

Prestige 724

G.SHDSL CSU/DSU

User's Guide

Version 3.40

August 2001

ZyXEL

TOTAL INTERNET ACCESS SOLUTION

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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 label 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 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.

Note

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.

Federal Communications Commission (FCC) Interference Statement

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

- This device may not cause harmful interference.
- 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 B 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:

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

Notice 1

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

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.



Declaration of Conformity

We, the Manufacturer/Importer

ZyXEL Communications Services GmbH.

Thaliastrasse 125a/2/2/4

A-1160 Vienna – AUSTRIA

declare that the product

Prestige 724

is in conformity with

(Reference to the specification under which conformity is declared)

Standard	Standard Item	Version
EN 55022	Radio disturbance characteristics – Limits and method of measurement.	1994
EN 61000-3-2	Disturbance in supply system caused by household appliances and similar electrical equipment “Harmonics”.	1995
EN 61000-3-3	Disturbance in supply system caused by household appliances and similar electrical equipment “Voltage fluctuations”.	1995
EN 61000-4-2	Electrostatic discharge immunity test – Basic EMC Publication.	1995
EN 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test.	1996
EN 61000-4-4	Electrical fast transient/burst immunity test – Basic EMC Publication.	1995
EN 61000-4-5	Surge immunity test.	1995
EN 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields.	1996
EN 61000-4-8	Power Magnetic Measurement.	1993
EN 61000-4-11	Voltage dips, short interruptions and voltage variations immunity tests.	1994

Note

CE and FCC Certifications

For more information about certifications, refer to www.zyxel.com.

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 discretion, 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 discretion 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 of character to the purchaser.

To obtain the services of this warranty, contact ZyXEL's Service Center 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 discretion 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. This warranty gives you specific legal rights, and you may also have other rights that vary from country to country.



Online Registration

Do not forget to register your Prestige (fast, easy online registration at www.zyxel.com) for free future product updates and information.

Customer Support

Please have the following information ready when you contact customer support.

- Product model and serial number.
- Information in **Menu 24.2.1 –System Information**.
- Warranty Information.
- Date that you received your device.
- Brief description of the problem and the steps you took to solve it.

METHOD LOCATION	E-MAIL SUPPORT/SALES	TELEPHONE/FAX	WEB SITE/ FTP SITE	REGULAR MAIL
WORLDWIDE	support@zyxel.com.tw support@europe.zyxel.com sales@zyxel.com.tw	+886-3-578-3942 +886-3-578-2439	www.zyxel.com www.europe.zyxel.com ftp.europe.zyxel.com	ZyXEL Communications Corp., 6 Innovation Road II, Science- Based Industrial Park, HsinChu, Taiwan 300, R.O.C.
NORTH AMERICA	support@zyxel.com sales@zyxel.com	+1-714-632-0882 800-255-4101 +1-714-632-0858	www.zyxel.com ftp.zyxel.com	ZyXEL Communications Inc., 1650 Miraloma Avenue, Placentia, CA 92870, U.S.A.
SCANDINAVIA	support@zyxel.dk sales@zyxel.dk	+45-3955-0700 +45-3955-0707	www.zyxel.dk ftp.zyxel.dk	ZyXEL Communications A/S, Columbusvej 5, 2860 Soeborg, Denmark.
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Preface

About Your Prestige

Congratulations on your purchase of the Prestige 724 G.SHDSL CSU/DSU.

The Prestige 724 is a CSU/DSU (Channel Service Unit/Data Service Unit) designed for small offices and branch offices to provide cost-effective access to high-speed G.SHDSL service. The Prestige is interoperable with frame relay and PPP routers via the data port interface. The Prestige offers both LAN-to-LAN and Internet access applications using your existing phone line.

The Prestige supports symmetrical multi-rate data transmission speeds from 144 Kbps to 2320 Kbps. The actual rate depends on the copper category of your telephone wires, distance from the central office and the type of DSL service you subscribe to. The Prestige's data port interface enables fast data transfer in either half-duplex or full-duplex mode depending on your Ethernet network. See the following section for more background information on DSL.

The Prestige uses TC-PAM line code with echo cancellation for high data rate transmissions over a single-twisted telephone wire pair without being affected by bridge taps or mixed cable links. It also provides high immunity from background noise.

Your Prestige is easy to install. You do not need to set any switches to configure it. Manage the Prestige via the SMT (System Management Terminal) - a menu-driven interface - using a terminal emulator through the console port.

Please visit our web site at www.zyxel.com for the latest product information.

About This User's Guide

This user's guide covers all operations of the Prestige. It will guide you through the correct configuration of your Prestige for various applications and show you how to get the best out of the many advanced features of your CSU/DSU.

Related Documentation

Related documentation includes:

- A Read Me First document that will help get your Prestige up and running right away. It contains detailed easy-to-follow instructions, Prestige default settings, handy checklists and information on setting up your computer.
- A Support CD. This CD includes:
 - This User's Guide.
 - Support Notes (FAQ, Application Notes, Support Tools).
 - Links to the ZyXEL Website and Global Support Network.

General Syntax Conventions

- “Type” means for you to type one or more characters and press the carriage return. “Select” or “Choose” means for you to select one from the predefined choices.
- The SMT menu titles and labels are in **Bold Times** font. Menu item choices are in **Bold Arial** font. Command and arrow keys are enclosed in square brackets. [ENTER] means the Enter, or carriage return key; [ESC] means the Escape key and [SPACE BAR] means the Space Bar.
- For brevity’s sake, we will use “e.g.,” as a shorthand for “for instance”, and “i.e.,” for “that is” or “in other words” throughout this user’s guide.
- The Prestige 724 may be referred to as the Prestige or the P724 in this user’s guide.

CSU/DSU and DSL Basics

What is a CSU/DSU?

A CSU/DSU (Channel Service Unit/Data Service Unit) is a hardware device that converts a digital data frame, the communications technology used on a local area network (LAN), into a frame appropriate to a wide-area network (WAN) and vice versa. It sits between the DTE (Data Terminal Equipment) and a transmission circuit such as a phone line and converts signals from the DTE (routers, bridges and multiplexors) into the bipolar digital signals used by digital lines.

What is DSL?

A DSL (Digital Subscriber Line) enhances the data capacity of the existing telephone wire running between the local telephone company switching offices and most homes and offices. While the wire itself can handle higher frequencies, the telephone switching equipment is designed to cut off signals above 4,000Hz to filter noise from the voice line. DSL services make use of signals above the 4,000Hz for data transfer. Several DSL services offer speeds of up to 52 Mbits/sec. DSL services are symmetrical (traffic flows at the same speed in both directions) or asymmetrical (the downstream capacity is higher than the upstream capacity).

As carrying distances decrease, data rates increase. This means that users who are beyond a certain distance from the telephone company's central office may not be able to obtain the higher speeds for DSL maximum transmission distances.

What is G.SHDSL?

G.SHDSL (Single-pair High-speed Digital Subscriber Line) is a symmetrical, bi-directional DSL service that operates on one twisted-pair wire and provides data rates up to 2.3 Mbits/sec. (The "G." in "G.SHDSL" is defined by the G.991.2 ITU (International Telecommunication Union) state-of-the-art industry standard). A G.SHDSL connection is a point-to-point dedicated circuit, meaning that the link is always up and there is no dialing required.

The Benefits of G.SHDSL

- **Continuous Connection** You are always online.
- **Dedicated Bandwidth** Line speed is "symmetric," i.e., the same bandwidth in both directions.
- **Investment Protection** Scalability. Offers a flexible upgrade path. You can choose a higher access speed yourself - no site visit is necessary.
- **Low Maintenance** Connectivity requires no complex manual configuration; G.SHDSL equipment is Plug and Play.
- **Distance Capabilities** G.SHDSL achieves 20% better loop-reach than older versions of symmetric DSL. (Loop reach defines speed that can be attained at various distances).

Chapter 1

Getting to Know Your G.SHDSL CSU/DSU

This chapter covers the key features and main applications of your Prestige.

The Prestige 724 is a CSU/DSU designed for small offices and branch offices to provide cost-effective access to high-speed G.SHDSL service. The Prestige is interoperable with frame relay and PPP routers via the Data interface. The Prestige offers both LAN-to-LAN and Internet access applications using your existing phone line.

1.1 Features of the Prestige

The following features make the Prestige a complete and flexible networking solution for most users.

Data Port Interface

Connects to a PPP/Frame Relay router and allows the router to use broadband service.

High Speed Scalability

One of the best features of G.SHDSL service is its scalability. Your Prestige G.SHDSL CSU/DSU supports symmetrical multi-rate data transmission speeds from 144 Kbps to 2320 Kbps. You can increase the capacity of the Internet connection (within certain distance limitations) without changing your ISP or purchasing new equipment. G.SHDSL's high symmetrical speeds are ideal for applications like web hosting and videoconferencing as well as the two-way data traffic needs of businesses.

Symmetrical High Speed Internet Access

The Prestige 724 supports symmetrical transmission rates of up to 2.3 Mbps. For NSP's (Network Service Provider) convenience, the Prestige also supports rate management depending on distances and service charges.

Protocols Supported

- FRF.8 Frame Relay/ATM PVC Service Interworking Implementation Agreement
- FRF.5 Frame Relay/ATM PVC Service Interworking Implementation Agreement
- RFC 1483 Multiple Protocol over AAL5
- RFC 2364 PPP over AAL5
- RFC 1490 Multiple Protocol over Frame Relay
- ATM Forum UNI 3.1/4.0 PVC

- F4/F5 loopback, AIS and RDI OAM cells
- Multiple Protocol Support – Transparent bridging for unsupported network layer protocols.
- Encapsulation – The Prestige supports FRF8_TRANSLATION, FRF8_TRANSPARENT, ENCAP_HDLC_RFC2364, FRF.5 and PPP.

Full Network Management

- Your Prestige offers you a variety of options for network management. It supports password protected local and remote network management via a telnet connection using SMT (System Management Interface). It also supports FTP (File Transfer Protocol) server and TFTP (Trivial FTP) for remote management.

Diagnostics Capabilities

- The Prestige can perform self-diagnostic tests. These tests check the integrity of the following circuitry:
 - FLASH memory
 - G.SHDSL circuitry
 - RAM

Ease of Installation

Your Prestige is designed for quick, easy and intuitive installation. Its compact size and light weight make it easy to position anywhere in your busy office.

Wall-Mounting

On the underside of the housing are two slots that can be used to wall-mount your Prestige.

1.2 Application Scenarios for the Prestige

1.2.1 Internet Access Application

The following figure depicts a typical Internet access application using your Prestige.

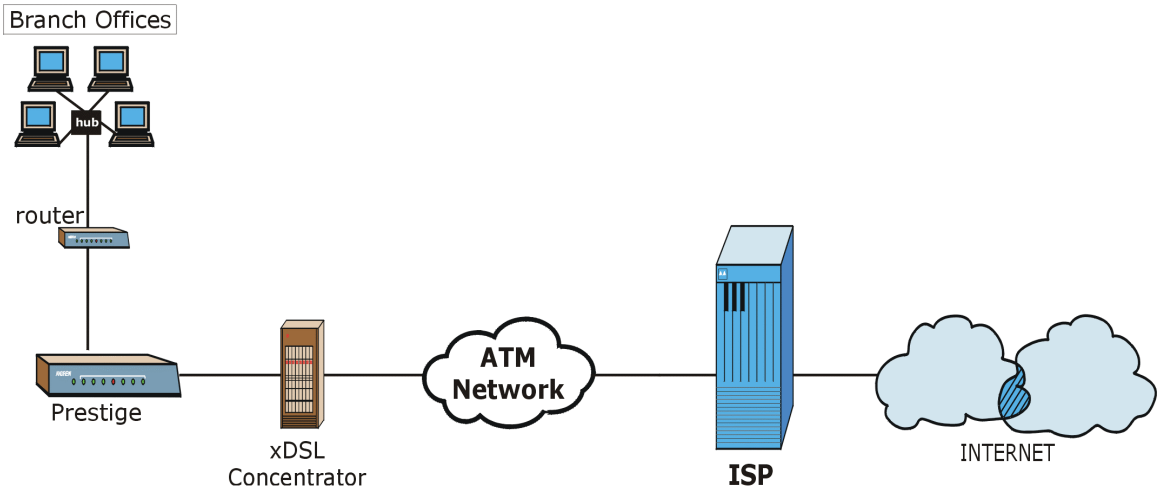


Figure 1-1 Internet Access Application

1.2.2 LAN-to-LAN Application

You can use the Prestige to connect two geographically dispersed networks over the DSL line. A typical LAN-to-LAN application is shown next.

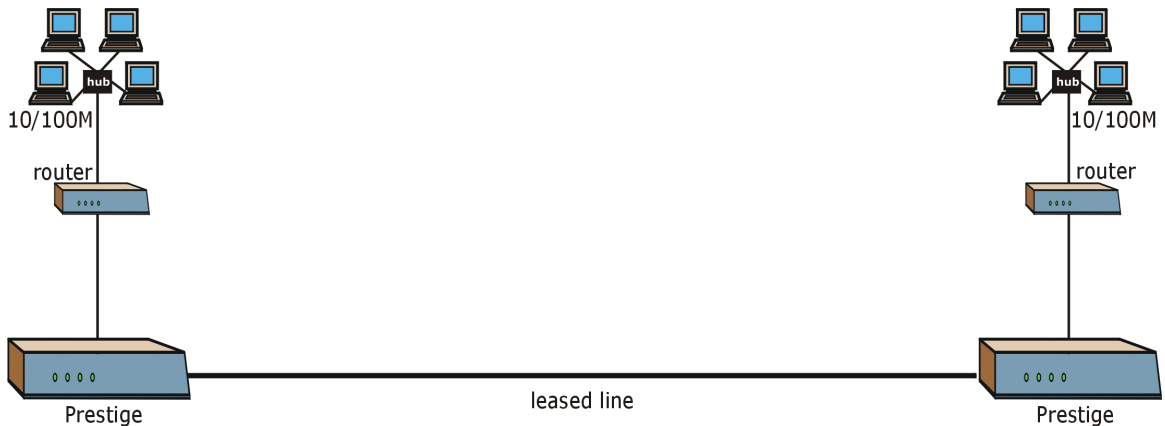


Figure 1-2 LAN-to-LAN Application

Chapter 2

Hardware Installation and Initial Setup

This chapter shows how to make connections and set up your DSL connection using the SMT.

2.1 Installation Requirements

In addition to your Prestige package, your computer should have the following hardware and software:

- A console port (to establish a connection to the Prestige).
- Communications software configured as follows: VT100 terminal emulation; 9600 baud; no parity, 8 data bits, 1 stop bit, no flow control.

2.2 Front Panel LEDs of the Prestige 724

The LED indicators on the front panel show the operational status of the Prestige.

