Pipeline Start Here Guide

Ascend Communications, Inc.
Part Number: 7820-0328-001
For software version 6.0
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Contacting Ascend Customer Service

You can request assistance or additional information by telephone, email, fax, or modem, or over the Internet.

Obtaining Technical Assistance

If you need technical assistance, first gather the information that Ascend Customer Service will need for diagnosing your problem. Then select the most convenient method of contacting Ascend Customer Service.

Information you will need

Before contacting Ascend Customer Service, gather the following information:

- Product name and model
- Software and hardware options
- Software version
- Service Profile Identifiers (SPIDs) associated with your product
- Your local telephone company's switch type and operating mode, such as AT&T 5ESS Custom or Northern Telecom National ISDN-1
- Whether you are routing or bridging with your Ascend product
- Type of computer you are using
- Description of the problem

How to contact Ascend Customer Service

After you gather the necessary information, contact Ascend in one of the following ways:

Telephone in the United States	800-ASCEND-4 (800-272-3634)
Telephone outside the United States	510-769-8027 (800-697-4772)
Austria/Germany/Switzerland	(+33) 492 96 5672
Benelux	(+33) 492 96 5674

France	(+33) 492 96 5673
Italy	(+33) 492 96 5676
Japan	(+81) 3 5325 7397
Middle East/Africa	(+33) 492 96 5679
Scandinavia	(+33) 492 96 5677
Spain/Portugal	(+33) 492 96 5675
UK	(+33) 492 96 5671
Email	support@ascend.com
Email (outside US)	EMEAsupport@ascend.com
Facsimile (FAX)	510-814-2312
Customer Support BBS by modem	510-814-2302

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, Inc.,
One Ascend Plaza,
1701 Harbor Bay Parkway,
Alameda, CA 94502

Need information about new features and products?

Ascend is committed to constant product improvement. You can find out about new features and other improvements as follows:

- For the latest information about 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`

Important safety instructions

The following safety instructions apply to the Pipeline:

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 models is 104° Fahrenheit (40° Celsius). Take care to allow sufficient air circulation or space between units when the Pipeline 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 Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.

4 Installation of the Pipeline in a rack without sufficient air flow can be unsafe.

5 If installed in a rack, the rack should safely support the combined weight of all equipment it supports. A fully loaded redundant-power Pipeline weighs 56 lbs (25.5 kg). A fully loaded single-power Pipeline weighs 30 lbs (13.6 kg).

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

7 Models with AC power inputs are intended for use with a three-wire grounding type plug—a plug which has a grounding pin. This is a safety feature. Equipment grounding is vital to ensure safe operation. Do not defeat the purpose of the grounding type plug by modifying the plug or using an adapter.

8 Before installation, use an outlet tester or a voltmeter to check the AC receptacle for the presence of earth ground. If the receptacle is not properly grounded, the installation must not continue until a qualified electrician has corrected the problem. Similarly, in the case of DC input power, check the DC ground(s).

9 If a three-wire grounding type power source is not available, consult a qualified electrician to determine another method of grounding the equipment.

10 Models with DC power inputs must be connected to an earth ground through the terminal block Earth/Chassis Ground connectors. This is a safety feature. Equipment grounding is vital to ensure safe operation.

11 Before installing wires to the Pipeline's DC power terminal block, verify that these wires are not connected to any power source. Installing live wires (that is, wires connected to a power source) is hazardous.

12 Connect the equipment to a 48VDC supply source that is electrically isolated from the AC source. The 48VDC source should be reliably connected to earth ground.

13 Install only in restricted-access areas in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA 70.

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

15 Do not attempt to service this product yourself. Opening or removing covers can expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.

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

17 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.

18 A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are *interconnected*, the voltage potential might cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action before interconnecting the products.

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.

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About This Guide

How to use this guide

This manual is part of a set that describes all the standard features of a Pipeline running software version 6.0. Some features might not be available with older versions of the software, or with specialty software loads, such as IP-, IPX-, or AppleTalk-only versions of the software.

Use this manual to find out what the Pipeline is used for, how to install it, and how to configure a basic connection. This manual supplies all of the information you need when using the Pipeline to connect to a single location.

What you should know

This guide is for anyone installing the Pipeline and setting up a primary configuration. To install and configure the Pipeline at this level, you only need basic knowledge about using your computer's operating system, and how to connect cables to your computer hardware.

To administer the unit or troubleshoot router connections, a basic understanding of the TCP/IP protocol is helpful. Additionally, it is helpful to know how to use Telnet, Ping, and VT100 terminal emulation software.

Documentation conventions

This section explains all the special characters and typographical conventions in this manual.

Convention	Meaning
`Monospace text`	Represents text that appears on your computer's screen, or that could appear on your computer's screen.
>	Points to the next level in the path to a parameter. The parameter that follows the angle bracket is one of the options that appears when you select the parameter that precedes the angle bracket.
Press Enter	Means press the Enter or Return key, or its equivalent, on your computer.
Note:	Introduces important additional information.
 **Caution:**	Warns that a failure to follow the recommended procedure could result in loss of data or damage to equipment.
 **Warning:**	Warns that a failure to take appropriate safety precautions could result in physical injury.

Manual set

This manual is part of a set which includes the following publications:

- *Pipeline Start Here*

  The *Start Here* manual explains how to install the Pipeline and describes how to set up a basic configuration.

- *Pipeline User's Guide*

  The *User's Guide* explains how to configure the Pipeline as a router or bridge, and how to manage the inbound and outbound traffic over the unit.

- *Pipeline Reference Guide*

  The *Reference Guide* contains an alphabetical listing of all the parameters, fields in the status menus, and how to use the DO commands.

Introduction to the Pipeline

1

This chapter contains the following topics:

What is a Pipeline?

A Pipeline is a network device that connects to an Ethernet network and routes or bridges data between your local network and remote networks over an ISDN line or Frame Relay connection. By connecting a Pipeline to a personal computer, you create a local area network and that can access remote networks, such as a corporate site or the Internet, at line rates up to 128 Kbps. You can connect any type of computer to the Pipeline via an Ethernet cable.

The Pipeline manages traffic coming into and going out of your local network. Any application on your local network that needs to exchange data with a remote network uses the Pipeline as its gateway to the wide area network. Connections are established and removed automatically. You do not need to use Dial-up Networking or manually dial calls. You can have up to two simultaneous connections—data or voice, or both. (Voice calls require that you have enabled phone ports on your Pipeline, and have voice support on your ISDN service.)

The Pipeline has an on-board micro processor, memory, and on-board software. You control who can call into your network, or what data can leave your network by specifying connection information in the Pipeline. When configuring your Pipeline, the settings are stored on the unit in non-volatile random access memory (NVRAM), where they are saved even if the unit is powered off.

Pipeline units have two phone ports on the back panel (which are enabled on all units except the Pipeline 50). Additionally, the Pipeline 85 includes a four-port Ethernet hub. The table below lists the hardware configurations of Pipeline models covered in this manual.

Model	Phone ports enabled	4-port Hub
Pipeline 50	No	No
Pipeline 75	Yes	No
Pipeline 85	Yes	Yes

Note: You can convert a Pipeline 50 to a Pipeline 75 via a software upgrade. For more information, contact the Ascend Technical Assistance Center.

System requirements

To use the Pipeline, you must have at least one personal computer with an Ethernet adapter, and you must have ISDN service or a Frame Relay connection installed. To connect to a remote site, such as a corporate office or the Internet, the remote end must be able to connect to the type of service you have, that is, ISDN or Frame Relay. TCP/IP software must be installed on your computer.

Pipeline features

The following sections list the features of the Pipeline.

Remote management

Your corporate administrator can manage your Pipeline, troubleshoot connections, and update the on-board software from the central site. Remote management is implemented in the following ways:

- Simple Network Management protocol (SNMP)
- Telnet
- Ascend remote management protocol
- Syslog (system event logs)
- On-board flash memory (enabling downloadable software upgrades)

Multiple networking protocols

You can configure the Pipeline to route or bridge traffic. The following protocols are supported:

- IP, IPX, and Appletalk routing
- Standard multiprotocol bridging
- Point-to-Point protocol (PPP), Multilink PPP, Multilink Protocol Plus (MP+)

Security

The built-in authentication protocols for securing your network are:

- Password Authentication protocol (PAP), Challenge Handshake protocol (CHAP), and Microsoft CHAP (MS-CHAP).
- Calling Line ID and Callback authentication.
- Token-based security with support for hand-held personal security cards, such as those provided by Enigma Logic, Security Dynamics, and Axent SecureNet.
- Transmit and receive packet filtering.

- Optional inclusion of the Ascend Secure Access Firewall software.
- Telnet password protection.
- Settable SNMP Read-only and Read/Write community strings.

Bandwidth optimization

Bandwidth optimization features which help you to minimize connection time and costs include the following:

- Multiple compression options
- Ascend Bandwidth on Demand transport protocol
- Ascend Inverse Multiplexing

Integrated analog and digital capabilities

A Pipeline unit with enabled phone ports gives you the flexibility of using digital (data) services and analog (voice) services on the same line at the same time. This means you can establish voice and data calls to different locations at the same time. By consolidating digital and analog services over one ISDN line, you do not need separate phone and data lines.

The integrated voice features included on the Pipeline are:

- Automatic call preemption. Incoming or outgoing analog calls preempt one B-channel while maintaining one B-channel for data connections.
- Two analog ports. These can be used for phones, modems, fax machines, or any device requiring an analog connection, such as a Caller ID device.
- Simultaneous, dual analog connections. If both B channels are free, both analog ports can be used simultaneously to different destinations.
- State of the art calling features. Hold, Drop, Transfer, and Conference calling are supported.
- Call routing. Incoming calls can be directed to a specific analog port.

Configuration methods

You can use any of the following methods to configure your Pipeline.

QuickStart

For Mac, Windows 95, and Windows NT, a QuickStart utility is included in the Java-Based Pipeline Configurator (JBPC) shipped on the Pipeline Companion CD. For Windows 3.1x, the QuickStart utility is a Windows program.

QuickStart prompts you for information about a remote site. If you will connect to a single destination (such as your corporate LAN or an Internet Service Provider), QuickStart is all you need to use to create a complete configuration.

Java-Based Pipeline Configurator (JBPC)

The JBPC provides a graphical user interface to the Pipeline on-board software. With it you can add, change, save, and restore configuration settings. The configuration fields are divided by function, in a set of tabbed panels. A complete HTML online help system is accessible from each panel. The JBPC is compatible with any computer running Windows 95 or NT, or MacOS.

On-board software

You can enter settings directly into the on-board software of the Pipeline. Additionally, the on-board software includes a number of diagnostic and administrative utilities that are not available in the JBPC or QuickStart utility.

You can access the on-board software in the following ways:

- Serial connection. You create a serial connection between your computer and the Pipeline (using a serial cable connected from a COM port on your computer to the terminal port on the back of the Pipeline), then communicate with the Pipeline directly through the COM port, using any communications program that supports VT100 emulation (such as HyperTerminal or Zterm).
- Ethernet connection. Once the Pipeline has been configured to have an IP address, you can open a Telnet session to the Pipeline over Ethernet by using the IP address of the Pipeline to establish the connection.

ISDN basics

Ordering ISDN service is called “provisioning the line.” If you need help provisioning your ISDN line, refer to Ascend’s web site at www.ascend.com, where you can find a web page all about provisioning an ISDN line in North America. Additionally, Ascend’s Technical Assistance Center can give you all the information you’ll need when you talk to your phone company.

If you need help with some of the terms associated with ISDN or with basic networking functions, please see the Networking Glossary on the Pipeline Companion CD. The Networking Glossary is an HTML title that you read with a web browser. Refer to the A-to-Z section for an explanation of hundreds of terms. The Networking Basics section illustrates how ISDN and other networking functions work.

Basic Rate Interface (BRI)

When you order ISDN service for your home or office, you get what is known as Basic Rate Interface. This gives you three channels: 2 B channels with a capacity of 56 to 64 Kbps each (depending on the service offered by your telephone company), and a single D channel with a capacity of 16 Kbps.

Whenever you make an ISDN call, you start by using one B channel. If the receiving end can accept the second B channel, and if the data requirements of your call need the extra bandwidth, your Pipeline uses the second B channel. You can set up the Pipeline to use only one B channel when connecting to a given phone number. Using the second B channel costs more. Sometimes there is a premium charge from the phone company for the first minute, so be aware that bringing up two channels can cost more even though the call is shorter. Check with the remote end to see if there are additional charges when connecting with both B channels, and make sure the remote end can handle a two-channel call.

The D channel is a 16 Kbps service that is used to manage the administrative tasks required by the ISDN service. It sets up calls, adds the second B channel, and clears calls. It is always a “live connection” so some services make use of it to transmit light traffic, such as credit card transactions or email notification.

Integrated digital and analog services

Did you know that you can make or receive voice calls while data calls are in progress if your ISDN service is provisioned for both voice and data? ISDN service can be customized. You can choose whether each of your B channels is available for just data, data or voice, or just voice. In this context, voice means plain old telephone service (and is actually called POTS). POTS services are analog instead of digital. Analog service is what your phone, fax, and ordinary modem use. If you choose to have voice integrated into your ISDN line (which is the standard), you can make and receive calls by plugging a phone (or two) into the back of the Pipeline. In fact, you can plug in any analog phone device, including a fax machine or a modem. For a small office, this gives you one phone-service account for all your telephone usage, Internet, and corporate dial-up charges.

Connecting to a switch

When you order ISDN service, you are actually requesting a line from a switch at your local telephone company's central office. Switches are in fact computers that route calls between their source and destination. When you set up your Pipeline, you need to specify the type of switch used by your ISDN service. The phone company will tell you what switch type your service uses when the line is installed.

At the same time, you will be given the telephone numbers for your ISDN B channels. The telephone company may refer to these as directory numbers. For most services, there are two B channels, and a directory number is assigned to each one.

Additionally, in North America there are two Service Profile Identifiers, called SPIDs (pronounced *spids*), assigned to each B channel. You need these ID numbers to enable the Pipeline to connect to the switch. An AutoSPID utility, included in the Pipeline, tries to guess the SPIDs; however, until SPID formats are standardized, not all can be guessed correctly, so be sure to have the information supplied by your telephone company available when configuring the Pipeline.

Local and remote networks

If you have a single computer with an Ethernet adapter installed in it, and you run an Ethernet cable from that adapter to the Pipeline, you create a local area network with two devices—your PC and the Pipeline. On your local area network, the Pipeline is the default gateway to the wide area network (WAN). The wide area network refers to the Internet or any distant network, such as a remote corporate LAN.

If you have multiple computers on your network, all can share the Pipeline as the default gateway to gain access to the wide area network.

A remote network must have a device that is suitable for accepting calls from your Pipeline. If the Pipeline uses an ISDN line to access the wide area network, then the remote network has to be able to receive ISDN calls. Similarly, if your service is Frame Relay, the remote network must be able to accept a Frame Relay connection.

How the Pipeline establishes connections

When you set up your Pipeline, you need to set up connection information about at least one remote location. The set of information is called a Connection profile. A profile is an group of settings about a particular connection. It includes all the information needed to set up a call.

Whenever an application on the local network sends data to a remote network, or whenever data is sent to the Pipeline from a remote network, the Pipeline automatically tries to establish a connection with the remote network.

The Pipeline inspects packets on the Ethernet traffic. If it sees any that do not have a destination on the local network, it attempts to open a connection to the wide area network and deliver the packet to its destination in these ways:

- If the Pipeline finds the destination address in a Connection profile, it automatically establishes a connection to that destination.

  For example, if you have an email program set up to contact the corporate mail server, and you have configured a Connection profile to the corporate site, whenever your email program sends a request to pick up new mail, the Pipeline automatically establishes a connection to the corporate site.

- If the Pipeline doesn't find a matching Connection profile, it establishes a connection to the default route, which is generally the same as your first Connection profile, and forwards the data through that network.

The Pipeline will sometimes open a session to a remote site unnecessarily due to broadcast messages on your local network (which is often seen in AppleTalk environments). If you notice the WAN light on the front of the Pipeline going on when you think it should not, refer to the *User's Guide* for information about Filters. You can use a call filter to suppress unneeded connections.

