Pipeline 130 Start Here Guide

Ascend Communications, Inc.
Part Number: 7820-0332-001
For software version 6.0
January 26, 1998

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.

Installing the Pipeline

1

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.

Pipeline components

The Pipeline package contains the following components:

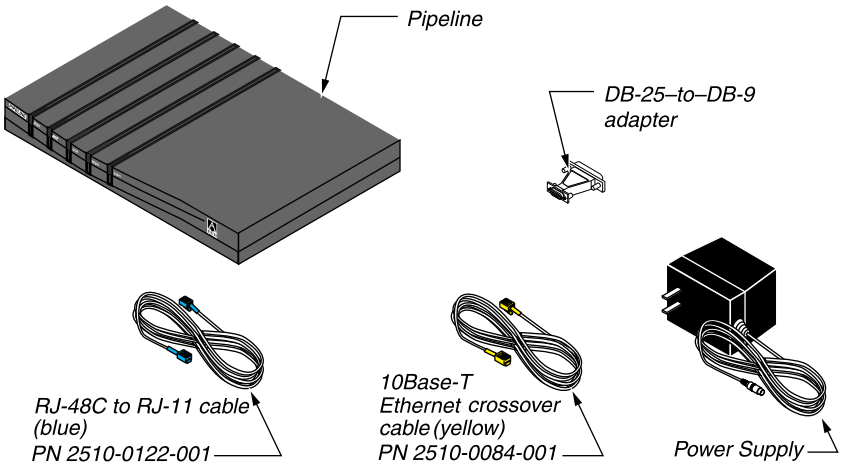


Figure 1-1. Hardware and accessories contained in the Pipeline package

- 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 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*.
- 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.

A WAN interface

Depending on your Pipeline model, you must have one of the following types of network service:

- ISDN
- 56K or 64K Switched service
- T1

The Pipeline is compatible with both AT&T and Northern Telecom central office switches, and can access all T1 switched digital services offered by AT&T's ACCUNET Switched Digital Services:

- MCI 56 Kbps and 64 Kbps services
- Sprint Switched 56 Kbps and 64 Kbps services

Note: The Pipeline can access only Switched-56 Kbps services on a T1 access line or a Switched-56 line.

In addition to switched circuits, the Pipeline can connect to nailed-up circuits, and to aggregate nailed-up and switched circuits.

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 1-15).

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 a leased line

Read this section before configuring your unit if your service is not ISDN, but a leased Frame Relay connection or a leased T1 line.

Caution: To avoid disrupting the Wide Area Network (WAN), you must contact your carrier for approval before connecting the Pipeline to the WAN. Once you have installed the Pipeline, you must notify the carrier before disconnecting the Pipeline from the WAN. If you disconnect or turn off the Pipeline without prior notification, the carrier might temporarily discontinue your leased service.

To connect the Pipeline to a leased line:

1. Connect your leased line to the inverted WAN port (the one with the tab hole facing up) on the back of the Pipeline. Connect the other end either directly to the leased line or through other network interface equipment.

   Note: If your Pipeline does not have an inverted WAN port, it is not designed to be connected to a leased line.

   Note: To connect to the demarcation point where the T1 line's metallic interface connects to other equipment, the T1 ports of the Pipeline must be equipped with internal CSUs. Otherwise, external CSUs or other WAN interface equipment must be installed between the Pipeline and the demarcation point.

2. Inform your service provider when your equipment is connected and ready for service. When your provider enables the service, you are ready to start up the unit.

Before using your leased line, you must configure it as described in "Configuring WAN Connections," in the *User's Guide*.

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 1-8 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 1-9 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) to connect the Pipeline to the ISDN line. Using the wrong cable can damage or destroy the Pipeline.

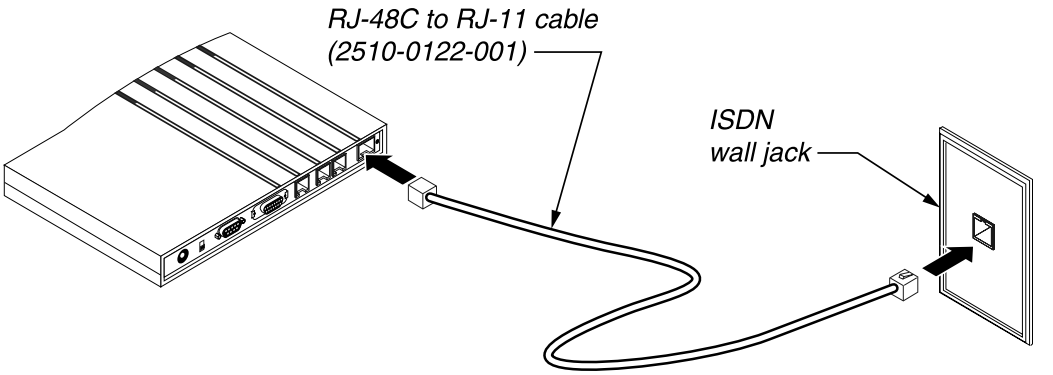


Figure 1-2. Connecting a U-interface Pipeline to the ISDN line

What's next?

