Prestige 2864I

User's Manual

ZyXEL
ACCESSING INTERNET & INTRANET

ZyXEL Limited Warranty

ZyXEL warrants to the original end user (purchaser) that this product is free from any defects in materials or workmanship for a period of up to two (2) years from the date of purchase. During the warranty period, and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, ZyXEL will, at its option, repair or replace the defective products or components without charge for either parts or labor, and to whatever extent it shall deem necessary to restore the product or components to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal value, and will be solely at the option of ZyXEL. This warranty shall not apply if the product is modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions. Note: Repair or replacement, as provided under this warranty, is the exclusive remedy of the purchaser. This warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular use or purpose. ZyXEL shall in no event be held liable for indirect or consequential damages of any kind or character to the purchaser.

To obtain the services of this warranty, please contact ZyXELs Service Center, refer to the separate Warranty Card for your Return Material Authorization number (RMA). Products must be returned Postage Prepaid. It is recommended that the unit be insured when shipped. Any returned products without proof of purchase or those with an out-dated warranty will be repaired or replaced (at the option of ZyXEL) and the customer will be billed for parts and labor. All repaired or replaced products will be shipped by ZyXEL to the corresponding return address, Postage Paid (USA and territories only). If the customer desires some other return destination beyond the U.S. borders, the customer shall bear the cost of the return shipment. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

FCC Part 15 Information

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

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operations.

This equipment has been tested and found to comply with the limits for a CLASS A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. 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.

If this equipment does cause harmful interference to radio/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 the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Shielded RS-232 cables are required to be used to ensure compliance with FCC Part 15, and it is the responsibility of the user to provide and use shielded RS-232 cables.

Information for Canadian Users

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operation, and safety requirements. The Industry Canada does not guarantee that the equipment will operate to a user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly. The customer should be aware that the compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

For their own protection, users should ensure that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.

This digital apparatus does not exceed the class A limits for radio noise emissions from digital apparatus set out in the radio interference regulations of Industry Canada.

The declarations of CE marking :

C E

The Prestige 2864I has been approved for connection to the Public Switched Telecommunication Network using interfaces compatible with ITU-TSS recommendation I.420 (Basic Rate ISDN user access). The Prestige 2864I complies with the following directives:

(1) The Council Directive 89/336/EEC of 3 May 1992 on the approximation of the laws of the member states relation to Electro Magnetic Compatibility.(EMC Directive)

(2) Council Directive 91/263/EEC of 29 April 1991 on the approximation of the laws of the Member States concerning telecommunication terminal equipment. (The Telecom Terminal Equipment Directive)

(3) 93/68/EEC of 22 July 1993 amending the Directives 89/336/EEC, 91/263 /EEC and 92/31/EEC.(Marking Directive)

(4) The Council Directive 92/31/EEC of 28 April 1992 amending directive on the approximation of the laws of the member states relating to EletoMagnetic Compatibility.

Customer Service

If you have questions about ZyXEL's Prestige or desire assistance, contact ZyXEL Communications Corporation in one of the following ways:

- You can reach ZyXEL in North America between 8:00 AM and 5:00 PM PST at (714) 693-0808, or outside North America, you can dial +886-3-5783942 EXT 252 between 8:00AM and 5:00PM Taiwan time (GMT +8:00).

- You can send a facsimile transmission (FAX) to ZyXEL

  in North America : (714) 693-8811

  in Taiwan: +886-3-5782439

- You can send electronic mail to ZyXEL at the Internet address:

  Sales inquiries: sales@zyxel.com in North America

  sales@zyxel.hinet.net outside North America

  Technical support: support@zyxel.com in North America

  support@zyxel.hinet.net outside North America

- For product line information, visit our site on the World Wide Web: http://www.zyxel.com.

- FTP:

  Information , such as ZyXEL software and ROM updates for North America can be found at this FTP address: ftp.zyxel.com

  for European versions and related files, use the address: ftp.zyxel.co.at

- You can send written communications at the following address:

  ZyXEL Communications Corporation
  6, Innovation Road II, Science-Based Industrial Park
  Hsinchu, Taiwan 300, R.O.C.
  or
  ZyXEL Communications Inc.
  4920 E. La Palma Avenue
  Anaheim, CA92807, U.S.A.

Table of Contents

Chapter 1 - Introduction

Welcome and thank you for purchasing the ZyXEL Prestige 2864I Remote Access Router. The Prestige is the first to integrate a Router, Bridge, ISDN terminal adapter and V.34 modem into a single device. In a modem-sized box, the Prestige offers inexpensive yet complete telecommunications and internetworking solutions for your home or branch office. The Prestige is ideal for everything from cruising the Internet to receiving calls from Remote Dial-in Users to making LAN-to-LAN connections to Remote Nodes.

Distinguishing features of the Prestige include support for a full range of networking protocols such as TCP/IP (Transmission Control Protocol/Internet Protocol), Novell IPX (Internet Packet Exchange), AppleTalk routing, and Transparent Bridging. The complete solution also includes Remote Dial-in User support, an Internet Single User Account, POTS line support (Plain Old Telephone System; also called a/b adapter in Europe), extensive Network Management, and solid security features.

Features of Your Prestige

The Prestige is packed with a number of features that give it the flexibility to provide a complete networking solution for almost any user.

Ease of Installation

The Prestige is a self-contained unit that is quick and easy to install. Physically, it resembles an external modem except for the fact that it is a router and uses an Ethernet cable to connect to the host network.

ISDN Basic Rate Interface (BRI)

Using either a standard S/T Interface or a U Interface, the Prestige supports a full range of switch types. The switch type depends on your location and the type of firmware loaded onto your Prestige. Please see Chapter 17 for more information on North American, European, and Asian ISDN firmwares and switch types supported by the Prestige.

The two B-channels can be used independently for two destinations. Or they can be bundled for one connection to support bandwidth-on-demand.

Built-in V.34 Modem

The Prestige has a built-in V.34 modem. This enables it to communicate to remote routers or users with speeds up to 28.8Kbps through the ISDN connection.

Multiple Networking Protocol Support

The Prestige is a multi-protocol router. It supports TCP/IPNovell IPX, AppleTalk routing, and Transparent Bridging.

Standard Phone Jack

The Prestige is equipped with a standard phone jack to connect to telephones, FAX machines, or modems. This allows the ISDN line to be used for voice calls as well as data calls.

Call On Demand

The Call On Demand feature allows the Prestige to automatically place a call to a Remote Node whenever there is traffic coming from any workstation on the LAN to that remote site.

Bandwidth On Demand

The Prestige supports bandwidth up to 128Kbps over a single ISDN BRI line. In addition, it dynamically allocates bandwidth between the two B channels, increasing or decreasing speeds as needed to allow for greater efficiency in data transfer.

Full Network Management

The Prestige incorporates SNMP(Simple Network Management Protocol) support and menu-driven network management via an RS-232 or Telnet connection. The Prestige is also equipped with a Call Detail Record (CDR) to help analyze and manage your telephone bill.

Security

The Prestige supports PAP (Password Authentication Protocol) and CHAP (Challenge Handshake Authentication Protocol).

Networking Compatibility

The Prestige is compatible with remote access products from other companies such as Ascend, Cisco, and 3Com. Furthermore, it supports Microsoft Windows 95 and Windows NT remote access capability.

Applications For Your Prestige

Some applications for the Prestige include:

Internet Access

The Prestige supports the TCP/IP protocol, which is the language used for the Internet. It is also compatible with access servers manufactured by major vendors such as Cisco and Ascend.

Internet Single User Account (SUA)

For a small office environment, the Prestige offers a Single User Internet Account from an ISP (Internet Service Provider). This allows multiple users on the LAN (Local Area Network) to access the Internet concurrently for the cost of a single user.

Multiprotocol LAN-to-LAN Connection

The Prestige can dial to or answer calls from another remote access router connected to a different network. The Prestige supports TCP/IP, Novell IPX, AppleTalk routing and has the capability to bridge any Ethernet protocol.

Telecommuting Server

The Prestige allows Remote Dial-in Users to dial-in and gain access to your LAN. This feature enables users that have workstations with remote access capabilities, e.g., Windows 95, to dial in using an ISDN terminal adapter (TA) to access the network resources without physically being in the office.

Mobile Users with V.34 Modems

The Prestige has a built-in V.34 modem. This allows mobile users that have workstations with remote access capabilities to dial-in to the Prestige using a standard V.34 modem to access the network resources.

Structure of this Manual

This manual is divided into five parts.

1. Part One - **Getting Started** (Chapter 1 to 3) - is structured as a step-by-step guide to help you connect, install and setup your Prestige to operate on your LAN.

2. Part Two - **The Internet** (Chapter 4) **-** describes how to configure the Prestige to connect to the Internet.

3. Part Three - **Setting Up Advanced Applications** (Chapter 5 to 10) **-** describes how to use the Prestige for more advanced applications, such as TCP/IP routing and Bridging.

4. Part Four - **Advanced Management** (Chapter 11 to 14) **-** provides information on advanced management features for network managers.

5. Part Five - **System Maintenance** (Chapter 15 to 16) **-** describes maintenance features for checking system status and logging errors.

Regardless of the application, it is important that you follow the steps outlined in Part One (Chapters 1-3) to correctly connect your Prestige to your LAN. You can then refer to other chapters of the manual depending on which applications you wish to use.

Additional Requirements for Installing the Prestige

In addition to the contents of your package, there are other hardware and software requirements you need before you can install and use your Prestige. These requirements include:

- An ISDN telephone line which has been installed by your telephone company
- An Ethernet connections to your computer
- A computer equipped with communications software. The communications software must be configured with the following parameters:
    - VT100 terminal emulation
    - 9600 Baud rate
    - No parity, 8 Data bits, 1 Stop bit

After the Prestige has been successfully connected to your network, you can make future changes to the configuration by using the Telnet application.

Please make sure that you have all of these components before you attempt to install your Prestige.

Chapter 2 - Before You Begin

To ensure successful installation of yourPrestige, we strongly recommend that you carefully follow the steps outlined in Chapters 2 and 3. These chapters are designed as a guide for you to collect the necessary information about your ISDN phone line, and the LAN which you will be connected to. Once this information has been collected, it will be used to configure your Prestige.

After you have successfully configured your Prestige, please see the appropriate Chapters to setup your application. For Internet Access, please see Chapter 4.

Road Map and Flow

Figure 2.1 shows a schematic flowchart. It is intended to serve as a guide to lead you through the steps for successful installation of your Prestige.
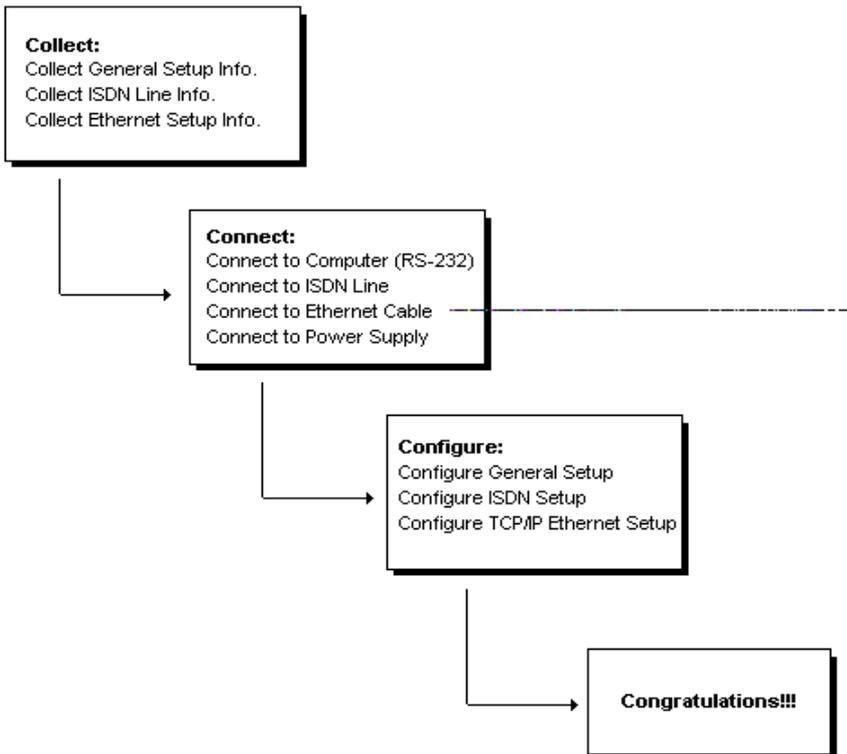
Figure 2.1 Guide to configure the Prestige

Completing the Worksheet

For your convenience, we have provided a worksheet on page 2-5. Record your findings onto the worksheet.

Ordering Your ISDNLine

If you do not have the ISDN line installed already, we suggest that you order it from your telephone company as soon as possible (it usually take a fair amount of time to get). Use the information in this section to place the order (see Chapter 17 for information on provisioning your ISDN line). If you have already installed your ISDN line, you can check the following section to make sure that you can use all the features of your Prestige.

1.   Contact your local telephone company's ISDN Ordering Center.

2.   Find out what type of ISDN service is available. Please refer to Chapter 17 to find out the provisioning information for the appropriate switch type and ISDN service. For the U.S., the Prestige (both the U and S/T interface) has been approved by Bellcore and has the IOC (ISDN Ordering Code) "S" Capability, EZ-ISDN 1.

3.   Provide your telephone company with the proper provisioning information.

4.   When the telephone company installs your ISDN line, please be sure to obtain the following information:

- ISDN switch type
- ISDN telephone number(s)
- ISDN Service Profile Identifiers (SPID) number(s) (only for North America)

Collecting General Setup Information

The Prestige requires certain system information You can obtain all the pertinent information from your network administrator. Record this information into the worksheet (page 2-5) as it becomes available. This worksheet will later be referred to as you configure your Prestige.

- **System Name.** This is the name given to the Prestige for identification purposes. This name should be no more than 8 alphanumeric characters. Spaces are not allowed, but "-" and "_" are accepted. This name can be obtained remotely via the SNMP management protocol and will be displayed as the prompt when the user enters the Command Mode.

- **Route IP Field.** For Internet access, you will need to enable the Route IP Field. Please see Chapter 4 for more details on configuring your Prestige for Internet access. To support Novell IPX, AppleTalk, or Bridging, please enable the appropriate protocol and see the related Chapters for the detailed information.

You have now collected all of the general setup information you need. Please make sure that you have entered all of these values onto the worksheet before proceeding to the next section.

Collecting ISDN Phone Line Information

After you have successfully installed the ISDN phone line (or if you already have one installed), you need to use the ISDN line information to complete the worksheet and configure the Prestige. Your telephone company can give you the following information to configure the Prestige:

Switch Type	Geography	No of Phone #s	No of SPIDs
AT&T 5ESS NI-1	North America	2	2
AT&T 5ESS Point to Point	North America	1	0
AT&T 5ESS Multipoint	North America	2	2
Northern Telecom NI-1	North America	2	2
Northern Telecom Custom	North America	2	2

Table 2.1 - Switch types and related information for North American ISDN firmware.

Switch Type	Geography	No of Phone #s	No of SPIDs
DSS1	Europe, Asia	2	N/A
1TR6	Germany	2	N/A

Table 2.2 - Switch types and related information for European and Asian ISDN firmware.

- **Switch Type -** This is the type of switch used by your telephone company. Find out from your telephone company and check the appropriate option on the worksheet. For North America, select your ISDN switch type. For DSS1 and 1TR6, verify this field to make sure that you have the proper firmware loaded.

- **B Channel Usage -** Determine which connection is appropriate for your B channel and check the corresponding option in the worksheet.

  If your Prestige is the only device using the ISDN line, then configure **B Channel Usage** to 'Switch/Switch' so that your device will use both B channels to communicate. If your Prestige is sharing the ISDN line with other devices, then configure B Channel to "Switch/Unused".

- **Telephone Number(s)**- Record into the worksheet the telephone number(s) given to you by your ISDN provider. Some switch types only have one telephone number. These phone numbers should be in a standard digit format (for example, 5551212). Please note that these fields will only accept digits, so '-' and spaces will not be accepted.

- **Analog Call** - Check off the appropriate 'Analog Call' option on the worksheet for each telephone number. This information is later used to configure the Prestige in routing an incoming analog call. Set to 'Voice' if you wish to route the incoming analog call for this telephone number to the PHONE port (a.k.a., 'POTS' in North

America and 'a/b adapter' in Europe). Set to 'Modem' if you wish to route the incoming analog call for this telephone number to the internal modem (e.g., when the Prestige is used as a dial-in server for the Remote Dial-in User).

- **SPID Number(s) -** (For North America only) The SPID (Service Profile Identifier) is a number used by a central office switch for identification purposes. With the Switch information, please see Table 2.1 to see how many SPIDs you have to enter.

You have now collected all of the necessary information about your ISDN phone line. Please make sure that these values are entered into your worksheet before you continue to the next section.

Collecting Ethernet Setup Information

This section assumes that you are setting up your Prestige for a TCP/IP connection. If you want to configure the Prestige for other protocols (e.g., IPX or AppleTalk), please refer to the appropriate chapters.

- **Ethernet Interface** - The first step is to determine the type of Ethernet interface you will be using on the Prestige. There are two options: AUI or UTP. Record the interface type onto the worksheet. If you have a 10Base2 (BNC), you should choose AUI.

- **IP Address -** An IP Address is required for TCP/IP protocol. The IP Address is the unique 32-bit number assigned to your Prestige. This address is written in dotted decimal notation (four 8-bit numbers, between 0 and 255, separated by periods), e.g., 192.68.203.5.

  Record the IP Address into the worksheet as assigned by your network administrator. Please note that every machine on an internet must have a unique IP address - do not assign an arbitrary address to any machine.

- **IP Subnet Mask -** This field is required for TCP/IP protocol. An IP address consists of two parts, the network ID and the host ID. The IP Subnet Mask is used to specify the network ID portion of the address, expressed in dotted decimal notation. The Prestige will automatically calculate this mask based on the IP address that you assign. Unless you have special need for subnetting, use the default mask as calculated by the Prestige.

  Table 2.3 lists some examples of IP subnet masks and the number of hosts that is allowed. Consult your network administrator if you are unsure of this value.

IP Subnet Mask	Number of Host ID's	Number of Bits
255.255.255.0	254	24
255.255.255.128	126	25
255.255.255.192	62	26
255.255.255.224	30	27
255.255.255.255	1	32

Table 2.3 IP subnet mask values and the corresponding number of host ID's

Worksheet for Collecting Information

General Setup Information:

System Name (for identification purposes): _____

Protocol Routing: ___ TCP/IP   ___ IPX   ___ AppleTalk   ___ Bridging

ISDN Setup Information:

Switch Type (check one):
___ AT&T 5ESS NI-1
___ AT&T Point to Point
___ AT&T 5ESS Multipoint
___ Northern Telecom NI-1
___ Northern Telecom Custom
___ DSS1
___ 1TR6

B-Channel Usage (check one):
___ Switch/Switch
___ Switch/Unused

1st Telephone Number: _____

Analog Call (check one):   ___ Voice   ___ Modem   ___ None

1st SPID Number: _____

2nd Telephone Number: _____

Analog Call (check one):   ___ Voice   ___ Modem   ___ None

2nd SPID Number: _____

Ethernet Setup Information:

Ethernet Interface (check one):
___ AUI
___ UTP

IP Address: _____._____._____._____

IP Subnet Mask: _____._____._____._____

Chapter 3 - Setting Up Your Prestige

This chapter outlines how to connect your Prestige to the LAN and the ISDN line. Figure 3.1 shows a diagram of the right panel and the rear panel of the Prestige. Please refer to this diagram to identify all of the ports on your device when you attempt to make the various connections.
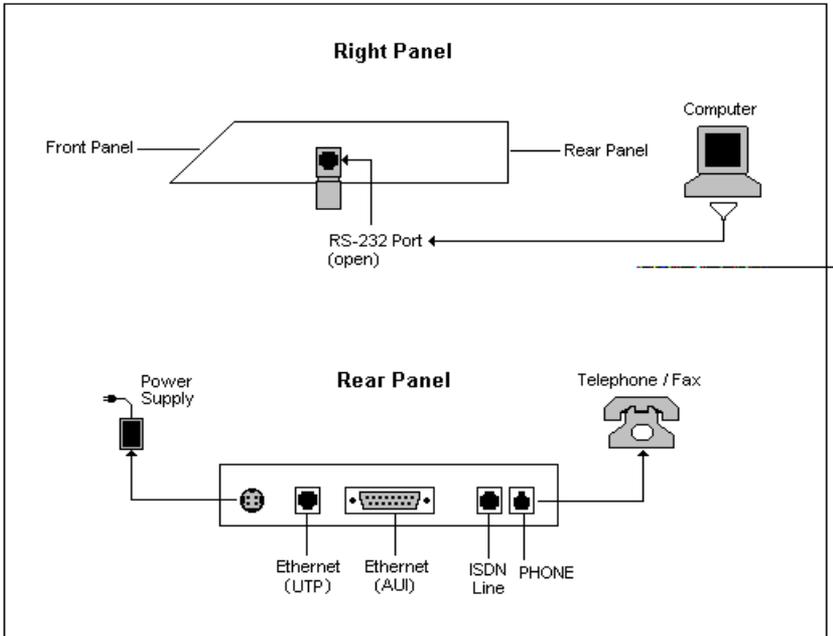
Figure 3.1 Diagram of Right Panel and Rear Panel of the Prestige

A Warning On Connection Cables

Several of the connection cables (RS-232, ISDN line and Ethernet cable) are very similar to each other. It is important that you use the correct cable for each connection; otherwise, your Prestige could be damaged.

Connecting Your Computer and Your Prestige

For the initial setup of your Prestige, you must use RS-232 and a communication software to configure the Prestige.

