Remote Access Server - Dial-Out User's Guide

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Dial-Out User's Guide

Preface

About this Guide

This guide provides instructions for installing and using Dial-Out software. The information in this guide applies to network administrators as well as dial-out users who make calls through communications programs.

The organization of this guide is as follows:

Chapter 1 provides basic information about the dial-out process and the Dial-Out software.

Chapters 2 and **3** discuss the setup and use of Dial-Out in Windows 3.1.

Chapters 4 and **5** discuss the setup and use of Dial-Out in Windows NT and Windows 95.

Chapters 6 and **7** discuss the setup and use of Dial-Out in DOS.

Chapters 8 and **9** discuss the setup and use of Dial-Out in Linux.

Appendix A provides answers to common problems with dial-out software.

Appendix B lists 3rd party communications programs that can be used for dial-out purposes.

Dial-Out User's Guide

Chapter 1: **Introduction**

What is Dial-Out Software?

Dial-Out software is a set of programs, that allow a user to dial-out by sharing modems with other network users. These modems are attached to one or more Remote Access Servers. When dial-out users share modems across a network, efficient use is made of the hardware and ports that are already installed. An additional benefit is that the same group of modems can be shared for both dial-in and dial-out purposes.

What is Dial-Out?

If a user's PC is attached to a LAN, they can use a communications program installed on the PC, to perform activities such as:

- connecting to an ISP (internet service provider)

- connecting to BBSs (bulletin board services)

- transferring data files to a system outside the network

- accessing electronic mail systems external to the network

- connecting to news and information services

The above types of transmissions are known as 'dial-out' calls because the user is connecting to a destination that is external to their LAN over a dial-up telephone line. The user is dialing out if the call is made via a server modem instead of a modem attached to the user's PC. Dial-Out software provides this dial-out capability. See "Figure 1: Dial-Out Basics" below.

Figure 1. Dial-Out Basics
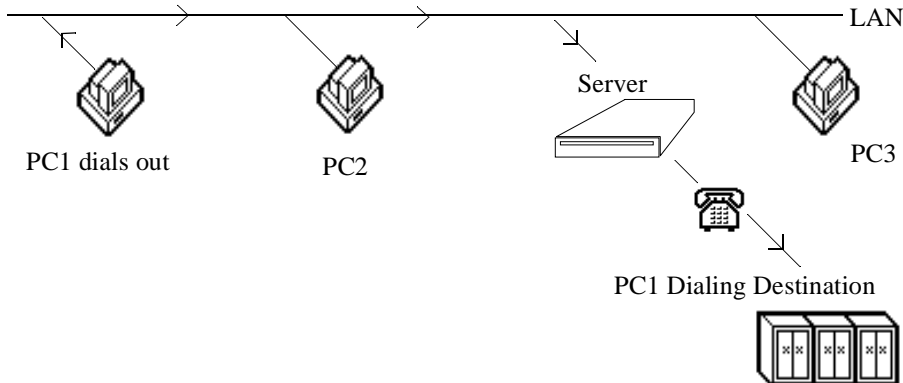
How the software works

Dial-Out runs in the background while the user works in their communications program.

How Dial-Out Works in Windows

Windows dial-out users run their communications program normally and then select one of the 'redirected COM ports' to make the call (see Note below). Windows communications programs use the Windows interface to access system resources, including the PC's COM ports. Windows then forwards the requests and data from the communications program to the appropriate server port.

Note: The dial-out user specifies which COM ports are to be re-directed and which COM ports are not to be redirected, i.e. left to operate normally. The term 'redirected COM port' means that the user's PC diverts the COM port, so that the call is sent over the LAN to a port on the server.

COM port Limitations

Normally, Windows restricts your PC to four COM ports due to hardware limitations. With the 'redirection' feature in Dial-Out, there is no COM port hardware limitation. The Redirector driver permits you to redirect any COM port between COM 1 and COM 9, even though some of these COM ports may not 'physically' exist on your system.

Note: Consult the documentation for the communications program to determine which COM ports it supports.

Figure 2: Communications before and after Redirection
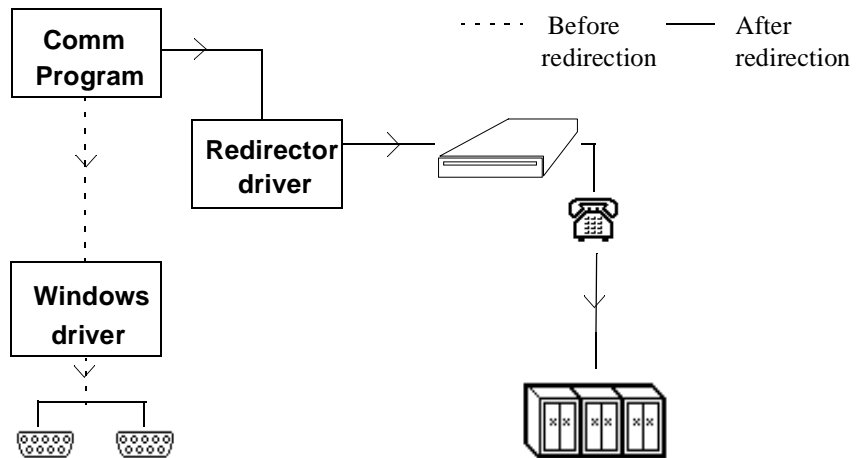
How Dial-Out Works in DOS

DOS based programs interact directly with the COM port hardware. Therefore, in a DOS environment, Dial-Out uses a different method to access the server's modems. If the user's DOS communications program supports either the INT14 or NASI standards, the program can be used to make dial-out calls.

The DOS user loads Dial-Out, then selects the port or pool and finally, runs their communications program. Once the user initiates the call from the communications program, Dial-Out routes the transmission to the server. The server then directs the call to an available modem and port.

Note: Dial-Out supports both INT14 and NASI standards, within DOS and Windows.

How Dial-Out Works in Linux

Linux programs that communicate through serial ports generally have a way of specifying the name of the character device to use. The standard serial ports are usually called /dev/ttyS0 for the first port, through to /dev/ttyS3 for the fourth port. The Dial-Out software will provide new character devices named /dev/ttyU0, /dev/ttyU1, etc. These device names will be configured to correspond to a modem or pool on a server. By setting the communications software to use one of the new device names, a modem on a server can be used for dial-out as if it were locally attached.