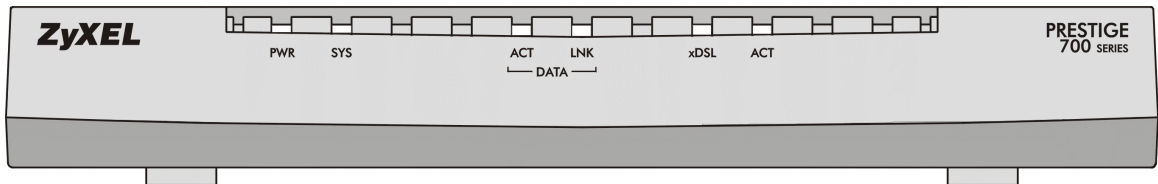


Figure 2-1 Front Panel of Prestige 724

Table 2-1 LED Functions

LED	COLOR	STATUS	DESCRIPTION
PWR	Green	On	The Prestige is receiving power.
SYS	Green	On Blinking Off	The Prestige is on and functioning properly. The system is rebooting or running self-diagnostics. The Prestige is not ready, has a malfunction or is off.
DATA			
ACT	Green	Off Blinking	The data port is not transmitting or receiving data. The data port is transmitting or receiving data.
LNK	Green	On	The link is up.

LED	COLOR	STATUS	DESCRIPTION
		Off	The link is down.
xDSL	Green	On Blinking Off	The G.SHDSL link is connected. The G.SHDSL link is connecting. The G.SHDSL link is disconnected.
ACT	Green	Off Blinking	The data port is not transmitting or receiving data. The data port is transmitting or receiving data.

2.3 Rear Panel and Connections of the Prestige 724

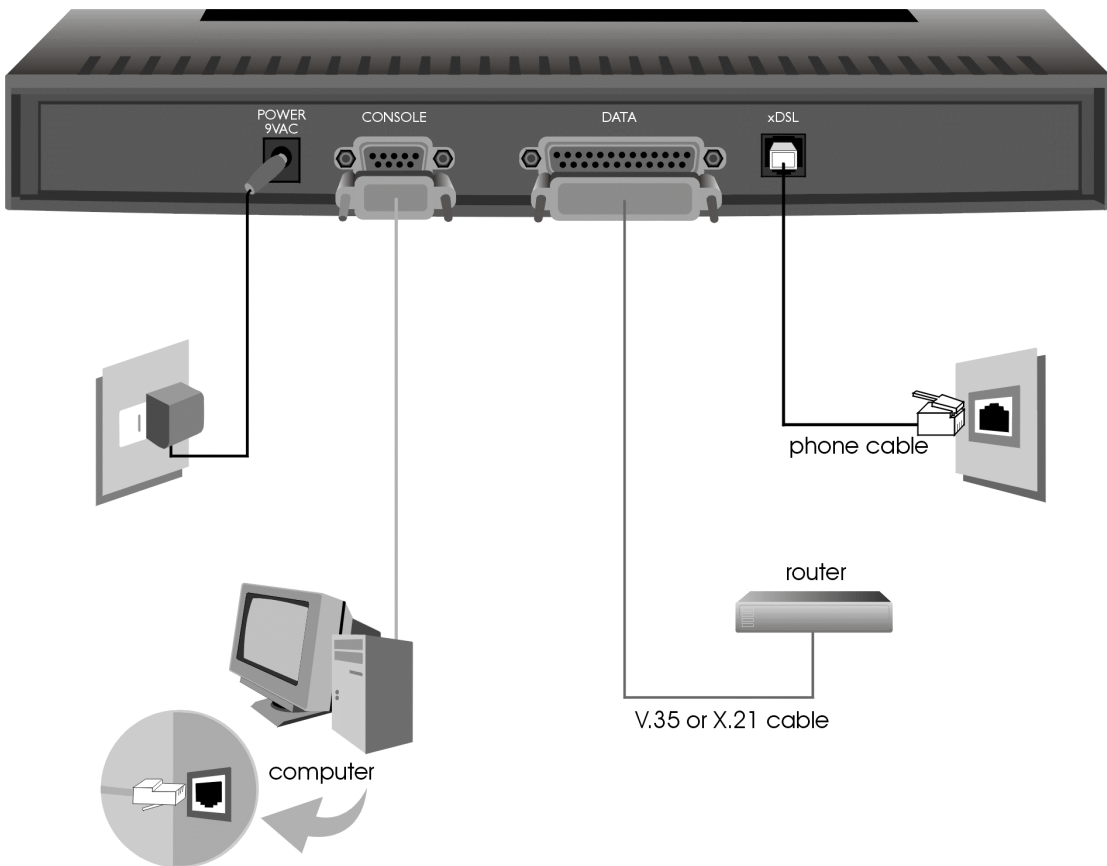


Figure 2-2 Rear Panel Connections of the Prestige 724

Step 1. Connecting the xDSL Line

Connect the Prestige (port labeled **xDSL**) into the telephone jack using the telephone cable (supplied).

Step 2. Connecting the DATA Port to your Router

Connect one end of the included data port cable (V.35 or X.21) to the **DATA** port of your Prestige and the other end to your router.

Step 3. Connecting a Computer to the Prestige

For the initial configuration of your Prestige, you need to use terminal emulator software on your computer and connect it to the Prestige through the **CONSOLE** port. Connect the 9-pin end of the console cable to the console port of the Prestige and the other end (choice of 9-pin or 25-pin, depending on your computer) end to a serial port (COM1, COM2 or other COM port) of your computer. You can use an extension RS-232 cable if the enclosed one is too short. After the initial setup, you can modify the configuration remotely through telnet connections.

Step 4. Connecting the Power Adapter to your Prestige

Connect the power adapter to the port labeled **POWER** on the rear panel of your Prestige.

To prevent damage to the Prestige, first make sure you have the correct power adapter. See the *Power Adapter Specification Appendix* for regional specifications.

2.4 Turning On Your Prestige

You can now turn on your Prestige by flipping the power switch to the on position (**I** is ON, **O** is OFF).

Step 1. Initial Screen

When you turn on your Prestige, it performs several internal tests as well as line initialization. After the initialization, the Prestige prompts you to press [ENTER] to continue, as shown.

```
Copyright (c) 1994 - 2001 ZyXEL Communications Corp.
HWSAR (FPGA) : programming (11969) ... done
HWSAR (FPGA) : testing ... done
Wan Channel init ..... done
Press ENTER to continue...
```

Figure 2-3 Power-On Display

Step 2. Entering the Default System Password

The login screen will prompt you to type the password. For your first login, type the default password 1234. The screen displays an “X” for each character you type.

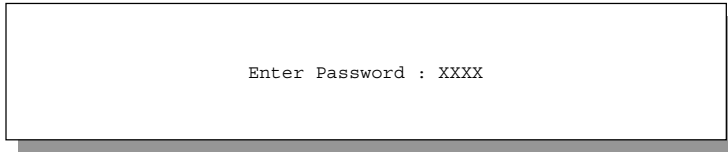


Figure 2-4 Login Screen

If, after logging on, there is no activity for longer than five minutes, your Prestige will automatically log you out and display a blank screen. Press [ENTER] to bring up the login screen again.

2.5 Navigating the SMT Interface

Use the SMT (System Management Terminal) interface to configure your Prestige. The following figure is an overview of the Prestige SMT menu screens.

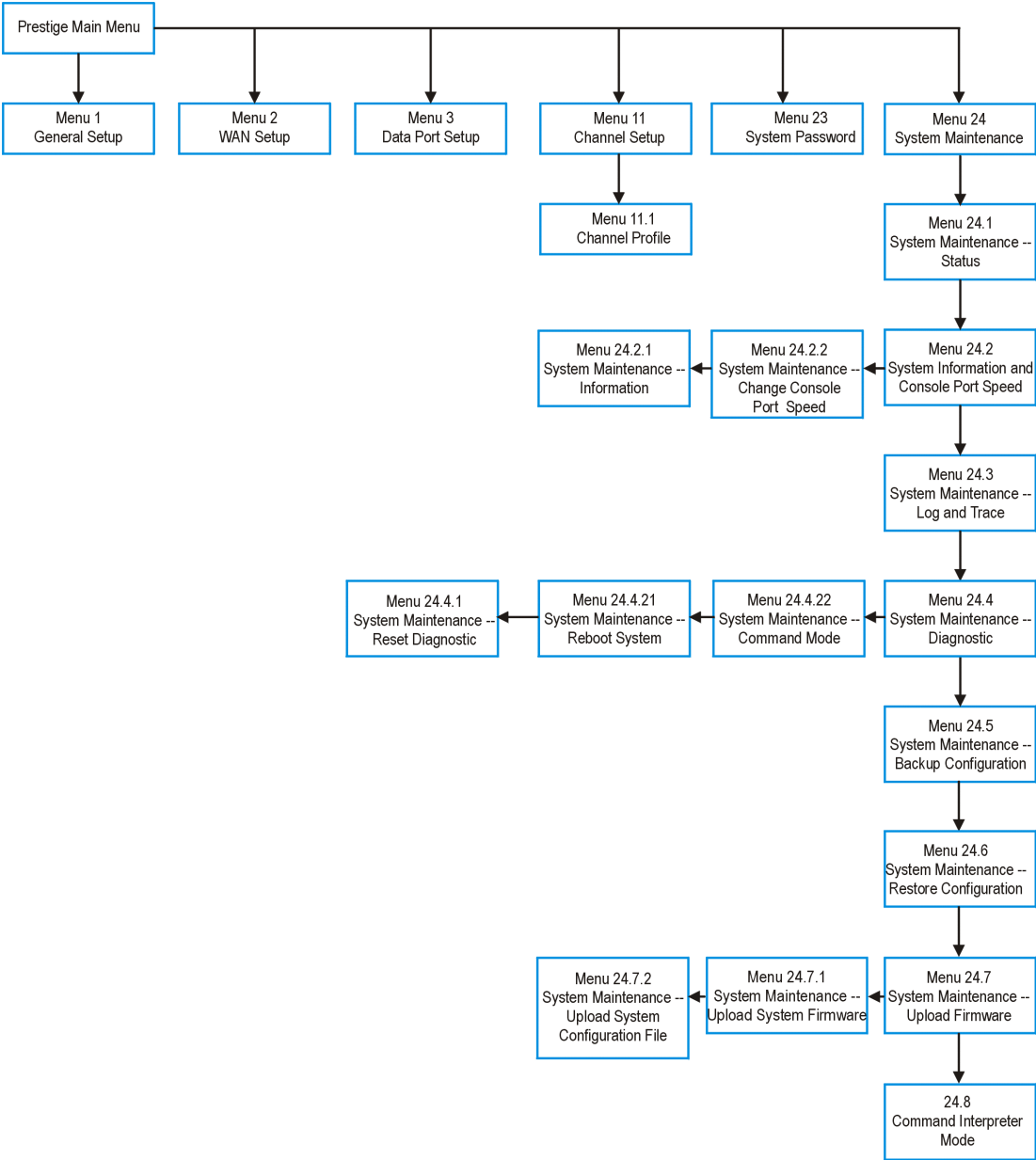


Figure 2-5 Prestige 724 SMT Menu Overview

2.6 SMT Menu Commands

Before changing the configuration, familiarize yourself with the operations listed in the following table.

Table 2-2 Main Menu Commands

OPERATION	KEYSTROKE	DESCRIPTION
Move down to another menu	[ENTER]	To move forward to a submenu, type in the number of the desired submenu and press [ENTER].
Move up to a previous menu	[ESC]	Press [ESC] to move back to the previous menu.
Move to a "hidden" menu	Press [SPACE BAR] to change No to Yes then press [ENTER].	Fields beginning with "Edit" lead to hidden menus and have a default setting of No . Press [SPACE BAR] once to change No to Yes , then press [ENTER] to go to the "hidden" menu.
Move the cursor	[ENTER] or [UP]/[DOWN] arrow keys.	Within a menu, press [ENTER] to move to the next field. You can also use the [UP]/[DOWN] arrow keys to move to the previous and the next field, respectively.
Entering information	Type in or press [SPACE BAR], then press [ENTER].	You need to fill in two types of fields. The first requires you to type in the appropriate information. The second allows you to cycle through the available choices by pressing [SPACE BAR].
Required fields	<?>	All fields with the symbol <?> must be filled in order to be able to save the new configuration.
N/A fields	<N/A>	Some of the fields in the SMT will show a <N/A>. This symbol refers to an option that is Not Applicable.
Save your configuration	[ENTER]	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.
Exit the SMT	Type 99, then press [ENTER].	Type 99 at the main menu prompt and press [ENTER] to exit the SMT interface.

**Remember to fill in all required fields (denoted by the symbol [?]).
N/A refers to an option that is Not Applicable.**

After you type the password, the SMT displays the main menu, as shown as shown next.

```

Copyright (c) 1994 - 2001 ZyXEL Communications Corp.
Prestige 724 Main Menu

Getting Started
  1. General Setup
  2. WAN Setup
  3. Data Port Setup

Advanced Applications
  11. Channel Setup

Advanced Management
  23. System Password
  24. System Maintenance

99. Exit

Enter Menu Selection Number:

```

Figure 2-6 SMT Main Menu

2.6.1 System Management Terminal Interface Summary

Table 2-3 Main Menu Summary

NO.	MENU TITLE	FUNCTION
1	General Setup	Use this menu to set up routing/bridging and general information.
2	WAN Setup	Use this menu to configure WAN settings.
3	Data Port Setup	Use this menu to configure the data port interface.
11	Channel Setup	Configure channel setup and remote management in this menu.
23	System Password	Change your password in this menu (recommended).
24	System Maintenance	From displaying system status to uploading firmware, this menu provides comprehensive system maintenance.
99	Exit	Use this menu to exit (necessary for remote configuration).

2.7 Changing the System Password

Change the default system password by performing the following steps.

- Step 1.** In the main menu, type 23 to display **Menu 23 – System Password** as shown in the following figure. When the menu appears, type the old system password, i.e., 1234, and press [ENTER].

```
Menu 23 - System Password

Old Password= ****
New Password= ****
Retype to confirm= ****

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

Figure 2-7 Menu 23 — System Password

- Step 2.** Type your new system password (up to 30 characters) and press [ENTER].
- Step 3.** Re-type your new system password to confirm and press [ENTER].
The screen displays an asterisk (*) for each character you type.

2.8 Resetting the Prestige

If you forget your password or cannot access the SMT menu, you need to reinstall the configuration file. Reinstallation replaces the current file with the factory configuration file. All custom configurations will be lost and the console port speed will be reset to the default. (9600 bps with 8 data bit, no parity, 1 stop bit (8n1), and no flow control.) The password will be reset to the default of 1234.

Turn off your Prestige and begin a terminal session with the current console port settings. Turn on your Prestige again. You should see the following screen. When you see the message `Press any key to enter debug mode within 3 seconds`, press any key. Make sure you already have the configuration file or download the latest one from the ZyXEL web site.