After the Prestige has been successfully installed, you can modify the configuration through remote Telnet connection. Chapter 14 describes using Telnet to configure your Prestige in greater details.

Connecting the RS-232 Cable to the Prestige

One white RS-232 cable is included in your package. To connect the RS-232 cable, first click open the door on the right panel to reveal the port. Plug one end of the RS-232 cable (looks like a telephone jack) into the port until the retainer clicks into place. Connect the other end of the RS-232 cable to the serial port (COM1, COM2, or any other COM port) of your computer.

Connecting ISDN Line to the Prestige

Plug one end of your black ISDN phone line which is included in your package into the socket on the rear panel of the Prestige labeled 'ISDN' and the other end into the ISDN wall jack.

Connecting Telephone/Fax to the Prestige (Optional)

You can connect a regular telephone, a fax machine or a modem to your Prestige to be used for analog calls just like a normal phone line. It should be noted that this is optional and is not required for you to run other applications using your Prestige. Plug one end of the telephone cord from a phone or fax or modem into the socket on the rear panel of the Prestige labeled 'PHONE'.

In order to receive incoming calls by device connected to the PHONE port, you need to set 'Voice' to the **Analog Call** field under the desired telephone number (e.g., **1st phone #**) in SMT Menu 2 - ISDN Setup. This configuration is discussed in detail in the previous chapter's 'Collecting ISDN Phone Line Information'.

Connecting Ethernet Cable to the Prestige

The Prestige supports two types of Ethernet connections. The connection procedure differs for each one; please follow the one that is appropriate for your installation.

- **UTP**
  The UTP port is used to connect to a 10BaseT network. 10BaseT networks use Unshielded Twisted Pair (UTP) cable and RJ-45 connectors that look like a bigger telephone plug with 8 pins. Two types of gray Ethernet cables come with the package:

  - Straight through cable (P/N 57-011-208400): Connect your Prestige to a 10BaseT hub.

  - Crossover cable (P/N 57-110-004290): Connect your Prestige to your computer directly without a hub. Warning: if this cable is used to connect ISDN, it may damage your Prestige.

- **AUI**

  The AUI port (the connector with 15 pins) is used to connect the Prestige to a 10Base5 (thicknet) network.

  If you have a **10Base2** network using BNC connectors and thin coaxial cables, you will need a transceiver between the AUI port and the 10Base2 cabling.

Connecting Power Supply to the Prestige

There are two cords coming out of the power supply.

- Plug the smaller connector with 4 pins into the power receptacle on the rear panel of the Prestige.

- Plug the bigger, three-pronged connector in an AC outlet. To turn on the power, press the switch in the 'I' direction.

Please make sure that all of your connections are secure before continuing. At this point, you should have connected the RS-232 cable, the ISDN phone line, the Ethernet cable, and the power supply. You can now power on your Prestige.

Front Panel of the Prestige

This section describes the LEDs on the front panel of the Prestige (Figure 3.2).
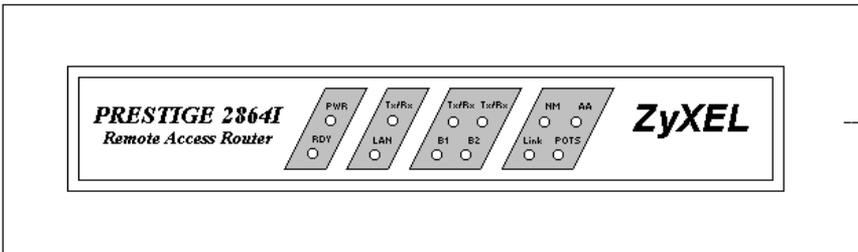
Figure 3.2 Illustration of Front Panel of Prestige

PWR - This LED (power) comes on as soon as you connect you Prestige to the power supply and switch it to the 'I' (on) position.

RDY - The ready LED will come on once the Prestige has been turned on and initialized. If this LED is blinking, there is an error and you need to contact technical support.

LAN - This LED indicates that the Prestige has been successfully connected to the LAN via the Ethernet interface.

B1 and **B2** - These LEDs are on if there is an active WAN session on that channel or if that channel is making or receiving a call.

Tx/Rx - Transmit/Receive LEDs will blink to indicate when there is traffic over the corresponding channel (B1 or B2).

Link - This LED indicates that the Prestige has an ISDN line connected to the WAN interface and it has been successfully initialized.

NM - The NM (network management) LED should be blinking if the Prestige is functioning properly.

POTS - This LED indicates the functionality of the POTS port on the Prestige. If there is a device plugged into this port, and the device is in use, this LED should be on.

AA - This LED (auto answer) indicates when the auto answer is turned on.

Powering On Your Prestige

When you power on your Prestige, the Prestige will perform several internal tests and will also do an ISDN line initialization. After these initialization, the Prestige will ask you to press ENTER to continue as shown in Figure 3.3 below:

```
Copyright (c) 1994 - 1996 ZyXEL Communications Corp.
RAS Version: V1.10a | 9/4/96
ethernet address: 00:a0:c5:40:00:03
Resetting ISDN firmware ..........
Switch Type is DSS1 - ISDN Firmware Version: V Prestige_4.05

Init ISDN line. (This may take up to 20 seconds.)
Press ENTER to continue...
```

Figure 3.3 Power on messages

If you press ENTER, then the Prestige will display a login screen and ask you to enter the password as shown in the Figure 3.4 below:

```
┌────────────────────┴──────────────────────────────────────┐
│                                                            │
│                                                            │
│                                                            │
│                                                            │
│              Enter Password :                              │
│                                                            │
│    ────────────────────────────────────────────────────── │
│                                                            │
│                                                            │
│                                                            │
│                                                            │
│                                                            │
└────────────────────────────────────────────────────────────┘
```
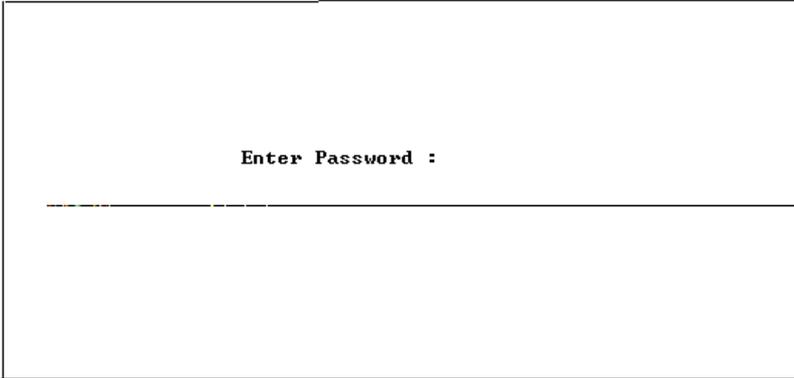
Figure 3.4 Password Screen

Enter the default password, '1234' to get into the Main Menu of System Management Terminal (SMT). Note that once you are in the SMT and if there is no activity for longer than 5 minutes, the Prestige will automatically log you out and will display a blank screen. If you see a blank screen, press ENTER to bring up the password screen.

Navigating Through the SMT

The SMT (System Management Terminal) is the interface that you use to configure the Prestige. There are several operations that you should be familiar with before you attempt to modify the configuration of your Prestige. These will be summarized here.

- **Moving Forward to Another Menu.** To move forward to a sub-menu below the current one, type in the number of the sub-menu and press ENTER.

- **Moving Backward to a Previous Menu.** Press the escape (Esc) key to move back to the previous menu. The only exception is the Main Menu, where typing '99' is the only method to exit from the SMT.

- **Moving the Cursor.** Within a menu, press the Enter (carriage return) to move to the next field. You can also use the Up and Down keys to move to the previous and the next field, respectively.

- **Entering Information.** There are two types of fields that you will need to fill in. The first is the type that requires you to type in the appropriate information. The second is the type that gives you choices to choose from. In the second case, press the SPACE-BAR to cycle through the available choices.

- **Required Fields.** Some of the fields in the SMT are essential in order to configure the Prestige. These fields will initially show a '?" indicating that the information must be filled in before that menu can be saved.

- **'N/A' Fields.** Some of the fields in the SMT will show a 'N/A' which refers to 'Not Available'. This symbol usually refers to an option that is not available.

- **Saving Your Configuration.**You can save your configuration by pressing ENTER at the message: 'Press ENTER to confirm or ESC to cancel': Saving the data on the screen will take you in most cases to the previous menu.

Figure 3.5 shows the Main Menu of SMT.
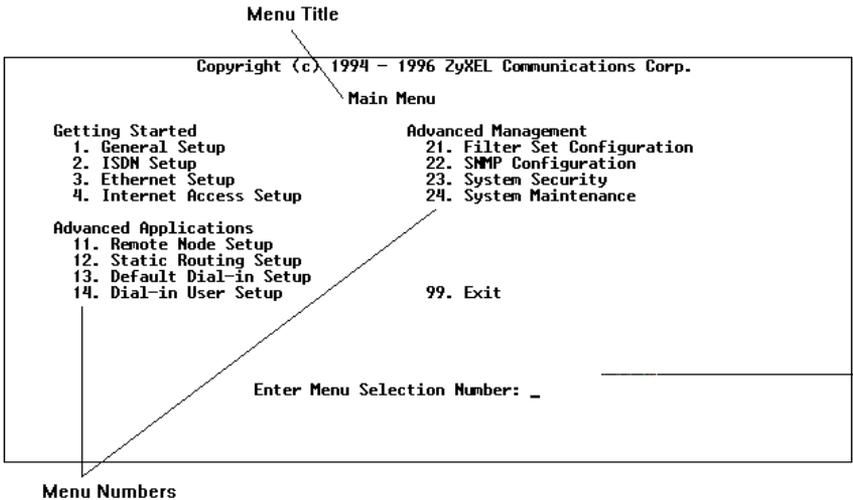
Figure 3.5 SMT Main Menu

Summary of SMT

This section summarizes all major Menus in the SMT:

#	Menu Title	Description
1	General Setup	Setup general information and enable specific protocol routing or bridging
2	ISDN Setup	Setup ISDN configuration
3	Ethernet Setup	Setup Ethernet configuration
4	Internet Access Setup	A quick and easy way to setup Internet connection
11	Remote Node Setup	Setup Remote Node for LAN-to-LAN connection including Internet connection. There are four Remote Nodes in a Prestige.
12	Static Routing Setup	Setup static route for different protocols. There are four static routes for each protocol.
13	Default Dial-in Setup	Setup default dial-in parameters such that your Prestige can be a dial-in server for the Remote Node and Remote Dial-in User
14	Dial-in User Setup	Setup Remote Dial-in User. There are eight Remote Dial-in Users in a Prestige.
21	Filter Set Configuration	Setup filters to be used in Menu 3 and Menu 11

		to provide security, call control, etc.
22	SNMP Configuration	Setup SNMP related parameters
23	System Security	Setup security related parameters
24	System Maintenance	Provide system status, diagnostics, firmware upload, etc.
99	Exit	To exit from SMT and return to the blank screen

SMT Menu number vs. Chapter number

The following matrix summarizes the SMT Menu number vs. the Chapter number in this User's Manual:

#	Menu Title	Chapter Number
1	General Setup	See Chap. 3
2	ISDN Setup	See Chap. 3
3	Ethernet Setup	For TCP/IP, see Chap. 3. For IPX, see Chap. 8. For AppleTalk, see Chap. 9. For Bridging, see Chap. 10
4	Internet Access Setup	See Chap. 4
11	Remote Node Setup	See Chap. 5. Also, for TCP/IP, see Chap. 7. For IPX, see Chap. 8. For AppleTalk, see Chap. 9. For Bridging, see Chap. 10
12	Static Routing Setup	F or TCP/IP, see Chap. 7. For IPX, see Chap. 8. For AppleTalk, see Chap. 9. For Bridging, see Chap. 10
13	Default Dial-in Setup	See Chap. 6
14	Dial-in User Setup	See Chap. 6
21	Filter Set Configuration	See Chap. 11
22	SNMP Configuration	See Chap. 12
23	System Security	See Chap. 13
24	System Maintenance	See Chap. 15
99	Exit	

General Setup

This menu contains administrative and system-related information. Enter '1' in the main menu to go to 'Menu 1 - General Setup'.

```
                       Menu 1 - General Setup

              System Name= p2864i
              Location= San Jose
              Contact Person's Name= John Doe


              Route IP= Yes
              Route IPX= No
              Route AppleTalk= No
              Bridge= No


                                            _____


              Press ENTER to Confirm or ESC to Cancel:

```

Figure 3.6 Menu 1 - General Setup

1. **System Name.** Choose a descriptive name for the Prestige for identification purpose, e.g., p2864i. This name should be no more than 8 alphanumeric characters. Spaces are not allowed, but "-" and "_" are accepted. This name can be retrieved remotely via the SNMP (Simple Network Management Protocol), used for CHAP authentication and will be displayed as the prompt in the Command Mode. See chapter 6 for more information on CHAP; see chapter 15 for more information on the Command Mode.

2. **Location.** Enter the geographic location (up to 31 characters) of your Prestige, e.g., San Jose.

3. **Contact Person's Name.** Enter the name (up to 8 characters) of the person in charge of this Prestige, e.g., John Doe. The Location and the Contact Person fields are optional.

4. **Protocols.** Turn on or off the individual protocols for your particular application. The AppleTalk protocol is only available as an option on the Prestige. Unsupported protocols will have a 'N/A' in their fields.

ISDN Setup

Menu 2 is for you to enter information about your ISDN line. Telephone companies at different geographic areas deploy different types of switches for ISDN service. Depending on the switch of your particular installation, you will have different number of telephone numbers. And if you are in the North America, you may also have SPIDs (Service Profile Identifier). Make sure that you have the correct and complete telephone numbers and SPIDs as in Table 2.1 and Table 2.2. You need to pass the ISDN setup before your system can make an outcall or answer an incoming call. Figure 3.7 shows the ISDN Setup for the North America and Figure 3.8 shows the ISDN Setup for the DSS1.

```
                        Menu 2 - ISDN Setup

            Switch Type= Northern Tel Custom

            B Channel Usage= Switch/Switch
            1st Phone #= 5552000
              SPID #= 0555200001
                Analog Call= Modem
            2nd Phone #= 5554000
              SPID #= 0555400001
                Analog Call= Voice


                                                    _____


                Press ENTER to Confirm or ESC to Cancel:

Press Space Bar to Toggle.
```
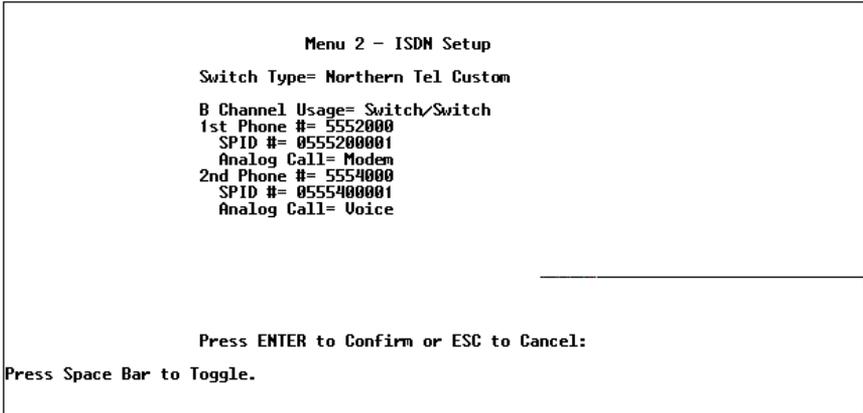
Figure 3.7 Menu 2 - ISDN Setup for North America

```
                        Menu 2 - ISDN Setup

            Switch Type= DSS-1

            B Channel Usage= Switch/Switch
            1st Phone #= 40001
                Analog Call= Modem
            2nd Phone #= 40002
                Analog Call= Voice




                                                                    __


                Press ENTER to Confirm or ESC to Cancel:
```
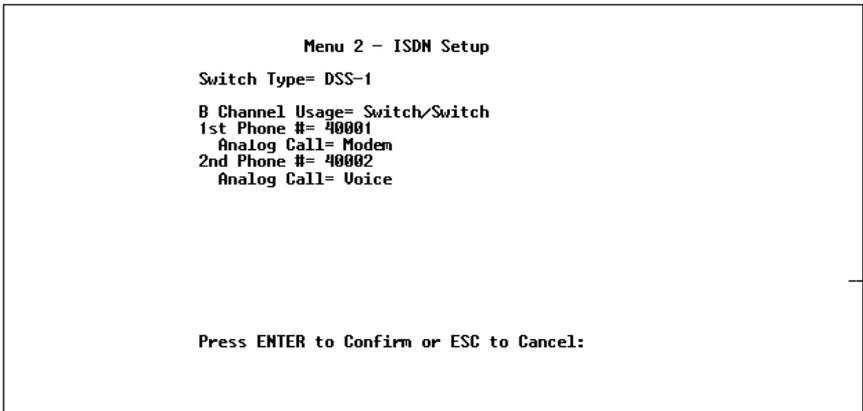
Figure 3.8 Menu 2 - ISDN Setup for DSS1

1. **Switch Type.** For DSS1 and 1TR6, this field is fixed. Please verify the switch type information with your telephone company. For North America, select the type of switch used by your telephone company. If your switch type is not currently shown, press the space bar to change to the next switch; repeat until you see the correct switch type. The Prestige will not be able to place or to receive calls if the wrong switch type is specified. If you are not sure, contact your telephone company to find out the exact switch type.

2. **B Channel Usage.** In general, this will be 'Switch/Switch'. If you are only using one B channel (e.g., your Prestige is sharing the ISDN BRI line with another device on the S/T bus), then select 'Switch/Unused'. The default is 'Switch/Switch'.

3. **Telephone Number(s).** Enter the telephone number(s) assigned to your ISDN line by your telephone company. Some switch types only have one telephone number. For North America, these phone numbers should be in a standard seven digit

format (for example, 5551212). Note that the Prestige only accepts digits; please do not include '-' and spaces in this field. This field should be no longer than 19 digits.

4. **Analog Call.** This tells the Prestige how to route an incoming analog call. Set to 'Voice' if you wish to route the incoming analog call for this telephone number to the PHONE port (a.k.a., 'POTS' port in North America and 'a/b adapter' in Europe). Set to 'Modem' if you wish to route the incoming analog call for this telephone number to the internal modem (e.g., when the Prestige is used as a dial-in server for the Remote Dial-in User).

5. **SPID Number(s) -** (For North America only) The SPID (Service Profile Identifier) is a number used by a switch for identification purposes. Depending on your switch type, you may have zero, one, or two SPID assigned to your line. For example, if your switch type is Northern Telecom Custom, you will have to enter two SPID numbers.

When you are finished, press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC to cancel them. When you press ENTER, the Prestige will use the information that you entered to initialize the ISDN link to the telephone company switch. It should be noted that whenever the switch type is changed, the ISDN initialization will take slightly longer. In addition, if you are using the U-interface, the system will also take slightly longer to initialize.

At this point, the Prestige will ask if you wish to test to see if your ISDN line has been successfully connected to your Prestige. If you select 'Yes', The Prestige will perform a loop-back test to check the ISDN line. See Figure 3.9 for an example of a successful loop-back test. If the loop-back test fails, please note the error message that you receive and take the appropriate troubleshooting action.

```
Setup LoopBack Test...
Dialing to 40002 ...
Sending and Receiving Data...
Disconnecting...
** LoopBack Test completed. OK **
### Hit any key to continue.###
_
```

Figure 3.9 ISDN Loop-back Test Screen

Ethernet Setup

Menu 3 is used to enter Ethernet related information. Depending on the protocols (TCP/IP, IPX or AppleTalk) on your LAN, you will need to configure each protocol separately.

General Ethernet Setup

This menu determines the type of Ethernet interface you are using as well as the filter sets you wish to implement to monitor your Ethernet traffic.

```
                Menu 3.1 - General Ethernet Setup

          Ethernet Interface= 10BaseT
          Input Filter Sets=
          Output Filter Sets=

                                                             ─




              Press ENTER to Confirm or ESC to Cancel:

Press Space Bar to Toggle.
```
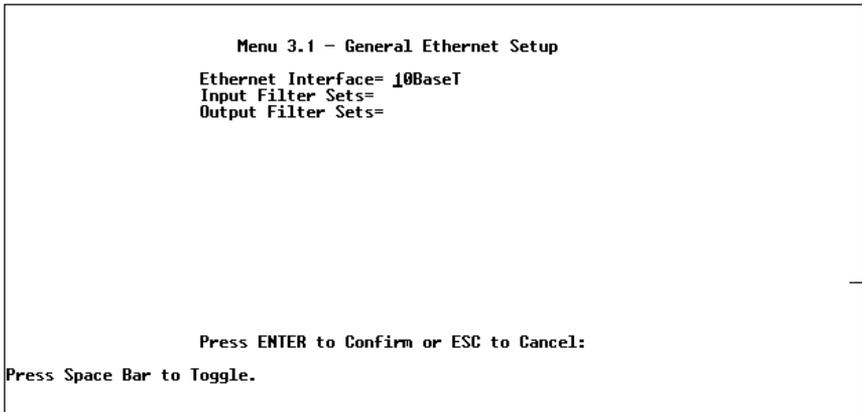
Figure 3.10 Menu 3.1 - General Ethernet Setup

From Menu 3 - Ethernet Setup, enter "1" to go to menu 3.1 -General Ethernet Setup. See Figure 3.10.

1. **Ethernet Interface -** The Prestige supports two types of Ethernet connections, the AUI (15-pin) or the connection for the 10BaseT network (looks like a bigger telephone plug). Determine which type you are using and select the appropriate option in this field.

2. **Input and Output Filter Sets**- The filter sets are used to block certain packets to reduce traffic and to prevent security breach. Filtering is a very involved subject, so leave these fields blank for the time being. After you have studied filtering in Chapter 11, come back and define the filter sets.