Equipment & Environment

Protocols Supported

The Windows 3.x and Windows 95 Dial-Out program supports the following protocols:

- Novell Internetwork Packet Exchange (IPX)
- Internet Protocol (IP)

The Windows NT Dial-Out program supports:

- Novell Internetwork Packet Exchange (IPX)
- Microsoft Network (IPX)
- Internet Protocol (IP)

The DOS Dial-Out program supports:

- Novell Internetwork Packet Exchange (IPX)

The Linux Dial-Out program supports:

- Internet Protocol (IP)

General requirements

The following equipment is necessary to support dial-out:

- Dial-Out software
- A Server that is installed on the network and configured for dial-out

Windows 3.x and Windows 95 Requirements

In addition to general equipment requirements, Windows users also need:

- Windows 3.1, Windows for Workgroups 3.11 (and later versions), running with DOS version 5.0 or DOS J5.0V (or higher)
- Windows 95

- The PC must be attached to a network running Novell IPX protocol or the IP protocol

- A 386 (SX) IBM-compatible PC, or higher

- At least 4 MB of RAM (random access memory)

- At least 4 MB of free disk space

- A Windows-based communications program, such as Procomm for Windows, or a Windows communications program that supports INT14 or NASI network standards, such as CROSSTALK for Windows.

Windows NT Requirements

- Windows NT 4.0 (or higher)

- Computers running Windows NT 4.0 should have Service Pack 3 installed

- PC must be attached to a network running Novell IPX, Microsoft IPX or the IP Protocol.

- At least 16 MB of RAM

- At least 10 MB of free disk space

- A Windows NT-based communications program, such as Hyperterminal or Winfax Pro 8.0

- A 486 (DX-66) IBM-compatible PC, or higher

DOS Requirements

In addition to general equipment requirements, DOS users also need:

- A 386 (SX) IBM-compatible PC, or higher

- At least 1 MB of RAM (random access memory)

- The PC must be attached to a Novell IPX network

- At least 2 MB of free disk space

- A DOS-based communications package that supports INT 14 or NASI network standards, for example, CROSSTALK (Mark IV)

- DOS Version 5.0 or DOS J5.0V (and later versions)

Linux Requirements

In addition to general equipment requirements, Linux users also need:

- A networked PC running the Linux operating system. Binary code is only provided for Intel based systems. The source code is available, which should compile for other processors

- The PC must be attached to a network running IP

- Between 1 MB and 6 MB of free disk space, depending on the components installed

- Linux-based communications software designed for use with asynchronous modems or fax modems, through standard serial ports.

- Linux kernel version 2.2.x or higher

- The X Window System environment, for running the configurator program and the modem status monitor program. X is not required for the dial-out driver software.

Communications programs

Dial-Out will work with most Windows and Linux communications programs. If you are using a DOS communications program, it must support NASI or INT14 standards. See Appendix B for a list of appropriate 3rd party communications programs.

Other Features

Network installation

If desired, the network administrator can install Dial-Out to a shared drive and then standardize the configuration settings. Subsequent installations on the user's PC make use of the standardized configuration settings from the network drive. The above approach allows the network administrator to configure the dial-out settings in one operation; there is no need to configure settings on each PC. See "Installing the software" in Chapters 2, 6 & 8 for details on this feature. This feature is NOT supported in **Dial-Out for Windows NT** or **Windows 95**.

Ports and Pools

Dial-Out allows dial-out users to select either ports or pools for making their calls. A port is a specific phone line used to transmit data from the server modem to the destination. A pool is a collection of modems which have common characteristics so that they are, in effect, interchangeable. The network administrator must first define the ports and pools on the server.

One benefit of pools is that they allow the dial-out calls to be directed to any available port in the pool. This flexibility results in the most efficient use of the ports. In addition, pools also allow the network administrator to group ports according to particular user needs. See "Configuring Connection Parameters" in Chapters 2, 4, 6 & 8 for details on this feature.

Note: In **Windows 95** and **Windows NT**, **Modem Resource** is synonymous with
          Ports.

Phone number

As an alternative to ports or pools, a phone number can be entered in Dial-Out configuration, making it easy for users to dial out to a single phone number. See "Configuring Connection Parameters" in Chapters 2 & 6 for details on this feature. This feature is not supported in **Dial-Out for Windows NT** or **Windows 95** or **Linux**.

Automatic Retry

Automatic retry is an optional feature. As soon as the communications program starts up, the user's PC automatically requests a connection to the server. If the requested server port is busy when the PC requests the connection, the Automatic Retry feature issues an on-screen message to the user. A message asks if the user wants the PC to automatically retry the request. See "Configuring Connection Parameters" in Chapter 2, 4 & 6 for details on this feature. This feature is not supported in **Dial-Out for Linux**.

Note: In the DOS version of the software, this feature is known as
          Retry Connection Request.

Queue Request

Queuing is an optional feature.

For DOS and Windows: As soon as a communications program starts up, the user's PC automatically requests a connection to the server. However, if the requested server port is busy at the time of the request, the Queuing feature issues an on-screen message to the user. A message asks if the user wants the PC to place the connection request in a queue. See "Configuring Connection Parameters" in Chapters 2, 4 & 6 for details on this feature.

Note: In the DOS version of the software, this feature is known as
          Queue Connection Request

For Linux: If the requested server port is busy at the time of the request, and queueing is enabled, the connection request will be placed in a queue on the server. The server will inform the PC when the port becomes available and the connection will then proceed. If the queue timeout configured on the PC expires before the port becomes available, the connection will be terminated in the same

manner as if queueing was not enabled. See "Configuring the Dial-Out Settings" in Chapter 8 for details on this setting this feature.

Modem Panel

The Modem Panel is an optional feature, for Windows 3.1 users only. The Modem Panel is a panel of lights, simulating the lights on a standard modem. Modem Panel shows the status of the particular server modem which your Windows communications program is using.

The user can choose to have the panel lights appear automatically whenever the Windows communications program starts up. Or the user can manually activate the Modem Panel from the Dial-Out group, whenever they want to view the status of the modem. See "Viewing the Status of the Modem" in Chapter 3 for details on this feature.