```
Bootbase Version: V2.04 | 2/7/2001 18:08:22
RAM: Size = 8192 Kbytes
DRAM POST: Testing: 8192K OK
FLASH: Intel 16M

ZyNOS Version: V3.40(BJ.0)a0 | 5/31/2001 15:57:50

Press any key to enter debug mode within 3 seconds.
.....
(Compressed)
  Version: P724, start: 0203e030
  Length: 151338, Checksum: 077E
  Compressed Length: B3133, Checksum: 5E4C
```

Figure 2-8 Starting the Prestige

To upload the configuration file, do the following:

1. Type `atlc` after the `Enter Debug Mode` message.
2. Wait for the `Starting XMODEM upload` message before activating XMODEM upload on your terminal.
3. After a successful firmware upload, type `atgo` to restart the Prestige.

The Prestige is now reinitialized with a default configuration file including the default password of 1234.

2.9 General Setup

Menu 1 – General Setup contains administrative and system-related information.

To view menu 1 and fill in the required information, follow these steps:

Step 1. In the main menu, type `1` to display **Menu 1 – General Setup**, shown next.

Step 2. Fill in the required fields and turn on the individual protocols for your applications, as explained in the following table.

```

Menu 1 - General Setup

System Name= Prestige
Location= MyHouse
Contact Person's Name= Derek

Press ENTER to Confirm or ESC to Cancel:

```

Figure 2-9 Menu 1 — General Setup

Table 2-4 General Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
System Name	<p>Type any descriptive name, (with no spaces), up to 30 alphanumeric characters long, including dashes “-” and underscores “_”. This field is for identification purposes but because some ISPs check this name you should enter your computer’s “Computer Name”.</p> <ul style="list-style-type: none"> • In Windows 95/98 click Start -> Settings -> Control Panel and then double-click Network. Click the Identification tab, note the entry for the Computer name field and enter it in the Prestige System Name field. • In Windows 2000 click Start->Settings->Control Panel and then double-click System. Click the Network Identification tab and then the Properties button. Note the entry for the Computer name field and enter it in the Prestige System Name field. 	Prestige

FIELD	DESCRIPTION	EXAMPLE
Location	Optional. Type the location of your Prestige (up to 31 characters).	MyHouse
Contact Person's Name	Optional. Type the name (up to 30 characters) of the person in charge of your Prestige.	Derek
When you have completed this menu, press [ENTER] at the prompt "Press ENTER to Confirm..." to save your configuration, or press [ESC] at any time to cancel.		

2.10 Setting Up the WAN Link

Use **Menu 2 – WAN Setup** to configure G.SHDSL settings for your WAN line. Different telephone companies deploy different types of G.SHDSL service. If you are unsure about any of this information, please check with your telephone company.

2.10.1 Service Type

Is your Prestige acting as a server or client?

1. The Prestige is a server if it is acting as COE (Central Office Equipment).
2. The Prestige is a client if it is acting as CPE (Customer Premise Equipment).

2.10.2 Rate Adaption

Enable **Rate Adaption** to have the Prestige find the best possible line rate. Disable **Rate Adaption** if you already know the best line rate.

2.10.3 Transfer Rates

The Prestige supports the following symmetrical multi-rate data transmission speeds:

144, 200, 208, 272, 392, 400, 528, 776, 784, 1040, 1160, 1168, 1544, 1552, 1736, 2064, 2313 and 2320 Kbps.

For back-to-back applications make sure that your Prestige and its peer have the same **Transfer Max Rate** and the same **Transfer Min Rate**. Two (maximum and minimum) transfer rates are used to accommodate fluctuations in line speed. This is known as Dynamic Bandwidth Allocation.

2.10.4 Standard Mode

If your Prestige is a server, then select the mode that applies to your region: ANSI (American National Standards Institute) and ETSI (European Telecommunications Standards Institute). If your Prestige is a

client, select the same **Standard Mode** that the server side selects. ANSI and ETSI create recommendations and standards for the telecommunications industry.

```

                                Menu 2 - WAN Setup

Service Type: Client
Rate Adaption= Disable
Transfer Max Rate(Kbps) = 2320K
Transfer Min Rate(Kbps) = 144K
Standard Mode= ETSI (ANNEX_B)

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

Figure 2-10 Menu 2 — WAN Setup

Table 2-5 Menu 2 — WAN Setup Description

FIELD	DESCRIPTION	EXAMPLE
Service Type	Press [SPACE BAR] and press [ENTER] to select Server (COE) if your Prestige is acting as a server; select Client (CPE) if your Prestige is acting as a client.	Client
Rate Adaption	Press [SPACE BAR] to select Enable (activate) or Disable (deactivate). When set to Enable , your Prestige will auto-detect the optimal single Transfer Rate for your DSL line that falls between the specified Transfer Max Rate and Transfer Min Rate fields. When set to Disable , the Transfer Max Rate field becomes your transfer rate.	Disable (default)
Transfer Max Rate (Kbps)	Change the default values in this field, ONLY at the request of your service provider. The Prestige supports the following symmetrical multi-rate data transmission speeds: 144, 200, 208, 272, 392, 400, 528, 776, 784, 1040, 1160, 1168, 1544, 1552, 1736, 2064, 2312 and 2320Kbps. Press [SPACE BAR] to select a Transfer Max Rate greater than or equal to the Transfer Min Rate and press [ENTER] to continue.	2320K (default)
Transfer Min Rate (Kbps)	Change the default values in this field, ONLY at the request of your service provider. The Prestige supports the following symmetrical multi-rate data transmission speeds: 144, 200, 208, 272, 392, 400, 528, 776, 784,	144K (default)

FIELD	DESCRIPTION	EXAMPLE
	1040, 1160, 1168, 1544, 1552, 1736, 2064, 2312 and 2320Kbps. Press [SPACE BAR] to select a Transfer Min Rate less than or equal to the Transfer Max Rate and press [ENTER] to continue.	
Standard Mode	Press [SPACE BAR] to select ANSI (ANNEX A) (if your Prestige is connected in North America) or ETSI (ANNEX B) (if your Prestige is connected in Europe) and press [ENTER] to continue. For all other regions, contact your service provider.	ETSI (ANNEX_B) (default)
When you have completed this menu, press [ENTER] at the prompt "Press ENTER to Confirm..." to save your configuration, or press [ESC] at any time to cancel.		

2.11 Data Port Setup

X.21/V.35 is a standard transfer rate implemented under recommendations by the ITU-TS (Telecommunication Standardization Sector of the International Telecommunications Union). X.21/V.35 provides the trunk interface between a network access device and a packet network with data rates greater than 19.2 Kbps.

2.11.1 Line Type

Select **user** if your Prestige is acting as a client or select **network** if your Prestige is acting as a server.

2.11.2 Link Management

The two main groups that create recommendations and standards in the telecommunications field are ITU – TS (Telecommunications Standardization Sector of the International Telecommunication Union) and ANSI (American National Standards Institute). Standards vary slightly for both organizations, so select the correct organization in the **Link Management** field in menu 3. Your Network Service Provider (NSP) should provide this information.

If your Prestige is a server, then select the mode that applies to your region. If your Prestige is a client, select the same **Link Management** mode that the server side selects. The Prestige and its peer must use the same **Link Management** mode.

2.11.3 Clock Source

Clock source determines which side tracks time for the Prestige and WAN router. Choose a device to become the clock source (either your WAN router or Prestige). If you select the Prestige as your clock

source, set the **Clock Source** field to **Internal**; if you select the WAN router as your clock source, set the **Clock Source** field to **External**.

To configure data port settings for your WAN router, enter 3 from the main menu to display **Menu 3 – Data Port Setup**, as shown next. If you are unsure of any of this information, please check with your WAN router vendor.

```

Menu 3 - Data Port Setup

Line Type= network
Link Management= ANSI (T1.617)
Clock Source= Internal

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

Figure 2-11 Menu 3 — Data Port Setup

Table 2-6 Menu 3 — Data Port Setup Description

FIELD	DESCRIPTION	EXAMPLE
Line Type	Press [SPACE BAR] to select user if your Prestige is acting as a client or network if it is acting as a server. Press [ENTER] after you have made your selection.	network
Link Management	This function is responsible for monitoring the up/down status and error performance of an individual link. If failure occurs, it also initiates recovery actions for the restoration of the failed link. Press [SPACE BAR] to select ANSI (T1.617) or ITU-T (Q.933) . If your Prestige is a server, then select the mode that applies to your region. If your Prestige is a client, select the mode that the server side selects. The Prestige and its peer must use the same Link Management mode.	ANSI (T1.617)
Clock Source	Press [SPACE BAR] to select Internal if your Prestige provides a clock to its peer and External if the clock is provided by its peer. Press [ENTER] after you have made your selection.	Internal (default)
When you have completed this menu, press [ENTER] at the prompt "Press ENTER to Confirm..." to save your configuration, or press [ESC] at any time to cancel.		

Chapter 3

Channel Setup

This chapter shows you how to set up channels on your Prestige.

3.1 Introduction

The Prestige converts frame relay/HDLC (High-level Data Link Control) frames to ATM (Asynchronous Transfer Mode) cells from the LAN to the WAN and vice-versa via channels. The encapsulation type you select, when configuring individual channels, determines the how frames/cells are converted.

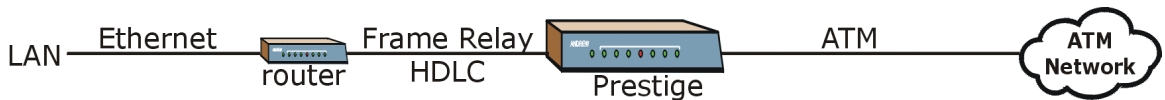


Figure 3-1 Prestige Conversion of Frame Relay/HDLC to ATM and Vice-Versa

3.1.1 Configuration Requirements

The VPI/VCI (Virtual Path Identifier/Virtual Circuit Identifier) and DLCI (Data Link Connection Identifier) numbers are similar to telephone numbers in that they specify the channel and destination that traffic will use. To learn more about channels and the topology of VCs (Virtual Circuits) refer to the *Virtual Circuit Topology Appendix*.

- To convert frame relay to ATM and vice-versa you need to know your:
 - VPI/VCI. Get this information from your NSP (Network Service Provider).
 - DLCI. Get this information from the device attached to the Prestige LAN port.
- To convert HDLC to ATM and vice-versa you need to know your:
 - VPI/VCI. Get this information from your NSP.
- To read about remote management configuration requirements refer to *section 3.4*.

3.1.2 Networks

ATM

Asynchronous Transfer Mode (ATM) is a popular end-to-end, high-performance, cell-oriented switching and multiplexing technology that uses fixed-length cells to carry different types of traffic from source to destination. A virtual channel connection is the basic unit of ATM that carries a single stream of cells, in order, from one switch to another until the cells reach their final destination. Two ATM switches may have many different virtual channel connections between them that belong to different users.

Frame Relay

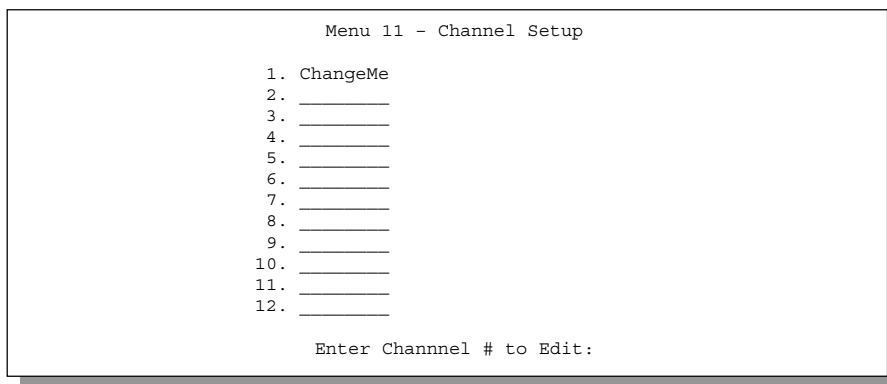
Frame relay is a form of packet-switching technology that routes frames of information from source to destination over a switching network owned by a carrier. Frame sizes are not fixed.

HDLC (High-level Data Link Control)

Similar to frame relay, HDLC organizes data into a unit (called a *frame*). HDCL frames are sent from point to point and are therefore considered a more local method of data transfer. Frame sizes are not fixed.

3.2 Channel Setup

To configure a channel you must first select a channel from menu 11. From the main menu, enter 11 to display **Menu 11 - Channel Setup** as shown next.



```
Menu 11 - Channel Setup

1. ChangeMe
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Enter Channnel # to Edit:
```

Figure 3-2 Menu 11 — Channel Setup

Enter the number of the channel that you want to configure and press [ENTER] to display **Menu 11.1 – Channel Profile**, shown next.

3.3 Channel Profile

A channel is a path that transfers data from and to the LAN. The following gives you information on how to configure a channel using **Menu 11.1 – Channel Profile**.

3.3.1 Channel Name

Name the channel you want to configure. Follow the naming rules in *Table 3-3*.

3.3.2 Active

You can conveniently disable or enable specific channels as needed.

3.3.3 Encapsulation

Select the appropriate encapsulation, when you configure your Prestige, in order to achieve end-to-end service interoperability between terminal equipment. The encapsulation type you select determines the how frames/cells are converted. If you are not sure what encapsulation type you should select then contact your NSP.

Encapsulation choices are described next. The figure shown next gives more detailed information about how packet headers are stripped.

FRF8_TRANSLATION

This encapsulation type converts frame relay to ATM and vice-versa. FRF8_TRANSLATION strips two headers (the *Frame Relay Header* and *1490 Header*) from the frame relay frame and maps one frame relay VC (Virtual Circuit) to one ATM VC.

Refer to *RFC 1490* and *RFC 1483* for more information.

FRF8_TRANSPARENT

This encapsulation type converts frame relay to ATM and vice-versa. FRF8_TRANSPARENT strips one header (the *Frame Relay Header*) from the frame relay frame. This encapsulation type maps one frame relay VC to one ATM VC.

FRF.5

This encapsulation type converts frame relay to ATM and vice-versa. FRF.5 does not strip any headers from the frame relay frame and maps many frame relay VCs to one ATM VC. The mapping function of this encapsulation type makes the overhead larger (or performance slower) than FRF8_TRANSLATION.

Refer to *RFC 1490* and *RFC 1483* for more information.

ENCAP_HDLC_RFC2364

This encapsulation type converts HDLC to ATM and vice-versa. ENCAP_HDLC_RFC2364 maps one HDLC VC to one ATM VC. Choose this encapsulation type if your LAN router provides PPP over HDLC service and the remote peer provides PPP over ATM.

Refer to *RFC 1662* for more information on PPP over HDLC and *RFC 2364* for more information on ENCAP_HDLC_RFC2364.

PPP

This encapsulation type supports ATM (PPP over ATM). Choose this encapsulation type if you want to set up a channel for remote management. This channel will be used exclusively for remote management and cannot be used to transfer data. The Prestige allows you to configure one channel for remote configuration. PPP over ATM terminates on the Prestige. For more information, refer to *section 3.4*.

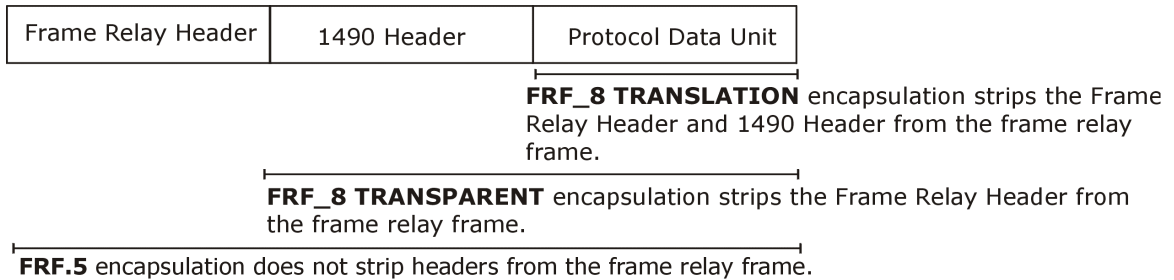


Figure 3-3 Headers Stripped By Some Encapsulation Types

The table shown next is a summative explanation of your encapsulation choices.

Table 3-1 Summation of Encapsulation Types

ENCAPSULATION	PRESTIGE CONVERTS BETWEEN	FRAME RELAY HEADERS STRIPPED	VC (VIRTUAL CIRCUIT) MAPPING BETWEEN
FRF8_TRANSLATION	frame relay & ATM	2	one frame relay VC & one ATM VC
FRF8_TRANSPARENT	frame relay & ATM	1	one frame relay VC & one ATM VC
FRF.5	frame relay & ATM	0	many frame relay VCs & one ATM VC
ENCAP_HDLC_RFC2364	HDLC & ATM	N/A	one HDLC VC & one ATM VC
PPP	N/A – This encapsulation terminates on the Prestige (remote management).		

3.3.4 VPI, VCI and DLCI

Refer to *section 3.1.1* for more information on VPI, VCI and DLCI.

Table 3-2 Valid Ranges for VPI, VCI and DLCI

VPI	VCI	DLCI
0 – 255	32 – 65535	16 - 991

3.3.5 Configure a Channel Profile

To configure a channel, enter a channel number from menu 11 and press [ENTER] to display the following figure.