TCP/IP Ethernet Setup

If you are setting up your network for the first time, please read the section *IP Address and the Internet* in the next chapter before proceeding. That section contains important information on how to assign IP addresses for your network.

```
                   Menu 3.2 - TCP/IP Ethernet Setup

              IP Address= 192.68.135.1
              IP Subnet Mask= 255.255.255.0
              RIP Direction= Both




                                         _____



              Press ENTER to Confirm or ESC to Cancel:


```
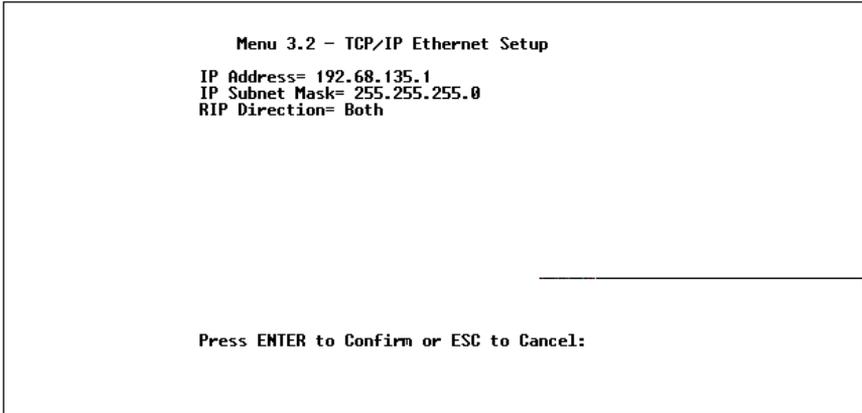
Figure 3.11 Menu 3.2 - TCP/IP Ethernet Setup

From Menu 3 - Ethernet Setup, enter "2" to go to Menu 3.2 - TCP/IP Ethernet Setup. See Figure 3.11.

1. **IP Address.** Enter the IP address of the Prestige in dotted decimal notation (four 8-bit numbers, between 0 and 255, separated by periods), e.g., 192.68.135.5. Please note that every machine on the TCP/IP network must have a unique IP address.

2. **IP Subnet Mask.** An IP address consists of two parts, the network ID and the host ID. The IP Subnet Mask is used to specify the network ID portion of the address, expressed in dotted decimal notation. The Prestige will automatically calculate this mask based on the IP address that you assign. Unless you have special need for subnetting, use the default subnet mask calculated by the Prestige.

3. **RIP Direction.** This parameter determines how the Prestige handles RIP (Routing Information Protocol), and the default is 'Both'. If set to 'Both', the Prestige will broadcast its routing table on the LAN, and incorporate RIP broadcasts by other routers into its routing table. If set to 'InOnly**',** the Prestige will not broadcast its routing table on the LAN; if set to 'OutOnly**',** the Prestige will broadcast its routing table but ignores any RIP broadcast packets that it receives. If set to 'None', the Prestige will not participate in any RIP exchange with other routers.

   Usually, you should leave this parameter at its default of 'Both' and let RIP propagate the routing information automatically.

When you are finished, press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC at any time to cancel them.

Novell IPX Ethernet Setup

Please refer to the chapter on Novell IPX configuration.

AppleTalk Ethernet Setup

Please refer to the chapter on AppleTalk configuration.

Bridge Ethernet Setup

Please refer to the chapter on Bridging configuration.

Chapter 4 - Configuring for Internet Access

Menu 4 of SMT allows you to configure your Internet access in one screen. Before you configure the Prestige for Internet access, you need to collect the following information from your ISP (Internet Service Provider).

For your Prestige:
- IP address of the ISP's gateway (optional)
- Telephone number(s) of your ISP
- Login name
- Password for authentication to the ISP

For your Workstation:
- Domain Name Server (DNS)
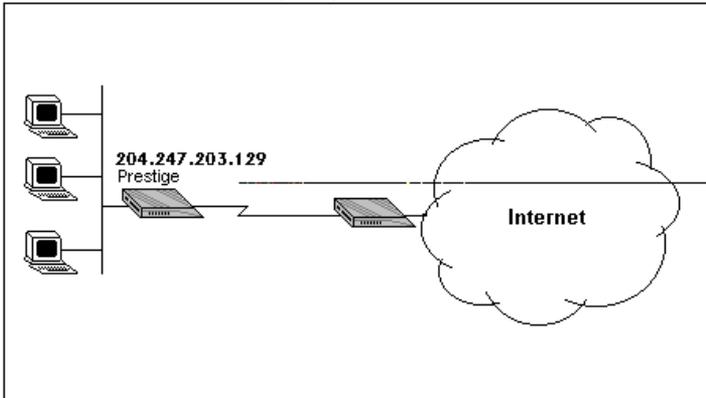
Figure 4.1 - Internet Access

IP Addresses and the Internet

Conventionally, the Internet (with a capital I) refers the large-scale interconnected networks across the world that was originally developed by the US Department of Defense. The Internet uses exclusively the TCP/IP protocols. The term "internet" (lower case i), however, refers to any interconnected networks using any protocol. An internet can be as simple as two hosts on a LAN (Local Area Network), or it can be as complex as the Internet itself.

Every machine on the Internet must have a unique address within that internet. If your networks are isolated from the Internet, e.g., only between your two branch offices, you can assign any IP addresses to the hosts without problems. However, the Internet Assigned Numbers Authority (IANA) has reserved the following three blocks of IP addresses specifically for private networks:

```
10.0.0.0     -  10.255.255.255
172.16.0.0   -  172.31.255.255
192.168.0.0  -  192.168.255.255
```

For this reason, it is recommended that you choose your network number from the above list.

You can obtain your IP address from the IANA, from an ISP, or assigned from a private network. If you belong to a small organization and your Internet access is through an ISP, the ISP can provide you with the Internet addresses for your local networks. On the other hand, if you are part of a much larger organization, you should consult your network administrator for the appropriate IP addresses.

Regardless of your particular situation, do NOT create any arbitrary IP address; always follow the guidelines above. For more information on address assignment, please refer to RFC 1597, *Address Allocation for Private Internets* and RFC 1466, *Guidelines for Management of IP Address Space*

Internet Access Configuration

The following steps describe the set-up procedure to configure your Prestige for Internet access. The parameters you will have to fill in will be indicated in **bold** type

```
              Menu 4 - Internet Access Setup

        ISP's Name= myisp
        ISP IP Addr= 10.145.233.5
        Pri Phone #= 5551000
        Sec Phone #= 5552000
        My Login= surfer
        My Password= *******
        Single User Account= No
          IP Addr= N/A
          Server IP Addr= N/A
        Telco Option:
          Transfer Rate= 64K

                                          _____


        Press ENTER to Confirm or ESC to Cancel:
```

Figure 4.2 Menu 4 - Internet Access Setup

1. From the Main Menu, enter '4' to go to 'Menu 4 - Internet Access Setup' (Figure 4.2).

2. **ISP's Name.** Enter the name of your Internet Service Provider, e.g., myisp. This information is for identification purposes only.

3. **ISP IP Addr.** Enter the IP Address of the remote gateway at the ISP's site. If you don't have this data, just leave it blank.

4. **Pri(mary) Phone #** and **Sec(ondary) Phone #.** Both the Primary Phone number and the Secondary Phone number refer to the number that the Prestige will dial to connect to the ISP. The Prestige will always call your ISP using the Primary Phone number first. If the Primary Phone number is busy or does not answer, the Prestige will call the Secondary Phone number if available. Once connected, the Prestige will use the BACP (Bandwidth Allocation Control Protocol) to establish the second B-channel if Multilink PPP is enabled, and the ISP also supports MP and BACP.

5. **My Login Name.** Enter the login name given to you by your ISP.

6. **My Password.** Enter the password associated with the login name above. Please note that this login name/password pair is only for the Prestige to connect to the ISP's gateway. When you use TCP/IP applications, e.g., FTP, to access the Internet from your workstation, you will need a separate login name and password for each server.

7. **Single User Account** Please see the following section for a more detailed discussion on the Single User Account feature. The default is 'No'.

8. **Telco Options: Transfer Rate -**This field (which only applies to outcalls) controls the rate at which the data is transferred between your Prestige and the Internet. There are four options for this field:

   • **64K -** The Prestige will place 64Kbps (bits per second) digital data calls. *(Default)*

   • **Modem -** Use this option if your Prestige wants to use Modem to connect to the Internet.

   • **56K -** (For the North America only) The Prestige will place 56Kbps digital data calls.

   • **DOVBS -** (For the North America only) The Prestige will place 56Kbps Data Over Voice Bearer Service (DOVBS) call. Some phone companies in the North America charges less if calls are made with DOVBS option.

9. Press ENTER at the message: 'Press ENTER to Confirm ...' to confirm your selections, or press ESC at any time to cancel your selections.

10. At this point, the SMT will ask if you wish to test the Internet connection. If you select 'Yes', the Prestige will call the ISP to test the Internet connection. If the test fails, please note the error message that you receive and take the appropriate troubleshooting steps.

Single User Account

Typically, if there are multiple users on the LAN wanting to concurrently access the Internet, they will have to subscribe to multiple IP addresses or a Class C subnetwork from the ISP. In either case, these two approaches will cost more than a single user account.

The Single User Account (SUA) feature allows customers to do the same as a Class C address but only pay for one IP address (i.e., Single User Account), thus saving significantly on the subscription fees. (Please check with your ISP before you enable this feature).

The IP address for the Single User Account can be either fixed or dynamically assigned by the ISP. In addition, you can also configure a server, e.g., a Web server, on your local network and make it accessible by the outside users.

If you do not set a server IP address, SUA offers the additional benefit of firewall protection. This is due to the fact that without defining a server in this Menu, all incoming inquiries to the server will be filtered out by the Prestige even if you do have a server on your network. This can prevent intruders from probing your system.

The Prestige accomplishes this address sharing by translating the internal LAN IP addresses to a single address that is globally unique in the Internet. For more information on the IP address translation, please refer to RFC 1631, *The IP Network Address Translator.* In summary,

1. SUA is an ideal, cost-effective solution for small offices with less than 20 hosts on the LAN wanting to concurrently access Internet.

2. SUA can provide one server address to be accessed by Remote Dial-in Users, thus controlling the incoming packets.

3. SUA can provide firewall protection if you do not configure a server IP address. All incoming inquiries will be filtered out by the Prestige. Therefore, servers on your network are protected.

4. UDP and TCP datagrams can be routed. In addition, ICMP echo can also be routed.

Figure 4.3 shows an example of a small office connected to the Internet via a Single User Account using the Prestige. Please note that if you enable the Single User Account feature, your local IP address MUST be selected from the list of IP addresses for private networks defined by IANA listed on page 4-2.
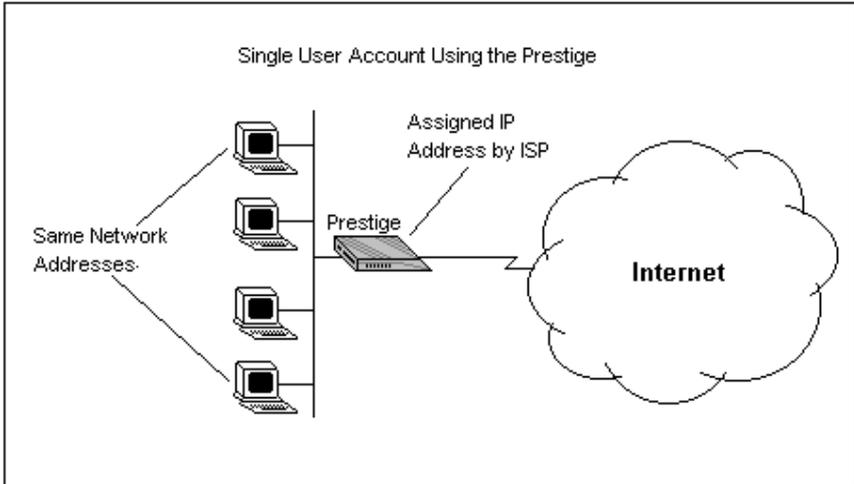
Figure 4.3 A Single User Account using the Prestige

Configuration for Single User Account

The steps for configuring your Prestige for Single User Internet Access are identical to conventional Internet Access (see previous section) with the exception that you need to fill in three extra fields.

Follow steps 1-8 from the previous section 'Configuration for Internet Access'.

1. **Single User Account.** Set this field set to 'Yes' to enable the Single User Account feature. Use the space bar to toggle between 'Yes' and 'No'.

2. **Single User Account: IP Addr.** If your ISP assigns you a dynamic IP address, enter '0.0.0.0' here. If your ISP assigns you a static IP address, enter that IP address here.

3. **Single User Account: Server IP Addr.** If you want to make your server, e.g., a Web server, accessible to the outside users, enter that server's IP address here. Otherwise, leave this field blank.

4. Press ENTER at the message: 'Press ENTER to Confirm ...' to confirm your selections, or press ESC at any time to cancel your selections.

5. At this point, the Prestige will ask if you wish to test the Internet connection. If you select 'Yes', the Prestige will call the ISP to test the Internet connection. If the test fails, please note the error message that you receive and take the appropriate troubleshooting steps.

Chapter 5 - Advanced Configuration: Remote Node Configuration

A Remote Node represents both a remote gateway and the internet behind it, across an ISDN connection. A Remote Node is required for placing calls to or answering calls from the remote network. Note that when you use Menu 4 to configure the Internet, the Prestige will automatically add a Remote Node for you. Once a Remote Node is configured properly, traffic to the remote LAN will trigger the Prestige to make a call automatically (i.e., Dial On Demand). Similarly, calls from the remote LAN will be answered automatically and security will be checked.

In this chapter, we will discuss the parameters that are protocol independent. The protocol-dependent configuration will be covered in subsequent chapters. For TCP/IP, see Chapter 7. For IPX, see Chapter 8. For AppleTalk, see Chapter 9. For bridging, see Chapter 10.

From the Main Menu, enter '11' to go to Menu 11 - Remote Node Setup. When in menu 11, enter the number of the Remote Node (1 to 4) that you wish to configure as shown in the Figure 5.1:
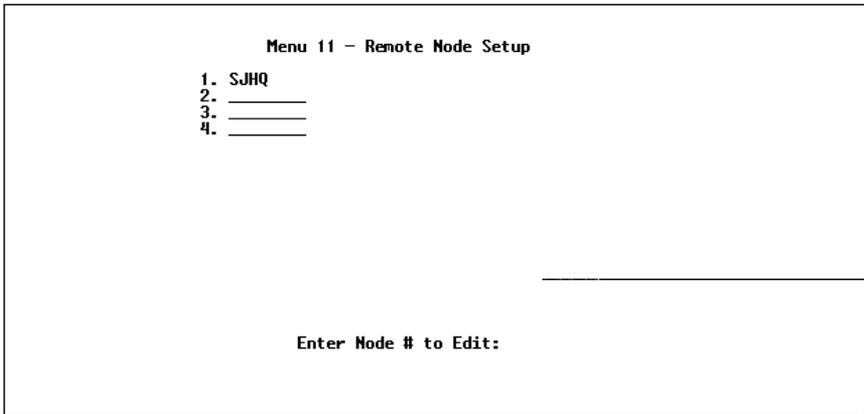
```
                    Menu 11 — Remote Node Setup

            1. SJHQ
            2. _____
            3. _____
            4. _____




                                          _____



                    Enter Node # to Edit:

```

Figure 5.1 Menu 11 - Remote Node Profile

Enter the Remote Node number to edit and you will go to the next submenu: '11.1 - Remote Node Profile' as shown in Figure 5.2 below:

```
                    Menu 11.1 - Remote Node Profile

    Rem Node Name= SJHQ              Route= IP
    Active= Yes                     Bridge= No
    Call Direction= Both
                                    Edit PPP Options= No
    Incoming:                       Rem IP Addr= 204.247.203.166
      Rem Login= 306t               Edit IP/IPX/AppleTalk/Bridge= No
      Rem Password= ******
      Rem CLID=                     Telco Option:
      Call Back= No                   Transfer Rate= 64K

    Outgoing:                       Session Options:
      My Login= 306d                  Input Filter Sets=
      My Password= ******             Output Filter Sets=
      Pri Phone #= 30001              Call Filter Sets=
      Sec Phone #= 30002              Idle Timeout(sec)= 300

               Press ENTER to Confirm or ESC to Cancel:

```

Figure 5.2 Menu 11 - Remote Node Profile

1. **Rem Node Name -** This is a required field. Enter a descriptive name for the Remote Node, e.g., SJHQ. This field can support up to eight (8) characters. This name must be unique from any other Remote Node name or Remote Dial-in User name.

2. **Active -** Press the space bar to toggle between 'Yes' and 'No'. When a Remote Node is deactivated, it has no effect on the operation of the Prestige, even though it is still kept in the database, and can be activated in the future.

3. **Call Direction -** If this parameter is set to 'Both', the Prestige can both place and receive calls to/from this Remote Node. If set to 'Incoming', the Prestige will not place a call to this Remote Node. If set to 'Outgoing', the Prestige will drop any call from this Remote Node.

    Several other fields in this menu depends upon this parameter. For example, in order to enable Call Back, the Call Direction must be 'Both'.

4. **Incoming: Rem Node Login Name -** Enter the login name that this Remote Node will use when it calls into the Prestige. The login name in this field combined with the Rem Node Password will be used to authenticate the incoming calls from this node.

5. **Incoming: Rem Node Password -** Enter the password used when this Remote Node calls into the Prestige.

6. **Incoming: Rem CLID -** This field is active only if Call Direction is either 'Both' or 'Incoming'. Otherwise, an 'N/A' appears in the field. This is the Calling Line ID (the telephone number of the calling party) of this Remote Node. If you enable the CLID Authen field in 'Menu 13 - Default Dial In', the Prestige will check this number against the CLID in the incoming call. If they do not match and the CLID Authen is 'Required', then the Prestige will reject the call.

7. **Incoming: Call Back -** This field will be valid only if Call Direction is 'Both'. Otherwise, an 'N/A' appears in the field. This field determines whether or not you wish the Prestige to call back after receiving a call from this Remote Node. If this option is enabled, the Prestige will disconnect the initial call from this node and call it back at the Outgoing: Primary Phone Number (see below).

8. **Outgoing: My Login Name -** This is a required field if Call Direction is either 'Both' or 'Out'. Enter the login name for the Prestige when it calls this Remote Node.

9. **Outgoing: My Password -** This is a required field if Call Direction is either 'Both' or 'Out'. Enter the password for the Prestige when it calls this Remote Node.

10. **Outgoing: Pri(mary) Phone #** and **Outgoing: Sec(ondary) Phone #.** Both the Primary Phone number and the Secondary Phone number refer to the number that the Prestige will dial to connect to the Remote Node. The Prestige will always call the Remote Node using the Primary Phone number first. If the Primary Phone number is busy or does not answer, the Prestige will call the Secondary Phone number if available. Once connected, the Prestige will use the BACP (Bandwidth Allocation Control Protocol) to establish the second B-channel if Multilink PPP is enabled, and the Remote Node supports MP and BACP.

11. **Route -** This fields determines the protocols that the Prestige will route. The choices for this field are based upon the features enabled on your Prestige.

12. **Bridge -** Bridging is used for protocols that are not supported or not turned on in the previous 'Route' field by the Prestige, e.g., SNA. When bridging is enabled, the Prestige will forward any packet that it does not recognize to this Remote Node; otherwise, the unrecognized packets are discarded. The disadvantage of bridging is that it usually generates large amount of traffic. Press the space bar to select either 'Yes' or 'No'.

13. **Edit PPP Options -** To edit the PPP options for this Remote Node, move the cursor to this field, use the space bar to select 'Yes' and press ENTER. This will bring you to 'Menu 11.2 - Remote Node PPP Options' (see Figure 5.3). For more information on configuring PPP options, please see the section 'Editing PPP Options'.

14. **IP Addr -** This is a required field if Route is set to 'IP'. Enter the IP address of this Remote Node.

15. **Edit IP/IPX/AppleTalk/Bridge Options -** To edit the parameters of the protocols, go to this field, select 'Yes' and press ENTER. This will bring you to 'Menu 11.3 - Remote Node Network Layer Options. For more information on filling out this screen, please refer to the chapter pertaining to your specific protocol.

16. **Telco Options: Transfer Rate -** This field (which only applies to outcalls) controls the rate at which the data is transferred between your Prestige and the Remote Node. There are four options for this field:

- **64K -** The Prestige will place 64Kbps (bits per second) digital data calls. *(Default)*

- **Modem -** Use this option if your Prestige wants to use Modem to connect to the Remote Node.

- **56K -** (For North America only) The Prestige will place 56Kbps digital data calls.

- **DOVBS -** (For North America only) The Prestige will place 56Kbps Data Over Voice Bearer Service (DOVBS) call. Some phone companies in North America charge less if calls are made with DOVBS option.

17. **Session Option: Input Filter Sets, Output Filter Sets** and **Call Filter Sets -** In these fields, select which filter set(s) you would like to implement to filter the incoming and outgoing traffic between this Remote Node and the Prestige. You can choose from 12 different filter sets. In addition, you can link up to 4 filter sets together for further customization (e.g., '1, 5, 9, 12'). Please note that spaces and ',' are accepted in this field.

    For more information on customizing your filter sets, please see Chapter 11. The default is blank, i.e., no filters defined.

18. **Session Option: Idle Timeout(sec) -**This value specifies the number of idle seconds that elapses before the Remote Node is automatically disconnected. Idle seconds is the period of time where no data is passed between the Remote Node and your Prestige. Administrative packets such as RIP are not counted as data. The default is 300 seconds (5 minutes).

Once you have completed filling in 'Menu 11.1 - Remote Node Profile', press ENTER at the message: 'Press ENTER to Confirm ...' to confirm your selections, or press ESC at any time to cancel your selections.