You can manually establish a connection to a remote site. To do so, use the Pipeline Monitor, which is part of the JBPC (discussed in Chapter 4, "Quick Start") or use the DO Dial command (explained in the *Reference Guide*).

In order for an outside caller to connect to your network, you need to set up a Connection profile for the party so that their call can be authenticated and established. If a caller without a Connection profile needs to connect to your network, a catch-all profile, named the Answer profile, can be used to authenticate the caller and set up the connection.

The Pipeline establishes a connection with a remote device by dialing it up (or accepting a dial-in call) and exchanging information. Both sides of a connection must be configured similarly in order for the session to be established. The information that is exchanged includes line types (such as ISDN, Frame Relay, voice) and data transmission rates (such as 56 or 64 Kbps), authentication and compression methods, and the type of routing or bridging to be used.

Using Dial-up Networking versus using a Pipeline

When using the Pipeline to reach remote networks, you won't use Dial-up Networking to make connections. Instead, you set up Connection profiles on the Pipeline that are similar to Dial-up Networking Connections. When the Pipeline needs to reach a remote network, it uses information from the application (such an email application's POP server or SMTP host) to find the address of the remote network it needs to reach, then automatically establishes a connection on the basis of a Connection profile to that remote network defined in the Pipeline.

If you previously used Dial-up Networking to contact the Internet, you configured TCP/IP on your computer to use the IP address of your Internet Service Provider (ISP) as the default gateway, or specified that you would obtain

the IP address automatically. Once connected, your computer became a part of your ISP's network. When using the Pipeline, you need to configure your computer's TCP/IP settings to use the IP address of the Pipeline as the default gateway. This is a significant change. Before, your computer became a part of your ISP's network, but by connecting a Pipeline to your computer over Ethernet, you now have your own network, and your Pipeline is your network's gateway to the wide area network.

You still might need some of the network services your ISP provides, such as:

- A Dynamic Host Configuration Protocol (DHCP) server, which assigns IP addresses (and other configuration settings) to hosts that don't have a unique IP address on the remote network.
- A Domain Name System (DNS) server, which lets you use names, rather than IP addresses, to reach destinations on the Internet, or in a TCP/IP network.

If you previously connected to an ISP using Dial-up Networking, your TCP/IP settings need to be changed. For an example of how to set up TCP/IP, see "Setting up a TCP/IP network" on page A-1. For more information about DHCP and DNS, see the Networking Glossary on the Pipeline Companion CD.

Using dynamically assigned IP addresses

If you are connecting to the Internet and do not have permanent IP addresses, set up private IP addresses on your local network (as explained below), and use a dynamically assigned IP address when signing onto the Internet by enabling the Network Address Translation (NAT) feature of the Pipeline, as described next.

Note: If you have your own IP addresses to use when connecting to your primary remote destination, such as your corporate LAN, be sure to use them. If you want to obtain dynamically assigned IP addresses for a second connection, such as to an Internet Service Provider, you can turn NAT on each time you need to use it.

Setting up private network addresses

An IP address consists of four sets of numbers separated by dots, as in 111.111.111.111. Each set of numbers is called an octet. Generally, an octet can have a value from 0 to 255. Different classes of IP addresses have rules about

what range of numbers is valid in each octet. When setting up a private network, you can use the example addresses shown below. If you want to choose different addresses, choose addresses that fit into the numbering scheme of a Class C network (small networks with 254 hosts or less).

A Class C address uses a number from 192 to 223 in the first octet of the IP address, and then any number from 0 to 255 in the following three octets. The "standard private address" starts with 192.168 in the first two octets. For example, you can use 192.168.100.1 as the private IP address for your Pipeline.

After choosing an IP address for your Pipeline, use the next address for your computer. For example, if you use 192.168.100.1 for the Pipeline, use 192.168.100.2 for your computer. (The next computer on your network would use 192.168.100.3, and the next would use 192.168.100.4, and so on.)

You also need a subnet address for your network devices. If one has not been assigned to you, you can use a subnet address of 255.255.255.0 or /24, if slash notation is used, both refer to the same value.

Using Network Address Translation (NAT)

If your ISP dynamically assigns IP addresses, you need to enable Network Address Translation (NAT). To do so in the QuickStart utility, check NAT to enable it. To turn NAT on in the on-board software, see "Setting up Network Address Translation (NAT)" on page 5-11.

When NAT is enabled, *every time the* Pipeline *dials out, it uses the Connection profile defined as the NAT profile, and sends a DHCP client request asking for configuration settings, which includes requesting an IP address.* The DHCP server loans the Pipeline an address that is unique on the remote network (which, in the case of an ISP, is the Internet).

When using NAT, the Pipeline intercepts traffic going out to the wide area network, and transparently substitutes the loaned IP address for the private network address used on the local network.

Possible changes to your application settings

When the Pipeline is ready to be put in service on your local network, you might need to change the connection settings of applications that previously used Dial-up Networking, such as email applications. In some cases, you might only need to deactivate dialing, such as for your web browser.

Note: When connecting with the Pipeline, you make network or PPP connections; not dial-up connections.

Setup guidelines

After installing the Pipeline, fill in the checklists in Chapter 3, "Basic Configuration Settings," then enter your information and test your settings by performing a test connection. If you need help resolving any installation or connection problems, refer to the "Troubleshooting" chapter of the *User's Guide*.

Sample configurations for setting up TCP/IP and for setting up your Pipeline, using the example IP addresses discussed throughout this manual, can be found in the appendixes.

For detailed information about any function or setting in the Pipeline, refer to the *User's Guide* and *Reference Guide*.

Installing the Pipeline

2

This chapter contains the following topics:

This chapter shows you how to install your Pipeline. The instructions include steps to install a Pipeline with a PC, Macintosh, or UNIX workstation.

Note: In the following installation steps, different Pipeline models are illustrated. Each illustration shows how to make the connection discussed, but not every model is illustrated for every step.

Identifying the different units

Pipeline 50 and 75

The new Pipeline 50 and 75 units have a different pack panel from original versions. Newer units can use software version 5.0B and higher; older units have less on-board memory, so be aware that there are different software loads for each of the units.

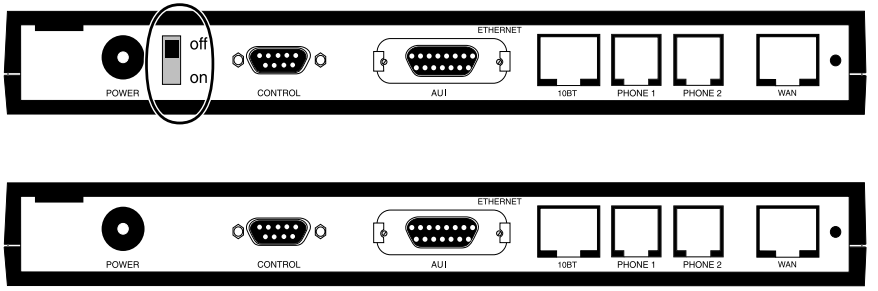


Figure 2-1. Old (top) and new (bottom) Pipeline 75 back panels

Note: If you have a combination of original and newer Pipeline units, use these illustrations to determine which units are new. You can tell the difference between original and newer units by looking for a switch (which is non-functional) on the back panel.

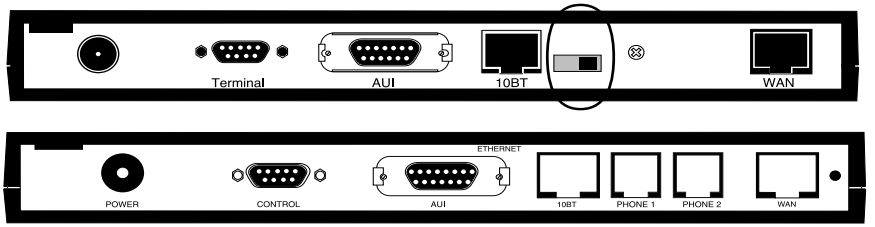


Figure 2-2. Old (top) and new (bottom) Pipeline 50 back panels

The Pipeline 50 and 75 units now have the same back panel. The POTS ports may be enabled on a Pipeline 50 by converting the unit to a Pipeline 75. This is done by obtaining a hash code from the Technical Assistance Center and performing a software upgrade.

Pipeline 85

The Pipeline 85 functions identically to the Pipeline 75. All features of the Pipeline 75 apply to the Pipeline 85. Using the Pipeline 85 hub does not require setting any software parameters in the Pipeline configuration.

Before installing the Pipeline 85, familiarize yourself with the unit's back panel.

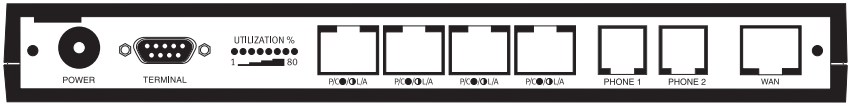


Figure 2-3. Pipeline 85 back panel

The ports and other elements on the back of the unit are, starting at the left:

- Power. Use the provided power supply to connect the unit to the power outlet. Always plug the cable into the Pipeline before connecting the other end into the outlet.

  Warning: Plugging the power supply into the wall socket before plugging the power cable into the Pipeline can create sparks, cause an electrical fire, or destroy the Pipeline.

  Because the Pipeline has no power switch, plugging in the power supply turns the unit on. After you plug in the Pipeline, it become ready to use in about a minute.
- Terminal (serial) port. You can create a serial connection between your computer and the Pipeline by connecting a serial cable between a COM port on your computer and the terminal port on the Pipeline.
- Utilization percent lights. These indicate the percentage of LAN utilization on the Pipeline hub (between hosts on the local network). The percentage does not have anything to do with the traffic over the WAN connection.
- Four 10Base-T Ethernet ports. A straight-through cable from any host on the local network to the Pipeline connects the host to the Pipeline hub, thus expanding the network. You can connect the Pipeline hub to another hub on your LAN to make the Pipeline available to a greater number of users.

  The notations under the 10Base-T ports have the following meaning:

  – P/C means Partition/Collision

  - L/A means Link/Activity
  - The full circle indicates that when the LED is on, the partition or link on the Ethernet LAN is active. It does not apply to the WAN connection.
  - The half circle indicates that when the LED flashes, a collision or other activity is present on the Ethernet LAN, not the WAN connection.
- Phone ports 1 and 2. These are analog ports to which you can attach any type of phone equipment, such as telephones, fax machines, caller ID devices, or modems. Please note that the analog ports do not support digital phone equipment, such as an ISDN telephone. The phone ports function identically to those on the Pipeline 75.
- WAN port. You connect your ISDN service here.

Please refer to the installation instructions for the Pipeline 75 for more detailed information. The main difference is the cabling of the Ethernet hub. Be sure you use a straight-through cable to connect to the hub. If you need to connect the Pipeline to another hub, refer to the documentation of the other hub for cabling information required to connect hub-to-hub.

Pipeline components

The Pipeline package contains the following components:

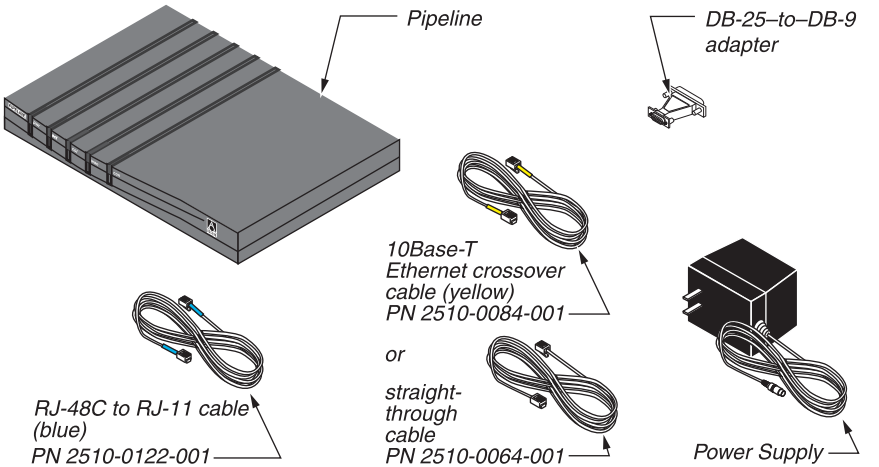


Figure 2-4. Hardware and accessories contained in the Pipeline package

- The Pipeline.
- An RJ-48C to RJ-11 ISDN cable (part number 2510-0122-001). The ends of this cable are blue.

  Each end of the cable has a different size modular jack. The larger jack is an RJ-48C, which fits the WAN port on the back of the Pipeline; the smaller jack is an RJ-11, which fits into the ISDN wall jack installed by your telephone company.
- A 10Base-T Ethernet crossover cable (part number 2510-0084-001)

  The ends of this cable are yellow. If you are using the Pipeline with only one computer and the computer has a 10Base-T Ethernet interface, you can use this cable to connect the computer directly to the 10Base-T Ethernet jack on the Pipeline, as shown later in this chapter. *You cannot use this cable for any other purpose.*

  A 10Base-T Ethernet straight-through cable (part number 2510-0064-001) is shipped with Pipeline 85 units. Use this cable to connect a computer directly to the Pipeline hub. To connect a Pipeline 85 to another hub, refer to the other hub's documentation for information about connecting hub-to-hub.

- A DB9–to–DB25 serial cable adapter (part number 2510-0052-002). Use might need to use this adapter when connecting a cable between the Terminal port on the Pipeline to a serial port on a computer, as described later in this chapter.
- A power supply.
- Three manuals: *Start Here, User's Guide,* and *Reference Guide*.
- Pipeline Companion CD-ROM
- A registration card.

In addition to the items that came with your Pipeline, you must have additional hardware and software and explained in the next two sections.

Hardware and interfaces you need to supply

In addition to the contents of the Pipeline box, you need other hardware and at least one of the telecommunications services described in this section.

An ISDN line

To use your Pipeline, you need a properly configured ISDN Basic Rate Interface (BRI) telephone line. For information on ordering ISDN service, search for the document, "Ordering ISDN Service for the Ascend Pipeline 25, 75, and 85" at www.ascend.com. This information is for service available in North America only.

Telephone equipment and cables

If your Pipeline has enabled phone ports on the back panel, you can optionally connect telephone equipment, such as a conventional analog telephone, fax machine, or modem. If you do so, you will need conventional telephone cable (normally with RJ-11 plugs at each end) for each device you connect. You can attach a Caller ID device on either phone port. The Pipeline does not support digital telephone equipment, such as an ISDN telephone.

See the Voice Features appendix in the *User's Guide* for information about how to configure your service, manage incoming and outgoing calls, plus information on using call hold, call wait, call conferencing, and other features.

An external network terminator (S-interface only)

If your Pipeline has an S interface, you need an external ISDN network terminator (NT-1 or an appropriate device, depending on your country requirements). In addition, if you want to connect more than one ISDN device to the same ISDN line, you must use an external NT1. To determine what kind of ISDN interface your Pipeline has, look at the box your Pipeline came in or the bottom of the unit:

- If your Pipeline is model number P*n*-1UBRI it has a U interface.
- If your Pipeline is model number P*n*-1SBRI it has an S interface.

A computer with a serial port

When using a UNIX workstation to configure and monitor a Pipeline, you need a computer with a serial communication port capable of transmitting data at 9600 bits per second. This is optional for Macintosh and PC installations, but is required whenever you need to make a serial connection. 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. While a permanent connection to the serial port is not necessary for communication to the remote network, it allows you to monitor the Pipeline at any time, manually connect to and disconnect from remote networks, and make configuration changes whenever necessary.

Note: Setting up a serial connection between a PC or Macintosh computer and the Pipeline is optional. Configuration and most monitoring can be performed over an Ethernet connection.

A modem cable

To connect the Pipeline to your computer's serial port (required for UNIX, but optional for PC and Macintosh), you need a modem cable (also called a serial cable, designed for connecting an external modem). The cable must be a "high-speed" modem cable, 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 a DB9 or DB25 male connector at the other end.

Note: You cannot use a null modem cable.