Service Manager Modem Status

The Service Manager Modem Status is an optional feature for Windows NT users only. The Service Manager Modem Status icon that is displayed in your system tray (lower right hand corner of your screen), is provided to reflect the status of the shared modem that you are using. Refer to "Changing Modem Status Properties" and "Service Manager Modem Status" for Windows NT in Chapter 5 for details of this feature.

Modem Status Application

The Modem Status Application is separate optional program for Linux users only. It is an X client application called **leds**. It displays a panel of lights, simulating the lights on a standard modem, to give the status of the signals on a given serial device. It can be used to show the status of a server modem that is being used by communications software on the PC. See "Viewing Modem Status" in Chapter 9 for details of this feature.

Chapter 2: **Setting up Dial-Out in Windows 3.x**

Overview

This chapter contains information on installing and configuring the Dial-Out software to use in Windows 3.x. For information on making a dial-out call in Windows, see Chapter 3.

The activities documented in this chapter include:

- Installing the software.
- Configuring the software settings.
- Viewing dial-out details.

Moving around in the screens

Button Conventions

Wherever the following buttons appear within Dial-Out, they serve the purposes described below:

Buttons	Purpose
OK	Click this button to close the window and save the changes.
Cancel	Click this button to close the window without saving the changes.
Default	Click this button to revert all settings in the window to the installation settings.
About	Click this button to display the version of Dial-Out that is installed.
Exit	Click this button to close Dial-Out.
Help	Click this button to get Help on the window displayed.

Refreshing Screen Changes

From the **File** menu at the **Dial-Out** window, choose **Refresh** to update the window.

Saving Changes

From the **File** menu at the **Dial-Out** window, choose **Save** to keep any changes you have made to Dial-Out.

Installing the software

The installation program for Dial-Out provides step-by-step instructions to guide you through the installation process. Installation makes the following changes:

- It copies files from the CD-ROM to the specified drive and directory based on the choices you make during installation.

- It creates the necessary program group and icons.

- It modifies all appropriate system files (not applicable if you install to a network drive).

Knowledge Required

The person who is installing the software requires knowledge of the PC working environment and network configuration to answer questions during the installation. Frequently, the network administrator is responsible for installing Dial-Out software. If the dial-out user is installing the software, they need to consult the network administrator when they are preparing for installation.

Preparing for installation

Before you install the Dial-Out software:

- Determine whether the PC meets the equipment requirements for the Windows software installation. See Chapter 1 for information on equipment requirements. Determine whether the dial-out user has a standard Windows communications program or a Windows program that supports INT14 (interrupt 14) or NASI (Netware Asynchronous Services Interface) standards. See Appendix B for a list of 3rd party communications programs.

- Determine which type of installation you want to perform. The following types of installation are available.

    a) Use the CD-ROM to install the software to the dial-out user's hard drive.

      or

    b) Use the CD-ROM to install the software to a network drive. This method permits the network administrator to install the software to a shared drive and then pre-configure the settings to be used by all dial-out users. See *c)* for subsequent installations on user PCs. See "Pre- Configuration" on page 14.

> *Note:* If you install Dial-Out to a network drive, the installation
> process does not modify any system files or create any icons.

or

c) Install the software from a shared network drive to the dial-out user's hard drive. This
type of installation does not require the CD-ROM. If using this method, ensure
that the network administrator has first completed the installation and pre-configuration
mentioned in *b*) above.

Installing from CD-ROM

To install the software from the installation CD-ROM to either the user's hard drive or a network
drive:

1. Start Microsoft Windows.

2. Place the CD-ROM in the CD-ROM drive.

3. **Windows 3.1**
   In Program Manager, choose **Run** from the **File** menu, type the CD-ROM drive letter (i.e.,
   D:\setup) and press **Enter**.

4. Perform the installation by following the prompts that appear on the screen.

Installing from network drive

To install Dial-Out software from a network drive to the dial-out user's hard drive:

1. From the Windows Program Manager, choose **Run** at the **File** menu.

2. In the Command Line box, type:

    `[drive]\[installation directory]\setup`

    Example:

    `j:\pdialout\setup`

3. Click **OK**.

4. Follow the screen instructions to complete a first-time installation or to upgrade the user's existing version. The setup program allows you to customize the installation.

5. At the end of the installation, restart the computer so changes to the system files can take effect.

Configuring the Dial-Out Settings

Once installation of the program is complete, the software is automatically configured with 'default' settings. These configuration settings control how the PC communicates with the server when the user dials out. It may be necessary to change some or all of the 'default' settings to ensure they meet the dial-out requirements of the user and the network.

Normally, configuration is a one-time activity, following installation. However, it may be necessary to reassess the settings under the following conditions.

- If the server settings change.

- If the communications program on the PC changes

- To achieve peak network efficiency.

Knowledge Required

The person configuring the user's PC requires a knowledge of the PC working environment and network configuration, in order to enter or select the correct information. Frequently, the network administrator is responsible for configuring the settings. Depending on the type of installation, the network administrator either pre-configures the settings on a network drive or configures the settings directly on the user's PC.

If the dial-out user is configuring the settings on their PC, they need to consult with the network administrator, before they begin.

Note: If the user's software was installed from a network drive, the installation settings are those that have been pre-configured by the network administrator. For further explanation, see "Pre-Configuration" on page 14.

Preparing for Configuration

Before you configure the Dial-Out settings, make sure that:

- Dial-Out has been installed either on a network drive or on a user's PC

- the PC used for configuration is attached to the network

- a Windows communications program has been installed on the user's PC

- one or more RAS are installed on the network

- the network administrator has configured one or more servers so that the user can dial-out from the user's PC.

Pre-Configuration

Pre-configuration applies only to Dial-Out software that has been installed on a network drive. 'Pre-configuration' means that the network administrator configures the dial-out settings on the network drive, before installing the software to each user's PC. Once the settings are properly configured, each user can then install the 'pre-configured' version of Dial-Out software on their PC's hard drive. This approach allows the network administrator to standardize the dial-out settings for all users, in one operation.