Bandwidth on Demand

The Bandwidth on Demand (BOD) feature allows you to bundle both B channels in one logical connection. The second channel is added and subtracted dynamically according to traffic demand. The Prestige uses the Bandwidth Allocation Control Protocol (BACP) and the Multilink Protocol (MP) in implementing bandwidth on demand.

The configuration of bandwidth on demand focuses on the Base Transmission Rate (BTR) and the Max. Transmission Rate (MTR). Table 5.1 shows the relation between BTR and MTR.

BTR & MTR Setting	No. of channel(s) used to initiate call	Max No. of channel(s) used	Bandwidth on demand
BTR = 64, MTR = 64	1	1	Off
BTR = 64, MTR = 128	1	2	On
BTR = 128, MTR = 128	2	2	Off

Table 5.1 Base Trans. Rate and Max. Trans. Rate relations

When bandwidth on demand is enabled, a second channel will be brought up if traffic on the initial channel is higher than the high **Target Utility** number for longer than the specified **Add Persist** value. Similarly, the second channel will be dropped if the traffic level falls below the low **Target Utility** number for longer than the **Subtract Persist**.

The **Target Utility** specifies the two line utilization thresholds at which you want the Prestige to add or subtract bandwidth. The range for this parameter is 30 to 64 kbps (kilobits per second). This parameter is low and high thresholds in data rate separated by a '-'. For example, '30-60' means the add threshold is 60 kbps and subtract threshold is 30 kbps. The Prestige will perform bandwidth on demand only if it initiates the call. The adding and subtracting is based on value set in the **BOD Calculation** field. If this field is set to 'Transmit or Receive', then traffic in either direction will be calculated to determine if a link should be added or dropped. 'Transmit' will only use outgoing traffic to make this determination, and 'Receive' will only use incoming traffic to make this determination.

Editing PPP Options

```
              Menu 11.2 — Remote Node PPP Options

           Multiple Link Options:
              BOD Calculation= Transmit or Receive
              Base Trans Rate(Kbps)= 64
              Max Trans Rate(Kbps)= 128
              Target Utility(Kbps)= 32-48
              Add Persist(sec)= 5
              Subtract Persist(sec)= 120




          ————————————————————————————————



              Enter here to CONFIRM or ESC to CANCEL:
```

Figure 5.3 Remote Node PPP Options

1. **Multiple Link Options: BOD Calculation**– Select the direction of the traffic you wish to calculate in order to determine when to add or subtract a link. The default for this field is Transmit or Receive.

2. **Multiple Link Options: Base Trans Rate**– Select the base data transfer rate for this Remote Node. This parameter is in kilobits per second (Kbps). There are two options for this field:

- **64** - Only one channel will be used. *(Default)*

- **128** - Two channels will be used when a packet triggers a call.

3. **Multiple Link Options: Max Trans Rate -** Enter the maximum data transfer rate allowed for this Remote Node. This parameter is in kilobits per second. There are two options for this field:

   - **64** - At most one channel can be used.

   - **128** - A maximum of two channels can be used. *(Default)*

4. **Multiple Link Options: Target Utility**- Enter the two thresholds separated by a '-' for subtracting and adding the second channel. The default is 32-48.

5. **Multiple Link Options: Add Persist**- This parameter specifies the number of seconds there traffic is above the adding threshold before the Prestige will bring up the second channel. The default is 5 seconds.

6. **Multiple Link Options: Subtract Persist**- This parameter specifies the number of seconds where traffic is below the subtracting threshold before the Prestige drops the second channel. The default is 5 seconds.

Once you have completed 'Menu 11.2 - Remote Node PPP Options', press ENTER at the message: 'Press ENTER to Confirm ...' to confirm your selections, or press ESC to cancel your selections.

Chapter 6 - Dial-In Configuration

You can configure the Prestige to receive calls from Remote Dial-in Users (e.g. telecommuters) and Remote Nodes. There are several differences between *Remote Dial-in Users* and *Remote Nodes:*

1. The Prestige can make calls to or answer calls from the Remote Node. But the Prestige will only answer calls from the Remote Dial-in User.

2. Each Remote Node can have its own set of parameters such as Bandwidth On Demand, Protocol, Security, etc.; while all Remote Dial-in Users share one common set, as defined in the Default Dial In Setup (Menu 13).

3. Generally, Remote Dial-in Users are individual users who dial in to the Prestige directly from their workstations, while Remote Nodes represent networks and are used for LAN-to-LAN connections.

This Chapter discusses how to setup Default Dial-in parameters for both Remote Node and Remote Dial-in User. The following sections give two examples of how the Prestige can be setup as a dial-in server for both.

Telecommuting

Figure 6.1 shows an example of Remote Dial-in User application, telecommuting. Telecommuting enables people to work at remote sites and yet still have access to the resources in the business office. Typically, a telecommuter will uses a client workstation with TCP/IP or IPX and dial-out capabilities, e.g., a Windows 95 PC or a Macintosh, and an ISDN Terminal Adapter (TA) or a Modem. For the telecommuters to call in to your LAN, you need to configure a Dial-In User Profile for each telecommuter. Additionally, you need to configure the Default Dial-In Setup to set the operational parameters for all dial-in users. You can configure up to eight (8) Remote Dial-in Users for the Prestige.
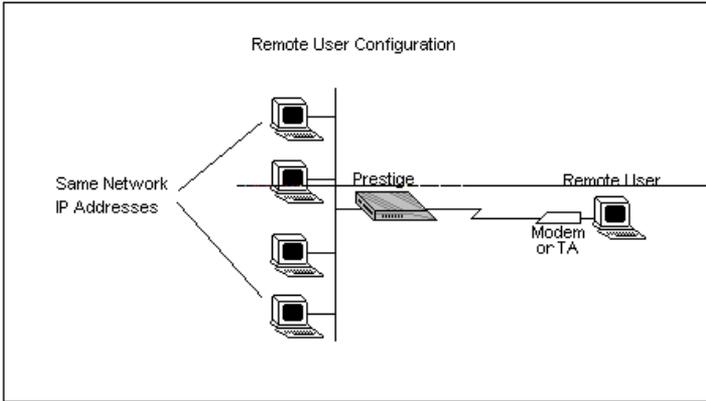
Figure 6.1 Example of Remote User: Telecommuter

Dial-In Server Application

The Prestige can also be used as a dial-in server. This application allows the Prestige to provide services for workstations on a remote network. For the Prestige to be set up as a dial-in server, you need to configure the Default Dial-In Setup to set the operational parameters for incoming call. Additionally, you will have to create a Remote Node for the router on the remote network (see Chapter 5). Figure 6.2 provides an example of the Prestige being used as a dial-in server.
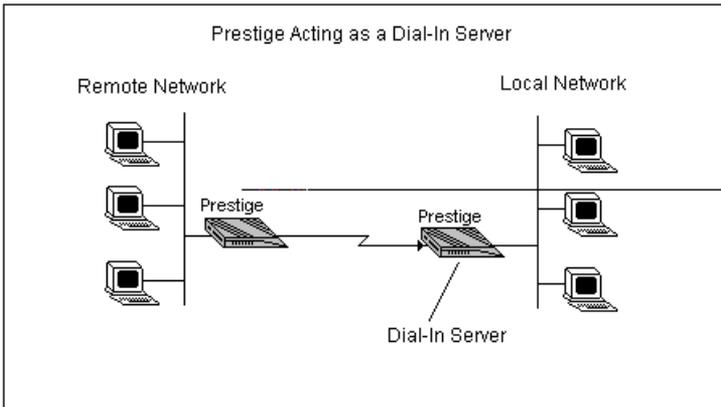
Figure 6.2 Example of a Dial-In Server Application

Default Dial-In Setup

This section covers the default dial-in parameters. The parameters in Menu 13 affect incoming calls from all Remote Dial-in Users, and Remote Nodes before authentication

is completed. Once authentication is completed, and if it matches a Remote Node, the Prestige will use parameters from that particular Remote Node.

```
                        Menu 13 - Default Dial-in Setup

        Telco Options:                      IP Address Supplied By:
          CLID Authen= None                   Dial-in User= Yes
                                              IP Pool= No
        PPP Options:                            IP Start Addr= N/A
          Recv Authen= CHAP/PAP                 IP Count(1,2)= N/A
        Mutual Authen= No
            PAP Login= N/A                  IPX Net Num. Supplied By:
            PAP Password= N/A                 IPX Pool= No
                                                IPX Start Net Num.= N/A
        Multiple Link Options:                  IPX Count(2,16)= N/A
          Max Trans Rate(Kbps)= 128
                                            Session Options:
                                              Input Filter Sets=
                                              Output Filter Sets=
                                              Idle Timeout= 300

                    Press ENTER to Confirm or ESC to Cancel:

    Press Space Bar to Toggle.
```

Figure 6.3 Menu 13 - Default Dial-in Setup

From the Main Menu, enter '13' to go to 'Menu 13 - Default Dial-in Setup' (see Figure 6.3). This section will describe how to configure the protocol-independent fields in this menu. For the protocol-dependent fields, please refer to the appropriate chapters.

1. **Telco Options: CLID Authen.**- This field sets the CLID authentication parameter for all incoming calls. There are three options for this field:

    - **None** - No CLID is required. (Default)

    - **Required** - Must provide CLID or call is disconnected.

    - **Preferred** - If the CLID is available then CLID will be used to do authentication. But if the CLID is not available, the call will continue.

2. **PPP Options: Recv. Authen. -**This field sets the authentication protocol used for incoming calls. The user names and passwords are configured in the next section (Remote users/Dial-in Users Setup).

    The Prestige support two authentication protocols: PAP (Password Authentication Protocol) and CHAP (Challenge Handshake Authentication Protocol).

    - **PAP** sends the user name and password in plain text

    - **CHAP** scrambles the password before it is sent over the wire.

    Generally speaking, CHAP is more secure than PAP; however, PAP is readily available on more platforms. The recommendation is to use CHAP whenever possible. Turning off the authentication is STRONGLY discouraged.

    There are four options for this field:

- **CHAP/PAP** - Prestige will try CHAP first, but PAP will be used if CHAP is not available. *(Default)*

- **CHAP** - use CHAP only.

- **PAP** - use PAP only.

- **None** - no authentication required.

3. **PPP Options: Mutual Authen.**- Some vendors, e.g. Cisco, implement a type of 'mutual authentication'. That is, the node that initiates the call will request a username and password from the far end that they are dialing to. If the Remote Node that is dialing in implements this type of authentication, set this field to 'Yes'.

4. **PAP Login -** This field will only be enabled if the Mutual Authen. field is set to 'Yes'. Enter in the login name to be used to respond to the far end's PAP authentication request. This field does not apply to CHAP authentication.

5. **PAP Password** - This field will only be enabled if the Mutual Authen. field is set to 'Yes'. Enter in the PAP password to be used to respond to the far end's authentication request. This field does not apply to CHAP authentication.

6. **Multiple Link Options: Max Trans Rate -**Enter the maximum data transfer rate between your Prestige and the Remote Dial-in User. The unit is in bits per second. There are two options for this field:

- **64 -** At most, one B channel will be used.

- **128 -** A maximum of two channels can be used. *(Default)*

7. **Dial-In IP Address Supplied By Dial-in User** - If set to Yes, it tells the Prestige to allow a remote host to specify its own IP address. This is to prevent the remote host from using an invalid IP address and potentially disrupting the whole network. If set to No, the remote host must use the IP address assigned by the Prestige from the IP pool, configured below. The default is 'Yes'.

8. **Dial-In IP Address Supplied By: IP Pool -**This field tells the Prestige to provide the remote host with an IP address from the pool. This field is required if Dial-In IP Address Supplied By: Dial-in User is set to 'No'. You can configure this field even if Dial-in User is set to 'Yes', in which case the Prestige will accept the IP address if the remote peer specifies one; otherwise, an IP address is assigned from the pool. The default is 'No'.

9. **IP Pool: IP Start Addr -**This field is active only if you selected 'Yes' in the Dial-In IP Address Supplied By: IP Pool field. The IP pool contains contiguous IP addresses and this field specifies the first one in the pool.

10. **IP Count(1,2)** - In this field, enter the number (1 or 2) of the addresses in the IP Pool. For example, if the starting address is 192.168.135.5 and the count is 2, then the pool will have 192.68.135.5 and 192.68.135.6

11. **Dial-In IPX Net. Num. Supplied By: IPX Pool -**This field tells the Prestige to provide the remote host with an IPX network number from the pool. Otherwise, the Prestige will generate a random IPX network number. The default is 'No'.

12. **IPX Start Net. Num. -** This field is active only if you selected 'Yes' in the Dial-In IPX Net. Num. Supplied By: IPX Pool field. The IPX pool contains contiguous IPX network numbers and this field specifies the first one in the pool.

13. **IPX Count(1,16)** - In this field, enter the number (1 - 16) of network numbers in the IPX Pool. For example, if the starting number is 12345678, and the count is 2, then the pool will have 12345678 and 12345679.

14. **Session Options: Input Filter Sets**and **Session Options: Output Filter Sets -**In these fields, you need to select the filter set(s) to filter the incoming and outgoing traffic between your Prestige and the Remote Dial-in User. Please keep in mind that these filter set(s) will only apply to all Remote Dial-in Users but not the Remote Nodes.

    You can choose from 12 different filter sets. In addition, you can link up to 4 filter sets together for further customization (e.g., '1, 5, 9, 12'). Please note that spaces and ',' are accepted in this field. For more information on customizing your filter sets, please see Chapter 11 on Filter Configuration.

    The default is blank, i.e., no filters.

15. **Session Options: Idle Timeout -**This value is the number of idle seconds that elapses before the dial-in user is automatically disconnected. Idle Timeout is the period of time when there is no data traffic between the dial-in user or Remote Node and the Prestige. This field will only be used if the Recv. Authen is set to 'None', and the call is not mapped to any Remote Node or Remote Dial-in User.

Once you have completed filling in 'Menu 13 - Default Dial-in Setup', press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC at any time to cancel your selections.

Dial-In Users Setup

The following steps describe the setup procedure for adding a Remote Dial-in User. From the Main Menu, enter '14' to go to '14. Dial-in User Setup' (see Figure 6.4)

```
                    Menu 14 - Dial-in User Setup
            1. joesmith
            2. _____
            3. _____
            4. _____
            5. _____
            6. _____
            7. _____
            8. _____


                                        _____


                    Enter Menu Selection Number:

```
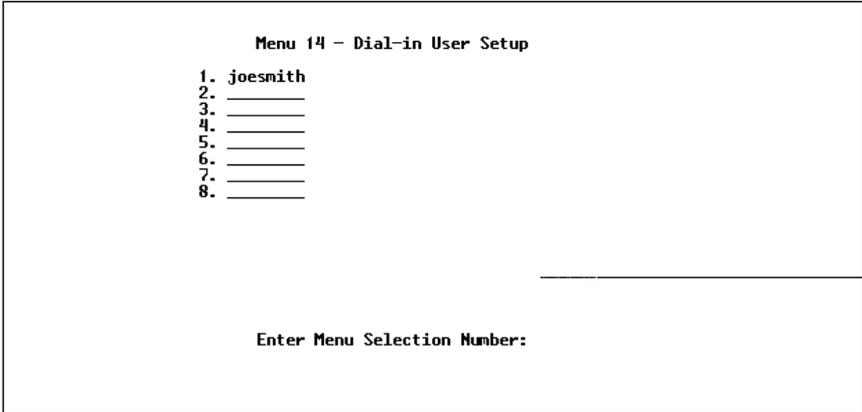
Figure 6.4 Menu 14 - Dial-in User Setup

Select one of eight users by number, this will bring you to 'Menu 14.1 - Edit Dial-in User' (see Figure 6.5).

```
                    Menu 14.1 - Edit Dial-in User

            User #: 1
            User Name= joesmith
            Active= Yes
            Passwd= ********
            Callback= No
            Callback Phone #= N/A
            Callback Override= N/A
            Rem CLID=
            Idle Timeout= 300


                                        _____


            Press ENTER to Confirm or ESC to Cancel: _

```
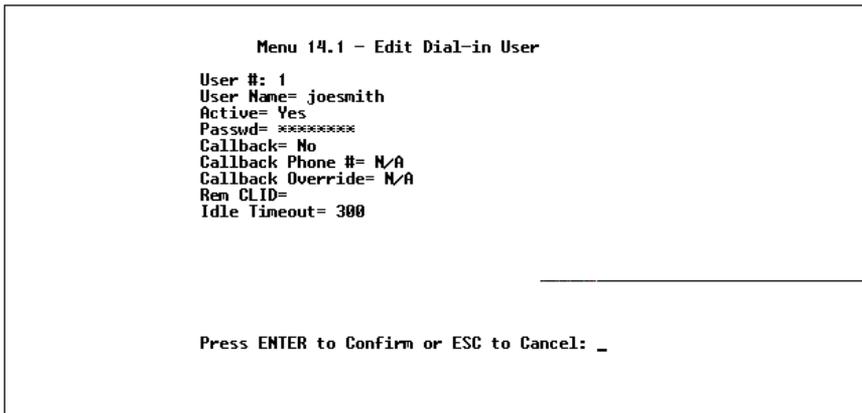
Figure 6.5 Menu 14.1 - Edit Dial-in User

1. **User Name** - This is a required field. This will be used as the login name for authentication. Choose a descriptive word for login, e.g., joesmith.

2. **Active -** You can disallow dial-in access to this user by setting this field to Inactive. When set to inactive, the user record is still kept in the database for later activation.

3. **Password -** Enter the password for the Remote Dial-in User.

4. **Callback -** This field determines if the Prestige will allow call back to the Remote Dial-in User upon dial-in. If this option is enabled, the Prestige will be able to call back to the Remote Dial-in User if they request it. In such a case, the Prestige will

     disconnect the initial call from this user and dial back to the specified call back number (see below). The default is no callback.

5.   **Callback Phone # -** If Callback is 'Yes', then this is a required field. Otherwise, an 'N/A' will appear in the field. Enter the telephone number to which the Prestige will call back.

6.   **Callback Override -** If Callback is 'No', an 'N/A' will appear in the field. The callback override allows the Remote Dial-in User to specify the call back telephone number on call-by-call basis. This is useful for when the Prestige returns a call back to a mobile user at different numbers, e.g., a sales rep in a hotel. Please note that the default is 'No', i.e., the Prestige always calls back at the fixed callback number.

7.   **Rem CLID -** If you have enabled the CLID Authen field in Menu 13, then you need to specify the telephone number from which this Remote Dial-in User calls. The Prestige will check this number against the CLID in the incoming call. If they do not match and the CLID Authen is 'Required', then the Prestige will reject the call.

8.   **Idle Timeout -** Enter the idle time (in seconds). This timeout determines how long the dial-in user can be idle before the Prestige disconnects the call. Idle time is defined as the period of time where there is no data traffic between the dial-in user and the Prestige. The default is 300 seconds (5 minutes).

Once you have completed filling in 'Menu 14.1 - Edit Dial-in User' , press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC at any time to cancel your selections.

More on CLID

CLID allows the Prestige to authenticate the caller before a call is answered, thus saving the cost of a connection. The Prestige uses the caller ID in the ISDN call setup message to match against the CLID in the database.

However, CLID may not be available due to your switch configuration.

Besides authentication, another application of CLID is to *combine* it with call back. For instance, your company pays for the connection charges for telecommuting employees, and you are using the Prestige as the dial in server. You can turn on both the CLID authentication and call back options for the dial-in users. By doing so, all usage are charged to the company instead of the employees, and your accounting department can avoid the hassles of accountability and reimbursement.

Chapter 7 - TCP/IP Configuration

This chapter shows you how to configure the Prestige for TCP/IP. Depending on your particular applications, you will need to configure different menus. For instance, Internet access is the most common application of TCP/IP. For this application, you should configure Menu 4. We will illustrate the configuration for other applications in the following sections.

IP Subnet Mask

A subnet mask is a 32-bit quantity that, when logically ANDed with an IP address, yields the network number. For instance, the subnet masks for class A, B and C without subnetting are 255.0.0.0, 255.255.0.0 and 255.255.255.0, respectively.

To create more network numbers, you shift some bits from the host ID to the network ID. For instance, to partition a class C network number 192.68.135.0 into two, you shift 1 bit from the host ID to the network ID. Thus the new subnet mask will be 255.255.255.128; the first subnet will have network number 192.68.135.0 with hosts 192.68.135.1 to 129.68.135.126 and the second subnet will have network number 192.68.135.128 with hosts 192.68.135.129 to 192.68.135.254.

It is recommended that you use the same subnet mask for all physical networks that share an IP network number. Table 7.1 lists the additional subnet mask bits in dot decimal notations. To use to following table, write down the original subnet mask and substitute the higher order 0's with the dot decimal of the additional subnet bits. For instance, to partition your class C network 204.247.203.0 with subnet mask 255.255.255.0 into 16 subnets (4 bits), the new subnet mask becomes 255.255.255.240.

No. of Bits	Dot Decimal
1	128
2	192
3	224
4	240
5	248
6	252
7	254
8	255

Table 7.1 Additional subnet mask bits in dot decimal notation.

LAN-to-LAN Application

A typical LAN-to-LAN application is to use the Prestige to call from a branch office to the headquarters, as depicted in the following diagram.
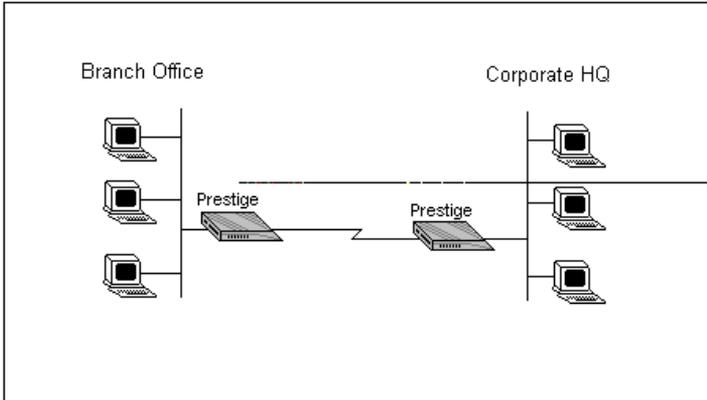
Figure 7.1 LAN-to-LAN application

For the branch office, you need to configure a Remote Node in order to dial out to the headquarters. Additionally, you may also need to configure Static Routes if some services reside beyond the immediate remote LAN.