```

Menu 11.1 - Channel Profile

Channel Name= 1
Active= Yes

Encapsulation= FRF8_TRANSLATION

Outgoing:
My Login= N/A          VPI= 8
My Password= N/A      VCI= 35
                      DLCI= 16

```

Figure 3-4 Menu 11.1 — Channel Profile

In **Menu 11.1 – Channel Profile**, fill in the fields as described in the following table.

Table 3-3 Channel Profile Menu Fields

FIELD	DESCRIPTION	EXAMPLE
Channel Name	Type a unique, descriptive name of up to eight characters for this channel for identification purposes. Spaces are not allowed, but dashes “-” and underscores “_” are accepted. Trailing spaces are truncated.	1
Active	Press [SPACE BAR] to select either Yes to activate or No to deactivate this channel. Inactive channels are displayed with a minus sign (-).	Yes

FIELD	DESCRIPTION	EXAMPLE
Encapsulation	<p>Press [SPACE BAR] to select the type of encapsulation you require. If you are unsure of this information contact your NSP. Options are:</p> <p>FRF8_TRANSLATION, FRF8_TRANSPARENT, ENCAP_HDLC_RFC2364, FRF.5 or PPP.</p> <p>Note: If you choose FRF.5 and wish to map multiple DLCIs then you must use one channel for each DLCI. You must use the same VPI/VCI for every DLCI mapped.</p> <p>Note: Do not select PPP unless you want to configure remote management. See <i>section 3.4</i> for more information.</p>	FRF8_TRANSLATION (default)
VPI	Enter the VPI (Virtual Path Identifier) that your NSP gives you. The range of the VPI is 0-255.	8 (default)
VCI	Enter the VCI (Virtual Channel Identifier) that your NSP gives you. The range of the VCI is 32-65535.	35 (default)
DLCI	<p>Enter the DLCI. Get this information from the device attached to the Prestige LAN port. The range of the DLCI is 16-991.</p> <p>When the Encapsulation field is ENCAP_HDLC_RFC2364 or PPP then this field is N/A.</p>	N/A
Outgoing:		
My Login	These fields are N/A unless you select PPP and therefore wish to configure remote management. If this is the case, refer to <i>section 3.4</i> for more information.	N/A
My Password		N/A
When you have completed this menu, press [ENTER] at the prompt "Press [ENTER] to confirm or [ESC] to cancel" to save your configuration or press [ESC] to cancel and go back to the previous screen.		

3.4 Remote Management

Remote management provides a dedicated channel that allows the Prestige to get the WAN IP address from your NSP.

The channel dedicated to remote management is not capable of data transfer.

Perform initial configuration of the remote management channel locally. To configure a channel for remote management, enter 11 from the main menu and then enter a channel number to display **Menu 11.1 – Channel Profile**, shown next. The channel number you select in menu 11 will determine which channel will be used for remote management.


```

Menu 11.1 - Channel Profile

Channel Name= Remote
Active= Yes
Encapsulation= PPP

Outgoing:
My Login= mylogin
My Password= *****

VPI= 8
VCI= 35
DLCI= N/A

```

Menu 11.1 — Fields Used To Configure Remote Management

Table 3-4 Menu 11.1 — Description of Fields Used To Configure Remote Management

FIELD	DESCRIPTION	EXAMPLE
Encapsulation	Press [SPACE BAR] and select PPP to configure remote management. The Prestige will acquire the WAN IP address from the PPP server. The remote management channel you select cannot be used for data transfer. To configure a channel for data transfer, refer to <i>section 3.3</i> .	PPP
VPI	Enter the VPI (Virtual Path Identifier) that your NSP gives you. The range of the VPI is 0-255.	8 (default)
VCI	Enter the VCI (Virtual Channel Identifier) that your NSP gives you. The range of the VPI is 32-65535.	35 (default)
Outgoing:		
My Login	Enter the login name that your NSP gives you. This field may contain up to 31 characters. Trailing spaces are truncated.	mylogin
My Password	Enter the password that your NSP gives you. It should be associated with the My Login field above. This field may contain up to 31 characters. Trailing spaces are truncated.	mypassword
When you have completed this menu, press [ENTER] at the prompt "Press [ENTER] to confirm or [ESC] to cancel" to save your configuration or press [ESC] to cancel and go back to the previous screen.		

After you save your configuration you can return to menu 11 to display the channel you selected for remote management, as shown next.

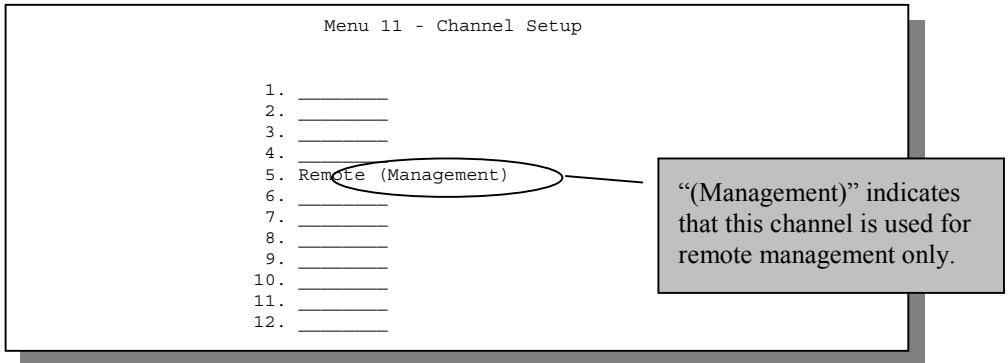


Figure 3-5 Menu 11 — Channel Setup (Remote Management)

Chapter 4

System Information & Diagnosis

This chapter covers SMT menus 24.1 to 24.4.

This chapter covers the diagnostic tools that help you to maintain your Prestige. These tools include updates on system status, port status, log and trace capabilities and upgrades for the system firmware.

Select menu 24 in the main menu to open **Menu 24 - System Maintenance**, as shown below.

```
Menu 24 - System Maintenance

1. System Status
2. System Information and Console Port Speed
3. Log and Trace
4. Diagnostic
5. Backup Configuration
6. Restore Configuration
7. Upload Firmware
8. Command Interpreter Mode

Enter Menu Selection Number:
```

Figure 4-1 Menu 24 — System Maintenance

4.1 System Status

The first selection, system status, gives you information on the status and statistics of the ports, as shown next. System Status is a tool that can be used to monitor your Prestige. Specifically, it gives you information on your G.SHDSL telephone line status, number of packets sent and received.

Step 1. Enter 24 to display **Menu 24 - System Maintenance**.

Step 2. In this menu, enter 1 to display the read-only **Menu 24.1 - System Maintenance - Status** menu shown next.

```

Menu 24.1 - System Maintenance - Status

Node-Lnk      Status      TxPkts      RxPkts      Errors      Tx B/s      Rx B/s      Up Time
1-TRLAT       Up          211         0           0           0           0           0:26:2
2             N/A         0           0           0           0           0           0:00:00
3             N/A         0           0           0           0           0           0:00:00
4             N/A         0           0           0           0           0           0:00:00
5             N/A         0           0           0           0           0           0:00:00
6             N/A         0           0           0           0           0           0:00:00
7             N/A         0           0           0           0           0           0:00:00
8             N/A         0           0           0           0           0           0:00:00
9             N/A         0           0           0           0           0           0:00:00
10            N/A         0           0           0           0           0           0:00:00
11            N/A         0           0           0           0           0           0:00:00
12            N/A         0           0           0           0           0           0:00:00

Data Port:
Tx Pkts: 53
Rx Pkts: 36
CPU Load= 3.8%

WAN:
Line Status: Up
Transfer Rate: 2320 Kbps

Press Command:
COMMANDS: 1-Reset Counters  ESC-Exit
    
```

Figure 4-2 Menu 24.1 — System Maintenance — Status

In **Menu 24.1 – System Maintenance – Status**, type 1 to reset the counters or [ESC] to display the previous screen.

Table 4-1 System Maintenance — Status Menu Fields

FIELD	DESCRIPTION
Node-Lnk	This is the node index number and link type. Link types are: TRLAT, TRPAT, HDLC, FRF5 and PPP.
Status	Shows the status of the channel.
TxPkts	The number of transmitted packets to this channel.
RxPkts	The number of received packets from this channel.
Errors	The number of error packets on this connection.
Tx B/s	Shows the transmission rate in bytes per second.
Rx B/s	Shows the receiving rate in bytes per second.
Up Time	Time this channel has been connected to the current channel.
Data Port Tx Pkts Rx Pkts	The number of transmitted packets to the LAN. The number of received packets from the LAN.
CPU Load	Specifies the percentage of CPU utilization.

FIELD	DESCRIPTION
WAN	Shows statistics for the WAN.
Line Status	Shows the current status of the xDSL line which can be Up or Down.
Transfer Rate	Shows the transfer rate based on Menu 2 – WAN Setup when the preceding field Line Status is Up.

4.2 System Information and Console Port Speed

This section describes your system and allows you to choose different console port speeds. To display **Menu 24.2 - System Information and Console Port Speed**, follow the steps below:

- Step 1.** From the main menu, type 24 to display **Menu 24 — System Maintenance**.
- Step 2.** Type 2 to display **Menu 24.2 - System Information and Console Port Speed**.
- Step 3.** From this menu you have two choices as shown in the next figure.

```

Menu 24.2 - System Information and Console Port Speed

1. System Information
2. Console Port Speed

Please enter selection:

```

Figure 4-3 Menu 24.2 — System Information and Console Port Speed

4.2.1 System Information

System Information (menu 24.2.1) gives you information about your Prestige such as current ZyNOS firmware version, xDSL firmware version, etc., as shown next. This is a READ-ONLY screen.

```

Menu 24.2.1 - System Maintenance - Information

Name:
Routing: CSU/DSU
ZyNOS F/W Version: V3.40(BJ.0)a3 | 6/14/2001
xDSL F/W Version: R.1.2

Press ESC or RETURN to Exit:

```

Figure 4-4 System Maintenance — Information

Table 4-2 Fields in System Maintenance

FIELD	DESCRIPTION
Name	Displays the system name of your Prestige. This information can be changed in Menu 1 – General Setup .
ZyNOS F/W Version	Refers to the version of the ZyNOS Network Operating System firmware. ZyNOS is a registered trademark of ZyXEL Communications Corp.
xDSL F/W Version	Displays the G.SHDSL system firmware version.
When you are finished viewing, press [ESC] or [ENTER] to exit.	

4.2.2 Console Port Speed

You can change the speed of the console port through **Menu 24.2.2 – Change Console Port Speed**. Your Prestige supports 9600, 19200, 38400 and 57600 bps for the console port. Use the [SPACE BAR] to select the desired speed in menu 24.2.2, as shown next.

```

Menu 24.2.2 - System Maintenance - Change Console Port Speed

      Console Port Speed: 9600

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

```

Figure 4-5 Menu 24.2.2 — System Maintenance — Change Console Port Speed

4.3 Log and Trace

Error logs trace records that are stored locally.

4.3.1 Viewing Error Log

The error/trace log records problems with your Prestige. Follow the procedure below to view the local error/trace log:

- Step 1.** Type 24 from the main menu to display **Menu 24 - System Maintenance**.
- Step 2.** From menu 24, type 3 to open **Menu 24.3 - System Maintenance - Log and Trace** shown next.

```
Menu 24.3 - System Maintenance - Log and Trace
1. View Error Log

Please enter selection:
```

Figure 4-6 Menu 24.3 — System Maintenance — Log and Trace

Step 3. Type 1 in menu 24.3 to view the error log (shown next).

After the Prestige finishes displaying the error log, you will have the option to clear it. Samples of typical error and information messages are shown next.

```
60      4 PP07  INFO  LAN promiscuous mode <0>
61      4 PINI  ERROR System Ert completed
63      e PINI  INFO  Session Begin
Clear Error Log (y/n) :
```

Figure 4-7 Sample Error and Information Messages

4.4 Diagnostic

The diagnostic facility allows you to test the different aspects of your Prestige to determine if it is working properly. Menu 24.4 allows you to choose among various types of diagnostic tests to evaluate your system, as shown next.

Follow the procedure next to get to **Menu 24.4 - System Maintenance – Diagnostic**.

Step 1. From the main menu, type 24 to display **Menu 24 – System Maintenance**.

Step 2. From this menu, type 4 to display **Menu 24.4 – System Maintenance – Diagnostic** shown next.

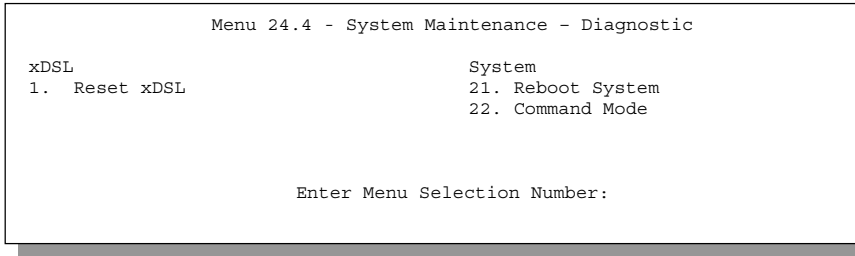


Figure 4-8 Menu 24.4 — System Maintenance — Diagnostic

The following table describes the diagnostic tests available in menu 24.4.

Table 4-3 System Maintenance Menu — Diagnostic

FIELD	DESCRIPTION
Reset xDSL	Type 1 to re-initialize the xDSL link to the telephone company.
Reboot System	Type 21 to reboot the Prestige.
Command Mode	Type 22 to enter the mode to test and diagnose your Prestige using specified commands. This mode is the same as the Command Interpreter Mode (described next).

4.5 Command Interpreter Mode

This mode is for debugging purposes only. Do not use the Command Interpreter Mode unless instructed to do so by a qualified service technician.

The Command Interpreter (CI) is a part of the main Prestige firmware. The CI provides much of the same functionality as the SMT, while adding some low-level setup and diagnostic functions. The CI can be entered from the SMT by selecting menu 24.8. Access can be either by Telnet or by a serial connection to the console port, although some commands are only available with a serial connection.

Enter 8 from **Menu 24 - System Maintenance**. A list of valid commands can be found by typing “help” or “?” at the command prompt. Type “exit” to return to the SMT main menu when finished.


