system statistics are described in Table 9.

Table 9 Description of System Statistics

System Statistics	Description
Product ID	Displays the product ID of the 56K LAN Modem.
Serial Number	Displays the serial number of the 56K LAN Modem.
Ethernet Address	Displays the Ethernet address of the 56K LAN Modem.
System software version number	Displays the firmware version of the 56K LAN Modem.
Boot software version number	For internal use only.
The LAN Modem has been up for	Displays the length of time the 56K LAN Modem has been running. This timer is cleared when the unit is power cycled or reset.
Date (Month/Day/Year)	Lists the current date of the LAN Modem *
Time (Hour:Minute:Second)	Lists the current time of the LAN Modem *
Built-in modem	Displays the DSP version of the LAN Modem

* This date and time is based on the computer used to initially set up the LAN Modem.

Understanding Current Call Information

The current call information is described in Table 10.

Table 10 Current Call Information Description

Current Call Information	Description
Connect Message	Indicates the modem CONNECT message received for the current call.
Call direction	Indicates whether the current call is incoming or outgoing.
Service provider name	Indicates the destination to which the current call is connected.
IP address in use	Indicates the IP address assigned by the service provider.
Primary DNS address	Indicates the primary DNS address of the service provider to which the current call is connected.

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Table 10 Current Call Information Description (continued)

Current Call Information	Description
Secondary DNS address	Indicates the secondary DNS address of the service provider to which the current call is connected. This field will be empty if a secondary DNS address is not needed.
Data call options	If the current call is a data call, indicates the type of data call (i.e.,PPP), the type of PPP authentication negotiated, and whether hi/fn LZS compression is on or off. For example, `PPP PAP/Compression-On`.
Call start time	Displays the date and time the call began.
The call has been up for (seconds)	Indicates the length of time (in seconds) that this current call has been connected.
The connection has been idle for (seconds)	Indicates the length of time (in seconds) that this current call has been idle.
Number of octets received	Indicates the number of octets (bytes) received by the 56K LAN Modem.
Number of octets transmitted	Indicates the number of octets (bytes) transmitted by the 56K LAN Modem.
Called telephone number	Indicates the telephone number dialed to reach the service provider for the current call.
Reason for call coming up	Indicates how the call was placed and which workstation placed the call. Depending on how the call placed you should see something similar to the following: "Manual Dial by Workstation A." "DNS query from Workstation A for http://www.somedomain.com." "Packet from Workstation A to IP address xxxx."

Understanding Last Call Information

The last call information is described in Table 11.

Table 11 Last Call Information Description

Last Call Information	Description
Connect Message	Indicates the modem CONNECT message received for the last call.
Call direction	Indicates whether the last call was incoming or outgoing.
Service provider name	Indicates the destination to which the last call connected
Data call options	Indicates the type of call (i.e., PPP).
Call start time	Displays the date and time the call began.
The call was up for (seconds)	Indicates the length of time the last call was connected.
Number of octets received	Indicates the number of octets (bytes) received by the 56K LAN Modem.
Number of octets transmitted	Indicates the number of octets (bytes) transmitted by the 56K LAN Modem.
Called telephone number	Indicates the telephone number dialed to reach the service provider for the last call.
Reason for call going down	Indicates why the last call was disconnected. For example, idle timer expired, or manual disconnect.

(continued)

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Table 11 Last Call Information Description

Last Call Information	Description
Reason for call coming up	Indicates how the call was placed and which workstation placed the call. Depending on how the call placed you should see something similar to the following: "Manual Dial by Workstation A." "DNS query from Workstation A for http://www.xxx.com." "Packet from Workstation A to IP address xxxx."

Understanding Service Provider Information

The Service Provider information described in Table 12 is provided after a call has ended.

Table 12 Service Provider information description

Service Provider Information	Description
Number of successful connections	Indicates the total number of successful connections to each service provider
Number of failed connections	Indicates the total number of unsuccessful connections to each service provider.
Total number of octets received	Indicates the total number of octets (bytes) received by the 56K LAN Modem.
Total number of octets transmitted	Indicates the total number of octets (bytes) transmitted by the 56K LAN Modem.
Total connection time (seconds)	Indicates the collective connection time for this particular service provider

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A

NETWORKING PRIMER

This chapter provides a description of basic networking concepts and modem terminology to help you better understand the key functionality of the 56K LAN Modem.

What is a network?

