U.S. Robotics ®

The Intelligent Choice in Information Access

Courier™ I-modem®

Getting Started Guide

Final Draft

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8100 N. McCormick Blvd.

Skokie, IL 60076-2999 USA

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How to Use this Guide

Use this Getting Started Guide to obtain the information you need to get your Courier™ I-modem® modem installed, configured, and running correctly.

For more information about advanced commands, view the I-modem Command Reference, which is on the *Connections* CD-ROM.

If you understand how ISDN works, you can skip directly to Chapter 3, *Ordering ISDN.*

Contacting U.S. Robotics

Please contact U.S. Robotics if you have any questions.

To do this	Contact
Contact U.S. Robotics Technical Support	1.800.231.8770
Use the Fax-on-Demand service	1.800.762.6163
Download updated I-modem x2 code from the U.S. Robotics Bulletin Board System	847.982.5092 (analog) 847.734.8612 (V.120 ISDN)
Download updated I-modem code	http://totalservice.usr.com
Visit the U.S. Robotics web site	http://www.usr.com
Visit U.S. Robotics on Compuserve	GO USROBOTICS
Visit U.S. Robotics on America Online	Keyword: USROBOTICS

I-modem Features

Dial Security to Control Access to Your System

The Courier's Dial Security feature allows you to control access at a modem-to-modem level instead of using software that runs on the host computer. With Dial Security, you can prevent unauthorized access to a system through the use of password prompting and dial-back.

Testing

ITU-T V.54 loopback testing is available. The Courier can perform analog, digital, and remote digital loopback tests to determine if there are problems with the phone line, the remote device, or your Courier's transmitter or receiver.

Flash ROM Upgradability

Courier modems are software-upgradable using XMODEM file transfers and U.S. Robotics Software Download (SDL) application, allowing you quick, easy access to updates of your Courier's technology. The latest upgrades can be obtained on the U.S. Robotics web site or Bulletin Board System.

Plug and Play Support for Windows 95

The software for the external and internal Courier has been developed to support Plug and Play (as defined by the Plug and Play External and Internal COM Device Specification, Version 1.00). When you connect your Courier to a computer that uses a Plug and Play operating system, the computer automatically detects and configure itself to the support your Courier.

Remote Configuration and Diagnostics

You can remotely configure and test your Courier. If you are a network administrator supporting remote users, this feature can save you time and money.

Terminal Adapter Features

ISDN Terminal Adapter

The I-modem is an ISDN terminal adapter; it enables your computer to

communicate on the ISDN at speeds of up to 64 kbps.

Optional Built-in NT-1

The *I-modems with Integrated NT-1* contain an on-board NT-1, sparing you the expense and extra cabling associated with an external NT-1.

Optional Analog Device Jack

The *I-modem with Integrated NT-1 and Analog Device Jack* allows you to plug in an analog telephone, fax machine, or modem, allowing analog devices to communicate over an ISDN B-channel. This applies to external units only.

TurboPPP

TurboPPP is U.S. Robotics' unique combination of asynchronous-to-synchronous PPP conversion, compression, multilink PPP (ML-PPP). You can use TurboPPP to access the Internet or remote local-area networks (LANs) at speeds of up to 128 kbps before compression and up to 512 kbps with compression.

Rate Adaptation

The I-modem's support of the V.120 and V.110 protocols allows it to map slower-speed asynchronous data to the 64-kbps B-channel. The I-modem's rate adaptation capability spans the range of 300 to 57600 bps.

Central Office Switch Compatibility

Works with AT&T 5ESS and Northern Telecom DMS-100 switches that run either their custom protocols or National ISDN-1, as well as with other manufacturer's switches that use National ISDN-1 or National ISDN-2 call control signaling (ITU-T Q.931/I.451 call control signaling).

Link Diagnostics

After each call, you can display a Link Diagnostics screen (ATI6) containing information about the last call, including the number of data characters transferred, line statistics, the call's rate, and the reason the call was disconnected.

Switched-56 Support

The I-modem can communicate to remote devices connected via Switched-56 circuits.

V.120 and V.110 Connections

V.120 and V.110 are standards for passing asynchronous data over ISDN B-channels, which are inherently synchronous. To make a connection using V.120 or V.110, devices at both ends of the connection must support V.120 or V.110.

Modem and Fax Calls

The I-modem emulates an analog fax/modem, allowing you to connect to remote analog modems and fax machines using 3.1 kHz audio format.

Voice Calls

If your I-modem has an Analog Device port, you can connect a standard, analog telephone and use the phone over your ISDN line. Be aware that the internal I-modem cannot provide ringing voltage through the Analog Device port, so equipment that autoanswers, such as a fax or answering machine, will not work correctly.

Integral V.Everything Modem Features

Supports Analog Fax/Modem Calls

The I-modem always makes and receives calls over ISDN. Since there is no guarantee that the device at the other end of the line is ISDN-capable, the I-modem can communicate with non-ISDN devices, such as analog modems and Group III fax.

x2 56-kbps Connectivity

If you have enabled x2, your Courier can connect at speeds up to 56 kbps. While line conditions may not always allow for 56 kbps connections, the new Courier software allows you to achieve the fastest analog speeds available.

Adaptive Speed Leveling to Adjust to Line Conditions

Adaptive Speed Leveling® (ASL) allows your Courier to monitor line conditions while connected, and fall back to the next lower speed if conditions are poor. Couriers also detect improved line conditions and shift upward to the next higher speed. The transmit and receive channels adapt independently, each detecting and adjusting to line conditions.

Calls to and from Modems and Fax Machines

When used with fax-capable communications software, your Courier auto-detects and responds to calls from modems and Group III fax machines using EIA-standard Class 1 or 2.0 fax software.

Data Compression—V.42 *bis*/MNP5

Data compression enables throughput of up to 230.4 kbps on analog connections. I-modems connecting under V.42 or HST error control use V.42*bis* compression. I-modems connecting under MNP error control use MNP Level 5 compression. Typically, files can be compressed from 2:1 to 4:1.

Error Control—V.42/MNP

Data integrity is ensured when the I-modem connects with remote devices that use the V.42 (LAPM), HST, or MNP error control protocols. Error control is available on analog calls at 1200 bps and above.

V.Everything

The Courier provides full support of the x2, V.34 standard, V.Fast Class, V.32 *terbo*, and many other modulation schemes, spanning the range of speeds between 300 bps and 56 kbps.

Courier I-modem Getting Started Guide

Chapter 2
The I-modem and ISDN

The Courier I-modem with ISDN/V.Everything is an Integrated Services Digital Network (ISDN) terminal adapter that can perform all the functions of a Courier V.Everything fax/modem.

Overview

The I-modem is capable of exchanging data over the ISDN at speeds of up to 128 kbps with ISDN devices *or* up to 56 kbps with analog devices, before compression.

Internal I-modem

There are two versions of the internal I-modem:

- The ISDN U-Interface with an analog device jack (Model U)
- The ISDN S/T-Interface (Model S/T)

External I-modem

There are two versions of the external I-modem:

- The ISDN U-Interface with an analog device jack (Model U)
- The ISDN S/T-Interface (Model S/T)

External I-modem for Macintosh

There is one version of the I-modem for Macintosh. The Courier I-modem for Macintosh is the same as Model U (ISDN U-Interface with Analog Device Jack).

What is ISDN?

Integrated Services Digital Network is an application of digital technology that provides end-to-end digital service over the public communications network. ISDN was designed to integrate the transmissions from a variety of devices, (computers, telephones, and fax machines) into one digital network.

Because ISDN was designed for transmitting digital information, it has many advantages over the analog telephone network. Digital transmission is more accurate and reliable, and that helps increase transmission speeds to up to 64 kbps per channel.

Benefits of ISDN

The benefits of ISDN include:

- Increased bandwidth
- Fewer errors during data transfer
- Quicker call setups and teardowns.

The ISDN Basic Rate Interface

Physical Appearance

The I-modem communicates over an ISDN Basic Rate Interface (BRI) line. You must order a BRI line from your local telephone company before you can use your I-modem. Chapter 2, *Ordering ISDN Service*, explains how to order ISDN and which services to request.

BRI works over the same wiring that is in place for your analog telephone lines. The difference is in the equipment you attach and the signaling used.

RJ45 Connector   RJ45 Jack

RJ11 Connector   RJ11 Jack
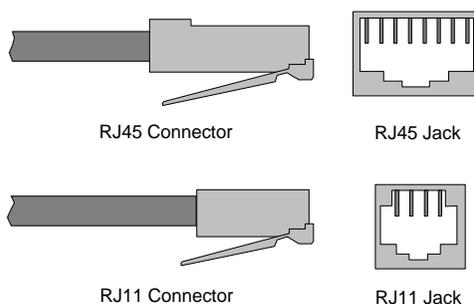
Figure 2.4 RJ45 and RJ11 Connectors and Jacks.

At your site, the BRI line takes the form of an RJ45 or RJ11 wall jack, which in ISDN is called the *U interface*. RJ45 connectors have eight pins and RJ11s have four or six pins. At the U-interface, you can plug an RJ11 connector into an RJ45 jack, and your line will work correctly.

The telephone company adds a line termination device at their end of the BRI that adapts the line for ISDN.

B-channels and D-channels

Though BRI signals are transmitted over an ordinary pair of wires, BRI typically contains three channels. The channels are created by complex signaling techniques.

BRI is composed of two 64-kbps B-channels and one 16-kbps D-channel:

This	Does this
B-channels	Carries (or "Bears") data or voice traffic
D-channel	Sets up and tears down calls

Logical View

D-channel (16 Kbps)
B-channel (64 Kbps)
B-channel (64 Kbps)

Physical View

RJ45 Connector
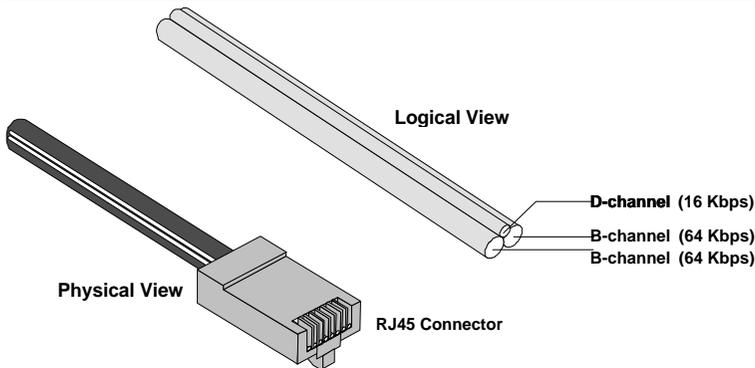
Figure 2.5 ISDN BRI—Three Logical Channels Over One Pair of Wires.

Required Components

BRI-line signals must be translated into signals your computer can understand. Several devices must be in place to perform the translation.

This	Is a device
TE2 (Terminal Equipment 2)	That does not have built-in ISDN capability. TE2s require Terminal Adapters (TAs), such as the I-modem, to communicate over the ISDN. Example: Computer.
TA (Terminal Adapter)	That translates between non-ISDN signaling that TE2s provide (such as EIA-232) and the S/T-interface signaling that the NT-1 understands.
NT-1 (Network Termination [Unit] -1	That ranslates between the short-distance signaling used at the *S/T-interface* and the longer-distance signaling used at the *U-interface*. NT-1s also convert from the two wires used for the phone line to the six or eight wires needed for the S/T bus.

How Does the I-modem Fit In?

The I-modem needs an NT-1 device to work with ISDN. If you currently use an NT-1 device, you can use the S/T-interface I-modem.

This version of I-modem	Allows the I-modem to connect
U-Interface Integrated NT-1	Directly to the U-interface
S/T-Interface	To an external NT-1 device (you must have an NT-1 device)

U-Interface with Integrated NT-1

Figure 1–5 illustrates how the I-modems with Integrated NT-1 connect your computer to the ISDN.
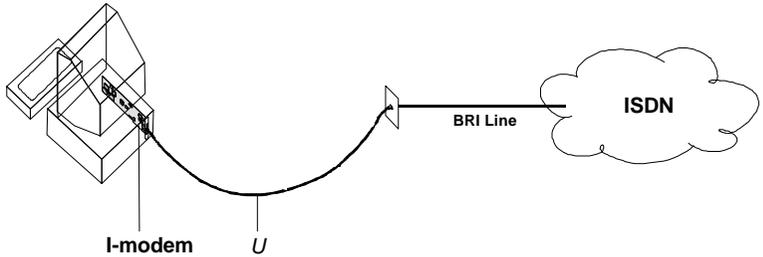
Figure 2.6 A Typical Installation of the I-modem

Once you've subscribed to ISDN service (see Chapter 2, *Ordering ISDN Service*, for much more detail), your local telephone company will install a BRI line at your site.

You install the I-modem in your computer and connect a cable between the I-modem and the phone jack. Then run the I-modem Configuration Manager or send commands to change a few settings. Before long, you'll be making calls on the ISDN.

S/T Interface

Figure 2.6 illustrates how the I-modem S/T connects your computer to the ISDN.

Note: Some NT-1s contain an integrated power supply.
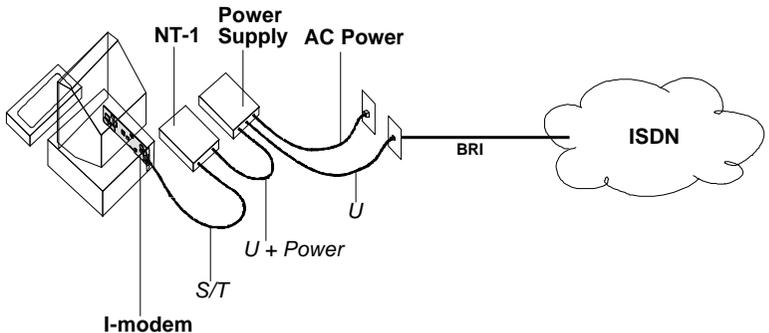
Figure 2.7 A Typical Installation of the I-modem S/T.

Setting Up Your I-modem for ISDN

You can get your ISDN service working by following these five easy steps:

Step One: Subscribe to ISDN service.

Step Two: Your local telephone company will install a BRI line at your site.

Step Three: Install the I-modem in your computer.

Step Four: Purchase and install an NT-1 (if necessary) and connect the cables.

Step Five: Run the I-modem Configuration Manager and change a few settings.

How the I-modem Calls a Variety of Devices

When you use the I-modem, all your calls go over one or both ISDN B-channels. However, you can set the I-modem to make different kinds of calls over the B-channel:

Internet Access (TurboPPP)

TurboPPP makes the most of your ISDN line in a way that's transparent to your computer and the networking applications running on it. You can use TurboPPP to access the Internet or remote local-area networks (LANs) at speeds of up to 128 Kbps before compression and up to 512 Kbps with compression.

TurboPPP is U.S. Robotics' unique combination of asynchronous-to-synchronous PPP conversion, compression, multilink PPP (MP-PPP), and PPP/MP-PPP spoofing.

Asynchronous-to-Synchronous PPP Conversion

Most Internet service providers that allow ISDN connections expect your data to arrive in synchronous Point-to-Point Protocol (PPP) format. Most computers, however, can't deliver synchronous PPP through their serial ports.

To solve this problem, the I-modem has the ability to convert asynchronous PPP data to synchronous PPP. This capability allows you to use networking software that is intended for asynchronous PPP connections (such as Windows 95 Dial-Up Networking or NetManage Chameleon) to access the Internet or remote LANs.

Compression

The I-modem supports the leading de-facto standards for compression over ISDN: Stac LZS, Microsoft, and Ascend.

Multilink PPP (MP-PPP)

Multilink PPP support enables the I-modem to use both of the available B-channels simultaneously. The I-modem uses PPP/MP-PPP spoofing to mediate between applications running on your computer, which may not be aware of MP-PPP, and host computers that support MP-PPP. In effect, the I-modem tricks both ends of the connection, keeping them happy communicating the way they're accustomed, while maximizing throughput.

Universal Connect

When the I-modem is set to Universal Connect, it autosenses V.120, V.110, or analog fax/modem connections. Use Universal Connect when calling ISDN or analog Bulletin Board Systems (BBSs), for example. For details, see Chapter 11, *Handshaking, Error Control, Data Compression, and Throughput*, in the *I-modem Command Reference* manual.

V.110 Connections

V.120 and V.110 are standards for passing asynchronous data over ISDN B-channels, which are inherently synchronous. To make a connection using V.120 or V.110, the device at the other end of the connection must also support V.120 or V.110. A typical application of V.120 is for BBSs.

Modem and Fax Calls

The I-modem emulates an analog fax/modem, allowing you to connect to remote analog modems and fax machines.

Clear-Channel Synchronous Connections

When you set the I-modem to make clear-channel synchronous connections, it sets up a 64 Kbps connection with a remote device, enabling you to exchange any kind of synchronous data. Common applications of clear-channel synchronous are videoconferencing and remote access to mini- or mainframe computers.

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Chapter 3
Ordering ISDN Service

This chapter gives you and your local telephone company all the information needed to set up the lines correctly.

Overview

To order ISDN service, contact your local telephone company, give them information about your I-modem, and record information that they give you, such as your new ISDN telephone numbers, called SPIDs.

If you decide that you would like assistance with the ordering process, call the **U. S. Robotics I-team** at **(888) USR-ISDN**.

The U.S. Robotics I-team

The I-team is a subset of U.S. Robotics' Customer Support department that provides assistance with the ISDN ordering and configuring process. The I-team determines the availability and pricing of ISDN service in your area, installation costs, lead time for installation, and will coordinate the configuration of the telephone company's equipment so your I-modem will work properly.

Requesting ISDN Service

1 Call your local telephone company and request Bellcore Capability Package **S** (listed in Bellcore SR-3840).

If your telephone company does not recognize Bellcore capability packages, request the following items:

- ISDN BRI service.
- Number of channels: 2B+D, with no packet-mode data on the D-channel.
- Call type support:

This channel	Supports
Data B-channel	Circuit-Switched Voice and Data (CSV/D)
Analog Device B-channel	Circuit-Switched Voice and Data (CSV/D)

- Dynamic TEI assignment.
- Multipoint bus configuration.
- No features or special services such as CACH EKTS, call forwarding, or hunt groups.
- Terminal Type A.
- RJ45 jack (RJ11 is acceptable).

