# Pipeline 25-Px

*Ascend Communications*

Part Number 7820-0285-002 July 26, 1996

# Important safety instructions

The following safety instructions apply to the Pipeline 25-Px:

**1** Read and follow all warning notices and instructions marked on the product or included in the manual.

**2** The maximum recommended ambient temperature for Pipeline 25-Px models is 104° Fahrenheit (40° Celsius). Care should be given to allow sufficient air circulation or space between units when the Pipeline 25-Px is installed in a closed or multi-unit rack assembly, because the operating ambient temperature of the rack environment might be greater than room ambient.

**3** The connections and equipment that supply power to the Pipeline 25-Px should be capable of operating safely with the maximum power requirements of the Pipeline 25-Px. In the event of a power overload, the supply circuits and supply wiring should not become hazardous. The input rating of the Pipeline 25-Px is printed on its nameplate.

**4** Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.

**5** Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous high voltage or other risks. Refer all servicing to qualified service personnel.

**6** General purpose cables are provided with this product. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer.

**7** When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.

In addition, if the equipment is to be used with telecommunications circuits, take the following precautions:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Avoid using equipment connected to telephone lines (other than a cordless telephone) during an electrical storm. There is a remote risk of electric shock from lightning.
- Do not use a telephone or other equipment connected to telephone lines to report a gas leak in the vicinity of the leak.

# Contents

# Figures

# Tables

# About This Guide

This guide explains how to set up the Pipeline 25-Px and how to configure it with settings provided by your network service provider or system administrator.

## What is in this guide?

This guide contains these chapters and appendixes:

- Chapter 1, “Introducing the Pipeline,” describes the unit’s features and how you can use them.
- Chapter 2, “Installing the Pipeline,” lists the contents of the product package and explains how to install the hardware.
- Chapter 3, “Configuring the Pipeline,” explains how to configure the unit with settings provided by your network service provider.
- Chapter 4, “Using the Pipeline,” tells you how to use the status windows, monitor connections, how to increase the speed of data connections, how to control telephone costs, how to use the voice features of the Pipeline, and other administrative information.
- Chapter 5, “Reference,” provides reference information for Pipeline 25-Px configuration settings and internal settings.
- Appendix A, “Configuring Communications Software,” provides detailed instructions for configuring two commonly used communications programs: PROCOMM PLUS Version 3 for Microsoft Windows and ZTerm for Macintosh.
- Appendix B, “System Event Messages,” lists all the possible event messages that can appear in the status windows.

- Appendix C, “ISDN Cause Codes,” lists ISDN diagnostic codes that appear in System Events status window.
- Appendix D, “Upgrading Pipeline Software,” explains how to install new versions of the Pipeline software.
- Appendix E, “Pipeline 25-Px Specifications,” lists hardware and software specifications for the Pipeline.
- Appendix F, “Radio and Television Interference,” explains how to prevent the Pipeline from interfering with radio or television reception.
- Appendix G, “Warranty and Service,” includes the warranty for your Pipeline and explains how to get technical support.

This guide also includes an index.

# What you should know

To use this guide, you must be familiar with the personal computer or workstation you’ll use to configure the Pipeline 25-Px. You need to understand

- the basics of using programs
- how to connect an external device to a serial port on your computer

For information about these, see the user’s guide for your computer.

If you do not already have communication software, such as the PROCOMM PLUS program described in Appendix A, “Configuring Communications Software,” you must know or learn how to install software on your computer. For more information, see the user’s guide for your computer.

If your computer does not already have a properly configured Ethernet adapter, you must know or learn how to install and configure the adapter. For more information, see the instructions included with the Ethernet adapter or your computer.

# Documentation conventions

This section explains the conventions used in this guide.

| Convention | Meaning |
|---|---|
| **`Monospace text`** | Monospace text represents information that you enter exactly as shown, and it identifies onscreen text, such as statistical information. |
| [] | Square brackets indicate an optional attribute that you append to a command. To include an attribute, type only the information inside the brackets. Do not type the brackets unless they appear in bold type. |
| *italics* | Italics represent variable information. Do not enter the words themselves in the command; enter the information they represent. |
| Key1-Key2 | Keys displayed next to each other represent combination keystrokes. To enter combination keystrokes, press one key and hold it down while you press one or more other keys. Release all the keys at the same time. |
| Press Enter | This means to press the key on your computer or terminal keyboard that generates a carriage return. On IBM PC and compatible computers, this key is labeled Enter. On Apple Macintosh computers, most Unix workstations, and many commonly used terminals, this key is labeled Return. |
| **Note:** | A note signifies important additional information. |
|  **Caution:** | A caution means that a failure to follow the recommended procedure could result in a loss of data or damage to equipment. |
|  **Warning:** | A warning means that a failure to take appropriate safety precautions could result in physical injury. |

# Introducing the Pipeline

# 1

This chapter contains:

# About this chapter

In this chapter, you'll learn about:

- The features of your Pipeline 25-Px
- The ways in which you can use your Pipeline 25-Px

**Note:** If you want to start using the Pipeline 25-Px immediately, you can skip this chapter and go on to Chapter 2, "Installing the Pipeline."

# Features of the Pipeline

The Pipeline 25-Px lets you connect a single computer to the Internet or to another network that uses TCP/IP protocols. To make the connection, the Pipeline 25-Px uses the Integrated Services Digital Network (ISDN), the global digital telephone network that can transmit computer data as well as voice.

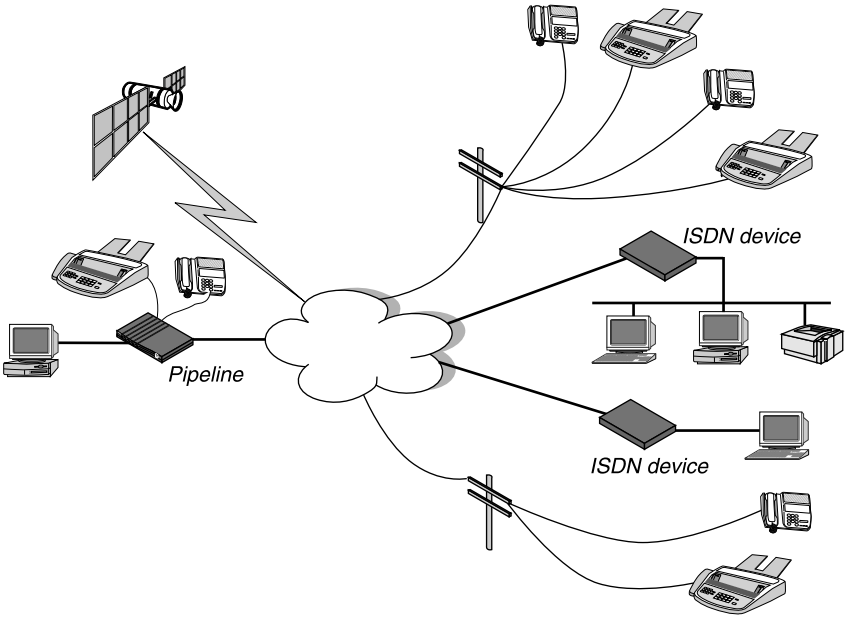



*Figure 1-1. Connecting to the ISDN*

The cloud in Figure 1-1 represents the global telephone network, and the many connections illustrate that it connects conventional telephones as well as computers and computer networks. Telephones and other telephone equipment, such as fax machines, use the network to transmit voice. Computers and computer networks with direct digital connections to the network, known as ISDN telephone service, can transmit data without first converting it to voice. ISDN telephone service lets computers send and receive information at much higher speeds than with conventional modems used on standard telephone lines.

The Pipeline 25-Px uses a low-cost ISDN telephone service known as the Basic Rate Interface (BRI). A BRI telephone line normally provides two separate channels for carrying information, known as bearer or B channels. Each B channel can carry voice or data, but not both at the same time. A third channel, known as the D channel, carries signals that control the flow of information on the B channels.

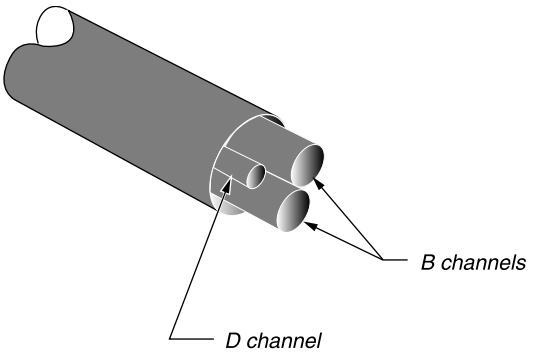



*Figure 1-2. An ISDN Basic Rate Interface (BRI) line*

**Note:** Although you can think of each channel as a separate “pipe” for data or voice, all three channels are carried on the same two wires used for conventional telephone service. In many cases, wiring for conventional telephone service can be reused without changes for ISDN service.

The Pipeline 25-Px lets you use the two B channels in any of the following ways:

- You can use one B channel for a voice call and the other for another voice call (such a voice call used to send or receive a fax).

- You can use one B channel for a voice call and the other for transmitting data at 64 or 56 kilobits per second (Kbps).

  The speed of a B channel is either 64 Kbps or 56 Kbps. The speed is determined by the telephone company or companies you use for a connection.

- You can use both B channels to transmit data at 128 or 112 Kbps to a single location.

  To use both channels for data, the Pipeline 25-Px uses a technique known as inverse multiplexing, which divides a data stream that is too large for a single B channel and diverts the overflow into a different B channel. When the data is received by the other ISDN device, the two B channels are recombined to create the original data stream.

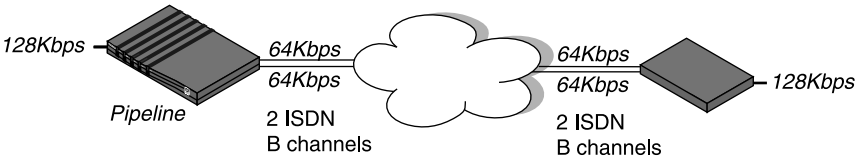



*Figure 1-3. Inverse multiplexing*

To use conventional phone devices—such as telephones and fax machines—on your ISDN telephone line, you simply plug them into the phone jacks on the Pipeline 25-Px. This flexibility makes the Pipeline 25-Px ideal for small and home offices.

The Pipeline 25-Px provides these additional features for voice calls:

- Call Waiting: When you make or get a voice call and there is another call to the same telephone number, an audible signal tells you that you have another call. You can then put the first call on hold and switch to the other call.
- Call Hold: You can put a voice call on hold. This lets you get an incoming call signaled by Call Waiting or make another call.
- Channel borrowing: If both B channels are being used for a data call to a single location and you get a voice call, one of the B channels can be borrowed for the voice call.

The Pipeline 25-Px includes these additional features for data calls, network administration, and system management:

- The ability to connect a single computer to the Internet or another TCP/IP network.
- The use of dynamic IP addressing, which lets you connect to an Internet service provider (ISP) without the need for a fixed Internet Protocol (IP) address. The ISP provides the address when you connect.
- Address translation, which makes it possible to have two IP addresses on a local network, one for your computer and another for the Pipeline, even though your network service provider provides only a single IP address.
- Support for Internet Protocol (IP) routing of data to the Internet or other IP network.
- Bandwidth on Demand: the ability to add an unused B channel to a data call when higher transmission speeds are needed, and to drop a B channel when less speed is needed.
- Support for Point-to-Point Protocol (PPP), Multichannel Point-to-Point Protocol (MPP), and Multilink Protocol Plus (MP+), which are three different techniques for encapsulating data sent over ISDN.
- Security features: support for PAP and CHAP access control (which require passwords) and for security-card access.
- The ability to be managed remotely from other Ascend products that support the Ascend Management Protocol (AMP).
- Flash memory, which makes it easy to upgrade the Pipeline 25-Px software.

# How you can use the Pipeline

The most common uses for the Pipeline 25-Px are:

- Connecting to the Internet
- Telecommuting

The following sections give examples.

## Connecting to the Internet

The Pipeline 25-Px provides very fast access to the Internet. It can speed transfers of all kinds of data, including graphics, video, and sound on the World Wide Web, as well as making it faster to use all other Internet services.

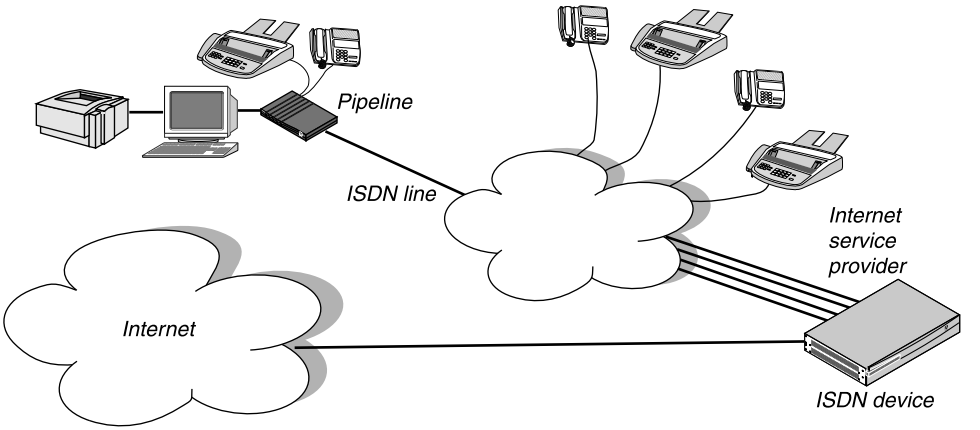



*Figure 1-4. Using the Pipeline to connect to the Internet*

## Telecommuting

For telecommuting, the Pipeline 25-Px can connect a single computer to a central site, such as the main office of a company. A telecommuter can have access to electronic mail, file servers, and other facilities at the central site.

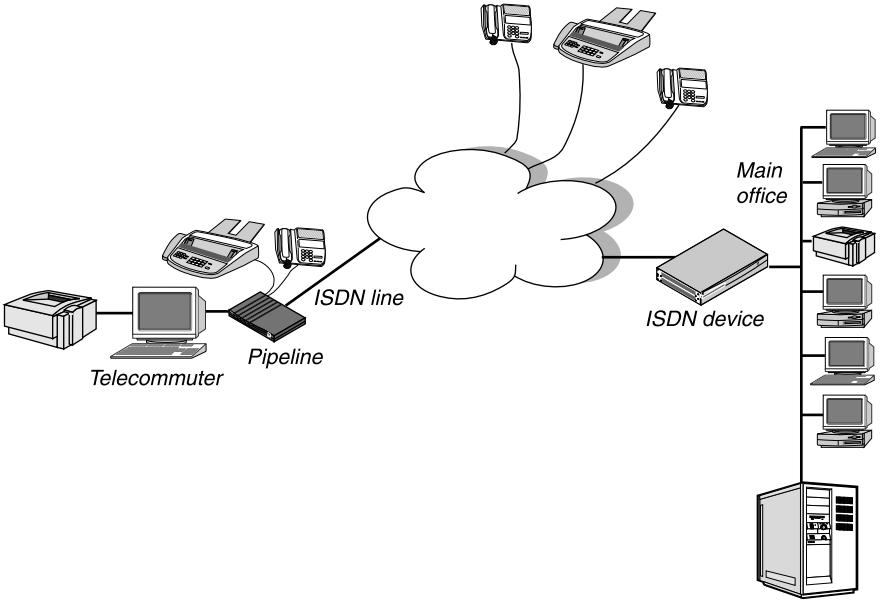



*Figure 1-5. Telecommuting with the Pipeline*

# Installing the Pipeline

# 2

This chapter contains:

# About this chapter

The chapter explains:

- What you need to do before installing your Pipeline 25-Px, including checking the contents of the Pipeline 25-Px box and making sure you have the other equipment you'll need, such as an Ethernet interface and a modem cable.
- How to choose a location for the Pipeline 25-Px.
- How to connect the cables for the Pipeline 25-Px.

When you're done, you'll be ready to configure your Pipeline.

# Preparing for installation

Before you install your Pipeline 25-Px, you need to do the following:

- Unpack the Pipeline 25-Px box and check its contents.
- Identify the model of the Pipeline 25-Px you have.
- Make sure you have everything else you need for installing the Pipeline 25-Px, such as an Ethernet adapter and a modem cable.

The following sections explain how to install your Pipeline.

## Checking the contents of the Pipeline box

Unpack the Pipeline 25-Px box and make sure that you have these hardware components:

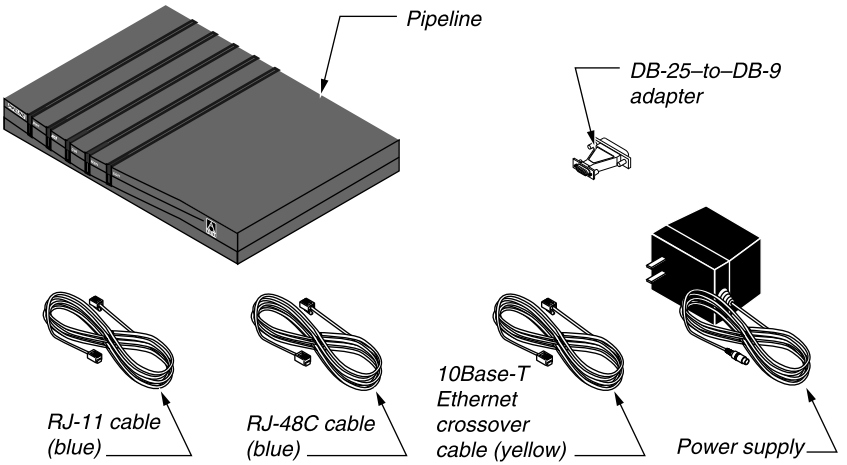



*Figure 2-1. Hardware contained in the Pipeline box*

- The Pipeline.
- An RJ-11 ISDN cable (part number 2510-0122-001).
  The ends of this cable are blue.

**Note:** Each cable and the serial cable adapter has a small paper label with its part number. The label can be hard to see; keep looking if you don't find it immediately.

- An RJ-48C ISDN cable (part number 2510-0064-001).

  **Note:** The ends of this cable are also blue. The only difference between the two blue cables is the size of their plugs. The plugs on the RJ-11 cable fit any wall jack for an ISDN line, while the plugs on the RJ-48C cable fit only wider RJ-45 jacks.
- A 10Base-T Ethernet crossover cable (part number 2510-0084-001).
  The ends of this cable are yellow.
- A DB-9–to–DB-25 serial cable adapter (part number 2510-0052-002).
- A power supply.

In addition, make sure you received the following:

- "Ordering ISDN Service for the Ascend Pipeline 25 and 75," a document containing information your telephone company needs when configuring ISDN telephone service for your Pipeline 25-Px.
- A registration card.

## Identifying the model of your Pipeline

To install the Pipeline 25-Px correctly, you need to know which model you have. There are two models:

- The U-interface model (model number P25-1U-PX) connects directly to an ISDN line.
- The S-interface model (model number P25-1S-PX) requires an external network terminator (NT1) device.

You can find the model number, which identifies the model, on the label on the bottom of the Pipeline 25-Px.

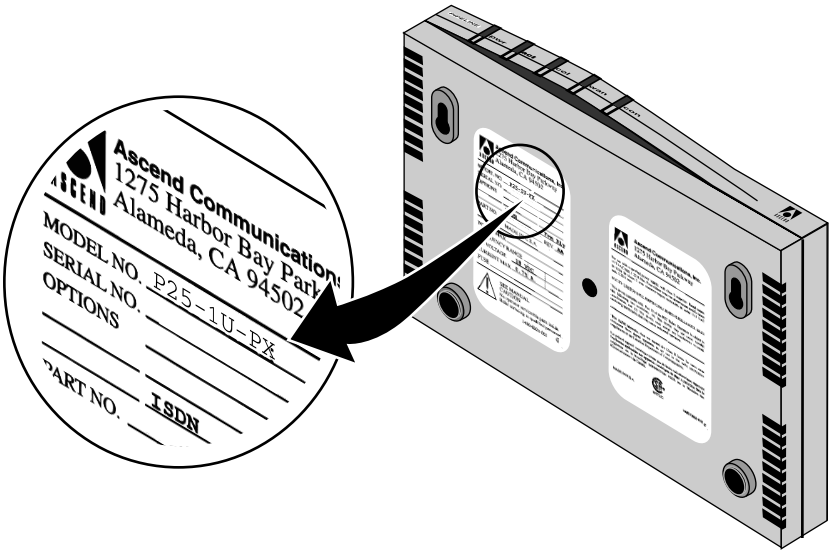



*Figure 2-2. Finding the model number of the Pipeline*

# What else you need for installation

In addition to the contents of the Pipeline 25-Px box, to install your Pipeline you need the hardware and software described in the following sections.

## An ISDN telephone line

To use your Pipeline, you need a properly configured ISDN Basic Rate Interface (BRI) telephone line. For information on ordering ISDN service, see the "Ordering ISDN Service for the Ascend Pipeline 25 and 75" document included with your Pipeline 25-Px.

## A computer with a serial port

To configure and monitor the Pipeline, you need a computer with a serial communication port capable of transmitting data at 9600 bits per second. The serial communication port is normally one you could use to connect an external modem. If you are not already familiar with your computer's serial ports, refer to your computer's user guide for more information.

If possible, you should set aside a serial port for a permanent connection to the Pipeline. If there are not enough serial ports for all the devices that need serial connections, consider adding another serial port if you can. With a permanent serial connection, you can monitor the Pipeline at any time, manually connect to and disconnect from remote networks, and make configuration changes whenever necessary.

If no serial port is currently free and you cannot add a serial port to your computer, disconnect from one of the serial ports a device that you can temporarily do without, such as an external modem. You can reconnect the device when you've finished configuring the Pipeline.

## A 10Base-T Ethernet interface

For the Pipeline to transmit data to and receive data from your computer, you need a properly configured 10Base-T (twisted-pair) Ethernet interface for your computer. The interface can be built into the computer, as it is on many recent Apple Macintosh and Macintosh-compatible personal computers, or it can be an add-on circuit board or PCMCIA card (PC card). Follow the instructions for

installing and configuring the interface that are included with the interface or with your computer.

**Note:** You can use only a 10Base-T interface with the Pipeline 25-Px. A cable for connecting the interface directly to the Pipeline 25-Px—the "crossover" cable—is included with the Pipeline.

## TCP/IP software

To communicate with your network service provider, your computer must have software for TCP/IP networking. This software lets you connect to the Internet and to other networks that use the same networking standards as the Internet. Many operating systems include software for TCP/IP. If TCP/IP software is not included in your operating system, you need to obtain a separate TCP/IP software package. For information on configuring the TCP/IP software, see the documentation for your operating system or TCP/IP software package. How to set your computer's Internet Protocol (IP) address to ensure compatibility with the Pipeline 25-Px is described in "Setting the IP address of your computer" on page 3-3.

## Communications software

To configure and monitor the Pipeline, you need communications software for your computer. This software must be able to:

- Emulate a VT100 terminal
- Make a direct connection to the Pipeline 25-Px (through the serial port to which the Pipeline 25-Px is connected, as described in "Connecting to the Control jack" on page 2-17) rather than through a modem.

Most communications software that you purchase separately, such as the PROCOMM PLUS program for Microsoft Windows, works reliably. For Macintosh computers, a shareware communications program, ZTerm, works well. PROCOMM PLUS and ZTerm are both described in Appendix A, "Configuring Communications Software."

**Caution:** The Terminal program included with Microsoft Windows 3.1 and the HyperTerm program included with Microsoft Windows 95 are not reliable enough for configuring the Pipeline 25-Px.

### A modem cable

To connect the Pipeline to your computer's serial port, you need a modem cable (a serial communication cable designed for connecting an external modem). The cable must be a "high-speed" modem cable, that is, one that supports the "hardware handshaking" technique used by almost all recently manufactured modems. This cable must have the appropriate plug for connecting to a serial communication port on your computer and either a 9- or 25-pin male "D" connector at the other end.

### An external network terminator (S-interface only)

If your Pipeline has an S interface, you need an external ISDN network terminator (NT1). To connect more than one ISDN device to the same ISDN line, you must use an external NT1. For information on distinguishing the U- and S-interface models of the Pipeline 25-Px, see "Identifying the model of your Pipeline" on page 2-4.