A network is a set of computers and other devices such as printers, modems, and scanners that are connected together either directly via physical cables or indirectly via dial-up telephone services. A network can be in the same room, the same building covering a local area or geographically dispersed over a wide area.

What is a LAN?

A Local Area Network (LAN) is two or more computers linked together in a contained location such as an office building. By linking the computers together and creating a LAN, users can share files and share access to printers.

To physically create a LAN each computer must be linked together using some type of cabling. Typically, Ethernet cabling is used. There are three main types of Ethernet networks, 10BASE-T, 10BASE-2 and 10BASE-5. The 56K LAN Modem supports up to ten 10BASE-T connections.

A 10BASE-T Ethernet network is used in small networks with only a few dozen devices closely located. The physical connection for a 10BASE-T Ethernet network is over a twisted pair cable. The connector used for 10BASE-T looks similar to the connector used for your telephone. A 10BASE-5 Ethernet network is used in large networks with many devices where transmissions occur over distant geographic areas. A 10BASE-2 (Thin) Ethernet network is used in smaller networks with all devices being relatively close together.

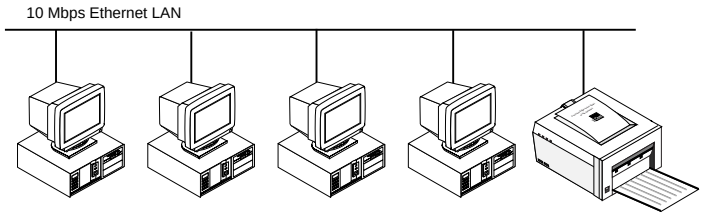

Figure 45 Example of a LAN

What is a WAN?

A Wide Area Network is the result of the connection of two or more LANs, typically using dial up telephone services via a modem, and often over far geographic distances.

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How does a LAN connect to a WAN?

You can connect a LAN to a WAN via a number of devices such as a router or a bridge that can place a call to the remote LAN using an analog telephone line. Routers and bridges are devices that link networks. A bridge sends every bit of information across the WAN while a router is considered a more sophisticated device because of its ability to route only the desired bits of information across the WAN. Routers are also capable of monitoring the integrity of the data and transmission path.

What is a LAN Modem?

A LAN Modem is a hybrid device which combines the dial-up capabilities of a standard modem and an Ethernet hub. This eliminates the computer COM port speed bottleneck associated with serial port based modems (the LAN runs at 10 Mbps) while providing local networking between the attached computers on the LAN. Even with this sophisticated functionality, a LAN Modem is easy to install and use and presents an ideal solution for small networks.

What is a POTS connection?

POTS stands for "Plain Old Telephone Service" and refers to a basic telephone connection without any added features or functions. A POTS line is used to connect analog devices, such as a telephone, fax machine, or your 56K LAN Modem to the public telephone network.

How do different devices communicate with each other?

Once the computers are physically connected in a network, they must run some type of standard communications software that allows different types of computers to communicate with each other. Transmission Control Protocol/Internet Protocol (TCP/IP) is becoming the most common software used to accomplish this.

What is TCP/IP?

TCP/IP is a standardized communications protocol that works across LANs and WANs, allowing different devices to communicate with each other. As its name indicates, TCP/IP has two main components; TCP and IP. TCP manages the transfer of data and corrects any errors that occur during transmission, ensuring that data is reliably transferred. IP is responsible for routing the data in packets from one location to another across a network. It then uses the source and destination information contained within each data packet to determine the proper routing and destinations for each packet of information.

Note that TCP/IP encompasses more than the two protocols which define its name. It provides additional functions comprises various software applications that allow various network services such as remote file transfer (FTP), remote login (Telnet), as well as email Simple Mail Transfer Protocol (SMTP) and Post Office Protocol (POP) 3.

What is an IP Address?

An IP address is a 32 bit address used by TCP/IP to uniquely identify the location of a device on a network. Note that the IP address does not refer to the device itself. If, for example, you relocate a PC to another area of the same network, you may need a new IP address.

The structure of this 32-bit address varies depending upon the size of the network on which the device is located. From largest to smallest, network types are referred to as Class A, Class B, Class C, and Class D. Within each class, a certain number of bits identifies the class, the network and the local address. For example, in a Class C network the first three bits (110) identify the network type

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as Class C. The next 21 bits identify the network and the last 8 represent the local or host address, limiting the number of devices to 256. In contrast, a Class A network allocates 24 bits for local addresses, allowing for many more devices.