Pre-Configuration Steps

To pre-configure Dial-Out installed on a network drive, use the following steps:

1. Install Dial-Out from the network drive onto a PC.

2. Double-click on the Dial-Out icon (within the group chosen during installation). The **Dial-Out** window appears.

3. Select **Configuration** from the menu bar.

4. Choose an item from the menu. The menu lists the different categories of configuration settings.

5. Review or change the configuration settings. See the appropriate sections of this chapter for more details.

6. When you have finished configuring the software for dial-out, click **Save** from the **File** menu.

7. Click the **Exit** button to close the **Dial-Out** window.

8. Restart Windows so that the new settings can take effect.

9. Use Windows File Manager to copy the pre-configured PDIALOUT.CON file from the installation directory on the PC to the installation directory on the network drive. Default installation directory is **\pdialout.**

Configuration Steps

To configure Dial-Out installed on a user's PC:

1. Double-click on the Dial-Out icon within the installed Dial-Out group. (The **Dial-Out** window appears.

2. Select **Configuration** from the menu bar.

3. Choose an item from the menu. The menu lists the different categories of configuration settings.

4. Review or change the configuration settings. See the appropriate sections of this chapter for more details.

5. When you have finished configuring the software for dial-out, click **Save** from the **File** menu.

6. Click the **Exit** button to close the **Dial-Out** window.

7. Restart Windows so that the new settings can take effect.

Configuring Connection Parameters

Use the **Connect Parameter** dialog box to identify the pools, ports or phone number to be used for dial-out. The network administrator can provide the appropriate information.
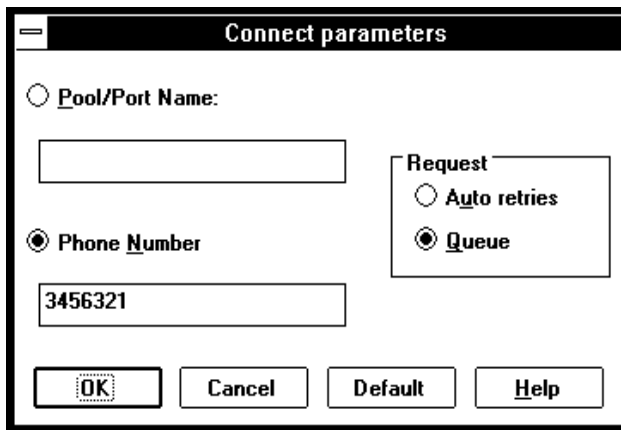
Detailed Information about the **Connect Parameters** dialog box appears next.

Connect Parameters Dialog Box	
Area	**Explanation**
Pool/Port Name	Choose this option or the phone number option, but not both. Enter the port or pool name to be used for dialing out from the user's PC. This port or pool can be located on any server in the network. Enter one of the following names, as provided by the network administrator.
	• the name of a specific port being requested.
	• the name of a pool. A 'pool' is a collection of ports having common characteristics so that the ports are, in effect, interchangeable.
	The Port or Pool name entry is only valid if the communications program uses the NASI or INT 14 standard. The comm port selected in the communication program will be redirected to the specified server Port or Pool name.
	The maximum length of a pool or port name is 16 characters (see Note below for exceptions).
	If your communications program supports NASI standards, do not exceed the following maximums: 8 characters for a pool name, and 14 characters for a port name.
Phone Number	Choose this option or the port/pool name option, but not both. Enter the complete phone number. If a phone number is entered, it appears on the Dial-Out window. From that window, the user can select the phone number for redirecting ports. If the phone number is selected for port redirection, the server performs the dialing function, instead of the communications program.
	When a phone number is chosen for redirection, the Dial-Out program will choose any available port on any RAS configured for dial-out.

Connect Parameters Dialog Box (cont'd)	
Area	**Explanation**
Auto retries	Choose this option if you want the PC to automatically retry the connection request. When the user starts up their communications program, the PC automatically requests a connection to the server. If the port or pools are busy, the user sees a message, asking if they want the PC to automatically retry the request. You can select either Auto Retries or Queue, but not both.
	The default installation setting is 'No'.
Queue	Choose this option if you want the server to place the connection request in a dialing queue. If the port or pool is busy, the user sees a message, asking if they want the PC to place the connection request in a queue. When a port becomes available, the queued request is processed automatically. You can select either Queue or Auto Retries, but not both.
	The default installation setting is 'Yes'.

Configuring Port Parameters

Use the **Port Parameters** dialog box to configure the settings for the ports and modem that will be allocated to the user (when the user's PC makes a connection request). The default settings use the server definitions for the allocated port. Do not alter these settings unless you need to override the server settings (for example, the communications program might require specific port settings). If you are in doubt about which settings to use, retain the default settings.

```
┌──────────────────────────────────────────────────────────────────┐
│ ▬                        Port parameters                           │
├──────────────────────────────────────────────────────────────────┤
│ Communication parameters      Flow Control          Data Forwarding│
│  ☐ Use server default parameters   ○ No flow control               │
│                                                   Packet size:  140    bytes │
│ Baud Rate: 38400       ▼                                            │
│                               ◉ Xon/Xoff flow control   Character timeout: 60   msecs │
│   Parity: NONE         ▼          Xon: 11H                          │
│                                                   Packet timeout:  720    msecs │
│ Data Bits: 8           ▼          Xoff: 13H                         │
│                                                     ┌───────────────┐ │
│ Stop Bits: 1           ▼      ○ Hardware flow control │ Trigger characters │ │
│                                                     └───────────────┘ │
│        ┌──────────┐   ┌──────────┐  ┌──────────┐   ┌──────────┐     │
│        │    OK    │   │  Cancel  │  │ Default  │   │   Help   │     │
│        └──────────┘   └──────────┘  └──────────┘   └──────────┘     │
└──────────────────────────────────────────────────────────────────┘
```

Detailed information about the **Port Parameters** dialog box appears next.