2 Specify your preferred long-distance provider.

3 Ask the telephone company which type of central-office switch your ISDN line will terminate and which protocol the switch uses. Record the switch type and protocol here:

✓	Switch	Protocol
	AT&T 5ESS	Custom
	AT&T 5ESS	National ISDN-1
	Northern Telecom DMS-100	Custom (PVC 0 or 1)
	Northern Telecom DMS-100	National ISDN-1 (PVC 2)
	Siemens EWSD	National ISDN-1
	Other	National ISDN-1

4 Obtain the following information from your local telephone company:

- 1 SPID (Service Profile Identifier) per B-channel.
- 1 DN (Directory Number) per B-channel.
- Call types supported on each B-channel.
- If the switch does not auto-assign TEIs (most do), then you need one fixed TEI per B-channel.

For this	Record the number here
SPID 1	
SPID 2	
DN 1	
DN 2	

5 If you have an internal I-modem, continue with Chapter 4, *Installing the Internal I-modem.*

If you have an external I-modem, continue with Chapter 5, *Installing the External I-modem.*

Courier I-modem Getting Started Guide

Chapter 4
Installing Your
Internal I-modem

This chapter explains how to:

- Configure with jumpers
- Configure with DIP switches
- Insert the internal I-modem
- Connect cables to the internal I-modem

Important: Review Chapter 2, *The I-modem and ISDN*, and Chapter 3, *Ordering ISDN Service*, before installing the I-modem.

Requirements

You need the following to install your I-modem:

- IBM-compatible computer with a free interface card slot
- An ISDN Basic Rate Interface line
- Communications software
- An NT-1 and Power Supply (I-modem S/T only)

Note: An NT-1 is a device that terminates the ISDN line and translates between the U-interface signaling from the telephone company and the S/T-interface signaling needed by ISDN terminal devices, such as the I-modem S/T. Only I-modem S/T's require an external NT-1.

Configuration Manager Requirements

You need the following to run the U.S. Robotics *I-modem Configuration Manager* software:

- 386SX, or better, CPU.
- 8 MB, or more, RAM.
- DOS 5.0 or higher and Windows 3.1, or higher.

Package Contents

Your I-modem package contains the following items:

- The I-modem
- Telephone cable
- Quick Reference card
- Customer Support card
- This *Getting Started* manual
- I-modem Configuration Manager diskette.
- The *Connections* CD-ROM, which contains:
  – I-modem *Command Reference Guide*
  – RapidComm communications software and manuals
  – Stampede Remote Office Gold software and manuals
  – Special offers
  – Updated I-modem INF file

Important!

The I-modem emulates a *serial interface card* with a 16550 UART. Like serial interface cards, it must be assigned a unique communications (**COM**) port number and a unique interrupt request (**IRQ**) number.

If you are using a computer with a Plug and Play compliant BIOS and operating system and you set the I-modem's jumpers to Plug and Play (the default), your computer's operating system will take care of the COM and IRQ settings for you.

Setting the COM port and IRQ yourself requires a detailed knowledge of the settings of the other adapter cards in your computer. If other adapter cards are set to use the same COM port or IRQ, conflicts may occur that could result in data loss or lockups.

First, determine whether your computer has a Plug and Play ISA bus. Check your computer's documentation to be sure. Keep these points about Plug and Play in mind:

- Your computer's operating system must support Plug and Play (examples of those that do: OS/2 Warp, Windows 95, Windows NT), or your computer's manufacturer must supply you with Plug and Play software.
- Your computer's Basic Input/Output System (BIOS) must support Plug and Play.

Installing Your Internal I-modem

To install your internal I-modem, do the following:

Step One: Configure your I-modem with jumpers (if necessary)

Step Two: Configure your I-modem with DIPs (if necessary)

Step Three: Insert your I-modem

Step Four: Connect the cables

Step One: Configuring with Jumpers

Your I-modem comes configured for Plug and Play, which allows
Windows 95 to automatically configure itself to work with the
I-modem.
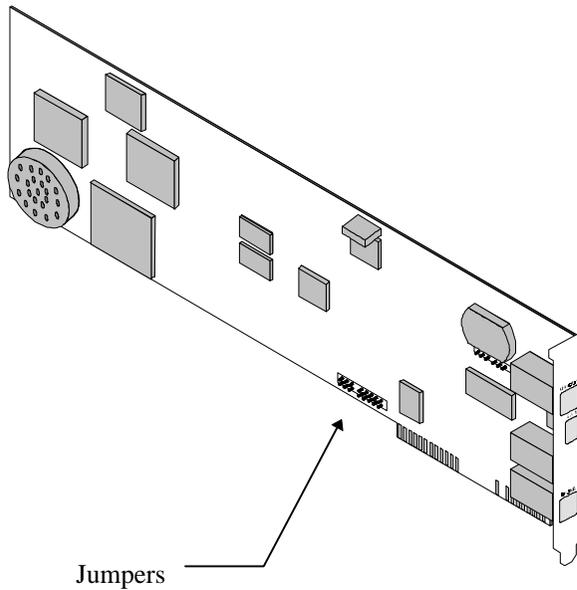
Jumpers

Figure 4.1 Jumpers

Default Jumper Settings
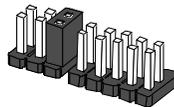
Figure 4.2 Default Jumper Settings

In addition to the shunt shown in Figure 4.2, the I-modem is shipped with two additional shunts. These shunts do not affect the configuration of your I-modem because they are attached to only one post; change the positions of these shunts only if you need to change hardware settings.

Notes:

- The S/T version has an additional set of jumpers.

- For most configurations, default settings will work. However, if your environment has multiple ISDN devices or you are using an NT-1, see the *I-modem Command Reference* manual.

Windows 95 Users

If you are using Window 95, you should not need to change the Plug and Play jumper settings, because Windows 95 automatically detects and configures your Courier.

Other IBM-PC Compatible Operating Systems

If you are using an IBM-PC compatible operating system, you may need to change the jumper settings to a COM port or IRQ setting that is not already used by your system.

For information about setting jumpers for different COM ports and IRQ settings, see Chapter 12, *Configuring Your Courier With DIP Switches and Jumpers.*

Step Two : Configuring with DIP Switches

You will probably not need to change the DIP switch settings, but review this section to be sure.

The DIP (Dual Inline Package) switches are located on the bracket of the I-modem. See Figure 3-7 to learn how to set the switches.
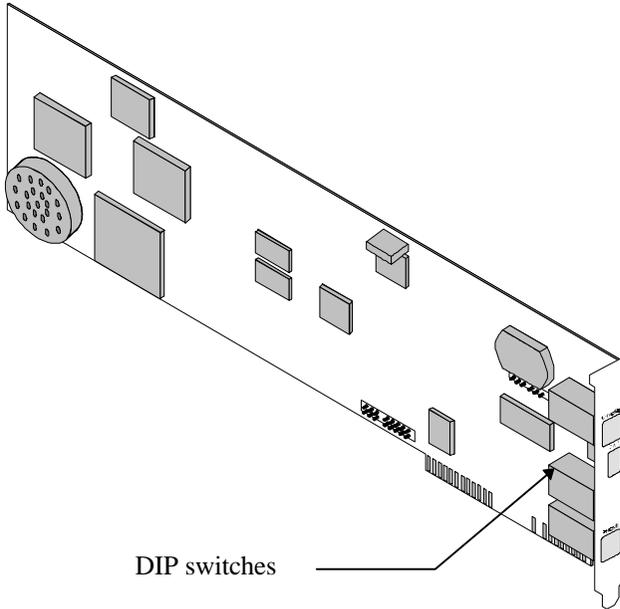
DIP switches

Figure 4.3 Location of the DIP Switches.

OFF ON

No effect	4	No effect
No effect	3	No effect
Ignore AT commands	2	Act on AT commands
Load &F0 template settings on power-on or reset	1	Load NVRAM settings at power-on or reset
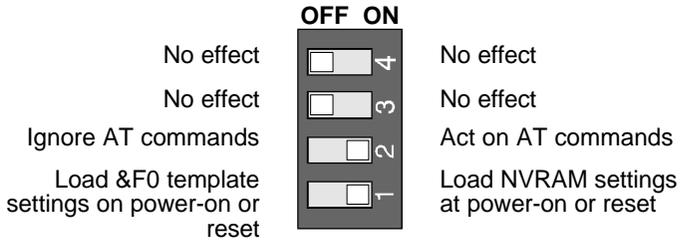
Figure 4.4 How to Set the DIP Switches.

For information about AT commands, refer to Chapter 2, *Using the AT Command Set*, in the *I-modem Command Reference* manual.

This DIP Switch	Position	Does this
1	ON (Default)	Loads the configuration that is stored in non-volatile memory (NVRAM)
	OFF	Loads the &F0 configuration that is stored in read-only memory (ROM)
2	ON (Default)	Acts on AT commands (smart mode)
	OFF	Ignores AT commands (dumb mode)
3	OFF	No effect
4	OFF	No effect

When you power on your computer or reset the I-modem, the DIP switch settings override the settings you may have made previously using AT commands.

Note: The following AT commands are not changed by a power-on or reset and must be changed manually: **&C***n*, **&D***n*, **E***n*, **Q***n*, **V***n*, **S0=***n*, **S14=***n*, and **S67=***n*.

If you change the DIP switch settings while the I-modem is on, you can avoid powering your computer off to make the new settings take effect. Just send the I-modem the ATZ or the ATZ! command. (ATZ! is a "hard" reset, which is just like powering the I-modem off and then on. ATZ is a "soft" reset, which is like rebooting the I-modem and not removing power.)

Step Three: Inserting the Modem

> **Note:** The illustrations in this section may not match the appearance of your computer. For more detail, refer to your computer's user's manual.
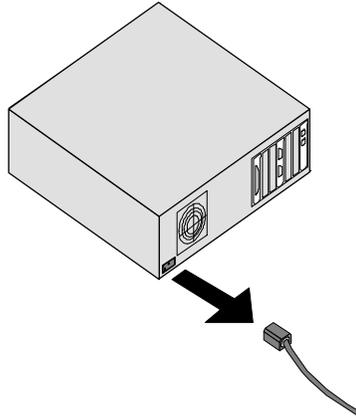
1 Turn off the computer's power and unplug the computer's power cord. Ground yourself.
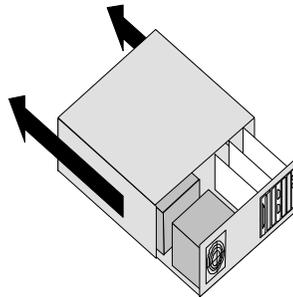
2 Remove the screws that hold on the computer's cover and slide the cover off.

3 Find an empty expansion slot that provides enough room to install your Courier.

4 Remove the screw that holds on the slot cover and remove the slot cover. Save the screw!
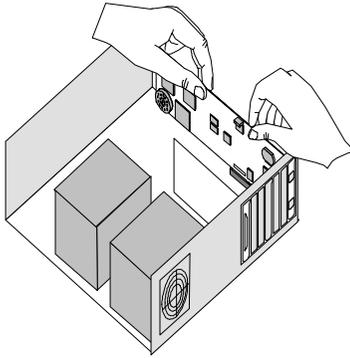
5 Insert your Courier into the slot and press down on the top edge of your Courier until it is seated firmly.

6 Using the screw you saved in Step 4, secure your Courier in your computer.

7 Replace the cover of your computer and tighten the screws.

You are now ready to connect the cables.

Step Four: Connecting the Cables

I-modems with Integrated NT-1 Model U

1 Connect one end of the U-interface cable to the ISDN BRI jack and the other end to the I-modem.
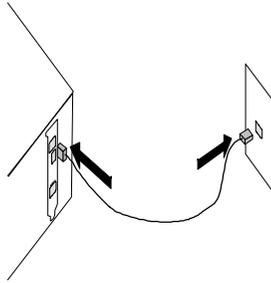
2 If your I-modem has an Analog Device port, connect an analog device, such as a standard telephone, now.

Be aware that the internal I-modem does not provide ringing voltage, which may prevent normal operation of devices that auto answer (such as fax or answering machines).

I-modem Model S/T

1 Connect one end of the S/T-interface cable to an S/T port on your NT-1 and the other end to the I-modem.

NT-1
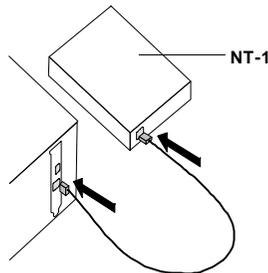
2 Install the NT-1 according to the steps listed in its documentation.

Testing the Installation

To test your Courier, use any communications software package, such as Windows Terminal, HyperTerminal, Procomm Plus, or RapidComm. HyperTerminal is used as an example. Every communications program is different; consult the documentation that came with your communications program for more information.

1 Run HyperTerminal.

2 Enter the name of your connection in **Name** and click **OK**.

3 Enter the phone number you want to dial in **Phone number** and click **OK**. If you only want to test your modem, you may enter any number.

Courier I-modem Getting Started Guide

4 Change any properties and:

To do this	Click this button
Dial a number	**Dial**
Test without dialing a number	**Cancel**
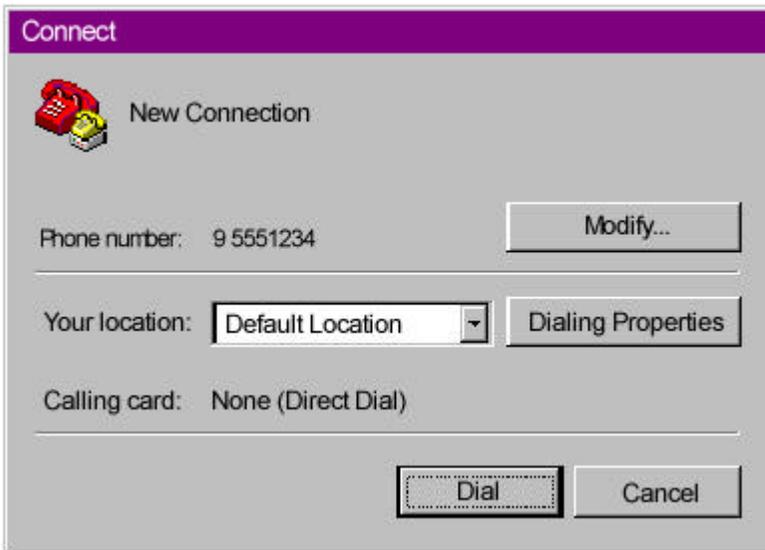
5 When the HyperTerminal terminal window appears, enter **AT** and hit **<enter>**. If your modem is connected and configured properly, you will see "OK" on the terminal screen.

You are now ready to configure your Courier modem.

This chapter explains how to:

- Connect the serial cable
- Connect the ISDN cable
- Connect the power cord

What You Need

You need the following to install your Courier I-modem:

- Computer or terminal with a serial port (16650 UART recommended)
- ISDN Basic Rate Interface (BRI) line

Package Contents

Your Courier I-modem package contains the following items:

- Courier I-modem
- Power adapter
- Telephone cable
- Quick Reference card
- Customer Support card
- This Getting Started manual
- The *Connections* CD-ROM, which contains:
  – Courier I-modem *Command Reference Guide*
  – RapidComm communications software and manuals
  – Stampede Remote Office Gold software and manuals
  – Special offers
  – An updated Courier I-modem INF file

Note about serial cables: You need a serial cable to connect your Courier to your computer. Because there are a variety of connector types that different computers require, and many users may already have an existing modem and serial cable, a serial cable is not provided with your Courier.

These figures show the controls, displays, and connectors on your Courier I-modem and indicate where to find more information about each.

Figure 5.1 Front panel of the I-modem
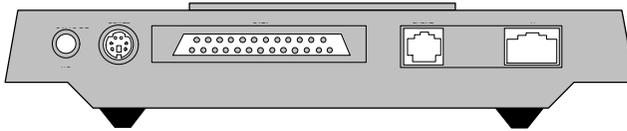
Figure 5.2 Rear panel of the I-modem

Installing Your External I-modem

To install your external I-modem, do the following:

Step One: Connect the serial cable

Step Two: Connect the ISDN cable

Step Three: Connect the power cable

Step One: Connecting the Serial Cable

1 Look at the back of your computer for a port:

If you have	Ports may be labeled this way
An IBM-compatible PC	COM, RS-232, or with symbols such as **IOIOI**, ⎍⎍⎍, or ☎.
A Macintosh	☎ (modem port) or 🖳 (printer port)

Refer to your computer's documentation to determine where the serial port is.
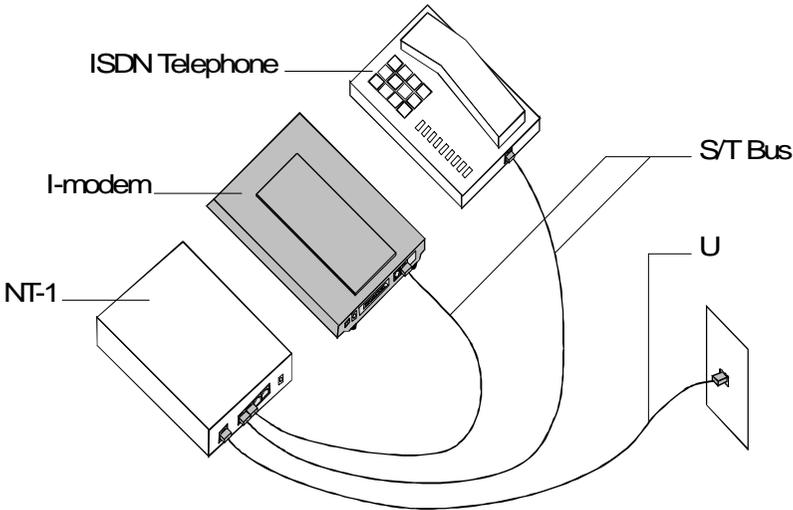
This is a typical Model S/T configuration, which requires an external NT-1 unit to connect to the ISDN wall jack. The I-modem Model U configuration is similar, but does not require an external NT-1. Instead, the I-modem Model U has an internal NT-1 and connects directly to the ISDN wall jack.