IP addresses are composed of four sets of eight bits usually separated by a period (for example, 192.168.1.1).

The IP address of the 56K LAN Modem identifies the 56K LAN Modem itself and the network it creates when devices are connected to the Ethernet ports.

What is a Subnet Mask?

Many networks are divided further into smaller sub networks. A subnet mask is a number that identifies the sub network to which your computer is connected. The subnet mask differentiates the part of the IP address that represents the network and the part that represents the host.

The bits of the subnet mask are set to 1 if the host should treat the corresponding bit in the IP address as part of the original network number. These bits in the mask are set to 0 if the host should treat the bits as part of the device number as shown in Figure 46.

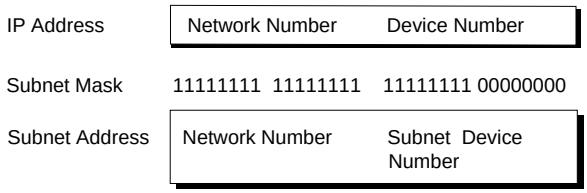

Figure 46 Subnet Mask

Dynamic and Static IP Addresses

IP addresses for public networks must be unique and provided by the Network Information Center (NIC). Because of the increasing popularity of the Internet, the NIC is running out of permanent IP addresses. It is therefore becoming more common to use dynamic IP addresses, which are assigned temporarily and then reused, instead of static IP addresses which are permanently assigned. For example, when accessing the Internet, your ISP has a pool of IP addresses it uses to provide temporary connections to multiple users. Once you disconnect from the Internet, the IP address you were using is placed back in the pool for use by another user.

If your LAN will not connect to the public Internet, you can set up your own unique (that is, private) IP address numbering. IP addresses for private networks such as an office LAN must also be unique but only within that LAN.

What is DHCP?

Dynamic Host Configuration Protocol is a process that automatically assigns a unique, temporary IP address to a newly attached computer on an IP network.

What is DNS?

Domain Name Service translates the common alphabetic name into the numeric IP address. For example, www.3com.com is translated to an specific IP address by DNS. If you do not use the DHCP functionality of the 56K LAN Modem, you will have to manually configure the following parameters for each computer on the LAN: IP address, subnet mask, DNS address and default gateway.

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What is NAT?

Network Address Translation, also known as IP address sharing, allows multiple users to share a single connection, such as an Internet connection. For example, with the 56K LAN Modem, when any user on the LAN launches a Web browser for Internet access, their computer's IP address is translated into the IP address provided by the ISP for access. This allows multiple users on your LAN to appear as one connection to your ISP.

You probably do not want to use NAT If your LAN network is static; that is, an IP address is assigned to your computer by your MIS department or ISP and manually configured.

What are numbered and unnumbered links?

Some networks require an IP address to be assigned to a WAN in addition to the LAN(s). If a WAN has an IP address assigned to it, it is considered a numbered link. If there is not an IP address assigned to a WAN, it is considered to be an unnumbered link.

How is overall throughput determined?

The performance of all linked devices must be considered to determine end-to-end throughput. Connection performance is affected by each device in the chain. Therefore, the slowest link in the chain determines the maximum throughput. On the LAN side, computers on a typical network can communicate with each other at up to 10 Mbps. When dialing up to a long distance location using 56K, you can establish a network connection speed of up to 56 Kbps without compression or up to 115.2 Kbps with compression. If you are dialing into the Internet, the speed of the router providing access must also be considered. In addition, the Internet itself may have speed limitations.

What is a modem?

The word "modem" is derived from the combination of two words: modulator/demodulator. The main function of a modem is to convert the analog signal of the telephone line into the digital signal required by your computer.

What is the difference between analog and digital signals?

Digital information is processed according to two finite states, expressed as either ON or OFF. Digital signals are therefore often referred to as binary. Most telephone lines, however, are analog, meaning that their signals are continuously varied along fluctuating rates and values. Before the advent of online services, the primary use for the telephone network was for transferring voice traffic, accomplished by converting the spoken voice into an electric signal of varying frequencies. Therefore, in order for your computer to understand the incoming analog data, a translation must take place; this is essentially the task of a modem.

What is error correction?