Port Parameters Dialog Box

Area	Explanation
Use server parameters	A checkmark indicates that you want the port settings to use the server definitions for the allocated port. The default installation setting is 'Yes' (box checked).
Baud rate	Select the baud rate of the port being used for the call. Select the maximum speed supported by both the modem and communications program. *Note:* You cannot select a baud rate if there is a checkmark in the 'Use server parameters' check box. The default installation setting is '38400'.
Parity	Select a parity type that matches: • the setting at the calling destination (contact the destination site to verify this information) **and** • the setting in the communications program. *Note:* You cannot select a parity setting if there is a checkmark in the 'Use server parameters' box. The default installation setting is 'NONE'.
Data Bits and Stop Bits	Select the data bits and stop bits that match: • the setting used at the calling destination (contact the destination site to verify this information) **and** • the setting in the communications program. *Note:* You cannot select either a data bits setting or stop bits setting if there is a checkmark in the 'Use server parameters' box. The default installation settings are '8' data bits and '1' stop bit.

Port Parameters Dialog Box (cont'd)	
Area	**Explanation**
Flow Control	Select whether or not you want to use flow control and, if so, the type of flow control. 'Flow control' regulates the flow of data between the communications program and the server modem. Match the setting to the communications program. Select one of the following options: 1. **No flow control** 2. **Xon/Xoff flow control** (to use software flow control) The Xon/Xoff fields display standard industry values. You should never need to change these values. 3. **Hardware flow control** This is the preferred option if the communications program supports it. The default installation setting is 'Hardware Flow Control'.
Packet size	Enter the size of individual network transmissions. 'Packets' are blocks of data transmitted on a network. Consider the following implications before you make any changes to the default setting: Setting the number lower results in more frequent network transmissions because packets are always sent when they are full. This change results in higher network traffic. Due to the above implications, do not change the packet size, unless you have a specific reason to do so. If you change the packet size, review the setting for the Packet timeout. The default installation setting is '140' bytes. The minimum setting is '1'. The maximum is '512'.

Port Parameters Dialog Box (cont'd)

Area	Explanation
Character timeout	Enter the duration of the character timeout, in milliseconds. 'Character timeout' is the maximum amount of time that can elapse without a character being sent. The packet is transmitted after the time period has elapsed. Consider the following implications before making changes to the default setting: • Set the number lower to improve the responsiveness of the system. However, this change may result in higher network traffic. *Note:* To ensure this setting is valid, make sure the number is lower than the Packet timeout number. Packets are always sent when they are filled, or if the Packet timeout expires. See "Packet timeout" below. The default installation setting is '60' milliseconds. The minimum setting is '0' (zero). The maximum is '65535'.
Packet timeout	Enter the duration of the packet timeout, in milliseconds. 'Packet timeout' is the maximum amount of time that a packet will wait for data before the packet is sent. Packet timeout begins to count down when the first character is placed in a packet. Consider the following implications before making changes to the default setting: • Lower the number, if the typical data transmission is smaller than a packet. Lowering the number can improve the responsiveness of the system. • The default installation setting is '720' milliseconds. • The minimum setting is '0' (zero). The maximum is '65535'.
Trigger characters button	Select this button if you want to enter a trigger character. Enter a trigger only if you have specific communications needs. They are not for general use. See "Setting a Trigger Character" on page 22.

Setting a Trigger Character

Set a trigger character only if you have very specific communications needs. They are not for general use.

A 'trigger' is a character that forces the transmission of a network packet. Data characters accumulate in packets before they are transmitted over the network. These packets are forwarded under one of the following circumstances:

- when a packet is filled

- when a character timeout occurs

- when a packet timeout occurs

- when a trigger character is encountered.

```
┌─┬──────────────────────────────────────────────────┐
│ ─ │              Trigger characters                  │
├─┴──────────────────────────────────────────────────┤
│ ┌─Trigger Characters──────────────────────────────┐ │
│ │ Enter up to 16 trigger characters in decimal or  │ │
│ │ hexadecimal (value followed by the letter H).    │ │
│ │                                                   │ │
│ │                                                   │ │
│ │  1. [    ]   2. [    ]   3. [    ]   4. [    ]    │ │
│ │                                                   │ │
│ │  5. [    ]   6. [    ]   7. [    ]   8. [    ]    │ │
│ │                                                   │ │
│ │  9. [    ]  10. [    ]  11. [    ]  12. [    ]    │ │
│ │                                                   │ │
│ │ 13. [    ]  14. [    ]  15. [    ]  16. [    ]    │ │
│ │                                                   │ │
│ └───────────────────────────────────────────────────┘ │
│                                                       │
│   [  OK  ]    [ Cancel ]   [Default]   [  Help  ]    │
└───────────────────────────────────────────────────────┘
```

Detailed information about the **Trigger Characters** dialog box appears next.

.

Trigger Characters Dialog Box	
Area	**Explanation**
Boxes 1 to 16	Enter a single value in each of the boxes. Enter any number of characters to a maximum of 16. Use either a decimal value or a hexadecimal value followed by the letter H. The default installation setting is not to have any trigger characters
	Example:
	If you frequently make file transfers and you know that each block of transmitted data ends with a consistent and unique character, you can define the end character as a trigger. The trigger ensures that each block of data is sent immediately.

Configuring Network Parameters

From the menu, choose **Network Parameters** to configure the Inactivity timeout, Connection timeout and Buffer size settings. Retain the Network default settings, unless the type of transmission specifically requires different settings.

```
┌─────────────────────────────────────────────────────┐
│ ▬              Network parameters                     │
├─────────────────────────────────────────────────────┤
│ ┌─Enabled Protocol:─┐   I̲nactivity timeout:  [30  ]  mins   │
│ │                   │                                  │
│ │  ○ I̲P             │   C̲onnection timeout: [6   ]  secs   │
│ │  ◉ I̲P̲X̲            │                                  │
│ │                   │   Buffer si̲ze:        [8192 ]  bytes  │
│ │                   │                                  │
│ └───────────────────┘                                  │
│                                                        │
│   [   OK   ]    [ Cancel ]    [ Default ]    [ H̲elp ]   │
└─────────────────────────────────────────────────────┘
```
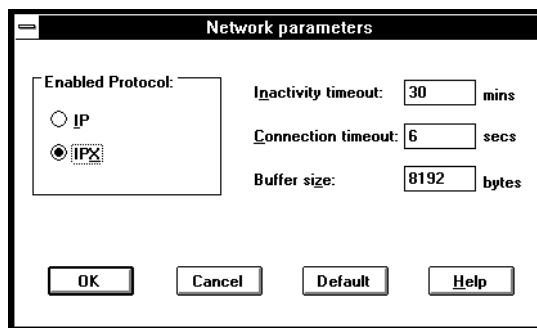
Detailed information about the **Network Parameters** dialog box appears next.