Step Two: Connecting the ISDN Cable

1 After you have selected the correct cable, connect the male DB-25 end of your serial cable to your Courier I-modem and the other end to a serial port on your computer.

If you have an IBM-compatible PC, connect the male DB-25 to your Courier I-modem and the other end to COM, RS-232, or with symbols such as **IOIOI**, ⎍⎍⎍, or ☎.

If you have a Macintosh, connect the male DB-25 to your Courier I-modem and the other end to ☎ (modem port) or ▤ (printer port)

> **Note:** Write down the number of the serial port to which you connect your Courier I-modem. If your serial ports are lettered instead of numbered, A is COM1 and B is COM2. If you cannot find a serial port, consult the documentation that came with your computer.

2 Connect one end of the phone cable to the wall jack and the other end to your Courier I-modem port labeled U.

3 If you have Model U and a telephone that you'd like to connect to your Courier I-modem, plug its cable into your Courier port labeled PHONE.

4 Plug one end of the power adapter into your Courier I-modem and the other end to a standard AC power outlet.

5 Switch your computer and modem power on.

You are now ready to configure your Courier I-modem.

This chapter explains how to configure and test the I-modem using the Configuration Manager software.

If the computer to which you've connected the I-modem cannot run Windows applications, follow the steps in Chapter 7, *Configuring With AT Commands.*

Overview

Configuration Manager

The I-modem Configuration Manager is designed to help you make the ISDN settings to your I-modem and test whether you have a working connection with the central-office switch.

Configuring the I-modem

Before you can make any calls, you need to configure the I-modem to work on your ISDN line. If you haven't ordered an ISDN line, see Chapter 3, *Ordering ISDN Service.*

Install and run the Windows Configuration Manager software shipped with the I-modem. The Configuration Manager runs on Windows 3.1, Windows 95, Windows NT, and Macintosh.

What You Should Know

Directory Numbers

Directory Numbers (DNs) take the form of ordinary seven- or ten-digit telephone numbers. Be sure to leave off the area code from your DN.

Service Profile Identifiers

Service Profile Identifiers (SPIDs) tell the telephone company about any special services and features to which you've subscribed. SPIDs can be up to 20 digits long.

Terminal Endpoint Identifier

The TEI is a one or two digit number that permanently identify a your connection with the central office switch.

Installing the Configuration Manager

1 Make sure the I-modem is attached to your computer and powered on.

2 Power-on your computer and start Windows.

3 Insert the **Courier I-modem Configuration Manager** diskette in drive A (or drive B).

4 **Windows 3.x:** From the **Program Manager** group's menu bar, select **File**, and then **Run...**

   Windows 95: Click **Start**, and then **Run…**

5 Enter **a:\setup** (or **b:\setup**, depending on the drive into which you inserted the diskette). The installation program will start.

6 When you're prompted, enter the drive and directory where you want the Configuration Manager installed. The default is **c:\i-modem**.

   The installation program installs the software and creates an I-modem Configuration Manager program group and icons.

The following window appears when installation is complete.
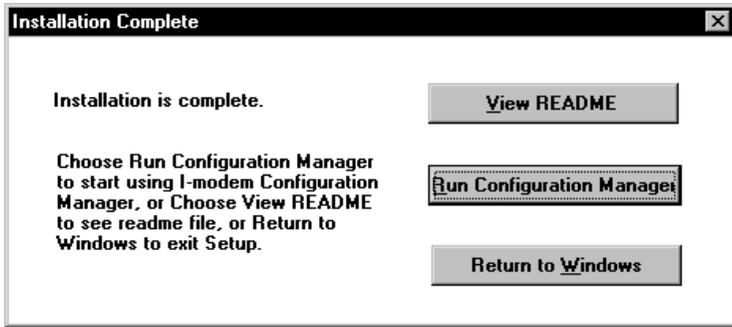
7 Eject the diskette from the drive.

Configuring the I-modem

1 Start the I-modem Configuration Manager by clicking the **ISDN Program** icon:

The following window appears:
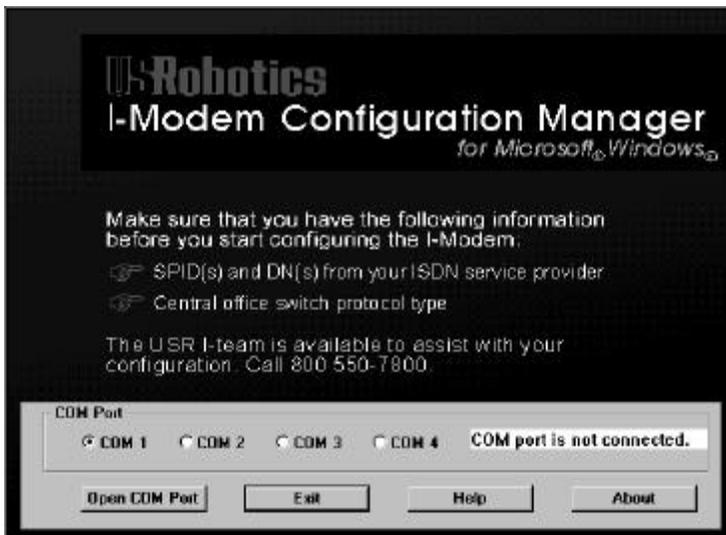
2 Select the COM Port to which the I-modem is connected and then select **Open COM Port**.

Once you communicate successfully with the I-modem, the first

window disappears and the following window appears:

(If you cannot communicate with the I-modem, you may have a COM port or IRQ conflict. Refer to Chapter 15, *Troubleshooting*, in the *I-modem Command Reference* manual.)
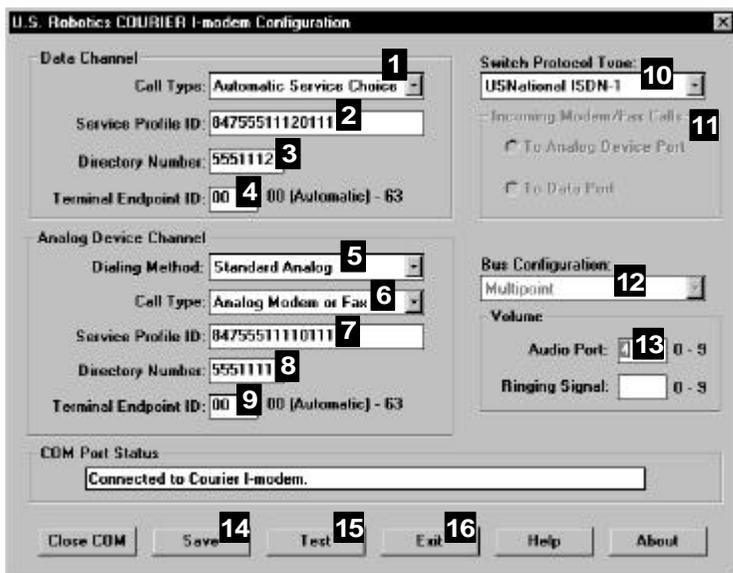
1 Data Channel Call Type

Choose one of the following call types for the Data B-channel. Your choice applies for both incoming and outgoing calls.

This call type	Allows these types of calls
Automatic Service Choice	V.120, then analog fax/modem
V.120 Rate Adaptation	V.120 only
V.110 Rate Adaptation	V.110 only
Analog Modem	Analog fax/modem only
Clear Channel	Clear-channel synchronous
Internet Access	TurboPPP, then analog fax/modem

2 Data Channel Service Profile ID

Enter the SPID (up to 20 digits) for the Data B-channel.

3 Data Channel Directory Number

Enter the DN for the Data B-channel. Do not include your area code.

4 **Data Channel Terminal Endpoint ID**

Typically, ISDN service providers assign TEIs automatically. If you were given a fixed TEI, type it in this blank. If not, leave 00.

5 **Analog Device Channel Dialing Method**

If you select	The I-modem dials
Standard Analog	Like a standard phone.
All Digits At Once	Like a cellular phone (press # to send dialed number).

6 **Analog Device Channel Call Type**

Choose one of the following call types for the Analog Device B-channel. Your choice applies to outgoing calls only.

If you want to use	Select this call type
Higher quality audio	3.1 kHz audio or speech (Analog Modem or Fax)
Lower quality audio	Speech

7 **Analog Device Channel Service Profile ID**

Enter the SPID (up to 20 digits) for the Analog Device B-channel.

8 **Analog Device Channel Directory Number**

Enter the DN for the Analog Device B-channel. Do not include your area code.

9 **Analog Device Channel Terminal Endpoint ID**

Typically, ISDN service providers assign TEIs automatically. If you were given a fixed TEI, type it in this blank. If not, leave 00.

10 **Switch Protocol Type**

Choose the switch protocol used by your ISDN service provider.

11 **Incoming Modem/Fax Call Routing**

This section is active only if you select AT&T 5ESS Custom as your switch protocol type. Explained in Special Considerations for AT&T 5ESS Custom later in this chapter.

12 **Bus Configuration**

This field is active only if you select AT&T 5ESS Custom as your switch protocol type. Explained in Special Considerations for AT&T 5ESS Custom later in this chapter.

13 **Audio Port Volume**

Controls the volume of the sound from the receiver of a device that's attached to the Analog Device port. 0 is quietest and 9 is loudest. 4 is the default and is recommended.

14 **Save Button**

Check all the settings to make sure they're correct, and then click **Save**. The following message appears:

I-Modem Configuration Settings

The I-Modem configuration values were successfully set.

OK
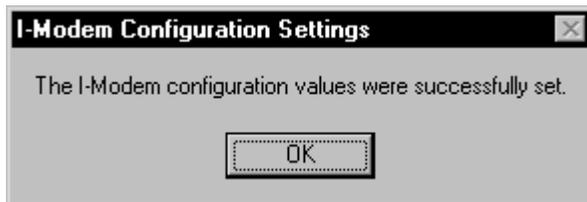
15 **Test Button**

Select **Test** to reset the I-modem and begin a 90-second period of attempts to connect to your central office switch. Watch the Switch Connectivity Test window.

```
I-modem Switch Connectivity Test                    [×]


    Physical Interface: | Active                    |
       Data Link Layer: | Active                    |


       Timeout: | 70 seconds |        |    OK    |
```
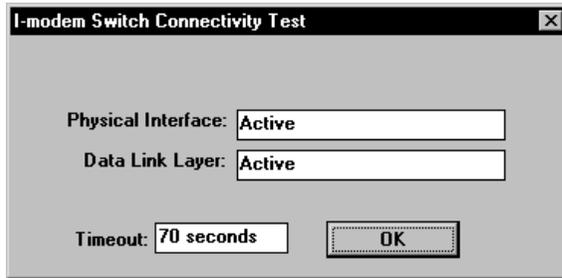
Physical Interface indicates whether there is a good
physical connection between the I-modem and the
central-office switch.

If the Physical Interface is	The I-modem has made
Inactive	No connection.
Active	A good connection.

The Data Link Layer can be active only when the Physical
Interface is active. An active Data Link Layer indicates
that the I-modem is ready to make or receive calls.

If the Data Link Layer is	Then the I-modem
Inactive	Is not ready to make or receive calls.
Active	Is ready to make or receive calls.
Active (Incorrect SPID)	Cannot make or receive calls because the central office switch does not recognize the SPID set in the I-modem.

```
Switch Test Completed                               [×]


    ( i )    The switch connection test has completed successfully.


                     |      OK      |
```

16 **Exit Button**

When you see the Switch Test Completed message,
you're ready to make and receive calls! Select Exit to
close the Configuration Manager.

Testing

1 Start your communications software package. Use a terminal emulation program, such as HyperTerminal.

2 Change the COM port and IRQ settings in your communications software to match the I-modem's setup.

3 Make a test data call.

> **a** Put your communications software in *Terminal Mode*.
>
> **b** Call the U.S. Robotics BBS. Type the following:
>
> **ATDT18477348612 <Enter>**
>
> Or, in the 847 area code:
>
> **ATDT7348612 <Enter>**
>
> **Note:** When you make ISDN calls, you won't hear dialing or training tones when the call is being made.
>
> You should see one of the following messages:
>
> **CONNECT 56000/ARQ/DIGITAL/V120**
> **CONNECT 64000/ARQ/DIGITAL/V120**

If you don't see one of these messages, refer to Chapter 15, *Troubleshooting*, in the *I-modem Command Reference* manual.

4 *I-modems with Analog Device Jack*: Make a test voice call.

When the network connects the call, the B1 or B2 LED should flash.

If you have set up your analog device B-channel to use **All Digits At Once** (en-bloc) dialing, you must press the star (*) key after you dial the number in order to send it.

If you have trouble making analog calls, refer to Chapter 15, *Troubleshooting*, in the *I-modem Command Reference* manual.

Note: Any device attached to the Analog Device port cannot use the line unless the I-modem is powered on.

Special Considerations for AT&T 5ESS Custom

If your central-office switch is an AT&T 5ESS that runs the Custom

protocol, you can use fewer than two SPIDs/DNs, although this is not recommended. Lines with fewer than two SPIDs/DNs prevent your making two analog-based calls at one time.

For example, with fewer than two SPIDs/DNs, you can make a digital call (such as V.120 or synchronous PPP) and a voice call at the same time, but not a fax/modem and a voice call simultaneously.

SPIDs	DNs	Bus Configuration
0	1	Point-to-Point
1	1	Multipoint
2	2	Multipoint

If You Have No SPIDS and Only One DN

Make these modifications when entering your line configuration.

2   **Data Channel Service Profile ID**

Leave this field blank.

3   **Data Channel Directory Number**

Enter your DN. Do not include your area code.

7   **Analog Device Channel Service Profile ID**

Leave this field blank.

8   **Analog Device Channel Directory Number**

Enter your DN again. Do not include your area code.

10   **Switch Protocol Type**

Select AT&T 5ESS Custom.

11 **Incoming Modem/Fax Call Routing**

Select one of the following:

To use	The I-modem routes incoming analog calls
Analog Device Port	To the Analog Device port (handled by the device attached to the Analog Device port).
Data Port	To the Data Port (handled by the I-modem).

12 **Bus Configuration**

Select Point-to-Point.

If You Have One SPID and One DN

Make these modifications when entering your line configuration.

2 **Data Channel Service Profile ID**

Enter your SPID (up to 20 digits).

3 **Data Channel Directory Number**

Enter your DN. Do not include your area code.

7 **Analog Device Channel Service Profile ID**

Enter your SPID (up to 20 digits).

This field should be blank if you have only on SPID.

8 **Analog Device Channel Directory Number**

Enter your DN. Do not include your area code.

10 **Switch Protocol Type**

Select AT&T 5ESS Custom.

11 **Incoming Modem/Fax Call Routing**

Select one of the following:

To use	The I-modem routes incoming calls
To Analog Device Port	To the Analog Device port (handled by the device attached to the Analog Device port).
To Data Port	To the Data Port (handled by the I-modem).

12 **Bus Configuration**

Select Multipoint.

This chapter explains how to configure and test the I-modem using AT commands and terminal software.

Overview

Configuring the I-modem

Before you can make any calls, you need to configure the I-modem to work on your ISDN line. If you haven't ordered an ISDN line, see Chapter 3, *Ordering ISDN Service.*

Run your communications software in Terminal mode and then use your software to send the I-modem AT commands.

What You Should Know

Directory Numbers

Directory Numbers (DNs) take the form of ordinary seven- or ten-digit telephone numbers. Be sure to leave off the area code from your DN.

Service Profile Identifiers

Service Profile Identifiers (SPIDs) tell the telephone company about any special services and features to which you've subscribed. SPIDs can be up to 20 digits long.

Terminal Endpoint Identifier

The TEI is a one or two digit number that permanently identify a your connection with the central office switch.

Preparing to Send AT Commands

1 Get the information from your ISDN service provider that contains your ISDN phone numbers and central-office switch type.

2 Start your computer and your communications software. Use a terminal emulation software package, such as HyperTerminal.

3 Put your communications software into *Terminal mode.*

When your communications software is in Terminal mode, the commands you type go directly through the serial port to the I-modem. Refer to the manual for your communications software to determine how to change to Terminal mode.

4 Set your communications software to use the COM port to which the I-modem is connected, as well as 8 data bits, no parity, and 1 stop bit.

5 Send the following command (all commands surrounded by angle brackets, like <Enter>, indicate key presses):

> **AT <Enter>**

If you installed the I-modem and set your communications software correctly, it sends the following response:

> **OK**

> **Note:** If you don't get an OK response, refer to Chapter 15, *Troubleshooting*, in the *I-modem Command Reference*.

Configuring and Testing Your I-modem

Before you can use your Courier, you must perform the following steps.

Step One: Configure the I-modem

Step Two: Check the I-modem's settings

Step Three: Save the settings

Step Four: Test the I-modem

Step One: Configuring the I-modem

1 Look over the information you received from your ISDN service provider to obtain your central-office switch and protocol type.

This switch type	Supports this protocol type
Northern Telecom DMS-100	National ISDN-1 (PVC 2)
	Custom (PVC 0 or 1)
AT&T 5ESS	National ISDN-1
	Custom*
Other (for example, Siemens EWSD)	National ISDN-1

The command is AT*W=*n*

To set this switch protocol type	Use this command
AT&T 5ESS Custom*	**AT*W=0**
Northern Telecom DMS-100	**AT*W=1**
National ISDN-1	**AT*W=2**
National ISDN-2	**AT*W=3**

---

* If your switch protocol is AT&T 5ESS Custom, see *Special Considerations for AT&T 5ESS Custom* on page 5-7.