An Ethernet interface

For the Pipeline to communicate with your computer, you need a properly configured 10Base-T or Thinnet Ethernet interface for your computer. The interface may be built into the computer or it may be an adapter card or PCMCIA card (PC card) in your laptop. Follow the instructions for installing and configuring the interface that are included with the interface or with your computer.

Software you need to supply

This section describes the additional software you need to in order to use your Pipeline.

Networking software

Depending on the type of network you will be connecting to, you need the appropriate networking software installed on your computer:

- If you are connecting to a Novell IPX network, you need IPX client software.
- If you are connecting to the Internet or to a TCP/IP network, you must have software that supports TCP/IP networking. Many operating systems, such as Windows 95 and newer Macintoshes, include this networking software. If

TCP/IP software is not included in your operating system, you can install MAX Link Pro TCP/IP software from the Pipeline Companion CD.

- If you are connecting to an AppleTalk network, both the AppleTalk and TCP/IP software you need are included in System 7.5.2 or later.

If you are unsure of the kind of software you must have installed on your computer, ask the network administrator or your Internet Service Provider. Once you have installed the networking software, you must configure it so that it can communicate with the local network. Be sure you designate the Pipeline as the default gateway.

TFTP server software

You can upgrade the on-board software on the Pipeline if you have a Trivial File Transfer Protocol server (TFTP server) installed on your local network, or have one available and running on a remote network. TFTP servers are readily available on the Internet at software download sites. TFTP is the file transfer protocol used for uploading binaries to network devices. Once you obtain a TFTP server, set up a tftpboot directory for outbound traffic. You can easily perform any level of software upgrade (standard, thin, or fat) using TFTP.

Without a TFTP server you can upgrade the on-board software using a serial connection, but you are limited to standard (thin) loads.

Communications software

To configure and monitor the Pipeline when using a UNIX workstation, or to access the Pipeline over a serial connection, you need communications software that can do the following:

- Emulate a VT100 terminal.
- Make a direct connection to the Pipeline (through the serial port to which the Pipeline is connected, as described in “Connecting to the Terminal port” on page 2-17).

On a Windows PC, you can use the Terminal or HyperTerminal program that ships with Windows. On a Mac, you can use the Zterm shareware program, available on the Ascend FTP server.

Caution: The HyperTerminal and Terminal programs cannot reliably restore saved configuration text files to the Pipeline.

Installation steps

Use the following installation steps in the order presented to connect your Pipeline to your computer or local network, and to your telecommunications service, and to place the unit in service.

Connecting to an ISDN line

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

Look at the box your Pipeline came in or the bottom of the unit.

- If your Pipeline model number ends with UBRI it has a U interface. Follow the instructions in the next section, “Connecting a U-interface Pipeline” on page 2-10 to connect the ISDN line.
- If your Pipeline model number ends with SBRI it has an S interface. Follow the instructions in the “Connecting an S-interface Pipeline” on page 2-11 to connect the ISDN line.

Connecting a U-interface Pipeline

To connect a Pipeline with a U interface to the ISDN line:

1. Insert the larger jack of the RJ-48C to RJ-11 ISDN cable (part number 2510-0122-001) into WAN jack on the back of the Pipeline.

   The ends of this cable are blue.

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

Warning: *Do not* use a 10Base-T Ethernet cable (part number 2510-0084-001 or 2510-0064-001) to connect the Pipeline to the ISDN line. Using the wrong cable can damage or destroy the Pipeline.

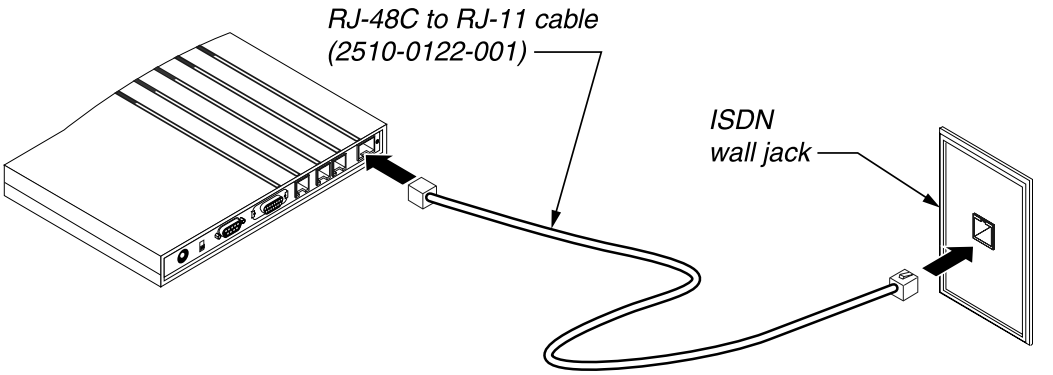


Figure 2-5. Connecting a U-interface Pipeline to the ISDN line

What's next?

- If you're using a single computer with the Pipeline, skip to "Connecting the Ethernet" on page 2-12.
- If you're connecting a network of computers to the Pipeline, skip to "Connecting to a network" on page 2-13.

Connecting an S-interface Pipeline

To connect a Pipeline with an S interface to the ISDN line:

1 Insert the end of the RJ-48C to RJ-11 ISDN cable (part number 2510-0122-001) with the larger jack into WAN jack on the back of the Pipeline.

The ends of this cable are blue.

Warning: *Do not* use the 10Base-T Ethernet crossover cable (part number 2510-0084-001) or the 10Base-T straight-through cable (part number 2510-0064-001), included with the Pipeline to connect the Pipeline to the ISDN line. Using the wrong cable can damage or destroy the Pipeline.

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 your NT-1 documentation to identify the correct jack.

3 Connect the external NT-1 to the ISDN wall jack following the directions provided in your NT-1 documentation.

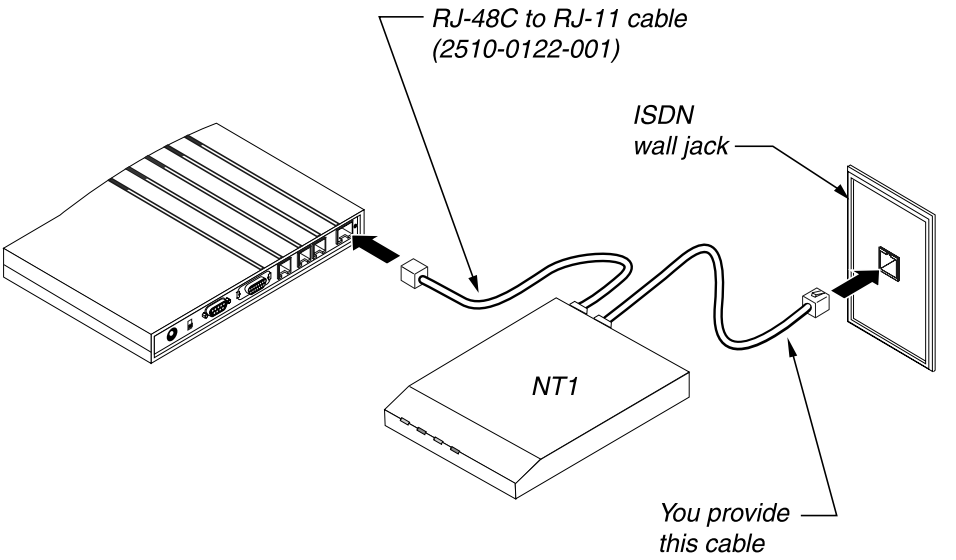


Figure 2-6. Connecting an S-interface Pipeline to the ISDN line

What's next?

- If you're using a single computer with the Pipeline, skip to "Connecting the Ethernet" on page 2-12.
- If you're connecting a network of computers to the Pipeline, skip to "Connecting to a network" on page 2-13.

Connecting the Ethernet

To connect a single computer with a 10Base-T Ethernet interface to the Pipeline, use the 10Base-T cable included with the Pipeline. For a Pipeline 50 or 75, use the crossover cable, part number 2510-0084-001. For a Pipeline 85, use the straight-through cable, part number 2510-0064-001.

1 Insert one end of the 10Base-T cable into the 10BT jack on the back of the Pipeline. Attach to any of the four Ethernet ports on the Pipeline 85.

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

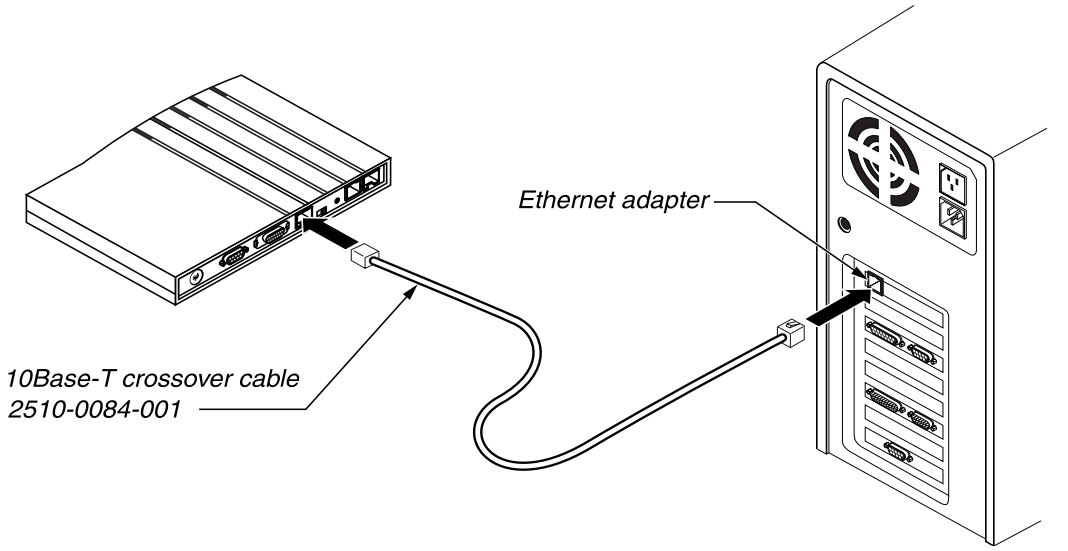


Figure 2-7. Connecting the Pipeline to the computer's Ethernet's interface

What's next?

Skip to the next step: "Connecting to the Terminal port" on page 2-17.

Connecting to a network

- To connect a 10Base-T (twisted-pair) Ethernet network with a hub to the Pipeline, see "Connecting to a 10Base-T network with a hub" on page 2-13.
- To connect a Thinnet (10Base-2) Ethernet network to the Pipeline, see "Connecting to a Thinnet network" on page 2-14.

Connecting to a 10Base-T network with a hub

To connect the Pipeline to a 10Base-T hub:

1 Insert one end of a 10Base-T cable into the Pipeline 10BT jack.

Caution: Do not use the 10Base-T crossover cable included with the Pipeline (part number 2510-0084-001) to connect the Pipeline to a 10Base-T hub. This

cable is only for connecting the Pipeline 50 or 75 directly to a computer, as described in "Connecting the Ethernet" on page 2-12.

2 Insert the other end of the cable into an unused port on the 10Base-T hub.

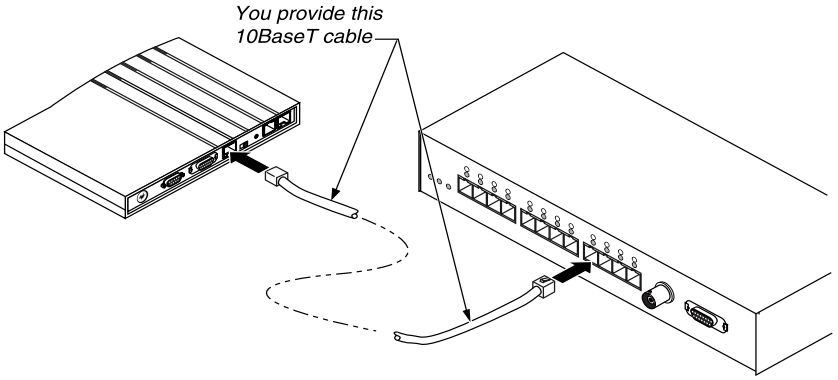


Figure 2-8. Inserting the 10Base-T cable into the hub

Caution: When connecting a Pipeline 85 in a hub-to-hub configuration, be sure to check your other hub's documentation to see what type of cable is required to connect the two hubs together.

What's next?

Skip to "Connecting to the Terminal port" on page 2-17.

Connecting to a Thinnet network

To connect the Pipeline to a Thinnet (10Base-2) network:

1 Connect a Thicknet-to-Thinnet transceiver to the Pipeline AUI jack.

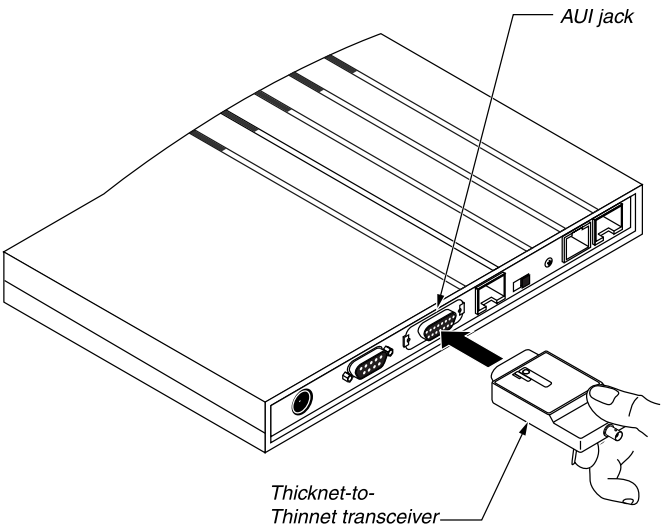


Figure 2-9. Connecting the Thicknet to Thinnet transceiver

2 Connect a T connector to the transceiver and, if the Pipeline is the last device on the network, connect a terminator to it.

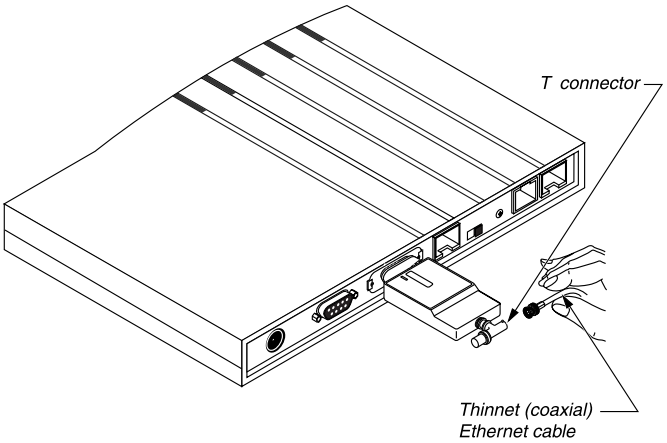


Figure 2-10. Connecting the T connector and terminator to the transceiver

3 Connect the Thinnet coaxial cable to the T connector.

4 Get a T connector for the other end of the cable.

If the computer at the other end of the cable is the last device on that end of the network, connect a terminator to it.

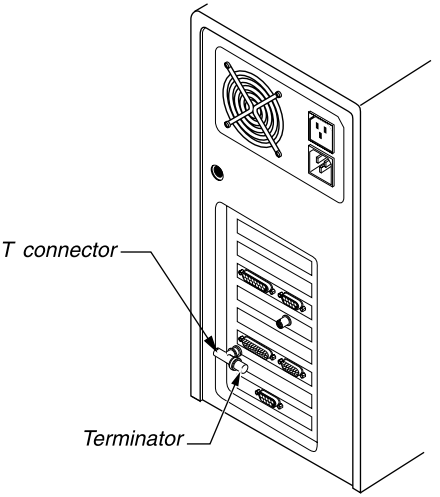


Figure 2-11. Connecting a second T connector and terminator

5 Connect the other end of the cable to the T connector and connect the T connector to the computer's Ethernet interface.