Network Parameters Dialog Box

Area	Explanation
Enabled Protocol	Select the protocol which dial-out should use to access and connect to the servers configured for dial-out. The choices are: • IP • IPX This parameter will have been set during the installation of the Dial-Out software. *Note:* If this parameter is changed, the Dial-Out PC will have to be restarted for the new protocol to be active.

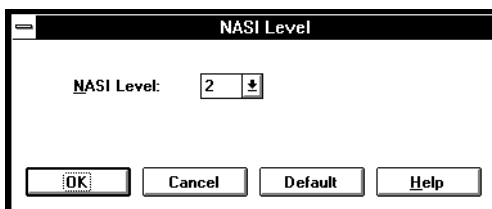| Network Parameters Dialog Box (cont'd)	
Area	**Explanation**
Inactivity timeout	Enter the duration of the inactivity time-out, in minutes. Inactivity timeout is the amount of time you allow a connection to be maintained without any port activity.
	The default installation setting is '30' minutes.
	The minimum setting is "0" (no inactivity timeout). The maximum is "99".
Connection timeout	Enter the duration of the connection timeout, in seconds. 'Connection timeout' is the amount of time you allow for the server to answer the user's request for a port, before ending the request. The dial-out user receives a message when a connection timeout occurs.
	Note: Limit any changes in the connection timeout setting, to situations where the network contains multiple 'bridges' or special configurations. Such situations can lengthen the network response time.
	The default installation setting is '6' seconds
	The minimum setting is '0'. The maximum is '65535'.
Buffer size	Buffers' are storage areas used to hold information sent to and from the server. Consider the following implications before you make any changes to the default setting.
	• Lower the number to reduce the buffer space in the PC.
	• Increase the number to provide more buffer space in the PC. This change allows the system to process the data more efficiently, because there will be fewer situations when the system needs to wait for data.
	Windows 3.x
	The default installation setting is '8192' bytes.

Configuring NASI Level Settings

Use the **NASI Level** dialog box to indicate the correct version of NASI (if the user's communications program supports NASI standards).

```
┌─────────────────────────────────────────────┐
│ ▬              NASI Level                     │
├─────────────────────────────────────────────┤
│                                               │
│    NASI Level:     │ 2  │ ▼ │                 │
│                                               │
│                                               │
│  ┌────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐ │
│  │  OK    │ │  Cancel  │ │ Default  │ │  Help    │ │
│  └────────┘ └──────────┘ └──────────┘ └──────────┘ │
└─────────────────────────────────────────────┘
```

Detailed information about the **NASI Level** dialog box appears next.

NASI Level Dialog Box

Area	Explanation
Nasi level	If the user has a communications program that does not support NASI standards, ignore this setting as it is not applicable.
	• '2' indicates that the NASI interface conforms to specifications in the Novell NASI API Reference, dated September, 1988.
	• '3' indicates that the NASI interface conforms to specifications in Novell version 3. Try selecting '3' if the user's communications program does not operate correctly.
	The default installation setting is '2'.

Viewing Dial-Out Details

At the **Dial-Out** window you can view:

- the names of servers on the network

- details about available servers, ports and pools.

- details about the user's dial-out setup

- the user's currently redirected COM ports.
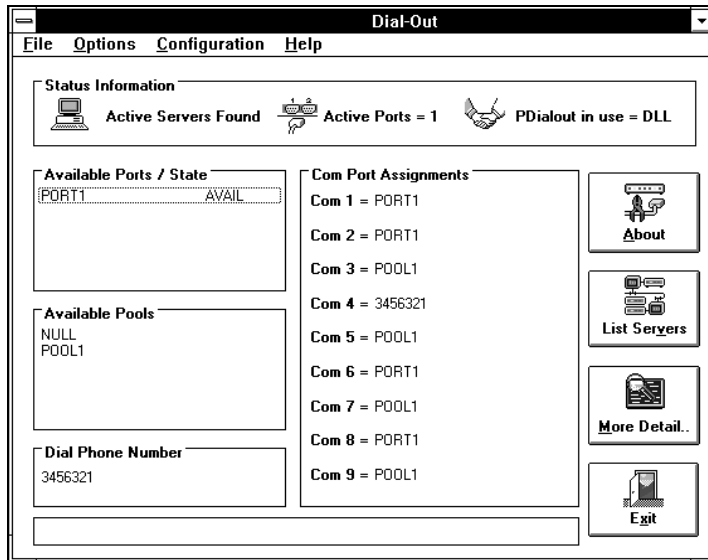
Viewing the Server Names

From the **Options** menu, choose **Servers** or click on the **List Servers** button. The **List Servers** window displays the active RAS servers on the network.

Note: If a server name has been assigned to more than one RAS server, this server name will appear only once in the list.
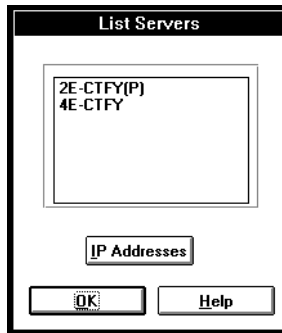
IP Addresses for Direct Polling

When IP routers are configured not to route IP broadcast messages, the Dial-Out program is unable to detect the presence of any RAS servers that are not on the local LAN segment.

The Direct IP Address Polling feature enables the user to configure the IP addresses of the servers that are on remote LAN segments. The Dial-Out program can poll these addresses directly so that the servers can be found.