Remote Node Setup

Follow the procedure in chapter 5 to fill the protocol-independent parameters in Menu 11, Remote Node Profile. For the protocol-dependent parameters, follow the instructions below. If you are configuring the Prestige to receive an incoming call, you also need to set the default dial-in parameters in menu 13 (see Chapter 6).

1. **Route** - Make sure IP is among the protocols in the "**Route**" field.

2. **IP Address** - Enter the IP address of the gateway at the remote site (in this case, headquarters). If the remote router is using a different IP address than the one entered here, the Prestige will drop the call.

3. **Edit IP/IPX/AppleTalk/Bridge** - Press the space bar to change it to 'Yes' and press Enter to go to the 'Menu 11.3 - Remote Node Network Layer Options' menu (see Figure 7.2 below)

4. **Rem IP Address** - This will show the IP address you entered for this Remote Node in the previous menu.

5. **Rem IP Subnet Mask** - Enter the subnet mask for the remote network.

6. **My WAN Addr** - Some implementations, especially the UNIX derivatives, requires hosts on both ends of the ISDN link to have separate addresses from the LAN, and that the addresses must have the same network number. If this is the case, enter the IP address assigned to the WAN port of the Prestige. Please note that this is the address assigned to the local Prestige, not the remote router (see Figure 7.3).

```
              Menu 11.3 - Remote Node Network Layer Options

 IP Options:                          AppleTalk Options:
   Rem IP Addr: 204.247.203.166         Dial-On-Query= N/A
   Rem Subnet Mask= 255.255.255.0       Rem LAN Net Range= N/A
   My WAN Addr= 0.0.0.0                   1st Zone Name= N/A
   Metric= 3                             2nd Zone Name= N/A
   Private= No                        My WAN Net #= N/A
   RIP= Both                            My WAN Node ID= N/A
 IPX Options:                          Metric= N/A
   Dial-On-Query= N/A                  ZIP Timeout(min)= N/A
   Rem LAN Net #= N/A
   My WAN Net #= N/A                   Bridge Options:
   Hop Count= N/A                        Dial-On-Broadcast= N/A
   Tick Count= N/A                       Ethernet Addr Timeout(min)= N/A
   W/D Spoofing(min)= N/A
   SAP/RIP Timeout(min)= N/A

                  Enter here to CONFIRM or ESC to CANCEL:

```

*Figure 7.2   Remote node TCP/IP configuration menu*
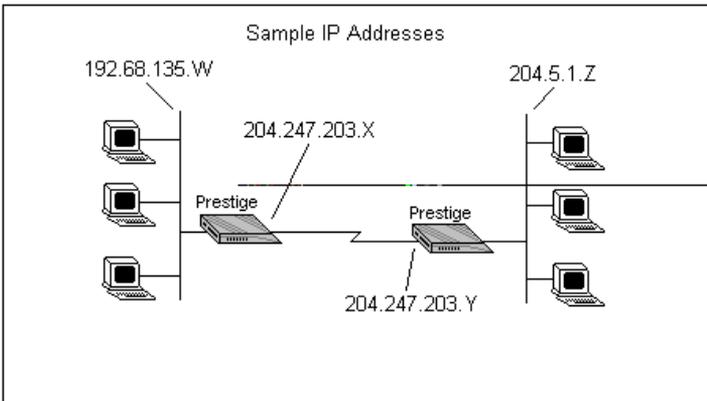
Figure 7.3   Example of IP WAN Alias Number

7. **Metric** - The metric represents the "cost" of transmission for routing purpose. IP routing uses hop count as the measurement of cost, with the minimum of 1 for directly connected networks. Enter a number that approximate the cost for this link. The number need not be precise, but it must be between 1 and 16. In practice, 2 or 3 is usually a good number.

8. **Private** - This parameter determines if the Prestige will include the route to this Remote Node in its RIP broadcasts. If set to yes, this route is kept private and not included in RIP broadcast. If no, the route to this Remote Node will be propagated to other hosts through RIP broadcasts.

9. **RIP** - This parameter determines how the Prestige handles RIP (Routing Information Protocol), and the default is 'Both'. If set to 'Both', the Prestige will broadcast its routing table on the WAN, and incorporate RIP broadcasts by the

other router into its routing table. If set to 'In Only', the Prestige will not
broadcast its routing table on the WAN; if set to 'Out Only', the Prestige will
broadcast its routing table but ignores any RIP broadcast packets that it receives. If
set to 'None', the Prestige will not participate in any RIP exchange with other
routers. Usually, you should leave this parameter at its default of 'Both' and let
RIP propagate the routing information automatically.

Once you have completed filling in the Network Layer Options Menu, press ENTER to
return to Menu 11. Press ENTER at the message: 'Press ENTER to Confirm ...' to save
your selections, or press ESC at any time to cancel your selections.

Static Route Setup

On a directly connected internet, RIP usually handles the routing automatically.
However, RIP cannot propagate across isolated networks, as in the case before a
connection is made between the two subnetworks using one Class C IP address.
Without a route, no packets can be forwarded to their destinations. A static route is
used to resolve this problem by providing the Prestige with some static routing
information. As a matter of fact, when you configure the Internet Access or a Remote
Node, a static route is implicitly created by the Prestige. Figure 7.4 shows an example
of using a static route. In the example, stations on the '204.5.1.0/24' subnetwork can
access the remote stations using the static route. The route will have a destination of
'204.5.1.64/26' with the gateway address being that of the Remote Node (204.5.1.150).
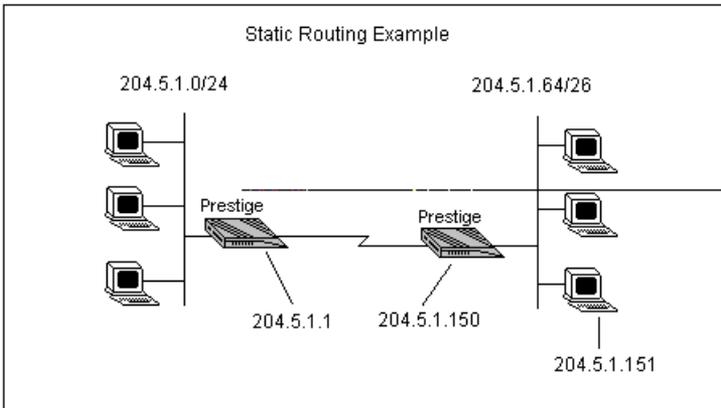
*Figure 7.4 Static Routing Example*

Please note that in normal circumstances, the Prestige will have adequate routing
information after you configure the Internet access and Remote Nodes; you do not need
to configure additional static routes. You will need to configure static routes only for
unusual cases, e.g., subnetting. To create an additional static routes for IP, use Menu
12, Static Route Setup.

```
                    Menu 12.1 - Edit IP Static Route

             Route #: 1
             Route Name=
             Active= No
             Destination IP Address= ?
             IP Subnet Mask= ?
             Gateway IP Address= ?
             Metric= 2
             Private= No




             Press ENTER to Confirm or ESC to Cancel:
```

Figure 7.5 IP Static Route Setup

1. **Route Name** - Enter a descriptive name for this route. This is for identification purpose only.

2. **Active** - This fields allows you to activate/deactivate this static route.

3. **Destination IP Address** - This parameter specifies the IP *network* address of the final destination. Routing is always based on network number. If you need to specify a route to a single host, use a subnet mask of 255.255.255.255 in the subnet mask field to force the network number to be identical to the host ID.

4. **IP Subnet Mask** - Enter the subnet mask for this destination. Please follow the discussion on IP subnet mask in this chapter.

5. **Gateway IP Address** - Enter the IP address of the gateway. The gateway is an *immediate* neighbor of the Prestige that will forward the packet to the destination. On the LAN, the gateway must be a router on the same segment as the Prestige; over ISDN, the gateway must be the IP address of one of the Remote Nodes.

6. The **Metric** and the **Private** parameters have the same meaning as those in the Remote Node Setup.

Once you have completed filling in the menu, press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC at any time to cancel your selections.

Chapter 8 - Novell IPX Configuration

This chapter shows you how to configure the Prestige for IPX. Depending on your particular applications, you will need to configure different menus. We will illustrate the configuration for some applications in the following sections.

IPX Network Environment

Frame Type

The stations on an IPX network (both clients and servers) can run on four (4) different frame types existing on one physical Ethernet cable. These frame types include 802.2, 802.3, Ethernet II (DIX), and SNAP.

Network Numbers

Whenever you are setting up an IPX routing environment, it is important to correctly configure the network numbers on the LAN. On any IPX network, there is an external network number - that is, the number associated with the frame type on the Ethernet cable to which the stations on the network are joined. In addition to this external network number, each NetWare server has its own internal network number. It is important to remember that every network number has to be unique for that entire internetwork. So if a server station had an internal network number of '00000011', there is no other network number (internal or external) of '00000011' anywhere on the entire network.

There will be two different scenarios when you connect your Prestige to a LAN: one with a server (server side), and one without a server (client side). See Figure 8.1.
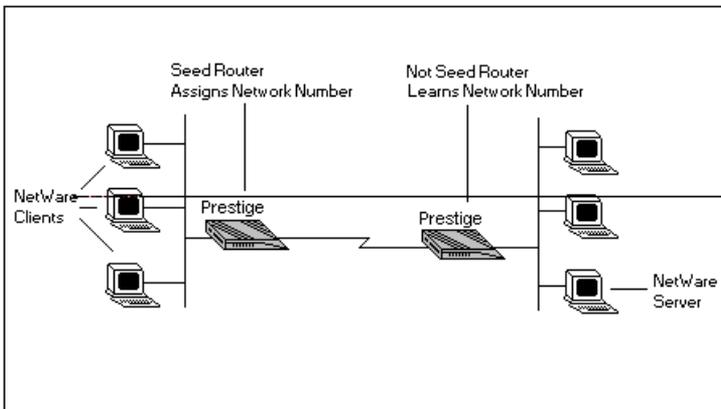

Figure 8.1 Prestige Operating in IPX Environments

Prestige on LAN with Server

When the Prestige is being connected to a LAN with an existing NetWare server station, you will not need to configure the Prestige as a seed router, and hence the network number parameter in the Ethernet Setup Menu for the Prestige. Rather, the Prestige will 'learn' the network number of the network it is attached to through the regular RIP broadcasts sent by the server and add this route to its routing table.

Prestige on LAN without Server

If the Prestige is connected to a LAN without an existing NetWare server station, then it needs to create a unique external network number to apply to that frame on the LAN. This Prestige must then be configured as a Seed Router, and the network number can be configured in the Ethernet Setup Menu. The network number must be unique and not used anywhere else on the entire internetwork.

IPX Spoofing

The Prestige comes with several pre-defined call filters designed to prevent certain IPX packets from triggering a call to a Remote Node. These filters should inform your Prestige which packets should be ignored as traffic.

When you are routing IPX packets, the default call filters are defined as follows:

- Block periodical SAP and RIP response messages

- Block NetWare serialization packets

- Allow SAP and RIP inquiry packets

These call filters prevent the Prestige from making a call to the Remote Node, thus preventing the expense of an unnecessary phone call.

IPX Ethernet Setup

The first step is to set up the Prestige on the LAN. From menu 3, select option 3 to go to Menu 3.3 - Novell IPX Ethernet Setup (Figure 8.2).

```
            Menu 3.3 - Novell IPX Ethernet Setup

    Seed Router= Yes

    Frame Type 802.2= Yes
       IPX Network #= 12345678

    Frame Type 802.3= No
       IPX Network #= N/A

    Frame Type Ethernet II= No
       IPX Network #= N/A

    Frame Type SNAP= No
       IPX Network #= N/A            _____


    Press ENTER to Confirm or ESC to Cancel:

```

Figure 8.2 Menu 3.3 - Novell IPX Ethernet Setup

1. **Seed Router** - Determine if the Prestige is to act as a seed router. This value
   depends on the existing network. If there is a NetWare server providing the
   network number, select 'No'. If there is no NetWare server providing the network
   number, select 'Yes'.

2. **Frame Type** - For every frame type that the Prestige needs to support, you need to
   set the corresponding field to 'Yes'. The frame type(s) selected here must be the
   same frame type(s) as the server or client stations on that network. Otherwise, the
   devices will not be able to communicate. You can select more than one of these
   four frame types.

   - 802.2
   - 802.3
   - Ethernet II
   - SNAP

3. **IPX Network #** - If you selected the Prestige to act as a seed router, you need to
   provide a unique network number to be associated with the network that the
   Prestige has joined. Please keep in mind that this number must not be used
   anywhere else on the entire internetwork.

Once you have completed filling in the Menu 3.3, press ENTER the save message to
save your selections, or press ESC at any time to cancel your selections.

LAN-to-LAN Application

A typical LAN-to-LAN application is to use the Prestige to call from a branch office to
the headquarter such that all of the stations on the branch office network have access to
the server at the headquarters, as depicted in the following diagram.

Branch Office   Corporate HQ

External Network
Number = 333

NetWare
Clients

Prestige   Prestige

NetWare
Server

External Network
Number = 222   Internal Network
                    Number = 111
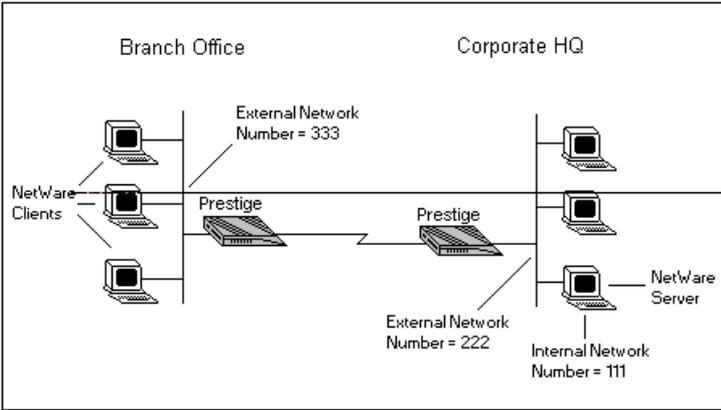
Figure 8.3 LAN-to-LAN application

For the branch office, you need to configure a Remote Node in order to dial out to the headquarter.

Remote Node Setup

Follow the procedure in chapter 5 to fill the protocol-independent parameters in Menu 11, Remote Node Profile. For the protocol-dependent parameters, follow the ensuing instructions. If the Prestige is configured to receive an incoming call, you can configure the default dial-in parameters in menu 13 (see chapter 6).

1. **Route** - Make sure IPX is among the protocols in the 'Route' field.

2. **Edit IP/IPX/AppleTalk/Bridge**- Press the space bar to change it to 'Yes' and press Enter to go to the network layer options menu.

```
                Menu 11.3 - Remote Node Network Layer Options

    IP Options:                          AppleTalk Options:
      Rem IP Addr: 204.247.203.166         Dial-On-Query= N/A
      Rem Subnet Mask= N/A                 Rem LAN Net Range= N/A
      My WAN Addr= N/A                       1st Zone Name= N/A
      Metric= N/A                            2nd Zone Name= N/A
      Private= N/A                         My WAN Net #= N/A
      RIP= N/A                               My WAN Node ID= N/A
    IPX Options:                           Metric= N/A
      Dial-On-Query= Yes                   ZIP Timeout(min)= N/A
      Rem LAN Net #= 00000222
      My WAN Net #= 00000000             Bridge Options:
      Hop Count= 1                         Dial-On-Broadcast= N/A
      Tick Count= 2                        Ethernet Addr Timeout(min)= N/A
      W/D Spoofing(min)= 3
      SAP/RIP Timeout(min)= 3

                Enter here to CONFIRM or ESC to CANCEL:

```

Figure 8.4 Remote Node IPX Configuration Menu

3. **Dial-On-Query** - This field is necessary for the Prestige on the client side LAN. When set to 'Yes', any Get Service SAP or RIP broadcasts coming from the LAN will trigger the Prestige to make a call to that Remote Node. If it is set to 'No', the Prestige will not make the outcall.

4. **Rem LAN Net #** - In this field, enter the internal network number of the NetWare server on the remote side LAN. The Prestige will create a route to access this server.

5. **My WAN Net #** - In this field, you can enter in the WAN network number of the device that you are connecting to. This number will be used for the negotiation between the Prestige and the remote device. If you leave this field as '00000000', the Prestige will select the greater WAN network number between the two devices.

6. **Hop Count** - This field indicates the number of intermediate networks that must be passed through to reach the Remote Node. The default is one (1).

7. **Tick Count** - This field indicates the time-ticks required to reach the Remote Node. The default is two (2).

8. **W/D Spoofing(min)** - This field is used for the Prestige on the server side LAN. The Prestige can spoof a response to a server's WatchDog request after the connection is dropped. In this field, enter in the time (number of minutes) that you want the Prestige to spoof the WatchDog response.

9. **SAP/RIP Timeout(min)** - This field indicates the amount of time that you want the Prestige to maintain the SAP and RIP entries learned from this Remote Node in its internal tables after the connection has been dropped. If this information is retained, then the Prestige will not have to get the SAP information when the line is brought back up. Enter the time (number of minutes) in this field.

Once you have completed filling in the Network Layer Options Menu, press ENTER to return to Menu 11.1. Press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC at any time to cancel your selections.

Static Route Setup

If your LAN-to-LAN application has NetWare servers on both sides of the link, then any NetWare client stations will have access to a server on their LAN (see Figure 8.5).
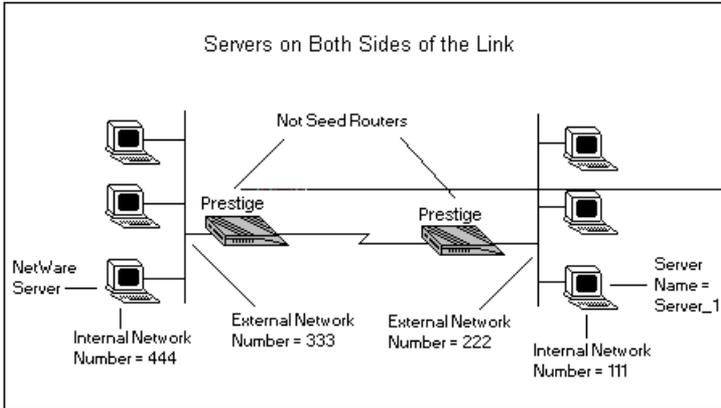
Figure 8.5 NetWare Servers on Both Sides of the Link

This may present a problem if you desire your client station to access a server at a remote site. For example, in the above diagram, suppose that a client station on the network on the left wishes to access the NetWare server on the right (internal network number = 111). However, the SAP broadcasts will receive a response from the server on the left (internal network number = 444). A static route is used to resolve this problem by providing the Prestige with some static routing information to access the remote server.

From Menu 12, select one of the four possible IPX Static Routes (see Figure 8.6).

Figure 8.6 Menu 12.2 - Edit IPX Static Route

1. **Server Name** - In this field, enter in the name that has been configured for the server. This name must be the *exact* name configured in the NetWare server.

2. **Network #** - This field contains the internal network number of the remote server which you wish to access. Do not use '00000000' or 'FFFFFFFF' for this field.

3. **Node #** - This field contains the address of the node on which the server resides. If you are using a Novell IPX implementation, this value is '000000000001'.

4. **Socket #** - This field contains the socket number on which the server will receive service requests. The default for this field is hex 0451.

5. **Type #** - This field identifies the type of service the server provides. The default for this field is hex 0004.

6. **Gateway Node** - In this field, enter the number (1-4) of the Remote Node that is linked to this static route. That is, the Remote Node that you wish to route the packet to.

The 'Hop Count' and 'Tick Count' fields have the same meaning as those in the Remote Node Setup.

Once you have completed filling in the menu, press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC at any time to cancel your selections.

Chapter 9 - AppleTalk Configuration

This chapter shows you how to configure the Prestige for AppleTalk. Depending on your particular applications, you will need to configure different menus. We will illustrate the configuration for some applications in the following sections.

AppleTalk Network Environment

In AppleTalk networking, each network must have at most one router, called a seed router, on which the network range and the zone list of that network are stored. The nodes on the network, including other routers, get their network number and zone name from the seed router. If the Prestige is the only router on your network, then you must configure it as a seed router; if it is not, then you can configure any one of the routers as the seed.

The network range determines the range of network numbers that a node on this network can assume. For instance, if the network range is 10-19, then a node can pick an AppleTalk address with network number 15. Keep in mind that your network range must NOT overlap those of any other networks.

An AppleTalk zone is an administrative division of the nodes sharing a physical network. For instance, if the sales department and the marketing department share one network, then you can specify the first zone as Sales and the second as Marketing. The sales department employees then can set their Macintoshes to zone Sales, and marketing employees set theirs to zone Marketing. Usually, if you don't have different departments sharing one network, there is no need to specify more than one zone name for a network.

Unlike the network range where overlapping is not allowed, you can have a zone that covers multiple networks. For instance, if the sales department employees work in two buildings, then you would include Sales in the zone list of both networks.

Since all nodes get their network parameters from the seed router, it is recommended that you always power on the seed router first, followed by non-seed routers and finally the client Macintoshes.