```
Menu 24 - System Maintenance

1. System Status
2. System Information and Console Port Speed
3. Log and Trace
4. Diagnostic
5. Backup Configuration
6. Restore Configuration
7. Firmware Update
8. Command Interpreter Mode

Enter Menu Selection Number:
```

Figure 4-9 Command Interpreter Mode in Menu 24

```
Copyright (c) 1994 - 2001 ZyXEL Communications Corp.
ras>P724> ?
Valid commands are:
sys          exit          device        wan
xdsl        frelay          ip            ppp
bridge      hdap            show          set
test
P724>
```

Figure 4-10 Valid Commands

Chapter 5

Firmware and Configuration File Maintenance

This chapter tells you how to back up and restore your configuration file as well as upload new firmware and a new configuration file.

5.1 Filename Conventions

The configuration file (often called the romfile or rom-0) contains the factory default settings in the menus such as password, DHCP Setup, TCP/IP Setup, etc. It arrives from ZyXEL with a “rom” filename extension. Once you have customized the Prestige's settings, they can be saved back to your computer under a filename of your choosing.

ZyNOS (ZyXEL Network Operating System sometimes referred to as the “ras” file) is the system firmware and has a “bin” filename extension. With many ftp and tftp clients, the filenames are similar to those seen next.

```
ftp> put firmware.bin ras
```

This is a sample ftp session showing the transfer of the computer file " firmware.bin" to the Prestige.

```
ftp> get rom-0 config.cfg
```

This is a sample ftp session saving the current configuration to the computer file config.cfg.

If your (t)ftp client does not allow you to have a destination filename different than the source, you will need to rename them as the Prestige only recognizes “rom-0” and “ras”. Be sure you keep unaltered copies of both files for later use.

The following table is a summary. Please note that the internal filename refers to the filename on the Prestige and the external filename refers to the filename not on the Prestige, that is, on your computer, local network or ftp site and so the name (but not the extension) will vary. After uploading new firmware see the **ZyNOS F/W Version** field in **Menu 24.2.1 - System Maintenance - Information** to confirm that you have uploaded the correct firmware version. The AT command is the command you enter after you press “y” when prompted in the SMT menu to go into debug mode.

Table 5-1 Filename Conventions

FILE TYPE	INTERNAL NAME	EXTERNAL NAME	DESCRIPTION
Configuration File	Rom-0	*.rom	This is the configuration filename on the Prestige. Uploading the rom-0 file replaces the entire ROM file system, including your Prestige configurations, system-related data (including the default password), the error log and the trace log.
Firmware	Ras	*.bin	This is the generic name for the ZyNOS firmware on the Prestige.

5.2 Backup Configuration

The Prestige displays different messages explaining different ways to backup, restore and upload files in menus 24.5, 24.6, 24. 7.1 and 24.7.2; depending on whether you use the console port or Telnet.

Option 5 from **Menu 24 - System Maintenance** allows you to backup the current Prestige configuration to your computer. Backup is highly recommended once your Prestige is functioning properly. FTP and TFTP are the preferred methods for backing up your current configuration to your computer since FTP and TFTP are faster. You can also perform backup and restore using menu 24 through the console port. Any serial communications program should work fine; however, you must use Xmodem protocol to perform the download/upload and you don't have to rename the files (see *section 5.1*).

Please note that the terms “download” and “upload” are relative to the computer. Download means to transfer from the Prestige to the computer, while upload means from your computer to the Prestige.

5.2.1 Backup Configuration

Follow the instructions as shown in the next screen.

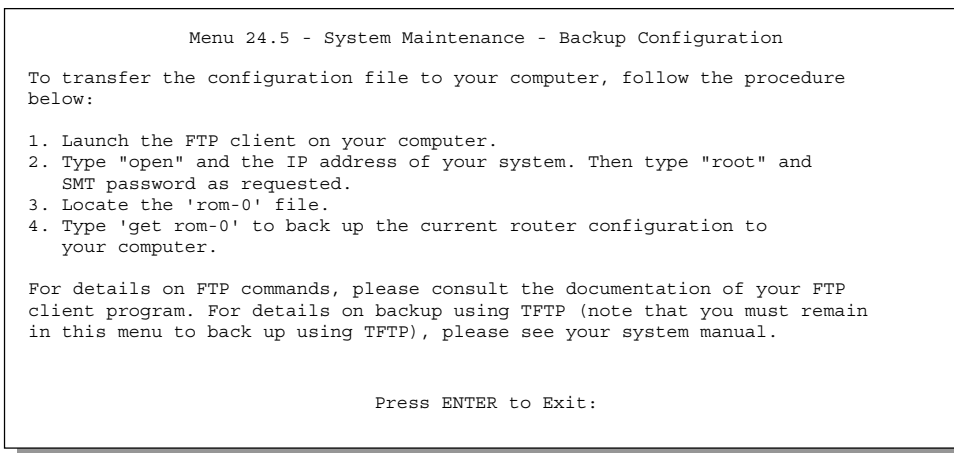


Figure 5-1 Telnet in Menu 24.5

5.2.2 Using the FTP Command from the DOS Prompt

- Step 1.** Launch the FTP client on your computer.
- Step 2.** Enter “open”, followed by a space and the IP address of your Prestige.
- Step 3.** Press [ENTER] when prompted for a username.
- Step 4.** Enter your password as requested (the default is “1234”).
- Step 5.** Enter “bin” to set transfer mode to binary.
- Step 6.** Use “get” to transfer files from the Prestige to the computer, for example, “get rom-0 config.rom” transfers the configuration file on the Prestige to your computer and renames it “config.rom”. See earlier in this chapter for more information on filename conventions.
- Step 7.** Enter “quit” to exit the ftp prompt.

5.2.3 Example of FTP Commands from the DOS Prompt

```

331 Enter PASS command
Password:
230 Logged in
ftp> bin
200 Type I OK
ftp> get rom-0 zyxel.rom
200 Port command okay
150 Opening data connection for STOR ras
226 File received OK
ftp: 16384 bytes sent in 1.10Seconds 297.89Kbytes/sec.
ftp> quit

```

Figure 5-2 FTP Session Example

5.2.4 Third Party FTP Clients

The following table describes some of the commands that you may see in third party FTP clients.

Table 5-2 General Commands for Third Party FTP Clients

COMMAND	DESCRIPTION
Host Address	Enter the address of the host server.
Login Type	Anonymous. This is when a user I.D. and password is automatically supplied to the server for anonymous access. Anonymous logins will work only if your NSP or service administrator has enabled this option. Normal. The server requires a unique User ID and Password to login.
Transfer Type	Transfer files in either ASCII (plain text format) or in binary mode.
Initial Remote Directory	Specify the default remote directory (path).
Initial Local Directory	Specify the default local directory (path).

5.2.5 TFTP and FTP over WAN Will Not Work When

- Telnet service is disabled.
- A filter is applied to block Telnet service.
- There is a SMT console session running.

5.2.6 Backup Configuration Using TFTP

The Prestige supports the up/downloading of the firmware and the configuration file using TFTP (Trivial File Transfer Protocol) over LAN. Although TFTP should work over WAN as well, it is not recommended.

To use TFTP, your computer must have both telnet and TFTP clients. To backup the configuration file, follow the procedure shown next.

- Step 1.** Use telnet from your computer to connect to the Prestige and log in. Because TFTP does not have any security checks, the Prestige records the IP address of the telnet client and accepts TFTP requests only from this address.
- Step 2.** Put the SMT in command interpreter (CI) mode by entering 8 in **Menu 24 – System Maintenance**.
- Step 3.** Enter command “sys stdio 0” to disable the SMT timeout, so the TFTP transfer will not be interrupted. Enter command “sys stdio 5” to restore the five-minute SMT timeout (default) when the file transfer is complete.
- Step 4.** Launch the TFTP client on your computer and connect to the Prestige. Set the transfer mode to binary before starting data transfer.
- Step 5.** Use the TFTP client (see the example below) to transfer files between the Prestige and the computer. The file name for the configuration file is “rom-0” (rom-zero, not capital o).

Note that the telnet connection must be active and the SMT in CI mode before and during the TFTP transfer. For details on TFTP commands (see following example), please consult the documentation of your TFTP client program. For UNIX, use “get” to transfer from the Prestige to the computer and “binary” to set binary transfer mode.

5.2.7 TFTP Command Example

The following is an example tftp command:

```
TFTP [-i] host get rom-0 config.rom
```

where “i” specifies binary image transfer mode (use this mode when transferring binary files), “host” is the Prestige IP address, “get” transfers the file source on the Prestige (rom-0 name of the configuration file on the Prestige) to the file destination on the computer and renames it config.rom.

5.2.8 Third Party TFTP Clients

The following table describes some of the fields that you may see in third party TFTP clients.

Table 5-3 General Commands for Third Party TFTP Clients

COMMAND	DESCRIPTION
Host	Enter the IP address of the Prestige. 192.168.1.1 is the Prestige's default IP address when shipped.
Send/Fetch	Use "Send" to upload the file to the Prestige and "Fetch" to back up the file on your computer.
Local File	Enter the path and name of the firmware file (*.bin extension) or configuration file (*.rom extension) on your computer.
Remote File	This is the filename on the Prestige. The filename for the firmware is "ras" and for the configuration file, is "rom-0".
Binary	Transfer the file in binary mode.
Abort	Stop transfer of the file.

Refer to *section 5.2.5* to read about configurations that disallow TFTP and FTP over WAN.

5.2.9 Backup Via Console Port

Backup configuration via console port by following the HyperTerminal procedure shown next. Procedures using other serial communications programs should be similar.

Step 1. Display menu 24.5 and enter "y" at the following screen.

```
Ready to backup Configuration via Xmodem.
Do you want to continue (y/n):
```

Figure 5-3 System Maintenance — Backup Configuration

Step 2. The following screen indicates that the Xmodem download has started.

```
You can enter ctrl-x to terminate operation any time.
Starting XMODEM download...
```

Figure 5-4 System Maintenance — Starting Xmodem Download Screen

Step 3. Run the HyperTerminal program by clicking **Transfer**, then **Receive File** as shown in the following screen.

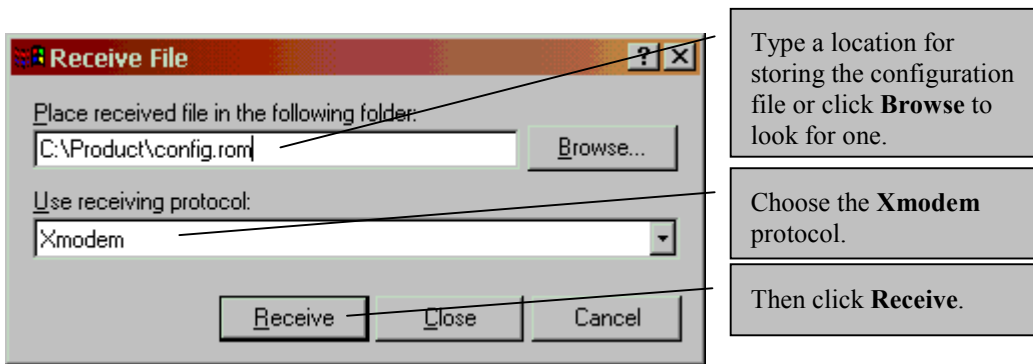


Figure 5-5 Backup Configuration Example

Step 4. After a successful backup you will see the following screen. Press any key to return to the SMT menu.

```
** Backup Configuration completed. OK.
### Hit any key to continue.###
```

Figure 5-6 Successful Backup Confirmation Screen

5.3 Restore Configuration

This section shows you how to restore a previously saved configuration. Note that this function erases the current configuration before restoring a previous back up configuration; please do not attempt to restore unless you have a backup configuration file stored on disk.

FTP and TFTP are the preferred methods for restoring your current computer configuration to your Prestige since FTP and TFTP are faster. Please note that you must restart the system after the file transfer is complete.

WARNING!

DO NOT INTERRUPT THE FILE TRANSFER PROCESS AS THIS MAY PERMANENTLY DAMAGE YOUR PRESTIGE. WHEN THE RESTORE CONFIGURATION PROCESS IS COMPLETE, THE PRESTIGE WILL AUTOMATICALLY RESTART.

5.3.1 Restore Using FTP or TFTP

For details about backup using (T)FTP please refer to earlier sections on FTP and TFTP file upload in this chapter.

```
Menu 24.6 -- System Maintenance - Restore Configuration

To transfer the firmware and configuration file to your computer, follow the
procedure below:

1. Launch the FTP client on your computer.
2. Type "open" and the IP address of your system. Then type "root" and
   SMT password as requested.
3. Type "put backupfilename rom-0" where backupfilename is the name of
   your backup configuration file on your computer and rom-0 is the
   remote file name on the system. This restores the configuration to
   your system.
4. The system reboots automatically after a successful file transfer

For details on FTP commands, please consult the documentation of your FTP
client program. For details on backup using TFTP (note that you must remain
in this menu to back up using TFTP), please see your system manual.

Press ENTER to Exit:
```

Figure 5-7 Telnet into Menu 24.6

- Step 1.** Launch the FTP client on your computer.
- Step 2.** Enter “open”, followed by a space and the IP address of your Prestige.
- Step 3.** Press [ENTER] when prompted for a username.
- Step 4.** Enter your password as requested (the default is “1234”).
- Step 5.** Enter “bin” to set transfer mode to binary.
- Step 6.** Find the “rom” file (on your computer) that you want to restore to your Prestige.
- Step 7.** Use “put” to transfer files from the Prestige to the computer, for example, “put config.rom rom-0” transfers the configuration file on the Prestige to your computer and renames it “config.rom”. See earlier in this chapter for more information on filename conventions.
- Step 8.** Enter “quit” to exit the ftp prompt. The Prestige will automatically restart after a successful restore process.

5.3.2 Restore Using FTP or TFTP Session Example

```
ftp> put config.rom rom-0
200 Port command okay
150 Opening data connection for STOR rom-0
226 File received OK
221 Goodbye for writing flash
ftp: 16384 bytes sent in 0.06Seconds 273.07Kbytes/sec.
ftp>quit
```

Figure 5-8 Restore Using FTP or TFTP Session Example

Refer to *section 5.2.5* to read about configurations that disallow TFTP and FTP over WAN.

5.3.3 Restore Via Console Port

Restore configuration via console port by following the HyperTerminal procedure shown next. Procedures using other serial communications programs should be similar.

Step 1. Display menu 24.6 and enter “y” at the following screen.