Error correction is a method by which modems verify the integrity of the data they are receiving. If an error is found, the corrupted or damaged packet of information, referred to as a frame, is resent. While this may impose a delay on the transmission speed, the data across the connection will be nearly 100% error-free. The current error correction standard is known as V.42. It is the most common error correction protocol in use today.

What is Data Compression?

Data compression is a method of reducing the amount of bandwidth required when transmitting a file over a network. This is accomplished by condensing any duplicate characters into a more compact form. For example, the series of numbers 0101 0101 0101 0101 0101 0101 0101 may be more simply expressed as "8 times 0101". Two common compression protocols are MNP-5 and V. 42bis.

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Note that employing data compression upon pre-compressed files, such as a ZIP archive, may actually increase the time required for file transmission. As such, V.42bis is preferable in these circumstances, as it is capable of recognizing pre-compressed files and withholding additional, unnecessary compression.

How does 56K technology work?

The V.90 56K ITU standard allows modems to receive data at up to 56 Kbps over the standard, public switched telephone network (PSTN). V.90 technology overcomes the theoretical limitations imposed on previous analog modems by exploiting the digital connections that most Internet and on-line service providers use at their end to connect to the PSTN, such as a T1 or an ISDN BRI line.

Typically, the only analog portion of the PSTN is the phone line that connects your home to the telephone company's central office (CO). Over the past two decades, the telephone companies have been replacing portions of their original analog networks with digital circuits. However, the connection from your home to the CO will likely remain analog for some years to come.

V.90 technology takes advantage of the typical network configuration found when an analog modem (such as your 56K LAN Modem) accesses a digitally connected ISP. By bypassing the analog-to-digital conversion in the downstream path, 56K technology can use nearly all of the available 64K network bandwidth. (Upstream data, typically less sensitive, travels at the standard V.34 rate of 33.6K.)

Based on "encoding" rather than "modulation", the result is download speeds once thought not possible. Older, V.34 modems treat the PSTN as if it were entirely analog; they therefore cannot take advantage of the bandwidth made available when one end of the connection--that of your ISP, for instance--is completely digital.

Possible Limitations

Note that several factors may affect your 56K LAN Modem's performance. Current FCC rules limit download speeds to 53 Kbps. Poor line conditions or heavy traffic may impact performance, just as with older V.34 modems. In real applications, speeds typically range from the 40s to the low 50s (Kbps), with the average in the mid-to upper 40s.There are cases where performance is in the 30s, and others where true V.90 performance may not be possible. Note that both your phone line as well as your service provider must be V.90 capable; this means that your service provider must conform to the V.90 standard. Lastly, V.90 requires that there be no more than one analog-to-digital conversion in the downstream path; PBX devices, such as those found in corporate telephone systems or some hotels, may introduce additional conversions.

For assistance with locating an 56K service provider in your area, or for a more detailed explanation of 56K technology, visit 3Com's 56K Web page at **`http://www.3com.com/56k`**.

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B USING THE CUSTOM WEB BROWSER

An Internet Explorer Web browser tailored for use with your 56K LAN Modem is provided on the *3Com Companion Programs* CD-ROM. You may prefer to use this browser as it has been customized for your 56K LAN Modem, as shown in Figure 47, making it easier to use.

If you use a different Web browser, make sure that it supports frames. (Netscape 3.0 and later and Internet Explorer 3.0 and later both support frames.)

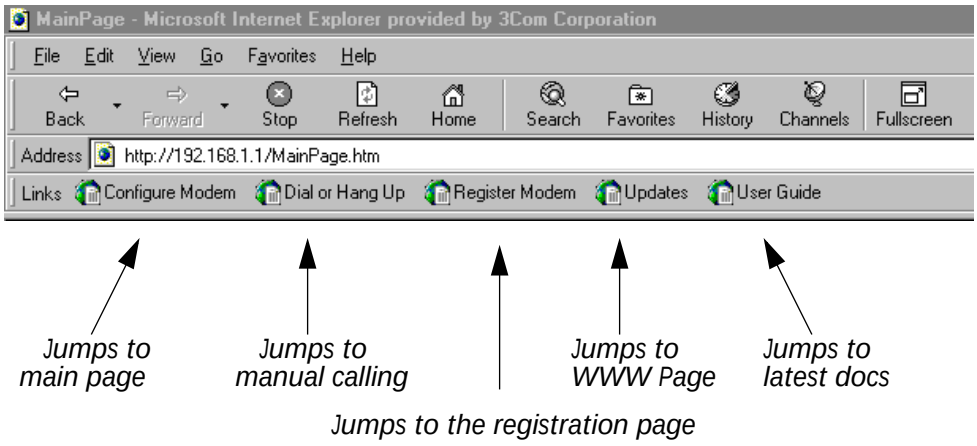

Figure 47 56K LAN Modem Custom Internet Explorer Browser

Custom Links

The following custom buttons provide direct links to 56K LAN Modem configuration and information Web sites.