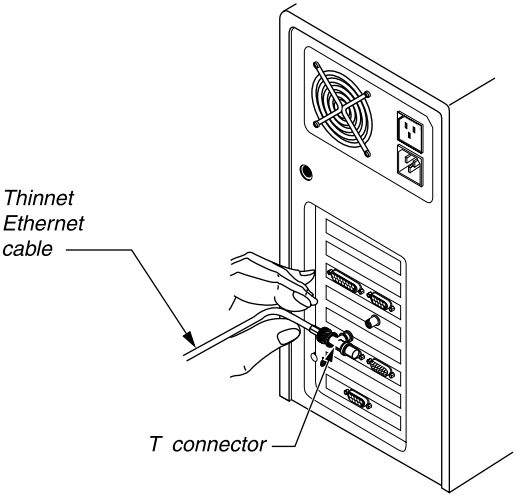


Figure 2-12. Connecting the Thinnet cable to the T connector

What's next?

Continue with "Connecting to the Terminal port" on page 2-17.

Connecting to the Terminal port

If you are connecting a UNIX workstation to the Pipeline, you must configure the Pipeline via a serial connection. The following sections explain how to connect different types of computers to the Pipeline:

- If you are using a Unix workstation to configure the Pipeline, see "Connecting a UNIX workstation" on page 2-17.
- If you are using an IBM-compatible personal computer to configure the Pipeline, see "Optional serial connection to an IBM-compatible computer" on page 2-18.
- If you are using a Macintosh computer to configure the Pipeline, see "Optional serial connection to a Macintosh computer" on page 2-19.

Connecting a UNIX workstation

To connect a workstation or other computer running UNIX:

1 Connect a modem cable for the computer to the Terminal port on the back of the Pipeline.

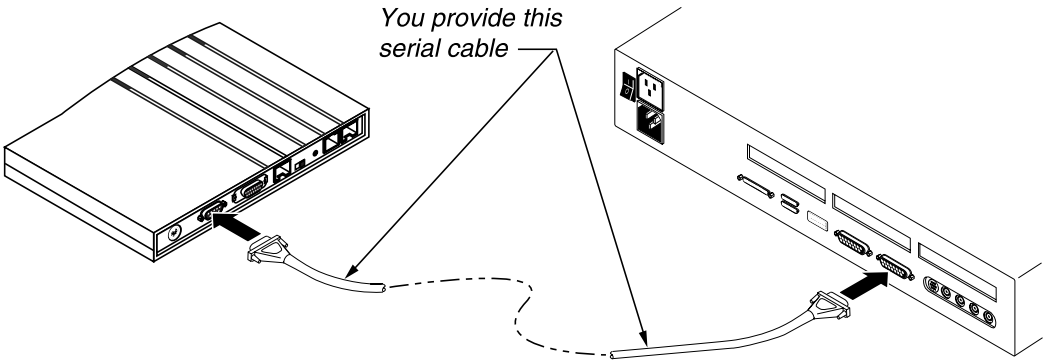


Figure 2-13. Connecting the modem cable to the Pipeline Terminal port

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

What's next?

For Pipeline 75 and Pipeline 85 models, you can attach telephone equipment to the POTS ports to use the analog services of ISDN with your Pipeline. If you have a Pipeline 50, you can enable the POTS ports by upgrading to a Pipeline 75. To do so, you need to obtain a hash code from the Technical Assistance Center.

- If you are connecting telephone equipment to the Pipeline, see "Connecting telephone equipment" on page 2-21.
- If you are not connecting telephone equipment to the Pipeline, see "Starting up the Pipeline" on page 2-24.

Optional serial connection to an IBM-compatible computer

To connect an IBM-compatible personal computer to the Pipeline:

1 Find an unused serial connector on your computer. Make a note or which serial port you are connecting to (most often COM1 or COM2); you'll need this information later when setting up the configuration software. If no serial port is currently free, disconnect from one of the ports a device that you can temporarily do without, such as an external modem.

2 Connect a modem cable to the serial connector.

3 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 to the plug.

4 Connect the cable to the Terminal port on the back of the Pipeline.

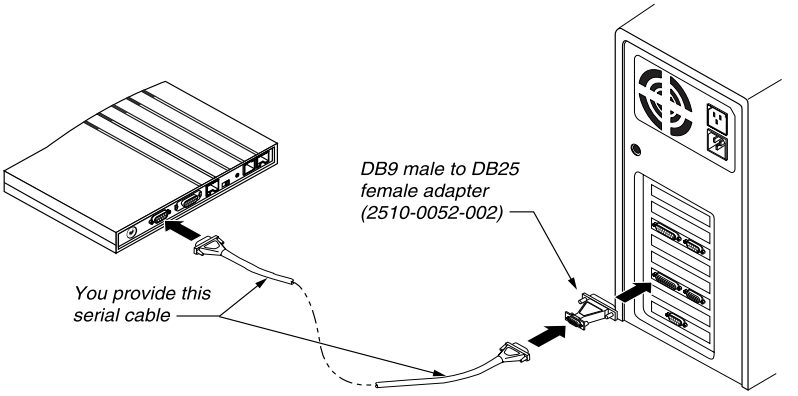


Figure 2-14. Connecting the modem cable to the Pipeline Terminal port

What's next?

- If you are connecting telephone equipment to the Pipeline, see "Connecting telephone equipment" on page 2-21.
- If you are not connecting telephone equipment to the Pipeline, see "Starting up the Pipeline" on page 2-24.

Optional serial connection to a Macintosh computer

To connect a Macintosh or compatible personal computer to the Pipeline:

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.

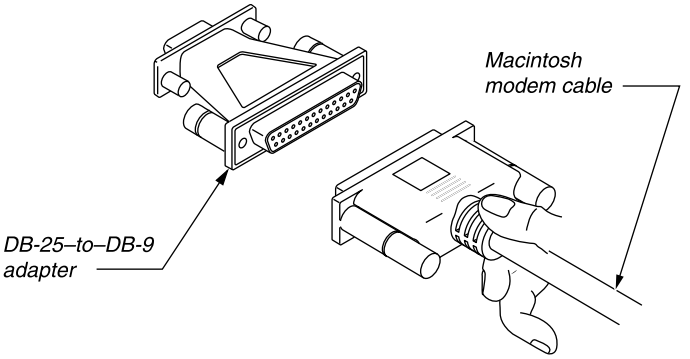


Figure 2-15. Connecting an adapter to a Macintosh modem cable

2 Connect the cable to the Terminal port on the back of the Pipeline.

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

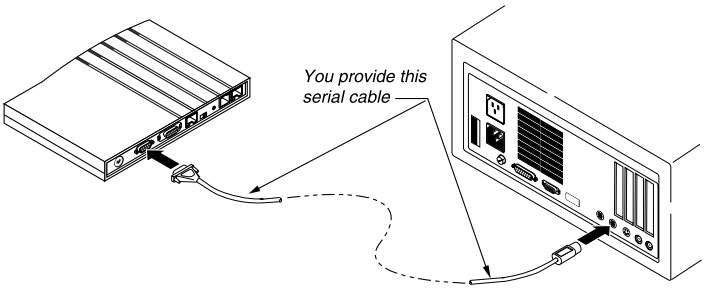


Figure 2-16. Connecting a Macintosh to the Pipeline Terminal port

What's next?

- If you are connecting telephone equipment to the Pipeline, see "Connecting telephone equipment" on page 2-21.
- If you are not connecting telephone equipment to the Pipeline, see "Starting up the Pipeline" on page 2-24.

Connecting telephone equipment

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

Although you can connect more than one analog device to a particular Phone port, you can only make or receive one call on each port at a time. For information on how voice calls are made, and how the ISDN line can be used for voice, data, or both at once, see Appendix D, “Pipeline Voice Features.”

The number of telephone devices you can connect to each phone port is limited, in part, by the total “ringer equivalence” of the devices connected to the port, as well as by other factors such as the length of the phone cable. (The ringer equivalence, measured in units known as REN, is a measure of how much electrical energy telephone equipment draws from the phone line.)

Whenever possible, only connect one device to each phone port. The sum of the REN values of the devices connected to a single port should not exceed 3. (The REN value of a device is often marked on its case. REN values may also be listed in product specification sheets for the device.)

If you encounter problems when connecting more than one device to a port, try replacing one or more of the devices with devices with lower REN values or try using a shorter or better-quality phone cable.

To connect conventional telephones or other analog telephone equipment to the ISDN line:

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

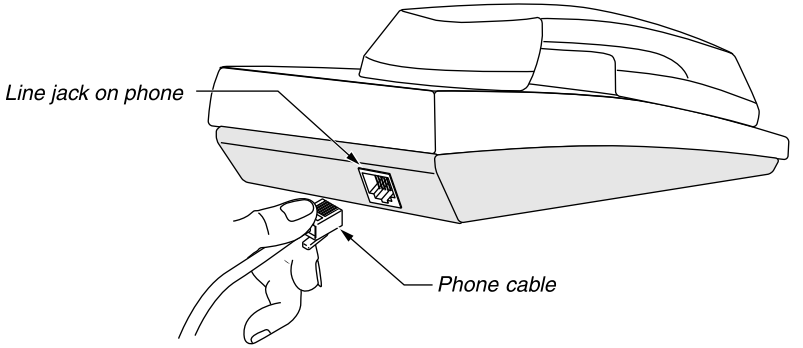


Figure 2-17. Connecting the telephone cable to a telephone

2 Connect the other end of the cable to the Phone 1 port on the Pipeline.

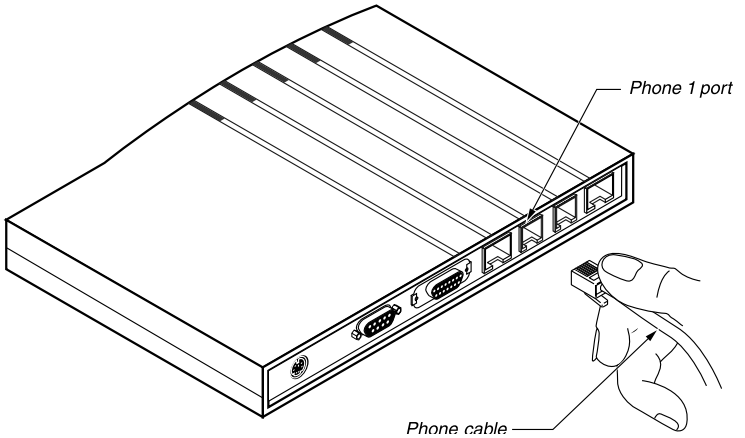


Figure 2-18. Connecting the telephone cable to the Pipeline Phone 1 port

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 as described later in this chapter.

3 Connect one end of another modular telephone hookup cable to a fax machine or other telephone device.

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

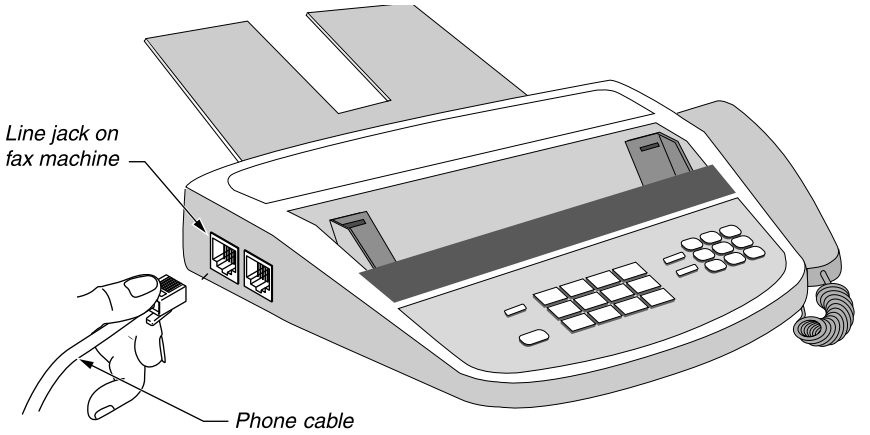


Figure 2-19. Connecting the telephone cable to a fax machine

4 Connect the other end of the cable to the Phone 2 port on the Pipeline.

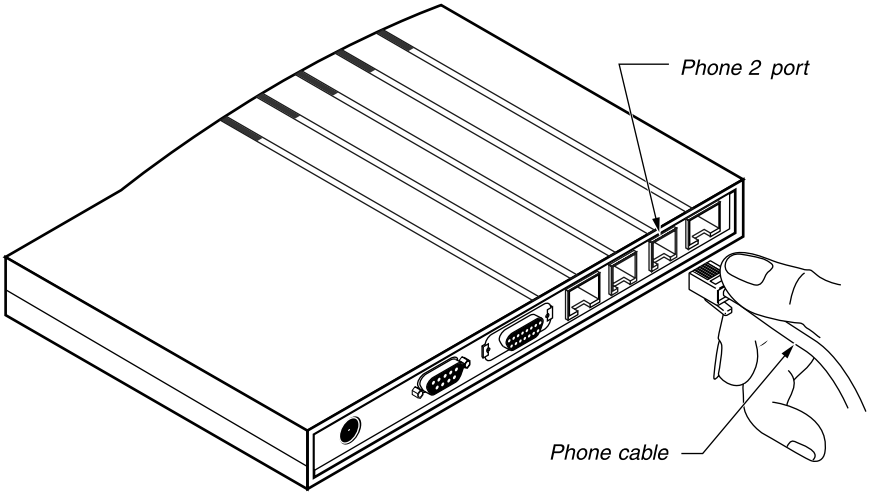


Figure 2-20. Connecting the telephone cable to the Pipeline Phone 2 port

What's next?

- See "Starting up the Pipeline" on page 2-24.

Starting up the Pipeline

Position yourself so you can see the LEDs on the front panel of the Pipeline.

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 can create sparks, cause an electrical fire, or destroy the Pipeline.

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

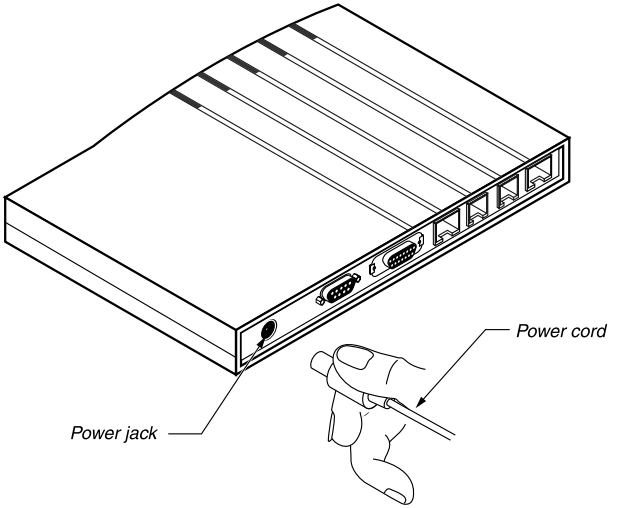


Figure 2-21. Connecting the power cord to the Pipeline

2 Insert the AC power plug into an electrical outlet.

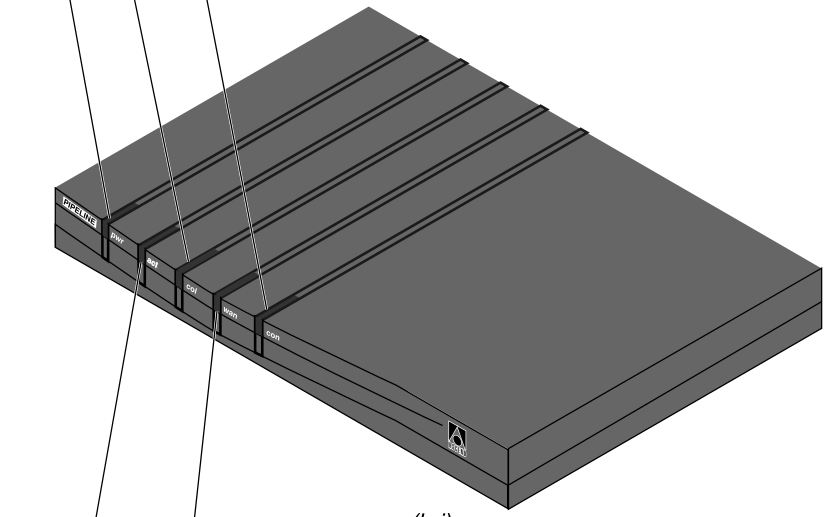
Because the Pipeline has no power switch, plugging in the power supply turns the Pipeline on. After you plug in the Pipeline, it takes about a minute for it to be ready to use. The status light on the front of the Pipeline labeled PWR comes on immediately to indicate that the power is on.