- If you're using a single computer with the Pipeline, skip to "Connecting the Ethernet" on page 1-10.
- If you're connecting a network of computers to the Pipeline, skip to "Connecting to a network" on page 1-11.

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), 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.

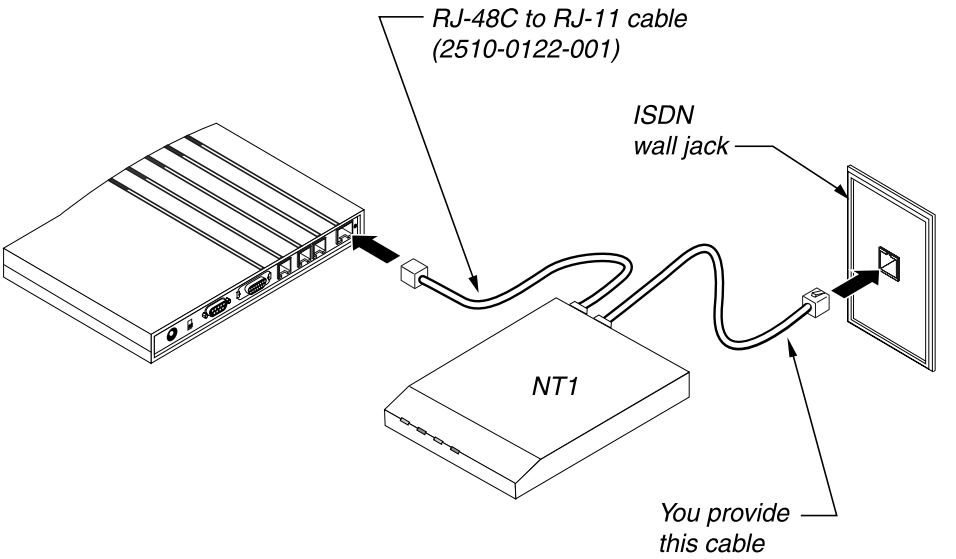


Figure 1-3. Connecting an S-interface Pipeline to the ISDN line

What's next?

- If you're using a single computer with the Pipeline, skip to "Connecting the Ethernet" on page 1-10.
- If you're connecting a network of computers to the Pipeline, skip to "Connecting to a network" on page 1-11.

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.

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

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

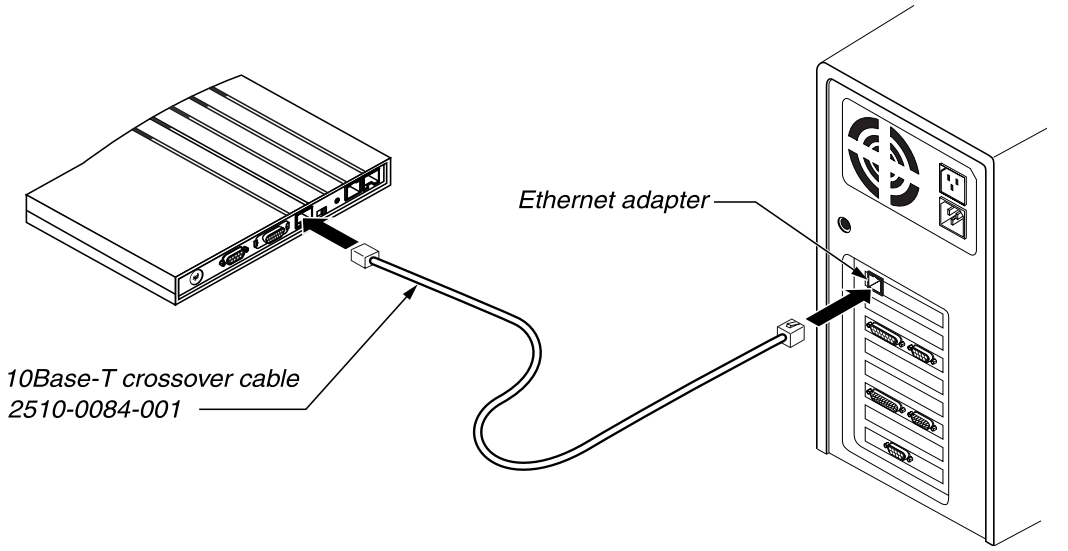


Figure 1-4. Connecting the Pipeline to the computer's Ethernet's interface

What's next?

Skip to the next step: "Connecting to the Terminal port" on page 1-15.

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 1-11.
- To connect a Thinnet (10Base-2) Ethernet network to the Pipeline, see "Connecting to a Thinnet network" on page 1-12.

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 directly to a computer, as described in "Connecting the Ethernet" on page 1-10.