- Configure Modem

  Click here to jump to the 56K LAN Modem configuration main page.

- Dial/Hang Up

  Click here to jump to the 56K LAN Modem's Manual Calling page where you can connect to and disconnect from the service providers you configured.

- Register Modem

  Click here to jump to the 56K LAN Modem registration page.

- Updates

  Click here to jump to the site where you will find the latest information on the 56K LAN Modem such as the latest firmware version and user documentation.

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- User Guide

  Click here to jump to the Internet location of the *OfficeConnect 56K LAN Modem User Guide*.

Using Favorites

Under the *Favorites* menu, a subcategory labeled *3Com sites* lists several helpful sites already bookmarked for you. These include:

- 3Com Corporate

  This takes you to the 3Com Corporate Web site.

- 3Com Remote Access

  This takes you to the 3Com Remote Access Web site.

- 3Com Shopping

  This takes you the 3Com Shopping Network.

- 3Com Small Business

  This takes you to the 3Com Small Business Networking Web site.

- 3Com Support

  This takes you the 3Com Support Web site.

Installing the Custom Internet Explorer Browser

If you already have a version of the Internet Explorer Web browser installed and you would like to install a later, customized version, you should first uninstall the previous version. Also, while installing the later version, you may be asked to replace the older files. It is recommended that you do so.

To install the custom web browser, do the following

1. Insert the *3Com Companion Programs* CD-ROM into your computer's CD-ROM drive.
2. From the main screen, click *Internet Explorer*.
3. Follow the instructions on the screen.

Installing Future Releases of Internet Explorer

Once you install the 56K LAN Modem custom Internet Explorer Web browser, you can install future release of standard Internet Explorer while maintaining the links listed under Favorites. However, any customized buttons may be removed from the newer version.

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C

FACTORY DEFAULTS

This appendix lists the factory default settings of the 56K LAN Modem.

56K LAN Modem Factory Defaults

Refer to Table 13 for the 56K LAN Modem factory defaults.

Table 13 56K LAN Modem Factory Defaults

LAN Parameters	
LAN Modem IP Address *	192.168.1.1
Subnet Mask	255.255.255.224
DHCP Server	Enabled
NetBIOS Filtering	Disabled
Use Data Compression	No
Use NAT	Yes
Data Call Timeout Values	
Minimum Call Duration	2 minutes
Automatic Data Call Inactivity Disconnect	7 minutes
Manual Data Call Inactivity Disconnect	15 minutes
Receiving Call Parameters	
Auto Answer	Disabled

* The 56K LAN Modem attempts to use this default IP address to communicate with the computer during initial configuration. If communication cannot be established initially, the 56K LAN Modem will change its default IP address. If this occurs, the IP address will be different from the default shown here.

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D SPECIFICATIONS

This appendix describes the following specifications of the 56K LAN Modem.

- General
- Year 2000 Compliance

General Specifications

Refer to Table 14 for the 56K LAN Modem specifications.

Table 14 56K LAN Modem Specifications

Network Interface	Analog (POTS) telephone service provided by the telephone company
Network (analog) Connector	RJ-11
LAN Interface	Ethernet IEEE 802.3 10BASE-T standard
Physical Dimensions	
Length	8.66 in (22.0 cm)
Width	5.44 in (13.8 cm)
Height	1.56 in (4.0 cm)
Environmental Operating Range	
Operating temperature	50˚ to 122˚F (10˚ to 50˚C)
Relative humidity	Up to 90% noncondensing
Power	
Input	110-240 VAC*
Output	13 VDC

* You must use the power supply provided with your 56K LAN Modem.