The LED labeled CON comes on when you connect the Pipeline to its power source, and goes off when the internal power-on self test (POST) passes.

If there is no service, or the unit is not configured, or there is a problem with the WAN interface, the WAN LED will flash. Refer to Figure 2-22 on page 2-26 for descriptions of all the Pipeline LEDs.

Note: When using the Pipeline with some ISDN services or switch types (often seen with NET 3 in South Africa, Germany, and France), the WAN light may flash when the connection is disconnected. This occurs in power save mode. The WAN light will come back on when starting the next connection.

Reading the Pipeline LEDs



pwr
The pwr (power) LED comes on as soon as you connect the Pipeline to a power source.

col
The col (collision) LED blinks when there are collisions on the Ethernet interface

con
The con (condition) LED comes on when you connect the Pipeline to its power source, and stays on while the condition of the unit is tested.

The LED goes off when the test is complete. If the LED stays on for longer than 90 seconds, see the troubleshooting chapter.

act
The act (activity) LED blinks when there are packets transmitted or received in the Ethernet interface.

wan (bri)
The wan LED is:

- *Off if there is an active BRI line and no connection.*
- *On if there is a WAN session active.*
- *Blinking if there is an error with the BRI interface (such as no physical or logical link).*

Figure 2-22. Pipeline front-panel display lights

Mounting the Pipeline on a wall

If possible, choose a location for the Pipeline that lets you view the lights on the front. These lights show the current status of the Pipeline, such as whether the WAN connection is active, and can help you diagnose problems.

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 includes two screw slots for this purpose. The following figure shows the size and spacing of screws you need for wall mounting.

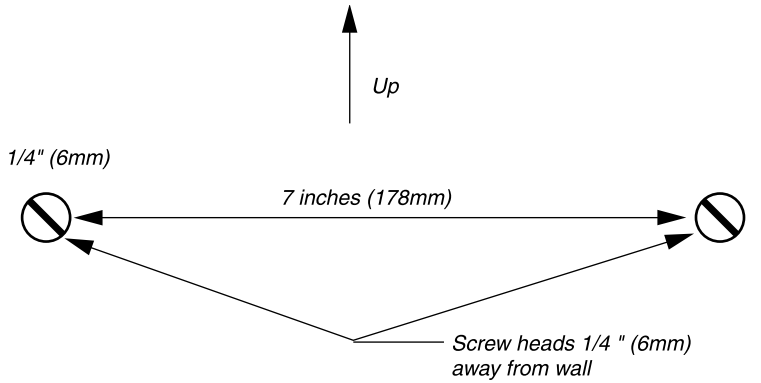


Figure 2-23. Placement of screws for mounting the Pipeline on a wall

Basic Configuration Settings

3

This chapter contains the following topics:

Overview

This chapter contains checklists of every setting you need to configure the Pipeline to connect to a single remote network, with space for you to record your settings. Wherever possible, parameters are left at their default value.

This is the easiest method of getting started. For most small office/home office installations, this basic configuration is all you need to use your Pipeline. For information on setting up incoming connections and additional outgoing connections, refer to the chapter entitled, “Configuring WAN Connections,” in the *User’s Guide*.

For an example of how to configure TCP/IP on a computer running Windows 95 or MacOS, see Appendix A, “TCP/IP Example Settings. ” For an example of how to set up an IP routing connection (to connect to the Internet or to a network using TCP/IP), see Appendix B, “IP Routing Configuration Example. ”

TCP/IP information

To connect to an IP network, such as the Internet, you need to configure TCP/IP on your computer. The information you need is listed in the following table. To help you set up a private network, or to understand how to configure TCP/IP, refer to "How the Pipeline establishes connections" on page 1-8.

Table 3-1. TCP/IP settings checklist

Required TCP/IP information	Your setting
IP address for Pipeline (which is the router or default gateway).	
IP address of your computer (which is also know as the host). This should be the next address after the Pipeline.	
Subnet address (or subnet mask) of your local network.	
Host name and domain of your computer (used in PC settings only).	
Domain Name System (DNS) addresses (preferably two addresses).	

These settings are used when configuring TCP/IP *on your computer.*

When configuring the Pipeline with the QuickStart utility, these settings are automatically detected by the configuration utility.

When configuring the on-board software, refer to these settings for the IP address of the Pipeline.

For more information, see Appendix A, "TCP/IP Example Settings. "

ISDN or Frame Relay information

If you have an ISDN line, use the information that was given to you by your telephone company to fill in the following table:

Table 3-2. ISDN line settings checklist

Required ISDN information	Your setting
Switch type	
Directory number for B1	
Directory number for B2	
SPID for B1 (North America only)	
SPID for B2 (North America only)	

If you have a Frame Relay connection, contact your Frame Relay administrator to obtain the switch type and a Data Link Connection Indicator (DLCI) for each Connection profile you need to define and enter the information in the table below:

Table 3-3. Frame Relay connection settings checklist

Frame Relay information	Your settings
Switch type	
DLCI	

Note: If you have Frame Relay service, you need to configure the Pipeline using the on-board software.

Routing information

The following table lists basic information you need to set up the Pipeline as a router. Fill in this table, then fill in the IP or IPX routing information table.

Table 3-4. Basic routing settings checklist

Basic routing information	Your settings
Routing method	IP, IPX, or both
Account name	
Account password	
Name of remote network (not prompted for in QuickStart)	
Number to dial into remote network	
Authentication method	

IP routing information

If you will be routing to an IP network, fill in the following table:

Table 3-5. Remote IP network settings checklist

Remote IP network information	Your settings
IP address of the Pipeline (detected automatically by QuickStart)	
Subnet address of your network	
Remote network's IP address	
Remote network's subnet address	

IPX routing information

If you will be routing to an IPX network, your network administrator will supply the information you need to fill in the following table:

Table 3-6. Remote IPX network settings checklist

Remote IPX network information	Your settings
IPX Frame	
IPX Enet#	
IPX SAP Proxy (not prompted for in QuickStart)	
IPX SAP Proxy Net# (not prompted for in QuickStart)	
Dial Query (not prompted for in QuickStart)	

AppleTalk routing

You can obtain a special version of the Pipeline software that enables AppleTalk routing. For information about the capabilities of the software, limitations, and how to configure it, contact the Ascend Technical Assistance Center.

Bridged connections

If you need to move data that is not IP, IPX, or AppleTalk, you need to enable bridging. Bridging causes your local network to look like it is part of the larger network you dial into. You should only bridge to a corporate LAN, with assistance from the administrator of that LAN. You should never bridge to the Internet. For information about how to set up your Pipeline as a bridge, see the *User's Guide*.

Entering your settings

If you plan to use the QuickStart utility of the JBPC, refer to “Running the QuickStart utility” on page 4-3, and begin making selections. If you need help with any item, click the help button. Use your settings from the tables in this chapter to fill in fields in the QuickStart utility. You can follow a sample configuration that uses the QuickStart utility in “Setting up IP routing using QuickStart” on page B-3.

To configure the Pipeline using the on-board software, see Chapter 5, “Using the On-board Software” to see how to make a serial connection and how to navigate the on-board menus. You can follow a sample configuration of the on-board software in “Setting up IP routing in the Configure menu” on page B-5.

Quick Start

4

This chapter contains the following topics:

Installing the JBPC

The QuickStart utility is part of the Java-Based Pipeline Configurator (JBPC). You can access the JBPC in these ways:

- The JBPC is shipped on the Pipeline Companion CD-ROM, and can be run from the CD without installing the software onto your computer. Alternatively, you can install the JBPC and run it from your computer.
- You can download the latest version of the JBPC from ftp.ascend.com /pub/Software-Releases/PL_CDROM.

To install from the CD, insert the Pipeline Companion CD into your computer's CD drive. If your computer's operating system is Windows 95, Windows NT 4.0, or Macintosh, the CD's AutoPlay feature presents a selection menu when you insert the disc. The selection menu leads you through the contents of the CD, starting with the location of the Java-based Pipeline Configurator. Follow the on-screen instructions.

To install the downloaded version, open the self-extracting archive and follow the on-screen instructions.

Note: For Windows 3.1x, the QuickStart utility is supported as a separate Windows program. (The program is available on the Pipeline Companion CD, or on disk by contacting the Ascend Technical Assistance Center, or downloadable from the Ascend FTP server at ftp.ascend.com /pub/Software-Releases/ PL_CDROM.)

For Windows 3.1x, use the QuickStart utility to assign an IP address to the Pipeline. Then use Telnet to connect to the Pipeline, using the IP address to access the unit. (An example of how to Telnet to the Pipeline can be found in "Telneting into the Pipeline" on page B-8.) Alternatively, you can use a serial connection to configure the unit.

Opening the JBPC

You can run the JBPC from the Pipeline Companion CD, or if you installed the JBPC, select the Pipeline Console from the Start > Programs menu, or double-click the icon.

When running the JBPC, you will notice a number of other Java programs starting up when you run the Pipeline Console. The following programs might be used:

- The Java Virtual Machine. You don't need to start or close this application. It is managed by the configurator.
- The Ascend Pipeline. This is the main console window (shown below). Closing this program, closes any open Java program.
- Find, Monitor, QuickStart, and the Configurator are all Java programs that open and close automatically.

Running the QuickStart utility

When you launch the configurator, the main console window is displayed.

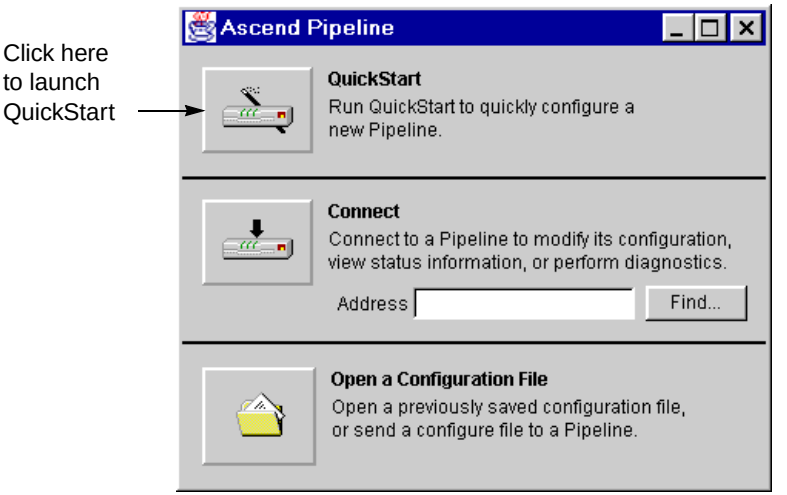


Figure 4-1. The QuickStart button

QuickStart prompts you for the information it needs to configure a single connection. A checklist of information you need when responding to QuickStart prompts can be found in Chapter 3, “Basic Configuration Settings.”

Connecting to the Pipeline

After running QuickStart, you can make additional setting by clicking Connect.

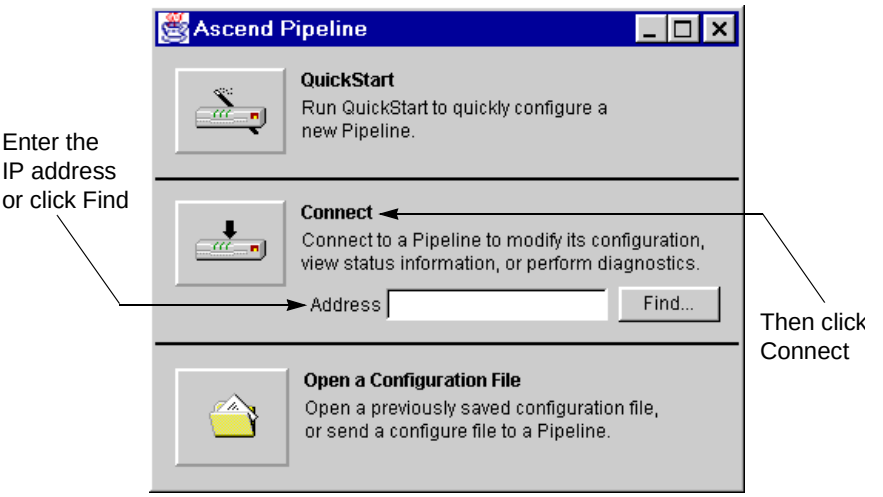


Figure 4-2. The Connect button

First, enter the IP address of the Pipeline to open the configurator. If you don't know it, click the Find button, and the configurator will search your local network for any Pipeline units. From a list of found units, click on the one you want to configure. The current configuration on that unit (or the default settings shipped with the unit) are downloaded to the JBPC.

If you make any changes to the Pipeline when using the JBPC you need to update the on-board software on the Pipeline, as the JBPC is an external program that can be used to configure *any* Pipeline on your network. (The location of the Update button is shown in Figure 4-3.)

Using the configuration panels

After you connect to the Pipeline, and the current configuration is loaded into the JBPC, you can view all of the current settings, and add, change, or delete settings, as needed. Refer to the *User's Guide* for information about how to construct profiles to get the results you want. Then use the tabbed interface of the

JBPC to enter the values. Use the on online help system for information about where to enter information, or about the allowed values, or dependencies for any setting.

The figure below shows the front panel of the configurator tabs.

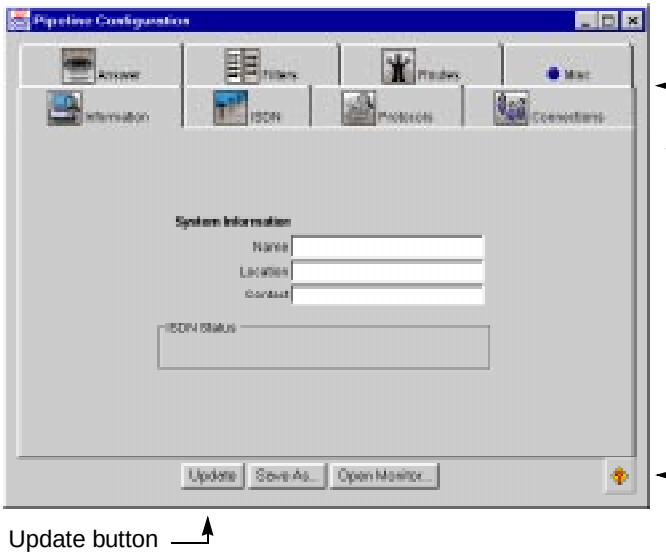


Figure 4-3. The JBPC tabbed configuration interface

Updating the Pipeline configuration

After making changes to the current configuration, you need to update the Pipeline before the new settings can be used. The Pipeline configuration is stored in non-volatile random access memory (NVRAM) on the Pipeline, and is preserved even when the power is off. When you click the Update button, the entire configuration is sent back to Pipeline, including your changes.

Saving the configuration to a file

If you want to use the configuration from one unit to update a number of other units, or if you simply want to save your configuration to a file, click the Save As button and assign a name to the configuration file. To open the file and use it to

configure another unit, or to restore your own Pipeline, see “Opening a configuration file from disk” on page 4-8.

Opening the Monitor

The Pipeline Monitor is a Java program that shows you the status of your ISDN line. It shows you a log of all your connections and lets you manually dial a remote site.

To manually dial a remote site, click Dial Connection. A list of all configured Connection profiles is presented. All you need to do to connect is click on the name of the site to call, then click Dial.

To see the current ISDN status, click the down arrow and the screen expands to show a status window. Each of the two B channels, and line utilization percentages are shown.

The Event log (open in the figure below) shows all the activity on the Pipeline. You can use this information to diagnose the Pipeline. The Event screen can be expanded and scrolled as events fill up the window.

The Monitor screen is shown below.