```
Ready to restore Configuration via Xmodem.
Do you want to continue (y/n):
```

Figure 5-9 System Maintenance — Restore Configuration

Step 2. The following screen indicates that the Xmodem download has started.

```
Starting XMODEM download (CRC mode) ...
CCCCCCCC
```

Figure 5-10 System Maintenance — Starting Xmodem Download Screen

Step 3. Run the HyperTerminal program by clicking **Transfer**, then **Receive File** as shown in the following screen.

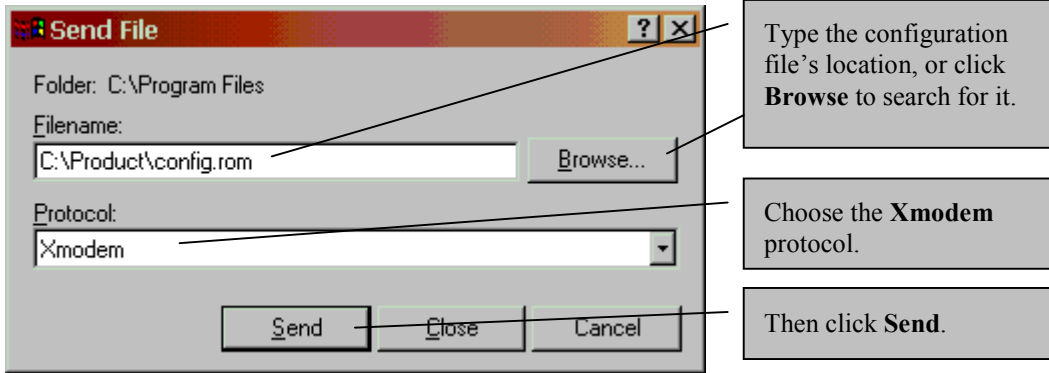


Figure 5-11 Restore Configuration Example

Step 4. After a successful restoration you will see the following screen. Press any key to restart the Prestige and return to the SMT menu.

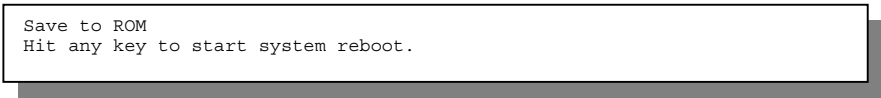


Figure 5-12 Successful Restoration Confirmation Screen

5.4 Uploading Firmware and Configuration Files

This section shows you how to upload firmware and configuration files. You can upload configuration files by following the procedure in the previous *Restore Configuration* section or by following the instructions in **Menu 24.7.2 - System Maintenance - Upload System Configuration File** (for console port).

WARNING!

DO NOT INTERRUPT THE FILE TRANSFER PROCESS AS THIS MAY PERMANENTLY DAMAGE YOUR PRESTIGE.

5.4.1 Firmware File Upload

FTP is the preferred method for uploading the firmware and configuration files. To use this feature, your computer must have an FTP client.

When you telnet into the Prestige, you will see the following screens for uploading firmware and the configuration file using FTP.

```
Menu 24.7.1 - System Maintenance - Upload System Firmware

To upload the system firmware, follow the procedure below:

1. Launch the FTP client on your computer.
2. Type "open" and the IP address of your system. Then type "root" and
   SMT password as requested.
3. Type "put firmwarefilename ras" where "firmwarefilename" is the name
   of your firmware upgrade file on your workstation and "ras" is the
   remote file name on the system.
4. The system reboots automatically after a successful firmware upload.

For details on FTP commands, please consult the documentation of your FTP
client program. For details on uploading system firmware using TFTP (note
that you must remain on this menu to upload system firmware using TFTP),
please see your manual.

Press ENTER to Exit:
```

Figure 5-13 Telnet Into Menu 24.7.1 — Upload System Firmware

5.4.2 Configuration File Upload

You see the following screen when you telnet into menu 24.7.2.

```
Menu 24.7.2 - System Maintenance - Upload System Configuration File

To upload the system configuration file, follow the procedure below:

1. Launch the FTP client on your computer.
2. Type "open" and the IP address of your system. Then type "root" and
   SMT password as requested.
3. Type "put configurationfilename rom-0" where "configurationfilename"
   is the name of your system configuration file on your computer, which
   will be transferred to the "rom-0" file on the system.
4. The system reboots automatically after the upload system configuration
   file process is complete.

For details on FTP commands, please consult the documentation of your FTP
client program. For details on uploading system firmware using TFTP (note
that you must remain on this menu to upload system firmware using TFTP),
please see your manual.

Press ENTER to Exit:
```

Figure 5-14 Telnet Into Menu 24.7.2 — System Maintenance

To upload the firmware and configuration files, follow these examples:

FTP File Upload Command from the DOS Prompt Example

- Step 1.** Launch the FTP client on your computer.
- Step 2.** Enter “open”, followed by a space and the IP address of your Prestige.
- Step 3.** Press [ENTER] when prompted for a username.
- Step 4.** Enter your password as requested (the default is “1234”).
- Step 5.** Enter “bin” to set transfer mode to binary.
- Step 6.** Use “put” to transfer files from the computer to the Prestige, for example, “put firmware.bin ras” transfers the firmware on your computer (firmware.bin) to the Prestige and renames it “ras”. Similarly “put config.rom rom-0” transfers the configuration file on your computer (config.rom) to the Prestige and renames it “rom-0”. Likewise “get rom-0 config.rom” transfers the configuration file on the Prestige to your computer and renames it “config.rom.” See earlier in this chapter for more information on filename conventions.
- Step 7.** Enter “quit” to exit the ftp prompt.

5.4.3 FTP Session Example of Firmware File Upload

```
331 Enter PASS command
Password:
230 Logged in
ftp> bin
200 Type I OK
ftp> put firmware.bin ras
200 Port command okay
150 Opening data connection for STOR ras
226 File received OK
ftp: 1103936 bytes sent in 1.10Seconds 297.89Kbytes/sec.
ftp> quit
```

Figure 5-15 FTP Session Example of Firmware File Upload

More commands (found in third party FTP clients), are listed earlier in this chapter.

Refer to *section 5.2.5* to read about configurations that disallow TFTP and FTP over WAN.

5.4.4 TFTP File Upload

The Prestige also supports the uploading of firmware files using TFTP (Trivial File Transfer Protocol) over LAN. Although TFTP should work over WAN as well, it is not recommended.

To use TFTP, your computer must have both telnet and TFTP clients. To transfer the firmware and configuration files, follow the procedure shown next.

- Step 1.** Use telnet from your computer to connect to the Prestige and log in. Because TFTP does not have any security checks, the Prestige records the IP address of the telnet client and accepts TFTP requests only from this address.
- Step 2.** Put the SMT in command interpreter (CI) mode by entering 8 in **Menu 24 – System Maintenance**.
- Step 3.** Enter the command “sys stdio 0” to disable the console timeout, so the TFTP transfer will not be interrupted. Enter “command sys stdio 5” to restore the five-minute console timeout (default) when the file transfer is complete.
- Step 4.** Launch the TFTP client on your computer and connect to the Prestige. Set the transfer mode to binary before starting data transfer.
- Step 5.** Use the TFTP client (see the example below) to transfer files between the Prestige and the computer. The file name for the firmware is “ras”.

Note that the telnet connection must be active and the Prestige in CI mode before and during the TFTP transfer. For details on TFTP commands (see following example), please consult the documentation of your TFTP client program. For UNIX, use “get” to transfer from the Prestige to the computer, “put” the other way around, and “binary” to set binary transfer mode.

5.4.5 TFTP Upload Command Example

The following is an example tftp command:

```
TFTP [-i] host put firmware.bin ras
```

where “i” specifies binary image transfer mode (use this mode when transferring binary files), “host” is the Prestige’s IP address, “put” transfers the file source on the computer (firmware.bin – name of the firmware on the computer) to the file destination on the remote host (ras - name of the firmware on the Prestige).

Commands that you may see in third party TFTP clients are listed earlier in this chapter.

5.4.6 Uploading Via Console Port

FTP or TFTP are the preferred methods for uploading firmware to your Prestige. However in the event of your network being down, uploading files is only possible with a direct connection to your Prestige via the console port. Uploading files via the console port under normal conditions is not recommended since FTP or TFTP is faster. Any serial communications program should work fine; however, you must use the Xmodem protocol to perform the download/upload.

5.4.7 Uploading a Firmware File Via Console Port

Step 1. Select 1 from **Menu 24.7 – System Maintenance – Upload Firmware** to display **Menu 24.7.1 - System Maintenance - Upload System Firmware**, then follow the instructions as shown in the following screen.

```

Menu 24.7.1 - System Maintenance - Upload System Firmware

To upload system firmware:
1. Enter "y" at the prompt below to go into debug mode.
2. Enter "atur" after "Enter Debug Mode" message.
3. Wait for "Starting XMODEM upload" message before activating
   Xmodem upload on your terminal.
4. After successful firmware upload, enter "atgo" to restart the
   system.

Warning: Proceeding with the upload will erase the current router
firmware.

Do You Wish To Proceed:(Y/N)

```

Figure 5-16 Menu 24.7.1 as seen using the Console Port

Step 2. After the "Starting Xmodem upload" message appears, activate the Xmodem protocol on your computer. Follow the procedure as shown previously for the HyperTerminal program. The procedure for other serial communications programs should be similar.

5.4.8 Example Xmodem Firmware Upload Using HyperTerminal

Click **Transfer**, then **Send File** to display the following screen.

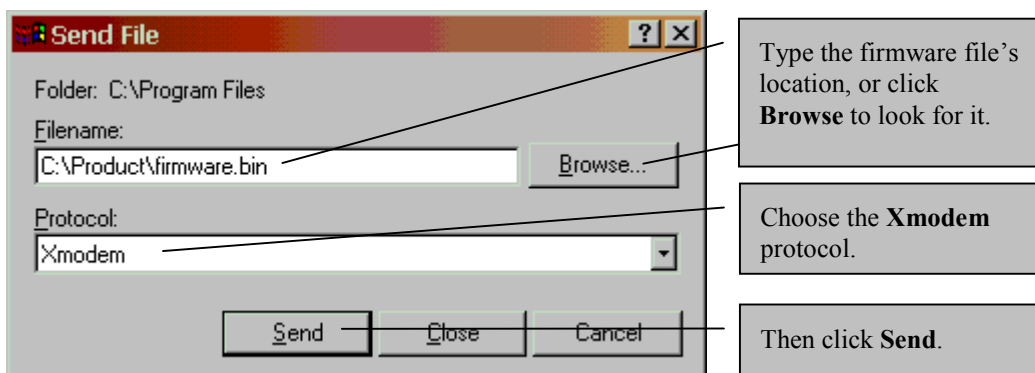


Figure 5-17 Example Xmodem Upload

After the firmware upload process has completed, the Prestige will automatically restart.

5.4.9 Uploading a Configuration File Via Console Port

- Step 1.** Select 2 from **Menu 24.7 – System Maintenance – Upload Firmware** to display **Menu 24.7.2 - System Maintenance - Upload System Configuration File**. Follow the instructions as shown in the next screen.

```
Menu 24.7.2 - System Maintenance - Upload System Configuration File

To upload system configuration file:
1. Enter "y" at the prompt below to go into debug mode.
2. Enter "atlc" after "Enter Debug Mode" message.
3. Wait for "Starting XMODEM upload" message before activating
   Xmodem upload on your terminal.
4. After successful firmware upload, enter "atgo" to restart the
   system.

Warning:
1. Proceeding with the upload will erase the current
   configuration file.
2. The system's console port speed (Menu 24.2.2) may change
   when it is restarted; please adjust your terminal's speed
   accordingly. The password may change (menu 23), also.
3. When uploading the DEFAULT configuration file, the console
   port speed will be reset to 9600 bps and the password to
   "1234".