### Telephone equipment and cables

If you will use the Pipeline 25-Px to make or receive voice calls, you need the necessary telephone equipment (such as a conventional analog telephone or a fax machine) and a conventional telephone cable (normally with RJ-11 plugs at each end) for each device you connect.

## Jacks on the Pipeline

The Pipeline 25-Px has these jacks on the back.

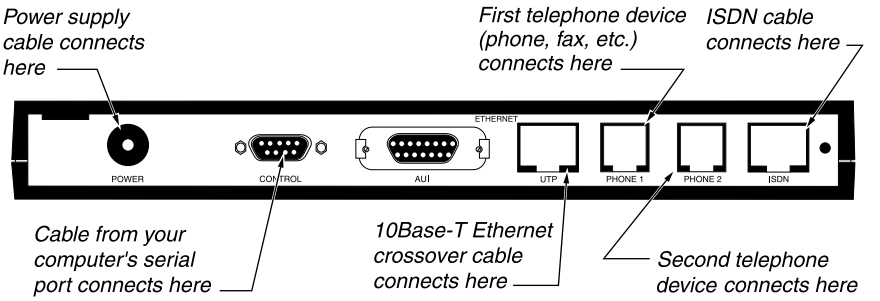



*Figure 2-3. Back panel of the Pipeline*

The following sections explain how to connect the appropriate cables to these jacks.

# Choosing a location for the Pipeline

If possible, choose a location for the Pipeline 25-Px that lets you view the lights on the front. These lights show the current status of the Pipeline, such as whether the ISDN line is in use, and can help you diagnose problems.

# Connecting the cables

The sections that follow explain how to connect the cables for the Pipeline 25-Px. When you're done, you'll be ready to configure the Pipeline as described in the next chapter.

## Connecting to the ISDN line

The first step in installing your Pipeline 25-Px is connecting it to your ISDN telephone line. How you connect the Pipeline 25-Px to the ISDN line depends on what model of the Pipeline 25-Px you have:

- If your Pipeline 25-Px has a U interface—which lets you connect it directly to the ISDN line—follow the instructions in the next section, "Connecting a U-interface Pipeline."

- If your Pipeline has an S interface—which lets you connect more than one ISDN device to the same line—follow the instructions in "Connecting an S-interface Pipeline" on page 2-10.

To find out what interface your Pipeline 25-Px has, see "Identifying the model of your Pipeline" on page 2-4.

## Connecting a U-interface Pipeline

If you have a Pipeline with a U interface, follow these steps to connect it to the ISDN line:

**1** Insert one end of the RJ-11 ISDN cable included with the Pipeline (part number 2510-0122-001) into the ISDN jack on the back of the Pipeline.

The ends of this cable are blue. The other cable whose ends are blue—the RJ-48C ISDN cable, part number 2510-0064-001—has wider plugs.

**Warning:** Although the RJ-11 plug is slightly narrower than the ISDN jack, it *is* the correct cable. *Do not* use a 10Base-T Ethernet cable, such as the crossover cable included with the Pipeline 25-Px (part number 2510-0084-001), to connect the Pipeline 25-Px to the ISDN line, even though its larger plug appears to be the correct one. Using the wrong cable can damage or destroy the Pipeline 25-Px.

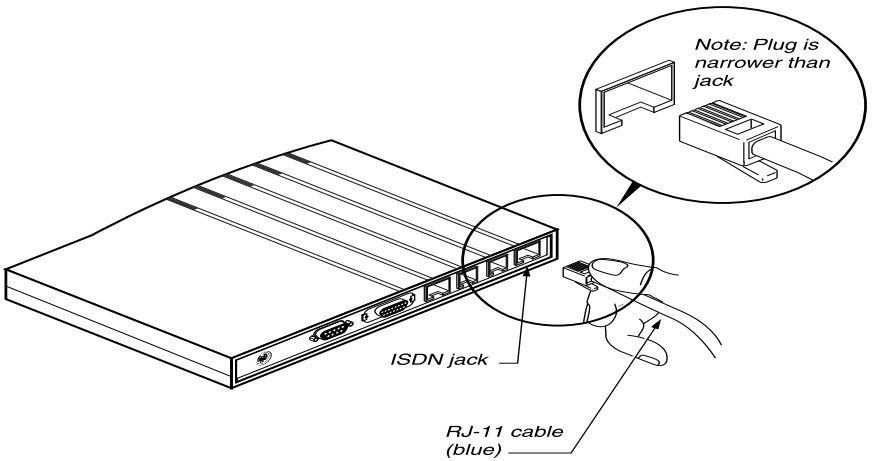



*Figure 2-4. Connecting the ISDN cable to the Pipeline*

**2** Insert the other end of the cable into the ISDN wall jack.

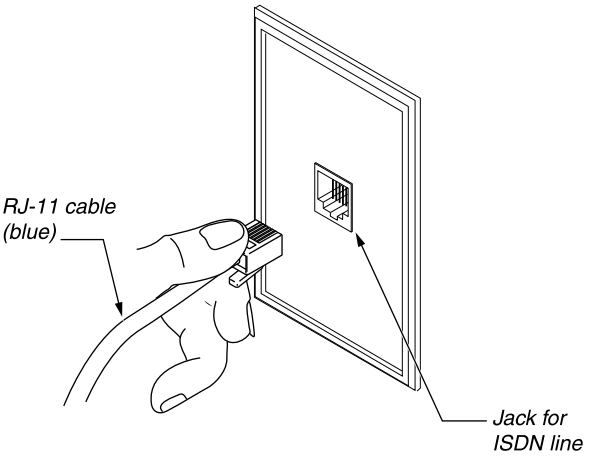



*Figure 2-5. Connecting the ISDN cable to the ISDN wall jack*

Once you're finished connecting the ISDN cable, skip to the next task, "Connecting the Pipeline to your computer" on page 2-14.

## Connecting an S-interface Pipeline

If you have a Pipeline with an S interface, follow these steps to connect it to the ISDN line:

**1** Insert one end of the RJ-48C ISDN cable (part number 2510-0064-001) included with the Pipeline into the ISDN jack on the back of the Pipeline.

The ends of this cable are blue. The other cable whose ends are blue—the RJ-11 ISDN cable, part number 2510-0122-001—has narrower plugs.

**Warning:** *Do not* use a 10Base-T Ethernet cable, such as the crossover cable included with the Pipeline 25-Px (part number 2510-0084-001), to connect the Pipeline 25-Px to the ISDN line. Using the wrong cable can damage or destroy the Pipeline 25-Px.

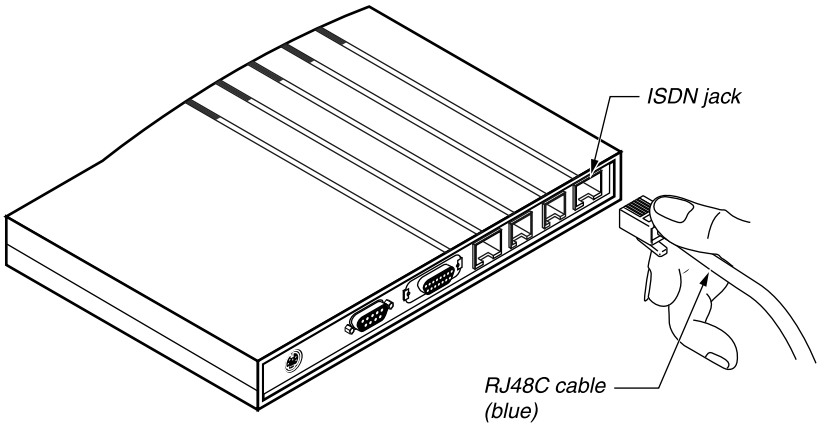



*Figure 2-6. Connecting the ISDN cable*

**2** Insert the other end of the cable into the appropriate jack on the external network terminator (NT-1) device for your ISDN connection.

Consult the documentation for the network terminator to identify the correct jack.

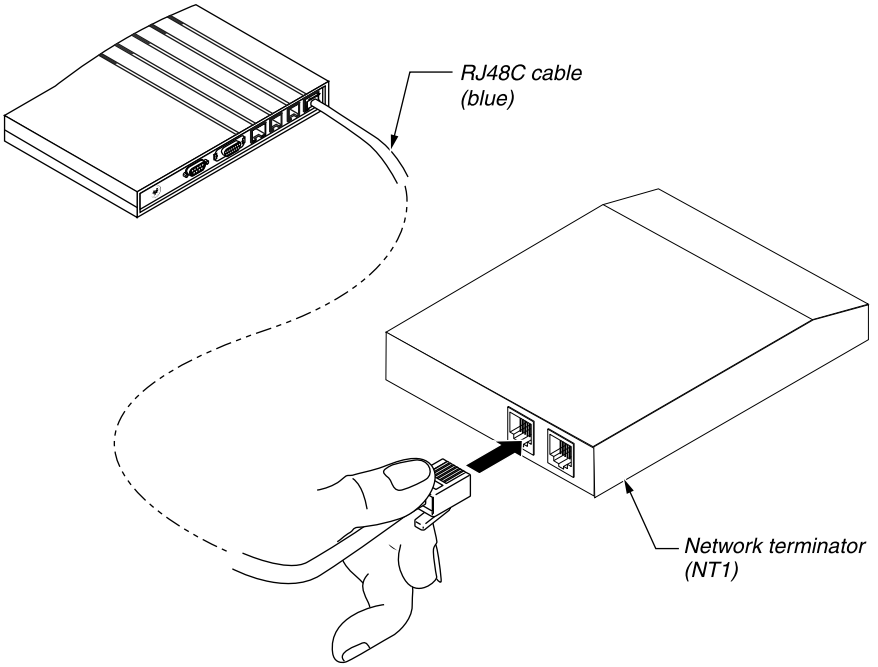



*Figure 2-7. Inserting the ISDN cable into the network terminator*

**3** Insert one end of the RJ-11 ISDN cable included with the Pipeline (part number 2510-0122-001) into the appropriate jack on the external NT-1. The ends of this cable are also blue.

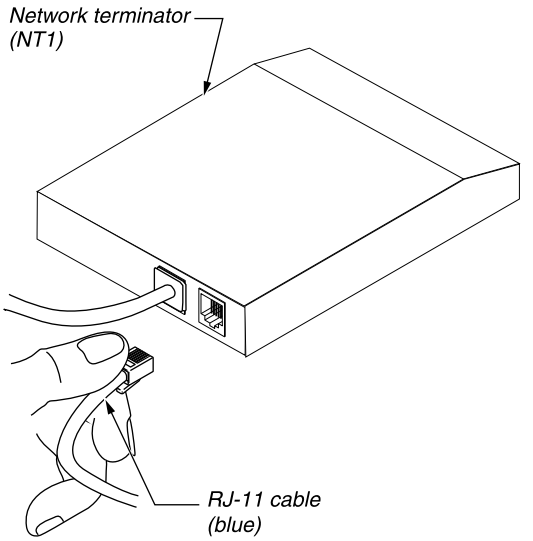



*Figure 2-8. Inserting the other ISDN cable into the network terminator*

**4** Insert the other end of the RJ-11 ISDN cable into the ISDN wall jack.

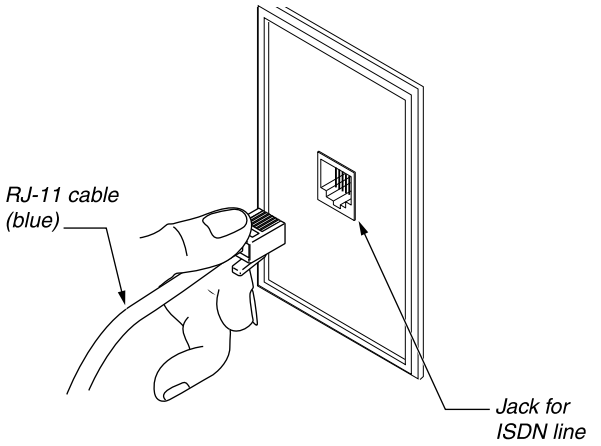



*Figure 2-9. Inserting the IDSN cable into the ISDN wall jack*

# Connecting the Pipeline to your computer

You can connect just one computer to the Pipeline 25-Px, and that computer must have a 10Base-T (twisted-pair) Ethernet interface.

**Note:** The computer cannot be connected to other computers on a local-area network. The computer's Ethernet interface can be connected only to the Pipeline.

You connect the computer and Pipeline with a special 10Base-T cable, known as a crossover cable, that is included with the Pipeline.

**Note:** In a 10Base-T crossover cable, two of the internal wires are crossed. Such a cable makes it possible to build a simple 10Base-T Ethernet network that has just two devices. It eliminates the need for a 10Base-T hub, which is required for all 10Base-T Ethernet networks with more than two devices.

**1** Insert one end of the 10Base-T crossover cable (part number 2510-0084-001) into the UTP jack on the back of the Pipeline.

The ends of this cable are yellow.

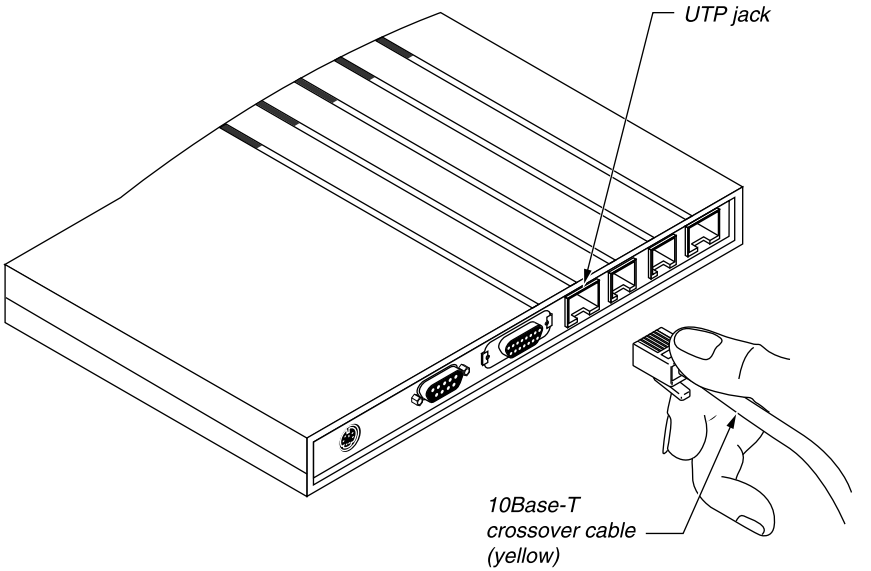



*Figure 2-10. Inserting the 10Base-T crossover cable into the Pipeline*

**Note:** "UTP" stands for "unshielded twisted pair," the type of cabling used for 10Base-T networks.

**2** Insert the other end of the cable into the 10Base-T Ethernet jack on the computer.

The following illustrations show how to connect the cable to an IBM PC, an Apple Macintosh, and a Unix workstation.

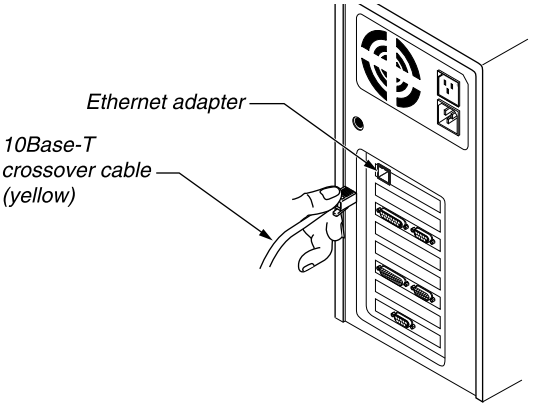



*Figure 2-11. Inserting the 10Base-T crossover cable into an IBM PC*

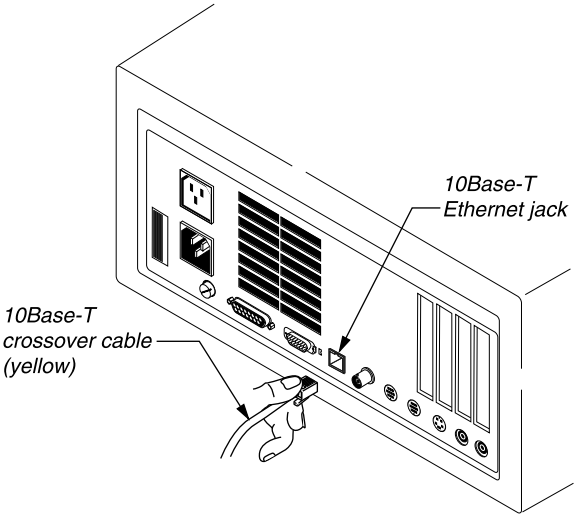



*Figure 2-12. Inserting the 10Base-T crossover cable into a Macintosh*

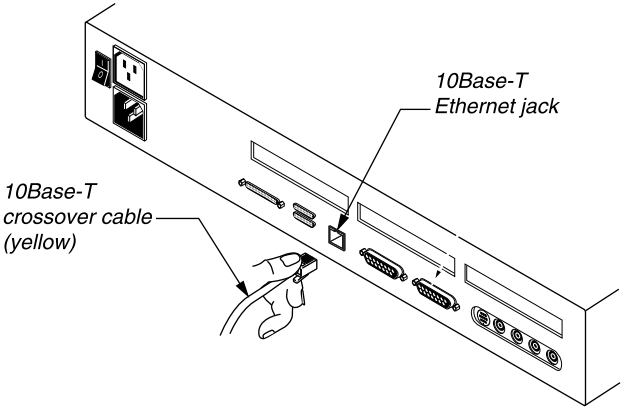



*Figure 2-13. Inserting the 10Base-T crossover cable into a Unix workstation*

# Connecting to the Control jack

You need one more connection between your computer and the Pipeline: a connection from a serial communication port on your computer to the Control jack on the Pipeline. You'll use this connection to configure and monitor the Pipeline, as described in Chapter 3, "Configuring the Pipeline," and Chapter 4, "Using the Pipeline."

Before connecting to the Control port, identify the serial port you will use (for example, COM1 or COM2 on an IBM or IBM-compatible personal computer or the printer port or modem port on an Apple Macintosh or Macintosh-compatible personal computer).

**Note:** Write down which serial port you'll use. You'll need this information later when setting up the Pipeline 25-Px configuration software.

The following sections explain how to connect different types of computers to the Control jack:

- If you are using an IBM or IBM-compatible personal computer to configure the Pipeline 25-Px, follow the instructions in "Connecting an IBM-compatible computer" on page 2-17.
- If you are using a Macintosh computer to configure the Pipeline 25-Px, skip to the instructions in "Connecting a Macintosh" on page 2-19.
- If you are using a Unix workstation to configure the Pipeline 25-Px, skip to the instructions in "Connecting a Unix workstation" on page 2-22.

## Connecting an IBM-compatible computer

To connect an IBM or IBM-compatible personal computer to the Control jack, follow these steps:

**1** Connect a modem cable to a serial connector on your computer.
The cable must have a plug that fits the connector.

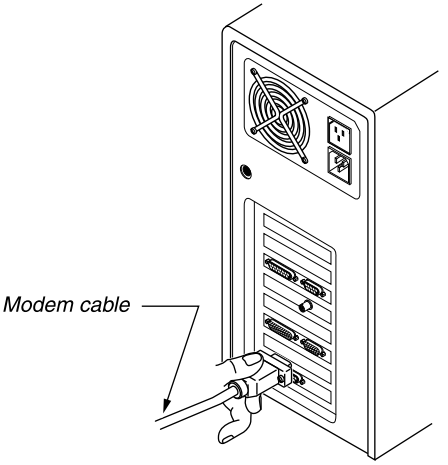



*Figure 2-14. Connecting the modem cable to the computer*

**2** If the plug at the other end of the modem cable has 25 pins, connect the 25-to-9 pin adapter included with the Pipeline (part number 2510-0052-002) to the plug.

**Note:** Try plugging in the cable first to see if it works, as described in the next step. If it does, you don't need the adapter.

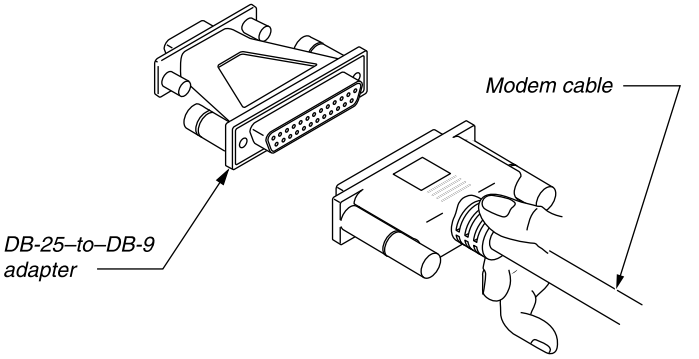



*Figure 2-15. Connecting an adapter to the modem cable*

**3** Connect the cable to the Control jack on the back of the Pipeline.

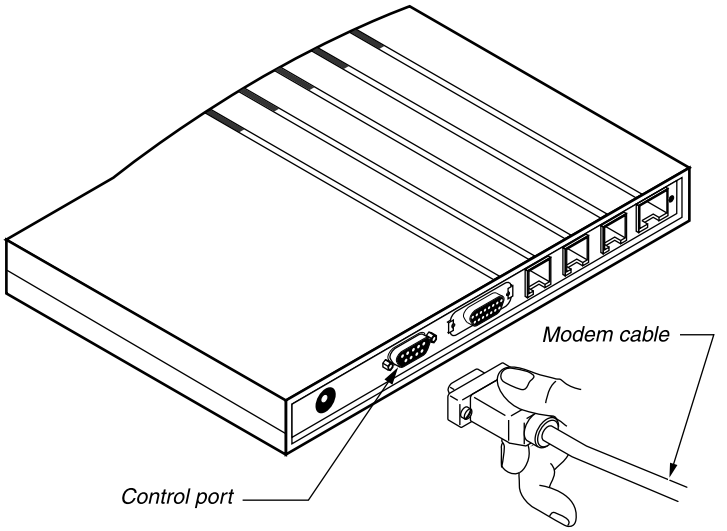



*Figure 2-16. Connecting the modem cable to the Pipeline Control jack*

When you're done connecting the computer to the Pipeline 25-Px, skip to the next task, "Connecting telephone equipment" on page 2-23.

## Connecting a Macintosh

To connect a Macintosh or Macintosh-compatible personal computer to the Control jack, follow these steps:

**1** Connect the 25-to-9 pin adapter included with the Pipeline (part number 2510-0052-002) to the DB-25 end of a Macintosh modem cable.