2 Set the appropriate bus configuration.

To set	Use this command
Point to point	**AT*M=0**
Multipoint	**AT*M=1**

3 Set up the **ANALOG DEVICE** B-channel.

   a Set the Service Profile Identifier (SPID).

     The command is AT*S1=*n*

     Example: **AT*S1=84755511110111 <Enter>**

   b Set the Directory Number (DN).

     The command is AT*P1=*n*

     Example: **AT*P1=5551111**

   c Set the Terminal Endpoint Identifier (TEI), if you were assigned one. If not, continue with step **d**.

     The default setting is 0, or dynamic TEI assignment. The TEI permanently identifies your link with the central office switch.

     The command is AT*T1=*n*

If your TEI	Use this command
Is dynamic	**AT*T1=00**
Is fixed	**AT*T1=*n*,** where n is a number from 1 to 63.

d Set the Call Type.

> **Note:** The call type that you choose will apply to outgoing calls only.

The command is AT*V1=*n*

To set this call type	Use this command
3.1 kHz audio (for modem, fax, or voice calls)	**AT*V1=0**
Speech only	**AT*V1=1**

4 Set up the **DATA** B-channel.

    a Set the Service Profile Identifier (SPID).

        The command is AT*S2=*n*

        Example: **AT*S2=84755511120111**

    b Set the Directory Number (DN).

        The command is AT*P2=*n*

        Example: **AT*P2=5551112**

    c Set the Terminal Endpoint Identifier (TEI), if you were assigned one. If not, continue with step **d**.

        The default setting is 0, or dynamic TEI assignment.

        The command is AT*T2=*n*

If your TEI	Use this command
Is dynamic	**AT*T2=00**
Is fixed	**AT*T2=*n*,** where n is a number from 1 to 63.

d   Set the Call Type.

> **Note:** The call type you choose will apply to both incoming and outgoing calls.

The command is AT*V2=*n*

To set this call rype	Use this command
Automatic service choice (Universal Connect)	**AT*V2=0**
V.120 rate adaption calls only	**AT*V2=1**
V.110 rate adaption calls only	**AT*V2=2**
Modem or fax emulation only	**AT*V2=3**
Clear-channel synchronous calls only	**AT*V2=4**
Internet access mode (default)	**AT*V2=5**

You are done configuring your I-modem.

Step Two: Checking the Configuration

Send **ATI12 <Enter>**, and check that the settings you made are correct.

Step Three: Saving the Configuration

Reset the I-modem by sending **ATZ! <Enter>** or power off the modem and power it on again.

Sending ATZ is not sufficient! Send **ATZ! <Enter>** Your settings will not take effect until the I-modem undergoes this type of reset.

> **Note:** If your phone company requires compliance with Bellcore Special Report NWT 1953, which introduces a random delay of 45 to 65 seconds when bringing up your line, you can set the I-modem to comply by sending **ATS67.4=1 <Enter>**. To disable compliance, send **ATS67.4=0 <Enter>**.

Step Four: Testing the Configuration

1 After you reset your I-modem (in Step Three) watch the I-modem's LED status indicators. **AA**, **DTR**, **MR**, **RTS**, and **CTS** should be lit green, and **NS** should blink yellow rapidly.

Watch the **NS** LED closely. It should follow this pattern:

Step	The NS LED	Means this
1	Fast blink (8 per second), Yellow	Searching for U interface (I-modem Model 1 and 2 only)
2	Slow blink (1 per second), Yellow	Searching for S/T interface
3	Slow blink (1 per second), Green	Physical connection active
4	Green solid	Ready to make or receive calls

These are error conditions and suggested solutions:

If NS LED does this	This may be the problem
Red blink (1 per second)	Incorrect SPID. Send **ATI12 <Enter>** and re-check your SPID and DN settings.
Red solid	No physical connection. Make sure that the U-interface cable is plugged into the I-modem.

2 Make a test data call.

Call the U.S. Robotics BBS. Type the following:

ATDT18477348612 <Enter>

Or, in the 847 area code:

ATDT7348612 <Enter>

> **Note:** When you make ISDN calls, you won't hear dialing or training tones when the call is being made. This is normal.

You should see one of the following messages:

CONNECT 56000/ARQ/DIGITAL/V120
CONNECT 64000/ARQ/DIGITAL/V120

> **Note:** If you don't see one of these codes, refer to Chapter 15, *Troubleshooting*, in the *I-modem Command Reference*.

Special Considerations for AT&T 5ESS Custom

If your central-office switch is an AT&T 5ESS that runs the Custom protocol, you can use fewer than two SPIDs/DNs, although this is not recommended. Lines with fewer than two SPIDs/DNs prevent your making two analog-based calls at one time.

For example, with fewer than two SPIDs/DNs, you can make a digital call (such as V.120 or synchronous PPP) and a voice call at the same time, but not a fax/modem and a voice call simultaneously.

SPIDs	DNs	Bus Configuration
0	1	Point-to-Point
1	1	Multipoint
2	2	Multipoint

If You Have No SPIDs and Only One DN

Make these modifications when entering your line configuration.

1 Switch protocol type. Set to AT&T 5ESS Custom: enter **AT*W=0**

2 Bus configuration. Set to Point-to-Point: enter **AT*M=0**

3a Data channel SPID. Leave blank: enter **AT*S2=** and press **<Enter>**.

3b Data channel DN. Enter your DN (do not include your area code.

For example, **AT*P2=5551111**

4a Analog Device channel SPID. Leave blank: enter **AT*S1=** and press **<Enter>**.

4b Analog Device channel DN. Enter your DN: for example, **AT*P1=5551111**

Also, decide whether incoming analog fax/modem calls are routed to the Analog Device port (to be handled by the voice device attached to the Analog Device port) or to the Data Port (to be handled by the I-modem).

To route these calls to	Use this command
Analog Device Port	**ATS67.3=0**
Data Port	**ATS67.3=1**

If You Have One SPID and One DN

Make these modifications when entering your line configuration.

1 Switch protocol type. Set to AT&T 5ESS Custom: type **AT*W=0 <Enter>**.

2 Bus configuration. Set to Multipoint: type **AT*M=1 <Enter>**.

3a Data channel SPID. Enter your SPID (up to 20 digits): for example, type **AT*S2=84755511110111 <Enter>**.

3b Data channel DN. Enter your DN (do not include your area code. For example, **AT*P2=5551111 <Enter>**.

4a Analog Device channel SPID. Leave blank: enter **AT*S1=** and press **<Enter>**..

4b Analog Device channel DN. Enter your DN: for example, **AT*P1=5551111 <Enter>**.

Also, decide whether incoming analog fax/modem calls are routed to the Analog Device port (to be handled by the device attached to the Analog Device port) or to the Data Port (to be handled by the I-modem).

To route calls to the	Use this command
Analog Device Port	**ATS67.3=0**
Data Port	**ATS67.3=1**

Courier I-modem Getting Started Guide

Chapter 8
Configuring Your Courier
For Windows 95

This chapter explains how to:

- Configure your I-modem for use with Plug and Play
- Obtain and install the latest I-modem files
- Configure Dial-Up Networking to access your ISP

Overview

The first time you start Windows 95 after you've installed your Courier, Windows 95 auto-detects your Courier. Since Windows 95 supports Plug and Play, most installations are trouble-free.

> **Note for external Courier users:** You must power on your I-modem before you start Windows 95, or Windows 95 will not recognize your I-modem.

What You Need

You need Windows 95 with Dial-Up Networking installed to configure your I-modem for Windows 95.

Configuring Your Courier With Plug and Play

Plug and Play mode allows Windows 95 to automatically detect your I-modem and determine which modem configuration file (called an INF file) to use.

> **Note for internal Courier users:** If you do not want to use the Plug and Play mode of your operating system, you must manually change the jumpers on the modem to the desired COM port/ IRQ settings. For information about setting jumpers for different COM ports and IRQ settings, see Chapter 12, *Configuring Your Courier With DIP Switches and Jumpers.*

Follow the steps below to install I-modem INF file for Windows 95:

1 Power on your computer and start Windows 95. Your computer detects new hardware and displays the following window:
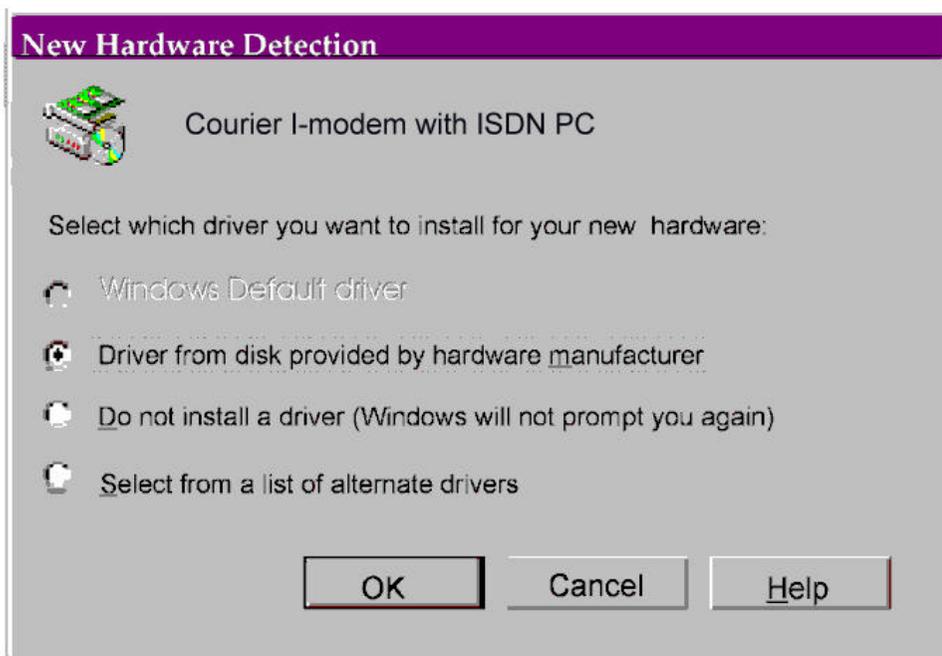
2 Select **Driver from disk provided by hardware manufacturer** and click **OK** to install the INF file that is provided on the root directory (D:\ or the correct path of your CD-ROM) of the *Connections* CD-ROM.

3 When the following window appears, insert your *Connections* CD-ROM, change the default drive (A:\) in "Copy Manufacturer's files from" to D:\ (or the correct path of your CD-ROM) and click **OK** to install the INF file.

Install from Disk   ✕

> Insert the manufacturer's installation disk into the drive selected, and then click OK.
>
> **OK**
>
> **Cancel**
>
> Copy manufacturer's files from:
>
> `A:\`   ▼   **Browse...**
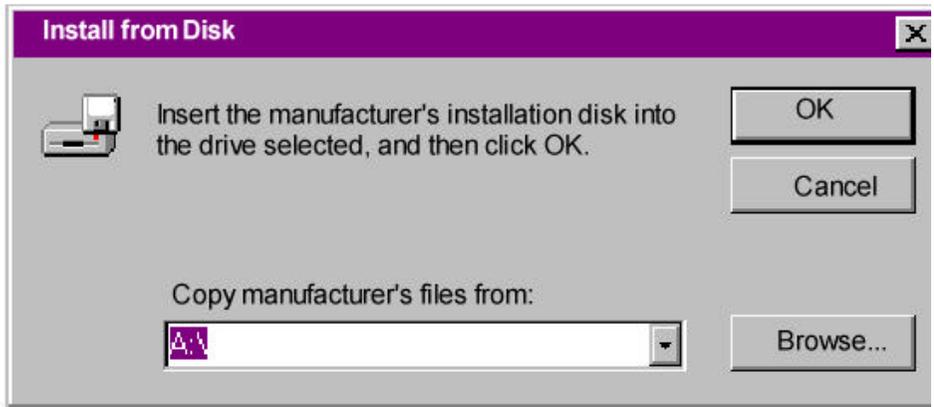
Windows 95 displays the following window asking you to choose your I-modem type from the list:

Install New Modem

> Click the manufacturer and model of your modem. If your modem is not listed, or if you have an installation disk, click Have Disk.
>
> Mode**l**s
>
> | Courier HST Dual Standard Fax+ASL+Cell | ▲ |
> | Courier HST Dual Standard V.32bis+ASL | |
> | Courier I-Modem with ISDN & V.34 | |
> | **Courier I-Modem with ISDN & V.34 PC** | |
> | Courier Terbo Dual Standard Fax | |
> | Courier Terbo Dual Standard Fax PC | |
> | Courier Terbo V.32bis Fax | ▼ |
>
> **Have Disk...**
>
> < **Back** | Next > | Cancel

4 Select the **Courier I-modem with ISDN & V.34 PC (Internal)** or **Courier I-modem with ISDN & V.34 (External)** from the list and click **OK**.

Your I-modem is now ready to use!

Files Needed By Your I-modem

For your I-modem to work most efficiently,
U.S. Robotics recommends that you use the latest version of the following
two files from the U.S. Robotics web site (http://totalservice.usr.com) or
ISDN (847.734.8612) or analog (847.982.5092) BBS.

This file	Does this
The I-modem software	Contains software that contains new feature updates
The INF file	Helps your computer work more effectively with your I-modem

Installing the Latest I-modem Software

See your I-modem *Command Reference Manual* for information about upgrading your Courier's software.

Accessing Your Internet Service Provider

This section explains how to set up your I-modem to access the Internet using Windows 95 Dial-Up Networking. You can also use Dial-Up Networking to access Internet Service Providers (ISPs) or remote LANs. To access your ISP or a remote LAN, you must do the following:

Step One: Determine if Dial-Up Networking is installed.

Step Two: Install Dial-Up TCP/IP support.

Step Three: Set up a connection to your ISP.

Step Four: Customize TCP/IP settings (if necessary).

Step One: Determine if Dial-Up Networking is Installed

1 **Click Start | Settings | Control Panel**.

2 On the Control Panel, double-click on Network to display the Network Window.

Network

Network   ? ✕

Configuration | Identification | Access Control

The following network components are installed:

- Dial-Up Adapter
- SMC EtherCard Elite 16 Ultra (8216, 8216C, 8216T)
- IPX/SPX-compatible Protocol -> Dial-Up Adapter
- IPX/SPX-compatible Protocol -> SMC EtherCard Elite 16
- TCP/IP -> Dial-Up Adapter

Add...   Remove   Properties

Primary Network Logon:

Client for NetWare Networks

File and Print Sharing...

Description
TCP/IP is the protocol you use to connect to the Internet and wide-area networks.

OK   Cancel

If Dial-Up Networking	Do this
Is listed	Go to the section "Installing TCP/IP Support" to install Dial-Up Networking.
Is not listed	Go to Step 3.

3 Return to the Control Panel and double-click on Add/Remove Programs to open the Add/Remove Programs Properties window:

Add/Remove Programs
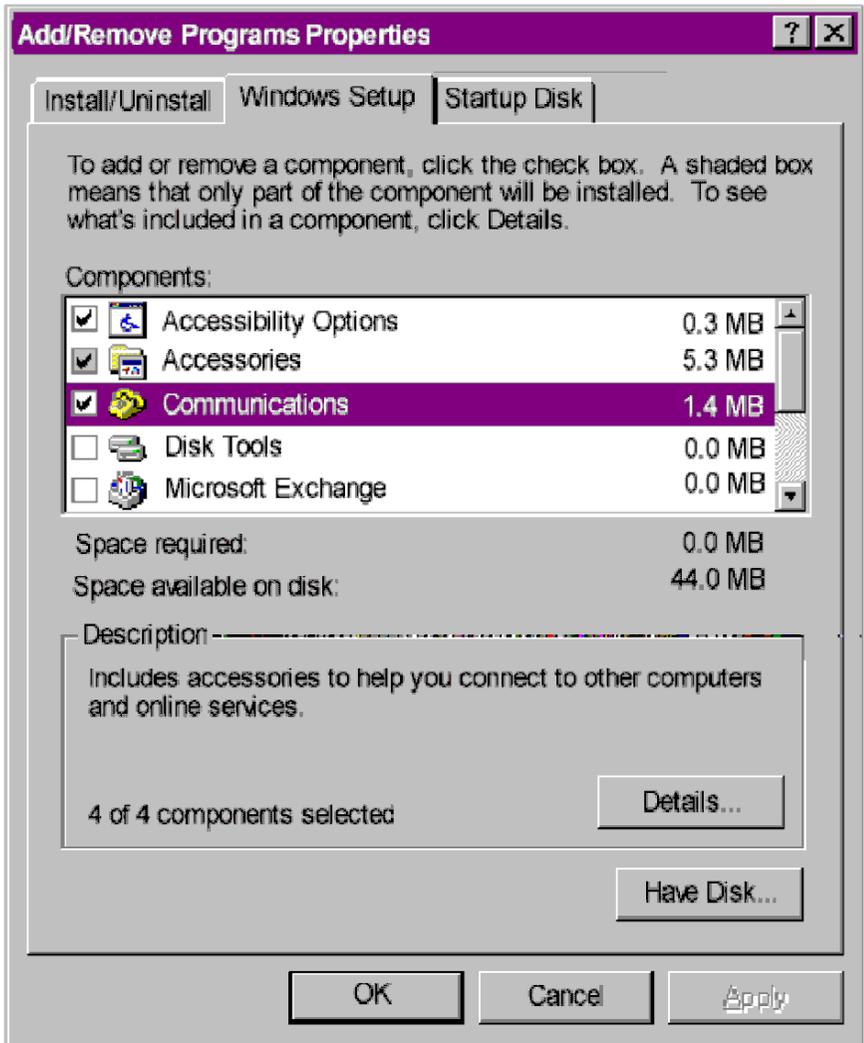
4 Click Windows Setup tab.