To add RAS IP addresses to the polling list:

1. Click the **IP Addresses** button on the List Servers. The **IP Address for Direct Polling** dialog box appears.

```
 ═══════════ IP Addresses for Direct Polling ═══════════
   Server Name:              IP Address:
  ┌───────────────────┐   ┌───────────────────┐   ┌─────────┐
  │                   │   │                   │   │  Add    │
  └───────────────────┘   └───────────────────┘   └─────────┘

  ┌─────────────────────────────────────────────┐ ┌─────────┐
  │                                             │ │ Remove  │
  │                                             │ └─────────┘
  │                                             │
  │                                             │
  │                                             │
  │                                             │
  └─────────────────────────────────────────────┘
  ┌──────────────┐   ┌──────────────┐   ┌──────────────┐
  │      OK      │   │    Cancel    │   │     Help     │
  └──────────────┘   └──────────────┘   └──────────────┘
```
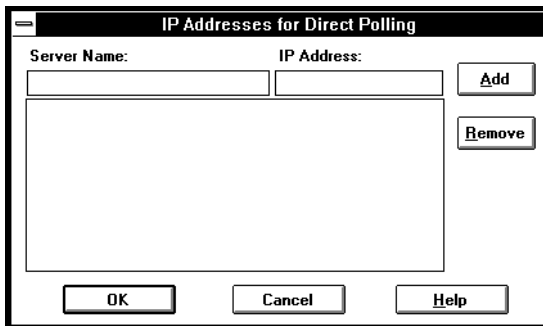
2. Enter the RAS server's name in the **Server Name** field. The name consists of up to 15 alpha-numeric characters.

3. Enter the **IP Address** for the server in dotted decimal notation.

4. Click the **Add** button. The entry will be added to the list. The list is sorted alphabetically according to the **Server Names**.

5. Click **OK**. The list of addresses will be stored on the Dial-Out PC's hard disk in a file called **remhosts.ini.**

6. The **List Server** window will re-appear. The Dial-Out program will now send messages directly to the addresses contained in the IP address list. If a response is received then the server name will be added to the list.

To remove IP addresses from the polling list:

1. Select the entries in the IP Address list that you want to remove. The **Ctrl** and **Shift** keys can be used to select multiple entries.

2. Click the **Remove** button. The entries will be removed from the list.

3. Click **OK** to save the new list to the **remhosts.ini** file.

remhosts.ini File

This file contains the list of IP addresses for Direct Polling. It is located in the installation directory for the Dial-Out program (default is C:\pdialout). The **IP Address for Direct Polling** dialog box reads and writes this file.

Each entry is kept on an individual line. The server name starts in the first column followed by the IP address. If the server name contains any spaces, then the entire server name will be enclosed in quotes. The server name and the IP address will be separated by at least one space or tab character.
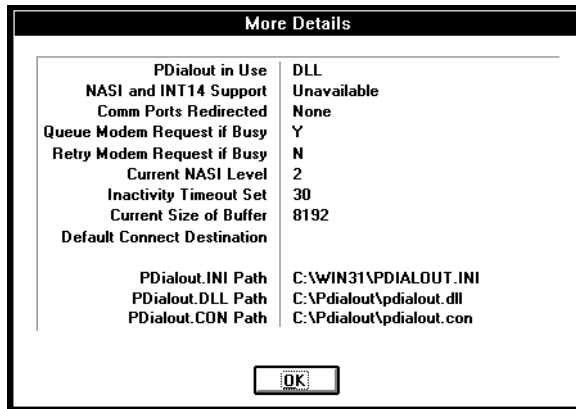
Viewing Available Servers, Ports & Pools

View server and port details at the **Dial-Out** window. An explanation of the applicable areas appears next.

Description	Explanation
Status information	Use this area to view basic information about the availability of servers and ports, as well as the currently redirected COM port.
	Active servers found
	This area indicates if the Dial-Out has located any active servers on the network.
	Active Ports
	This area reflects the number of active dial-out ports that Dial-Out has located on the network.
	Pdialout
	This area refers to the way Dial-Out is started up when you run it.
	The two possibilities here are TSR (Terminate & Stay Resident program) or DLL (Windows dynamic link library).

Description	Explanation
Available Ports/State	The list displays the currently defined ports for all servers on your network. Dial-Out automatically locates these ports on the network. To the right of each port appears the state of the port. Any of the following states are possible:

State	Explanation
AVAIL	This port is available and ready to use.
INUSE	This port is currently in use.
OUT	The port has been disabled by the system administrator, the port has been assigned a modem type of **Direct Connection**, or the port is unable to communicate with the attached modem.

	If the same port name is assigned to more than one port on any of the detected servers, the port name appears once. If this port name is chosen for redirection, the Dial-Out software will use the first available port with that name.
Available Pools	The list displays the currently defined pools for all communication servers on your network. The Dial-Out software automatically locates these pools on the network.
	If the same pool name has been assigned on multiple RAS servers, the pool name appears once. If this pool name is chosen for redirection, the Dial-Out software will use the first available port in a pool with that name
	NULL Pool
	The Dial-Out program creates a NULL pool name if it detects any servers configured for dial-out. This pool name can be chosen for redirection. This will cause the Dial-Out software to access any available port on any server on the network.

Viewing the Setup Details

From the **Options** menu, choose **More Detail** or click on the **More Detail** button. The **More Details** window displays key information about the current Dial-Out setup.

```
┌───────────────────────────────────────────────────┐
│                    More Details                    │
├───────────────────────────────────────────────────┤
│                                                     │
│        PDialout in Use │ DLL                        │
│   NASI and INT14 Support │ Unavailable              │
│     Comm Ports Redirected │ None                    │
│ Queue Modem Request if Busy │ Y                     │
│ Retry Modem Request if Busy │ N                     │
│       Current NASI Level │ 2                         │
│     Inactivity Timeout Set │ 30                     │
│     Current Size of Buffer │ 8192                   │
│ Default Connect Destination │                       │
│                                                     │
│          PDialout.INI Path │ C:\WIN31\PDIALOUT.INI  │
│          PDialout.DLL Path │ C:\Pdialout\pdialout.dll│
│          PDialout.CON Path │ C:\Pdialout\pdialout.con│
│                                                     │
│                    ┌────────┐                       │
│                    │  OK    │                       │
│                    └────────┘                       │
└───────────────────────────────────────────────────┘
```

A description of the **More Details** dialog box appears next.