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

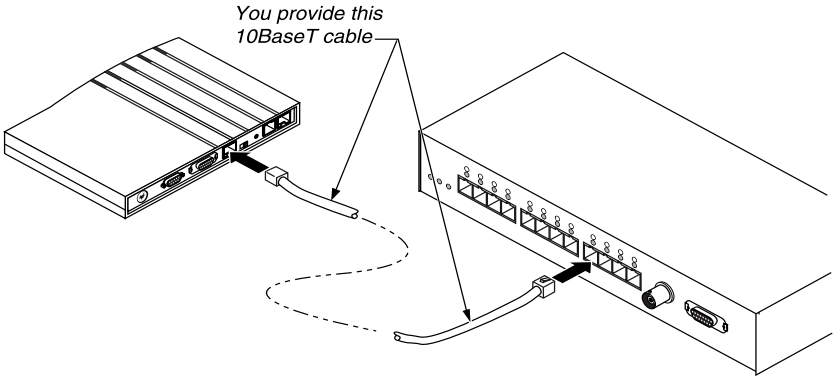


Figure 1-5. Inserting the 10Base-T cable into the hub

What's next?

Skip to "Connecting to the Terminal port" on page 1-15.

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.

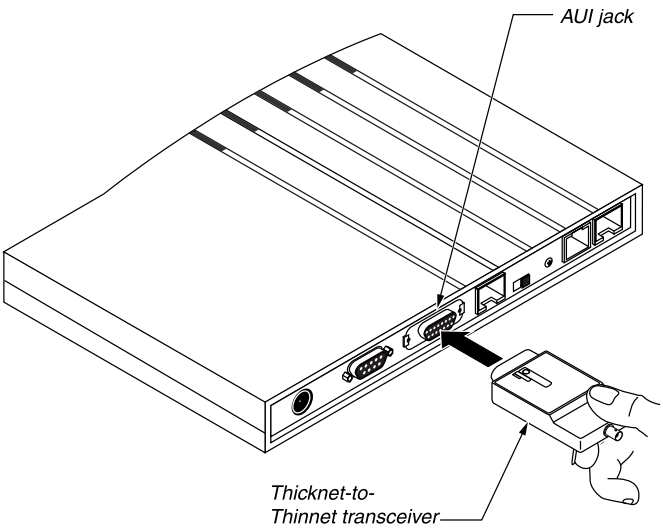


Figure 1-6. Connecting the Thicknet to Thinnet transceiver

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

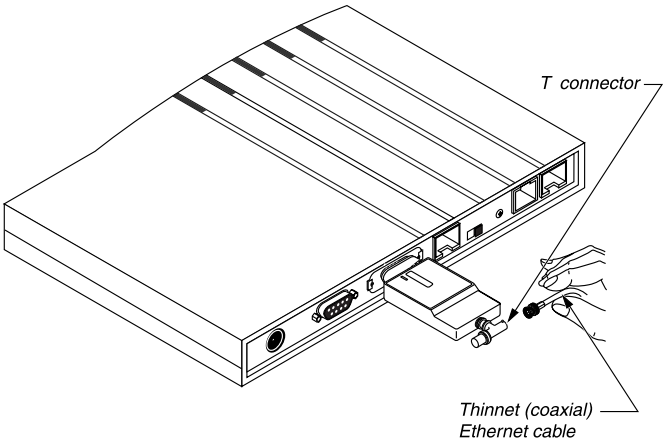


Figure 1-7. Connecting the T connector and terminator to the transceiver

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.

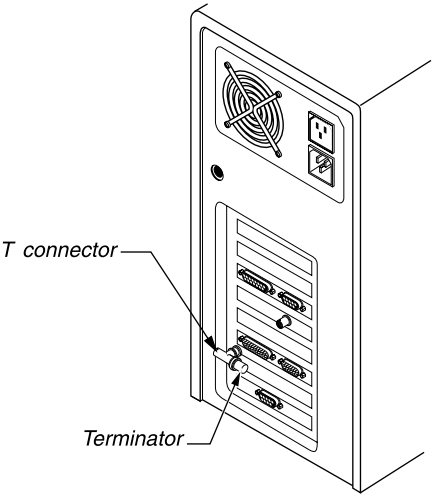


Figure 1-8. Connecting a second T connector and terminator

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

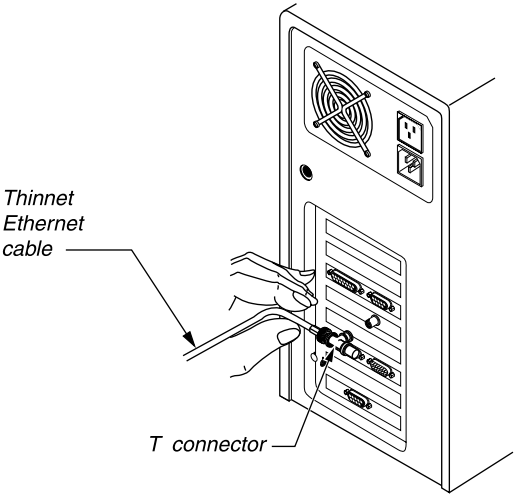


Figure 1-9. Connecting the Thinnet cable to the T connector

What's next?