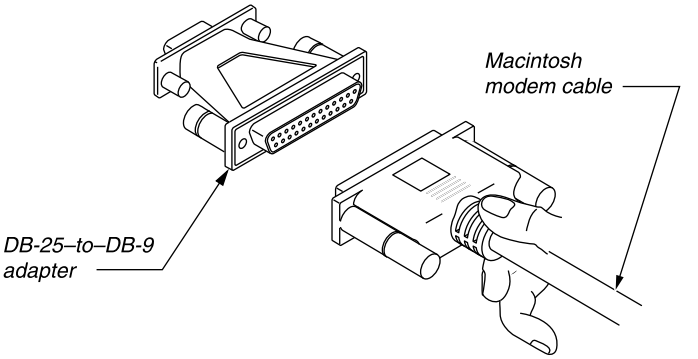



*Figure 2-17. Connecting an adapter to a Macintosh modem cable*

**2** Connect the cable to the Control jack on the back of the Pipeline.

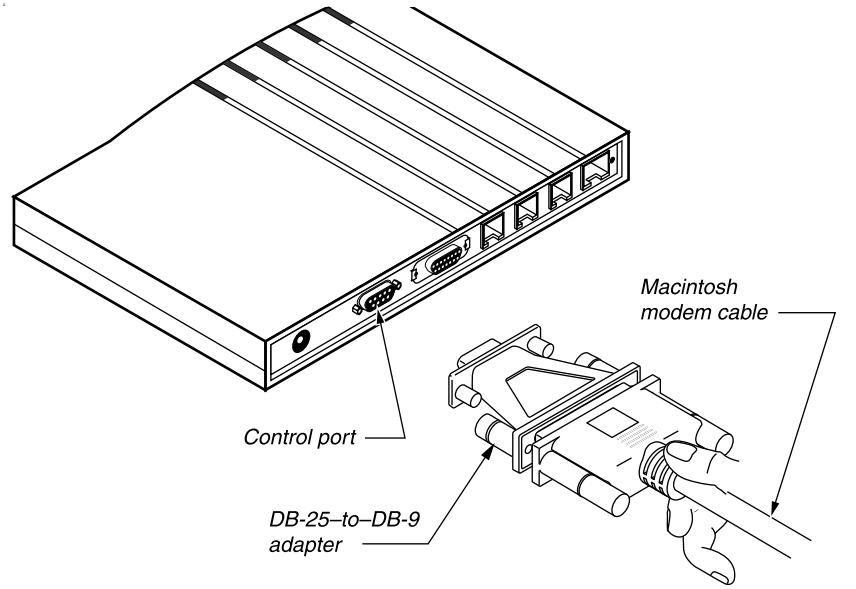



*Figure 2-18. Connecting the Macintosh modem cable with adapter to the Pipeline Control jack*

**3** Connect the other end of the cable to a serial port (either the Modem or Printer port) on the computer.

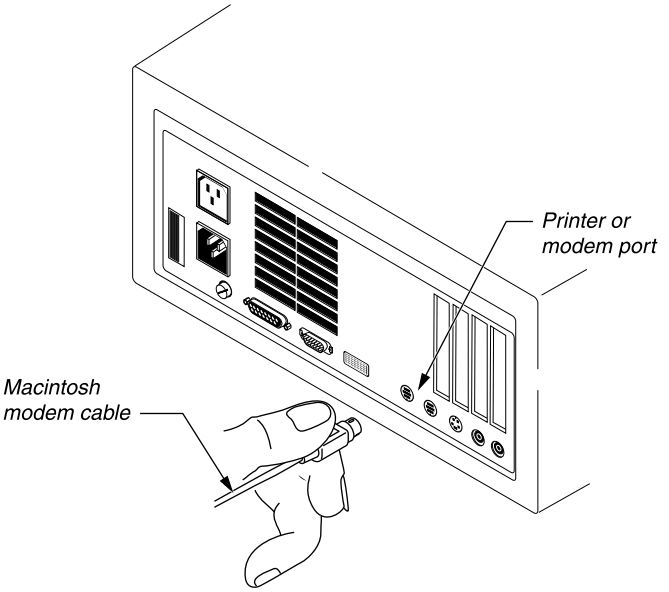



*Figure 2-19. Connecting the modem cable to the Macintosh*

When you're done connecting the computer to the Pipeline 25-Px, skip to the next task, "Connecting telephone equipment" on page 2-23.

## Connecting a Unix workstation

To connect a workstation or other computer running Unix to the Control jack, follow these steps:

**1** Connect a modem cable for the computer to the Control jack on the back of the Pipeline.

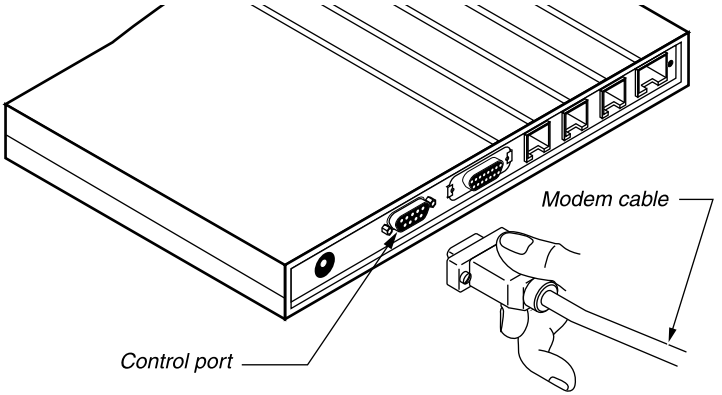



*Figure 2-20. Connecting the modem cable to the Pipeline Control jack*

**2** Connect the other end of the cable to the serial port on the computer.

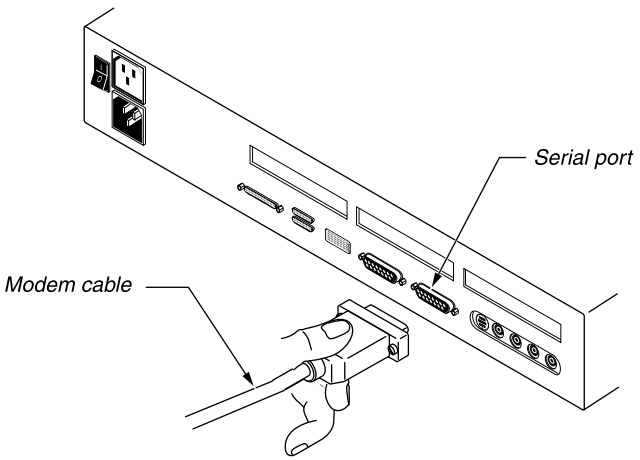



*Figure 2-21. Connecting the modem cable to the serial port*

## Connecting telephone equipment

You can connect conventional telephones or other analog telephone equipment, such as a fax machine, to the Phone jacks on the back of the Pipeline. With most kinds of ISDN service, each of the two Phone jacks can get or receive voice calls for one of the two telephone numbers for your ISDN line.

**Note:** If the ISDN service provided by your telephone company is AT&T Custom Point-to-Point, you can receive incoming calls only on the Phone 1 jack. If you have this service, connect all telephone equipment to the Phone 1 jack using a line splitter or other device.

Although you can connect more than one analog device to a particular Phone jack, you can make or receive no more than one call on each jack at a time.

**Note:** Whenever possible, connect no more than one analog device to each Phone jack. If you must connect more than one device, see "Analog devices and REN limits" on page 2-26.

If you want to connect a conventional telephone or another analog telephone device to the ISDN line, follow these steps:

**1** Connect one end of a modular telephone cable to a conventional telephone or other telephone device.

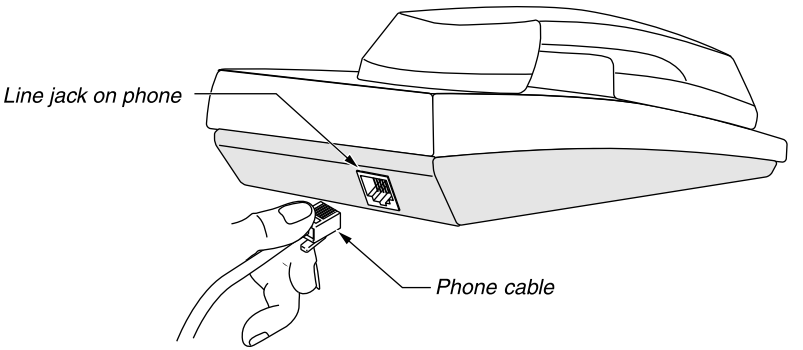



*Figure 2-22. Connecting the telephone cable to a telephone*

**2** Connect the other end of the cable to the Phone 1 jack on the Pipeline 25-Px.

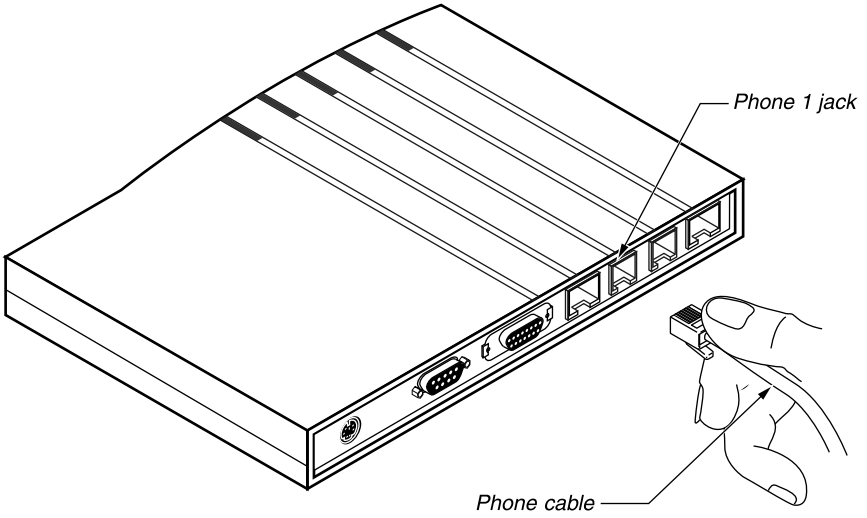



*Figure 2-23. Connecting the telephone cable to the Pipeline Phone 1 jack*

**Note:** Although you've connected a phone, you won't get a dial tone when you pick up the receiver until you connect the power supply for the Pipeline 25-Px as described later in this chapter.

If you're connecting only one analog device to the Pipeline, skip to "Attaching the power cord" on page 2-26.

If you want to connect a second conventional telephone or another analog telephone device, such as a fax machine, to the ISDN line, follow these steps:

**1** Connect one end of another modular telephone cable to the device.

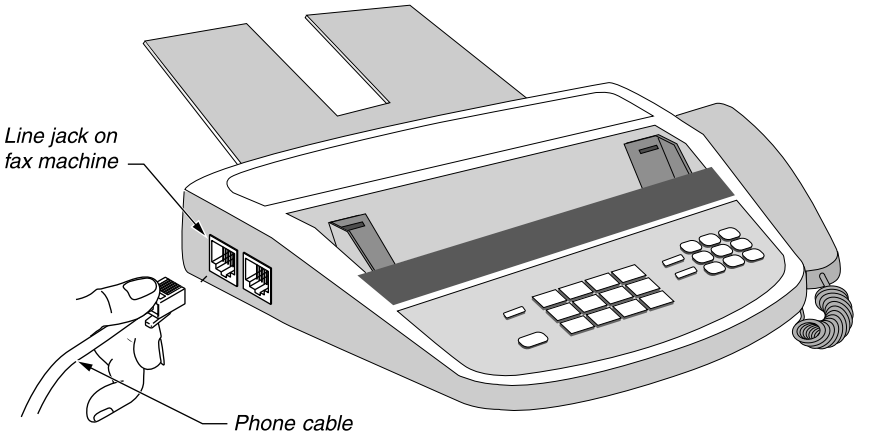



*Figure 2-24. Connecting the telephone cable to a fax machine*

**2** Connect the other end of the cable to the Phone 2 jack on the Pipeline 25-Px.

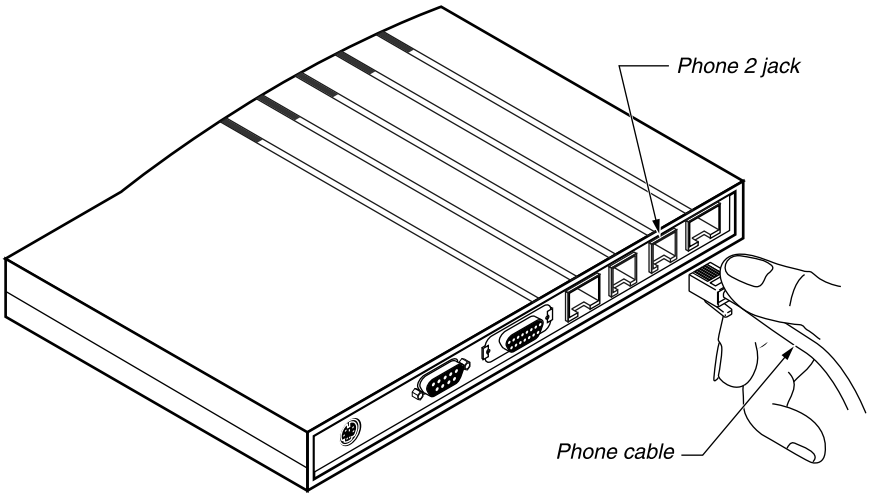



*Figure 2-25. Connecting the telephone cable to the Pipeline Phone 2 jack*

### Analog devices and REN limits

**Note:** If you are connecting no more than one analog device to each Phone jack, you can skip this section.

The number of analog devices you can connect to a single Phone jack is limited. The limit is determined by the total "ringer equivalence" (or REN) of the devices connected to the jack, as well as by other factors such as the length of the phone cable. ("Ringer equivalence" specifies how much electricity a device requires from the phone line, and REN is the unit used to measure it. The REN value of a device is often marked on its case, and it may also be listed in product specifications for the device.) In no case should the sum of the REN values of the devices connected to a single Phone jack exceed 3.

## Attaching the power cord

The last step in installing the Pipeline 25-Px is attaching the power supply.

**Warning:** You **must** perform the following steps **in the order listed.** Plugging the power supply into the wall socket before plugging the power cable into the Pipeline 25-Px can create sparks, cause an electrical fire, or destroy the Pipeline.

To connect the power supply, follow these steps:

**1** Plug the power cord into the Power jack of the Pipeline.

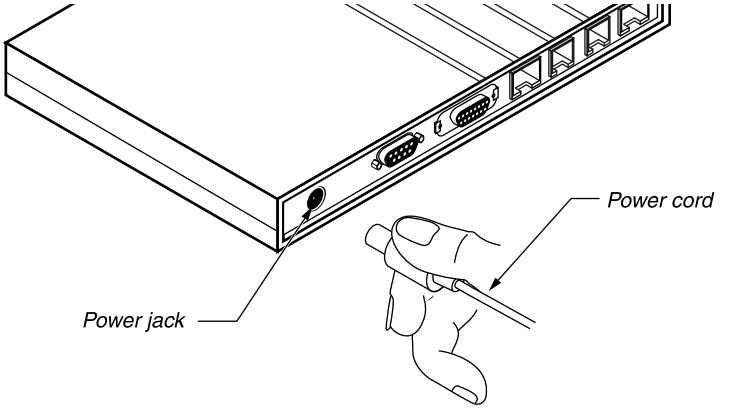



*Figure 2-26. Connecting the power cord to the Pipeline*

**2** Insert the AC power plug into an electrical outlet.

**Note:** To protect the Pipeline 25-Px from power surges, use a surge protector or an uninterruptible power supply (UPS) with built-in surge protection.

**Note:** Because the Pipeline 25-Px has no Power switch, plugging in the power supply turns the Pipeline 25-Px on. To turn off the Pipeline 25-Px, you must unplug the power supply.

After you plug in the Pipeline, it takes about a minute for it to be ready to use. The status light on the front of the Pipeline 25-Px labeled PWR comes on immediately to indicate that the power is on. Refer to Figure 2-27 for descriptions of all the Pipeline 25-Px LEDs.

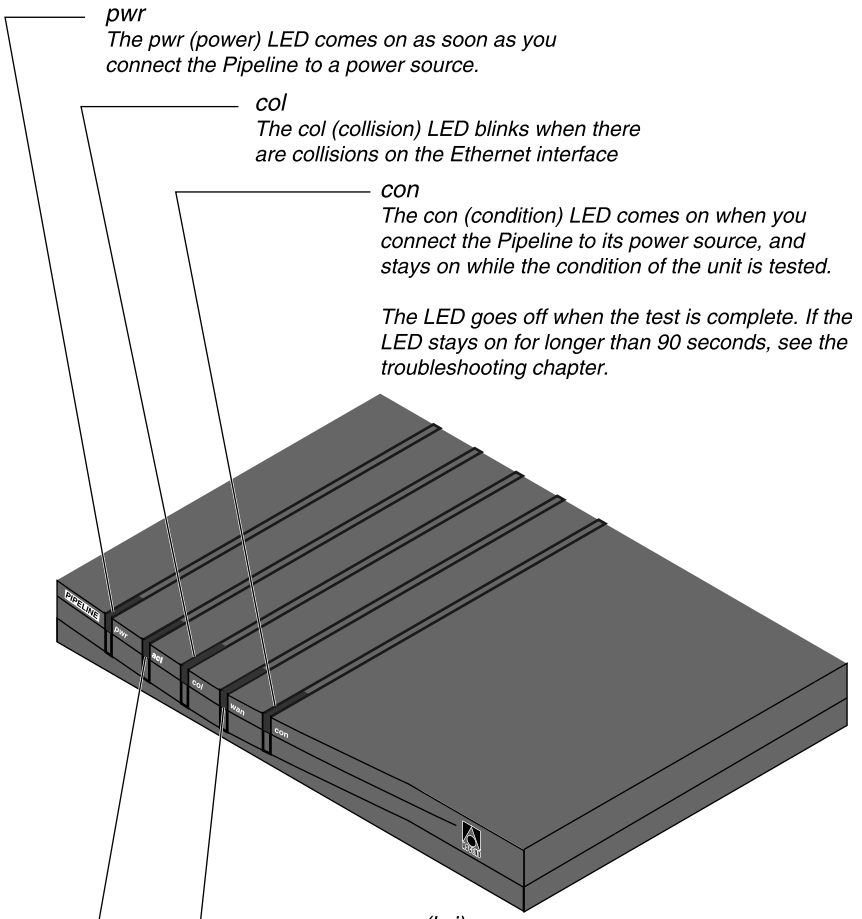



*Figure 2-27. Pipeline 25-Px LEDs*

# Mounting the Pipeline on a wall

In some cases, it may be useful to mount the Pipeline on a wall rather than putting it on a flat surface. The bottom of the Pipeline 25-Px includes two screw slots for this purpose.

**Note:** Wall mounting is optional.

The following figure shows the size and spacing of screws you need for wall mounting.

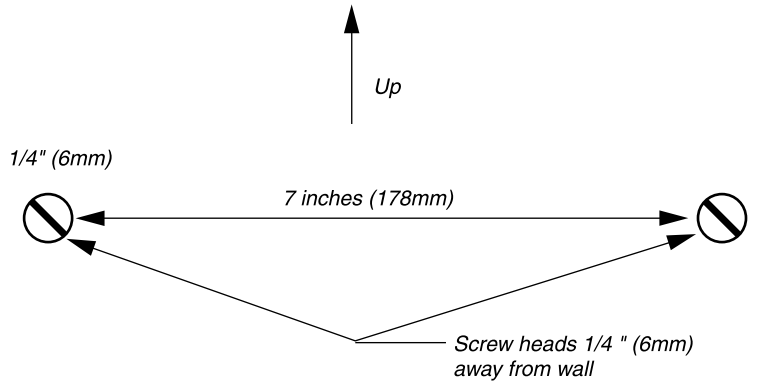



*Figure 2-28. Placement of screws for mounting the Pipeline on a wall*

**Note:** Although the status lights are visible when the Pipeline 25-Px is mounted on a wall, the labels for the lights are not. To make it easy to identify the lights, write the labels on a piece of tape and tape them to the Pipeline.

# What to do next

You've finished installing the Pipeline. The next chapter, "Configuring the Pipeline," explains how to configure it for your ISDN service and network service provider.

# Configuring the Pipeline

# 3

This chapter contains:

# About this chapter

To make the Pipeline 25-Px work, you first need to give it a variety of information, such as information about the ISDN service provided by your telephone company and one or more telephone numbers that the Pipeline dials to connect to other locations. This process is called configuring the Pipeline. In this chapter, you'll learn how to configure your Pipeline 25-Px by using its configuration menus.

**Note:** If your Pipeline 25-Px has already been configured for you by your network service provider, you can skip this chapter.

The chapter explains:

- How to give your computer an Internet Protocol (IP) address that works with the Pipeline 25-Px.
- How to set up a communications program on your personal computer or workstation to communicate with the Pipeline 25-Px.
- How to use the configuration menus to configure the Pipeline 25-Px.
- How to test the ISDN line.

This chapter assumes that you have been given the necessary configuration settings from your network service provider. In many cases, these settings will be specific to the Pipeline 25-Px, and they will be easy to find in the configuration menus. If, however, you get only general configuration information that applies to a number of different ISDN devices, the information in this chapter will help you to identify the settings you need to change. If after reading this chapter you are not certain which settings to change, contact your network service provider.

# About the compression option

How you configure the Pipeline 25-Px is determined in part by whether it has the following option. If this option is required for a setting, it is noted in the description of the setting.

- Data compression hardware module (part number P25-HP-COMP)

  For maximum data transmission speeds (up to 512 Kbps), you can order the Pipeline 25-Px with the data compression option. This optional module,

which compresses data you send and receive via ISDN, works only when the ISDN communications device to which you're connecting is made by Ascend. The module must be installed by Ascend or an Ascend distributor.

You can determine if your Pipeline 25-Px has this option by checking the white label on your Pipeline 25-Px packing box or on the bottom of the Pipeline 25-Px. For information on how to upgrade your Pipeline 25-Px to include this option, see your Ascend reseller.

# Setting the IP address of your computer

To use the Pipeline 25-Px, your computer must have an Internet Protocol (IP) address that is compatible with the IP address of the Pipeline. To assign a compatible address, follow these steps:

**1** If you don't already know how to set your computer's IP address, find the necessary instructions in the manuals for your computer's operating system or for your TCP/IP software package.

**2** Assign the following IP address to your computer:

```
181.100.100.100
```

**Note:** This address always works if you use the recommended IP address for the Pipeline, as described in "Specifying the IP address of the Pipeline" on page 3-21. If there is any reason you cannot use this IP address, see the description of the My Addr setting on page 5-3 for more information.

**3** Specify the following IP address as the gateway:

```
181.100.100.99
```

This address, which specifies where to send data bound for your network service provider, is the address you will assign to the Pipeline.

**4** If you need to specify a network mask, use the following value:

```
255.255.0.0
```

How the Pipeline 25-Px uses these addresses, which is different from the way most Internet connections work, is described in the following sections.

**Note:** If you just want to connect and don't need to understand the techniques the Pipeline 25-Px uses for connecting to a network, skip to "Setting up your communications software" on page 3-5.

## About dynamic IP addressing

To connect to the Internet or to other networks that use TCP/IP networking, your computer needs a special address, known as an Internet Protocol (IP) address, that is unique on the entire network. The most economical way to get an IP address, and the one supported by the Pipeline 25-Px, is to get an address from your network service provider each time you connect to the network. This technique, known as dynamic IP addressing, allows your network service provider to have a pool of IP addresses and assign them only when needed. When you disconnect from the network, the address can be reused by another computer connecting to the network.

The Pipeline 25-Px handles dynamic IP addressing invisibly; you never see or know the IP address that is assigned to your computer by the network service provider. The Pipeline automatically translates the dynamically assigned address to a static address you assign to your computer, as described in the next section.

## About address translation

The IP addresses for the Pipeline 25-Px and the computer connected to it are private addresses that are visible only to the Pipeline and the computer, not to the network to which you connect. When the Pipeline 25-Px receives data from the network, it automatically translates the dynamic IP address assigned by the network service provider to the private IP address assigned to the computer. When the computer sends data to the network, the Pipeline 25-Px automatically translates the private address to the dynamic address.

The automatic address translation process performed by the Pipeline 25-Px simplifies the job of your computer's networking software. You can configure the software as though it were on a small local-area network with an Internet gateway, with separate IP addresses for the computer and gateway, even though your network service provider supplies only a single IP address.

# Setting up your communications software

Before you can configure your Pipeline 25-Px, you must set up the communications software you'll use to do the configuration. This section explains how.

## Installing the communications software

If you haven't already installed your communications software, do it now. For detailed instructions for configuring two commonly used communications programs, PROCOMM PLUS for Windows and ZTerm for Macintosh, see Appendix A, "Configuring Communications Software."

## Checking for the correct settings

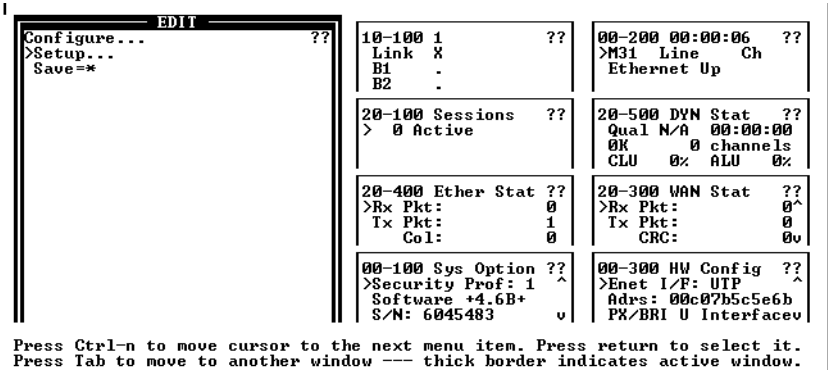
In some cases, the communications software may already be configured properly. To check, follow these steps:

1. Open the communications software.

   If the software includes a separate Terminal or Data Terminal utility, run that utility.