AppleTalk Ethernet Setup

The first step is to set up the Prestige on the LAN. From menu 3, select option 4 to go to Menu 3.4 - AppleTalk Ethernet Setup (Figure 9.1).

```
                   Menu 3.4 - AppleTalk Ethernet Setup

              Seed Router= Yes
              Network Range= ?
              1st Zone Name= ?
              2nd Zone Name=
              ZIP Timeout(min)= 1




                                        _____



              Press ENTER to Confirm or ESC to Cancel:
input: LowNetworkNumber-HighNetworkNumber
```

Figure 9.1 Menu 3.4 - AppleTalk Ethernet Setup

1. **Seed Router** - This field indicates, 'Yes' or 'No', whether or not the Prestige is a seed router on the LAN. If this field is set to 'Yes', then you will have to provide the network range for the Prestige.

2. **Network Range** - This field is active only if 'seed router' is set to 'Yes'. Enter the network range numbers for the LAN in the following format: 'low network number-high network number'.

3. **1st Zone Name** - This field contains the 1st zone name for the Prestige. The Prestige will have access to all the services provided by the zone entered here.

4. **2nd Zone Name** - This field contains the 2nd zone name for the Prestige. The Prestige will have access to all the services provided by the zone entered here.

5. **ZIP Timeout(min)** - In this field, enter the time (number of minutes) that you wish the Prestige to retain the ZIP information while aging the zone information on the LAN. If this information is retained, then the Prestige will not have to re-negotiate the protocol when the line is brought back up.

Once you have completed filling in the Menu 3.4, press ENTER the save message to save your selections, or press ESC at any time to cancel your selections.

LAN-to-LAN Application

To get a complete picture of an AppleTalk internet, the routers need to talk to one another to get the necessary data. This exchange of data cannot happen until the connection between a router and its peer is established. However, without a connection, a router cannot learn the services offered on a remote network and hence there will be no traffic to trigger the call. The purpose of the Remote Node Setup is for you to enter the minimal initial information to trigger the Prestige to place a call. For instance, the zone names in the Remote Nodes will be presented to the users before a call is made. When a user selects a zone covering a Remote Node, it triggers the Prestige to place the

call. After the connection is established, the data exchange can take place and the user will get a complete list of zones and servers on the remote networks.

Remote Node Setup

Follow the procedure in chapter 5 to fill the protocol-independent parameters in Menu 11, Remote Node Profile. For the protocol-dependent parameters, follow the ensuing instructions.

1. **Route** - Make sure AppleTalk is among the protocols in the "**Route**" field.

2. **Edit IP/IPX/AppleTalk/Bridge** - Press the space bar to change it to 'Yes' and press Enter to go to the network layer options menu (see Figure 9.2)

```
                Menu 11.3 - Remote Node Network Layer Options

    IP Options:                      AppleTalk Options:
      Rem IP Addr: 204.247.203.166     Dial-On-Query= No
      Rem Subnet Mask= N/A             Rem LAN Net Range= 0-0
      My WAN Addr= N/A                   1st Zone Name=
      Metric= N/A                        2nd Zone Name=
      Private= N/A                     My WAN Net #= 0
      RIP= N/A                           My WAN Node ID= 0
    IPX Options:                       Metric= 1
      Dial-On-Query= N/A               ZIP Timeout(min)= 3
      Rem LAN Net #= N/A
      My WAN Net #= N/A               Bridge Options:
      Hop Count= N/A                   Dial-On-Broadcast= N/A
      Tick Count= N/A                  Ethernet Addr Timeout(min)= N/A
      W/D Spoofing(min)= N/A
      SAP/RIP Timeout(min)= N/A

                  Enter here to CONFIRM or ESC to CANCEL:
```

*Figure 9.2 Remote node IPX configuration menu*

3. **Dial-On-Query** - This field is necessary for the Prestige on the caller side LAN. When set to 'Yes', any Multicast broadcasts coming from the LAN will trigger the Prestige to make a call to that Remote Node. If it is set to 'No', the Prestige will not make the outcall.

4. **Rem LAN Net Range** - In this field, enter the network range number of the remote LAN. The format should be 'low network number-high network number'.

5. **1st Zone Name** - In this field, enter name of the zone that you wish to have access to on the remote side. This router on the remote site must have access to this zone.

6. **2nd Zone Name** - In this field, enter name of the zone that you wish to have access to on the remote side. This router on the remote site must have access to this zone.

7. **My WAN Net #** - In this field, you can enter in the WAN network number of the device that you are connecting to. This number will be used for the negotiation between the Prestige and the remote device.

8. **My WAN Node ID** - This field contains the WAN node ID for your Prestige.

9.   **Metric** - The metric represents the "cost" of transmission for routing purpose. Enter a number that approximate the cost for this link. The number need not be precise, but it must be between 1 and 16. In practice, 2 or 3 is usually a good number.

10. **ZIP Timeout(min)** - In this field, enter the time (number of minutes) that you wish the Prestige to retain the ZIP information while the line is down. If this information is retained, then the Prestige will not have to re-negotiate the protocol when the line is brought back up.

Once you have completed filling in the Network Layer Options Menu, press ENTER to return to Menu 11. Press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC at any time to cancel your selections.

Static Route Setup

The following steps describe a setup procedure for configuring an AppleTalk static route.
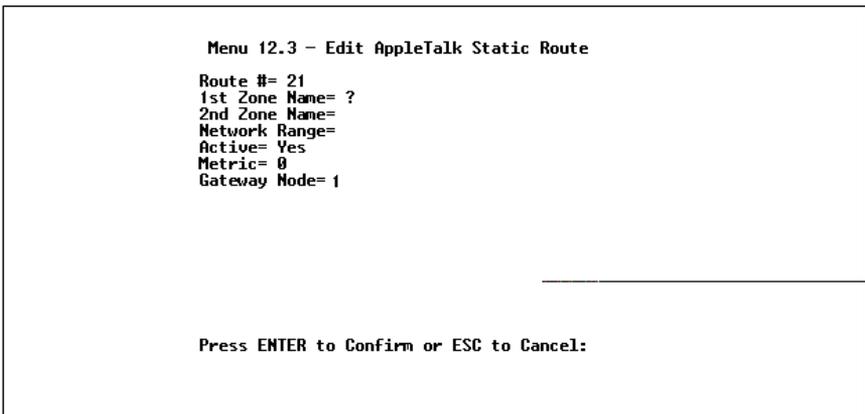
```
              Menu 12.3 - Edit AppleTalk Static Route

              Route #= 21
              1st Zone Name= ?
              2nd Zone Name=
              Network Range=
              Active= Yes
              Metric= 0
              Gateway Node= 1


                                         _____



              Press ENTER to Confirm or ESC to Cancel:
```

Figure 9.3 AppleTalk Static Route Setup

1.   **1st Zone Name** - In this field, enter name of the zone on the remote side that you wish to route your packets to. It is important that the router on the remote site have access to this zone.

2.   **2nd Zone Name** - In this field, enter name of the zone on the remote side that you wish to route your packets to. It is important that the router on the remote site have access to this zone.

3.   **Network Range** - This field contains the network range of the LAN that you wish to route your packets to. Enter the range using the format 'low network number - high network number'.

4.   **Active** - This field indicates whether the static route is active or not.

5.   **Metric** - The metric represents the "cost" of transmission for routing purpose. Enter a number that approximate the cost for this link. The number need not be precise, but it must be between 1 and 16. In practice, 2 or 3 is usually a good number.

6.   **Gateway Node** - In this field, enter the number (1-4) of the Remote Node that is linked to this static route. That is, the Remote Node that you wish to route the packet to.

Once you have completed filling in the menu, press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC at any time to cancel your selections.

Chapter 10 - Bridging Configuration

This chapter shows you how to configure the Bridging options for the Prestige. Depending on your particular applications, you will need to configure different menus. We will illustrate the configuration for some applications in the following sections.

Bridging IPX Spoofing

The Prestige comes with several pre-defined call filters designed to prevent certain IPX packets from triggering a call to a Remote Node. These filters should inform your Prestige which packets should be ignored as traffic.

When you are bridging IPX packets, the default call filters are defined as follows:

- Block periodical SAP and RIP response messages

- Block SAP and RIP inquiry packets if set to Handle IPX as 'Server'

- Allow SAP and RIP inquiry packets if set to Handle IPX as 'Client' or 'None'

These call filters prevent the Prestige from making a call to the Remote Node, thus preventing the expense of an unnecessary phone call.

Bridge Ethernet Setup

Bridging is used to forward packets of unsupported protocols whose destination is not on the local Ethernet to the WAN.

Basically, all non-local packets are bridged to the WAN, however, the Prestige applies a special handling for certain IPX packets to reduce the number of calls, depending on the setting of the "Handle IPX" field".

- If it is set to **None,** nothing is done to IPX traffic.

- If it is set to **Client,** all RIP and SAP (Service Advertising Protocol) periodical response packets will not trigger the call.

- If it is set to **Server,** all RIP and SAP packets will not trigger the call. In addition, during the time when the ISDN line is down, the Prestige will reply to the servers' watchdog messages on behalf of remote clients. The period of time that the Prestige will do this is linked to the *Ethernet Address Timeout* parameter in each Remote Node (see Chapter 5). When a remote Ethernet address is aged out, there is no need in maintaining its connection to the IPX server.

```
                    Menu 3.5 - Bridge Ethernet Setup
                 Handle IPX= Client




                                         _____



                 Press ENTER to Confirm or ESC to Cancel:
Press Space Bar to Toggle.
```
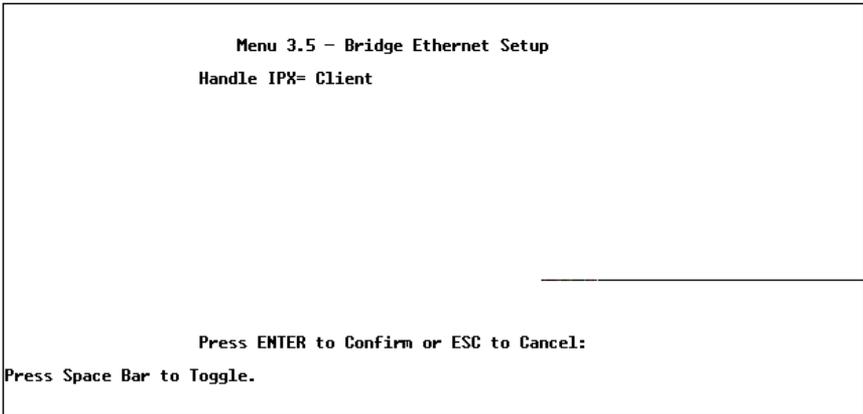
Figure 10.1 Bridge Ethernet Setup

From Menu 3 - Ethernet Setup, enter "5" to go to Menu 3.5 - Bridge Ethernet Setup. See Figure 10.1.

1. **Handle IPX** - Set this parameter to **None** if there is no IPX traffic on the LAN or if you do not want to apply any special handling for IPX. Set it to **Client** if there are only client workstations on the LAN. Set it to **Server** if there are only IPX servers on the LAN.

   If there are both clients and servers on the LAN, then the setting depends on if the local clients will access the remote servers. If they do, set it to **Client** and set Dial-On-Broadcast in menu 11.2 to **Yes** to allow the client queries to trigger the call. If they do not, set it to **Server**.

When you are finished, press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC at any time to cancel them.

LAN-to-LAN Application

A typical LAN-to-LAN application is to use the Prestige to call from one office to another office such that stations on one network have access to stations on the remote side and vice versa. You will need to configure a Remote Node in order to dial out to another office.

Remote Node Setup

Follow the procedure in chapter 5 to fill the protocol-independent parameters in Menu 11, Remote Node Profile. For the protocol-dependent parameters, follow the ensuing instructions.

1. **Bridge** - Make sure this field is set to 'Yes'.

2. **Edit IP/IPX/AppleTalk/Bridge**- Press the space bar to change it to 'Yes' and press Enter to go to the network layer options menu (see Figure 10.2)

```
              Menu 11.3 - Remote Node Network Layer Options

   IP Options:                        AppleTalk Options:
     Rem IP Addr: 204.247.203.166       Dial-On-Query= N/A
     Rem Subnet Mask= N/A               Rem LAN Net Range= N/A
     My WAN Addr= N/A                     1st Zone Name= N/A
     Metric= N/A                          2nd Zone Name= N/A
     Private= N/A                       My WAN Net #= N/A
     RIP= N/A                             My WAN Node ID= N/A
   IPX Options:                         Metric= N/A
     Dial-On-Query= N/A                 ZIP Timeout(min)= N/A
     Rem LAN Net #= N/A
     My WAN Net #= N/A                 Bridge Options:
     Hop Count= N/A                      Dial-On-Broadcast= Yes
     Tick Count= N/A                     Ethernet Addr Timeout(min)= 3
     W/D Spoofing(min)= N/A
     SAP/RIP Timeout(min)= N/A

               Enter here to CONFIRM or ESC to CANCEL:

```

Figure 10.2 Remote Node Bridging configuration

4. **Dial-On-Broadcast** - This field is necessary for the Prestige on the caller side LAN. When set to 'Yes', any broadcasts coming from the LAN will trigger the Prestige to make a call to that Remote Node. If it is set to 'No', the Prestige will not make the outcall.

5. **Ethernet Addr Timeout(min)**- In this field, enter the time (number of minutes) that you wish the Prestige to retain the Ethernet Addr information in its internal tables while the line is down. If this information is retained, then the Prestige will not have to re-negotiate the protocol and recompile the tables when the line is brought back up.

Once you have completed filling in the Network Layer Options Menu, press ENTER to return to Menu 11. Press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC at any time to cancel your selections.

Default Dial-In Setup for Bridge

There is only one parameter you need to fill out for Bridging applications.

1. **PPP Options: Recv. Authen.**- verify that this field is *not* set to 'None' Bridging applications must have some sort of authentication turned on in order to match to a Remote Node.

Once you have completed filling in the menu, press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC at any time to cancel your selections.

Bridge Static Route Setup

You can configure Bridge static routes for your Bridging applications.

```
            Menu 12.4 - Edit Bridge Static Route

         Route #: 31
         Route Name= Remote
         Active= Yes
         Ether Address= ?
         IP Address=
         Gateway Node= 1



                                         _____



         Press ENTER to Confirm or ESC to Cancel:

```

Figure 10.3 Menu 12.4 - Bridge Static Route

1. **Route Name** - In this field, enter a name for this bridge static route for identification purposes.

2. **Active** - This field indicates whether the static route is active or not.

3. **Ether Address** - In this field, enter the MAC address of the destination device that you wish to bridge your packets to.

4. **IP Address** - If available, enter the IP address of the destination device that you wish to bridge your packets to.

5. **Gateway Node** - In this field, enter the number (1-4) of the Remote Node that is linked to this static route. When an incoming packet's destination Ether (MAC) address matches the value entered above, then it will trigger a call to this Remote Node.

Once you have completed filling in the menu, press ENTER at the message: 'Press ENTER to Confirm ...' to save your selections, or press ESC at any time to cancel your selections.

Chapter 11 - Filter Configuration

About Filtering

The Prestige uses filters to decide whether or not to allow passage of a data packet and/or to make a call over the ISDN line. There are three types of filters involved: incoming data filters, outgoing data filters, and call filters. Data filters screen the data to determine if the packet should be allow to pass. Call filters are used to determine if a call should be placed.

Outgoing packets must pass through the data filters before they encounter the call filters. Call filters are divided into two groups: default call filters and user-defined call filters. Prestige has default call filters that filter out administrative packets, e.g., RIP and SAP packets. The Prestige applies the default filters first and then the user-defined call filters if applicable (see Figure 11.1).
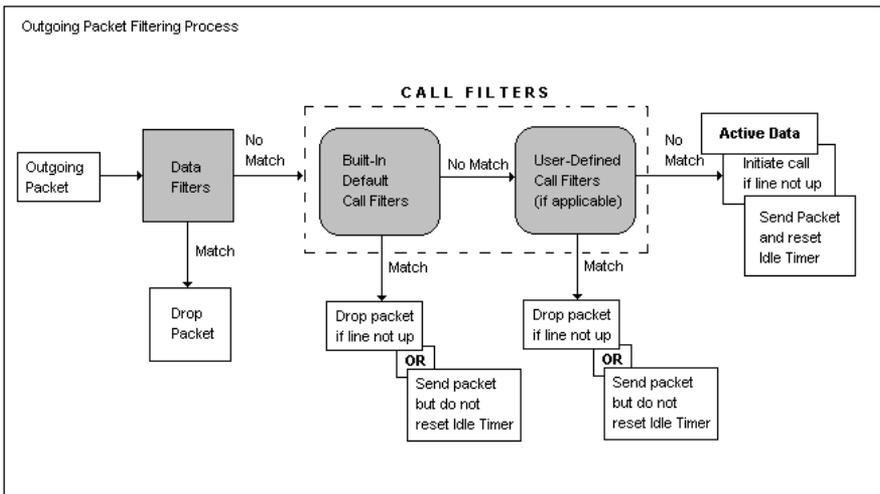
Figure 11.1 Outgoing packet filtering process

For incoming packets, the Prestige applies data filters only. Packets are processed depending upon whether a match is made. The Prestige allows you to customize the filter sets that you wish to use. This following sections describe how to configure the Prestige's filter sets.

Prestige's Filter Structure

You can configure up to twelve filter sets with six rules in each set. Therefore, the Prestige allows you to customize up to 72 filter rules (12 x 6).

When implementing these filter sets, you can link up to four of the filter sets together to screen the data packet. Therefore, with each filter set having up to six rules, you can have a maximum of 24 rules active for a single filtering application.

Configuring a Filter Set

In order to distinguish between the 12 filter sets, each filter set should have a name or some comments. You can edit these comments in the following way.

1. From the Main Menu, select option '21. Filter Set Configuration'. This will bring you to 'Menu 21 - Filter Set Configuration' (Figure 11.2).

2. From this menu, you can choose from among the twelve filter sets. Select the filter set you wish to configure (1-12).

This will bring you to the **Edit Comments** field. Whatever the comments are for that filter set will be displayed in this field. You can edit the comments you wish to use to identify that filter set.

Once you have completed filling in **Edit** Comments field, press ENTER at the message: 'Press ENTER to Confirm ...' to confirm your selections, or press ESC at any time to cancel your selections. The new information will now be displayed in the read-only section of 'Menu 21 - Filter Set Configuration'.

```
                    Menu 21 - Filter Set Configuration
        Filter                              Filter
        Set #        Comments               Set #        Comments
        ____       _____              ____       _____
          1        Filter Set #1              7        _____
          2        Filter Set #2              8        _____
          3        _____                9        _____
          4        _____               10        _____
          5        _____               11        _____
          6        _____               12        _____


              Enter Filter Set Number to Configure= 0_____

              Edit Comments=

              Press ENTER to Confirm or ESC to Cancel:

```
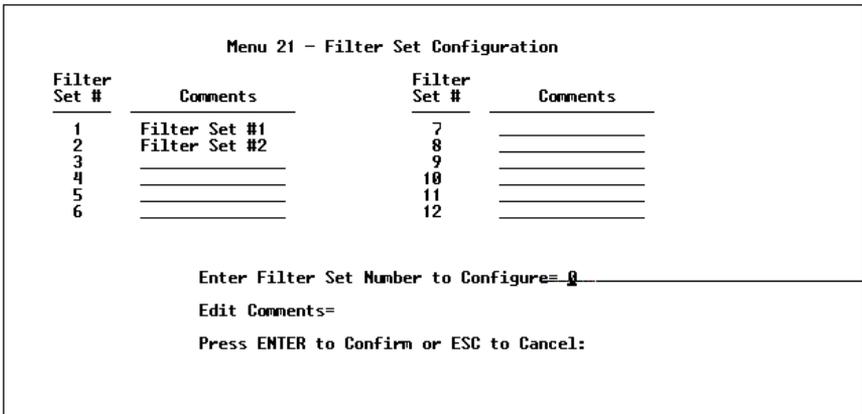
Figure 11.2 Menu 21 - Filter Set Configuration

Once you press ENTER, you will be taken to 'Menu - 21.1 - Filter Rules Summary' (Figure 11.3). The information displayed in this menu is read-only. From here, you can examine the parameters of each rule that you have configured for that set. The following is a brief description of the abbreviations used in this menu.

- **#** - Refers to the filter rule number (1-6)

- **A** - Refers to Active. 'Y' means the filter rule is active and 'N' means the filter rule is inactive.

- **Type** - Refers to the type of filter rule. This can display 'GEN' for generic, 'IP' for TCP/IP, 'IPX' for Novell IPX, or 'APT' for AppleTalk.

- **Filter Rules** - The filter rule parameters will be displayed here (see below).

- **M** - Refers to More. 'Y' means there are more rules to check, 'N' means they aren't.

- **m** - Refers to Action Matched. 'F' means to forward the packet, 'D' means to drop the packet, and 'N' means check the next rule.

- **n** - Refers to Action Not Matched. 'F' means to forward the packet, 'D' means to drop the packet, and 'N' means check the next rule.

```
                    Menu 21.1 - Filter Rules Summary
 # A Type                      Filter Rules                          M m n
 - - ----   -----------------------------------------------------    - - -
 1 Y IP     Pr=17, SA=204.247.203.2, SP=520, DA=192.68.135.1         N F D
 2 Y Gen    Off=4, Len=2, Mask=ffff, Value=0802                      N D N
 3 Y IPX    PT=ad, SS<2222, DS!=1111                                 N F N
 4 Y APT    DT=244, DN=[32-64], DS!=200, SN=[100-450], SS>100        N D F
 5 N
 6 N




                                                       _____

                  Enter Filter Rule Number (1-6) to Configure: _

```

Figure 11.3 Menu 21.1 - Filter Rules Summary

If the filter type is 'IP' (TCP/IP), the following abbreviations will be used:

- **Pr** - refers to Protocol.
- **SA** - refers to Source Address.
- **SP** - refers to Source Port number.
- **DA** - refers to Destination Address.
- **DP** - refers to Destination Port number.