Continue with "Connecting to the Terminal port" on page 1-15.

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 1-15.
- If you are using an IBM-compatible personal computer to configure the Pipeline, see "Optional serial connection to an IBM-compatible computer" on page 1-16.
- If you are using a Macintosh computer to configure the Pipeline, see "Optional serial connection to a Macintosh computer" on page 1-17.

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.

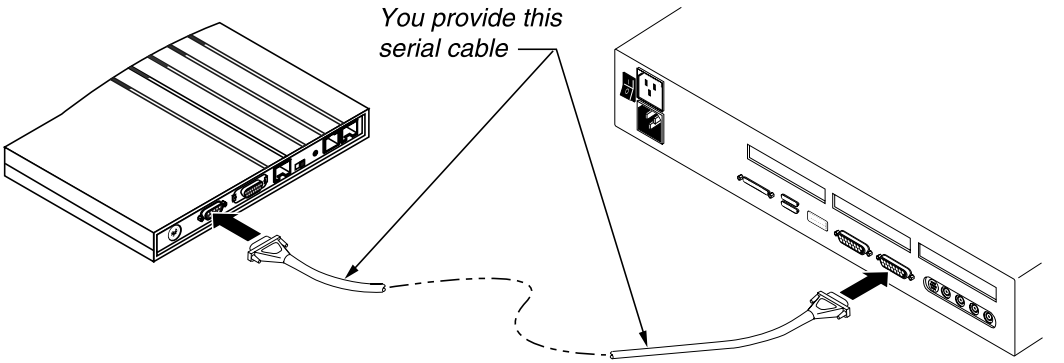


Figure 1-10. Connecting the modem cable to the Pipeline Terminal port

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

What's next?

- See "Starting up the Pipeline" on page 1-18.

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.

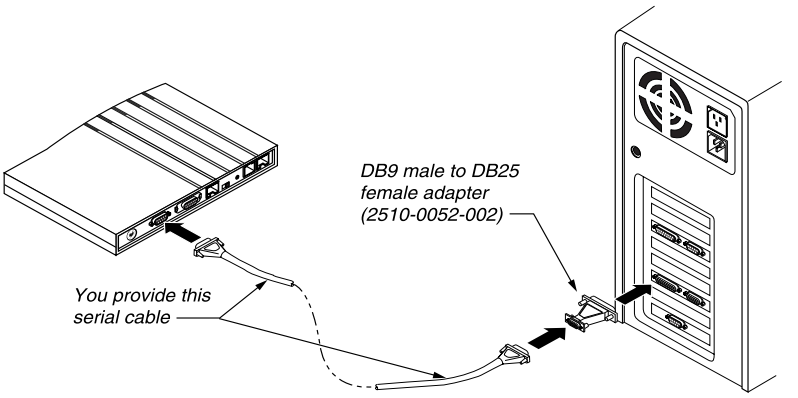


Figure 1-11. Connecting the modem cable to the Pipeline Terminal port

What's next?

- See "Starting up the Pipeline" on page 1-18.

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.

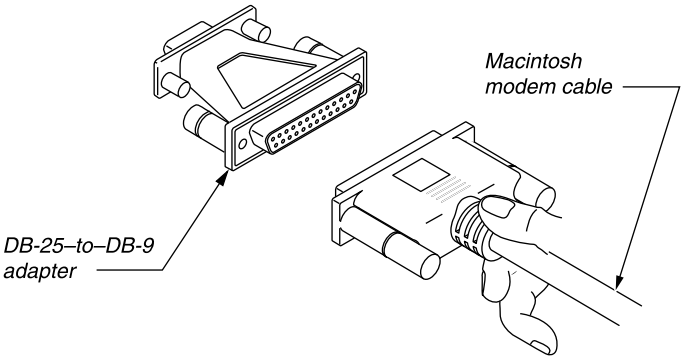


Figure 1-12. Connecting an adapter to a Macintosh modem cable

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.

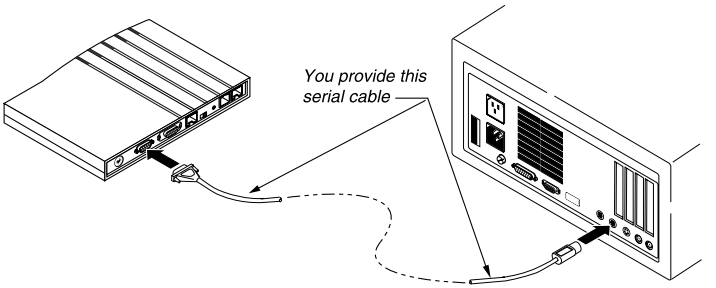


Figure 1-13. Connecting a Macintosh to the Pipeline Terminal port

What's next?