2. Press Control-L (by pressing the L key on the keyboard while holding down the Control key).

If the software is configured correctly, the Pipeline 25-Px configuration windows shown in the following illustration appear.




If the software is configured correctly, skip to "Entering configuration settings" on page 3-9 and begin configuring your Pipeline 25-Px. If not, go on to the next section.

## Entering configuration settings

Appendix A, "Configuring Communications Software," gives step-by-step instructions for configuring

- Version 3 of PROCOMM PLUS, the most popular communications software for Microsoft Windows
- ZTerm, a shareware communications program for Apple Macintosh computers

If you are using PROCOMM PLUS 3 or ZTerm and want detailed configuration instructions, follow the instructions in the appendix and then skip to "Viewing the configuration windows" on page 3-8. If not, use the settings in the next section to configure your communications software.

## Settings for communications software

To communicate with the Pipeline 25-Px, set up your communications software as follows:

**Note:** If you are not already familiar with the settings listed, see the documentation for your communications software. If you're using the software for the first time, going through an online or printed tutorial if the software includes one is often a quick way to get started.

- **Direct connection:** Tell the software that there is a serial cable connecting the Pipeline directly to the computer.
- **Serial port:** Specify which of the computer's serial ports the software uses. This is the port to which you connected the Pipeline with a modem cable, as described in "Connecting to the Control jack" on page 2-17.

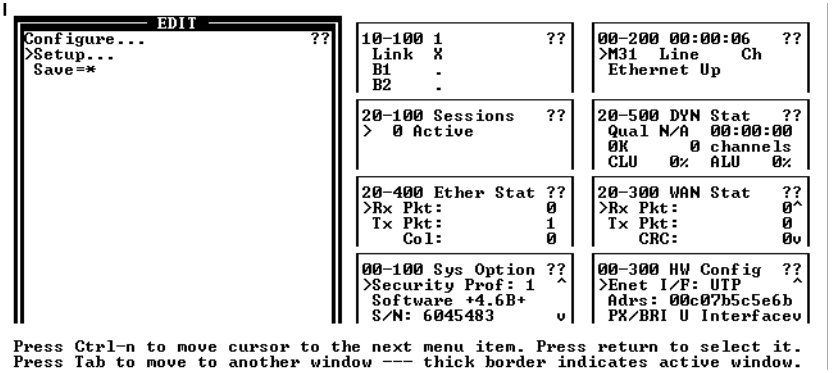
  **Note:** If the only serial port available is currently used by an internal modem, you may need to use your computer's setup software to specify an external connector for the port that will be used in place of the internal modem. In some cases, you also may need to remove the modem. See the manual for the modem and your computer's user manual for details.
- **Flow control:** Turn *off* software flow control (XON/XOFF) and, if possible, hardware flow control (RTS/CTS).
- **Default file transfer protocol:** Specify Xmodem CRC/1K if it is available, or Xmodem 1K or Xmodem if Xmodem CRC/1K is not one of the choices. (Most versions of Xmodem perform CRC—cyclical redundancy checking, a way to detect data transmission errors—and can perform 1K transfers without the need to specify these separately.) Although Xmodem is not needed for configuring the Pipeline, you use it when you upgrade the Pipeline software, as described in Appendix D, "Upgrading Pipeline Software."
- **Terminal type:** Specify VT100 or, if it is not available, VT102.
- **Duplex:** If the software lets you choose, specify Full. Because this is by far the most common choice, most communications software sets this by default.
- **Data bits:** Specify 8.
- **Stop bits:** Specify 1.
- **Parity:** None

# Viewing the configuration windows

Once you've installed and configured your communications software and opened the VT100 terminal window, you can view the Pipeline configuration windows by following this step:

**1** Press Control-L (by pressing the L key on the keyboard while holding down the Control key).

The configuration windows appear.




The Edit window at the left of the screen displays the menus you use to enter configuration settings, as described in the following sections. The other windows, know as status windows, provide information about the current status of the Pipeline. Status windows are discussed in Chapter 4.

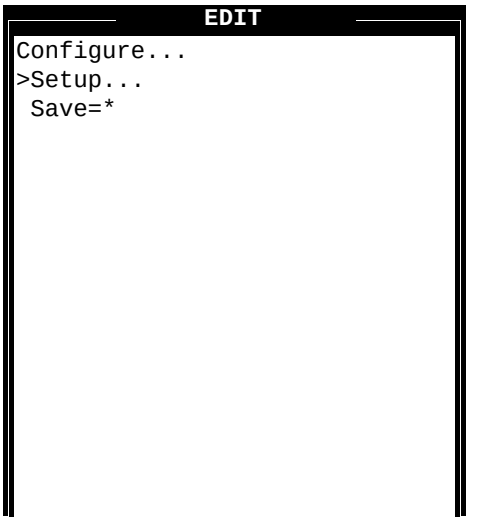
**Note:** The heavy border around the Edit window indicates that it is the active window, the one that responds to what you type at the keyboard. To enter configuration settings, as described in the next section, the Edit window must be active. If you accidently press the Tab key, another window becomes active. To make the Edit window active again, press Tab repeatedly until the window is shown with a heavy border.

# Entering configuration settings

If your Pipeline 25-Px was not configured for you, you need to enter configuration settings for connecting to the remote site. These settings are normally provided for you by the administrator of the remote site. This section explains how to use the configuration menus, lists the settings they contain, and explains how to change the settings.

## Moving the marker

When you first open the configuration windows, the Configure menu appears.



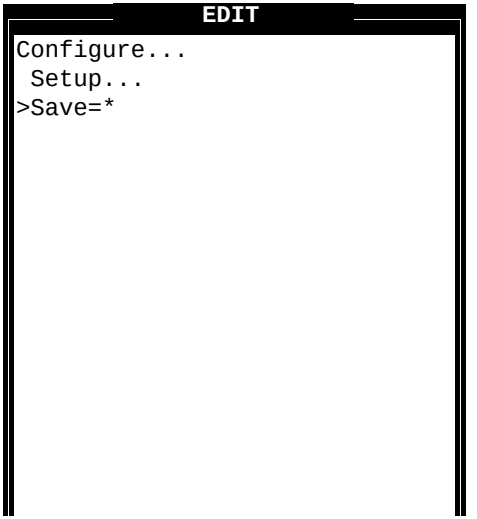

Every menu contains a marker, a greater-than (>) sign that indicates where you are in the menu. Here, the marker is at the Setup... menu item.

**Note:** The marker is not the pointer that you move with a pointing device, such as a mouse, on most modern computers. You use the keyboard to move the marker, as described in this section.

To move down the marker, follow this step:

**1** Press the down-arrow key on the keyboard or, if that doesn't work, press Control-N (by pressing the N key on the keyboard while holding down the Control key).

The marker moves down to the next item.




To move up the marker, follow this step:

**1** Press the up-arrow key on the keyboard or, if that doesn't work, press Control-P (by pressing the P key on the keyboard while holding down the Control key).

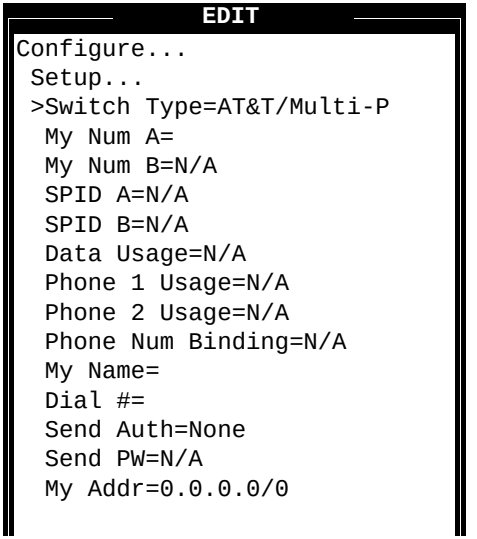
## Opening and viewing the Setup menu

All the configuration settings for the Pipeline 25-Px are contained in the Setup menu. To open this menu, follow these steps:

**1** Move the marker to Setup... if it isn't already there.

**2** Press the Return key.

The Setup menu appears.




## Specifying the switch type

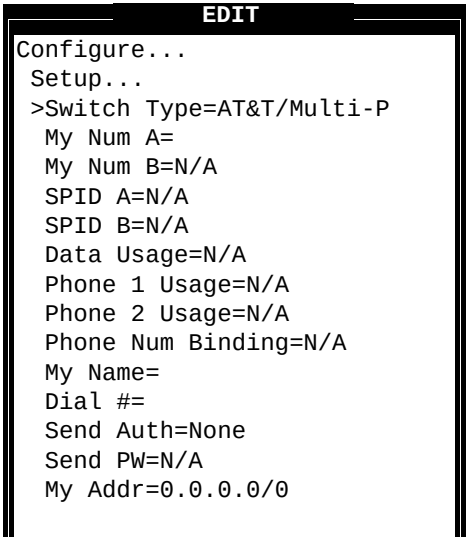
The Switch Type setting specifies the type of service for your ISDN line. By default, the value of Switch Type is AT&T/P-T-P, which specifies that your ISDN service is AT&T Custom Point-to-Point.

To set the value of Switch Type, follow these steps:

**1** Move the marker to Switch Type if it isn't already there.

**2** If the value shown is not correct, press Enter.

This changes the setting to its next possible value, AT&T/Multi-P, which specifies that your ISDN service is AT&T Custom Multipoint.




Pressing Enter again chooses the next value, and so on. When you reach the last possible value, pressing Enter again chooses the first value.

The most common values for Switch Type are:

- AT&T/P-T-P, which specifies that your ISDN service is AT&T Custom Point-to-Point.
- AT&T/Multi-P, which specifies that your ISDN service is AT&T Custom Multipoint.
- NI-1, which specifies that your ISDN service is National ISDN-1 (NI-1), a standard service that is available from most telephone companies.

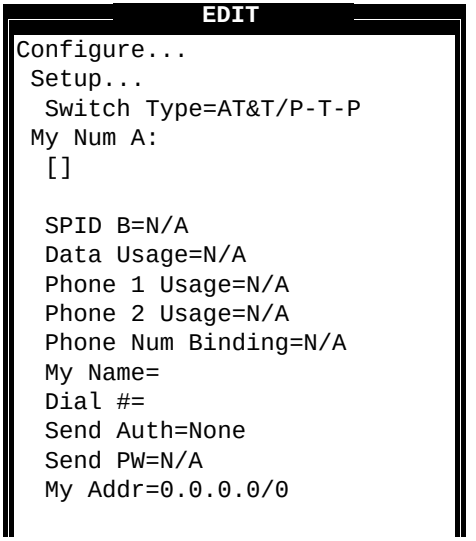
## Specifying ISDN telephone numbers

There can be one or two telephone numbers for your ISDN line.

To enter the first number, follow these steps:

**1** Move the marker to My Num A.

**2** Press Enter.
This opens a text box.




**3** Type the telephone number in the text box.

Hyphens in the telephone number are optional. For example,

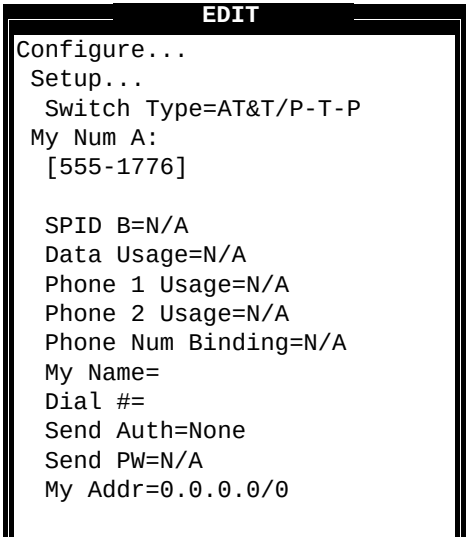
`555-1212`

and

`5551212`

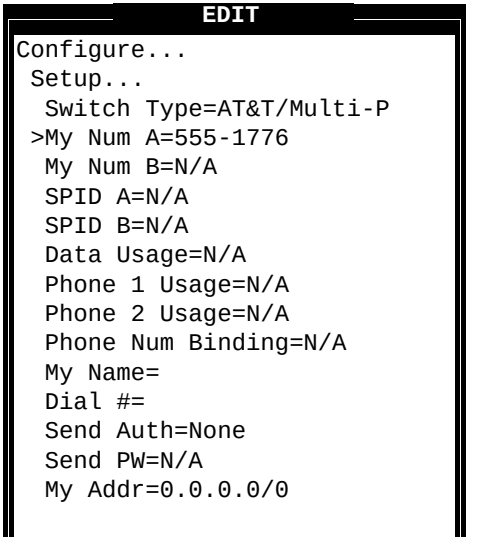
are interchangeable.

**Note:** If you make a mistake when typing text into a text box, press the Backspace (or Delete or Del) key on the keyboard to delete the incorrect characters. You can also delete characters by pressing Control-H (by pressing the H key on the keyboard while holding down the Control key).




**4** Press Enter.

When you're done, the telephone number appears in the menu.




If there is second telephone number for your ISDN line, enter it by following these steps:

**Note:** Not all settings apply to all configurations. For example, if AT&T/P-T-P is the value of the Switch Type setting, My Num B—the setting for a second telephone number—does not apply, because there can be only one telephone number for AT&T Custom Point-to-Point service. For these settings, N/A (for "not applicable") appears in place of a value, and you cannot enter a value.

**1** Move the marker to My Num B.

**2** Press Enter.

**3** Type the telephone number.

Hyphens in the telephone number are optional. For example,

`555-1213`

and

`5551213`

are interchangeable.

**4** Press Enter.

## Specifying SPIDs

A service profile identifier (SPID) identifies an ISDN device, such as the Pipeline 25-Px, that is connected to an ISDN line. Depending on the type of ISDN service you have, you may need to specify one, two, or no SPIDs for your Pipeline 25-Px.

**Note:** If AT&T/P-T-P is the value of the Switch Type setting, the settings for SPIDs—SPID A and SPID B—are both N/A.

To enter the first SPID, follow these steps:

1. Move the marker to SPID A.
2. Press Enter.
3. Type the SPID.
4. Press Enter.

To enter the second SPID, follow these steps:

1. Move the marker to SPID B.
2. Press Enter.
3. Type the SPID.
4. Press Enter.

## Specifying data and phone usage

The Data Usage setting specifies whether one or both of the B channels for your ISDN line (identified by the SPIDs you just entered) are used to carry data. (For information about B channels, see “Features of the Pipeline” on page 1-2.)

**Note:** If AT&T/P-T-P is the value of the Switch Type setting, Data Usage is N/A.

To enter a value for the Data Usage setting, follow these steps:

1. Move the marker to Data Usage.
2. If the value shown is not correct, press Enter until the correct value appears. The possible values are:

- A, which specifies that only the B channel specified by the SPID A setting is to be used for data.
- B, which specifies that only the B channel specified by the SPID B setting is to be used for data.
- A+B, which specifies that both B channels are to be used for data.

The Phone 1 Usage and Phone 2 Usage settings specify the telephone numbers for analog telephones or other devices connected to the Phone 1 and Phone 2 jacks of the Pipeline 25-Px.

**Note:** If AT&T/P-T-P is the value of the Switch Type setting, Phone 1 Usage and Phone 2 Usage are N/A.

To enter a value for the Phone 1 Usage setting, follow these steps:

**1** Move the marker to Phone 1 Usage.

**2** If the value shown is not correct, press Enter until the correct value appears.

The possible values are:

- A, for using the telephone number specified by the My Num A setting for the device connected to the Phone 1 jack.
- B, for using the telephone number specified by the My Num B setting for the device connected to the Phone 1 jack.

**Note:** The values of Phone 1 Usage and Phone 2 Usage must not both be A or both be B. You cannot use the same telephone number for both Phone jacks.

- None, which disables the Phone 1 jack.

**Note:** You cannot make or receive voice calls through a disabled Phone jack. Moreover, if a telephone number for your ISDN service is not assigned to a Phone jack (or to an ISDN device other than the Pipeline 25-Px that is connected to the same ISDN line and that handles voice calls, such as an ISDN telephone), it is not possible to make a voice call to that number.

To enter a value for the Phone 2 Usage setting, follow these steps:

**1** Move the marker to Phone 2 Usage.

**2** If the value shown is not correct, press Enter until the correct value appears.

**Note:** This value must not be the same as the value for the Phone 1 Usage setting.

The possible values are:

– A, for using the telephone number specified by the My Num A setting for the device connected to the Phone 2 jack.

– B, for using the telephone number specified by the My Num B setting for the device connected to the Phone 2 jack.

**Note:** The values of Phone 1 Usage and Phone 2 Usage must not both be A or both be B. You cannot use the same telephone number for both Phone jacks.

– None, which disables the Phone 2 jack.

**Note:** You cannot make or receive voice calls through a disabled Phone jack. Moreover, if a telephone number for your ISDN service is not assigned to a Phone jack (or to an ISDN device other than the Pipeline 25-Px that is connected to the same ISDN line and that handles voice calls, such as an ISDN telephone), it is not possible to make a voice call to that number.

## Specifying phone number binding

When the value of the Switch Type setting is NTI or NI-1, the Phone Num Binding setting specifies whether to always use the same telephone number for a particular telephone or other analog device, even when the number is already in use and the number for the other B channel is available. For complete information about this setting, see page 5-8.

**Note:** If the value of the Switch Type setting is not NTI or NI-1, Phone 2 Usage is N/A.

To enter a value for the Phone Num Binding setting, follow these steps:

**1** Move the marker to Phone Num Binding.

**2** If the value shown is not correct, press Enter until the correct value appears.

The possible values are:

– Yes, which turns on phone number binding.

– No, which turns off phone number binding.

## Specifying the name of the Pipeline

The My Name setting specifies the name of the Pipeline 25-Px.

**Note:** This setting is for the name of the Pipeline, not your name. Your network service provider uses the name and your password to identify you when you connect. The name is normally assigned by your network service provider.

To enter a value for My Name, follow these steps:

1. Move the marker to My Name.
2. Press Enter.
3. Type the name.

   The name can contain up to 72 characters. Upper- and lowercase letters in the name are distinguished; for example, the value

   `mitchellspipeline`

   cannot be used in place of

   `MitchellsPipeline`

   **Note:** Your network service provider can deny entry if the value of My Name or the values for other settings, such as a password, are not correct. For this reason, the value must be exactly the same as the one you are given by the network service provider.
4. Press Enter.

## Specifying the phone number to dial

The Dial # setting is the telephone number of the network service provider to which you're connecting.

To enter a value for Dial #, follow these steps:

1. Move the marker to Dial #.
2. Press Enter.
3. Type the number.

**Note:** The number can include hyphens, but it **must not** include commas. If you need to press one or more numbers on your telephone (such as 9) to get an outside line, include the number or numbers before the telephone number.

**4** Press Enter.

## Specifying authorization and passwords

The Send Auth setting specifies the kind of password authorization, if any, that is used when connecting to the network service provider.

To enter a value for Send Auth, follow these steps:

**1** Move the marker to Send Auth.

**2** If the value shown is not correct, press Enter until the correct value appears.
The most common values are:

- PAP, for Password Authorization Protocol authorization.
- CHAP, for Challenge Handshake Authentication Protocol authorization.
- None, when no password authorization is required.

The Send PW setting is the password to use when connecting to the network service provider.

**Note:** If the value of the Send Auth setting is None, Send PW is N/A.

To enter a value for the Send PW setting, follow these steps:

**1** Move the marker to Send PW.

**2** Press Enter.

**3** Type the password.
The password must be exactly the same as the one you are given by the network service provider. Upper- and lowercase letters in the password are distinguished.

**4** Press Enter.

## Specifying the IP address of the Pipeline

The My Addr setting specifies the local Internet Protocol (IP) address of the Pipeline 25-Px. This is a private address that is visible only to the computer connected to the Pipeline, not to the network to which you connect. To specify the IP address, follow these steps:

1. Move the marker to My Addr.
2. Press Enter.
3. Type

   `181.100.100.99/16`

   Use this recommended value unless it is impossible to change the IP address of the computer connected to the Pipeline 25-Px. Because of the way the Pipeline 25-Px handles IP addresses, this address—together with the recommended IP address 181.100.100.100 for your computer—is all that are necessary for the Pipeline 25-Px to connect to the network service provider.

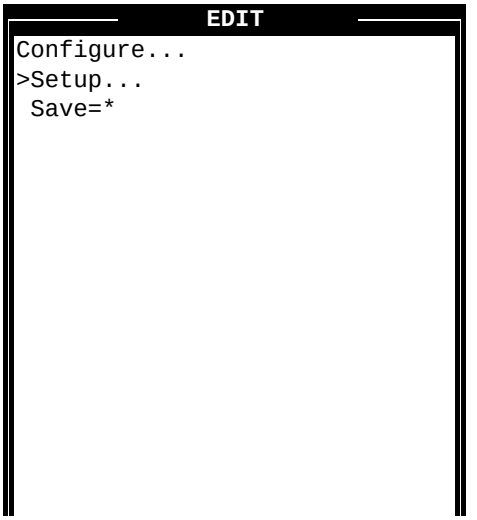
   For information about setting IP addresses and about how the Pipeline 25-Px handles IP addresses, see “Connecting the cables” on page 2-8.
4. Press Enter.

## Saving the settings

Changes to configuration settings do not take effect until you save them. To save the settings, follow these steps:

1. Press the Escape (Esc) key on the keyboard.

   This closes the Setup menu and opens the Configure menu. If you’ve made changes to configuration settings and have not yet saved them, an asterisk appears to the right of the Save item in the Configure menu.




**2** Move the marker to Save.

**3** Press Enter.

If the settings were saved, the following message appears.


If there is another setting you need to change, an error message appears. If this occurs, follow these steps:

**4** Move the marker to Setup and then press Enter.

**5** Change the setting as described earlier in this chapter.

**6** Perform steps 1-3 to save the settings.

# Testing the ISDN line

Once you've configured the Pipeline 25-Px, you can test the ISDN line to make sure it is working properly. The following sections explain how.

## Checking for a dial tone

A test to do before using your Pipeline 25-Px is to make sure you get a dial tone for analog telephones or other telephone equipment connected to the Phone jacks. Follow these steps to check the Phone jacks:

**1** Plug a conventional (analog) telephone into a Phone jack you want to use (either Phone 1 or Phone 2) if you haven't already done so.

**2** Pick up the handset and listen for a dial tone.

It sometimes takes longer to get a dial tone on an ISDN line than on a conventional analog line. Wait a few seconds if you don't hear a dial tone immediately.

**3** If you want to use the other Phone jack for another analog telephone device, such as a fax machine, repeat steps 1-2 with the other jack.

## Transferring data

If the tests in the previous section were successful, try using one or more applications that connect to your network service provider, such as an electronic mail client or a World Wide Web browser. With its default settings, the Pipeline 25-Px should dial the network service provider automatically and disconnect automatically when the line isn't used for a specified period (two minutes by default).

## Writing down your settings

Once you've tested your Pipeline and are confident it is working correctly, you're almost ready to start using your Pipeline. The last step is to write down your settings and store them in a safe place. If you ever need to reenter the settings, such as after upgrading the software for your Pipeline, you can refer to the list of settings you've saved.

# What to do next

You've finished configuring the Pipeline. The next chapter, "Using the Pipeline," explains how to monitor the Pipeline, improve its performance, and use it for voice calls.