If the filter type is 'GEN' (generic), the following abbreviations will be used:

- **Off** - refers to Offset.
- **Len** - refers to Length.

If the filter type is 'IPX' (Novell IPX), the following abbreviations will be used:

- **PT** - refers to IPX Packet Type.
- **SS -** refers to Source Socket.
- **DS** - refers to Destination Socket.

If the filter type is 'APT' (AppleTalk), the following abbreviations will be used:

- **DT** - refers to DDP Type.
- **DN** - refers to Destination Network.
- **DS** - refers to Destination Socket.
- **SN** - refers to Source Network.
- **SS** - refers to Source Socket.

For more information on configuring the filter rule parameters, please refer to the next section.

To configure a specific filter rule, simply select the number of the filter rule (1-6) you wish to configure and press ENTER. This will take you to 'Menu 21.1.1 - TCP/IP Filter Rule' (next section).

Configuring a Filter Rule

There are four types of filter rules that you can configure. Some of the parameters will differ depending on the type of rule. When you first enter the filter rule menu, you will be presented with 'Menu 21.1.1 - TCP/IP Filter Rule' (Figure 11.4). If you wish to configure another type of filter rule, you need to select the appropriate type (by pressing SPACE bar) under the **Filter Type** field and press ENTER. This will bring you to corresponding menu.

TCP/IP Filter Rule

This section will show you how to configure a TCP/IP filter rule for your Prestige. The fields in the menu are indicated in **bold** type.

```
              Menu 21.1.1 - TCP/IP Filter Rule

         Filter #: 1,1
         Filter Type= ICP/IP Filter Rule
         Active= Yes
         IP Protocol= 17    IP Source Route= No
         Destination: IP Addr= 192.68.135.1
                      IP Mask= 255.255.255.255
                      Port #= 520
                      Port # Comp= None
             Source:  IP Addr= 204.247.203.2
                      IP Mask= 255.255.255.255
                      Port #= 520
                      Port # Comp= Equal
         TCP Estab= N/A                    _____
         More= No          Log= None
         Action Matched= Forward
         Action Not Matched= Drop

             Press ENTER to Confirm or ESC to Cancel:
Press Space Bar to Toggle.
```

Figure 11.4 Menu 21.1.1 - TCP/IP Filter Rule

1. **Active** - In this field, you can make the filter rule active or inactive. There are two options:

   - Yes *(Default)*

- No

2. **IP Protocol** - Protocol refers to the IP specific number of the protocol. The range for this value should be between 0 and 255. For example, '6' refers to the TCP protocol.

3. **IP Source Route -** Determine, 'Yes' or 'No', whether to check the source route.

4. **Destination: IP Addr -** In this field, enter the destination IP Address of the packet you wish to filter. The address is usually written in dotted decimal notation such as a.b.c.d where a, b, c, and d are numbers between 0 and 255. **Destination: IP Mask** - In this field, enter in the IP subnet mask that will be used to mask the bits of the IP Address given in **Destination: IP Addr**. Please refer to Table 2.2 'IP Subnet Mask Values and the Corresponding Number of Host ID's' for more information. **Destination: Port # -** Enter the destination port of the packets that you wish to filter. The range of this field is 0 to 65535.

5. **Destination: Port # Comp -** In this field, you can select what comparison quantifier you wish to enable to compare to the value given in **Destination: Port #**. There are five options for this field:

   - None *(Default)*
   - Less
   - Greater
   - Equal
   - Not Equal

6. **Source: IP Addr -** In this field, enter the source IP Address of the packet you wish to filter. The address is usually written in dotted decimal notation such as a.b.c.d where a, b, c, and d are numbers between 0 and 255.

7. **Source: IP Mask -** In this field, enter in the IP subnet mask that will be used to mask the bits of the IP Address given in **Source: IP Addr**. Please refer to Table 2.2 'IP Subnet Mask Values and the Corresponding Number of Host ID's' for more information.

8. **Source: Port # -** Enter the source port of the packets that you wish to filter. The range of this field is 0 to 65535.

9. **Source: Port # Compare -** In this field, you can select what comparison quantifier you wish to use to compare to the value given in **Source: Port #**. There are five options for this field:

   - None *(Default)*
   - Less
   - Greater
   - Equal
   - Not Equal

10. **TCP Estab -** This field is dependent upon the **IP Protocol** field. This field will be inactive ('N/A') unless the value in that field is 6 (TCP protocol). In this field you determine what type of TCP packets to filter. There are two options:

    - Yes - filter match only established TCP connections
    - No - filter match both initial and established TCP connections *(Default)*

11. **More** - In this field, you can determine if you want to pass the packet through the next filter rule before an action is taken. There are two options for this field:

    - Yes
    - No (Default)
    If **More** is 'Yes', then **Action Matched** and **Action Not Matched** will be 'N/A'.

12. **Log -** In this field, you can determine if you wish to log the results of packets attempting to pass the filter rule. These results will be displayed on the System Log (see Chapter 15). There are 4 options for this field:

    - None - No packets will be logged. *(Default)*
    - Action Matched - Only packets that match the rule parameters will be logged.
    - Action Not Matched - Only packets that do not match the rule parameters will be logged.
    - Both - All packets will be logged.

13. **Action Matched -** If all of the conditions for this filter rule are met, you can specify what to do with the packet. There are three options for this field:

    - Check Next Rule *(Default)*
    - Forward
    - Drop

14. **Action Not Matched -** If the conditions for the filter rule are not met, you can specify what to do with the packet. There are three options for this field:

    - Check Next Rule *(Default)*
    - Forward
    - Drop

Once you have completed filling in 'Menu 21.1.1 - TCP/IP Filter Rule', press ENTER at the message: 'Press ENTER to Confirm ...' to confirm your selections, or press ESC at any time to cancel your selections. This data will now be displayed on 'Menu 21.1 - Filter Rules Summary'.

Generic Filter Rule

This section will show you how to configure the protocol-independent parameters for a Generic filter rule for your Prestige. For information on the protocol-dependent fields, refer to the previous section, 'TCP/IP Filter Rule' and the following sections, 'Novell IPX Filter Rule' and 'AppleTalk Filter Rule'. The fields in the menu are indicated in **bold** type.

```
                    Menu 21.1.2 - Generic Filter Rule

            Filter #: 1,2
            Filter Type= Generic Filter Rule
            Active= Yes
            Offset= 4
            Length= 2
            Mask= ffff
            Value= 0802
            More= No            Log= None
            Action Matched= Drop
            Action Not Matched= Check Next Rule

                                            _____


            Press ENTER to Confirm or ESC to Cancel:
Press Space Bar to Toggle.
```

Figure 11.5 Menu 21.1.1 - Generic Filter Rule

1. **Offset -**   Offset refers to the value of the byte that you want to use as your starting offset. That is, in the data packet, at what point do you want to begin the comparison. The range for this field is from 0 to 255. *Default = 0*

2. **Length -** This field refers to the length (in bytes) of the data in the packet that the Prestige should use for comparison and masking. The starting point of this data is determined by **Offset**. The range for this field is 0 to 8. *Default = 0*

3. **Mask -** In this field, specify (in Hexadecimal) the value that the Prestige should logically qualify [and] the data in the packet. Since **Length** is given in bytes, you need to enter in twice the length hexadecimal numbers for this field. For example, if **Length** were '4', then a valid **Mask** must have 8 hexadecimal numbers, like '1155ABF8'.

4. **Value -** In this field, specify (in Hexadecimal) the value that the Prestige should use to compare with the masked packet. The value should align with **Offset**. Since **Length** is given in bytes, you need to enter in twice the length hexadecimal numbers for this field. For example, if **Length** were '4', then a valid **Value** must have 8 hexadecimal numbers, like '1155ABF8'. If the result from the masked packet matches **Value**, then the packet is considered matched.

Once you have completed filling in 'Menu 21.1.1 - Generic Filter Rule', press ENTER at the message: 'Press ENTER to Confirm ...' to confirm your selections, or press ESC at any time to cancel your selections. This data will now be displayed on 'Menu 21.1 - Filter Rules Summary'.

Novell IPX Filter Rule

This section will show you how to configure the protocol-dependent parameters for an IPX filter rule for your Prestige. The fields in the menu are indicated in **bold** type.

```
                    Menu 21.1.3 - IPX Filter Rule

              Filter #: 1,3
              Filter Type= IPX Filter Rule
              Active= Yes
              IPX Packet Type= ad
              Destination: Network #= 12345678
                           Node #= abcdef123456
                           Socket #= 1111
                           Socket # Comp= Not Equal
                   Source: Network #= 87654321
                           Node #= 654321fedcba
                           Socket #= 2222
                           Socket # Comp= Less
              Operation= N/A                      _____
              More= No             Log= None
              Action Matched= Forward
              Action Not Matched= Check Next Rule

                  Press ENTER to Confirm or ESC to Cancel:
Press Space Bar to Toggle.
```

Figure 11.6 Menu 21.1.3 - IPX Filter Rule

1. **IPX Packet Type** - Enter the IPX packet type value of the packet you wish to filter. This value should be two hex-bytes.

2. **Destination/Source Network #** - Enter the four hex-byte destination/source network numbers of the packet that you wish to filter.

3. **Destination/Source Node # -** In this field, enter in the six hex-byte value for the destination/source node number of the packet you wish to filter.

4. **Destination/Source Socket #** - Enter the destination/source socket number of the packets that you wish to filter. This should be a 4-byte hex value.

5. **Destination/Source Socket # Comp -** In this field, you can select what comparison quantifier you wish to use to compare to the value given in 'Destination Socket #' and 'Source Socket #'.

6. **Operation** - This field is only active if one of the 'Socket #' fields is '0452' or '0453' indicating SAP and RIP packets. There are seven options for this field which determines the operation for the IPX packet.

    - None
    - RIP Request
    - RIP Response
    - SAP Request
    - SAP Response
    - SAP Get Nearest Server Request
    - SAP Get Nearest Server Response

Once you have completed filling in 'Menu 21.1.3 - IPX Filter Rule', press ENTER at the message: 'Press ENTER to Confirm ...' to confirm your selections, or press ESC at any time to cancel your selections. This data will now be displayed on 'Menu 21.1 - Filter Rules Summary'.

AppleTalk Filter Rule

This section will show you how to configure the protocol-dependent parameters for an AppleTalk filter rule for your Prestige. The fields in the menu are indicated in **bold** type.

```
                    Menu 21.1.4 - AppleTalk Filter Rule

            Filter #: 1,4
            Filter Type= AppleTalk Filter Rule
            Active= Yes
            DDP Type= 244
            Destination: Network Min= 32
                         Network Max= 64
                         Socket #= 200
                         Socket # Comp= Not Equal
                 Source: Network Min= 100
                         Network Max= 450
                         Socket #= 100
                         Socket # Comp= Greater
            More= No            Log= None      _____
            Action Matched= Drop
            Action Not Matched= Forward

                Press ENTER to Confirm or ESC to Cancel:

Press Space Bar to Toggle.
```

Figure 11.7 Menu 21.1.4 - AppleTalk Filter Rule

1. **DDP Type** - Enter in the DDP type of the AppleTalk packet that you wish to filter. This value should be between 0 and 255.

2. **Destination/Source Network Min and Max** - In these fields, enter the destination and source network ranges of the packets that you wish to filter. Theses should be values from 0 to 65535 with network min <= network max.

3. **Destination/Source Socket #** - Enter the destination/source socket number of the packets that you wish to filter. This should be a value from 0 to 255.

4. **Destination/Source Socket # Comp** - In this field, you can select what comparison quantifier you wish to use to compare to the value given in 'Destination Socket #' and 'Source Socket #'.

Once you have completed filling in 'Menu 21.1.4 - AppleTalk Filter Rule', press ENTER at the message: 'Press ENTER to Confirm ...' to confirm your selections, or press ESC at any time to cancel your selections. This data will now be displayed on 'Menu 21.1 - Filter Rules Summary'.

Chapter 12 - SNMP

About SNMP

The Simple Network Management Protocol (SNMP) is a protocol governing network management and the monitoring of network devices and their functions.   The Prestige supports the utilization of SNMP to regulate the communication that occurs between the manager station and the agent stations in a network. Basically, the Prestige, when connected to the LAN, acts as an agent station. In this way, the manager station on your LAN can monitor the Prestige as it would another station on the network. Please keep in mind that SNMP is only available if TCP/IP is configured on your Prestige.

Configuring Your Prestige For SNMP Support

The following steps describe a simple setup procedure for configuring the SNMP management.

```
                    Menu 22 – SNMP Configuration

           SNMP:
             Get Community= public
             Set Community= netman
             Trusted Host= 204.247.203.142
           Trap:
             Community= public
             Destination= 0.0.0.0







           Press ENTER to Confirm or ESC to Cancel:
```

Figure 12.1 Menu 22 - SNMP Configuration

1. From the Main Menu, select option '22. SNMP Configuration'. This will bring you to Figure 12.1 'Menu 22 - SNMP Configuration'.

2. You will then be prompted to enter the following information. Steps 3 - 7 will describe the specific parameters involved in the configuration. The parameters you will have to fill in will be indicated in **bold** type.

3. **Get Community -** From this field, you can determine what the Get Community is for your Prestige. The value entered into this field will be used to authenticate the community field for the incoming 'Get-' and 'GetNext-' requests from the management station. The default is 'public'.

4. **Set Community** - In this field, enter the Set Community for your Prestige. The value entered in this field will be used to authenticate the community field for the incoming 'Set-' requests from the management station. The default is 'public'.

5. **Trusted Host** - Enter the IP address of the 'trusted host' SNMP management station. If this field is configured, then the Prestige will only respond to SNMP messages coming from this address. If you leave the field blank (default), then the Prestige will respond to all SNMP messages it receives, regardless of origin.

6. **Trap: Community -** In this field, enter the community name that is sent with each trap to the SNMP manager. This should be treated like a password and match what the SNMP manager is expecting. The default is 'public'.

7. **Trap: Destination -** This field contains the IP address of the station that you wish to send your SNMP traps to.

8. Once you have completed filling in 'Menu 22 - SNMP Configuration', press ENTER to confirm your selections or press ESC to cancel your selections.

If you are unsure how to configure the fields for the SNMP configuration, please consult your network administrator.

Chapter 13 - System Security

About System Security For the Prestige

The Prestige incorporates a number of security measures to prevent unauthorized access to your network. For example, the Prestige supports both PAP (Password Authentication Protocol) and CHAP (Challenge Handshake Authentication Protocol) in authenticating a Remote Node. More information on CHAP and PAP can be found in Chapter 6. In addition, the Prestige also implements a user password to get into the SMT screen. You will have three attempts to enter the correct system password. If you do not do so, the SMT will kick you out. In addition, the Prestige will only support one user in the SMT at one time.

Configuring the SMT Password
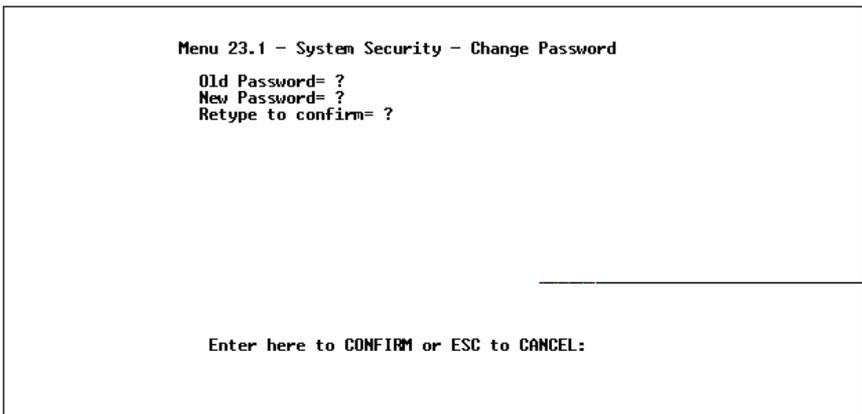
```
        Menu 23.1 - System Security - Change Password

          Old Password= ?
          New Password= ?
          Retype to confirm= ?




                                    _____



           Enter here to CONFIRM or ESC to CANCEL:

```

Figure 13.1 Menu 23.1 - System Security - Change Password

The following steps describe a simple setup procedure for configuring the SMT password. From the Main Menu, select option '23. System Security'. This will bring you to 'Menu 23 - System Security'.

1.   From this menu, you can select option '1. Change Password'. This will bring you to 'Menu 23.1 - System Security - Change Password' (see Figure 13.1).

2.   Type in your previous system password and press ENTER.

3.   Type in your new system password and press ENTER.

4.   Re-type your new system password for confirmation purposes and press ENTER.

You will now need to enter in this password when you try to get into the SMT. In addition, this password will also be used when a network administrator attempts to telnet to the Prestige.

Chapter 14 - Telnet Configuration and Capabilities

About Telnet Configuration

When you first configure your Prestige, it must be done via a computer connected to the RS-232 port. However, once the Prestige has been initially configured, you can use `telnet` to configure the device remotely (Figure 14.1).
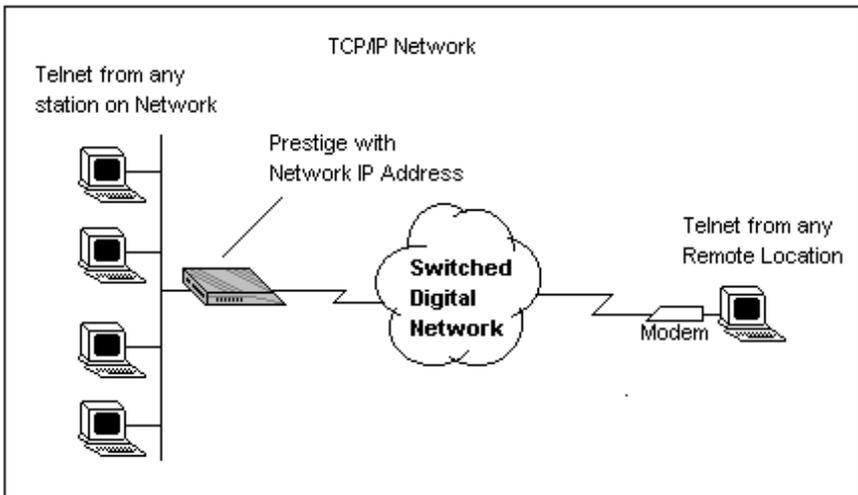

Figure 14.1 Telnet Configuration on a TCP/IP Network

In order to configure your Prestige in this way, you need to have assigned an IP Address to your device and have connected it to your network. Please see Chapter 3 for more information on assigning an IP Address. Once this is configured, any station on the LAN or remote network that has TCP/IP installed can use `telnet` remote management. If your Prestige is configured for IPX and/or AppleTalk routing but not IP in menu 1, `telnet` will still be available provided you assign the Prestige an IP address.

Telnet Capabilities

Single Administrator

To prevent confusion and discrepancy on the configuration, Prestige will only allow one terminal connection at any time. Prestige also gives priority to the RS-232 connection

over `telnet`. If you have already connected to the Prestige via `telnet`, you will be logged out if another user is connecting to the Prestige via the RS-232 cable. Only after the other administrator has been disconnected will you be able to `telnet` to the Prestige again.

System Timeout

When you are connected to the Prestige via `telnet`, there is a system timeout of 5 minutes (300 seconds). If you are not configuring the device and leave it inactive for this timeout period, then the Prestige will automatically disconnect you.

Chapter 15 - System Maintenance

The Prestige provides diagnostic tools that you can use to maintain your device. Some of these tools include updates on system status, ISDN B channel status, log and trace capabilities and upgrades to the system software. This chapter will describe how to use these tools in greater detail.

System Status

System Status is a tool that can be used to monitor your Prestige. Specifically, it will give you information on the status of your system software version, ISDN telephone line, number of packets sent and number of packets received.

```
              Menu 24.1 — System Maintenance — Status

ISDN   Link     Type      TXPkt       RXPkt       Error  CLU  ALU    Up Time
 B1    Idle    0Kbps         0           0           0   0%   0%    0:00:00
 B2     306Y  64Kbps        96          72           0   0%   0%    0:01:00

    Total Outcall Time:     0:00:00

    Ethernet                          Name: 306Y
      Link: Up                        RAS S/W Version: V1.10 I 8/17/96
      TX Pkt: 1287                    ISDN F/W Version: U Prestige_4.06
      RX Pkt: 2553                    Ethernet Address: 00:a0:c5:10:00:72
      Collision: 0                    Country Code: 225

    LAN Packet Which Triggered Last Call: (Type: IP)
    45 00 00 3C 07 33 00 00 3B 01 31 49 00 00 00 00 C0 44 87 01 08 00 2D 84
    20 04 00 02 00 2A DE 74 C0 44 87 01 00 01 02 03 04 05 06 07 08 09 0A 0B

                         Press Command: _

    COMMANDS: 1-Discon. B1   2-Discon. B2   3-Reset Counters   ESC-Exit
```

Figure 15.1 Example of Menu 24.1 - System Maintenance - Status

1. To get to the System Status, select option '24. System Maintenance. This will bring you to 'Menu 24 - System Maintenance'.

2. From this menu, select option '1. System Status'.

3. There are four (4) possible commands in 'Menu 24.1 - System Maintenance - Status' (see Figure 15.1). Entering **1** will disconnect the current B1 channel call; **2** will disconnect the current B2 channel call, **3** will reset the counters; and **ESC** will exit this screen.

4. Items 5 - 26 describes the fields present in 'Menu 24.1 - System Maintenance - Status'. It should be noted that these fields are READ-ONLY and are meant to be used for diagnostic purposes.