- See "Starting up the Pipeline" on page 1-18.

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.

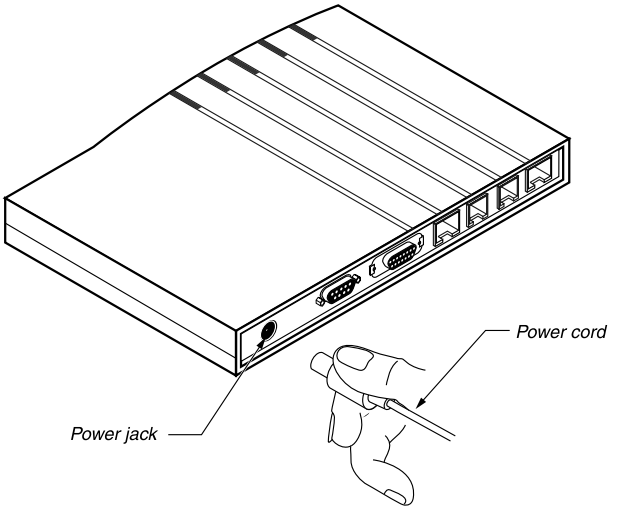


Figure 1-14. Connecting the power cord to the Pipeline

2 Insert the AC power plug into an electrical outlet.

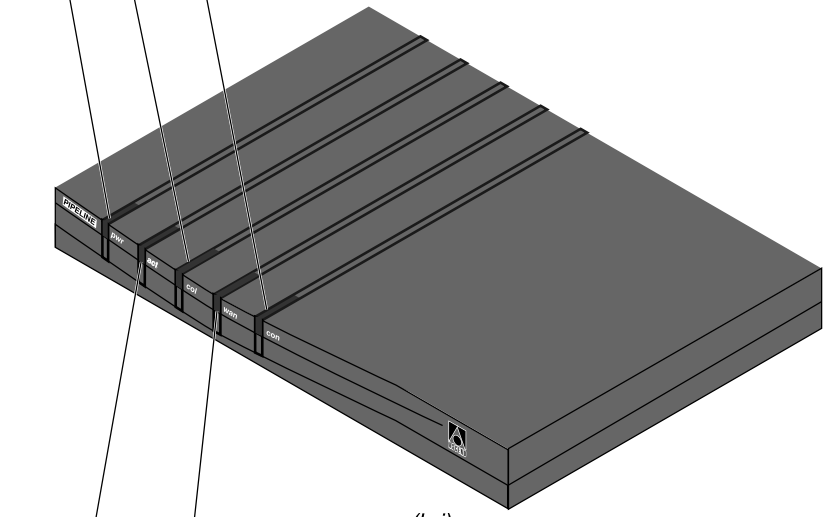
Because the Pipeline has no power switch, plugging in the power supply turns the Pipeline on. After you plug in the Pipeline, it takes about a minute for it to be ready to use. The status light on the front of the Pipeline labeled PWR comes on immediately to indicate that the power is on.

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 1-15 on page 1-20 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 1-15. 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.

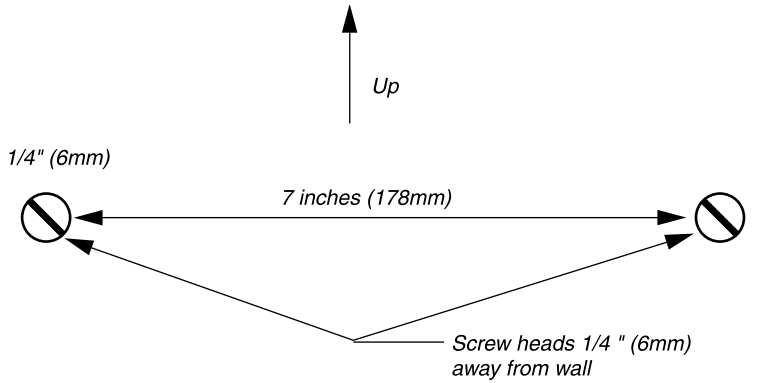


Figure 1-16. Placement of screws for mounting the Pipeline on a wall

Basic Configuration Settings

2

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 2-1. 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 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 2-2. 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 2-3. Frame Relay connection settings checklist

Frame Relay information	Your settings
Switch type	
DLCI	

For a T1 line, enter the values of the settings in the following table:

Table 2-4. T1 line information

T1 line information	Your settings
Framing Mode used by the physical layer	
Line encoding	
Number of DS0 Channels	
Buildout. This is the amount of attenuation to add to match the cable length from the Pipeline to the next repeater.	
Nailed T1 Group number	
Data Svc	

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 2-5. Basic routing settings checklist

Basic routing information	Your settings
Routing method	IP, IPX, or both
Account name	
Account password	
Name of remote network	

Table 2-5. Basic routing settings checklist (continued)

Basic routing information	Your settings
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 2-6. Remote IP network settings checklist

Remote IP network information	Your settings
IP address of the Pipeline	
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 2-7. Remote IPX network settings checklist

Remote IPX network information	Your settings
IPX Frame	
IPX Enet#	
IPX SAP Proxy	

Table 2-7. Remote IPX network settings checklist (continued)

Remote IPX network information	Your settings
IPX SAP Proxy Net#	
Dial Query	

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

To configure the Pipeline using the on-board software, see Chapter 3, "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-3.