Do You Wish To Proceed: (Y/N)
```

Figure 5-18 Menu 24.7.2 as seen using the Console Port

- Step 2.** After the "Starting Xmodem upload" message appears, activate the Xmodem protocol on your computer. Follow the procedure as shown previously for the HyperTerminal program. The procedure for other serial communications programs should be similar.

- Step 3.** Enter "atgo" to restart the Prestige.

5.4.10 Example Xmodem Configuration Upload Using HyperTerminal

Click **Transfer**, then **Send File** to display the following screen.

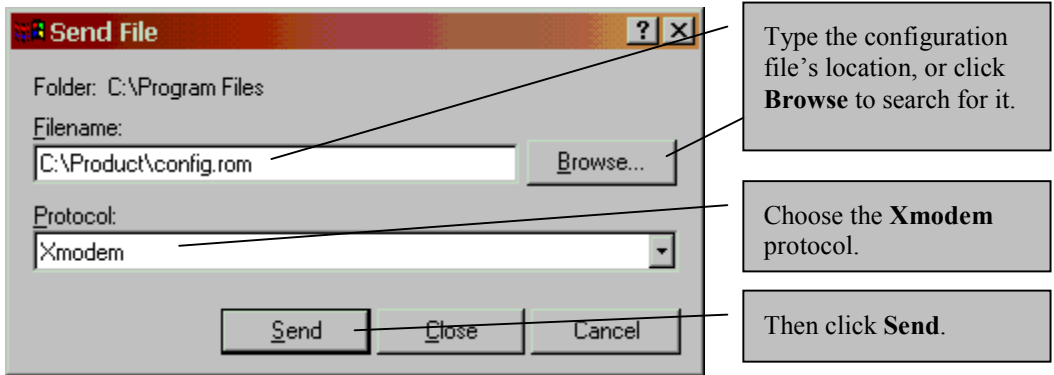


Figure 5-19 Example Xmodem Upload

After the configuration upload process has completed, restart the Prestige by entering “atgo”.

Chapter 6

Troubleshooting

This chapter covers potential problems and the corresponding remedies.

Table 6-1 Problems Starting the Prestige

PROBLEM	CORRECTIVE ACTION	
No LEDs are on when I turn on the Prestige.	Check the connection between the adapter and the Prestige. If this error persists, you may have a hardware problem. If this is the case, you should contact your vendor.	
Cannot access the Prestige via the console port.	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. It should be configured as follows:	VT100 terminal emulation.
		9600 bps is the Prestige's factory default speed. Try other speeds in case it has been changed.
		No parity, 8 data bits, 1 stop bit, no flow control.

Table 6-2 Problems Connecting with the WAN or Channel/ISP

PROBLEM	CORRECTIVE ACTION
Cannot initialize the PVC connection.	Verify the xDSL port/wall jack cable connection. The xDSL LED should be on. If not, verify in menu 24.1 that the Line Status is Down. Wait ten minutes until the PVC synchronizes and the field reads Up. If the field does not eventually read Up, verify in menu 2 that Service Type (Client or Server) and Transfer Rate are the same as the peer. If problems persist, check with the telephone company, ISP and/or the peer device (in a LAN-to-LAN application).
Cannot connect to a channel or ISP.	Check menu 11.1 to verify the correct Encapsulation for the channel. Check remote management configuration in menu 11.1.

Appendix A

Power Adapter Specifications

Diagram 1 Power Adapter Specifications

NORTH AMERICAN PLUG STANDARDS		
AC Power Adapter Model	MW41-0901000A	
Input Power	AC120Volts/60Hz/13W	
Output Power	AC9Volts/1.0A	
Power Consumption	10 W	
Safety Standards	UL, CUL (UL 1310, CSA C22.2 No.233-M91)	
EUROPEAN PLUG STANDARDS		
AC Power Adapter Model	JAA-091000E	DV-91AACUP
Input Power	AC230Volts/50Hz/65mA	AC230Volts/50Hz/85mA
Output Power	AC9Volts/1.0A	AC9Volts/1.0A
Power Consumption	10 W	10 W
Safety Standards	TUV, CE (EN 60950)	
UNITED KINGDOM PLUG STANDARDS		
AC Power Adapter Model	AD-0901000AK	
Input Power	AC230Volts/50Hz/0.2A	
Output Power	AC9Volts/1.0A	
Power Consumption	10 W	
Safety Standards	TUV, CE (EN 60950, BS 7002)	
AUSTRALIAN AND NEW ZEALAND PLUG STANDARDS		
AC Power Adapter Model	JAA-0901000AS	
Input Power	AC240Volts/50Hz/130mA	
Output Power	AC9Volts/1.0A	
Power Consumption	10 W	
Safety Standards	NATA (AS 3260)	

Appendix B

TCP/IP

This appendix describes how to prepare your computer and computer network to connect to the Internet.

Introduction

Since most Internet-related/network-related protocols are dependent on TCP/IP, you need to install and configure TCP/IP on your computer before you can access the Internet.

Windows 95/98/Me/NT/2000, Macintosh OS 7 and later operating systems and all versions of UNIX and LILINUX all include the software components you need to install and use TCP/IP on your computer. Windows 3.1 will require the purchase of a third-party TCP/IP application package.

Installing TCP/IP Components for Windows 95/98/Me

You need to open the Network window to add and to configure TCP/IP.

1. Click **Start** in the task bar (usually at the lower left-hand corner of the screen).
2. Move the mouse to **Settings** and then click **Control Panel**.
3. In the **Control Panel** window, double-click the **Network** icon to open it.

The network window displays a list of installed components. You need a network adapter, the TCP/IP protocol and Client for Microsoft Networks.

If you need the adapter:

- a. In the **Network** window, click **Add**.
- b. Select **Adapter** and then click **Add**.
- c. Select the manufacturer and model of you network adapter, and then click **OK**.

If you need TCP/IP:

- a. In the **Network** window, click **Add**.
- b. Select **Protocol** and then click **Add**.
- c. Select **Microsoft** from the list of manufacturers.
- d. Select **TCP/IP** from the list of network protocols and then click **OK**.

If you need Client for Microsoft Networks:

- a. Click **Add**.
- b. Select Client and then click **Add**.
- c. Select **Microsoft** from the list of manufacturers.
- d. Select **Client for Microsoft Networks** from the list of network clients and then click **OK**.
- e. Restart your computer so the changes you made take effect.

Configuration

After you have installed the appropriate TCP/IP components, you must assign your computer information related to it so that it can “communicate” with your network. The simplest way to achieve this is to have your computer automatically acquire this information using DHCP (Dynamic Host Control Protocol).

Configuring TCP/IP for Windows 95/98/Me Using DHCP

1. Install TCP/IP on each computer, leaving the computer configured to obtain configuration settings automatically (by DHCP).
2. Connect your Ethernet-interfaced computer to the Prestige
3. Restart the Prestige and allow it to boot.
4. Restart each computer.

Configuring TCP/IP for Windows 95/98/Me via Windows using Static Assignment (not using DHCP)

95.98.Me:

1. In the **Network** window, click the **TCP/IP** entry to select it and click the **Properties** button.
2. In the **TCP/IP Properties** window, select **Obtain an IP address automatically**.
3. Click the **WINS Configuration** tab and select **Disable WINS Resolution**.
4. Click the **Gateway** tab. Highlight any installed gateways and click the **Remove** button until there are none listed.
5. Click the **DNS Configuration** tab and select **Disable DNS**.
6. Click **OK** to save and close the **TCP/IP Properties** window.
7. Click **OK** to close the **Network** window. You will be prompted to insert your Windows CD.

When the drivers are updated, you will be asked if you want to restart your computer. Make sure your Prestige is on before clicking **Yes** at the prompt.

Configuring TCP/IP for Windows NT/2000

1. From **Network and Dial-up Connections**, right-click the **Local Area Connections** icon and click **Properties**.
2. Select the **Internet Protocol (TCP/IP)** entry and click the **Properties** button.
3. Select **Obtain an IP address automatically** and click the **Advanced** button. Note: Do not assign an arbitrary IP address or subnet mask to you computer, if you do, you will not be able to access the Internet.
4. Select any installed gateways and click the **Remove** button until there are none listed.
5. Click the **WINS** tab, select any WINS addresses and click the **Remove** button until there are none listed.
6. Click the **DNS** tab and select any DNS addresses. Click the **Remove** button until there are none listed.
7. Click **OK** to save and close the **Advanced TCP/IP Properties** window.
8. Click **OK** to close the **Connection Properties** window. Restart your computer if prompted, making sure that your Prestige is turned on first.

Verifying TCP/IP Properties in Windows 95/98/Me

Use the Windows 95/98/Me utility *winnpcfg.exe*.

1. In the taskbar, click **Start** and then **Run**.
2. In the Run window, type “winnpcfg” and then click **OK**. The IP Configuration window open and list information such as your computer’s IP address, subnet mask and default gateway.
3. Select your network adapter.
4. The window should update your current settings that should match the factory default TCP/IP values of the Prestige. The defaults are as follows:
 - IP Address is between 192.168.0.33 and 192.168.0.64
 - Subnet Mask: 255.255.255.0
 - Default Gateway: 192.168.1.1 (the Prestige)

Verifying TCP/IP Properties in Windows NT/2000

Use the Windows 2000 utility *ipconfig.exe*.

In the taskbar, click **Start**, **Program Files**, **Accessories**, and then **Command Prompt**.

In the Command Prompt window, type “ipconfig” and then press [ENTER]. The window will display information about your connection-specific DNS suffix, IP address, subnet mask and default gateway.

Configuring TCP/IP for the Macintosh

Beginning with Macintosh Operating System 7, TCP/IP is already installed on the Macintosh. On each networked Macintosh, you will need to configure TCP/IP to use DHCP by following these steps:

1. From the Apple menus, select **Control Panels**, then **TCP/IP**. The TCP/IP Control Panel opens:
2. From the “Connect Via” box, select your Macintosh’s Ethernet interface.
3. From the “Configure” box, select **Using DHCP Server**. You can leave the DHCP Client ID box empty.
4. Close the TCP/IP Control Panel.

Repeat this for each Macintosh on your network.

Verifying TCP/IP Properties for the Macintosh

After your Macintosh is configured and has restarted, you can check the TCP/IP configuration by returning to the TCP/IP Control Panel. From the Apple menu, select **Control Panels**, then **TCP/IP**.

The panel is updated to show your settings, which should match the values below if you are using the default TCP/IP settings:

- The IP Address is between 192.168.0.33 and 192.168.0.64
- The Subnet mask is 255.255.255.0
- The Router address is 192.168.1.1 (the Prestige)

If you do not see these values, you may need to restart your Macintosh or you may need to switch the “Configure” setting to a different option, then back again to “Using DHCP Server”.

Your Internet Account

If you want Internet Access, you need to contact an ISP (Internet Service Provider) for an Internet access account. For a single user account, the ISP supplies you with TCP/IP configuration information. Typically, this information is dynamically (automatically) assigned via DHCP but in most cases you will need to enter at least some information manually.

Appendix C

Virtual Circuit Topology

ATM is a connection-oriented technology, meaning that it sets up virtual circuits over which end systems communicate. The terminology for virtual circuits is as follows:

- **Virtual Circuit** A path between points in a network
- **Virtual Path** A bundle of virtual channels
- **Virtual Channel** Logical connections between end stations

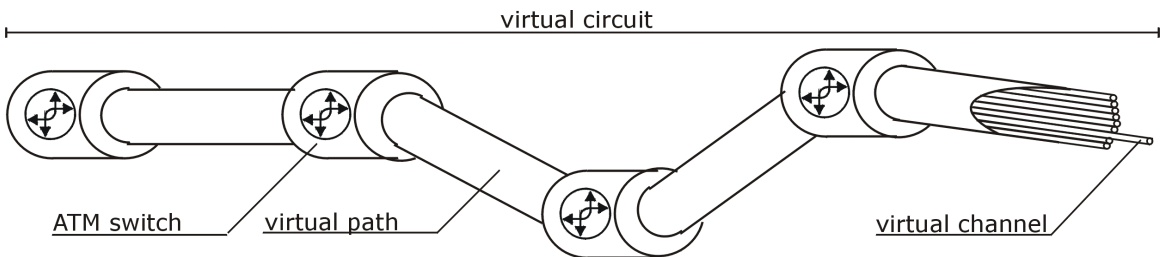


Diagram 2 Virtual Circuit Topology

Think of a virtual path as a cable that contains a bundle of wires. The cable connects two points and wires within the cable provide individual circuits between the two points. In an ATM cell header, a VPI (Virtual Path Identifier) identifies a link formed by a virtual path; a VCI (Virtual Channel Identifier) identifies a channel within a virtual path. The VPI and VCI are identified by, and correspond to, termination points at ATM switches on a virtual circuit. Your service provider should supply you with VPI/VCI numbers.

Glossary

100Base-T	Uses two pairs of twisted-pair wire with a maximum distance of 100 meters between the hub and the workstation.
10Base-T	The 10-Mbps baseband Ethernet specification that uses two pairs of twisted-pair cabling (Category 3 or 5), one pair for transmitting data and the other for receiving data.
ADSL	Asymmetrical Digital Subscriber Line is an asymmetrical technology which means that the downstream data rate of the line is much higher than the upstream data rate. ADSL operates in a frequency range that is above the frequency range of voice services, so the two systems can operate over the same cable.
Analog	An electrical circuit that is represented by means of continuous, variable physical quantities (such as voltages and frequencies), as opposed to discrete representations (like the 0/1, off/on representation of digital circuits).
ARP	Address Resolution Protocol is a protocol for mapping an Internet Protocol address (IP address) to a physical computer address that is recognized in the local network.
ATM	Asynchronous Transfer Mode. ATM is a LAN and WAN networking technology that provides high-speed data transfer. ATM uses fixed sized packets of information called cells. With ATM, a high QoS (Quality of Service) can be guaranteed.
Backbone	A high-speed line or series of connections that forms a major pathway within a network.
Bandwidth	This is the capacity on a link usually measured in bits-per-second (bps).
Bit	A Binary Digit (either a one or a zero); a single digit number in base-2. A bit is the smallest unit of computerized data.
Bridging	Bridging provides LAN to LAN frame forwarding services between two or more LANs. Frames from one LAN are forwarded across a bridge to a connected LAN, although filtering can be employed to selectively forward frames. Bridging works similar to the way repeaters work except that bridges forward frames based on their MAC (Medium Access Control) addresses which are hardware-level addresses of NICs (Network Interface Cards).
Byte	A set of bits that represent a single character. There are eight bits in a byte.
CHAP	Challenge Handshake Authentication Protocol is an alternative protocol that avoids sending passwords over the wire by using a challenge/response technique.
Client	A software program that is used to contact and obtain data from a server software program on another computer. Each client program is designed to work with one or more specific kinds of Server programs and each server requires a specific kind of

	client. A web browser, for example, is a specific kind of client.
CO	Central Office. A CO is a facility that serves local telephone subscribers. In the CO, subscribers' lines are joined to switching equipment that allows them to connect to each other for both local and long distance calls.
COE	Central Office Equipment. COE is where home and office phone lines terminate and connect to a much larger switching system.
CPE	Customer Premise Equipment. CPE is privately-owned telecommunication equipment at an organization's site that is attached to the telecommunication network. CPE includes routers, modems, PBXs, telephones, key systems, facsimile products, voice processing equipment and video communication equipment.
Crossover Ethernet Cable	A cable that wires a pin to its opposite pin, for example, RX+ is wired to TX+. This cable connects two similar devices, for example, two data terminal equipment (DTE) or data communications equipment (DCE) devices.
CSU/DSU	Channel Service Unit/Data Service Unit. CSUs and DSUs are actually two separate devices, but they are used in conjunction and often combined into the same box. CSU/DSU are hardware devices that convert digital signals used on a LAN into a digital signal used on a WAN and vice-versa (over a T-1 line, for example). These devices are part of the hardware you need to connect computer equipment to digital transmission lines. The CSU device connects with the digital communication line and provides a termination for the digital signal. The DSU device, sometimes called a digital service unit, is the hardware component you need to transmit digital data over the hardware channel. This device converts signals from bridges, routers and multiplexors into the bipolar digital signals used by the digital lines. Multiplexors mix voice signals and data on the same line.
DCE	Data Communications Equipment is typically a modem or other type of communication device. The DCE sits between the DTE (data terminal equipment) and a transmission circuit such as a phone line.
Digital	The use of a binary code to represent information, such as 0/1, or on/off.
DLCI	Data Link Connection Identifier. A DLCI specifies the channel and destination that frame relay traffic will use.
DNS	Domain Name System links names to IP addresses. When you access Web sites on the Internet you can type the IP address of the site or the DNS name. When you type a domain name in a Web browser a query is sent to the primary DNS server defined in your Web browser's configuration dialog box. The DNS server converts the name you specified to an IP address and returns this address to your system. Thereafter, the IP address is used in all subsequent communications.

Domain Name	The unique name that identifies an Internet site. Domain Names always have two or more parts that are separated by dots. The part on the left is the most specific and the part on the right is the most general.
DRAM	Dynamic RAM (Random Access Memory) stores information in capacitors that must be refreshed periodically.
DSL	Digital Subscriber Line technologies enhance the data capacity of the existing twisted pair wire that runs between the local telephone company switching offices and most homes and offices. There are actually seven types of DSL service, ranging in speeds from 16 Kbits/sec to 52 Mbits/sec. The services are either symmetrical (traffic flows at the same speed in both directions) or asymmetrical (the downstream capacity is higher than the upstream capacity). DSL connections are point-to-point dedicated circuits, meaning that they are always connected. There is no dial-up. There is also no switching, which means that the line is a direct connection into the carrier's frame relay, ATM (Asynchronous Transfer Mode) or Internet-connect system.
DSLAM	A Digital Subscriber Line Access Multiplexor (DSLAM) is a network device, usually at a telephone company central office, that receives signals from multiple customer Digital Subscriber Line connections and puts the signals on a high-speed backbone line using multiplexing techniques. Depending on the product, DSLAM multiplexers connect DSL lines with some combination of asynchronous transfer mode ATM, frame relay or IP networks.
DTE	Originally, Data Terminal Equipment meant Dumb Terminal Equipment. But today it is a computer, bridge or router that interconnects local area networks (LANs) in increasingly more intelligent ways.
EMI	ElectroMagnetic Interference. Interference by electromagnetic signals that can cause reduced data integrity and increased error rates on transmission channels.
Encapsulation	Encapsulation is the inclusion of one data structure within another structure so that the first data structure is hidden for the time being.