5 Double-click on Communications to display the Communications window:
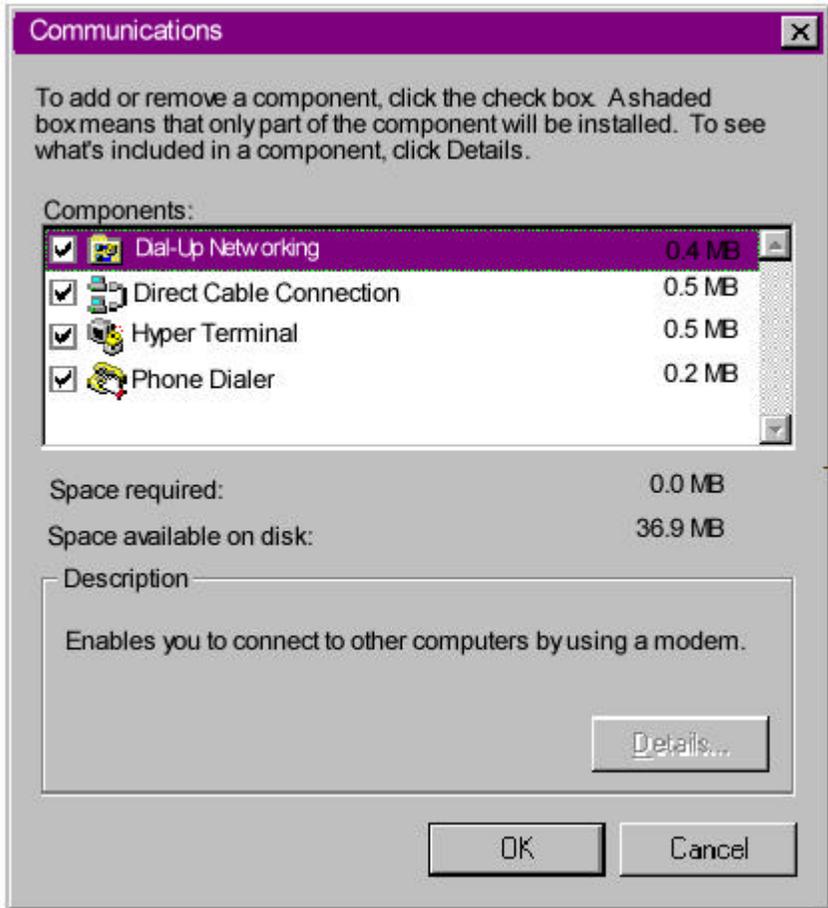
6 Click on Dial-Up Networking to check the box.

7 Click OK | OK.

8 Insert your Windows 95 Setup diskette or CD-ROM when you are prompted, and Windows 95 installs Dial-Up Networking.

Step Two: Installing Dial-Up TCP/IP Support

1 **Click Start | Settings | Control Panel**.

2 On the Control Panel, double-click on the
Network icon to display the following window:

Network
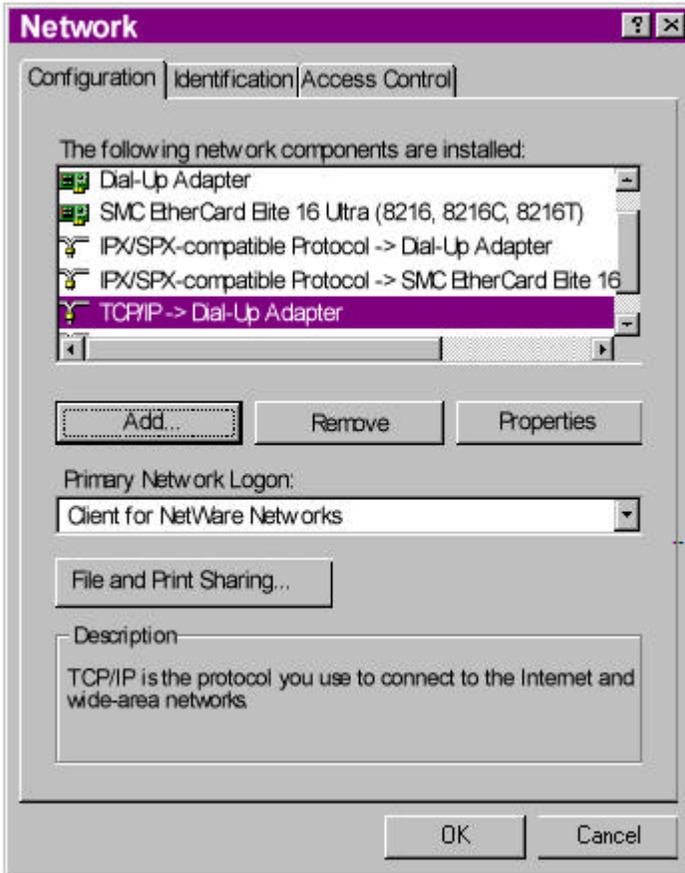
Determine if the TCP/IP Dial-Up Adapter is installed:

IF TCP/IP -> Dial-Up Adapter	Do this
Is not listed	Click **Add…**	**Protocol**	**Microsoft**	**TCP/IP**	**OK**.
	Insert your Windows 95 Setup diskette or CD-ROM when you are prompted, and Windows 95 installs TCP/IP protocol

	support.
Is listed	Read the section "Customize the TCP/IP Settings"

Step Three: Setting Up a Connection to Your ISP

1 Click **Start** | **Programs** | **Accessories** | **Dial-Up Networking**.

2 Double-click Make New Connection.

3 Select the correct Courier modem, if not already selected.

4 Type a name for the connection and click **Next** .

5 Type a phone number for the connection and click **Next**.

Make New Connection

Type the phone number for the computer you want to call:

Area code: Telephone number:

Country Code:

United States of America (1)

< Back   Next >   Cancel
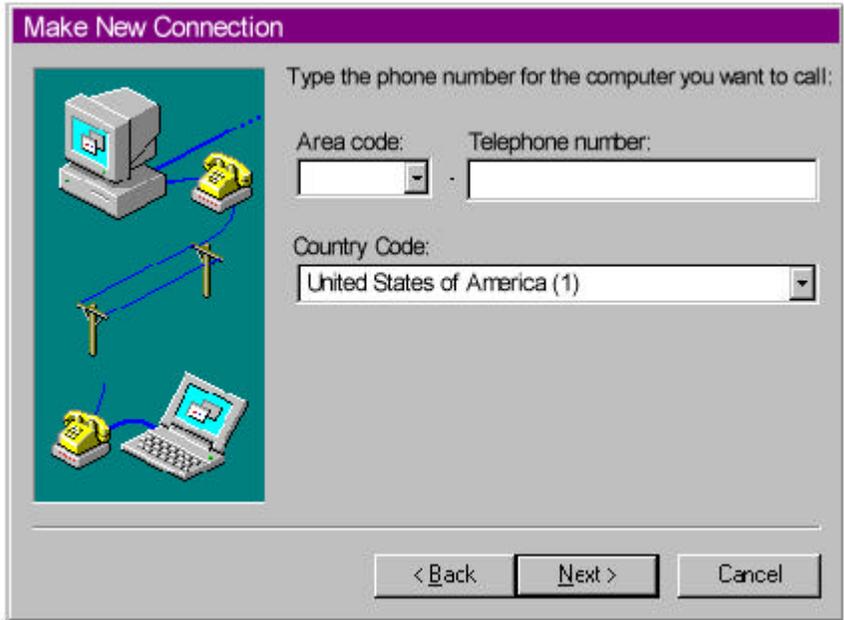
6 You should see a message indicating that a new connection was created successfully.

Make New Connection

You have successfully created a new Dial-Up Networking connection called:

My Connection 2

Click Finish to save it in your Dial-Up Networking folder. Double-click it to connect.

To edit this connection later, click it, click the File menu and then click Properties.

< Back   Finish   Cancel
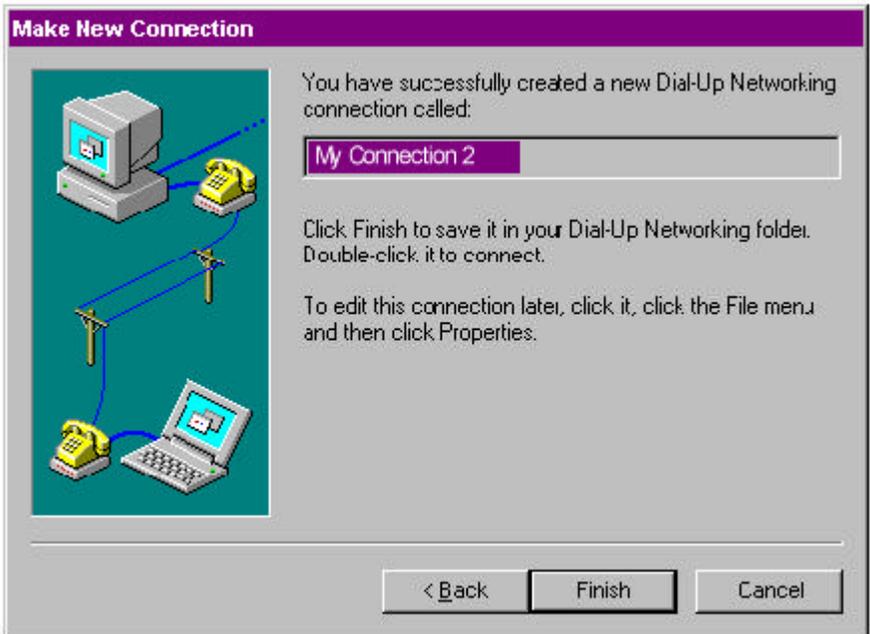
7 Click **Finish**.

8 On the Dial-Up Networking window, move your cursor to the new icon you have just created and click the right mouse button. Select **Properties** on the menu to display the following window:
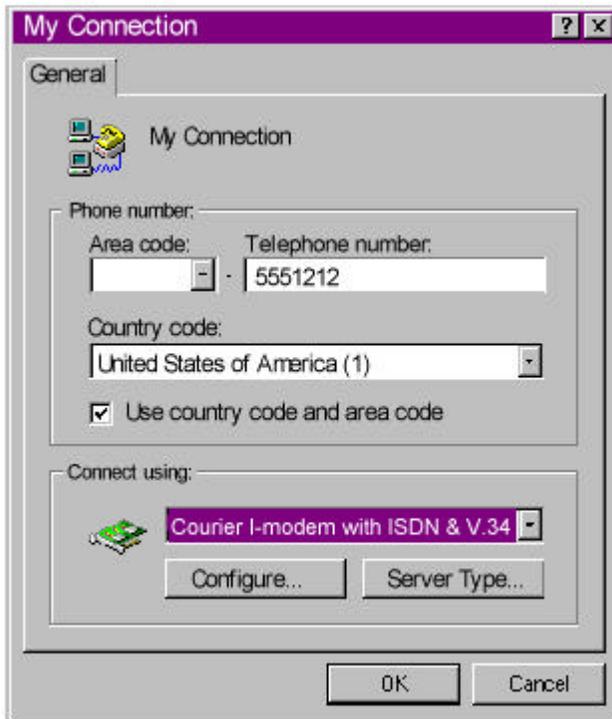
8 On the My Connection window, click **Server Type**…, and deselect the following:

- Log on to Network
- NetBEUI
- IPX/SPX Compatible

9 Click **OK**, and **OK**.

If your ISP	Do this
Gives you specific IP or server addresses	Go to **Step Four: Customizing TCP/IP Settings**
Does not give you specific IP or server addresses	Double-click on the icon you just created to dial your ISP.

Step Four: Customizing the TCP/IP Settings

Depending on the ISP you use, you may need to customize the TCP/IP settings. Contact your ISP for specific information, such as IP address, or domain name servers (DNS).

1 Click My Computer and double-click Dial-Up Networking icon to display all the connections you can customize.

2 Right-click the icon you created and select **Properties** to display the My Connection window.
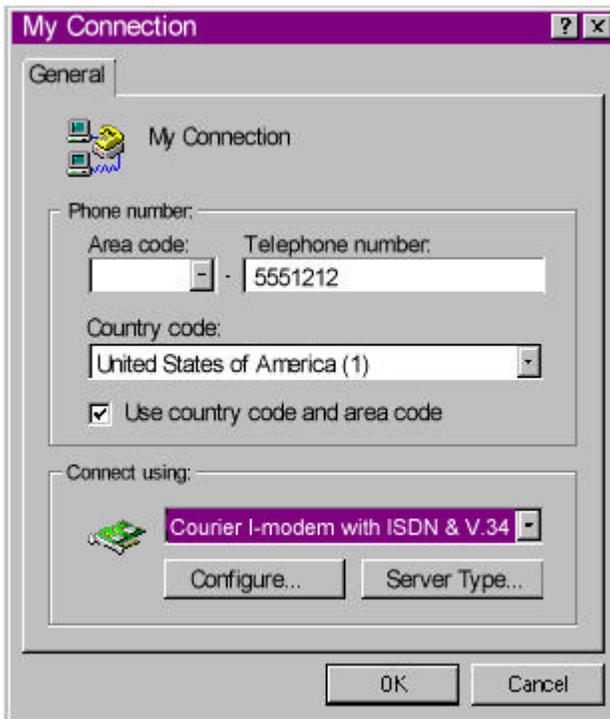
3 On the My Connection window, click **Server Type** to display the
TCP/IP Settings window.
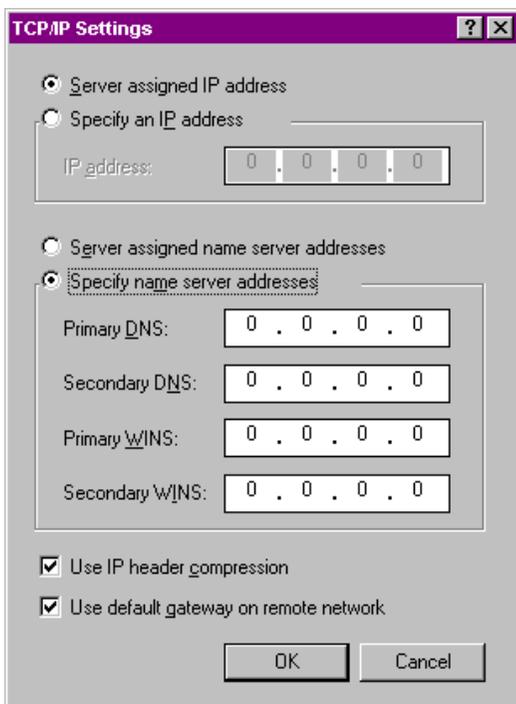
4 Specify an **IP address**, if needed:

If your ISP	Do this
Gives you a specific IP address	Click **Specify an IP address** and enter the IP address provided by your ISP
Does not give you a specific IP address	Click **Server assigned IP address**

5 After you specify an **IP Address**, specify **server assigned server addresses**, if needed:

If your ISP	Do this
Gives you specific server addresses	Click **Specify name server addresses** and enter the server address(es) provided by your ISP
Does not give you specific server addresses	Click **Server assigned server address**

6 Double-click your New Connection icon to connect!

Chapter 9
Configuring Your
I-modem For Macintosh

This chapter explains how to configure your I-modem for use with Macintosh computers.

Handshaking Cable

Use a hardware handshaking cable to connect your I-modem to the Macintosh.

System Configuration

Also, if you aren't using AppleTalk® Remote Access (ARA), set AppleTalk to **Inactive** (in Chooser).

The modem initialization string should be **AT&F1&D0**.

For instructions about how to set up your Macintosh communications software package, visit the U.S. Robotics Totalservice web site at http://totalservice.usr.com.

Accessing the Internet

Accessing the Internet through an ISP requires the following software:

- MacTCP or Open Transport (TCP/IP from the Control Panels menu), which has probably already been installed on your Macintosh
- SLIP or PPP dialing software

Note: You can find public domain PPP dialers (such as MacPPP and FreePPP) on the Internet.

Configuring MacTCP

1 Open the MacTCP control panel.

2 Click **PPP** and **More…**

3 In Obtain Address group box, click **Server**.

4 In Domain Name Server Information, enter the domain name and IP address for one or more domain name servers.

> **Note:** If you don't have domain name server information, contact your ISP.

```
┌─Obtain Address:─┐  ┌──────IP Address:──────┐
  ○ Manually         Class:│ A │ Address: 0.0.0.0
  ⦿ Server              Subnet Mask: 255.0.0.0
  ○ Dynamically      ┌┬┬┬┬┬┬┬┬┬┬┬┬┬┬┬┬┬┬┬┬┬┬┬┐
                      └┴┴┴┴┴┴┴┴┴┴┴┴┴┴┴┴┴┴┴┴┴┴┴┘
                         Net │ Subnet │ Node
                     Bits:  8      0      24

                     Net:    │0      │   ☐ Lock
┌─Routing Information:─┐     Subnet: │0      │   ☐ Lock
  Gateway Address:         Node:   │0      │   ☐ Lock

 │0.0.0.0           │  ┌─Domain Name Server Information:─┐
                        Domain        IP Address  Default
                       │isp.com     │ │199.199.9.9│  ⦿  ⬆
 ╔════╗  ┌────────┐     │isp.com     │ │199.199.8.9│  ○
 ║ OK ║  │ Cancel │     │            │ │           │  ○  ⬇
 ╚════╝  └────────┘
```

When you're finished configuring MacTCP, restart your Macintosh.

Installing MacPPP Dialer

When you install MacPPP for the first time, a PPP icon appears in the MacPPP folder. Put the PPP icon in the Extensions Folder, in the System Folder, and restart your Macintosh.

Configuring ConfigPPP Dialer

1 ConfigPPP is your PPP dialer.

2 Open ConfigPPP and click **New...**

3 Enter your Port Name and click **OK**.

4 Click **Config...** and set your Port Speed (the fastest speed for MacPPP is 57.6 kbps), phone number, and modem initialization string.