Using the On-board Software

3

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 Nailed T1
```

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.

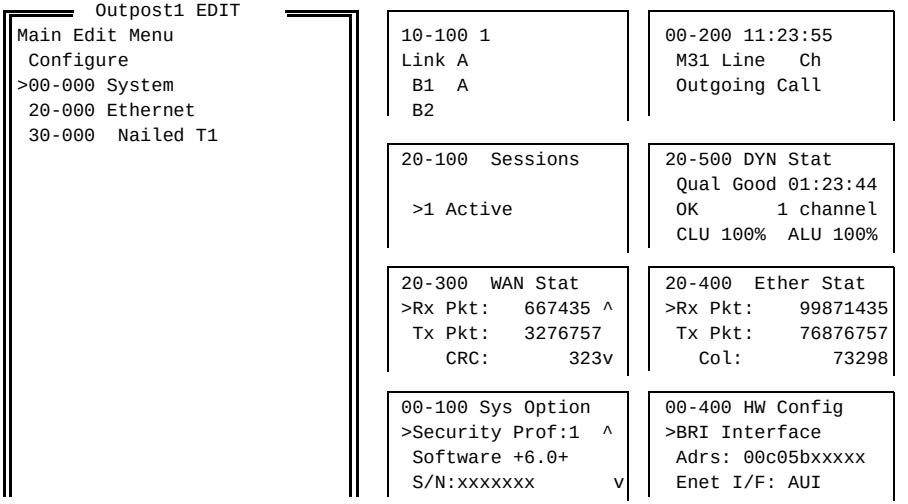


Figure 3-1. Pipeline configuration menus

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 3-1. 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 3-1. 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 or Nailed T1	Mod Config	Specific to the interface software loaded on the model.

The Configure menu is discussed in "Entering a basic configuration" on page 3-7. 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 Nailed T1
```

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.

```
Switch Type=
Chan Usage=
My Num A=
My Num B=
SPID 1=
SPID 2=
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 3-2. 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.
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.

Table 3-2. Configure menu parameters described (continued)

Parameter	What you should enter
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.
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.
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.

Table 3-2. Configure menu parameters described (continued)

Parameter	What you should enter
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 3-10.

If you are setting up IPX routing, complete the configuration by following the instructions in "Additional IPX settings" on page 3-11.

If you are setting up a Frame Relay connection, complete the configuration by following the instructions in "Additional Frame Relay settings" on page 3-12.

If you are setting up a T1 connection, complete the configuration by following the instructions in "Additional T1 line settings" on page 3-13.

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*.

Additional T1 line settings

To complete a T1 line configuration, do the following:

1 Open the Nailed T1 > Mod Config menu.

A listing similar to the following appears:

```
Nailed T1 Group=3
Activation=Enabled
Framing Mode=D4
Encoding=AMI
FDL=AT&T
Build Out= 0      dB
First DS0=1
Last DS0 =6
Clock Source=No
Loop Back=Normal
```

2 Assign a group number to the Nailed T1 line. Make sure the number matches the value of the Group parameter in the Telco options submenu of the Connection profile you are using for this line.

3 Set Activation=Enabled.

4 Select the Framing Mode for your T1 line.

5 Select the Encoding for your T1 line.

6 Set the type of Facilities Data Link line monitoring (if used).

7 Select the Buildout for your T1 line.

8 Enter the First and Last DS0 channel number.

9 Open Ethernet > Connections > *profile* > Telco Options submenu. Set Data Svc to the correct line rate.

All other settings can remain at their default. For specific information about each parameter, refer to the alphabetical parameter listing in the *Reference Guide*.

To verify the status of your T1 line, look at the Link Status window (top window next to the Main Edit Menu). The second line displays the word CARRIER if the line is up. If the line is down, RED is displayed. To verify that you are connected to the LAN, look in the upper right corner at the System Events window. You should see "LAN session up" listed as the status.

The status windows display all of the conditions reported by the Pipeline (except what you can find in the Syslog). The status windows are documented in the "Status Window Reference" chapter of the *Reference 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.

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:

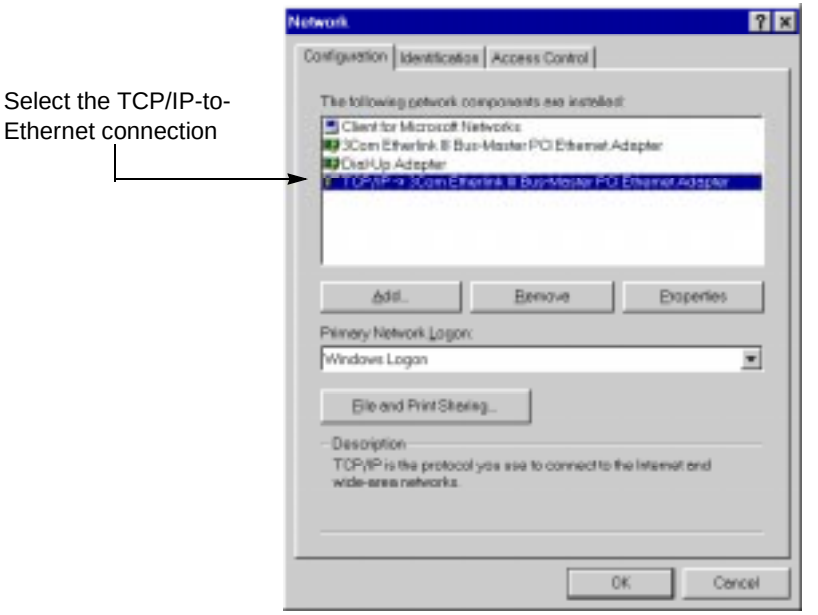


Figure A-1. Network configuration dialog in Windows 95

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.

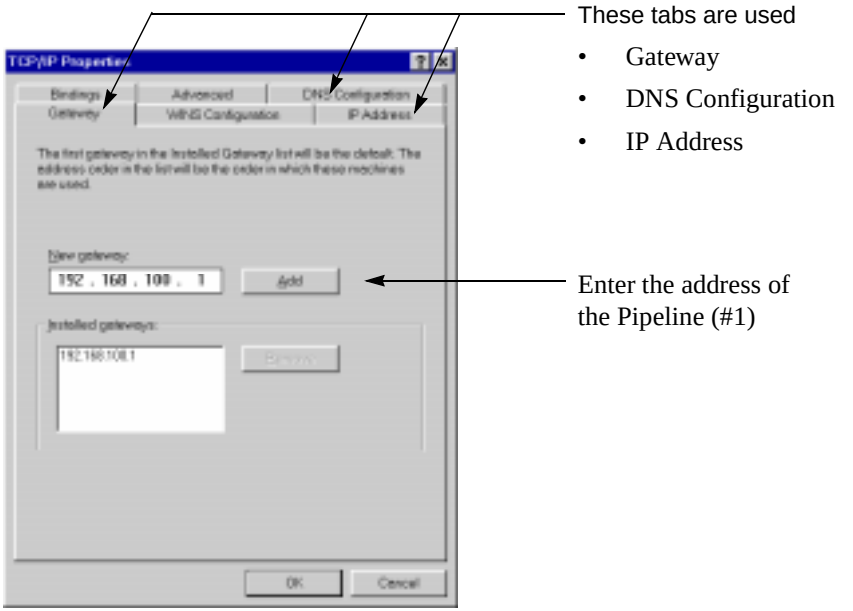


Figure A-2. TCP/IP Gateway properties

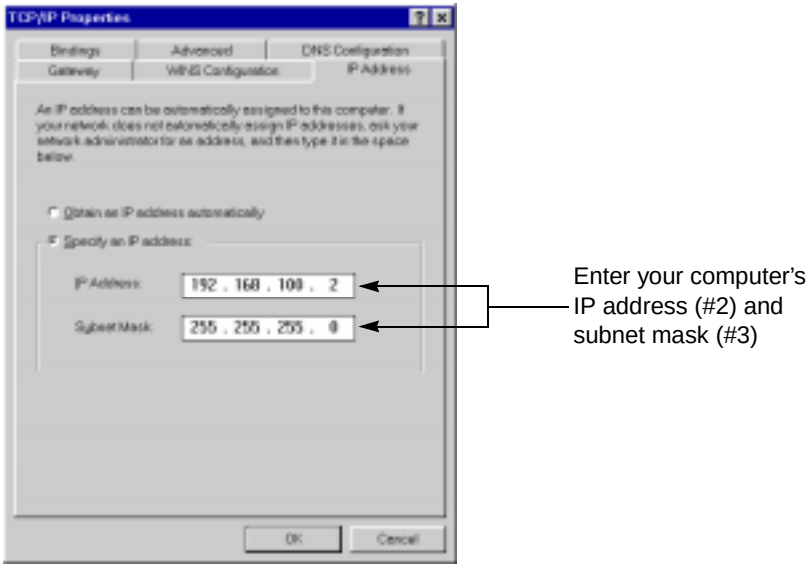


Figure A-3. TCP/IP IP Address properties

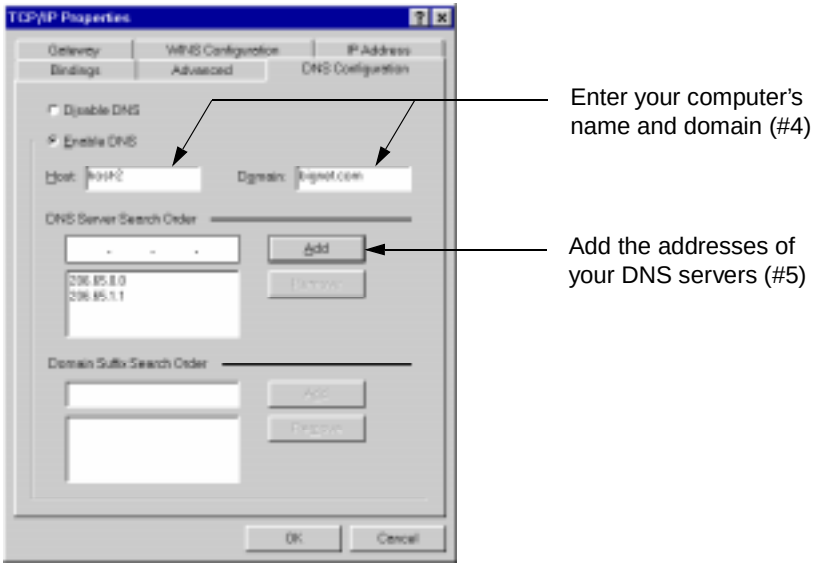


Figure A-4. TCP/IP host, domain, and DNS settings

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.

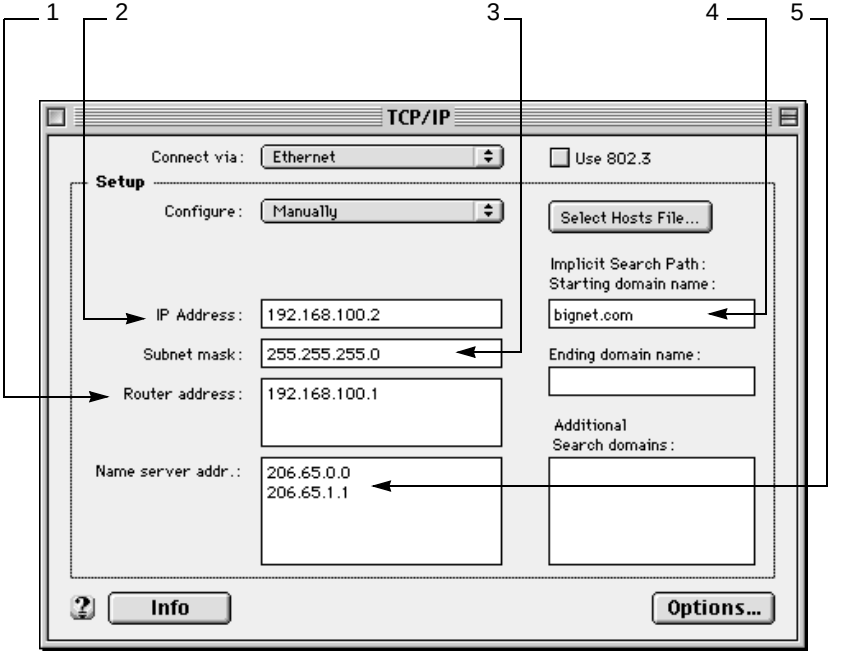