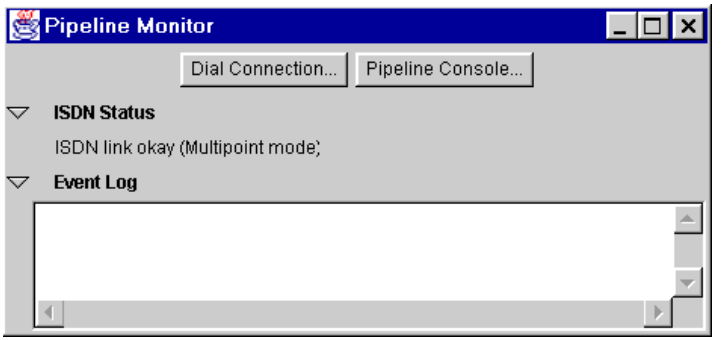


Figure 4-4. The Pipeline Monitor

Accessing the JBPC online help and Networking Basics

When you click the help button on any configuration panel, your default browser opens and the associated HTML help panel is loaded. The help system includes three sections, which can be selected from the top frame of the HTML title. The following three section are included in the title:

- A to Z, a glossary containing over 300 terms and acronyms used in Ascend networking and telecommunications.
- Basics, a short reference illustrating some of the most fundamental concepts in telecommunications.
- Help, which contains a listing of every field contained in the JBPC configurator. The help system's contents window can be scrolled to find any parameter, and the main window describes each parameter, including where it is located in the JBPC, example values, and dependencies.

The Basics section is shown below:

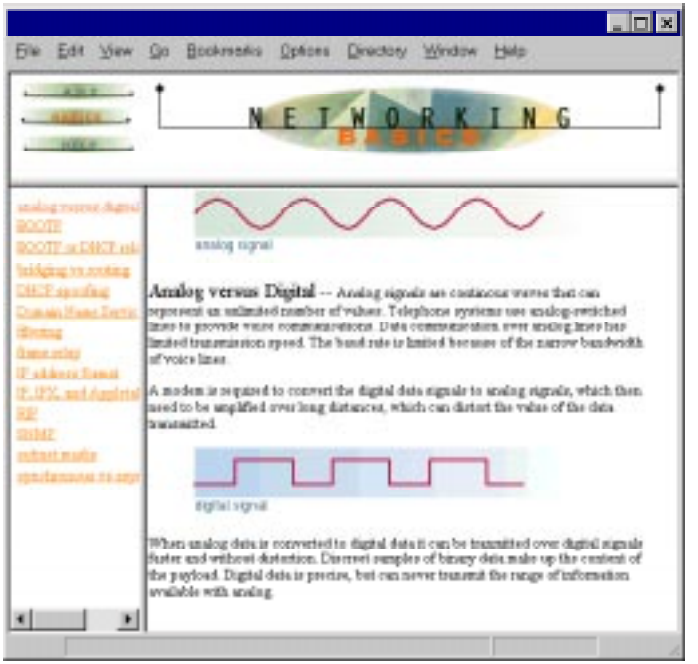


Figure 4-5. Networking Basics HTML screen

Opening a configuration file from disk

You can load a configuration into the Pipeline from a file.

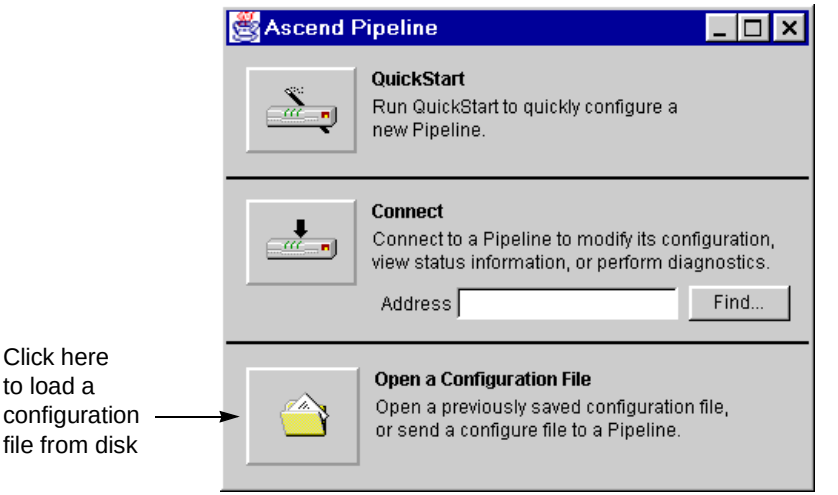


Figure 4-6. Open a Configuration File button

This button opens a find file dialog where you can select a configuration file from disk. By selecting a file, you automatically load the configuration into the tabbed interface console. From the console, click Update to send this configuration to a Pipeline. The unit to which the configuration is sent is specified in the following dialog:

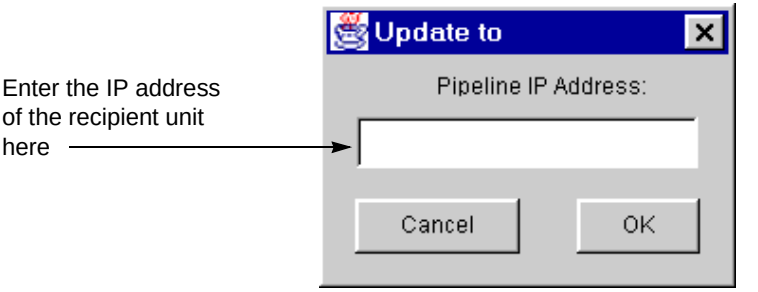


Figure 4-7. Updating the Pipeline from a previously saved file

Using the On-board Software

5

This chapter contains the following topics:

Establishing a serial connection to the Pipeline

You can access the on-board software by making a serial connection to the Pipeline by doing the following:

1 Connect a serial cable from a COM port on your computer to the Terminal port on the Pipeline. You need to supply the serial cable. For a Macintosh computer, connect a serial cable from the modem port (9-pin mini DIN) to the Pipeline. For a PC, connect a serial cable from an enabled COM port to the Pipeline. You will need one end of the cable to have a DB-9 or DB-25 male connector to plug into the Terminal port on the back of the Pipeline or into the supplied adapter, and then into the Pipeline.

2 Using a communications program (such as HyperTerm, Terminal, Zterm, or any program that supports VT100 terminal emulation), open a session directly with the COM port to which the Pipeline is connected.

3 Set your communications software to connect with these settings:

- 9600 bits per second
- Data bits 8
- Parity none
- Stop bits 1
- Flow control off

You should now see the on-board software's Main Edit Menu. Press Ctrl-L to reload or refresh the screen. The part of the screen you use to configure the Pipeline is on the left and looks like this:

```
Main Edit Menu
 >Configure...
  00-000 System
  20-000 Ethernet
  30-000 Serial WAN
  40-000 Dual POTS
```

Establishing a Telnet connection

You can establish a Telnet session with the Pipeline as soon as it has been assigned an IP address. Telnet uses the Ethernet connection from your computer to reach the Pipeline. To open a Telnet connection, do the following:

1 Open your Telnet application, or enter `Telnet` from the Run menu.

2 Open the connection by specifying the value of My Name or My Addr to identify the Pipeline. (My Name is the name of the Pipeline, and is also the account name you use to sign onto a remote service. My Addr is the IP address of the Pipeline.)

For example, to open a Telnet session, enter:

```
telnet 192.168.100.1
```

where the IP address shown here is an example address. You would enter the IP address of your unit.

3 You may be required to supply a password. The Telnet password is set in the Ethernet > Mod Config menu in the Telnet PW parameter.

If you don't remember the password, it can be found by making a serial connection to the unit and opening the Ethernet > Mod Config menu.

From a Telnet session you can configure, diagnose, and manage the Pipeline in just the same way as with a serial connection. (Access can be limited by setting security levels for network users as described in the *User's Guide*.)

Menus and status windows

The on-board software consists of the Main Edit Menu and eight status windows. The active window has a thicker border. Press the Tab key to select the next window. Selection is left to right, top to bottom. Back-Tab or Ctrl-O moves you in the opposite direction.

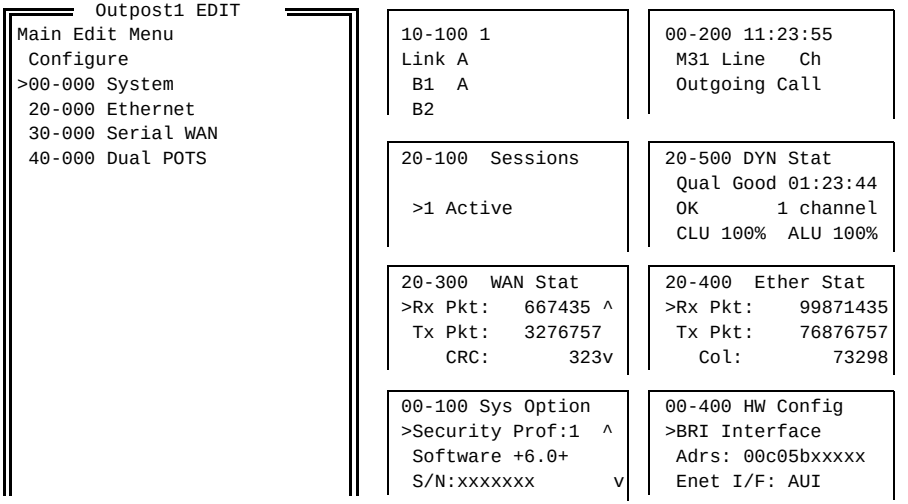


Figure 5-1. Pipeline configuration menus

To navigate the menu system:

- Use the up and down arrow keys or Ctrl-N or Ctrl-P to navigate up and down through the menus. A "^" and "v" at end of the line at the top and bottom of a menu or status window listing indicates more lines are present above and below.
- Press Enter to cycle through preset values for any parameter, or press enter to open an input field.
- Press Enter or move to the next field to make a selection or keep an entry.
- Press the Esc key to exit a menu. You will always have the choice of saving or discarding your changes before exiting.

Finding information in the menus

The Main Edit Menu occupies the left part of the screen. It contains a hierarchy of submenus as shown in the following table:

Table 5-1. The Main Edit Menu structure

Menu	Submenu	Description
Configure...		Basic settings to quickly set up a connection.
System	Sys Config	Contains remote management settings and others.
	Sys Diag	Used to save and restore configuration files.
	Security	Used to set up access privileges on the unit.
Ethernet	Connection	Incoming and outgoing connection profiles.
	Bridge Adrs	Matches MAC and IP addresses for a bridge table.
	Static Rtes	If used, specifies a static gateway.
	Filters	Where you define all your call and data filters.
	Frame Relay	Defines the Frame Relay service settings (if used).
	Answer	Where you specify incoming call instructions.

Table 5-1. The Main Edit Menu structure (continued)

Menu	Submenu	Description
	SNMP Traps	Specifies where to send SNMP traps packets.
	IPX Routes	Defines up to two IPX servers.
	IPX SAP Filters	Defines input and output SAP filters.
	NAT	Sets up how you obtain a dynamic IP address.
	Mod Config	A number of global Ethernet interface settings.
Serial WAN	Mod Config	Specific to the interface software loaded on the model. The Serial WAN menu item is present, but not enabled on the Pipeline 50, 75, and 85.
Dual POTS		Enables or disables voice features on units with enabled POTS ports.

The Configure menu is discussed in "Entering a basic configuration" on page 5-7. All of the other menus and their parameters are discussed in the *User's Guide*. Additionally, every parameter in the menu system is listed in alphabetical order in the Parameter Reference chapter of the *Reference Guide*.

Opening a menu

To open a menu, select it by placing the cursor (>) in front of the item and pressing Enter. To move the cursor down, press Ctrl-N (next) or the Down-Arrow key. To move it up, press Ctrl-P (previous) or the Up-Arrow key. (Note that some VT100 emulators do not support the use of arrow keys.)

```
Main Edit Menu
>Configure...
 00-000 System
 20-000 Ethernet
 30-000 Serial WAN
 40-000 Dual POTS
```

With the exception of parameters designated N/A (not applicable), you can edit all parameters in any menu. N/A indicates that a parameter does not apply, based on the value of parameter it is subordinate to; or based on a service not currently available on your system.

Changing parameters with text entries

To edit text (such as a password), move the cursor to the parameter and press Enter. An edit field opens, delimited by brackets. A blinking text cursor appears in the brackets, indicating that you can type in text. If the field already contains text, it is cleared when you type a character. To modify only a few characters of existing text, use the arrow keys to position the cursor, then delete or overtype the characters. To close the edit field and accept the new text, press Enter.

Setting parameters with predefined values

You can change the value of a parameter with predefined values by placing the cursor beside the parameter and pressing Enter until the correct value appears. To select a value, move to the next field or exit the profile (menu).

Saving or discarding your changes

When you are finished editing, press the Esc key. If you have entered or changed any parameters, the Exit menu appears:

```
EXIT
>0=ESC (Don't exit)
1=Exit and discard
2=Exit and save
```

You can save your changes by choosing the Exit and Save option and pressing Enter, or by pressing 2.

Status windows

By pressing the Tab key, you can make any status window active. If a plus sign (+) appears at the end of any line in a status window, it means that more text can be seen by selecting the line and scrolling to the end of it. If a "^" and "v" appear at the end of the top and bottom lines in a status window, it means that by making

the window active and pressing Ctrl-N or the down-arrow key, or Ctrl-P or the up arrow, you can display additional lines of text.

All of the information contained in the status windows is described in detail in the Status Window Reference chapter of the *Reference Guide*.

Entering a basic configuration

You can use this section to fill in basic configuration settings in the on-board software. After doing so, you can test your configuration.

Filling in the Configure menu

Open the Configure menu. The following is an example listing, and shows fields for a unit with phone ports:

```
Switch Type=
Chan Usage=
My Num A=
My Num B=
SPID 1=
SPID 2=
Data Usage=
Phone 1 Usage=
Phone 2 Usage=
Phone Num Binding=
Caller ID=Yes
Forward Disconnect= No
Ans Voice Call=
My Name=
My Addr=
Rem Name=
Rem Addr=
Dial #=
Route=
Bridge=
Send Auth=
Recv Auth=
```

```
Recv PW=
Save=
```

How to fill in each parameter is described in the following table:

Table 5-2. Configure menu parameters described

Parameter	What you should enter
Switch Type	Press Enter until the switch type for your service is displayed. **Note:** If you are not sure what the switch type is and you have ISDN service in North America, select AutoSPID and the Pipeline will connect to the switch by means of the AutoSwitch utility, identify it, and attempt to guess the SPIDs.
Chan Usage	The default is switch/switch. You can leave this setting at the default for most services. It refers to the method the telephone company uses to link your line to the public switched telephone network. Only when you have a leased line, do you need to use a setting other than the default. For Frame Relay you might need to specify switch/unused or leased/unused, but generally the default can be used.
My Num A My Num B	For ISDN, enter the directory numbers for your service. **Note:** AT&T Point-to-Point service uses only one directory number and no SPIDs. For Frame Relay, these parameters are not used.
SPID 1 SPID 2	Enter the numbers provided by your telephone company. For Frame Relay, these parameters are not used.
Data Usage Phone 1 Usage Phone 2 Usage Phone Num Binding	These parameters appear on units with phone ports. Leave the settings at the default unless you want to dedicate one channel for voice. The defaults allow voice and data on both channels. See the *Reference Guide* for details on each parameter. For Frame Relay, these parameters are not used.

Table 5-2. Configure menu parameters described (continued)

Parameter	What you should enter
Caller ID	For a unit with phone ports, Yes sends your directory number with outgoing calls. No blocks the number.
Forward Disconnect	For a unit with phone ports, when the unit is behind a PBX, and there is a problem disconnecting calls, set this parameter to Yes.
Ans Voice Call	Leave this setting at the default unless you are certain you do not want to accept voice calls or Data Over Voice calls. Setting this value to No on a unit with phone ports, disables incoming (not outgoing) calls. For Frame Relay, this parameter is not used. **Note:** This parameter does not apply to ISDN service in Japan.
My Name	Enter your Account name or Logon name. This becomes the name of the Pipeline and is used to authenticate when connecting to a remote network.
My Addr	For IP networks, this is the IP address of the Pipeline. If you will be obtaining your IP address dynamically when logging in, you still need an IP address for the Pipeline so it can function as the default gateway on your local network. For information about how to set up a private network, see “Using dynamically assigned IP addresses” on page 1-10.
Rem Name	The remote name is the name of the server you call into at the remote network. You might not be given the server’s name, but this name becomes the name of your primary Connection profile. You should give it an appropriate, descriptive name if none was provided.
Rem Addr	When connecting to an IP network, this is the IP address of the gateway or server at the remote network you dial into.
Dial #	The number the Pipeline dials to reach the remote network. For Frame Relay, this parameter is not used.