Year 2000 Compliance

The OfficeConnect LAN Modem is Year 2000 compliant. Specifically, its system clock is capable of accepting and storing dates including and beyond the year 2000. For information on Year 2000 compliance and 3Com products, visit the 3Com Year 2000 web page: **http://www.3com.com/products/yr2000.html**

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GLOSSARY

analog signals A variety of signals and wavelengths that can be transmitted over communications lines. An example is a voice call over the phone line.

baud rate A term used to measure the speed of an analog transmission from one point to another. Although not technically accurate, baud rate is commonly used synonymously with bit rate.

bit rate Also referred to as transmission rate. The number of binary digits (or bits) transmitted per second (bps). Communications channels using telephone channel modems are established at set bit rates, commonly 28,800, 56,000, or higher.

CHAP Challenge Handshake Authentication Protocol. CHAP is one of two PPP authentication protocols; PAP is the other. An authentication protocol requests information to verify a valid user. CHAP is a stronger authentication method because it uses encryption and may repeatedly request user verification at any time after link establishment.

central office (CO) The facility at which individual telephone lines in a limited geographic area are connected to the public telephone network.

compression Compression is a method of reducing the size of data packets without losing any information. If you desire, the 56K modem can automatically compress data for PPP calls to improve data transfer times using a compression method called hi/fn LZS.

DHCP Dynamic Host Configuration Protocol. DHCP allows a server to automatically assign an IP address to a newly-attached computer on an IP network.

default Value set at the factory.

Domain A domain is a unique name which refers to a single device on the Internet and is used for organizational purposes.

DNS Domain Name Server. DNS translates the common alphabetic name into the numeric IP address. For example, Oscar's_PC is translated to 192.168.1.2.

error control Various techniques that check the reliability of characters or blocks of data.

firmware Firmware is the code which resides in your 56K LAN Modem and controls its behavior. It differs from software in the form of programs that run on your computer.

FTP File Transfer Protocol. The protocol invoked when uploading or downloading files from a remote site via TCP/IP.

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ITU International Telecommunications Union. Headquartered in Geneva, Switzerland the ITU is an international organization within which governments and the private sector coordinate global telecom networks and services.

IP address An IP address is a set of numbers that uniquely identifies each device in a network.

ISP Internet Service Provider. A business that supplies access to the Internet such as your telephone company or AOL.

Kbps Kilobits per second. Kbps is the rate at which data is transmitted between communications equipment, such as 56K modems.

MS-CHAP Microsoft's proprietary version of CHAP. See also CHAP.

modem A device that transmits/receives computer data through a communications channel, such as a telephone line. A modem's essential task is to convert the analog signals of the telephone line into the digital signals required by your computer.

NetBIOS filtering NetBIOS filtering is a LAN Modem feature that helps prevent the LAN Modem from establishing unwanted calls. This feature filters the DNS requests made by NetBIOS that inadvertently cause the LAN Modem to place a call. NetBIOS is a protocol primarily used by Windows 98, 95 and NT for local file and printer sharing.

off hook/on hook Modem operations that are the equivalent of manually lifting a phone receiver (taking it off-hook) and replacing it (going on-hook).

PAP Password Authentication Protocol. PAP is one of two PPP authentication protocols; CHAP is the other. An authentication protocol requests information to verify a valid user. PAP requests the user's name and password for verification.

PC/TCP PC/TCP is a PC version of TCP/IP created by FTP software.

POTS Plain old telephone service.

PPP Point-to-Point Protocol. PPP provides a standard method of transmitting data through the Internet. PPP is used for communication between a computer and an Internet Service Provider.

PPTP Point-to-Point Tunneling Protocol. PPTP is a protocol that allows for Windows 95 and Windows NT systems to establish a secure connection to a remote, private network via a locally-dialed ISP account.

router A router is a device that links networks.

TCP/IP Transmission Control Protocol/Internet Protocol. TCP/IP is a standardized communications protocol which allows different types of devices to communicate with each other over LANs and WANs.

UDP User Datagram Protocol. UDP converts application data messages into packets to be sent via the Internet Protocol (IP), but does not verify a successful transmission. In this way, UDP is more efficient that TCP, leaving the reliability on the application that generates the message.

V.34 An ITU standard that currently allows data rates as high as 28,800 bps.

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V.34+ An enhancement to V.34 that enables transfer rates as high as 33, 600 bps.

V.90 V.90 is the ITU standard which allows modems to receive data at up to 56Kbps over the standard, public switched telephone network (PSTN). V.90 technology exploits the digital connections that most Internet and on-line service providers use at their end to connect to the PSTN, such as a T1 or an ISDN BRI line.

VPN A virtual private network is a secure, private data network that is established over the Internet, resulting in cost savings by using local, toll free access numbers. Also, because the existing Internet backbone is used, there is less investment needed in private network infrastructure.