Figure A-5. Macintosh TCP/IP settings

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 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 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 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 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
```

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-6 and "Securing the Pipeline" on page B-6.

#	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.
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 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.

FCC Part 68 Notice

This Ascend equipment complies with Part 68 of the FCC rules. Located on the equipment is a label that contains, among other information, the FCC registration number. If requested, this information must be provided to the telephone company.

This equipment cannot be used on the telephone company-provided coin service. Connection to Party Line Service is subject to State Tariffs.

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

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

If trouble is experienced with this equipment, please contact:

Ascend Communications, Inc.
1701 Harbor Bay Parkway
Alameda, CA 94502

If the trouble is causing harm to the telephone network, the telephone company may request you to remove the equipment from the network until the problem is resolved.

It is recommended that the customer install an AC surge arrestor in the AC outlet to which this device is connected. This is to avoid damage to the equipment caused by local lightening strikes and other electrical surges.

This equipment uses the following USOC jacks and codes:

Model Name	Facility Interface Code	Service Order Code	Jack Type
xxxx	xxxxx	xxxxxx	xxxxxxx
xxxx	xxxxx	xxxxxx	xxxxxxx
xxxx	xxxxx	xxxxxx	xxxxxxx

IC CS-03 Notice goes

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe

system, if present, are connected together. This precaution may be particularly important to rural areas.

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

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