Table 5-2. Configure menu parameters described (continued)

Parameter	What you should enter
Route	Choose IP, IPX, or IP and IPX as needed. If you choose IP, you must have TCP/IP set up on your computer. To route IPX, you need client IPX networking software installed and configured on your computer. Additionally, AppleTalk routing is available by downloading a special version of the Pipeline software.
Bridge	If you are using a Macintosh computer, and will be routing IP to the Internet or a corporate LAN (or routing IPX), you can bridge your AppleTalk packets by setting this parameter to Yes. Generally, bridging is enabled to move data that you do not have routing software for. If you set this parameter to Yes, refer to the *User's Guide* for information about configuring bridged connections.
Send Auth Send PW Recv Auth Recv PW	Auth refers to the authentication method used by the remote network to ensure you are who you say you are. You must use the authentication method required by the remote network administrator. If you allow others to call your Pipeline, you can authenticate incoming calls, but both sides must be configured to use the same method. The Send password is your account password used when logging into the remote network. The Receive password is one you set up in advance with an incoming caller who will be authenticated. For Frame Relay, these parameters do not apply.
Save	Pressing Enter saves your configuration. An asterisk appears in the field if there are changes not saved in the Configure menu.

If you are setting up IP routing and need to obtain an IP address dynamically, you need to configure Network Address Translation, as described in "Setting up Network Address Translation (NAT)" on page 5-11.

If you are setting up IPX routing, complete the configuration by following the instructions in "Additional IPX settings" on page 5-11.

If you are setting up a Frame Relay connection, complete the configuration by following the instructions in “Additional Frame Relay settings” on page 5-12.

Setting up Network Address Translation (NAT)

Enable NAT when you need to obtain an IP address dynamically when logging onto the remote network. To set up NAT, do the following:

1. From the Main Edit Menu, open Ethernet > NAT > NAT menu.
2. Enable NAT by setting Routing to Yes.

   ```
   Routing=Yes
   ```

3. Specify the Connection profile to dial when NAT is enabled.

   Open Ethernet > Connections. The first profile has the name you assigned to “Rem Name,” which is the name of the Connection profile to specify.
4. You can use the default settings in most cases. Information on how to set up NAT in various scenarios is described in the chapter on IP address management in the *User’s Guide*.

   Note: See the *User’s Guide* for information about how to configure NAT with Frame Relay.
5. Exit (Esc) and accept the changes.

Additional IPX settings

To complete an IPX configuration, do the following:

1. Open the Ethernet > Mod Config > Ether options submenu.

   A menu similar to the following appears:

   ```
   Ether options...
   IP Adrs=0.0.0.0/0
   2nd Adrs=0.0.0.0/0
   RIP=Both v-1
   Ignore Def Rt=Yes
   Proxy Mode=Always
   Filter=0
   IPX Frame=802.2
   IPX Enet#=00000000
   ```

```
IPX Pool#=00000000
IPX SAP Filter=0
IPX SAP Proxy=No
IPX SAP Proxy Net#=N/A
```

2 You can leave the settings at their default, except for the following. Using information supplied by your IPX system administrator, enter values for

- IPX Frame Type
- IPX Enet#
- IPX Pool#
- IPX SAP Proxy
- IPX SAP Proxy Net#

3 Exit and save your settings.

After entering the IPX information, you are ready to test your ISDN line and verify that it is operating correctly.

Additional Frame Relay settings

To complete a Frame Relay configuration, do the following:

1 Open the Ethernet > Mod Config > Frame Relay.

A menu similar to the following appears:

```
Name=
Active=
Call Type=Nailed
FR Type=DTE
LinkUp=No
Nailed Grp=1
Data Svc=56K
Dial #=N/A
Link Mgmt=T1.617D
N391=6
DTE N392=3
DTE N393=4
DCE N392=N/A
DCE N393=N/A
```

```
T391=10
T392=N/A
```

2. Select Name and enter a name for your Frame Relay connection. It can be any name, such as My FR Profile.
3. Set Active to Yes.
4. Set Call Type to Nailed.
5. Exit and save your settings.
6. Open Ethernet > Connections > *profile* (the name will match “Rem Name”).
7. Set Encaps to FR.
8. Open the Encaps Options submenu.

   A listing similar to the following appears:

```
>FR Prof=My FR Profile
 DLCI=300
```

9. Set FR Prof to the name of your Frame Relay profile (defined in Step 2).
10. Enter the DLCI value for this connection.
11. Exit and save the settings.

When your configuration settings are saved, and the Frame Relay service is physically connected to the Pipeline, you will automatically be connected to the remote network called “Rem Name.” Other connections can be made by defining additional Connection profiles. For more information, refer to the chapter entitled, “Configuring WAN Connections,” in the *User’s Guide*.

Performing a self-test

For ISDN connections, do a self test to verify your switch type, SPIDs, and other settings are correct. You can do this by running the test command in the Pipeline terminal server, as explained below.

To perform a self-test, open System > Sys Diag > Term Serv. The terminal server prompt is “ascend%”. To exit this window, type quit.

To test your set up, enter the following:

```
test My Num
```

where

- `My Num` is the number of your second B channel (My Num B). Use it when your ISDN line is provisioned for two directory numbers.
- Or, `My Num` is the number of your first B channel (My Num A). Use it when your ISDN line is provisioned for only one directory number.

For example, if you have two B channels, you would call the second number (without area code or long distance prefixes) by entering:

```
test 5551112
```

The Pipeline displays the progress of the call. If the ISDN line is correctly configured, it displays the following message:

```
calling...answering...testing...end
100 packets sent, 100 packets received
```

If the test was successful, enter:

```
quit
```

Next, dial into the remote network, as explained below.

If the test was not successful, make sure you entered the correct telephone number. If you still have problems, refer to the "Troubleshooting" appendix in the *User's Guide.* This appendix identifies common problems that can occur during setup, and explains how to identify what is wrong and how to fix it.

Manually dialing the remote network

You can manually dial the remote network using the DO Dial command. (DO commands are described in the chapter entitled, "DO Command Reference," in the *Reference Guide*.)

1 Open the Configure menu and press Ctrl-D.

A menu listing similar to the following appears.

```
DO...
 0=Esc
```

```
1=Dial
P=Password
C=Close TELNET
E=Termsrv
D=Diagnostics
```

2 Select Dial. The Pipeline makes an outgoing call using the value you entered in the Dial# parameter of the Configure menu. Watch the upper right hand corner Status Window. If you see the message: "LAN Session Up" your call was successful. If you get a different message, double check your settings. If you are still having trouble making a connection, refer to the appendix entitled, "Troubleshooting," in the *User's Guide*.

Once the Pipeline has been successfully configured, it automatically makes a call to the remote network whenever it receives traffic destined for that network. This occurs when, for example, you open a web browser, select an item in the Chooser on a Macintosh, or send email.

Securing the Pipeline

Once configured, the Pipeline should be secured, since anyone can use Telnet or SNMP to access and reconfigure the unit. Ways to limit access are described in the chapter entitled, "Setting up Pipeline Security," in the *User's Guide.* You should at least assign a Read/Write SNMP password and a Telnet password.

To assign a Read/Write SNMP password, do the following:

1 From the Main Edit Menu, open Ethernet > Mod Config > SNMP Options.

2 In SNMP options, enter an alphanumeric value for R/W Comm.

This password is required to make changes to the Pipeline via the JBPC.

3 Exit and save the settings.

To assign a Telnet password, do the following:

1 Open Ethernet > Mod Config > Ether Options submenu.

2 Enter a value for Telnet PW

Exit and save the setting.

TCP/IP Example Settings

A

This appendix covers the following topics:

Setting up a TCP/IP network

TCP/IP is the networking protocol used by the Internet, government agencies, universities, businesses, and other organizations to manage the flow of data in and out of their many interconnected networks.

To connect to a TCP/IP network, such as the Internet, you need to install TCP/IP networking software on your computer, and your Pipeline needs to be set up to route Internet Protocol (IP) packets. When you set up TCP/IP on your computer, you need to designate the Pipeline as the default gateway.

The following sections explain how to install and configure TCP/IP, and show you how to set up an Ethernet network with one or more computers, designating the Pipeline as the gateway to the wide area network.

Basic TCP/IP settings

When setting up TCP/IP, you need an IP address for your Pipeline and for each computer on your network. The main concern for most users is where to get the IP addresses, since most Internet Service Providers and many corporate network administrators assign you a single IP address when you logon to their network.

The following example shows you how to set up private addresses on your local network and obtain an IP address dynamically when logging onto the Internet or your corporate LAN.

The table below shows sample values that you can use for a private network if you are not assigned a set of IP addresses.

Note: If you *are* assigned unique IP addresses, be sure to use the lowest number for the Pipeline, since it is the gateway on your network.

Table A-1.A numbered list of sample TCP/IP values

#	Name/Address	Sample values	Comments
1	IP address for Pipeline (the router or default gateway)	192.168.100.1	Standard private IP addresses start at 192.168.xxx.xxx
2	IP address of computer (also know as a host)	192.168.100.2	Use the next address after the address of the Pipeline.
3	Subnet address (or subnet mask) of your network	255.255.255.0 or /24	This is the standard subnet address for a Class C host.
4	Host name and domain (the host name is required for PC settings only)	If you weren't assigned a host name, use any name, such as: host-2. (Don't enter your account logon name here.) Your domain is what follows the @ sign in your email address, as in: bignet.com	If you were assigned an IP address for your computer *and* your Pipeline, you might also have been assigned corresponding names, in which case, use the assigned host name.

Table A-1.A numbered list of sample TCP/IP values (continued)

#	Name/Address	Sample values	Comments
5	DNS addresses (the addresses shown are examples and are not real DNS addresses)	206.65.0.0 206.65.1.1	You must obtain 1 or 2 DNS addresses from your ISP or network administrator.

Setting up TCP/IP in Windows 95

If TCP/IP is not installed on your computer, you need to install it. To do so, from the Start menu, select Settings > Control Panel. Double click the Network icon to open the Network dialog. Click the Add, and double click Protocol. In the Add Protocol window, choose Microsoft and TCP/IP. You will need your original Windows 95 CD or diskettes to complete the installation.

Associate your Ethernet adapter with TCP/IP by selecting the adapter in the main Network dialog window, then click on Properties > Bindings, and click the check box to bind the adapter to TCP/IP.

To configure TCP/IP, in the main Network dialog, click on your TCP/IP-to-Ethernet adapter connection. A sample Network dialog and selection is shown below:

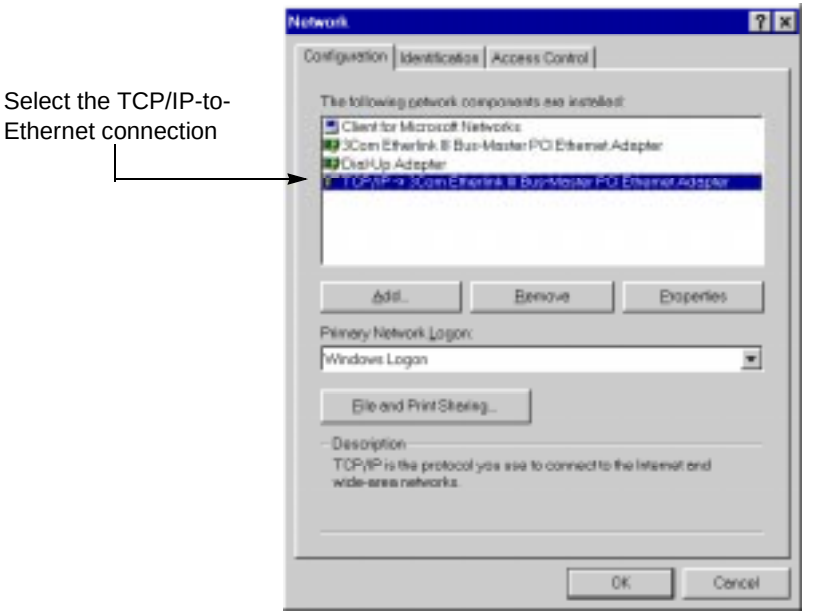


Figure A-1. Network configuration dialog in Windows 95

Click Properties. The following section show where each item from Table A-1 is entered in the TCP/IP panels.

Note: The number (#) listed in the sample settings in the illustrations corresponds to the row number in Table A-1.

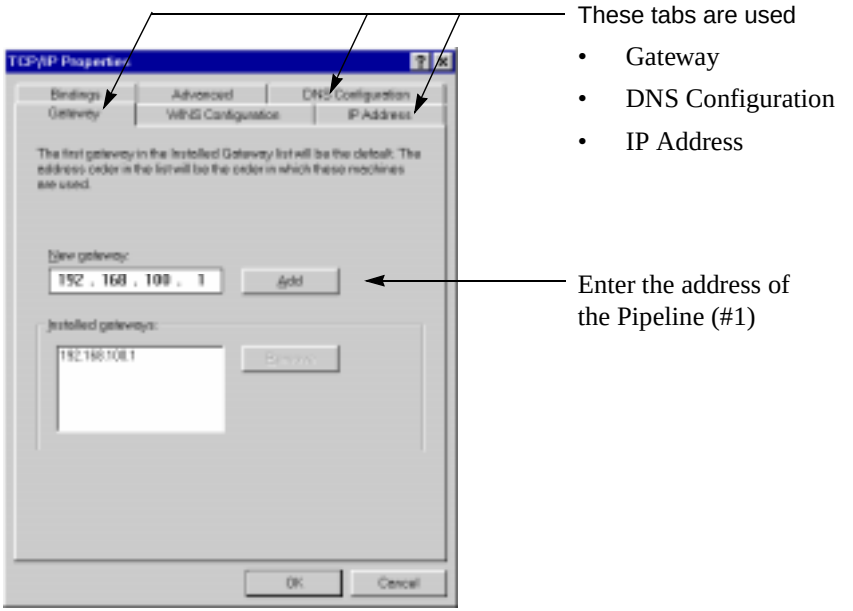


Figure A-2. TCP/IP Gateway properties

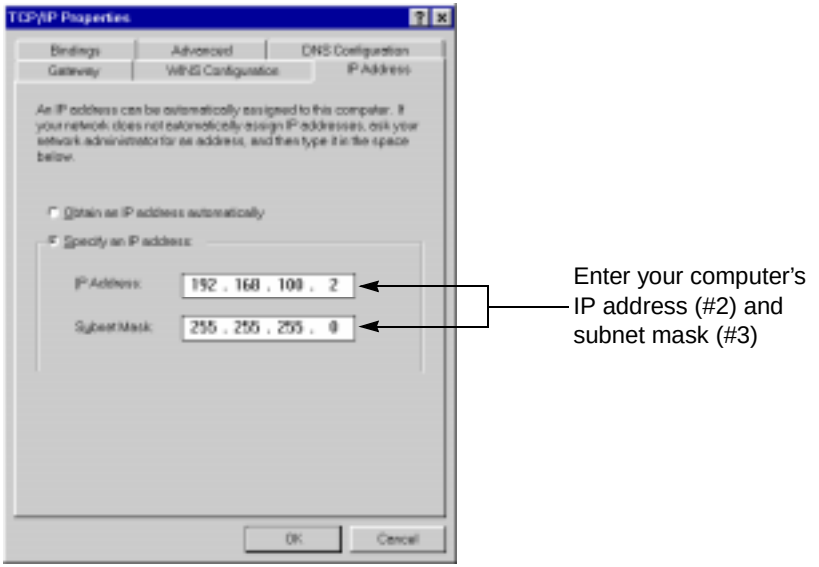


Figure A-3. TCP/IP IP Address properties

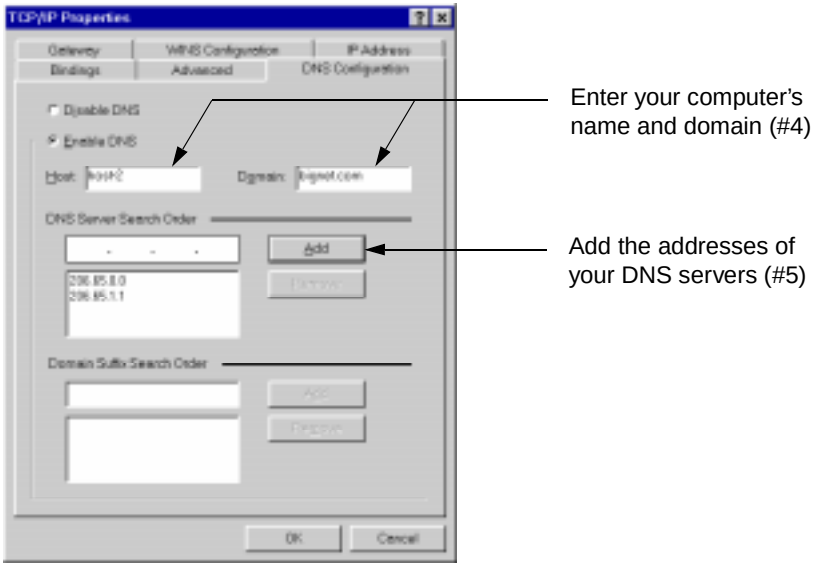


Figure A-4. TCP/IP host, domain, and DNS settings

These are all of the TCP/IP settings you need to enter. Be sure to restart your computer to load these settings into memory before configuring your Pipeline.