# Using the Pipeline

# 4

This chapter contains:

# About this chapter

This chapter explains how to use your Pipeline 25-Px. It tells how to:

- Monitor the Pipeline 25-Px and confirm that it is working properly.
- Improve the performance of the Pipeline 25-Px.
- Control telephone costs when using the Pipeline 25-Px.
- Use the voice features of the Pipeline 25-Px.
- Connect and disconnect manually.

# Monitoring the Pipeline

When you use the Pipeline 25-Px, it is essential that you monitor it to assure that it is working properly. You do this by

- checking the contents of the status windows
- observing the status lights on the front of the Pipeline 25-Px

The following sections explain how.

## Using the status windows

The Pipeline 25-Px status windows appear alongside the Edit window you use to configure the Pipeline. The sections that follow explain how to use the status windows.

### Viewing the status windows

To view the status windows, you must first open the configuration windows as described in “Viewing the configuration windows” on page 3-8. The Edit window, where you configure the Pipeline, is on the left. The other windows are all status windows.

The information in status windows can only be read; you cannot change it directly.

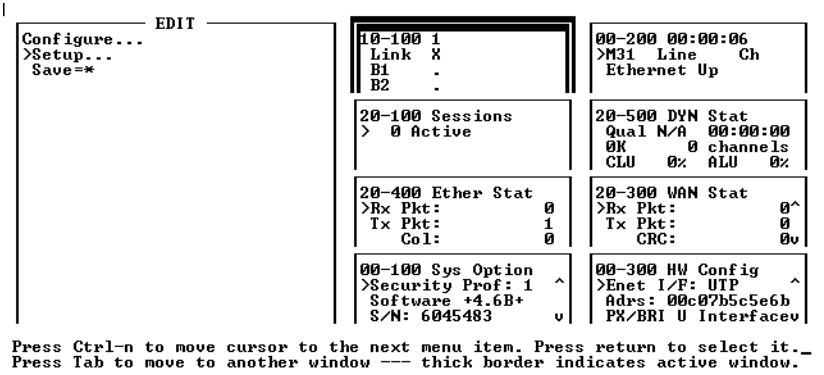
## Switching status windows

Only one of the windows on the VT100 terminal screen responds to what you type at the keyboard. This window, known as the active window, is surrounded by a thicker border. When you first turn on the Pipeline, the Edit window is active.

To make a status window active, follow this step:

**1** Press the Tab key.

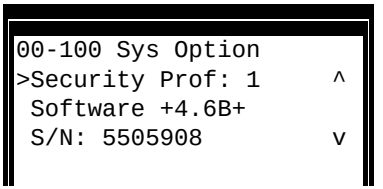
The first status window—the one labeled 10-100—becomes active.




Each time you press the Tab key, the next window becomes active. If the bottom right window is active, pressing the Tab key again makes the Edit window active.

## Scrolling through status windows

A few of the status windows are too small to display all of the information they contain. When this occurs, “scroll arrows” (^ and v symbols) appear at the right of the topmost and bottommost menu items in the window to indicate that you can scroll up or down to display more.




To scroll through the contents, make the window active and then press the down-arrow key (or Control-N) to move down or the up-arrow key (or Control-P) to move up.

## Checking the ISDN connection

Blinking question marks in the status windows and a blinking WAN light on the front of the Pipeline 25-Px indicate that the Pipeline is not connected to the ISDN line or that there is a problem with the line.

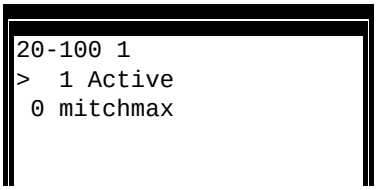
## Checking if the ISDN line is in use

When your ISDN line is being used for a data or voice call, the WAN light on the front of the Pipeline 25-Px is lit. If you're being charged by your telephone company for your calls, it's a good idea to put the Pipeline somewhere that lets you see the WAN light while you work. The WAN light is especially useful when you first start using the Pipeline and want to discover the causes of unwanted calls, as explained in "Controlling telephone costs" on page 4-9.

## Viewing active data calls

The status window labeled 20-100 shows whether there are any active data calls. The number to the right of `Active` indicates the number. The following lines list the call; the letter O indicates that it is online, that is, that the connection has been established and data can be transferred. To the right of that is the name of the ISDN device to which the Pipeline is connected.

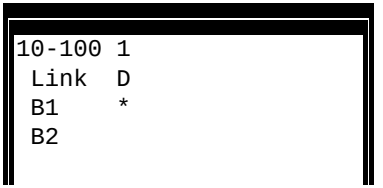
In this example, there is one active session to the device mitchmax.



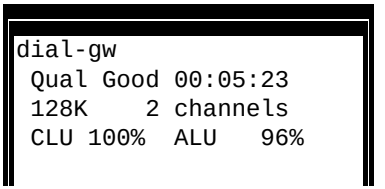

## Monitoring channel usage

The status window labeled 10-100 shows whether either or both of the B channels for your ISDN line is being used. An asterisk (*) to the right of B1 or B2 indicates that the channel is used either for a voice or data call. The letter h indicates that a voice call is on hold. The letter D indicates that a call is being dialed.

In this example, B1—the first B channel—is in use.



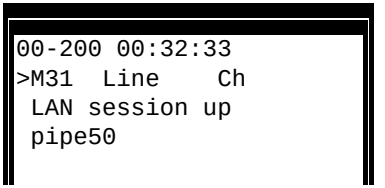

The DYN Stat status window also provides information about B channel usage. Its contents reflect the current state of data calls and change often during calls. When a data call is in progress, the name DYN Stat that appears at the top of the window is replaced by the name of the ISDN device to which you're connected. The second line shows the quality of the connection and how long the connection has been active. The third line shows the current speed of the connection in Kbps and how many B channels are currently being used.




## Viewing system messages

System messages are records of events that occur during Pipeline 25-Px operation. The Pipeline 25-Px stores the last 31 system messages. These messages are often needed by technical support personnel when diagnosing problems.

To view the messages, make the window labeled 00-200 active. The most recent message is displayed.




Above the message is a timestamp (using the clock in the Pipeline 25-Px, which cannot be set to outside time) that indicates when the message was logged. The message marked M31 is always the most recent message; previous messages, if any, are labeled M30, M29, and so on. The text for the message appears on the following line. To see earlier messages, press Control-N or the down-arrow key.

# Improving performance

There are several ways you can increase the speed and efficiency of data transfers with the Pipeline 25-Px. The following sections explain these.

## Increasing data transmission speed

By default, the speed of each B channel of the Pipeline 25-Px is 56 kilobits per second (Kbps), which is the slower of the two possible speeds for a B channel. Most telephone companies offer 64 Kbps service. If your telephone company provides 64 Kbps service, and if the other telephone companies, if any, handling your data calls also provide 64 Kbps service, you can increase your data transmission speed to 64 Kbps per channel by following these steps:

1. Open the configuration windows if they are not already open.
2. Switch to the Edit window if it is not already active and open the Setup menu if it is not already open.
3. Move the marker to Data Svc.
4. Press Enter repeatedly until the value 64K appears.
5. Press the Escape (Esc) key.
6. Move the marker to Save=*.
7. Press Enter to save the setting.

## Using both B channels for data calls

Using both B channels for a data call doubles the speed of the connection. Using both channels is possible if

- The ISDN device to which you're connected is configured to use the Multilink Protocol Plus (MP+) protocol.

  This protocol specifies how data is transmitted between the two ISDN devices. It is used automatically by the Pipeline 25-Px when the ISDN device to which you're connected uses it.

  **Note:** MP+ is supported only by ISDN devices manufactured by Ascend. If the device to which you're connecting also is made by Ascend, it is likely to use MP+. If you're not sure if this protocol is being used by the ISDN device to which you're connecting, contact your network service provider.

- Both the Pipeline 25-Px and the ISDN device are configured to allow two-channel data calls.

  This is true by default for the Pipeline 25-Px.

- The amount of data transmitted and the length of time it is transmitted is sufficient to trigger the use of a second B channel.

  How this works is described in the next section, "About Dynamic Bandwidth Allocation."

The important thing to remember is that to use both B channels for a single data call, *both* ISDN devices must be properly configured. The sections that follow describe the settings that are needed for the Pipeline 25-Px, all of which are set correctly by default. If you cannot use both B channels and the settings for your Pipeline 25-Px are correct, you'll need to contact your network service provider and find out if the ISDN device to which you're connecting is properly configured.

### About Dynamic Bandwidth Allocation

Dynamic Bandwidth Allocation (DBA) is a technique used for adding and subtracting B channels for a data call in response to the amount of data being transmitted. If more data is transmitted, a channel can be added and the speed of the transmission increases. If less data is transmitted, a channel can be removed and used for another purpose.

Here's an example of how DBA works:

- You connect to your network service provider.

  By default, the connection uses a single B channel.

- You start a file transfer.

  There is a lot of data to be transferred, and the entire capacity of the single B channel is used. When the usage of the B channel remains high for a certain length of time, a second B channel is added to the call and the speed of the transfer doubles.

- The file transfer is complete.

  You're no longer using the entire capacity of the two B channels, and after a period of time one of the B channels is removed from the call.

## Using data compression

A Pipeline 25-Px that includes the optional data compression hardware module (part number P25-HP-COMP) can transmit data up to four times as fast as a

standard Pipeline 25-Px. The data compression hardware module can be preinstalled at the factory or it can be installed later by Ascend or one of its resellers.

For data compression to work, both of the ISDN devices must be made by Ascend and support either the STAC LZS compression technique or a variation of the STAC technique used by the Microsoft Windows 95 operating system. (Compression support is standard on many Ascend products and optional on the Pipeline 25-Px.) In addition, compression must be enabled on both devices.

The extent to which data can be compressed depends on the data. Only rarely can data be compressed to 1/4 its original size, which quadruples transmission speeds, but it is common to compress data to 1/2 its original size, which doubles transmission speeds.

If your Pipeline 25-Px has the data compression hardware module, follow these steps to turn on compression:

1. Open the configuration windows if they are not already open.
2. Switch to the Edit window if it is not already active and open the Setup menu if it is not already open.
3. Move the marker to Link Comp.
4. Press Enter repeatedly until the correct value appears.

   Choose Stac to specify the STACKER LZS data compression technique, MS-Stac to specify the Microsoft LZS Coherency Compression technique used by the Windows 95 operating system, or None to turn off data compression.
5. Press the Escape (Esc) key.
6. Move the marker to Save=*.
7. Press Enter to save the setting.

# Controlling telephone costs

For some Pipeline users, controlling the cost of ISDN telephone service can be a challenge. The following sections offer advice for dealing with some of the more common problems.

## Using a single B channel for data calls

If your telephone company charges you separately for each B channel you use, one way to limit charges is to use only one B channel for data calls. The drawback, of course, is that the speed of your connection is limited to the speed of a single channel (either 64 Kbps or 56 Kbps). To do this, follow these steps:

1. Open the configuration windows if they are not already open.
2. Switch to the Edit window if it is not already active and open the Setup menu if it is not already open.
3. Move the marker to Max Ch Count and press Enter.
4. Type 1 and then press Enter.
5. Press the Escape (Esc) key.
6. Move the marker to Save=*.
7. Press Enter to save the setting.

## Preventing unwanted calls

By default, data calls are made automatically whenever a program or service requests something from another location on the network. For example, if you are using a World Wide Web browser to view a Web page at another location and you do not currently have a connection to your network service provider, the Pipeline dials the network service provider for you automatically. Also by default, the Pipeline hangs up if the ISDN line has not been used for two minutes. This approach is normally very convenient, because it requires no intervention. When you need something from another location on the network, the connection is made automatically.

The drawback to this approach is that there are programs and services that either cause unwanted data calls to be made or that prevent calls from being hung up. The tasks they perform are either not worth the cost of a call or are not worth tying up the line for. For example, certain network protocols use “I’m alive” messages to say that a printer, server, or other service is still available. When such messages are sent once a minute or more, the ISDN line would normally be used continuously, resulting in enormous phone bills.

Use the information in the following sections to help you identify when unwanted calls are being made and to find approaches for dealing with them. If

the suggestions don't work for your configuration, contact your network service provider, network administrator, or Ascend for advice.

## Watching for calls

The simplest way to see when calls are being made automatically is to watch the WAN light on the front of the Pipeline. When the WAN light is lit continuously, the line is in use. If you don't know why the WAN light is lit and it either remains lit for long periods or is lit frequently, you need to investigate.

The status windows also display when calls are made, as described in "Viewing active data calls" on page 4-4 and "Monitoring channel usage" on page 4-5.

## Closing programs

A common cause of unwanted calls is an application that makes frequent or continuous use of network services. World Wide Web browsers, File Transfer Protocol (FTP) clients, and network monitors are just some of the programs that can cause calls to be made or that keep calls up. Electronic mail clients that frequently check for new mail are other possible culprits. Try to identify what programs cause calls and either quit those that you do not have to have open all the time or change their configuration settings, such as the frequency of e-mail checks. If necessary, quit all programs and see if unwanted calls are still being made. If not, open one program at a time and observe what happens before opening another.

## Turning off network services

Certain services provided by networks can also keep an ISDN line up. For example, continuous access to remote printers or servers may require frequent "I'm alive" messages that cause calls to be made. These problems can be more difficult to solve and in some cases can only be solved by eliminating the service. If you suspect a problem with a network service, contact your network service provider.

# Using voice features

An ISDN telephone line can carry data, voice, or both at once. You can use the Phone 1 and Phone 2 jacks on the Pipeline 25-Px to connect standard telephones, fax machines, or other analog telephone equipment to the same ISDN line you use for data.

In the following sections, the term analog device refers to any conventional telephone device, such as a telephone or fax machine, that you connect to one of the Phone ports of the Pipeline 25-Px.

## How voice features work

The following sections give an overview of the Pipeline 25-Px voice features and explain how your ISDN service can be shared by voice and data calls.

### How your ISDN service affects voice features

The voice features that are available on your Pipeline 25-Px are determined in part by the type of ISDN service your telephone company provides and by the telephone switch it uses to provide that service. For example, most types of residential ISDN service include two telephone numbers. Because each voice call requires its own telephone number, you need two telephone numbers to make or receive two different voice calls at the same time, such as when making a voice call at the same time you receive a fax. In contrast, one type of ISDN service, AT&T Custom Point-to-Point, includes only one telephone number.

The sections that follow note differences in voice features for certain types of ISDN service and for certain switches. Because standardized ISDN services, such as National ISDN-1 (NI-1), are becoming more common, these differences are becoming less frequent. A separate document, “Ordering ISDN Service for the Ascend Pipeline 25 and 75,” explains how to order ISDN Basic Rate Interface (BRI) service—the affordable ISDN service for which the Pipeline 25-Px is designed—and lists advantages and disadvantages of different types of BRI service. If your telephone company offers more than one type of BRI service, you can use the lists of advantages and disadvantages to determine which type is best for you.

**Note:** The voice features of the Pipeline 25-Px are identical to those of the Pipeline 25, and so are the settings for the telephone switch your telephone company uses for your ISDN service. Because the Pipeline 25 is widely used, most telephone companies know the switch settings that are necessary. When ordering ISDN service for a Pipeline 25-Px, tell them you will be using a Pipeline 25. If your telephone company does not know the proper settings, you can copy and send them the recommended settings listed in "Ordering ISDN Service for the Ascend Pipeline 25 and 75." These settings are necessary for the voice features to work as described in the following sections.

## How outgoing voice calls are handled

When an ISDN telephone line is configured properly for the Pipeline 25-Px, each B channel can carry either voice or data. When a B channel is used for voice, it can carry a single voice call.

The voice-handling features of the Pipeline 25-Px make it easy to make outgoing voice calls:

- If neither B channel is currently in use, you can make a voice call by picking up the receiver of a telephone connected to either analog port.
- If a single B channel is currently in use for a data call, you can make a voice call by picking up the receiver of a telephone connected to either analog port. The other B channel is then used for the call.
  - Exception: If the switch is a Northern Telecom DMS-100 and the value of the Phone Num Binding parameter is Yes, you cannot make the call if the currently used B channel and the analog port to which the phone is connected both use the same telephone number.
- If a single B channel is currently in use for a voice call, you can make a voice call on the other telephone number by picking up the receiver of a telephone connected to the other analog port. The other B channel is then used for the call.
  - Exception: If the type of ISDN service is AT&T Custom Point-to-Point, there can be only one voice call at a time. Because AT&T Custom Point-to-Point service includes only one telephone number, all outgoing voice calls use that number.
- If both B channels are used for a data call to the same location, you can make a voice call by picking up the receiver of a telephone connected to either ana-

log port. The Pipeline 25-Px automatically borrows one of the B channels for the voice call. This feature works for outgoing calls on all types of ISDN service and all switches.

If both B channels are used for any other combination of calls—for two voice calls, for one voice call and one data call, or for two data calls to different locations—you cannot make another voice *or* data call.

## How incoming voice calls are handled

The voice-handling features of the Pipeline 25-Px also make it easy to receive incoming voice calls. In the most common configuration, where each analog port is assigned to a different telephone number, incoming voice calls are handled as follows:

- If neither B channel is currently in use, you can receive a voice call on either telephone number.
- If a single B channel is currently used for a data call, you can receive a voice call on either telephone number. The other B channel is used for the voice call. The call is routed to the analog port assigned to the telephone number.
  - Exception: If the telephone switch for your ISDN service is a Northern Telecom DMS-100, the caller receives a busy signal if the incoming call is for the same telephone number used by the data call. Note that when a single-channel data call is made and there is no other call in progress, the telephone number specified by the My Num B parameter is always used, leaving the telephone number specified by the My Num A parameter available for voice calls.
- If a single B channel is currently used for a voice call, you can receive a voice call for the telephone number not used by the current voice call. The call is routed to the analog port assigned to the telephone number.
- If a single B channel is currently used for a voice call, and there is an incoming call to the same telephone number as the current call, the caller receives a busy signal.
- If both B channels are used for a data call to the same location, you can receive a voice call to either telephone number. The Pipeline 25-Px automatically borrows one B channel for the voice call, and the call is routed to the analog port assigned to the telephone number.

  - Exceptions: AT&T Custom Multipoint service and AT&T Custom Point-to-Point service do not support channel borrowing for incoming calls. With these services, callers receive a busy signal whenever both B channels are in use.
- If both B channels are used for any other combination of calls—for two voice calls, for one voice call and one data call, or for two data calls to different locations—the Pipeline 25-Px cannot handle another voice call, and callers to either telephone number receive a busy signal.

Incoming voice calls are handled differently with AT&T Custom Point-to-Point service. Because this service includes only one telephone number, it can handle only one voice call at a time.

- If a single B channel is currently used for a data call, you can receive a voice call. The call is routed to the Phone 1 port.
- If a B channel is currently used for a voice call, a caller to the telephone number receives a busy signal.
- If both B channels are in use, a caller to the telephone number receives a busy signal.

**Note:** In one kind of ISDN service, a voice call is used to carry data. The technique is known as Data Over Voice (DOV). If a Pipeline 25-Px receives an incoming voice call for one of its telephone numbers, neither Phone port is assigned to the telephone number, and a B channel is available, the Pipeline 25-Px assumes that DOV is being used, converts the voice to data, and routes the data to your computer.

## Using Call Waiting

The Pipeline 25-Px supports Call Waiting, a feature that generates a distinctive tone when you are using a telephone number for a voice call and another voice call is made to the same telephone number. The Call Waiting tone, which is generated by the Pipeline 25-Px, is either an approximation of the Call Waiting tone provided by most telephone companies or, on a Pipeline 25-Px with a U interface, a brief “burr” tone.

To use Call Waiting, follow these steps:

**1** When you hear the call waiting tone, decide whether you want to answer the new call.

2 If you do want to answer the new call, put the current call on hold by quickly pressing and releasing your telephone's switchhook (the button that is depressed when you hang up the telephone).

3 To return to the first call, quickly press and release your telephone's switchhook again. This puts the second call on hold.

## Using Call Hold

The Pipeline 25-Px also supports Call Hold, which lets you put the current call on hold. To put a call on hold, follow these steps:

1 Quickly press and release your telephone's switchhook (the button that is depressed when you hang up the telephone).

You can now make another call.

2 To return to the call you put on hold, quickly press and release your telephone's switchhook again.

If you have a second call, this puts the second call on hold while you take the first call.

# Connecting and disconnecting manually

Normally, the Pipeline 25-Px automatically connects to and disconnects from your network service provider. To connect manually, follow these steps:

1 Open the configuration windows if they are not already open.

2 Go to the Configure menu if it is not already open.

3 Press Control-D (by holding down the Control key while you press the D key).

The DO menu appears.

4 Move the marker to 1=Dial and then press Enter.

To disconnect manually, follow these steps:

1 Open the VT100 configuration menus if they are not already open.

2 Go to the Configure menu if it is not already open.

3 Press Control-D (by holding down the Control key while you press the D key).

The DO menu appears.

**4** Move the marker to 2=Hang Up and then press Enter.

# Reference

# 5

This chapter contains these sections:

# About this chapter

This chapter provides reference information for Pipeline 25-Px configuration settings that you can change with its configuration menus as well as for its preconfigured internal settings.

# Configuration settings

Settings are listed in alphabetical order. Each listing provides information in this format:

---

**Setting Name**

**Description:** The Description text explains the setting.

**Usage:** The Usage text explains how to use the setting.

**Example:** The Example text shows you an example entry or setting.

**Dependencies:** The Dependencies text tells you what other information you need to configure and use the setting.

**See Also:** The See Also text points you to related settings.

## Alphabetical listing of settings

---

**Data Usage**

**Description:** This setting specifies which of your ISDN telephone numbers to use for incoming data calls. If your ISDN service allows data calls on only one telephone number, you can use this setting to specify the telephone number to use.

**Usage:** Press Enter to cycle through the choices.

- A allows incoming data calls to the telephone number specified by the My Num A setting.

- B allows incoming data calls to the telephone number specified by the My Num B setting.
- A + B allows incoming data calls to the telephone number specified by the My Num A setting or the telephone number specified by the My Num B setting.

**Dependencies:** If the value of the Switch Type setting is AT&T/P-T-P, the Data Usage setting is N/A. There is only one telephone number for this type of ISDN service, and this telephone number is used for all data calls.

**See Also:** My Num A, My Num B, Switch Type

---

### Dial #

**Description:** This setting specifies the phone number the Pipeline 25-Px dials to reach the ISDN device at another location.

**Usage:** Press Enter to open a text field. Then, type a telephone number. You can enter up to 37 characters, and you must limit those characters to the following:

```
1234567890()[]!z-*#|
```

The Pipeline 25-Px sends only the numerical characters to place a call.

The default value is null.

Press Enter to close the text field.

---

### My Addr

**Description:** This setting specifies the local IP address of the Pipeline 25-Px. This is a private address that is visible only to the computer connected to the Pipeline, not to the network to which you connect.

**Usage:** You should use the recommended value, 181.100.100.99/16, unless it is impossible to change the IP address of the computer connected to the Pipeline 25-Px.

To enter an address, press Enter to open a text field and then type the address. If you do not use the recommended address, the address must consist of four numbers between 100 and 255 that are separated by periods, as in this example:

```
100.222.111.101
```

When you're done entering the address, press Enter to close the text field.

The default value is 0.0.0.0/0.

**Dependencies:** When the Pipeline 25-Px connects your computer to the network, the network service provider assigns an IP address to your computer. This address is different from the local IP address of the computer, and it is used only while you are connected to the network. When you receive data from the network, the Pipeline 25-Px automatically converts this address to the local address of your computer. When you send data to the network, the Pipeline 25-Px automatically converts the local address of your computer to the address assigned by the network service provider.

For the Pipeline 25-Px and the computer to communicate, they must be on the same subnet. To ensure this, make the last of the four numbers of their local addresses different by only one. For example, if you use the recommended value for My Addr

```
181.100.100.99/16
```

you can ensure that the computer is on the same subnet by setting its IP address to

```
181.100.100.100
```

## My Name

**Description:** This setting specifies a name for the Pipeline.

**Usage:** Press Enter to open a text field. Then, type in the name. It can include up to 72 characters. Upper- and lowercase letters are distinguished.