5 Click **Authentication...** and enter the user name and password your ISP assigned you.

6 Click **Done**.
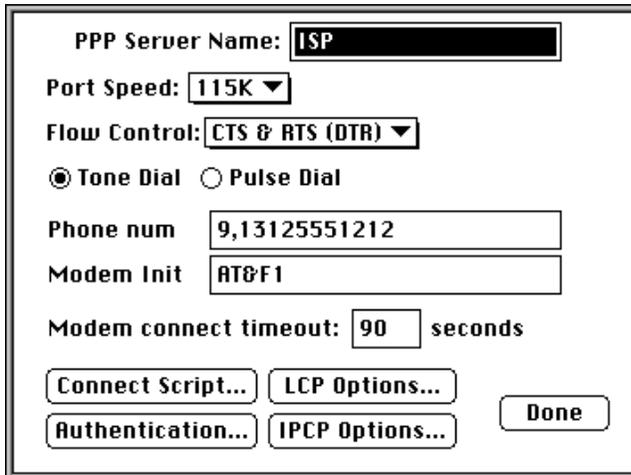
```
PPP Server Name: ISP
Port Speed: 115K ▼
Flow Control: CTS & RTS (DTR) ▼
⦿ Tone Dial   ○ Pulse Dial
Phone num    9,13125551212
Modem Init   AT&F1
Modem connect timeout: 90   seconds

[ Connect Script... ]  [ LCP Options... ]
[ Authentication... ]  [ IPCP Options... ]   [ Done ]
```

Dialing With ConfigPPP

In Config PPP, click **Open**. Config PPP dials your ISP and establishes your PPP connection.

Chapter 10
Configuring Your I-modem
for Other Operating Systems

This chapter explains how to configure your I-modem for:

- Windows 3.x
- Windows NT
- MS-DOS
- OS/2
- UNIX, Linux, or AIX

If You Are Using Windows 3.x

Windows 3.x comes with a built-in communications software package, Windows Terminal. You can use Windows Terminal to test your I-modem or you can install the communications software package that is included on the *Connections* CD-ROM.

Because Windows Terminal only supports speeds up to 19200 bps, it is recommended that you use a third-party communications software package.

For instructions about how to set up your Windows 3.x communications software package, visit the U.S. Robotics Totalservice web site at http://totalservice.usr.com.

If You Are Using Windows NT 4.0

What You Need

You need Windows NT with Remote Access Service (RAS) installed to configure your I-modem for Windows NT.

Configuring Your I-modem

To obtain and install the I-modem INF file for Windows NT, follow the same steps as Windows 95 users.

Installing the Latest I-modem Software

After you obtain the latest I-modem INF file, copy it to the C:\WINNT\INF subdirectory.

For more information about Windows NT, see the Windows NT documentation or visit the U.S. Robotics Totalservice web site at http://totalservice.usr.com.

If You Are Using MS-DOS

Because there is no communications software built in to MS-DOS, you must install and run a third-party communications software package to operate your I-modem.

RapidComm, which is included on the *Connections* CD-ROM, contains MS-DOS and Windows 3.1 versions of RapidComm.

You must choose the COM port to which your I-modem is attached in whatever communications software package you are using.

For instructions about how to set up your MS-DOS communications software package, see the software documentation or visit the U.S. Robotics Totalservice web site at http://totalservice.usr.com.

For Internal Couriers Only

You must choose the COM port, IRQ, and the I/O address within the communications software that you use. These are the standard I/O address and IRQ settings for each COM port:

COM Port	I/O Address	IRQ
COM1	03F8	IRQ4
COM2	02F8	IRQ3
COM3	03E8	IRQ4
COM4	02E8	IRQ3

If You Are Using OS/2

Replace the standard OS/2 serial port drivers COM.SYS and VCOM.SYS with SIO.SYS and VSIO.SYS. You can get these enhanced drivers from the U.S. Robotics web site.

For instructions about how to set up your OS/2 communications software package, visit the U.S. Robotics Totalservice web site at http://totalservice.usr.com.

For Internal Couriers Only

These are the standard I/O address and IRQ settings for each COM port:

COM Port	I/O Address	IRQ
COM1	03F8	IRQ4
COM2	02F8	IRQ3
COM3	03E8	IRQ4
COM4	02E8	IRQ3

Nonstandard COM/IRQ settings are done by adding switches (command line parameters) to the COM.SYS (or SIO.SYS) line in CONFIG.SYS.

For example, to select COM3 and IRQ5, enter the following command line:

```
\OS2\BOOT\COM.SYS /i5/c3
```

If You Are Using UNIX, Linux, or AIX

Linux has a built-in communications software package called minicom. You can obtain minicom on the U.S. Robotics FTP site (ftp.usr.com) in the usr/bin directory.

For instructions about how to set up your UNIX®, Linux, or AIX communications software package, visit the U.S. Robotics Totalservice web site at http://totalservice.usr.com.

These are the standard port names and settings:

Outgoing Calls	Incoming Calls	Port	IRQ	I/O Address
/dev/cua0	/dev/ttyS0	COM1	4	03F8
/dev/cua1	/dev/ttyS1	COM2	3	02F8
/dev/cua2	/dev/ttyS2	COM3	4	03E8
/dev/cua3	/dev/ttyS3	COM4	3	02E8

Use the **setserial** command to tell Linux about any nonstandard COM/IRQ combinations that you may have set using your Courier's jumpers. Setserial also selects serial port speed and I/O port address.

Courier I-modem Getting Started Guide

Chapter 11
Configuring TurboPPP
With AT Commands

This chapter explains how to control TurboPPP with AT commands.

Overview

TurboPPP allows your I-modem to use both B-Channels to send and receive data over the ISDN.

TurboPPP includes the following features:

This feature	Allows the I-modem to
PPP/ML-PPP (Multilink PPP)	Accept PPP/ML-PPP calls
Dynamic Data Bandwidth Allocation (DBA)	Save money by only using the second B-channel when it is need for data transfers, and then dropping the second B-channel when it is not needed

Point to Point Protocol (PPP) / ML-PPP

Your Courier I-modem now supports Originate and Host Mode PPP/ ML-PPP. Host Mode ML-PPP allows you to set the I-modem to accept ML-PPP calls. Originate Mode allows PPP/ML-PPP calls to be made from the I-modem.

Determining TurboPPP Settings

To do this	Use this command
Obtain an overview of TurboPPP settings	**ATI16**

Setting PPP/ML-PPP Host and Originate Mode

Use the following *P settings to control PPP/ ML-PPP:

To do this	Use this setting	Or these settings
Set all PPP-related default values	***P=0**	***V2=5, S68.2=0, S68.3=0, S68.6=0, S69.1=0, *D1=2, *D2=24 *D3=90, *D4=44, *K=1**
Set Asynchronous to Synchronous PPP	***P=1**	**S68.2=1**
Set Single Link TurboPPP	***P=2**	**S68.2=0, S68.3=1**
Set ML-PPP	***P=3**	**S68.2=0, S68.3=0 (default)**

Note: Before you can use this feature you must enable PPP/ ML-PPP using ***V2=5**.

Making Calls With ML-PPP

You can make ML-PPP calls with any PPP dialer.

Making an Outgoing ML-PPP Call

When making an outgoing ML-PPP call, enter the number of the host. If the phone number for two calls is different, you must enter both of them. They must be separated by an '&' as shown below. If only one phone number is given, the same number will be dialed for both calls.

Making an Incoming ML-PPP Call to Your I-modem

When someone attempts to call your I-modem using ML-PPP, they must call the Data number first and the Voice number second.

See the following figures for an example of phone numbers with and without ML-PPP using Windows 95. These rules apply when using terminal programs with other operating systems.

Regular Connection Without ML-PPP

Connection With ML- PPP

Dynamic Data Bandwidth Allocation

Dynamic Data Bandwidth Allocation is a cost savings feature that helps you save money by only using the second B-channel when it is need for data transfers, and then dropping the second B-channel when it is not needed. Dynamic Bandwidth Allocation determines the need for the second B-channel by measuring the amount of data sent or received during a set period of time.

Dynamic Data Bandwidth Allocation settings (*D0, *D1, *D2, *D3, and *D4) determine under which conditions the second link should be brought up or down.

If you enter a value in	TurboPPP does this
*D3 that is more than the time set in *D1	Brings up the second link
*D4 that is less than the time set in *D2	Brings down the second link

Important: Dynamic Bandwidth Allocation is set on by default. To turn off Dynamic Bandwidth Allocation, use ***D0=1**.

Controlling Dynamic Bandwidth Allocation in ML-PPP

Use the following *D0 settings to control Dynamic Bandwidth Allocation:

To do this	Use this setting	Or this setting
Enable Dynamic Bandwidth Allocation in ML-PPP (default).	*D0=0	**S68.6=0**
Disable Dynamic Bandwidth Allocation in ML-PPP	*D0=1	**S68.6=1**

Use the following settings to control the period of time your I-modem samples the throughput in order to determine if the second link needs to be brought up or down:

To set the period of time your I-modem samples throughput to determine	Use this setting	Example
If a second link should be brought up	*D1=n, where n equals 1-255 five second units	***D1=2** (ten seconds)
If a second link should be brought down	*D2=n, where n equals 1 -255 five second units	***D2=10** (50 seconds)

Setting When the Second Link Comes Up

Use the following *D3 setting to determine when the I-modem should bring up a second link:

To do this	Use this setting	Example
Determine when the second link should be brought up, based on the level of utilization of the existing link	*D3=n, where n equals 1 -100%	***D3=90** (90%)

Setting When the Second Link Comes Down

Use the following *D4 setting to determine when the I-modem should bring down a second link:

To do this	Use this setting	Example
Determine when the second link should be brought down, based on the level of utilization of the existing link	*D4=n, where n equals 1-100%	***D4=44**

Enabling the Tone When the Second Link Comes Up

Use the following *T settings to enable the tone when the I-modem brings up a second link:

To do this	Use this setting	Or this setting
Enable tone when second link is brought up (default)	***T=0**	**S69.1=0**
Disable tone when second link is brought up	***T=1**	**S69.1=1**

Using Compression in TurboPPP mode

Courier I-modem supports the following three types of compression modes in TurboPPP.

Pass-through Compression

Pass-through compression allows the terminal applications running on each PC on both ends of the connection to perform compression. Using this form of compression, the Courier I-modem does not perform compression.

Pass-through compression allows for maximum compression by eliminating the serial port bottleneck.

Auto Mode Compression

Auto Mode Compression allows the I-modem to negotiate compression if your application cannot negotiate compression. This is the default.

Turbo Mode Compression

Turbo Mode Compression allows the I-modem to negotiate compression with the remote host and disable compression between the I-modem and your application.

Setting Modes of Compression

Use the following *K settings to use compression in TurboPPP mode:

Use this mode of compression	Use this setting
Pass-through Mode	***K0**
Auto Mode (Default)	***K1**
Turbo Mode	***K2**

U.S. Robotics recommends that you enable the compression in your application software and keep compression set to &K1 (default).

> **Note:** Under Auto Mode Compression (&K1), the I-modem allows your application to negotiate compression. If you have enabled compression in your application and the application successfully negotiates compression, then the I-modem switches to Transparent Mode compression and allows your application do data compression.

I-modem supports a 230 kbps DTE rate using ML-PPP.

Chapter 12
Configuring Your I-modem
With DIP Switches and Jumpers

This chapter explains how to:

- Locate DIP switches
- Configure with DIP switches
- Configure with jumpers (internal I-modem only)

DIP Switches on the External I-modem

Locating DIP Switches

On the external I-modem, the DIP switches are on the bottom of the unit.
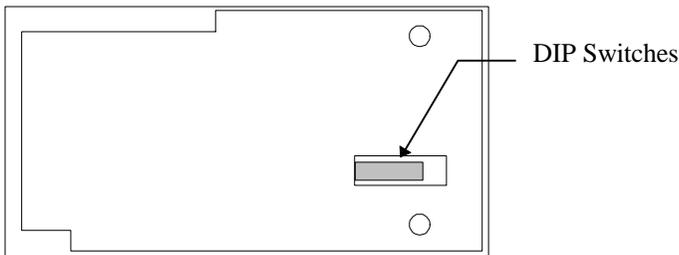

Figure 8.1 DIP Switches on the External Courier

Default DIP Switches (Model U)

Here are the default settings for the Model U I-modem:

To do this	Set DIP Switch	To this setting
Load &FO settings upon reset	1	OFF
Load NVRAM settings upon reset		ON(Default)
Ignore AT commands	2	OFF
Enable AT commands		ON (Default)

Note: On the Model U, DIP switches 3 and 4 are unused.

Default DIP Switches (Model U, V.35)

The V.35 interface is provided so that you can connect the I-modem to a bridge, router, or multiplexer, as a replacement or backup for a CSU/DSU and leased lines.

To change the setting to V.35, flip the DIP switches on the bottom of the I-modem to the following positions (DIP switches 1 and 2 aren't shown in the figure because their settings are not relevant):

Figure 8.2 Default DIP Switches for the External Model U Courier

Default DIP Switches (Model S/T)

If you have Model S/T, the default DIP switches are the same as in figure 8.2.

In addition, there are additional default settings: DIP switch 1 and 2 are set ON. DIP switch 3 through 12 are set OFF.

Use the following chart to set termination on the Model S/T.

To set this termination	Set these DIP switches
0 Ohm termination	9 through 12 OFF
50 Ohm termination	9 and 11 OFF
	10 and 12 ON
100 Ohm termination	9 and 11 ON
	10 and 12 OFF

DIP Switches on the Internal I-modem

Locating DIP Switches

On the internal I-modem, the DIP switches are on the end of the unit.
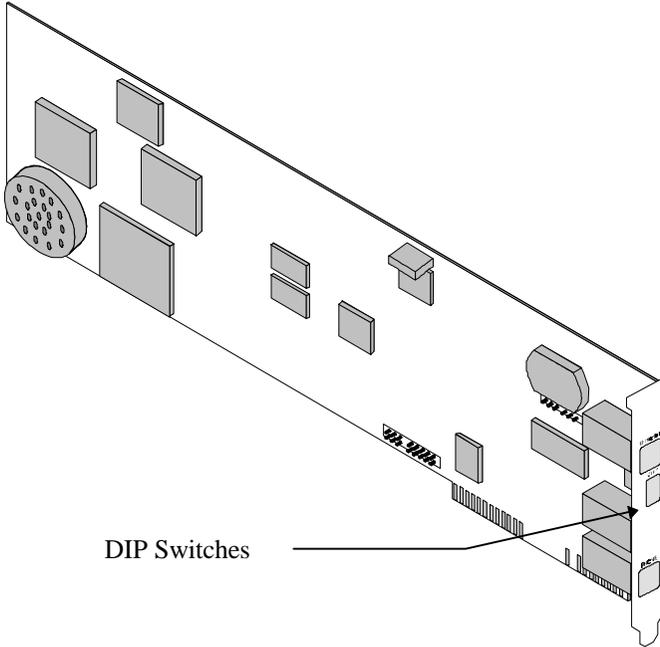
DIP Switches

Figure 8.5 DIP Switches on the Internal Courier

Default DIP Switches

DIP switches 1 and 2 are set ON. DIP switches 3 and 4 are unused.

Using DIP Switches to Configure Your I-modem

To do this	Set DIP Switch	To this setting
Load &FO settings upon reset	1	OFF
Load NVRAM settings upon reset		ON(Default)
Ignore AT commands	2	OFF
Enable AT commands		ON (Default)

Note: DIP switches 3 and 4 are unused.

Jumpers on the Internal I-modem

Locating Jumpers

Your internal I-modem is set to Plug and Play. You shouldn't have to change this setting, however, if you have multiple devices connected to your system, you may need to change the jumper settings to avoid hardware conflicts.
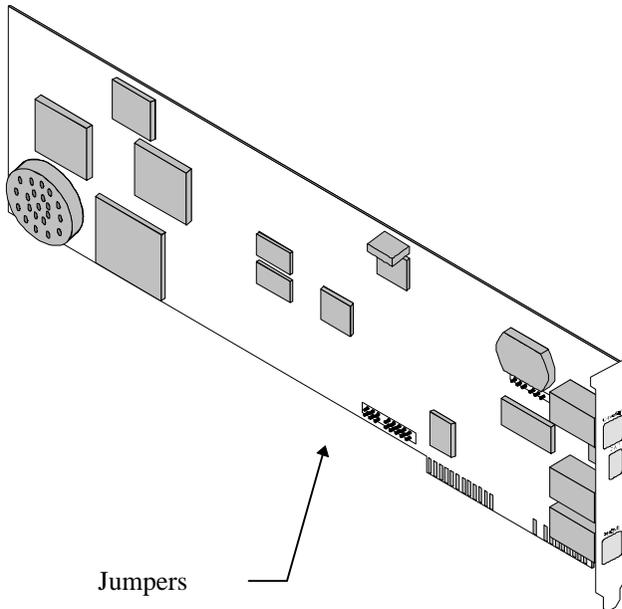
Jumpers

Figure 8.8 Jumpers on the Internal Courier

Changing Jumper Settings

You can add shunts (see figure 8.9) to cover sets of pins on the jumper blocks (see figure 8.8).

Caution: If you do not have any hardware conflicts, you do not need to use this section.

To change jumper settings, use tweezers or needle-nosed pliers and gently rock the jumper back and forth as you lift.
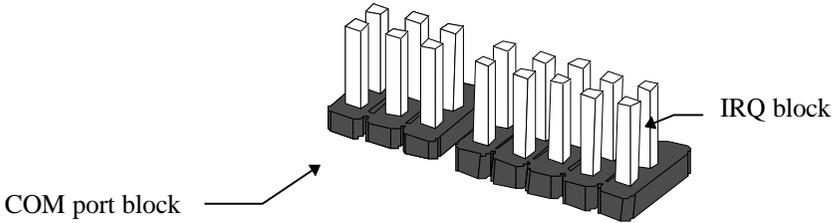

IRQ block

COM port block

Figure 8.9 Jumper Blocks Without Shunts

Figure 8.10 Shunt

Note: Do not grasp the shunts too firmly. If you grasp them too firmly, you may crush the shunt or damage the modem.
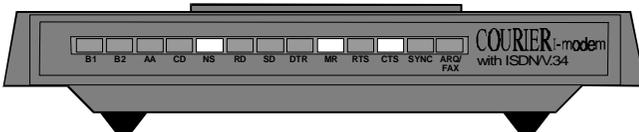
Setting Jumpers for a Specific COM Port or IRQ

To set your modem to	To set the COM port jumpers to
COM 1	
COM 2	
COM 3	
COM 4	
Plug and Play	

Setting Jumpers for a Specific IRQ

To set your modem to	To set the IRQ jumpers to
IRQ 2	
IRQ 3	
IRQ 4	
IRQ 5	
IRQ 7	

This chapter explains how to view the twelve LEDs on the front of your external I-modem.