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3Com Corporation LIMITED WARRANTY

OfficeConnect 56K LAN Modem

HARDWARE

3Com warrants this hardware product to be free from defects in workmanship and materials, under normal use and service, for the following length of time from the date of purchase from 3Com or its authorized reseller:

Lifetime, except that the fan and power supply hardware (if any) are warranted for one (1) year

3Com's sole obligation under this express warranty shall be, at 3Com's option and expense, to repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or if neither of the two foregoing options is reasonably available, 3Com may, in its sole discretion, refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3Com. Replacement products may be new or reconditioned. 3Com warrants any replaced or repaired product or part for ninety (90) days from shipment, or the remainder of the initial warranty period, whichever is longer.

SOFTWARE

3Com warrants that each software program licensed from it will perform in substantial conformance to its program specifications, for a period of ninety (90) days from the date of purchase from 3Com or its authorized reseller. 3Com warrants the media containing software against failure during the warranty period. No updates are provided. 3Com's sole obligation under this express warranty shall be, at 3Com's option and expense, to refund the purchase price paid by Customer for any defective software product, or to replace any defective media with software which substantially conforms to applicable 3Com published specifications. Customer assumes responsibility for the selection of the appropriate applications program and associated reference materials. 3Com makes no warranty or representation that its software products will meet Customers' requirements or work in combination with any hardware or applications software products provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected. For any third party products listed in the 3Com software product documentation or specifications as being compatible, 3Com will make reasonable efforts to provide compatibility, except where the non-compatibility is caused by a "bug" or defect in the third party's product or from use of the software product not in accordance with 3Com's published specifications or user manual.

YEAR 2000 WARRANTY

In addition to the Hardware Warranty and Software Warranty stated above, 3Com warrants that each product sold or licensed to Customer on and after January 1, 1998 that is date sensitive will continue performing properly with regard to such date data on and after January 1, 2000, provided that all other products used by Customer in connection or combination with the 3Com product, including hardware, software, and firmware, accurately exchange date data with the 3Com product, with the exception of those products identified at 3Com's Web site, http://www.3com.com/products/yr2000.html, as not meeting this standard. If it appears that any product that is stated to meet this standard does not perform properly with regard to such date data on and after January 1, 2000, and Customer notifies 3Com before the later of April 1, 2000, or ninety (90) days after purchase of the product from 3Com or its authorized reseller, 3Com shall, at its option and expense, provide a software update which would effect the proper performance of such product, repair such product, deliver to Customer an equivalent product to replace such product, or if none of the foregoing is feasible, refund to Customer the purchase price paid for such product.

Any software update or replaced or repaired product will carry a Year 2000 Warranty for ninety (90) days after purchase or until April 1, 2000, whichever is later.

OBTAINING WARRANTY SERVICE

Customer must contact a 3Com Corporate Service Center or an Authorized 3Com Service Center within the applicable warranty period to obtain warranty service authorization. Dated proof of purchase from 3Com or its authorized reseller may be required. Products returned to 3Com's Corporate Service Center must be pre-authorized by 3Com with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepaid and packaged appropriately for safe shipment, and it is recommended that they be insured or sent by a method that provides for tracking of the package. The repaired or replaced item will be shipped to Customer, at 3Com's expense, not later than thirty (30) days after 3Com receives the defective product.

Dead- or Defective-on-Arrival. In the event a product completely fails to function or exhibits a defect in materials or workmanship within the first forty-eight (48) hours of installation but no later than thirty (30) days after the date of purchase, and this is verified by 3Com, it will be considered dead- or defective-on-arrival (DOA) and a replacement shall be provided by advance replacement. The replacement product will normally be shipped not later than three (3) business days after 3Com's verification of the DOA product, but may be delayed due to export or import procedures. When an advance replacement is provided and Customer fails to return the original product to 3Com within fifteen (15) days after shipment of the replacement, 3Com will charge Customer for the replacement product, at list price.

3Com shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3Com for repair, whether under warranty or not.

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WARRANTIES EXCLUSIVE

IF A 3COM PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, CUSTOMER'S SOLE REMEDY FOR BREACH OF THAT WARRANTY SHALL BE REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM'S OPTION. TO THE FULL EXTENT ALLOWED BY LAW, THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, TERMS, OR CONDITIONS, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES, TERMS, OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, SATISFACTORY QUALITY, CORRESPONDENCE WITH DESCRIPTION, AND NON-INFRINGEMENT, ALL OF WHICH ARE EXPRESSLY DISCLAIMED. 3COM NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE OR USE OF ITS PRODUCTS.