Ethernet	A very common method of networking computers in a LAN. There are a number of adaptations to the IEEE 802.3 Ethernet standard, including adaptations with data rates of 10 Mbits/sec and 100 Mbits/sec over coaxial cable, twisted-pair cable and fiber-optic cable. The latest version of Ethernet, Gigabit Ethernet, has a data rate of 1 Gbit/sec.
FAQ	Frequently Asked Questions. FAQs are documents that list and answer the most common questions on a particular subject.
FCC	The FCC (Federal Communications Commission) is in charge of allocating the electromagnetic spectrum and thus the bandwidth of various communication systems.
Flash memory	A nonvolatile storage device that can be electrically erased and reprogrammed so that data can be stored, booted and rewritten as necessary.

Frame Relay	Frame relay is a form of packet-switching technology that routes frames of information from source to destination over a switching network owned by a carrier. Frame sizes are not fixed.
G.SHDSL	A Single-pair High-speed Digital Subscriber Line is a symmetrical, bi-directional DSL service that operates on one twisted-pair wire. The “G.” in “G.SHDSL” refers to ITU (International Telecommunication Union) “G” standards. G.SHDSL provides data rates from 192kbps up to 2.3 Mbps at distances of 6,000 feet to 20,000 feet on 26 AWG copper. Unlike traditional HDSL systems, which use two twisted pair, G.SHDSL reduces equipment and lease-line costs by providing the same service using only one twisted pair. See also DSL.
Gateway	A gateway is a computer system or other device that acts as a translator between two systems that do not use the same communication protocols, data formatting structures, languages, and/or architecture.
HDLC	High-level Data Link Control is a bit-oriented (the data is monitored bit by bit), link layer protocol for the transmission of data over synchronous networks.
Host	Any computer on a network that is a repository for services available to other computers on the network. It is quite common to have one host machine provide several services, such as WWW and USENET.
HTTP	Hyper Text Transfer Protocol. The most common protocol used on the Internet. HTTP is the primary protocol used for web sites and web browsers. It is also prone to certain kinds of attacks.
IANA	Internet Assigned Number Authority acts as the clearing house to assign and coordinate the use of numerous Internet protocol parameters such as Internet addresses, domain names, protocol numbers, and more. Use a search engine to find the current IANA web site.
ICMP	Internet Control Message Protocol is a message control and error-reporting protocol between a host server and a gateway to the Internet. ICMP uses Internet Protocol (IP) datagrams, but the messages are processed by the TCP/IP software and are not directly apparent to the application user.
Inside Wiring	Wiring that is done from the point of demarcation to the jack in the wall where the line terminates.
Integrity	Proof that the data is the same as originally intended. Unauthorized software or people have not altered the original information.
Internet	(Upper case “I”). The vast collection of inter-connected networks that use TCP/IP protocols evolved from the ARPANET (Advanced Research Projects Agency Network) of the late 1960’s and early 1970’s.
internet	(Lower case “i”). Any time you connect two or more networks together, you have an

	internet.
Intranet	A private network inside a company or organization that uses the same kinds of software that you would find on the public Internet, but that is only for internal use.
IP	Internet Protocol. (Currently IP version 4 or IPv4). The underlying protocol for routing packets on the Internet and other TCP/IP-based networks.
IPCP (PPP)	IP Control Protocol allows changes to IP parameters such as the IP address.
IPX	Internetwork Packet eXchange The native NetWare internetworking protocol is IPX (Internetwork Packet Exchange). Like IP (Internet Protocol), IPX is an internetworking protocol that provides datagram services.
IRC	Internet Relay Chat. IRC was developed in the late 1980s as a way for multiple users on a system to “chat” over the network. Today IRC is a very popular way to “talk” in real time with other people on the Internet. However, IRC is also one avenue hackers use to obtain information about your system and/or company. Moreover, IRC sessions are prone to numerous attacks that, while not dangerous, can cause system crashes.
ISP	Internet Service Providers provide connections into the Internet for home users and businesses. There are local, regional, national, and global ISPs. You can think of local ISPs as the gatekeepers into the Internet.
ITU-T	The ITU-T (Telecommunication Standardization Sector of the International Telecommunications Union) is the primary international body for fostering cooperative standards for telecommunications equipment and systems. It was formerly known as the CCITT (Consultative Committee for International Telephony and Telegraphy).
LAN	Local Area Network is a shared communication system to which many computers are attached. A LAN, as its name implies, is limited to a local area. This has to do more with the electrical characteristics of the medium than the fact that many early LANs were designed for departments, although the latter accurately describes a LAN as well. LANs have different topologies, the most common being the linear bus and the star configuration.
LEC	Local Exchange Carrier. The local phone companies – either a Regional Bell Operating Company (RBOC) or an independent phone company (e.g., GTE) – that provide local transmission services.
LED	Light Emitting Diode. LEDs are visual indicators that relay information about the status of specific MII951 functions to the user by lighting up, turning off or blinking. LEDs are usually found on the front panel of the physical device. Examples include Status, Power and System LEDs.
Linux	A version of the UNIX operating system designed to run on IBM Compatible computers.

Loop-reach	Loop reach defines speed that can be attained at various distances. This is very important for DSL technology as distance from the CO (Central Office) influences attainable speeds.
MAC	On a local area network (LAN) or other network, the MAC (Media Access Control) address is a computer's unique hardware number. (On an Ethernet LAN, it's the same as your Ethernet address). The MAC layer frames data for transmission over the network, then passes the frame to the physical layer interface where it is transmitted as a stream of bits.
Multiplexor	Multiplexors or MUXs, as they are often called, are devices that combine signals from various sources such as PBX (Private Branch Exchange), asynchronous terminals or a bridge connected to a WAN. A multiplexor transmits these signals as a single data stream over a digital line. Multiplexors, among other tasks, conserve bandwidth.
Name Resolution	The allocation of an IP address to a host name. See also DNS.
NetBIOS	Network Basic Input/Output System. NetBIOS is an extension of the DOS BIOS that enables a computer to connect to and communicate with a LAN.
Network	Any time you connect two or more computers together, allowing them to share resources, you have a computer network. Connect two or more networks together and you have an internet.
NIC	Network Interface Card. A board that provides network communication capabilities to and from a computer system. Also called an adapter.
Node	Any single computer connected to a network.
PAP	Password Authentication Protocol is a security protocol that requires users to enter a password before accessing a secure system. The user's name and password are sent over the wire to a server where they are compared with a database of user account names and passwords. This technique is vulnerable to wiretapping (eavesdropping) because the password can be captured and used by someone to log onto the system.
Point of Demarcation	The physical point where the phone company ends its responsibility with the wiring of the phone line.
POP	Post Office Protocol. This is a common protocol used for sending, receiving, and delivering mail messages.
Port	An Internet port refers to a number that is part of a URL, appearing after a colon (:), directly following the domain name. Every service on an Internet server listens on a particular port number on that server. Most services have standard port numbers, e.g. Web servers normally listen on port 80.

Port (H/W)	An interface on a computer for connecting peripherals or devices to the computer. A printer port, for example, is an interface that is designed to have a printer connected to it. Ports can be defined by specific hardware (such as a keyboard port) or through software.
POTS	Plain Old Telephone Service is the analog telephone service that runs over copper twisted-pair wires and is based on the original Bell telephone system. Twisted-pair wires connect homes and businesses to a neighborhood central office. This is called the local loop. The central office is connected to other central offices and long-distance facilities.
PPP	Point to Point Protocol. PPP encapsulates and transmits IP (Internet Protocol) datagrams over serial point-to-point links. PPP works with other protocols such as IPX (Internetwork Packet Exchange). The protocol is defined in IETF (Internet Engineering Task Force) RFC 1661 through 1663. PPP provides router-to-router, host-to-router, and host-to-host connections.
Protocol	A “language” for communicating on a network. Protocols are sets of standards or rules used to define, format and transmit data across a network. There are many different protocols used on networks. For example, most web pages are transmitted using the HTTP protocol.
PSTN	Public Switched Telephone Network was put into place many years ago as a voice telephone call-switching system. The system transmits voice calls as analog signals across copper twisted cables from homes and businesses to neighborhood COs (central offices); this is often called the local loop. The PSTN is a circuit-switched system, meaning that an end-to-end private circuit is established between caller and callee.
PVC	Permanent Virtual Circuit. A PVC is a logical point-to-point circuit between customer sites. PVCs are low-delay circuits because routing decisions do not need to be made along the way. Permanent means that the circuit is preprogrammed by the carrier as a path through the network. It does not need to be set up or torn down for each session.
ras	This is the name of the firmware on the ZyXEL device. Renaming may be necessary when uploading new firmware to the device.
RBOC	Regional Bell Operating Company. There are currently seven regional telephone companies that were created by the AT&T divestiture.
RFC	An RFC (Request for Comments) is an Internet formal document or standard that is the result of committee drafting and subsequent review by interested parties. Some RFCs are informational in nature. Of those that are intended to become Internet standards, the final version of the RFC becomes the standard and no further comments or changes are permitted. Change can occur, however, through subsequent

	RFCs.
RIP	Routing Information Protocol is an interior or intra-domain routing protocol that uses distance-vector routing algorithms. RIP is used on the Internet and is common in the NetWare environment as a method for exchanging routing information between routers.
Rom-0	This is the name of the configuration file on your ZyXEL device. Renaming may be necessary when uploading a new configuration file to your ZyXEL device.
Router	A device that connects two networks together. Routers monitor, direct and filter information that passes between these networks. Because of their location, routers are a good place to install traffic or mail filters. Routers are also prone to attacks because they contain a great deal of information about a network.
SAP	In NetWare, the SAP (Service Advertising Protocol) broadcasts information about available services on the network that other network devices can listen to. A server sends out SAP messages every 60 seconds. A server also sends out SAP messages to inform other devices that it is closing down. Workstations use SAP to find services they need on the network.
SDSL	A Symmetrical Digital Subscriber Line is a symmetrical, bi-directional DSL service that operates on one twisted-pair wire. It can provide data rates up to the T1 rate of 1.544 Mbps/sec, and it operates above the voice frequency, so voice and data can be carried on the same wire.
Server	A computer, or a software package, that provides a specific kind of service to client software running on other computers.
SMT	System Management Terminal. The SMT is a menu-based interface that you use to configure your device.
Splitter	In telephony, a splitter, sometimes called a "plain old telephone service splitter" is a device that divides a telephone signal into two or more signals, each carrying a selected frequency range, and can also reassemble signals from multiple signal sources into a single signal
STP	Shielded Twisted-Pair cable consists of copper-core wires surrounded by an insulator. Two wires are twisted together to form a pair; the pair form a balanced circuit. The twisting prevents interference problems, STP provides protection against external crosstalk.
Straight-through Ethernet cable	A cable that wires a pin to its equivalent pin. This cable connects two dissimilar devices, for example, a data terminal equipment (DTE) device and a data communications equipment (DCE) device. A straight through Ethernet cable is the most commonly used Ethernet cable.

SUA	Single User Account. Your system's SUA feature allows multiple user Internet access for the cost of a single ISP account. See also NAT.
TCP	Transmission Control Protocol is a connection-oriented transport service that ensures the reliability of message delivery. It verifies that messages and data were received.
Terminal	A device that allows you to send commands to a computer somewhere else. At a minimum, this usually means a keyboard, display screen and some simple circuitry.
Terminal Software	Software that pretends to be (emulates) a physical terminal and allows you to type commands to a computer somewhere else.
Twisted Pair	Two insulated wires, usually copper, twisted together and often bound into a common sheath to form multi-pair cables. In ISDN, the cables are the basic path between a subscriber's terminal or telephone and the PBX or the central office.
UDP	User Datagram Protocol. DP is a connectionless transport service that dispenses with the reliability services provided by TCP. UDP gives applications a direct interface with the Internet Protocol (IP) and the ability to address a particular application process running on a host via a port number without setting up a connection session.
UNIX	A widely-used operating system in large networks. Usually used on workstations and servers.
URL	Uniform Resource Locator. URL is an object on the Internet or an intranet that resides on a host system. Objects include directories and an assortment of file types, including text files, graphics, video and audio. A URL is the address of an object that is normally typed in the Address field of a Web browser. A URL is basically a pointer to the location of an object.
V Series Recommendations	V.xx or V Series Recommendations are the most commonly used international modem/telephone network standards. The V.xx series recommendations are from the ITU-TS (Telecommunication Standardization Sector of the International Telecommunications Union) and will probably replace the old American Telephone and Telegraph Company/Bell System MNP (Microcom Networking Protocol) standards. Some modems offer both MNP and ITU-T standards; however, MNP generally offers much lower transfer rates than the V.xx series. See also, V.35 Data Port Interface.
V.35 Data Port Interface	V.35 is a standard transfer rate implemented under recommendations by the ITU-TS (Telecommunication Standardization Sector of the International Telecommunications Union). V.35 provides the trunk interface between a network access device and a packet network with data rates greater than 19.2 Kbps. V.35 may use the bandwidths of several telephone circuits as a group. See also, V Series Recommendations.
VCI	Virtual Channel Identifier. A VCI is a number that denotes a particular logical connection between end stations (users or networks). A VCI specifies the channel and

	destination that ATM traffic will use. See also, VPI.
VPI	Virtual Path Identifier. AVPI is a number that denotes a bundle of virtual channels. A VPI specifies the path and destination that ATM traffic will use. See also, VCI.
WAN	Wide Area Networks link geographically dispersed offices in other cities or around the globe. Just about any long-distance communication medium can serve as a WAN link including switched and permanent telephone circuits, terrestrial radio systems and satellite systems.
WWW	World Wide Web. Frequently used (incorrectly) when referring to "The Internet". WWW has two major definitions. One, the whole constellation of resources that can be accessed using Gopher, FTP, HTTP, telnet, USENET, WAIS and other tools. Two, the universe of hypertext servers (HTTP servers).
X Series Recommendations	X.xx or X Series Recommendations are the international modem/telephone network standards. The X.xx series recommendations are from the ITU-TS (Telecommunication Standardization Sector of the International Telecommunications Union) and will probably replace the old American Telephone and Telegraph Company/Bell System MNP (Microcom Networking Protocol) standards. Some modems offer both MNP and ITU-T standards; however, MNP generally offers much lower transfer rates than the X.xx series. See also, X.21 Data Port Interface.
X.21 Data Port Interface	V.21 is a standard transfer rate implemented under recommendations by the ITU-TS (Telecommunication Standardization Sector of the International Telecommunications Union). X.21 provides the trunk interface between a network access device and a packet network. X.21 may use the bandwidths of several telephone circuits as a group. See also, X Series Recommendations.
xDSL	Digital Subscriber Line(s) where x, when specified, denotes a particular flavor of DSL, eg., ADSL, G.SHDSL, SDSL, VDSL, RDSL, etc.
ZyNOS	ZyXEL Network Operating System is the firmware used in many ZyXEL products.

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