This LED	Status	Means your I-modem
B1	Green blink (8/sec)	Digital call connected at 64 or 56 kbps.
	Green blink (1/sec)	Analog modem or fax call connected.
	Green	Voice call connected.
	Off	Not connected.
B2	Green blink (8/sec)	Digital call connected at 64 or 56 kbps.
	Green blink (1/sec)	Analog modem or fax call connected.
	Off	Not connected.
AA	On	Will auto answer calls
	Blinking	Has detected an incoming call
	Off	Will not auto answer calls
CD	On	Has detected a carrier from a remote device or carrier-detect has been forced on
	Off	Has not detected a carrier

This LED	Status	Means your I-modem
NS	Green	Line ready
	Green blink (1/sec)	S/T-interface OK, but line not yet ready
	Red blink (1/sec)	Incorrect SPID
	Amber blink (1/sec)	Looking for S/T-interface
	Red	U-interface not found (I-modem Model U)
	Amber blink (8/sec)	Looking for U-interface (I-modem Model U)
	Off	The I-modem does not have control of the line.
RD	Flashing	Is sending data to your computer
	Off	Is idle
SD	Flashing	Is receiving data from your computer
	Off	Is idle
DTR	On	Has received a Data Terminal Ready (DTR) signal from your computer
	Off	Has not detected DTR
MR	On	Configurable. See *Command Reference* Manual
	Flashing	Is retraining with a remote device or is in Test mode
	Off	Configurable. See *Command Reference* Manual
RTS	On	Has detected the Request to Send (RTS) signal from your computer
	Off	Has not detected the RTS signal from your computer
CTS	On	Is sending your computer the Clear to Send (CTS)
	Off	Is not sending your computer the CTS signal
SYNC	On	Is in synchronous mode
	Blinking	Has activated Dial Security
	Off	Is not in synchronous mode/Dial Security not active
ARQ/FAX	On	Is using V.42 *bis* error correction
	Flashing	Is retransmitting data to the remote modem
	Blinking	Is in fax mode
	Off	Is not using error control, not retransmitting data, and not faxing

Use this chapter to:

- Determine if your I-modem has x2 enabled
- Use the new features

Enhanced x2 Features

Your I-modem with x2™ has new result codes and the following new features.

To do this	Use this command
Detemine if x2 is enabled in your modem	**ATI7**
Disable or enable x2	**ATS58**
Limit the upper speed limit of an x2 connection	**AT&N**
Limit the lower speed limit of an x2 connection	**AT&U**

Note: New x2 features should be transparent to most users. If you are an advanced user, see the sections "Controlling x2" and "Controlling Link Speeds with &N and &U" later in this chapter for detailed information regarding these features.

How to Tell if x2 is Enabled in Your I-modem

If you aren't sure whether x2 is enabled in your I-modem, use the ATI7 command to display product configuration information. If x2 is enabled on your I-modem, the following information displays:

```
USRobotics I-modem Configuration Profile...
Copyright, 19xx-96, U.S. Robotics. All rights reserved.


Product type            US/Canada External
Options                 HST,V32bis,Terbo,VFC,V34+,x2
Fax Options             Class 1,Class 2.0
Clock Freq              {Clock Frequency}
Eprom                   256k
Ram                     32k


Supervisor date         {Date}
DSP date                {Date}


Supervisor rev          {x.x.x}
DSP rev                 {x.x.x}


Serial Number           {serial number}


OK
```

Note: Dates, serial numbers, revision numbers, and Clock Frequencies may vary. The most important line is the "Options" line, which lists support for x2.

Obtaining x2

For information about how x2 works, visit the x2 web site at
http://www.usr.com/x2

How x2 Works

For information about how x2 works, visit the x2 web site at
http://www.usr.com/x2

Controlling x2

The I-modem allows you to communicate using x2 Server Mode and x2
Symmetric Mode.

x2 Server Mode

Using x2 Server Mode, you can accept calls from x2 client modems.
Using this mode, the x2 client modem that connects to your I-modem can
receive data at speeds up to 56 kbps and send data at V.34 speeds.

x2 Symmetric Mode (Host Mode)

Using x2 Symmetric Mode, your I-modem can connect at speeds of 56 or
64 kbps in both directions over a 3.1 kHz voice call (*V2=3). For x2
Symmetric Mode to work, our I-modem must connect to a modem using
x2 Symmetric Mode, such as another I-modem.

Note: In some areas, 3.1 kHz voice calls over ISDN are cheaper than data
calls.

Use the following S58 settings to control x2:

To do this	Use this command
Disable x2	**S58.0=1**
Force A-law mode	**S58.2=1**
Disable Symmetric Mode	**S58.3=1**

Note: A-law is required in all countries but the United States, Canada,
Japan, Taiwan, and Hong Kong. If you are using your
I-modem in one of these countries, do not force A-law mode.

Controlling Link Speeds with &N and &U

You can use the &N and &U commands to control link speeds. Couriers
without x2 can still use the &N and &U commands, but can only control
link speeds up to 33.6 kbps.

Controlling Link Speeds

You can use the &N and &U commands to control the link speeds of your I-modem with x2. Use the following table to determine how to use &N and &U commands:

To limit the	Use
Highest possible connect speed	&N
Lowest possible connect speed	&U
Range of possible connect speeds	&N and &U

Table 14.1 Using Link Speeds

Note: The default values for &N and &U are 0. If you change these values, you will limit the speeds at which you can connect. U.S. Robotics recommends that you do not alter these values.

Limiting the Highest Possible Connect Speed

The &N command allows you to limit the highest possible connect speed. If a remote modem attempts to connect to your Courier with x2 at a speed higher than &N, your Courier with x2 will not allow it to connect.

To limit the	Use this command	Where x is
Highest possible connect speed	**AT&N=x**	**A value from 0 to 32**

Limiting the Lowest Possible Connect Speed

The &U command allows you to limit the lowest possible connect speed. If a remote modem attempts to connect to your Courier with x2 at a speed lower than &U, your Courier with x2 will not allow it to connect.

To limit the	Use this command	Where x is
Lowest possible connect speed	AT&U=x	A value from 0 to 32

Limiting a Range of Possible Connect Speeds

By setting &N and &U values, you can limit the range of speeds at which your Courier with x2 connects. If a remote modem does not connect to your Courier with x2 at a range between the speeds designated by the &N and &U commands, your Courier with x2 will not allow it to connect.

Note: The link speed associated with the &U argument cannot be greater than the link speed associated with &N argument.

Use the following table to understand the relationship between &U and &N commands:

If &U	And &N	Then your modem
Equals zero	Equals zero	Connects at the highest possible speed.
	Is greater than zero	Connects at the &N speed only.
Is greater than zero	Is greater than zero and greater than &U	Connects at the highest possible speed in the range from &U to &N.

Table 14.2 Constraints on Link Speed

&N and &U Command Values

Use the following table for a complete list of &N and &U link speeds and their associated indexes:

Link Speed	Index	Link Speed	Index	Link Speed	Index
Highest	0	21600	11	45333	22
300	1	24000	12	46666	23
1200	2	26400	13	48000	24
2400	3	28800	14	49333	25
4800	4	31200	15	50666	26
7200	5	33600	16	52000	27
9600	6	33333	17	53333	28
12000	7	37333	18	54666	29
14400	8	41333	19	56000	30
16800	9	42666	20	57333	31
19200	10	44000	21	64000	32

Table 14.3 Link Speeds and Indexes

Note: For x2-mode links, &N and &U are used to constrain the speed of the higher speed direction of the link.

Troubleshooting x2 Client Connections

Use the chart below to understand issues affecting your I-modem with x2 and how to fix them:

This may be the issue	Do this	
x2 may not be enabled on your Courier.	See the section "How to Tell if x2 is Enabled" (Use the **ATI7** command)	
Several conditions may exist.	Use the **ATI11** command and check the "x2 status" field for more information.	
	If this message appears	**You cannot use x2 because**
	"Multiple CODECS in channel"	There are multiple analog-to-digital conversions on the channel.
	"Remote modem is not x2"	The remote modem does not support x2.
	"Channel is x2-capable but feature is not installed"	You have not purchased x2.
Your Courier may be connected to the public network via a PBX or other telephone equipment with analog-to-digital and digital-to-analog conversions.	Contact your telephone equipment vendor for information about obtaining pure analog service. Due to extra analog-to-digital conversions performed by some PBX's and other telephone equipment, x2 client modems may not be able to make x2 connections.	
There is another issue.	Do the following: • Visit the U.S. Robotics x2 Web Site at http://totalservice.usr.com • Contact U.S. Robotics Technical Support at 800.231.8770	

This should only be used by client modems (such as Sportster or Courier) that are attempting to connect to your I-modem.

New x2 Result Codes

Use the following table for a list of all result codes, including new x2 result codes:

Numeric	Alphanumeric
180	`CONNECT 33333`
181	`CONNECT 33333/ARQ`
182	`CONNECT 33333/x2`
183	`CONNECT 33333/ARQ/x2`
184	`CONNECT 37333`
185	`CONNECT 37333/ARQ`
186	`CONNECT 37333/x2`
187	`CONNECT 37333/ARQ/x2`
188	`CONNECT 41333`
189	`CONNECT 41333/ARQ`
190	`CONNECT 41333/x2`
191	`CONNECT 41333/ARQ/x2`
192	`CONNECT 42666`
193	`CONNECT 42666/ARQ`
194	`CONNECT 42666/x2`
195	`CONNECT 42666/ARQ/x2`
196	`CONNECT 44000`
197	`CONNECT 44000/ARQ`
198	`CONNECT 44000/x2`
199	`CONNECT 44000/ARQ/x2`
200	`CONNECT 45333`
201	`CONNECT 45333/ARQ`
202	`CONNECT 45333/x2`
203	`CONNECT 45333/ARQ/x2`
204	`CONNECT 46666`
205	`CONNECT 46666/ARQ`
206	`CONNECT 46666/x2`

New x2 Result Codes (Continued)

Numeric	Alphanumeric
207	CONNECT 46666/ARQ/x2
208	CONNECT 48000
209	CONNECT 48000/ARQ
210	CONNECT 48000/x2
211	CONNECT 48000/ARQ/x2
212	CONNECT 49333
213	CONNECT 49333/ARQ
214	CONNECT 49333/x2
215	CONNECT 49333/ARQ/x2
216	CONNECT 50666
217	CONNECT 50666/ARQ
218	CONNECT 50666/x2
219	CONNECT 50666/ARQ/x2
220	CONNECT 52000
221	CONNECT 52000/ARQ
222	CONNECT 52000/x2
223	CONNECT 52000/ARQ/x2
224	CONNECT 53333
225	CONNECT 53333/ARQ
226	CONNECT 53333/x2
227	CONNECT 53333/ARQ/x2
228	CONNECT 54666
229	CONNECT 54666/ARQ
230	CONNECT 54666/x2
231	CONNECT 54666/ARQ/x2
232	CONNECT 56000

New x2 Result Codes (Continued)

Numeric	Alphanumeric
233	CONNECT 56000/ARQ
234	CONNECT 56000/x2
235	CONNECT 56000/ARQ/x2
236	CONNECT 57333
237	CONNECT 57333/ARQ
238	CONNECT 57333/x2
239	CONNECT 57333/ARQ/x2
240	CONNECT 64000
241	CONNECT 64000/ARQ
242	CONNECT 64000/x2
243	CONNECT 64000/ARQ/x2

Table 14.4 New Result Codes

There is a complete list of result codes in your
I-modem Command Reference.

Appendix A
Other I-modem Features

This chapter explains how to use new features not covered in the *Courier I-modem Command Reference* manual.

Data Over Voice

Data Over Voice (DOV) is a feature that allows the I-modem to make more cost effective 3.1 kHz analog calls while allowing the I-modem to send digital data at 56 kbps.

Note: DOV is becoming widely used due to the fact that Regional Bell Operating Companies usually charge less for analog calls than digital calls. DOV allows users to pay a lower fee while taking advantage of the digital transmission.

Protocols Supported by Data Over Voice

You can use Data Over Voice with V.120 and Multilink PPP calls.

Configuring Data Over Voice

Use the following *V2 settings to control Data Over Voice:

To force	Use these commands
V.120 DOV calls	***V2=0** and **S69.5=1**
Multilink PPP DOV calls	***V2=5** and **S69.5=1** and the usual PPP setting
Incoming analog Multilink PPP calls through the data port	***V2=5**, **S69.5=1** and **S67.2=1** and the usual PPP setting

Period Dial Modifier

The period ('.') dial modifier is used to send DTMF tones after the telephone number is dialed. The period dial modifier can be used with the comma (',') dial modifier to insert delay between the numbers as appropriate for the application. A typical application for the period dial modifier is use with PBX systems.

Example: **ATDT18479335200.980234**

In this example, 18479335200 will be dialed using ISDN signaling, then 980234 will be dialed using in band DTMF signaling.

PCSDL vs. XMODEM

In certain situations, such as running under a multitasking OS such as Microsoft Windows 95, you may experience difficulty performing a software download using PCSDL. As a result, U.S. Robotics recommends using PCSDL under *DOS only* or performing software download using the XMODEM file transfer protocol as described in the *Courier I-modem Command Reference* in section 17-2.

230 kbps DTE Rate Under Windows®

If you are using a Windows® 95 terminal program, you will be unable to set your transmission speed to 230 kbps.

230 kbps in Internal I-modems

The I-modem operates at 230 kbps when appropriate regardless of the transmission speed setting.

Note: Windows does not display the actual data rate for internal I-modems.

230 kbps in External I-modems

To take advantage of the 230 kbps data rate, you may need to purchase a high speed (230 kbps) serial card.

Note: Depending on the serial card you purchase, the actual data rate may not appear correctly in Windows. Consult the serial card documentation if this problem occurs.

Saving Money With Analog Calls

By default, the I-modem anticipates the rare occasion that telephone company equipment incorrectly allows a digital connection when you call a modem or fax machine. In these situations, although the I-modem proceeds with the call as a standard analog (fax or modem) call, the telephone company bills the call as digital.

Digital and Analog Billing Structures

Often the billing structure for digital ("data") calls is different than for analog ("3.1 kHz audio") calls. In some areas, telephone companies charge a flat rate for analog local calls and bill digital calls by usage at a metered rate. Although all long-distance calls are typically metered, long-distance digital calls tend to be slightly more expensive than long-distance analog calls.

To do this	Use this setting
Prevent the I-modem from behaving like a fax/modem over digital connections	**S68.0=1**

When you use this setting, and the I-modem detects an analog device over a digital connection, it ends the call. If you check the call status information by sending I6 , the I-modem reports:

```
Disconnect Reason is Analog Destination Over a Digital
Network Connection.
```

Forcing Analog Calls

If your calls to analog devices fail and you can't figure out why, you can always:

To do this	Use this setting
Force analog calls (and be billed at analog rates)	***V2=3**

Courier I-modem Getting Started Guide

Appendix B
Technical Information

This chapter describes technical and serial port information.

Technical Specifications

Standards Compatibility

Your I-modem uses multiple standard data communications protocols and is also compatible with many nonstandard schemes. The following schemes are supported:

ISDN

This standard	Supports
ITU-T Q.921	ISDN data link layer
ITU-T Q.931/I.451	ISDN call control signaling variants: • AT&T 5ESS Custom • Northern Telecom DMS-100 • National ISDN-1 • National ISDN-2
ITU-T V.120/I.463	Encapsulates asychronous or synchronous data for transmission over the ISDN at 56 or 64 kbps.
ITU-T V.110/I.462	Encapsulates asychronous or synchronous data for transmission over the ISDN at 56 or 64 kbps.