If you have other computers or devices on your network that need access to the wide area network, set them up similarly. A second computer's IP address would be the next IP address higher than the one used for this computer. Use subsequent, higher numbers for the next computers or devices you connect to your local network. All devices need to use the IP address of the Pipeline as their default gateway in order to access the wide area network. And all the devices use the same subnet address (also called a subnet mask).

Setting up TCP/IP on a Macintosh

The Open Transport software on a Macintosh is used to set up TCP/IP. Start by opening the Apple menu, then select Control Panel, and then TCP/IP. You enter your TCP/IP information in this dialog box.

Note: The number associated with each input field refers to the row number containing sample data and explanations in Table A-1 on page A-2.

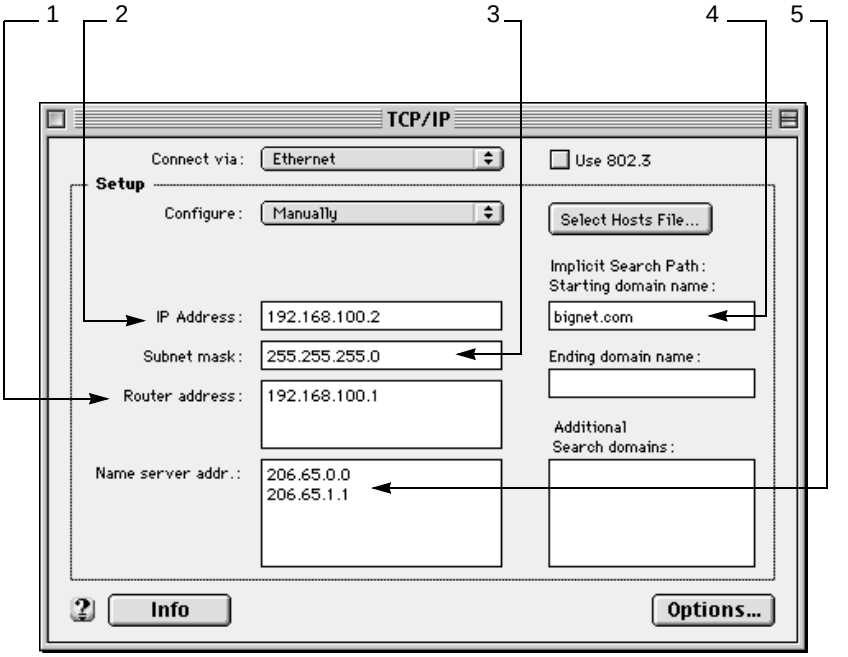


Figure A-5. Macintosh TCP/IP settings

When setting up TCP/IP on your Macintosh, be sure to set the “Connect via” button (at the top of the dialog box) to Ethernet so that the connection to your Pipeline is automatically made over your built-in Ethernet adapter.

After the Pipeline is configured, you can use Telnet to connect to the Pipeline to make any changes. To do so, use any Telnet software, and enter the IP address of the Pipeline to open the connection. You will need to have your Telnet software set up to emulate a VT100 terminal.

IP Routing Configuration Example

B

This appendix covers the following topics:

Sample Pipeline configuration data

Using the information in this appendix, you can see how to set up IP routing to connect to an Internet Service Provider (ISP) or a corporate remote IP network using the QuickStart utility of the JBPC or the on-board software on the Pipeline.

Use the *placement* of the sample data in the examples to guide you when you enter your own data. The sample data represents the minimum amount of information you need.

If you need configuration information, contact these sources:

- For information about your ISDN line, contact your telephone company.
- For information about the remote network, contact the administrator of that network, such as the network administrator for your Internet Service Provider, or your corporate network administrator.

Before you start configuring your Pipeline, be sure TCP/IP is configured, as described in Appendix A, “TCP/IP Example Settings.”

Sample ISDN information

When your ISDN line is installed, you will be given a document that should list the switch type and your directory numbers. If your service is installed in North America, the service profile identifiers (SPIDs) associated with your service. The following sample data is similar to what you get when your ISDN line is installed. The sample values are used in the QuickStart and Configure menu examples (by line #) to help you identify where to enter your information.

#	ISDN information	Sample values
6	Switch type	DMS-100 NI1
7	Directory number for B1	8005551111
8	Directory number for B2	8005551112
9	SPID for B1	800555111101
10	SPID for B2	800555111202

Sample remote network information

When you set up an account with an ISP or any remote network, you need the type of information listed below. The sample values are used in the QuickStart and Configure menu examples (by line #) to help you enter your information.

#	ISP or Remote network	Sample values
11	Account name	outpost1
12	Account password	abquoo33
13	IP addresses	Dynamically assigned at logon. (Use NAT.)
14	Remote gateway name	bignet-gate
15	Remote IP address	206.100.10.1
16	Remote subnet address	/32 or 255.255.255.255
17	Remote dial-up number	17005553333
18	Authentication method	PAP

Setting up IP routing using QuickStart

Using the example data above, you can see how to enter information when using the QuickStart utility to configure your Pipeline.

Notice that the IP address of the Pipeline is not asked for by QuickStart. Instead, QuickStart looks at the TCP/IP settings you have on your computer and uses the IP address assigned as the default gateway for the Pipeline. Be sure to enter your computer's TCP/IP settings before using QuickStart to configure the Pipeline.

Additionally, QuickStart doesn't ask for the name of the remote network (which it does in the on-board software). The name assigned to the remote network is "default" and this becomes the name of the first Connection profile set up on the Pipeline.

To run the QuickStart Utility, do the following:

1 Insert the Pipeline Companion CD into your computer's CD drive. For Windows 95 and NT, and for Macintosh computers, the CD will automatically open and display the main menu.

2 Select Start Here, and then select either

- Configure the Pipeline from CD. This opens the JBPC main screen.
- Install the JBPC to your hard drive. Follow the on-screen instructions to complete the installation and run the JBPC.

3 From the JBPC main screen, click the QuickStart button to begin.

The information in the following table describes what you should enter in each screen to set up IP routing. The data used in this example is taken from the sections above, "Sample ISDN information" and "Sample remote network information" on page B-2.

Note: This example is also a continuation of the example TCP/IP set up described in Appendix A, "TCP/IP Example Settings."

Table B-1. Entering sample values in QuickStart

#	QuickStart	Sample Values	Comments
	Usage Option	Internet Telecommuter	Route IP is the default. Select Route IP.
13	Network Address Translation	Check NAT to obtain your IP address dynamically.	Don't check NAT if you have been assigned an IP address.
 6 7 9 8 10	ISDN line information Switch type Primary number SPID Secondary number SPID	Sample values: NI1 8005551111 800555111101 8005551112 800555111202	 Let QuickStart detect as much as possible.
  17 15 16	Remote Server Number to dial Remote IP address Subnet Mask	The name is not asked for. Enter the number as it is dialed, as in 17005553333 Enter the IP address of the remote network, such as 206.100.10.0 Enter the subnet mask, as in 255.255.255.255	QuickStart uses 'default'. The area code is not needed if the number is local. Use any IP address not on your local network if you don't have the address. Do not use 0.0.0.0. If you don't have an address use 255.255.255.255.

Table B-1. Entering sample values in QuickStart (continued)

#	QuickStart	Sample Values	Comments
	Authentication	Sample values:	
11	Login Name	outpost1	Your logon name is now the name of your Pipeline.
12	Password	abquoo33	
18	Encrypt password	For PAP, leave unchecked.	Check for CHAP.

Setting up IP routing in the Configure menu

You can easily configure the Pipeline as an IP router by directly entering values into the on-board software menus. To do so, establish a serial connection to the Pipeline by connecting a serial cable from the terminal port on the back of the Pipeline to a COM port on your computer. Then, using HyperTerminal, Terminal, or Zterm, access the on-board software.

Establishing a serial connection in Windows 95

To set up a serial connection, do the following:

1 Check for an available COM port. Check that the available external COM port is enabled by doing the following:

- From the Start button, select Settings > Control Panel > System.
- Double click the System icon and select the Device Manager tab at the top of the screen, then select “View devices by type”.
- Click on the plus (+) sign next to line called “Ports (COM and LPT).” This shows you how many COM ports you have. You need to use one external port to make the connection to the Pipeline. This is a temporary

connection, so if you need to disconnect another device, you can reconnect it as soon as the Pipeline configuration is saved. Future access can be via Telnet over the Ethernet connection.

2. Use a high-speed serial cable (sometimes called a modem cable, but not a null modem cable) and connect one end to the available COM port, and the other end to the Terminal port on the back of the Pipeline. You might need to use the DB9-to-DB25 cable adapter that came with the Pipeline.
3. After making the serial connection, open the HyperTerminal program and enter any name for the connection.
4. In the Phone Number dialog, use the drop-down list from the "Connect using:" field and click on "direct to COM *n*", selecting the port connected to the Pipeline.
5. Click OK and fill in the COM Properties window. The settings to use are Bits per second 9600, Data bits 8, Parity None, Stop bits 1, and Flow control None
6. Click OK.

You should now see the on-board software's Main Edit Menu. Press Ctrl-L to reload or refresh the screen. The part of the screen you use to configure the Pipeline is on the left and looks like this:

```
Main Edit Menu
 >Configure...
  00-000 System
  20-000 Ethernet
  30-000 Serial WAN
  40-000 Dual POTS
```

To navigate the menu system:

- Use the up and down arrow keys or Ctrl-N or Ctrl-P to navigate up and down through the menus.
- Press Enter to cycle through preset values for any parameter, or press enter to open an input field.
- Press Enter or move to the next field to make a selection or keep an entry.
- Press the Esc key to exit a menu. You will always have the choice to save or discard your changes before exiting.

Entering configuration information

To open the Configure menu, be sure the pointer (>) is on Configure, and press Enter. The following list shows the parameters on the Configure menu and what you should enter for each one.

Note: The information in the following table is a continuation of the example that starts at Appendix A, "TCP/IP Example Settings.".

After entering all the information called for in the Configure menu, be sure to continue on to "Setting up Network Address Translation (NAT)" on page B-8 and "Securing the Pipeline" on page B-9.

#	Configure menu with sample values	What you should enter
6	`Switch Type=NI1`	Use AutoSPID for the Switch Type, and the Pipeline will determine the switch type and guess the SPIDs for you.
	`Chan Usage=Switch/Switch`	Use the default shown when connecting to ISDN.
7 8	`My Num A=8005551111` `My Num B=8005551112`	Enter the complete directory number for each of your B channels. They are the phone numbers for your ISDN line.
9 10	`SPID 1=800555111101` `SPID 2=800555111202`	Check the values guessed by AutoSPID. If necessary, enter the numbers the telephone company gave you.

	`Data Usage=A+B`
	`Phone 1 Usage=A`
	`Phone 2 Usage=B`
	`Phone Num Binding=No`
	`Ans Voice Call=Yes`
		Use the defaults shown for a Pipeline 75 or 85. The phone usage and binding settings do not apply to a Pipeline 50.

11 13	`My Name=outpost1` `My Addr=192.168.100.1/24`	Enter the account name assigned by your ISP or corporate network administrator, and enter the IP address that was given to you. Or enter a private address and subnet mask for your Pipeline.

14 15 16	`Rem Name=bignet-gate` `Rem Addr=206.100.10.0/32`	Enter a name for the remote network's gateway. Then enter the IP address and subnet mask of the remote network. The administrator of the remote network will give you this information. Use the syntax shown in "My Addr" to enter the subnet mask (this is called slash notation).
17	`Dial #=17005553333`	Enter the phone number used to reach the remote network.
	`Route=IP` `Bridge=No`	Use the defaults shown.

18
12
18
12
	`Send Auth=PAP`
	`Send PW=abquoo33`
	`Recv Auth=PAP`
	`Recv PW=abquoo33`
		Select the authentication protocol your ISP or corporate administrator uses, and enter your account logon password. Recv Auth and Recv PW are optional. They are used only if the other end will be calling into the Pipeline.

	`Save=`	Be sure the IP address assigned to the Pipeline (in My Addr) is the IP address used for your TCP/IP default gateway. Accept the changes when exiting.

Telneting into the Pipeline

Using the IP address of the Pipeline, you can use Telnet to access the on-board software of the Pipeline. (This eliminates the need for a serial connection.) On a PC, establish a Telnet connection to the unit from the Start menu by selecting Run, then enter `telnet` followed by the IP address of the Pipeline. For example, assuming the IP address of the Pipeline is 192.168.100.1, you would enter:

```
telnet 192.168.100.1
```

Setting up Network Address Translation (NAT)

Enable NAT when you need to obtain an IP address dynamically when logging onto the remote network. To set up NAT, do the following:

1 From the Main Edit Menu, open Ethernet > NAT > NAT menu.

Position the cursor on Ethernet and press Enter,
then position the cursor on NAT and press Enter,
then position the cursor on NAT... and press Enter.

2 Enable NAT by setting Routing to Yes.

```
Routing=Yes
```

3 Specify the Connection profile to dial when NAT is enabled. “Rem Name” automatically becomes your first Connection profile when you fill in the Configure menu, so the name entered for Rem Name is the name of the NAT profile. In this example, the value is:

```
NAT profile=bignet-gate
```

4 Exit (Esc) and accept the changes.

Securing the Pipeline

Assign a Read/Write SNMP password. This ensures that remote updates to the Pipeline via SNMP (or by the JBPC) are only allowed when using the password. To enter the R/W Comm password, do the following:

1 From the Main Edit Menu, open Ethernet > Mod Config > SNMP Options.

2 In SNMP options, enter an alphanumeric value for R/W Comm.

3 Exit (Esc) and accept the changes.

Warranties and FCC regulations

C

This appendix covers the following topics:

Product warranty

1 Ascend Communications, Inc. warrants that the MAX will be free from defects in material and workmanship for a period of twelve (12) months from date of shipment.

2 Ascend Communications, Inc. shall incur no liability under this warranty if

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

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

4 Ascend Communications, Inc. MAKES NO EXPRESS OR IMPLIED WARRANTIES REGARDING THE QUALITY, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE BEYOND THOSE THAT APPEAR IN THE APPLICABLE Ascend Communications, Inc. USER'S DOCUMENTATION. Ascend Communications, Inc. 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 Communications, Inc. 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 Communications, Inc. 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 Communications, Inc. will ship surface freight. Expedited freight is at customer's expense.
2. The customer must return the defective product to Ascend Communications, Inc. within fourteen (14) days after the request for replacement. If the defective product is not returned within this time period, Ascend Communications, Inc. will bill the customer for the product at list price.

Out-of warranty repair

Ascend Communications, Inc. 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.

FCC Part 15 Notice

Warning: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential 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 unlikely to cause harmful interference. But if it does, 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 Communications, Inc.

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