5. **ISDN** shows statistics for **B1** and **B2** channels respectively. These are the information displayed for each channel:

6. **Link** - shows the Remote Node the channel is currently connected to or the status of the channel (Idle, Calling, or Answering)

7. **Type** - the current connecting speed (56K, 64K, or the modem speed)

8. **TXPkt** - the number of transmitted packets on this channel

9. **RXPkt** - the number of received packets on this channel

10. **Error** - the number of error packets on this channel

11. **CLU** (Current Line Utilization) - percentage of current bandwidth used on this channel

12. **ALU** (Average Line Utilization) - average CLU for this channel

13. **Up Time** - how long this channel has been connected to the current Remote Node

14. **Total Outcall Time** shows the total outcall time for both **B1** and **B2** channels since the system has been powered up.

15. **Ethernet** shows the current status of the LAN connection on your Prestige

16. **Link** - shows the current status of the LAN (Up or Down if it is 10BaseT; otherwise, if it is configured as AUI, this will show AUI).

17. **TX Pkt** - the number of transmitted packets to LAN

18. **RX Pkt** - the number of received packets from LAN

19. **Collision** - number of collisions

20. **Name** displays the system name of your Prestige. This information can be modified in 'Menu 1 - General Setup'

21. **RAS S/W Version** refers to the version of the current RAS software

22. **ISDN F/W Version** refers to the version of the current ISDN firmware

23. **Ethernet Address** refers to the Ethernet (MAC) address assigned to your Prestige.

24. **Country Code** refers to the one byte country code value (in decimal notation), e.g., 225 indicates North America.

25. **LAN Packet Which Triggered Last Call** shows the first 48 octets of the LAN packet that triggered the last outgoing call. There are four different types of packets: IP, IPX, AppleTalk, and RAW. By viewing the packet information, you can determine which station has sent a packet to cause the Prestige to make an outcall.

    Figure 15.2 shows two examples: the first of an ICMP Ping packet (Type: IP) triggering the call and the second with a SAP broadcast packet (Type: Raw) triggering the call. With this information, you can determine the source IP address of the packet or the source MAC address of the packet.
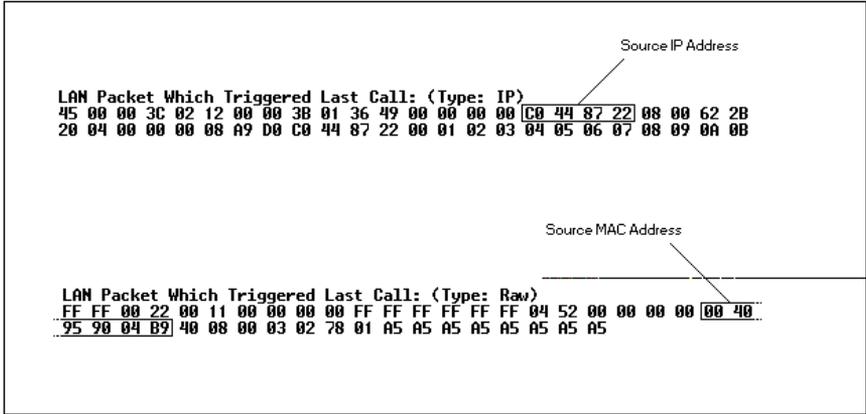
Figure 15.2 Examples of LAN Packets Triggering the Call

Log and Trace

Log and trace tools allow users of the Prestige to view the error logs and trace records to potentially troubleshoot any errors that may occur. The Prestige is also able to generate syslogs to send to other machines.

1. To get to the Log and Trace, select option '24. System Maintenance. This will bring you to 'Menu 24 - System Maintenance'.

2. From this menu, select option '3. Log and Trace'. This will bring you to 'Menu 24.3 - System Maintenance - Log and Trace'.

3. You will be given two options.

    *   View Error Log
    *   Syslog and Accounting

The following list describes the fields involved in the trace and log options.

View Error Log

Selecting the first option from 'Menu 24.3 - System Maintenance - Log and Trace' will display the Error Log in the system. The Error Log does not only provide the error messages but it is also a source of information about your Prestige.

You can also clear the Error Log on your Prestige. After each display, you are prompted with an option to do so. Enter the appropriate choice and press ENTER.

Syslog And Accounting

Syslog and Accounting can be configured in 'Menu 24.3.2 -- System Maintenance - Syslog and Accounting' (see Figure 15.3). This menu configures the Prestige to send UNIX syslogs to another machine.

```
        Menu 24.3.2 — System Maintenance — Syslog and Accounting

                Syslog:
                Active= No
                Syslog IP Address= ?
                Log Facility= Local 1




                                        _____


                Press ENTER to Confirm or ESC to Cancel:
Press Space Bar to Toggle.
```
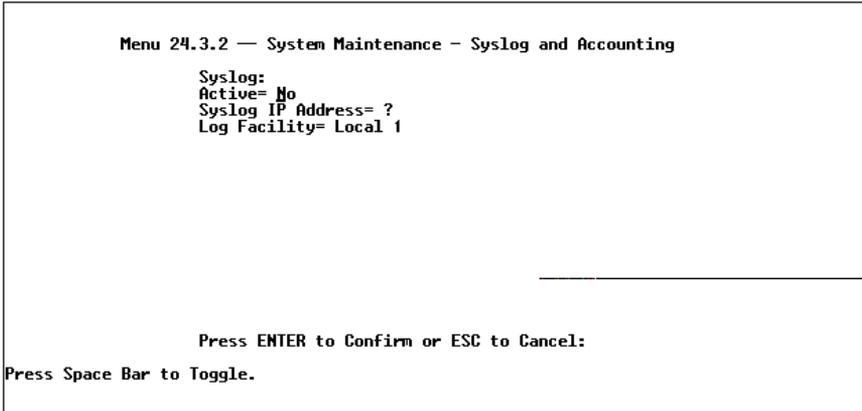
Figure 15.3 - Menu 24.3.2 -- System Maintenance - Syslog and Accounting

The User needs to configure the following 3 parameters to activate syslog:

1. **Active** - Use the space bar to turn on of off the syslog option

2. **Syslog IP Address**- Input the IP Address that you wish to send your syslog to. The address is usually written in dotted decimal notation such as a.b.c.d where a, b, c, and d are numbers between 0 and 255.

3. **Log Facility** - Use the space bar to toggle between the 7 different Local options. This feature is used for UNIX application.

The Prestige will send three different types of syslog messages: Call information messages, Error information messages, and Session information messages. Some examples of these messages are shown below.

Call Information Messages:
```
line 1 channel 1, call 41, C01, Incoming Call, 40001
line 1 channel 1, call 41, C01, ANSWER Connected, 64K 40001
line 1 channel 1, call 41, C01, Incoming Call, Call Terminated
```

Error Information Messages:
```
line 1, channel 1, call 44, E01, CLID call refuse
line 1, channel 1, call 45, E02, IP address mismatch
```

Session Information Messages:
```
line 1, channel 1, call 41, I01, IPCP up, 306L
line 1, channel 1, call 41, I01, IPCP down, 306L
```

Diagnostic

The diagnostic functions on your Prestige allow you to test aspects of your device to determine if they are working properly. The following list provides a short description to the types of diagnostic tests available to your system.

```
              Menu 24.4 - System Maintenance - Diagnostic

   ISDN                              System
    1.  Hang Up B1 Call               21. Reboot System
    2.  Hang Up B2 Call               22. Command Mode
    3.  Reset ISDN
    4.  ISDN Connection Test
    5.  Manual Call

   TCP/IP
    11. Internet Setup Test
    12. Ping Host


                     Enter Menu Selection Number:

              Manual Call Remote Node= N/A
              Host IP Address= N/A
```
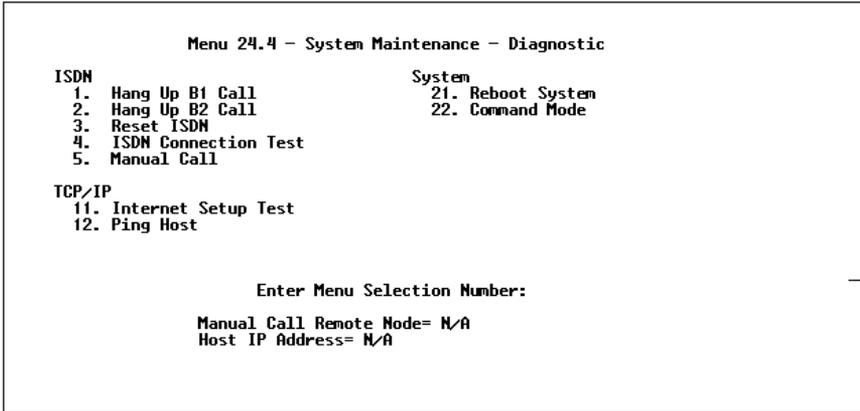
Figure 15.4 - Menu 24.4 - System Maintenance - Diagnostic

1. From the Main Menu, select option '24. System Maintenance'. This will bring you to 'Menu 24 - System Maintenance'.

2. From this menu, select option '4. Diagnostic'. This will bring you to Figure 15.4 'Menu 24.4 - System Maintenance - Diagnostic'.

3. Items 4 - 12 will describes the nine (9) options to test your Prestige and its connections.

4. **Hang Up B1 Call** - This tool hangs up the B1 line. This will only be useful if the B1 line is currently connected to a Remote Node or a dial-in user.

5. **Hang Up B2 Call** - This tool hangs up the B2 line. This will only be useful if the B2 line is currently connected to a Remote Node or a dial-in user.

6. **Reset ISDN** - This command will re-initialize the ISDN link to the telephone company.

7. **ISDN Connection Test**- You can test to see if your ISDN line has been successfully connected to your Prestige by using this option. This command will trigger the Prestige to perform a loop-back test to check the functionality of the ISDN line. If your line is working properly, the test will succeed. Otherwise, note the error message that you receive and consult your network administrator.

8. **Manual Call** - This provides a way for the users of the Prestige to place a manual call to a Remote Node. This tests the connectivity to that Remote Node. When you use this command, you will see traces displayed on the screen showing what is happening during the call setup and protocol negotiation. See Figure 15.5 to see an

example of a successful connection and Figure 15.6 to see an example of a connection that has failed due to authentication.

```
Start dialing for node<1>
### Hit any key to continue.###
Dialing chan<2> phone(last 9-digit):40101
Call CONNECT speed<64000> chan<2> prot<1>
LCP up
CHAP send response
CHAP login to remote OK!
IPCP negotiation started
IPCP up
```

Figure 15.5 Trace Display for a Successful IPCP Connection via Manual Call

```
Start dialing for node<1>
### Hit any key to continue.###
Dialing chan<2> phone(last 9-digit):40101
Call CONNECT speed<64000> chan<2> prot<1>
LCP up
CHAP send response
***Login to remote failed. Check name/passwd.
Receive Terminate REQ
LCP down
Line Down chan<2>
```

Figure 15.6 Trace Display for a Failed IPCP Connection via Manual Call

9. **Internet Setup Test** - This test checks to see if your Internet access configuration has been done correctly. When this option is chosen, the Prestige will PING the Internet IP Address. If everything is working properly, you will receive an appropriate response. Otherwise, note the error message and consult your network administrator.

10. **Ping Host** - This diagnostic test pings the host which determines the functionality of the TCP/IP protocol on your system.

11. **Reboot System** - This option reboots the system. This serves to implement any changes that may have been recently added to your system.

12. **Command Mode**- This option allows the user to enter the command mode. This mode allows you to diagnose and test your Prestige using a specified set of commands.

Backup Configuration

Selecting option 5 from 'Menu 24 - Maintenance' will allow you to backup your current Prestige configuration onto disk. Backup is highly recommended once your Prestige configuration is functioning.

You need to download the configuration onto disk. Procedure for downloading varies depending on the type of software used to access the Prestige but you must use the XMODEM protocol to perform the download.

Restore Configuration

Selecting option 6 from 'Menu 24 - Maintenance' will restore backup configuration from disk to the Prestige. You need to upload a backup file to the Prestige. Procedure for uploading varies depending on the type of software used to access the Prestige but you must use the XMODEM protocol to restore the configuration.

Please keep in mind that configuration is stored on flash ROM in the Prestige so even if power failure were to occur, your configuration is safe.

Software Update

Software update is only possible through the RS-232 cable connection. You cannot use `telnet` to update the software version of your Prestige. Please note that this function will delete the old software before installing the new software. Do not attempt to utilize this menu unless you have the new software version. There are two different software updates: RAS code and ISDN code.

- **RAS code update**- Type 'atur' and wait until the Prestige responds with an OK to begin uploading the new software (upload procedure varies depending on the type of software used to access the Prestige). You must use the XMODEM protocol to perform the upload. After uploading is successful, type 'atgo' to start your Prestige (see Figure 15.7 for an example of downloading RAS using *PCPLUS*).

- **ISDN code update**- Type 'atrs', 'atis', and then 'atupx' at the command prompt before uploading the new firmware (upload procedure varies depending on the type of software used to access the Prestige). You must use the XMODEM protocol to perform the upload. After uploading is successful, power off the Prestige, and then power it back on to restart.

```
To update software, system needs to be rebooted.
After system is rebooted, 'Enter Debug Mode' will be displayed.
Please enter 'atur' to upload RAS code.
Or enter 'atrs', 'atis', then 'atupx' to upload ISDN code.
Do you want to continue (y/n):
Enter Debug Mode
atur
Now erase flash ROM for uploading RAS code...

Starting XMODEM upload.......
S
Programing successful....

OK
atgo
Initialing Driver...




```

| Alt-Z FOR HELP | ANSI | FDX | 38400 N81 | LOG CLOSED | PRINT OFF | OFF-LINE |

Figure 15.7 An example of uploading RAS using PCPLUS

Command Interpreter Mode

This option allows the user to enter the command interpreter mode. This mode allows
you to diagnose, test and configure your Prestige using a specified set of commands. A
list of valid commands can be found by typing 'help' at the command prompt. For more
detailed information, please check ZyXEL Web site or send email to ZyXEL Support
Group.

Chapter 16 - Troubleshooting

This chapter contains some problems you may run into when using your Prestige. After each problem description, we have provided some instructions to help you diagnose and solve the problem.

Problems Starting Up the Prestige

None of the LEDs are on when I power up the Prestige.

1. Check the power cord and the power supply and make sure it is connected to your Prestige.

2. Otherwise, you may have a hardware problem; contact technical support if problems persist.

Connecting the RS-232 cable, I cannot access the SMT.

1. Check to see if the Prestige is connected to your computer's serial port.

2. Check to see if the communications program is configured correctly. The communications software should be configured as follows:

    - VT100 terminal emulation
    - 9600 Baud rate
    - No parity, 8 Data bits, 1 Stop bit

Problems With the ISDN Line

The ISDN initialization failed.

This problem occurs when you attempt to save the parameters entered in menu 2, but receive the message, "Save successful, but Failed to initialize ISDN; Press ESC to exit".

1. Check the error log (in menu 24.3.1), you should see a log entry for the ISDN initialization failure in the format, "ISDN init failed. code<n>...". Note the code number, n.

2. If the code is 1, the ISDN link is not up. This problem could be either the ISDN line is not properly connected to the Prestige, or the ISDN line is not activated. Verify that the ISDN line is connected to the Prestige and also to the wall outlet (to the telephone company).

3. If the code is 2, this indicates an SPID error. Verify the SPID(s) that you have entered in menu 2. If these are correct, try to initialize again from menu 24.4.3.

4. If the code is 3, this indicates a general failure. Verify the SPID(s) in menu 2. If these are correct, you may also need to verify the provisioning information for your switch by contacting your telephone company.

The ISDN loopback test failed.

1. If the ISDN initialization has passed, then the loopback test should also pass. Verify the phone numbers that have been entered in menu 2. The loopback test will dial the number entered in the 2nd Phone # field (except for switch types with only one phone number). If you need to dial a prefix (e.g., '9') to get an outside line, then you have to enter the phone number as '95551212' or '914085551212'. If it is an internal line, you may only need to enter the last four or five digits (according to your internal dialing plan), e.g., 51212.

Problems with the LAN Interface

Can't PING any station on the LAN

1. Check the LAN LED on the front panel of your Prestige. If it is on, then the link is up. If it is off, then check the cables connecting your Prestige to your LAN.

2. The type of Ethernet interface that you have configured in menu 3.1. Verify that you are using the same (AUI or 10BaseT) as configured in this menu.

3. Verify with your network administrator that the IP address and the IP subnet mask configured in menu 3.2 are valid for that LAN.

4. Check the physical Ethernet cable, and make sure the connections on the Prestige and also to the hub are secure.

Problems Connecting to a Remote Node or ISP

1. Check menu 24.1 to verify the ISDN status. If it indicates 'down' then refer to the section on the ISDN line problems.

2. In menu 24.4.5, do a manual call to that Remote Node. You will see some messages printed onto the screen. The messages will show you whether the call has been connected or not. If the call is not connected, verify the following parameters in menu 11: Pri(mary) Phone #, Sec(ondary) Phone #, and Transfer Rate.

3. If the call is connected, but the call still terminates, then there may be some kind of negotiation problem. Verify the following parameters in menu 11: My Login, My Password, Route, IP LAN Addr. Also verify your IP address in menu 3.2.

4. If you check the error log in menu 24.3.1, this will usually give you some logs regarding why the call was dropped. If there is nothing in the log, the call may have been dropped by the remote device that you dialed in to. Make sure that the configuration parameters between these two devices are consistent.

Problems Connecting to a Remote User

1. First verify that you have configured the authentication parameters in menu 13. These would be CLID Authen, Recv. Authen, and Mutual Authen.

2. If the Remote Dial-in User is negotiating IP, verify that the IP address is supplied correctly in menu 13. Check that either the Remote Dial-in User is supplying a valid IP address, or that the Prestige is assigning a valid address from the IP pool.

3. If the Remote Dial-in User is negotiating IPX, verify that the IPX network number is valid from the IPX pool (if it is being used).

4. In menu 14, verify the username and password for the Remote Dial-in User.

Chapter 17 - ISDN Switch Types supported by Prestige

Table 17.1 summarizes the different type of switch types supported by the Prestige and some related information on the switch types (number of phone numbers and SPID numbers). It should be noted that the information in this table is for the 'common' case and is recommended for those cases. Exceptions still exist to these figures. You can locate the provisioning information for the appropriate North American switch type in the next sections.

Switch Type	Geography	No. of Phone #s	No. of SPIDs
AT&T 5ESS NI-1	North American	2	2
AT&T 5ESS Point to Point	North American	1	0
AT&T 5ESS Multipoint	North American	2	2
Northern Telecom NI-1	North American	2	2
Northern Telecom Custom	North American	2	2
DSS1	Europe, Asia	2	N/A
1TR6	Germany	2	N/A

Table 17.1 - Switch Types and Related Information

Provisioning For the U.S. Switches

For the U.S., the Prestige (both the U and S/T interface) has been approved by Bellcore and has the IOC (ISDN Ordering Code) "S" Capability, EZ-ISDN 1. Please provide this information to your telephone company when you order your ISDN line. If your telephone company is not familiar with this IOC, then ask them what kind of switch you will be connected to and use the information under each switch type to order your ISDN line.

Provisioning For the AT&T 5ESS Switches

The AT&T 5ESS switch type supports three types of ISDN service. These are: National ISDN-1 (NI-1), Multipoint, and Point-to-Point.

For AT&T 5ESS National ISDN-1

Provisioning Feature	Setting
Term Type	A
Circuit Switched Voice (CSV)	1
CSV Additional Call Offering (ACO)	Unrestricted

CSV limit	2
CSV Notification Busy (NB) limit	1
Circuit Switched Data (CSD)	1
CSD Additional Call Offering (ACO)	Unrestricted
CSD limit	2
CSD Notification Busy (NB) limit	1
MTERM	2

For AT&T 5ESS Multipoint

Provisioning Feature	Setting
Term Type	D
Call Appearances (CA)	1
CA Quantity	1
Circuit Switched Voice (CSV)	1
CSV Flexible Call Offering (FCO)	Unrestricted
CSV limit	2
CSV Notification Busy (NB) limit	1
Circuit Switched Data (CSD)	1
CSD Flexible Call Offering (FCO)	Unrestricted
CSD limit	2
CSD Notification Busy (NB) limit	1
MTERM	2

For AT&T 5ESS Point-to-Point

Provisioning Feature	Setting
Term Type	A
Call Appearances (CA)	1
CA Quantity	1
Circuit Switched Voice (CSV)	1
CSV Flexible Call Offering (FCO)	Unrestricted
CSV limit	2
CSV Notification Busy (NB) limit	1
Circuit Switched Data (CSD)	1
CSD Flexible Call Offering (FCO)	Unrestricted
CSD limit	2
CSD Notification Busy (NB) limit	1
MTERM	2

Provisioning For the Northern Telecom Switch

The Northern Telecom switch type supports two types of ISDN service. These are: National ISDN-1 and Custom.

For Northern Telecom National ISDN-1

Provisioning Feature	Setting
Signaling	Functional
Protocol Version Control (PVC)	2 (National ISDN-1)
TEI assignment	Dynamic
Maximum number of keys (maxkeys)	3 (1 to 64 OK)
Release key	No
Ringing indicator	No
Electronic Key Telephone System (EKTS)	Yes or No (set to opposite of ACO)
Additional Call Offering (ACO)	Yes or No (set to opposite of EKTS)
Number of call appearances	2
Notification Busy Limit	3

For Northern Telecom Custom

Provisioning Feature	Setting
Signaling	Functional
Protocol Version Control (PVC)	1 (Custom)
TEI assignment	Dynamic
Maximum number of keys (maxkeys)	3 (1 to 64 OK)
Release key	No
Ringing indicator	No
Electronic Key Telephone System (EKTS)	Yes or No (set to opposite of ACO)
Additional Call Offering (ACO)	Yes or No (set to opposite of EKTS)
Number of call appearances	2