Modulation

This modulation	Supports
x2	Up to 56 kbps downstream and V.34 speeds upstream
ITU-T V.34	33.6/31.2/28.8/26.4/24/21.6/19.2/16.8/14.4/12 kbps; 9600/7200/4800 bps asynchronous Trellis Coded Modulation (TCM)
V.FC	28.8/26.4/24/21.6/19.2/16.8/14.4 kbps asynchronous TCM
V.32 *terbo*	21.6/19.2/16.8/14.4/12 kbps; 9600/7200 bps asynchronous TCM; 4800 bps asynchronous Quadrature Amplitude Modulation (QAM)
HST	16.8/14.4/12 kbps; 9600/7200 bps asynchronous, asymmetrical, 450 bps back channel with automatic handshake adjustment to 300 bps TCM and QAM; 4800 bps asynchronous, asymmetrical, 450 bps back channel with automatic handshake adjustment to 300 bps QAM.
ITU-T V.32 *bis*	14.4/12 kbps; 9600/7200 bps asynchronous TCM; 4800 bps asynchronous QAM
ITU-T V.32	9600 bps asynchronous, TCM; 4800 bps asynchronous, QAM
ITU-T V.22 *bis*	2400 bps asynchronous, QAM
Bell 212A	1200 bps (also V.22) asynchronous, Differential Phase Shift Keying (DPSK)
ITU-T V.23	1200 bps asymmetrical with 75 bps back channel with Frequency Shift Keying (FSK), used by some U.K. and European phone systems.
Bell 103	300 bps (ITU-T V.21 optional) asynchronous, Frequency Shift Keying (FSK)

Error Control, Data Compression, Testing, and Dialing

This	Supports
ITU-T V.42	LAPM error control, 1200 bps and higher
MNP	Levels 2, 3 and 4 error control, level 5 data compression, 1200 bps and higher
HST	Asymmetrical mode, at 16.8/14.4/12 kbps; 9600/ 7200/4800 bps, 450/300 bps back channel
ITU-T V.42 *bis*	Data compression, 1200 bps and higher
ITU-T V.54	Digital and remote digital loopback testing
ITU-T V.25 *bis*	Dialing and answering method for automatic calling and/or answering equipment

Fax

Your I-modem provides Group III-compatibility when controlled by Class 1 or Class 2.0 fax software. In addition, your I-modem adheres to the following standards:

This	Supports
TIA/EIA-578	Service Class 1 Asynchronous Facsimile DCE Control Standard
TIA/EIA-592	Service Class 2.0 Asynchronous Facsimile DCE Control Standard
ITU-T V.17	14.4/12 kbps
ITU-T V.29	9600/7200 bps
ITU-T V.27 *ter*	4800/2400 bps
ITU-T V.21	300 bps

Additional Specifications

This feature	Supports		
Serial port	DB-25		
Serial interfaces	EIA RS-232		
Supported serial port rates	230400, 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200, and 300 bps		
Adaptive Speed Leveling (ASL)	21600, 19200, 16800, 14400, 12000, 9600, 7200, and 4800 bps		
ISDN physical interface	RJ45 jack		
Communications channel	ISDN B-channels		
Data format	Binary, serial; defaults to 8-bit word length, no parity, and 1 stop bit.		
	Word Length	**Parity (1 Bit)**	**Stop Bits**
	7	Even, Odd	1
	8	None	1
Flow Control Buffers	Variable sizes		
Command Buffer	56 characters, excluding the AT prefix, Carriage Return, and spaces		
Test Options	Remote digital loopback, digital loopback, test pattern, and dial test		
Failed Call Timeout	60 second default, programmable 2-255 sec.		
Answer Tone Timeout	60 seconds		
Answer Tone Detector	2080-2120 Hz		
Loss of Carrier (Disconnect Timer)	0.7 second default, programmable 0.2-25.5 sec.		
Equalization	Adaptive		
Receive Sensitivity	- 44 dBm $\pm$ 2 dBm		
Transmit Level	- 9 dBm maximum		
Transmitter Frequency Tolerance	.01%		

This feature	Supports
Certification	FCC Part 68 and Part 15, Class B Domestic; IC (Canada) CS-03, UL listed

Ringer Equivalence

Ringer Equivalence Number: **3**

Ringer equivalence is defined as the maximum sum of the REN values for all the analog devices that are attached to the I-modem. Because a typical telephone has a REN value of 0.6, the I-modem can support up to five phones connected through the Analog Device port over short loops.

Power Consumption

At	Normal	Peak
+5 V	800 mA	1500 mA
+12 V	250 mA	350 mA
-12 V	20 mA	50 mA

Serial Ports

Most computers provide a DB-25 or DB-9 port that conforms to the EIA-232 standard. If you are connecting your I-modem to a Macintosh computer, see the section *For Macintosh Computers*.

The EIA-232 Interface

The I-modem's serial port is factory set to signal according to the EIA-232 standard:
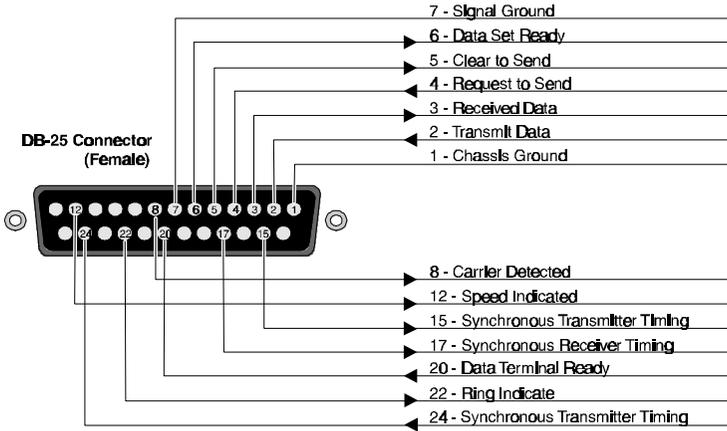
Figure B.1 Signals at your Courier's Serial Port.

Wiring a DB-25 to DB-9 Cable

DB-9 connectors for PCs should be wired at the computer end of the cable as shown below.
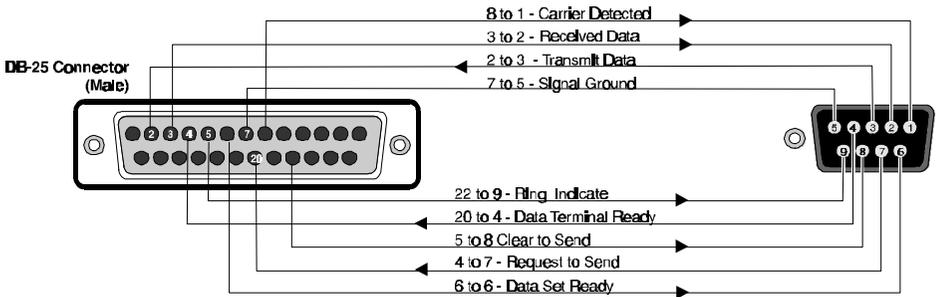
Figure B.2 Wiring a DB-25 Cable

Minimum Requirements

Some computer/terminal equipment supports only a few of your I-modem's EIA-232 signals. The minimum required for your I-modem to operate asynchronously follows:

DB-25	DB-9	Supports this signal
Pin	Pin	Function
2	3	Transmitted Data
3	2	Received Data
7	5	Signal Ground
20	4	Data Terminal Ready

Flow Control Requirements

If your computer and software support Clear to Send and you wish to use Transmit Data hardware flow control (&H1), Pin 5 (DB-25) or Pin 8 (DB-9) is required.

If your computer and software support Request to Send and you wish to use Received Data hardware flow control (&R2), Pin 4 (DB-25) or Pin 7 (DB-9) is required.

For Macintosh Computers

If you're connecting your I-modem to a Macintosh computer, we strongly recommend that you purchase a hardware handshaking cable to get the most reliable performance.
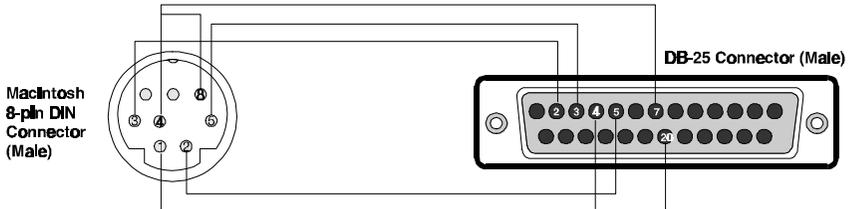
Figure B.3 Macintosh Computer Cable Pinout

Mac Pin	Mac Pin Description	Modem Pin	Modem Pin Description
1	Output Handshake	4, 20	Request-to-Send and Data Terminal Ready
2	Input Handshake	5	Clear-to-Send
3	Transmit Data -	2	Transmit Data
4	Ground	7	Ground
4, 8	Ground to Received Data		
5	Received Data -	3	Received Data

Serial Ports (Macintosh modem)

These are the signals generated or accepted by your I-modem's serial port:
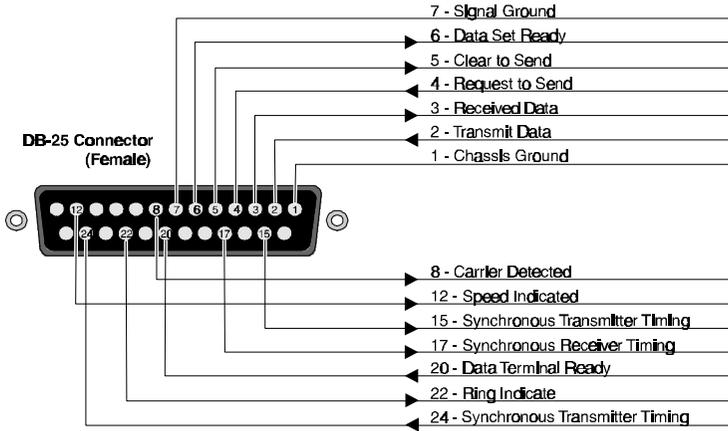
Figure B.4 Pinouts for your Courier's Serial Port
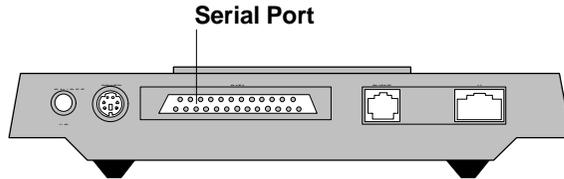
Serial Port

Figure C-1. Location of the Serial Port.

Choosing a Serial Cable

Obtain a serial cable. Use the chart below to determine what type of cable to purchase:

If you have a serial connector in the back of your computer that looks like this	You need to purchase this type of shielded serial connector
	DB-25 female connector to DB-25 female connector
	DB-25 female connector to DB-9 female connector
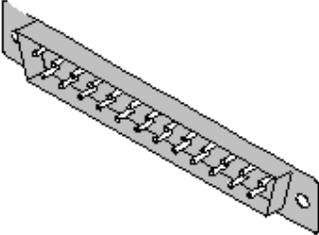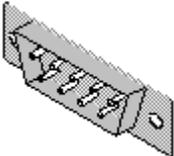
Notes for Macintosh Users

For top performance, your serial port should support speeds of 115.2 kbps. Most Macintosh serial ports support 57.6 kbps. To make your

serial port operate faster, you may need to install a high-speed serial card designed for the Macintosh, such as a NuBus card.

Notes for Mainframe Users

If you plan to connect your Courier I-modem to a mainframe computer or use your Courier to dial in to a mainframe computer, refer to Synchronous Applications in your Courier *I-modem Command Reference* manual.

Macintosh

These are the signals generated or accepted by the I-modem's serial port:
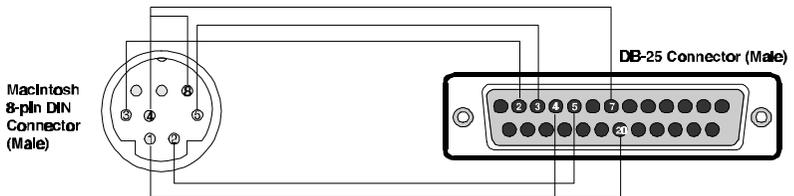
Figure C-2. Pinouts for the Courier's Serial Port.

U.S. Robotics Access Corp. Limited Warranty

Terms of the Limited Warranty

Your U.S. Robotics® product is covered by a Limited Warranty.
U.S. Robotics warrants that the product that you have purchased from U.S.
Robotics or from a U.S. Robotics authorized reseller is free from defects in
materials or workmanship during the Limited Warranty period, identified in the
chart below, which is effective on the date of purchase.

During the Limited Warranty period, U.S. Robotics will repair or replace the
product with the same or a similar model, which may be a remanufactured unit,
at U.S. Robotics option, without charge for either parts or labor. Replacement
parts assume the remaining warranty of the parts they replace. This Limited
Warranty extends only to the original purchaser and is non-transferable.

The chart below identifies the terms of the factory repair/replacement warranty, as well as software/firmware updates and telephone support services included with the U.S. Robotics Limited Warranty.

	Free Telephone Support	**Free Software/ Firmware Updates**	**Hardware Support**
LANLinker Product Family	For 90 days, effective upon purchase	For 90 days, effective upon purchase	1 year Factory Repair/ Replacement
Total Control **Product Family**	For 90 days, effective upon purchase	For 90 days, effective upon purchase	2 years Factory Repair/ Replacement
TOTALswitch **Product Family**	For 90 days, effective upon purchase	For 90 days, effective upon purchase	3 years Factory Repair/ Replacement
Allegra, Modem Pool and NETServer* **Product Families**	For 90 days, effective upon purchase	For 90 days, effective upon purchase	2 years Factory Repair/ Replacement
Allegra, Courier and DataBurst* **Product Families**	For 90 days, effective upon purchase	For 90 days, effective upon purchase	5 years Factory Repair/ Replacement

* The Allegra T1 for Windows NT®, Allegra T1 for NetWare®, Allegra PRI for Windows NT and Allegra PRI for NetWare are covered under a 2-year warranty. All other Allegra products carry a 5-year warranty.

What Is NOT Covered By the Limited Warranty

Items not covered by the Limited Warranty include, but are not limited to, the following:

- Product installation support
- A product purchased from anyone other than U.S. Robotics or a U.S. Robotics authorized reseller
- Routine cleaning, or normal cosmetic and mechanical wear
- A product that is modified, tampered with, misused or subjected to abnormal working conditions, including, but not limited to, lightning and water damage
- Damage from repair or replacement of warranteed parts by anyone other than U.S. Robotics or a U.S. Robotics authorized service provider

THIS LIMITED WARRANTY DOES NOT GUARANTEE YOU UNINTERRUPTED SERVICE. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS LIMITED WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANT OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. U.S. ROBOTICS SHALL IN NO EVENT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL DAMAGES OF ANY KIND OR CHARACTER, INCLUDING, WITHOUT LIMITATION, LOSS OF REVENUE OR PROFITS, FAILURE TO REALIZE SAVINGS OR OTHER BENEFITS, LOSS OF DATA OR USE, DAMAGE TO EQUIPMENT AND CLAIMS AGAINST THE PURCHASER BY ANY THIRD PERSON, EVEN IF U.S. ROBOTICS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Jurisdiction Laws

This Limited Warranty gives you specific legal rights. You may have others, which vary from jurisdiction to jurisdiction. Some jurisdictions do not allow limitations on duration of an implied warranty, or the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you.

How To Access Your Warranty Services

Telephone Support

Warranty

<u>For 90 days, effective upon product purchase</u>, you will have access to our technical support analysts. To obtain telephone support under the conditions of this Limited Warranty, call the appropriate U.S. Robotics number.

North America
1-800-231-8770 (toll free)
Monday - Friday
7. a.m. - 8 p.m.
Central Standard Time

Europe, Middle East, Africa
353-1-205-7700
Monday - Friday
9 a.m. - 7 p.m
Central European Time

All Other Locations
1-847-797-6600
Monday - Friday
7 a.m. - 8 p.m.
Central Standard Time

What Information Should I Have Ready Before Calling For Support?

To enable U.S. Robotics to respond to your inquiry as efficiently and effectively as possible, please have available as much of the following general and product-specific information as possible before calling for support.

General Information

√   Serial number and part number
      (both are contained within the barcode affixed to the unit)
√   Product model name and number
√   Detailed, specific questions

Product-Specific Information

√   Applicable error messages
√   Add-on boards or hardware
√   Third-party hardware or software
√   Operating system type and revision level

Telephone Support Options

Customers who require telephone support beyond 90 days from the purchase date will be referred to a U.S. Robotics sales representative to establish a service contract, if desired.

Software/Firmware Updates

Warranty

<u>For 90 days, effective upon product purchase</u>, you will have access to U.S. Robotics' Systems Software ⁄ Firmware Updates from the U.S. Robotics' Network Systems Division web site: ***http://totalservice.usr.com***

Software/Firmware Update Options

Customers who require Software ⁄ Firmware updates beyond 90 days from the purchase date will be referred to a U.S. Robotics sales representative to establish a service contract, if desired.

Hardware Support
Warranty

During the applicable Limited Warranty period, if U.S. Robotics determines your product requires servicing, you will be given a Service Repair Order (SRO) number to help us track your Limited Warranty request. Once you have received your SRO number, mail the product, postage prepaid and insured, to the below-listed shipping address. Please make sure your SRO number is clearly visible on the outside of the package and be sure to pack your unit securely.

Call the appropriate U.S. Robotics number, listed below, for Hardware Support of your product.

North America

1-800-231-8770 (toll free)
Monday - Friday
7. a.m. - 8 p.m.
Central Standard Time

Europe, Middle East, Africa

353-1-205-7700
Monday - Friday
9 a.m. - 7 p.m
Central European Time

All Other Locations

1-847-797-6600
Monday - Friday
7 a.m. - 8 p.m.
Central Standard Time

Shipping Checklist - Did You Include:

√   Your Name
√   Your Company's Name
√   Return Shipping Address
√   A Contact Telephone Number
√   Serial Number and Part Number (both are contained within the barcode attached to the unit)
√   Brief Problem Description

Shipping Address

North America and Locations Outside of Europe, Middle East, Africa
U.S. Robotics
ATTN: SRO Receiving
1800 W. Central Rd.
Mt. Prospect, IL 60056-2293

Europe, Middle East, Africa
U.S. Robotics Services, Ltd.
ATTN: RMA Department
5 Richview Office Park
Clonskeagh, Dublin 14
SRO#Ireland

Hardware Support Options

Customers who require out-of-warranty hardware support will be referred to a U.S. Robotics sales representative to establish a service contract, if desired.

Notices

FCC Registration

FCC15: CJE-0263
FCC 68: CJEUSA-73130-FA-E

Connecting to the Telephone Company's Lines

The telephone company may request the telephone number(s) to which your Courier is connected and the FCC information printed above.

If your Courier is malfunctioning, it may affect the telephone lines. In this case, disconnect your Courier until the source of the difficulty is traced.

FCC Notice: Radio and Television Interference

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference does not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is

encouraged to try to correct the interference by one or more of the following measures:

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

IC (Industry Canada)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the radio interference regulations of Industry Canada (formerly Canadian Department of Communications).

Le présent appareil numérique n'émet pas de bruits radio-électriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par Industrie Canada (antérieurement le ministère des Communications du Canada).

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

Before installing this equipment, make sure you are permitted to connect it to the facilities of the local telecommunications company. You must also install the equipment using an acceptable method of connection. In some cases, you may also extend the company's inside wiring for single line individual service by means of a certified connector assembly (telephone extension cord). You should be aware, however, that compliance with the above conditions may not prevent degradation of service in some situations.

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

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

Warning: Do not attempt to make such connections yourself; contact the appropriate electric inspection authority or electrician.

UL Listed Accessory

Your internal Courier modem is a UL listed accessory. It must be used with a UL listed computer.

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