**Dependencies:** The Pipeline 25-Px sends the name to the remote device whenever it establishes a PPP link. The name appears in the top line of the Edit window. Always enter a system name to identify the Pipeline 25-Px.

Because the Pipeline 25-Px uses the My Name setting for authentication, you must type it exactly as the remote network expects it.

Press Enter again to close the text field.

---

**My Num A**

**Description:** This setting specifies the phone number assigned to the ISDN telephone line. If two phone numbers are assigned to the line, specify one here and one in My Num B.

**Usage:** Press Enter to open a text field and then type a telephone number. The character set is limited to the following characters:

`1234567890()[]!z-*#"`

You can include a hyphen in the phone number but no spaces.

**Example:** 5105551972

**Dependencies:** You must get this number from the telephone company providing your service.

**See Also:** My Num B

---

**My Num B**

**Description:** This setting specifies the phone number assigned to the line. If two phone numbers are assigned to the line, specify one here and one in My Num A.

**Usage:** Press Enter to open a text field and then type a telephone number. The character set is limited to the following characters:

`1234567890()[]!z-*#"`

You can include a hyphen in the phone number but no spaces.

**Example:** 5105551972

**Dependencies:** You must get this number from the telephone company providing your service.

**See Also:** My Num A

### Phone 1 Usage

**Description:** This setting specifies the Service Profile Identifier (SPID) for a telephone or other analog device connected to the Phone 1 port of the Pipeline 25-Px. For all types of ISDN service that use SPIDs, incoming voice calls to the directory number (telephone number) corresponding to this SPID are routed to the Phone 1 port.

SPIDs identify devices connected to the ISDN line. All types of ISDN service except AT&T Custom Point-to-Point use SPIDs to specify the device that receives an incoming call. When you order ISDN service for a Pipeline 25-Px, you normally get two SPIDs, one for each directory number (telephone number).

Each SPID for a Pipeline 25-Px can identify more than one device. It identifies the Pipeline 25-Px when the corresponding directory number is used for an incoming data call. It identifies a telephone or other analog device when the device uses the corresponding directory number for an incoming voice call. This sharing of SPIDs is possible because a single directory number can handle data or voice, but not both at the same time. The description of the Data Usage setting explains how to use the same SPIDs for data.

**Usage:** Press Enter to cycle through the choices.

- Choose A to route incoming voice calls for the directory number corresponding to the SPID A setting to the Phone 1 jack. This is normally the directory number specified by the My Num A setting.
- Choose B to route incoming voice calls for the directory number corresponding to the SPID B setting to the Phone 1 jack. This is normally the directory number specified by the My Num B setting.
- Choose None to prevent analog calls from being routed to the Phone 1 jack.

**Dependencies:** AT&T Custom Point-to-Point service does not use SPIDs. Because of this, the Phone 1 Usage setting is N/A for Custom Point-to-Point service. With Custom Point-to-Point service, the Pipeline 25-Px can handle only one voice call at a time. An incoming voice call is always routed to the Phone 1 jack.

**See Also:** Phone 2 Usage, Data Usage

### Phone 2 Usage

**Description:** This setting specifies the Service Profile Identifier (SPID) for a telephone or other analog device connected to the Phone 2 port of the Pipeline 25-Px. All incoming voice calls to the directory number (telephone number) corresponding to this SPID are routed to the Phone 2 port.

SPIDs identify devices connected to the ISDN line. All types of ISDN service except AT&T Custom Point-to-Point use SPIDs to specify the device that receives an incoming call. When you order ISDN service for a Pipeline 25-Px, you normally get two SPIDs, one for each directory number (telephone number).

Each SPID for a Pipeline 25-Px can identify more than one device. It identifies the Pipeline 25-Px when the corresponding directory number is used for an incoming data call. It identifies a telephone or other analog device when the device uses the corresponding directory number for an incoming voice call. This sharing of SPIDs is possible because a single directory number can handle data or voice, but not both at the same time. The Description of the Data Usage setting explains how to use the same SPIDs for data.

**Usage:** Press Enter to cycle through the choices.

- Choose A to route incoming voice calls for the directory number corresponding to the SPID A setting to the Phone 2 jack. This is normally the directory number specified by the My Num A setting.
- Choose B to route incoming voice calls for the directory number corresponding to the SPID B setting to the Phone 2 jack. This is normally the directory number specified by the My Num B setting.
- Choose None to prevent analog calls from being routed to the Phone 2 jack.

**Dependencies:** AT&T Custom Point-to-Point service does not use SPIDs. Because of this, the Phone 2 Usage setting is N/A for Custom Point-to-Point service. With Custom Point-to-Point service, the Pipeline 25-Px can handle only one voice call at a time. Incoming voice calls are always routed to the Phone 1 jack.

**See Also:** Phone 1 Usage, Data Usage

**Phone Num Binding**

**Description:** This setting forces an outgoing call to use the directory number for the port to which the device is connected. It is N/A unless the value of the Switch Type setting is NTI (Northern Telecom DMS-100 Custom) or NI-1 (National ISDN-1).

When ISDN service is provided by a Northern Telecom DMS-100 switch, each B channel is associated with a particular directory number (telephone number). Because of this, when a B channel is in use, its directory number is not available. If Phone Number Binding is set to No, an outgoing call that would normally be made on a particular directory number can be made on the other directory number if the B channel for the first directory number is already in use and the B channel for the second directory number is free.

If outgoing calls must come from a particular telephone number to be identified by Caller ID, setting Phone Number Binding to Yes ensures that the call is made using the directory number for the port to which the device is connected. If the B channel for this directory number is already in use, the call cannot be made.

When Phone Number Binding is N/A, any call originated at the Pipeline 25-Px is associated with the phone number set in the Data/Phone Usage settings. If the outgoing call is a data call and Data Usage is set to A+B, the data call will be placed from the first available phone number.

**Usage:** Press Enter to toggle between Yes and No.

- Yes means that an outgoing call is always made on the directory number for the port to which the device is connected. If the B channel for this directory number is already in use, the call cannot be made. Set this setting to Yes only if calls *must* be made on a particular directory number to be identified by Caller ID.
- No means an outgoing call that would normally be made on a particular directory number can be made on the other directory number if the B channel for the first directory number is already in use and the B channel for the second directory number is free.

**Dependencies:** This setting is N/A unless your ISDN switch type is NTI or NI-1.

**See Also:** Data Usage

### Send Auth

**Description:** This setting specifies the authentication protocol that the Pipeline 25-Px requests when initiating a connection using PPP or MP+ encapsulation. The answering side of the connection determines which authentication protocol, if any, the connection uses.

**Usage:** Press Enter to cycle through the choices.

- None specifies that the Pipeline 25-Px does not request an authentication protocol for outgoing calls.

  None is the default.

- PAP (Password Authentication Protocol) is a PPP authentication protocol.

  PAP provides a simple method for the Pipeline 25-Px to establish its identity in a two-way handshake. Authentication takes place only upon initial link establishment, and does not use encryption.

  If you choose PAP, the Pipeline 25-Px requests this protocol for authentication. The remote device must support PAP.

- CHAP (Challenge Handshake Authentication Protocol) is a PPP authentication protocol.

  CHAP is more secure than PAP. CHAP provides a way for the remote device to periodically verify the identity of the Pipeline 25-Px using a three-way handshake and encryption. Authentication takes place upon initial link establishment; a device can repeat the authentication process any time after the connection is made.

  If you choose CHAP, the Pipeline 25-Px requests this protocol for authentication. The remote device must support CHAP.

**Dependencies:** Keep this additional information in mind:

- If you request PAP or CHAP, you must also specify a password using Send PW in a Connection Profile.

**See Also:** Recv Auth, Recv PW, Send PW

### Send PW

**Description:** This setting specifies the password that the Pipeline 25-Px sends to the remote end of a connection on outgoing calls. If the password specified by

Send PW does not match the remote end's value for Recv PW, the remote end disconnects the link.

**Usage:** Press Enter to open a text field. Then, type the password that the remote end requires the Pipeline 25-Px to send.

You can enter up to 20 characters; the password is case sensitive. Leave the field blank if the remote end does not require a password.

Press Enter again to close the text field.

**Dependencies:** Keep this additional information in mind:

- You must specify a value for Send PW when the Pipeline 25-Px uses PAP or CHAP authentication (Send Auth=PAP or Send Auth=CHAP).

**See Also:** Recv Auth, Recv PW, Send Auth

**SPID A**

**Description:** This setting specifies the ISDN BRI Service Profile Identifier (SPID) associated with My Num A. An SPID is a number assigned to an ISDN BRI line for service identification at the ISDN service provider's central office. It is typically formed by adding a code to the phone number assigned to the line. Your carrier provides you with one or more SPIDs.

All types of ISDN service except AT&T Custom Point-To-Point can have two phone numbers. The primary phone number (My Num A) requires a matching primary SPID (SPID A). The secondary phone number (My Num B) requires a matching secondary SPID (SPID B).

If you have AT&T Point-to-Point service, only one phone number is assigned to the ISDN BRI line, and no SPIDs are used.

**Usage:** Press Enter to open a text field. Then, type up to 16 characters; you must limit those characters to numbers, hyphens, and parentheses. The default value is 0 (zero). Press Enter again to close the text field.

**Dependencies:** Keep this additional information in mind:

- You must enter a value for SPID A unless you have AT&T Custom Point-To-Point service for your ISDN line.

- If the Pipeline 25-Px uses only one channel of a multipoint ISDN BRI line and another device uses the other channel, you can choose to operate in single-terminal mode.

**See Also:** My Num A, My Num B, SPID B, Switch Type

---

**SPID B**

**Description:** This setting specifies the ISDN BRI Service Profile Identifier (SPID) associated with My Num B. An SPID is a number assigned to an ISDN BRI line for service identification at the central office (CO). It is typically formed by adding a code to the phone number assigned to the line. Your carrier provides you with one or more SPIDs.

All types of ISDN service except AT&T Custom Point-To-Point can have two phone numbers. The primary phone number (My Num A) requires a matching primary SPID (SPID A). The secondary phone number (My Num B) requires a matching secondary SPID (SPID B).

If you have AT&T Point-to-Point service, only one phone number is assigned to the ISDN BRI line, and no SPIDs are used.

**Usage:** Press Enter to open a text field. Then, type up to 16 characters; you must limit those characters to numbers, hyphens, and parentheses. The default value is 0 (zero). Press Enter again to close the text field.

**Dependencies:** Keep this additional information in mind:

- If the Pipeline 25-Px uses only one channel of a multipoint ISDN BRI line and another device uses the other channel, you can choose to operate in single-terminal mode.

**See Also:** My Num A, My Num B, SPID B, Switch Type

### Switch Type

**Description:** This setting specifies the network switch and ISDN service type used for your ISDN line.

A switch is the device that connects the calling party to the answering party. The connection is a switched circuit consisting of one or more channels.

**Usage:** Press Enter to cycle through the choices. Your choices differ depending on the profile.

You can select one of the switch types listed in Table 5-1.

*Table 5-1. Switch types*

| Switch type | Explanation |
|---|---|
| AT&T/P-T-P | AT&T Point-to-Point (default) |
| AT&T/Multi-P | ATT&T Mulitpoint |
| NT1 | Northern Telecommunications, Inc. |
| NI-1 | National ISDN 1 |
| NI-2 | National ISDN-2 |
| U.K. | United Kingdom: ISDN-2<br>Hong Kong: HKT Switchline BRI<br>Singapore: ST BRI<br>Euro ISDN countries: Austria, Belgium, Denmark, Germany, Finland, Italy, Netherlands, Portugal, Spain, Sweden<br>Identical to NET 3 |
| SWISS | Switzerland: Swiss Net 2 |
| NET 3 | Identical to U.K. |
| GERMAN | Germany 1TR6 version: DBP Telecom |

*Table 5-1. Switch types*

| Switch type | Explanation |
|---|---|
| MP GERMAN | Germany: 1TR6 multipoint |
| FRANCE | France: FT Numeris |
| DUTCH | Netherlands 1TR6 version: PTT Netherlands BRI |
| BELGIUM | Belgium: Pre-Euro ISDN Belgacom Aline |
| JAPAN | Japan: NTT INS-64 |
| AUSTRALIA | Australia and New Zealand |

# Internal settings

The following settings are internal to the Pipeline and cannot be changed. The descriptions explain how they affect the operation of the Pipeline.

### Add Pers

**Description:** This setting determines the number of seconds the Pipeline will wait before adding a B channel to a connection in cases where the average bandwidth has been exceeded.

**Usage:** The preset value is 5 seconds.

### Ans Orig

**Description:** This setting specifies whether the Pipeline will originate calls, answer calls, or both.

**Usage:** The preset value is Call Only, which means that the Pipeline can only originate calls.

**Base Ch Count**

**Description:** This setting specifies the number of B channels the Pipeline uses when originating calls. A B channel can be added or taken away in response to demand.

**Usage:** The preset value is 1.

**Data Svc**

**Description:** This setting specifies type and speed of data service provided for the ISDN line.

**Usage:** The preset value is 56K, which permits a 56 Kbps (thousand bits per second) data transfer rate on each B channel.

**Dst Address**

**Description:** This is the IP address of the remote site.

**Usage:** On the Pipeline, this address is always provided automatically by the remote site.

**Encaps**

**Description:** This setting specifies the encapsulation to use when exchanging data over ISDN.

**Usage:** The preset value is MPP, which causes the Pipeline to use Multichannel Point-to-Point Protocol encapsulation when available, or PPP (Point-to-Point Protocol) encapsulation otherwise.

**Ethernet**

**Description:** This setting specifies which Ethernet connector you use to connect the Pipeline to your computer.

**Usage:** The preset value is UTP, which specifies the 10Base-T jack on the Pipeline.

**Idle**

**Description:** This setting specifies number of seconds the Pipeline will wait before clearing a data call when there is no activity.

**Usage:** The preset value is 120 seconds (2 minutes).

**Link Comp**

**Description:** This setting enables or disables data compression.

**Usage:** If your Pipeline 25-Px has the optional data compression hardware module, the preset value is Stac, which turns on STACKER LZS data compression. If your Pipeline 25-Px does not have the optional data compression hardware module, this setting is N/A.

**Max Ch Count**

**Description:** This setting specifies the maximum number of B channels to use for a data connection.

**Usage:** The preset value is 2.

**Min Ch Count**

**Description:** This setting specifies the minimum number of B channels to use for a data connection.

**Usage:** The preset value is 1.

**Remote Mgmt**

**Description:** This setting disables or enables remote management of the Pipeline.

**Usage:** The preset value is Yes, which allows remote management. Remote management is only possible from other Ascend devices with Ascend Management Protocol (AMP) software, and only when the MPP protocol is used for the connection.

# Configuring Communications Software

# A

This appendix contains:

# About this appendix

This appendix provides step-by-step instructions for configuring version 3 of PROCOMM PLUS, the most commonly used communications software for Microsoft Windows, and ZTerm, a widely-used shareware communications program for the Apple Macintosh and compatibles. You can use either of these programs to communicate with the Pipeline 25-Px.

Because all communications programs have many features in common, these instructions may help you find and understand relevant settings in other communications software.

# Configuring PROCOMM PLUS

The following sections explain how to install PROCOMM PLUS and how to configure it.

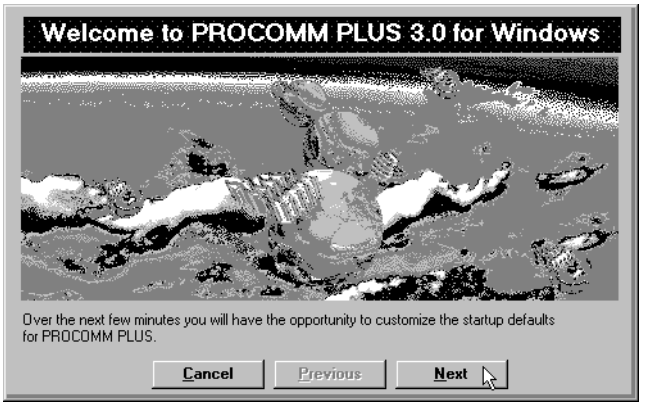
**Note:** The procedures described here apply only to Version 3.0 of PROCOMM PLUS. The exact procedures are different in earlier versions.

## Installing PROCOMM PLUS

To install PROCOMM PLUS version 3, follow these steps:

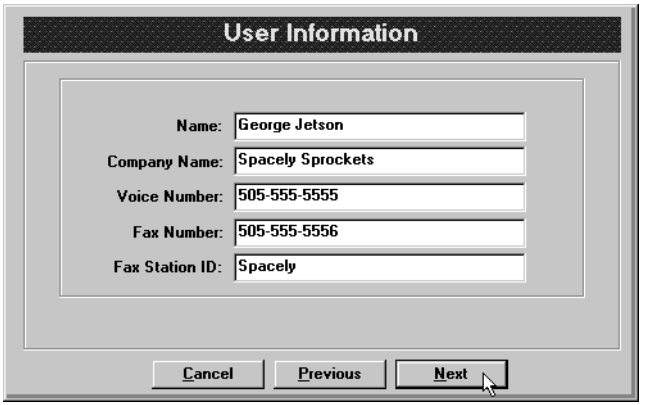
**1** Insert the first floppy disk or CD-ROM and run the Setup utility.

The following startup screen appears.

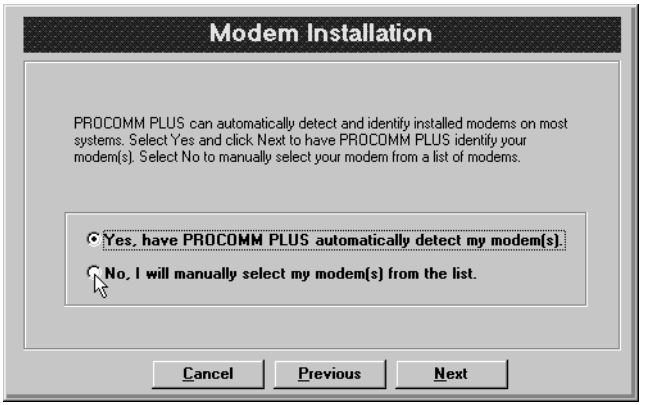



**2** Click Next to continue.
The User Information window appears.

**3** Enter the information about yourself and your telephone numbers.




**4** When you're done, click Next.
The Modem Installation window appears.



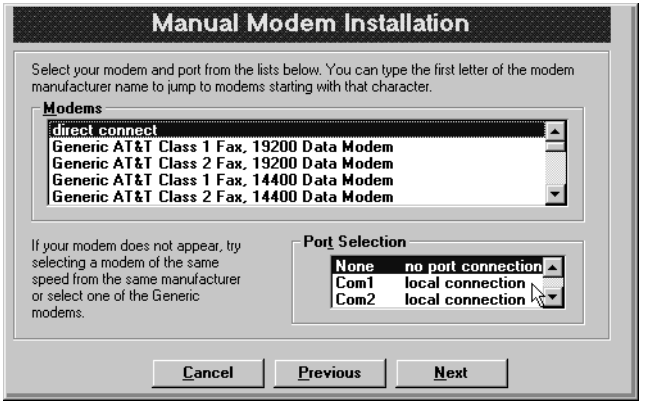

**5** Click the No button.

**6** Click Next to continue.

The Manual Modem Installation window appears.

**7** In the Modems list, select Direct Connect if it isn't already selected. From the Port Selection list, select the serial port you will use to connect to the Pipeline.

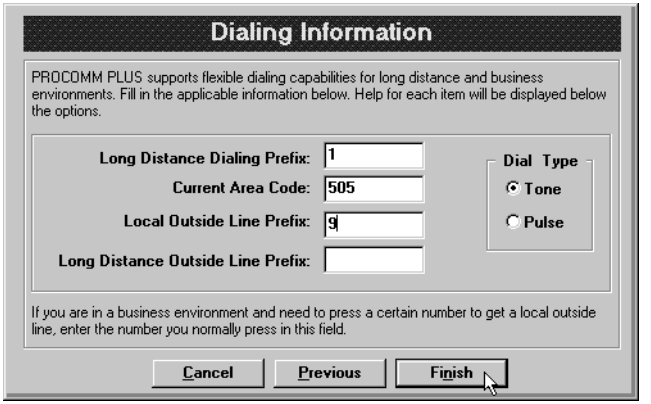
For information on choosing a serial port, see "A computer with a serial port" on page 2-5 and "Connecting to the Control jack" on page 2-17.



**8** Click Next to continue.

The Dialing Information window appears. You do not need to enter information in this window.

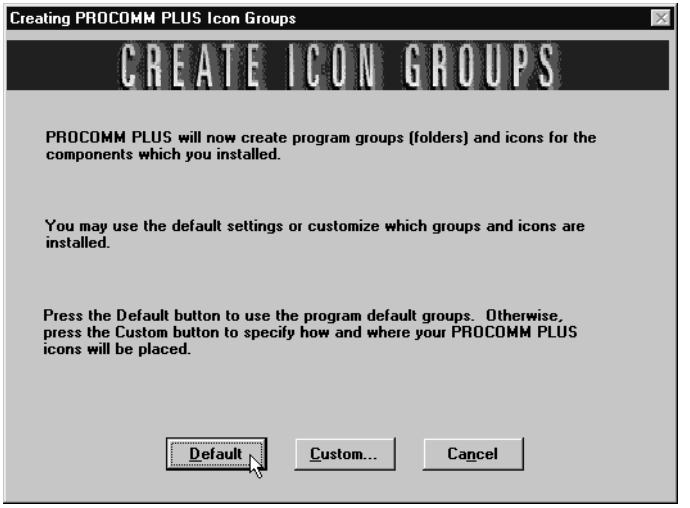
**9** Click Finish.




If other windows appear that ask what features you want to install, select those that are appropriate for you.

When Create Icon Groups window appears, follow this step:

**10** Click Default.

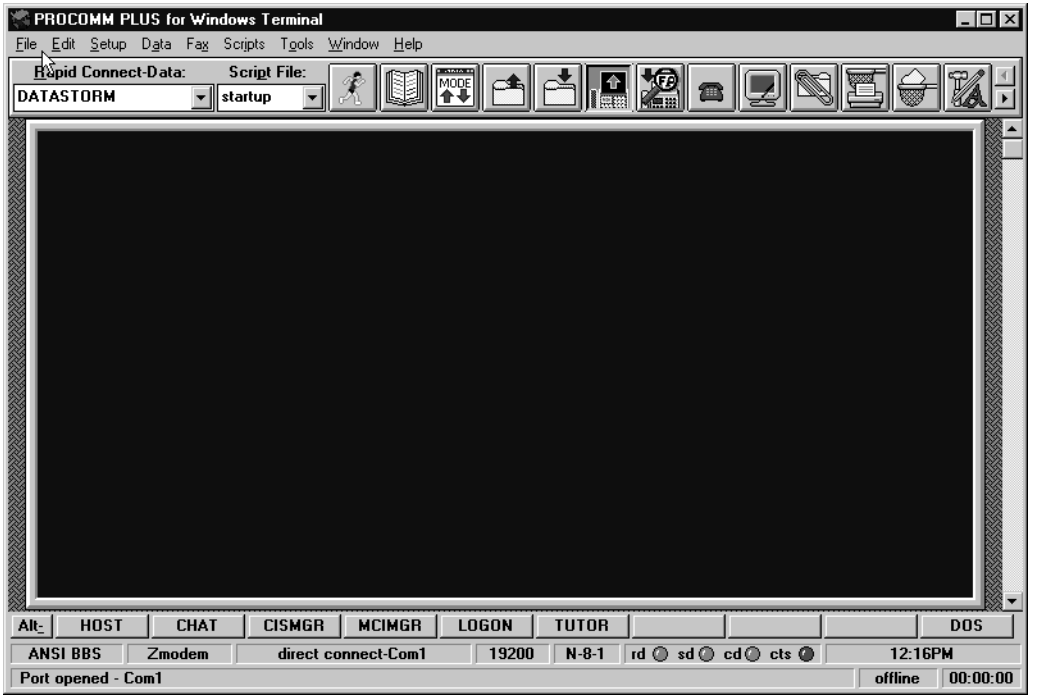



The View README File window appears. If you are using PROCOMM PLUS for the first time, you may want to read this file. If not, click No.