3COM SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT OR MALFUNCTION IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLECT, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO OPEN, REPAIR OR MODIFY THE PRODUCT, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, OTHER HAZARDS, OR ACTS OF GOD.

LIMITATION OF LIABILITY

TO THE FULL EXTENT ALLOWED BY LAW, 3COM ALSO EXCLUDES FOR ITSELF AND ITS SUPPLIERS ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATA, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF ITS PRODUCTS, EVEN IF 3COM OR ITS AUTHORIZED RESELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM'S OPTION. THIS DISCLAIMER OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

DISCLAIMER

Some countries, states, or provinces do not allow the exclusion or limitation of implied warranties or the limitation of incidental or consequential damages for certain products supplied to consumers, or the limitation of liability for personal injury, so the above limitations and exclusions may be limited in their application to you. When the implied warranties are not allowed to be excluded in their entirety, they will be limited to the duration of the applicable written warranty. This warranty gives you specific legal rights which may vary depending on local law.

GOVERNING LAW

This Limited Warranty shall be governed by the laws of the State of California, U.S.A. excluding its conflicts of laws principles and excluding the United Nations Convention on Contracts for the International Sale of Goods.

3Com Corporation
5400 Bayfront Plaza
Santa Clara, CA 95054
(408) 326-5000

FCC CLASS B STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1 This device may not cause harmful interference, and

2 This device must accept any interference received, including interference that may cause undesired operation.

WARNING: 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, and the Canadian Department of Communications Equipment Standards entitled, "Digital Apparatus," ICES-003. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from the one which the receiver is connected to.

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- Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet prepared by the Federal Communications Commission helpful:

The Interference Handbook

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

NOTE: In order to maintain compliance with the limits of a Class B digital device, 3Com requires that you use quality interface cables when connecting to this device. Changes or modifications not expressly approved by 3Com could void the user's authority to operate this equipment. Refer to the manual for specifications on cabling types.

FCC Declaration of Conformity

We declare under our sole responsibility that the

Model:	**Description:**
3C886	OfficeConnect 56K LAN Modem

to which this declaration relates, is in conformity with the following standards or other normative documents:

- Federal Communications Commission 47 CFR Part 15, subpart B
- **3Com Corporation**, 5400 Bayfront Plaza, P.O. Box 58145, Santa Clara, CA 95052-8145

FCC Part 68 Statement

3Com Corporation
Model No: 3C886
Made in Ireland

This equipment complies with Part 68 of the FCC Rules. On the bottom of this equipment is a label that contains, among other information, the FCC 68 registration number and Ringer Equivalence Number (REN) for this equipment. If requested, this information must be provided to the telephone company.

The REN is used to determine the number of devices you may legally connect to your telephone line. In most areas, the sum of the REN of all devices connected to one line must not exceed five (5.0). You should contact your telephone company to determine the maximum REN for your calling area.

An FCC compliant telephone cord with a modular plug is provided with this equipment. This device connects to the telephone network via an RJ -11 plug and jack. The plug and jack also comply with FCC part 68 rules. Be sure that the telephone line you are connecting the modem to is a standard analog line and not a digital (PBX), party, or coin telephone line.

If this device causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But, if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could effect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this device, for repair and warranty information, please refer to the Technical Support insert for repair information and the warranty section of this User Guide for warranty information.

In the event of device malfunction, all repairs should be performed by 3Com or an authorized agent. It is the responsibility of users requiring service to report the need for service to our company or to one of our authorized agents. In the event service is required, refer to the Technical Support insert for information. Service can be obtained at:

· 3Com Customer Repair Service
· 353 Betsy Ross Drive
· Santa Clara, CA 95054

If the device is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.This registered device is capable of providing users access to interstate providers of operator services through the use of equal access codes.

This registered device provides proper answer supervision to the PSTN when DID calls are answered by the called station, answered by the attendant, routed to a recorded announcement that can be administered by the CPE user, or routed to a dial prompt and this device returns answer supervision on all DID calls forwarded to the PSTN. Permissible exceptions are as follows: a call is unanswered, a busy tone is received, a recorded tone is received.

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