The installation is now complete. Click Finish to begin entering communications settings.

## Entering communications settings

When you finish installing PROCOMM PLUS, the Terminal window appears.

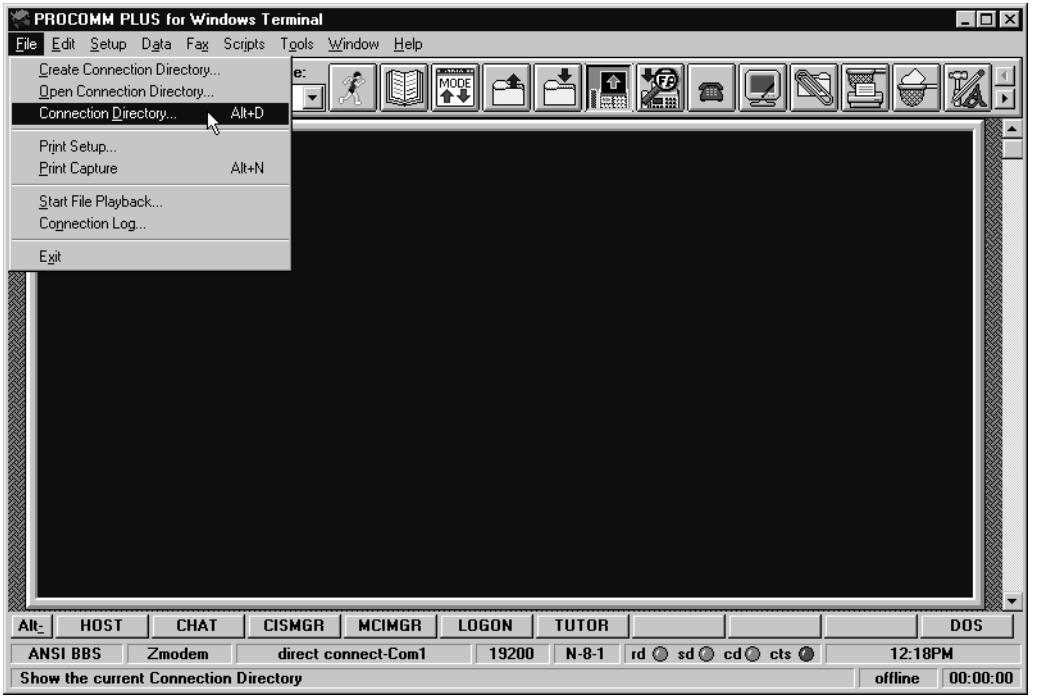



## Creating a directory entry

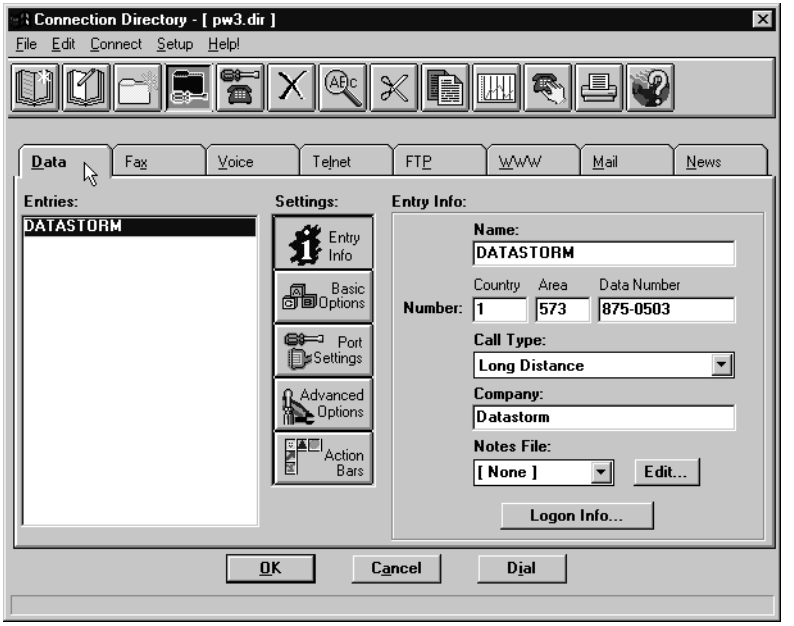
Saving the directory entry and its communications settings allows you to connect to the Pipeline at any time. To save the entry, follow these steps:

**1** From the File menu in the Terminal window, choose Connection Directory.

**Note:** Be sure to chose from the menu in the Terminal window, not the main PROCOMM PLUS window.

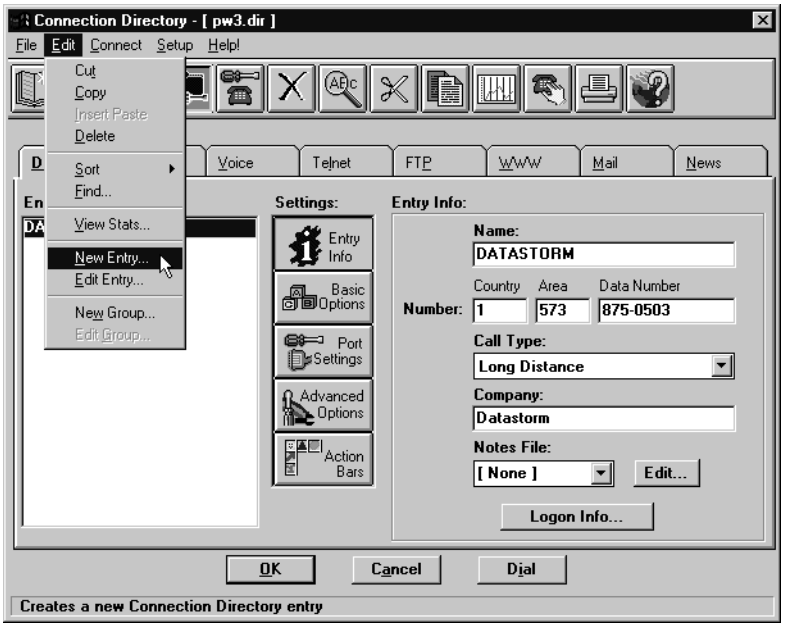



The Connection Directory window appears.

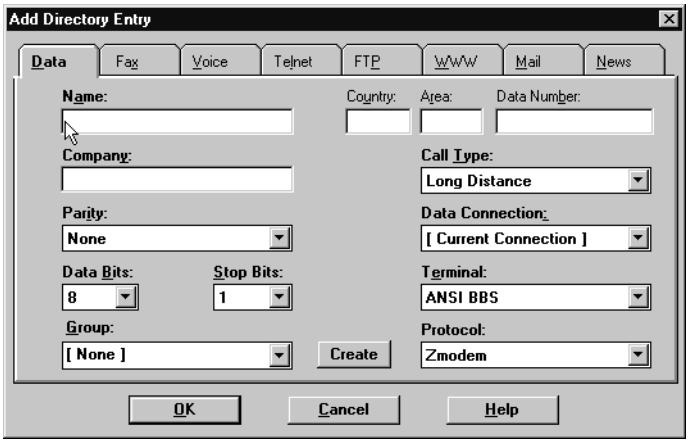



You next create the directory entry.

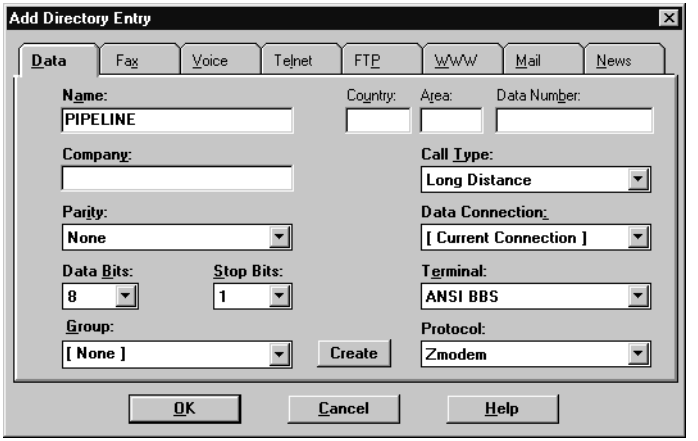
**2** From the Edit menu, choose New Entry.




The Add Directory Entry window appears.

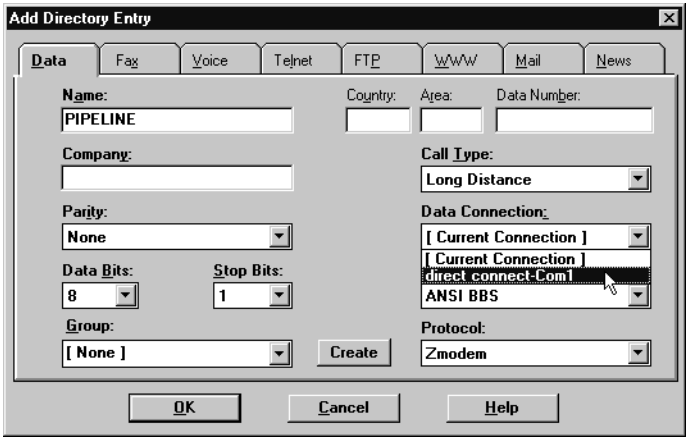


**3** Enter a name for the entry in the Name field.
Choose a name that identifies this as the entry for connecting to the Pipeline.



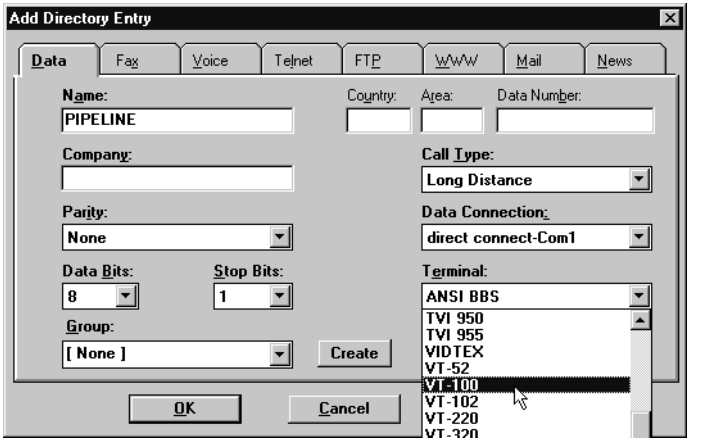

You next specify the kind of connection to the Pipeline.

**4** From the Data Connection list, choose Direct Connect.



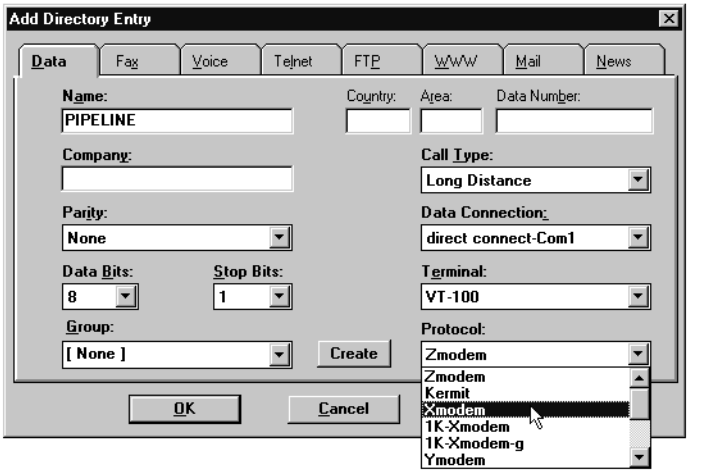

You next specify the type of terminal that PROCOMM PLUS emulates when communicating with the Pipeline.

**5** From the Terminal list, choose VT-100.




You next specify the file transfer protocol to use when downloading software to the Pipeline.

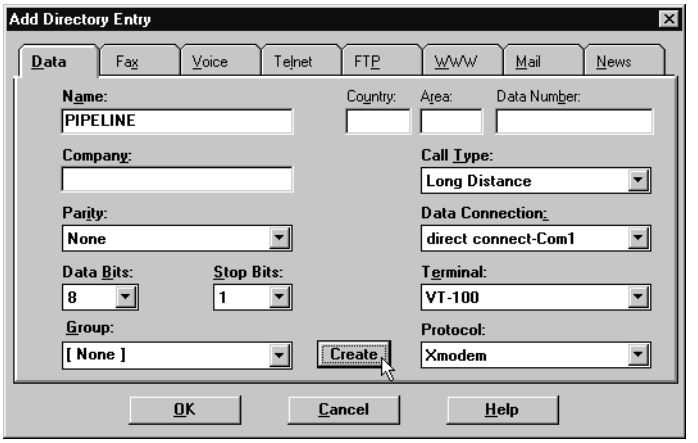
**6** From the Protocol list, choose 1K-Xmodem.



**7** Set Parity to None, Data Bits to 8, and Stop Bits to 1 if they are not already set to these values.

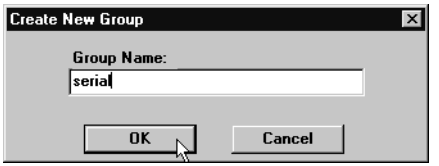
You next create a group in which to store the directory entry. You use groups for organizing entries.

**8** Click the Create button to the right of the Group list.




The Create New Group window appears.

**9** Type the name of the group and click OK.
Choose a name that specifies the relationship of the entries in the group. For example, you may want a group for all the entries that make direct connections through the serial port rather than with a modem.



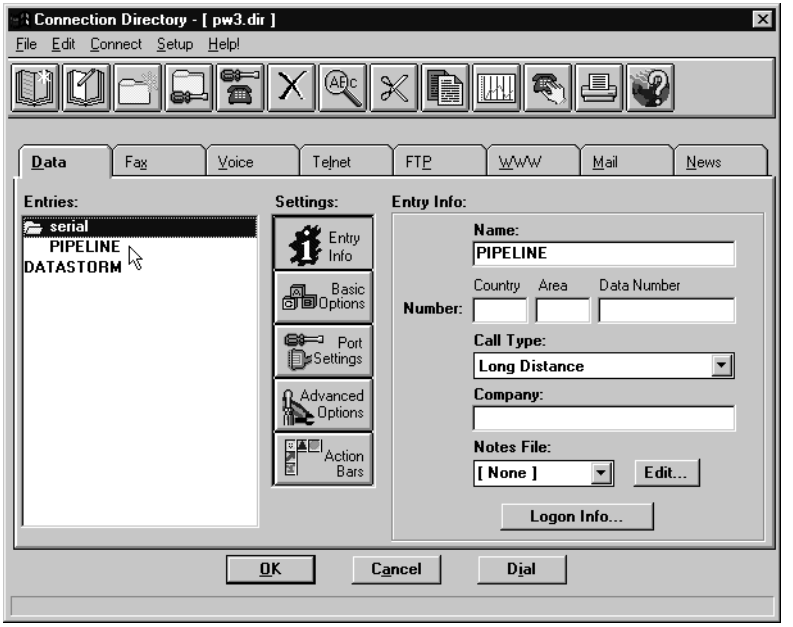

You're now ready to create the directory entry for connecting to the Pipeline. The entry is automatically added to the group you specified.

**10** Click OK.

The new directory entry should appear in the list of entries at the left of the Connection Directory window. If the folder for the group you just created is closed, double-click its icon to reveal the group's contents.

You next select the new entry and specify additional settings for it.

**11** Click the name of the entry in the list.

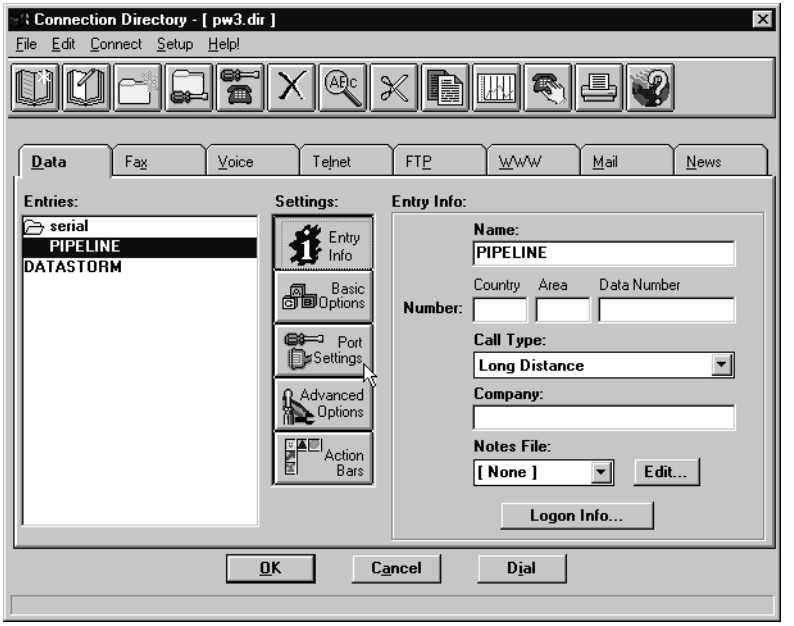



The settings you specify in the following sections apply to the selected entry.

## Entering serial port settings

To specify the serial port settings to use for the new directory entry, follow these steps:

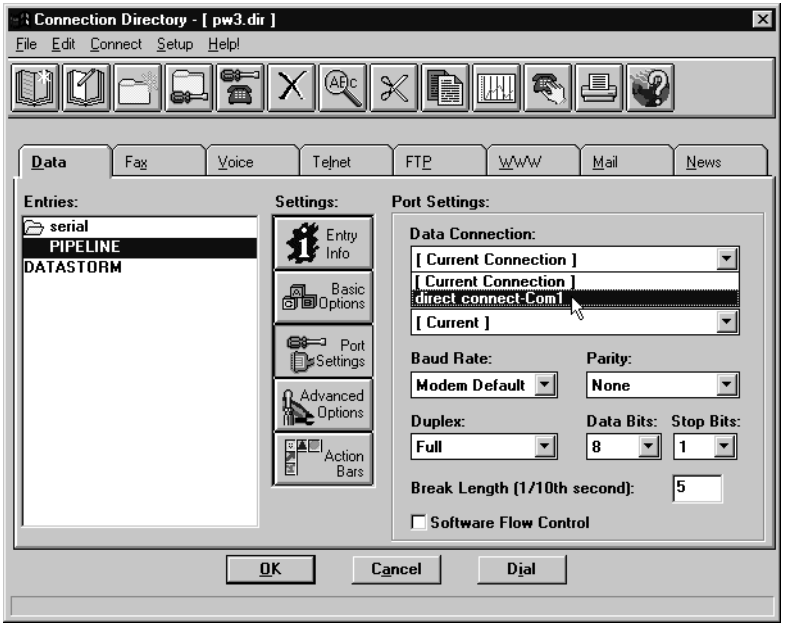
**12** Click Port Settings.




The current port settings appear at the right of the window.

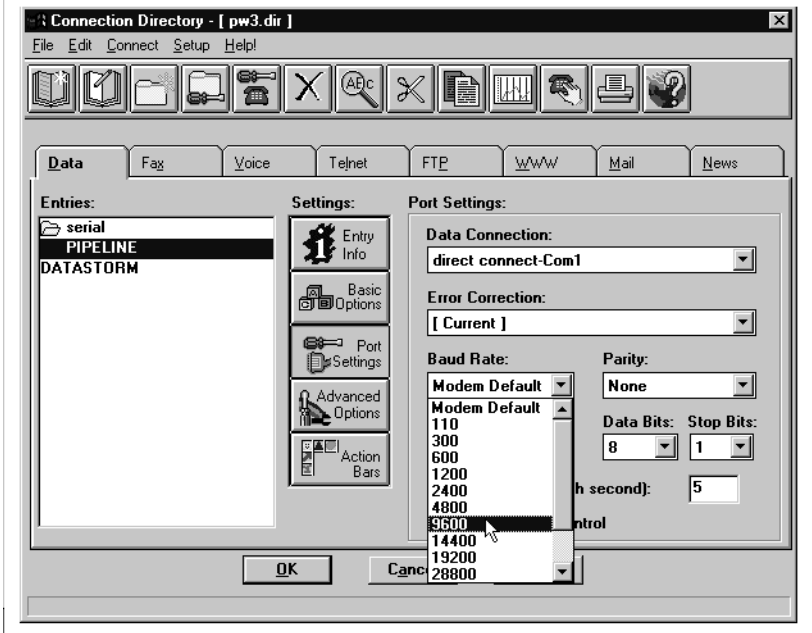
**13** From the Data Connection list, choose Direct Connect and the serial port you'll use for the connection to the Pipeline.

**Note:** For information on choosing a serial port, see "A computer with a serial port" on page 2-5 and "Connecting to the Control jack" on page 2-17.




You next specify the speed of the connection to the Pipeline.

**14** From the Baud Rate list, choose 9600.




## Saving the directory entry

You've finished entering the settings and are ready to save the directory entry.

**15** From the File menu for the Connection Directory window, choose Save.

This saves any changes you've made to directory entries.

# Connecting to the Pipeline

To establish a connection to the Pipeline, follow this step.

**1** From the Connect menu, choose Connect.

You can now follow the instructions in "Viewing the configuration windows" on page 3-8.

# Configuring ZTerm

ZTerm is a shareware communications program for Apple Macintosh and compatible computers. It is available from the Ascend FTP site and from archives of Macintosh software on the Internet and on major online services.

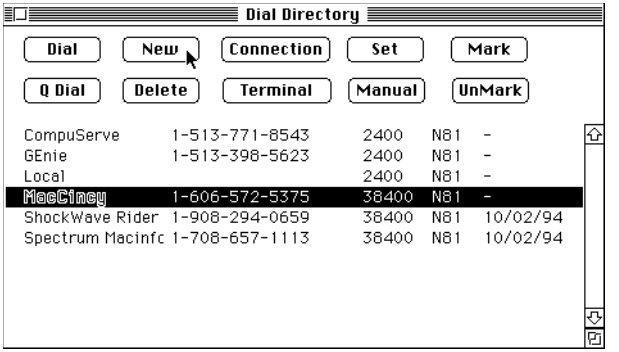
## Creating a directory entry

To create a ZTerm directory entry for connecting to the Pipeline, follow these steps:

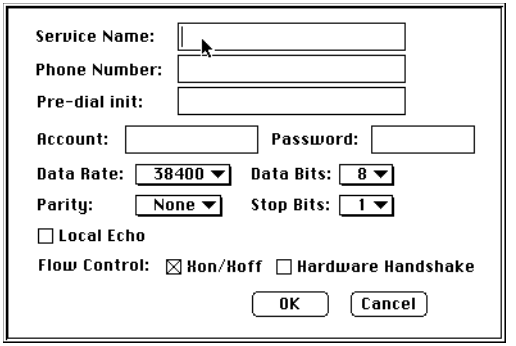
**1** Open ZTerm.

**2** From the Dial menu, choose Directory.


**3** In the Dial Directory window that appears, click New to create a new directory entry.

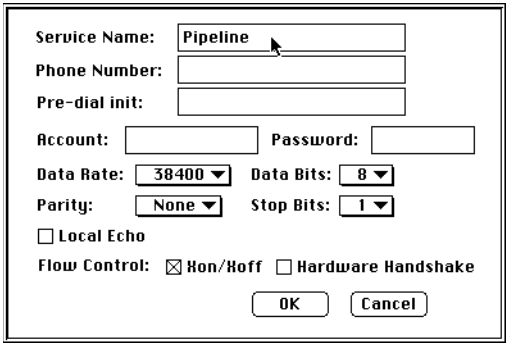


A dialog box appears in which you enter the name of the directory entry and settings for the connection.

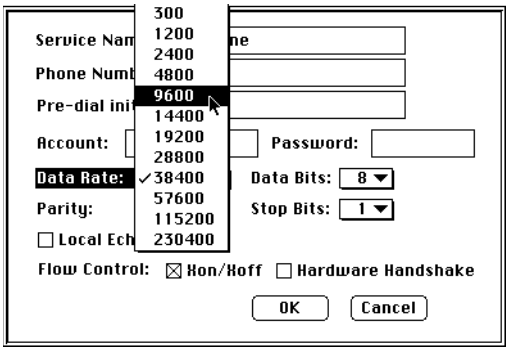



**4** In the Service Name field, type a name for the directory entry.

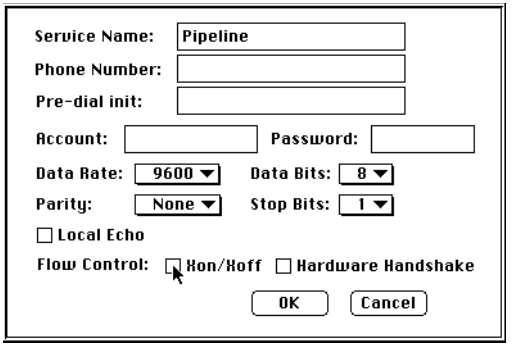
This will be the name you select when you later want to connect to the Pipeline.



**5** Choose 9600 from the Data Rate pop-up menu.



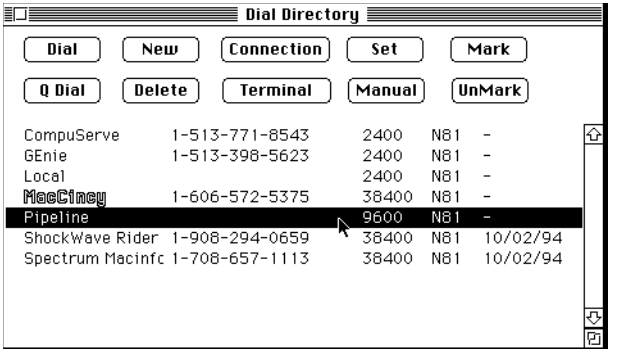

**6** If either the Xon/Xoff or Hardware Handshake buttons is selected, click it to deselect it.




**7** Choose 8 for Data Bits, 1 for Stop Bits, and None for Parity if they are not already chosen.

**8** Click OK.

The new directory entry for connecting to the Pipeline appears in the Dial Directory window. The settings for the connection appear to the right of the entry's name.




## Specifying a terminal type

You next specify the type of terminal to emulate when connecting to the Pipeline.

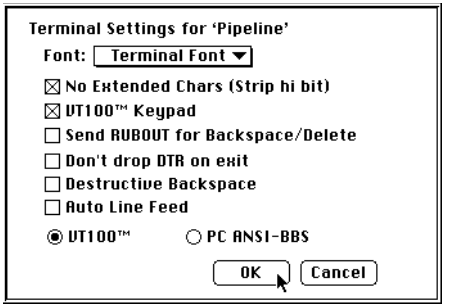
**1** From the Settings menu, choose Terminal.


A dialog box appears in which you specify a terminal type and settings for that type.

**2** Click the VT100 button if it isn't already selected.

**3** Click the VT100 Keypad button if isn't already selected.

**4** Click the No Extended Chars button if isn't already selected.



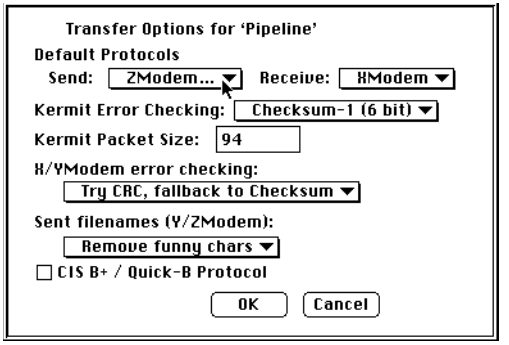

**5** Click OK.

## Specifying file transfer options

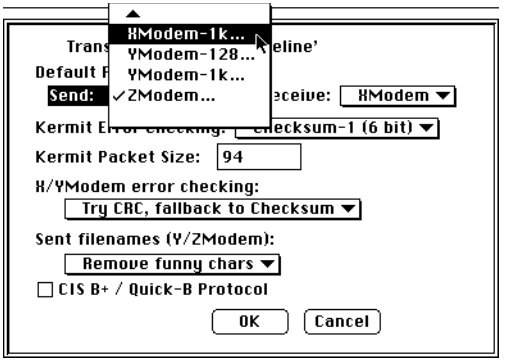
You can now specify how to transfer files to the Pipeline, which you do when you upgrade the Pipeline software.

**1** From the Settings menu, choose Transfer Options.


The Transfer Options dialog box appears.




**2** From the Default Protocols pop-up menu, choose Xmodem-1k.




**3** Choose Try CRC, Fallback to Checksum from the X/YModem Error Checking pop-up menu if it isn't already chosen.

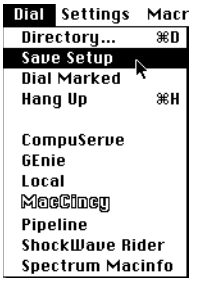
**4** Click OK.

## Saving the settings

You've now entered all the settings you need to connect to the Pipeline. The next step is to save the settings so that you can connect to the Pipeline at any time.

To save the settings, follow this step.

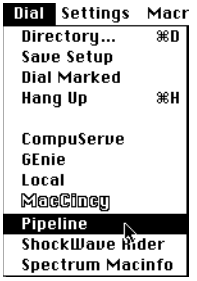
**1** From the Dial menu, choose Save Setup.



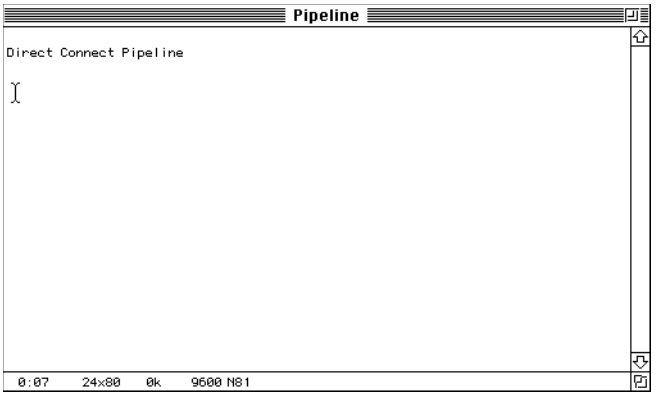

## Connecting to the Pipeline

To connect to the Pipeline, follow these steps.

**1** From the Dial menu, choose the name of the directory entry for Pipeline.




After a brief pause, the following appears in the window for the directory entry to indicate that there's a direct connection to the Pipeline.




You can now follow the instructions in “Viewing the configuration windows” on page 3-8.

# System Event Messages

# B

This appendix contains:

# List of system event messages

This section lists system event messages and their meanings.

*Table B-1. System Events*

| Event Message | Meaning |
|---|---|
| Added Bandwidth | Bandwidth has been added to an active call. |
| Assigned To Port | The assignment of an incoming call to a serial host port or the Ethernet module has been determined. |
| Busy | Number at other end is busy. |
| Call Disconnected | The call ended unexpectedly. |
| Call Refused | An incoming call could not be connected to the specified serial host port because it was busy or otherwise unavailable. |
| Call Terminated | An active call was disconnected normally, although not necessarily by operator command. |
| Ethernet Up | Appears after the Ethernet interface has been initialized and is running. |
| Far End Hung Up | The far end terminated the call normally. |
| Incoming Call | An incoming call has been answered at the network interface, but has not yet been assigned to a serial host port or to the IP router. |
| Incoming Glare | The Pipeline 25-Px received an incoming glare signal from the switch. Your telephone lines may be configured incorrectly. |

*Table B-1. System Events (continued)*

| Event Message | Meaning |
|---|---|
| Incomplete Add | An attempt to add channels to an inverse-multiplexing call failed; some channels were added, but less than the number requested. This can also occur when placing a call and the first channel connects, but the requested base channel count fails. |
| Internal Error | Call setup failed because of a lack of system resources, such as insufficient memory. If this type of error occurs, notify the Ascend Technical Assistance Center. |
| LAN Security Error | An MPP, PPP, or terminal server session is terminated because of a security violation; for example, you entered an incorrect password. |
| LAN Session Down | Appears before call terminated if a PPP or an MPP session is terminated. |
| LAN Session Up | Appears after incoming call if a PPP or an MPP session is established. |
| Missing Wink-Start | The switch did not reply with the wink-start signal, either because the line was out of service or because the switch was busy. In either case, the Pipeline 25-Px could not even start to dial a call over that line. |
| Network Problem | Call could not be completed because of a network problem. |
| No Chan Other End | No channel was available on the far end to establish the call. |
| No Channel Avail | No channel was available for the call. |

*Table B-1. System Events (continued)*

| Event Message | Meaning |
|---|---|
| No Connection | The far end did not answer when the call was dialed. |
| No Phone Number | There is no phone number entered in the Connection profile from which you tried to place a call. |
| No Trunk Available | All lines are out of service. |
| Not Enough Chans | A request to dial multiple channels or to increase bandwidth could not be completed because there were not enough channels available at that time. |
| Outgoing Call | The Pipeline 25-Px has dialed a call. |
| Remote Mgmt Denied | A request to run the remote Pipeline 25-Px by remote management was rejected. |
| Removed Bandwidth | Bandwidth has been subtracted from an active call. |
| Request Ignored | The request to manually change bandwidth during a call was denied. |
| Trunk Down | One or more lines are out of service. |
| Trunk Up | One or more lines were out of service, but have now returned to service. |
| Wrong Sys Version | The software at the far end is incompatible with the Pipeline 25-Px system software. |

# ISDN Cause Codes

C

This appendix contains:

# Checking the status windows

ISDN cause codes can help you diagnose problems with calls. They appear in the 00-200 System Events status window.

# List of cause codes

The cause codes listed on this table are not valid for German 1TR6 networks (WANs).

*Table C-1. ISDN Cause Codes*

| Code | Cause |
|---|---|
| 0 | Valid cause code not yet received |
| 1 | Unallocated (unassigned) number |
| 2 | No route to specified transit network (WAN) |
| 3 | No route to destination |
| 4 | Send special information tone |
| 5 | Misdialed trunk prefix |
| 6 | Channel unacceptable |
| 7 | Call awarded and being delivered in an established channel |
| 8 | Prefix 0 dialed but not allowed |
| 9 | Prefix 1 dialed but not allowed |
| 10 | Prefix 1 dialed but not required |
| 11 | More digits received than allowed, call is proceeding |
| 16 | Normal clearing |

*Table C-1. ISDN Cause Codes (continued)*

| Code | Cause |
|---|---|
| 17 | User busy |
| 18 | No user responding |
| 19 | No answer from user (user alerted) |
| 21 | Call rejected |
| 22 | Number changed |
| 23 | Reverse charging rejected |
| 24 | Call suspended |
| 25 | Call resumed |
| 26 | Non-selected user clearing |
| 27 | Destination out of order |
| 28 | Invalid number format (incomplete number) |
| 29 | Facility rejected |
| 30 | Response to STATUS ENQUIRY |
| 31 | Normal, unspecified |
| 33 | Circuit out of order |
| 34 | No circuit/channel available |
| 35 | Destination unattainable |
| 37 | Degraded service |
| 38 | Network (WAN) out of order |

*Table C-1. ISDN Cause Codes (continued)*

| Code | Cause |
|---|---|
| 39 | Transit delay range cannot be achieved |
| 40 | Throughput range cannot be achieved |
| 41 | Temporary failure |
| 42 | Switching equipment congested |
| 43 | Access information discarded |
| 44 | Requested circuit channel not available |
| 45 | Pre-emptied |
| 46 | Precedence call blocked |
| 47 | Resource unavailable, unspecified |
| 49 | Quality of service unavailable |
| 50 | Requested facility not subscribed |
| 51 | Reverse charging not allowed |
| 52 | Outgoing calls barred |
| 53 | Outgoing calls barred within CUG |
| 54 | Incoming calls barred |
| 55 | Incoming calls barred within CUG |
| 56 | Call waiting not subscribed |
| 57 | Bearer capability not authorized |
| 58 | Bearer capability not presently available |

*Table C-1. ISDN Cause Codes (continued)*

| Code | Cause |
|---|---|
| 63 | Service or option not available, unspecified |
| 65 | Bearer service not implemented |
| 66 | Channel type not implemented |
| 67 | Transit network selection not implemented |
| 68 | Message not implemented |
| 69 | Requested facility not implemented |
| 70 | Only restricted digital information bearer capability is available |
| 79 | Service or option not implemented, unspecified |
| 81 | Invalid call reference value |
| 82 | Identified channel does not exist |
| 83 | A suspended call exists, but this call identity does not |
| 84 | Call identity in use |
| 85 | No call suspended |
| 86 | Call having the requested call identity has been cleared |
| 87 | Called user not member of CUG |
| 88 | Incompatible destination |
| 89 | Non-existent abbreviated address entry |
| 90 | Destination address missing, and direct call not subscribed |
| 91 | Invalid transit network selection (national use) |

*Table C-1. ISDN Cause Codes (continued)*

| Code | Cause |
|---|---|
| 92 | Invalid facility parameter |
| 93 | Mandatory information element is missing |
| 95 | Invalid message, unspecified |
| 96 | Mandatory information element is missing |
| 97 | Message type non-existent or not implemented |
| 98 | Message not compatible with call state or message type non-existent or not implemented |
| 99 | Information element non-existent or not implemented |
| 100 | Invalid information element contents |
| 101 | Message not compatible with call state |
| 102 | Recovery on timer expired |
| 103 | Parameter non-existent or not implemented, passed on |
| 111 | Protocol error, unspecified |
| 127 | Internetworking, unspecified |

# Upgrading Pipeline Software

# D

This appendix contains:

# About this appendix

The software for the Pipeline 25-Px is continually being enhanced to support new features and improve performance. The Pipeline 25-Px is designed so that you can upgrade its software and take advantage of these new features without returning the Pipeline to the factory.

To see what version of the software is currently running on the Pipeline 25-Px, look in the Sys Option status window.

# Upgrading the software

To install new software for your Pipeline, follow these steps:

**1** Obtain the new software for your Pipeline 25-Px.

New versions are available on the Ascend FTP server, ftp.ascend.com, or from the Ascend Technical Assistance Center. For information on contacting the Technical Assistance Center, see "Ascend Customer Service" on page G-2.

**2** Put the software on your computer's hard disk or, if it is on a floppy disk, insert the floppy disk into your computer's disk drive.

**3** Connect the Control jack of your Pipeline to your computer's serial port if it is not already connected.

For information on connecting to the Control jack, see "Connecting to the Control jack" on page 2-17.

**4** Run your communications program.

Be sure the program is configured to use Xmodem CRC/1K for file transfers if this choice is available, or Xmodem 1K or Xmodem if Xmodem CRC/1K is not one of the choices. Most versions of Xmodem perform CRC—cyclical redundancy checking, a way to detect data transmission errors—and can perform 1K transfers without the need to specify these separately. For information on configuring your communications program, see "Setting up your communications software" on page 3-5.

**Note:** Many Microsoft Windows versions of communications programs do *not* work with this procedure.

**Note:** If you are using an Apple Macintosh or compatible, use your communications software's Binary setting for transferring files, *not* MacBinary.

**5** Open the Pipeline configuration windows if they are not already open.

**6** Write down your current configuration settings.

**Note:** Installing new software overwrites all existing configuration settings. You must reinstall the settings manually after the installation is complete.

**7** Type the following four-key sequence in rapid succession (press each key in the sequence shown, one after the other, as quickly as possible):

```
Esc [ Esc -
```

Esc is the escape key, [ is the left bracket key, and - is the minus key.

**Note:** Be sure to release each key before pressing the next. You need to press and release all four keys within about a second.

If you did this correctly, the following Xmodem control characters appear:

```
CKCKCKCK
```

If not, the most likely cause is that you didn't press the four-key sequence quickly enough. Try again—most people use both hands and keep one finger on the escape key.

**8** When the Xmodem control characters appear, use your communications software to transfer the file using Xmodem file transfer protocol.

On most communications software, there is a command or menu item for this with a name like Send File. This command provides options, such as Xmodem and Zmodem, for transferring files, and it also allows you to specify the file to transfer.

Your communications program begins sending the binary file to your Pipeline 25-Px. This normally takes from 5 to 15 minutes.

**Note:** Don't worry if your communications program displays several "bad batch" messages. This is normal.

When the upload process is complete, the Pipeline 25-Px resets itself. This takes several minutes. When the self-test is complete, the configuration windows reappear with all settings set to their default values.

## Restoring configuration settings

Once you have upgraded your software, reenter the configuration settings you wrote down before upgrading the software.

# Pipeline 25-Px Specifications

E

This appendix contains these sections:

# Hardware specifications

## Dimensions

8.2 in x 6 in x 1.2 in [20.8 cm x 15.24 cm x 3.05 cm]

## Weight

2.25 lbs [1.02 kg]

## LAN interface

10 MB/S Ethernet (10Base-T)

The Pipeline 25-Px supports the physical specifications of IEEE l802.3 with Ethernet 2 (Ethernet/DIX) framing. It provides a single Ethernet interface that supports 10Base-T (Unshielded Twisted Pair) Twisted pair Ethernet and IEEE 802.3 (10Base-T) with an RJ-45 connector.

To connect the computer to the Ethernet interface, use the crossover cable included with the Pipeline 25-Px.

## ISDN interface

BRI S/T Interface (model: P25-1S-PX) BRI U Interface (model: P25-1U-PX)

## Software upgrade

Via built-in flash RAM

## Power requirements

The Pipeline 25-Px's source power requirements are listed in Table E-1.

*Table E-1. Pipeline 25-Px power requirements*

| Element | Value |
|---|---|
| Voltage | 90-130 VAC, 0.4A 47-63 Hz.<br>20-240 VAC, 0.2A 47-63 Hz. |
| Phase | Single |
| Frequency | 47-63 Hz |
| Power | 11W (nominal) to 13.5W (maximum) |

The configuration settings for the Pipeline 25-Px are stored in battery-protected memory. When the Pipeline 25-Px is turned off, the profiles are not lost.

**Note:** Use a protected AC power source, or add surge protection between the power source and the Pipeline 25-Px.

## Environmental requirements

For best results, you should house the Pipeline 25-Px in a room with constant temperature and humidity. In general, cooler environments are better, and an operating temperature of 32° to 104° Fahrenheit (0° to 40° Celsius) is recommended. Storage temperatures of -40° to 176° Fahrenheit (-71.4° to 80° Celsius) are acceptable.

Humidity should be high enough to prevent accumulation of static electricity, but low enough to prevent condensation. An operating relative humidity of up to 90% is acceptable.

You can operate the Pipeline 25-Px at altitudes of 0 to 14800 ft. (0-4500 m).

## Safety certifications

FCC Class B, CSA, UL

## EMI/RF

FCC Part 68, FCC part 15

## Control port specifications

The Control port uses a standard DE-9 female connector that conforms to the EIA RS-232 standard for serial interfaces.

The Pipeline 25-Px uses the RS-232 pinouts listed in Table E-2.

*Table E-2. Terminal port and cabling pinouts*

| DE-9 pin number | RS-232 signal name | Function | I/O |
|---|---|---|---|
| 1 | DCD | Data Carrier Detect | O |
| 2 | RD | Serial Receive Data | O |
| 3 | SD | Serial Transmit Data | I |
| 4 | DTR | Data Terminal Ready | I |
| 5 | GND | Signal Ground | |
| 6 | DSR | Data Set Ready | O |
| 7 | RTS | Request to Send | I |
| 8 | CTS | Clear to Send | O |
| *9 | *RI | *Ring Indicator | *O |

*Pin 9 is not active (Ring Indication signal not supplied).

# Software specifications

## Protocols supported

TCP/IP routing

WAN Protocols Supported PPP, Multilink PPP (MP), Multilink Protocol Plus (MP+)

Bandwidth Management Multilink PPP (MP), Multilink Protocol Plus (MP+), TCP header compression, STAC data compression (optional)

## Security

PAP, CHAP

## Management

Directly via the Control port

Remotely from another Ascend product via the Ascend Management Protocol (AMP)

# Radio and Television Interference

# F

## FCC Part 15

**Warning:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

The authority to operate this equipment is conditioned by the requirement that no modifications will be made to the equipment unless the changes or modifications are expressly approved by Ascend.

## Canadian Notice

**Note:** The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the 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 (telephone extension cord). 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 any equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

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

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

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all the devices does not exceed 100.

This equipment does not support line loopbacks.

**Warning:** THE DIGITAL APPARATUS DOES NOT EXCEED THE CLASS A LIMITS FOR RADIO NOISE EMISSIONS FROM DIGITAL APPARATUS SET OUT IN THE RADIO INTERFERENCE REGULATIONS OF THE CANADIAN DEPARTMENT OF COMMUNICATIONS.

LE PRESENT APPAREIL NUMERIQUE N'EMET PAS DE BRUITS RADIOELECTRIQUES DEPASSANT LES LIMITES APPLICABLES AUX APPAREILS NUMERIQUES DE LA CLASSE A PRESCRITES DANS LE REGLEMENT SUR LE BROUILLAGE RADIOELECTRIQUE EDICTE PAR LE MINISTERE DES COMMUNICATIONS DU CANADA.

# Warranty and Service

# G

## Product warranty

**1** Ascend warrants that the Pipeline 25-Px will be free from defects in material and workmanship for a period of twelve (12) months from date of shipment.

**2** Ascend shall incur no liability under this warranty if

- the allegedly defective goods are not returned prepaid to Ascend within thirty (30) days of the discovery of the alleged defect and in accordance with Ascend's repair procedures; or
- Ascend's tests disclose that the alleged defect is not due to defects in material or workmanship.

**3** Ascend's liability shall be limited to either repair or replacement of the defective goods, at Ascend's option.

**4** Ascend MAKES NO EXPRESS OR IMPLIED WARRANTIES REGARDING THE QUALITY, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE BEYOND THOSE THAT APPEAR IN THE APPLICABLE Ascend USER'S DOCUMENTATION. Ascend SHALL NOT BE RESPONSIBLE FOR CONSEQUENTIAL, INCIDENTAL, OR PUNITIVE DAMAGE, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR DAMAGES TO BUSINESS OR BUSINESS RELATIONS. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES.

### Warranty repair

**1** During the first three (3) months of ownership, Ascend will repair or replace a defective product covered under warranty within twenty-four (24) hours of receipt of the product. During the fourth (4th) through twelfth (12th) months of ownership, Ascend will repair or replace a defective product covered under warranty within ten (10) days of receipt of the product. The warranty

period for the replaced product shall be ninety (90) days or the remainder of the warranty period of the original unit, whichever is greater. Ascend will ship surface freight. Expedited freight is at customer's expense.

**2** The customer must return the defective product to Ascend within fourteen (14) days after the request for replacement. If the defective product is not returned within this time period, Ascend will bill the customer for the product at list price.

### Out-of warranty repair

Ascend will either repair or, at its option, replace a defective product not covered under warranty within ten (10) working days of its receipt. Repair charges are available from the Repair Facility upon request. The warranty on a serviced product is thirty (30) days measured from date of service. Out-of-warranty repair charges are based upon the prices in effect at the time of return.

# Ascend Customer Service

When you contact Ascend Customer Service, make sure you have this information:

- The product name and model
- The software and hardware options
- The software version
- The SPIDs (Service Profile Identifiers) for your ISDN line
- Your local telephone company switch type and operating mode
- The type of computer you are using
- A description of the problem

# How to contact Ascend Customer Service

| Ways to contact Ascend Customer Service | Telephone number or address |
|---|---|
| Telephone in the United States | 800-ASCEND-4 800-272-3634 |
| Telephone outside the United States | 510-769-8027 |
| E-mail | support@ascend.com |
| Facsimile (FAX) | 510-814-2300 |

You can also contact the Ascend main office by dialing 510-769-6001, or you can write to Ascend at the following address:

Ascend Communications
1275 Harbor Bay Parkway
Alameda, CA 94502

## Need information on new features and products?

We are committed to constantly improving our products. You can find out about new features and product improvement as follows:

- For the latest information on the Ascend product line, visit our site on the World Wide Web:
  `http://www.ascend.com/`
- For software upgrades, release notes, and addenda to this manual, visit our FTP site:
  `ftp.ascend.com`

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