More Details Dialog Box

Area	Explanation
Pdialout	This area indicates how Dial-Out is loaded into the PC in order to run the program.
	• TSR (Terminate and Stay Resident program), meaning that a DOS program provides the dial-out services. The program is loaded into memory where it stays, after it finishes running, until it is specifically removed or the computer is turned off. This method must be used to get NASI or INT 14 support.
	or
	• DLL (Windows dynamic link library), meaning a Windows program provides the dial-out services.
NASI and INT14 Support	This area displays either Available or Unavailable. 'Available' only appears if the 'Pdialout' area displays 'TSR' (see area above).

More Details Dialog Box (cont'd)

Comm Port Redirected	This area displays the COM ports that are currently being redirected by Dial-Out. See Chapter 3 for redirection details.
Queue Modem Request if Busy	This area displays Y (Yes) or N (No) to indicate if 'Queue' has been selected as a configuration setting. See "Configuring Connection Parameters" on page 15 for details on changing this setting.
Retry Modem Request if Busy	This area displays Y (Yes) or N (No) to indicate if 'Auto retries' has been selected as a configuration setting. See "Configuring Connection Parameters" on page 15 for details on changing this setting.
Current NASI Level	This area displays '2' or '3', depending on what level has been selected as a configuration setting. See "Configuring NASI Level Settings" on page 26 for details on changing this setting.
Inactivity Timeout	This area displays a number from '0' to '99' depending on what number has been selected as a configuration setting. This number reflects the number of minutes a port can be inactive during a connection. After the designated number of minutes of inactivity, the port is disconnected. A time of '0' denotes that the port will not be disconnected until the user exits from the communications program. See "Configuring Network Parameters" on page 24 for details on changing this setting.
Current Size of Buffer	This area displays the size of the buffer in bytes. The buffer is used by Dial-Out to store data. See "Configuring Network settings" on page 24 for details on changing this setting.
Default Connect Destination	This area displays the pool or port name that has been specified in the configuration settings. See "Configuring Connection Parameters" on page 15 for details on changing this setting.
Path	This area displays the drive and directories where some of the Dial-Out software configuration files were installed.

Viewing the currently Redirected COM Ports

To determine the current state of the 9 COM ports recognized by Dial-Out, view the 'Com Port Assignments' area in the Dial-Out window.

Note: Although Dial-Out supports COM ports 1 to 9, many Windows communications programs allow only COM ports 1 to 4 in their setup. In this case, you are limited to using the ports listed in the communications program. In all cases, check the documentation for the communications program to determine whether the program lets you set up COM ports higher than 4.

Any of the following descriptions can appear in the 'COM Port Assignments' area:

Description	Explanation
Local	This port is not being redirected.
Pool name	Any request made by a communications program to this port is redirected to the pool specified. NULL pool name will allow the dial-out software to access any available port.
Port name	Any request made by a communications program to this port is redirected to the port specified. If more than one port is configured with this port name, then the dial-out software will access the first available port.
Phone number	During dial-out, the server assigns the first available port. The phone number provided, is passed to the server. The server dials the number and then completes the connection request.

Dial-Out User's Guide

Chapter 3: **Dialing Out in Windows 3.x**

Overview

This chapter provides guidelines for making dial-out calls, once the Dial-Out software has been set up. For information on setup of the Dial-Out software in Windows 3.x, see Chapter 2.

The activities documented in this chapter include:

- Redirecting the COM ports.
- Making the dial-out call.
- Viewing the status of the modem.

Redirecting the COM ports

The communications program normally sends data to the serial port (COM port) that is physically attached to the PC. The data is then transmitted to its destination via the modem attached to the same COM port.

With Dial-Out software installed, the data sent by the communications program is 'redirected' over the network to a selected port on the server. From that point, the data is sent via the attached modem to the appropriate destination.

Frequently, users redirect COM ports only once, prior to dialing out for the first time. The redirected COM ports remain in effect until you modify them.

Knowledge Required

To redirect COM ports you need to know that the network administrator has assigned ports, pools or telephone numbers to meet your dial-out needs. For example, if you are making external calls you require a port with an outside connection. You should also determine whether you need to keep any COM ports for 'local' uses such as local printing or for use with a local modem.

The above factors will help you decide which COM ports to redirect and which ports or pools to select. If you are using an assigned phone number, you will not have to select a port or pool.

If you are a Windows user, you should know whether your communications program uses either NASI or INT14. If it uses one of those standards, you do not need to redirect COM ports.

Preparing for Redirection

Before you redirect the COM ports, clarify the following information:

1. Find out which COM ports the communications program supports. You can only redirect the COM ports supported by the communications program.

2. Determine which COM port you want to redirect.

   a) If the dial-out user's PC has only two physical COM ports (COM 1 and COM 2), you can still select COM 3 or COM 4 as the ports you want to redirect.

   b) Reserve 'physical' COM ports for local uses, such as, an attached modem, or if the user wants to print locally. For example, if the PC has two physical COM ports (COM1 and COM 2), select COM 3 or COM 4 for redirection, instead of COM 1 or 2.

3. Decide which port or pool you want to use or determine which ones have been allocated to you by the system administrator.

How to Redirect Ports

To redirect the COM ports for dial-out:

1. Start the Dial-Out program by double-clicking on the Dial-Out icon within the Dial-Out group chosen during installation. The **Dial-Out** window appears.

2. Decide on the COM port which you want to redirect, and assign it to as follows:

   a) Select the port, pool or phone number for redirection. AVAIL appears next to a port that is open for you to use.

   b) Drag and drop the port name, pool name or phone number onto the selected COM port in the 'Com Port Assignments' area. Notice that the name of the port or pool, or the phone number now appears next to the COM port.

   c) Repeat *a)* and *b)* above if you want to redirect more COM ports.

3. Restart Windows so that the changes can take effect.

How to cancel redirection

If 'pool', 'port', or a phone number appears beside a COM port in the 'Com Port Assignments' area, that description means that the COM port is already redirected. To cancel the redirection of a COM port:

- In the 'Com Port Assignments' area, double-click on the applicable pool, port or phone number. The description reverts to 'Local', which means that you can now use this COM port with a local modem or for other local purposes.

Affect on Dialing Method

The method your system will use to perform the dialing operation, depends on the redirection choices you make.

- If you choose a port for redirection, your call is connected to that port. Your communications program uses its built-in dialing facility.

- If you choose a pool for redirection, and the pool DOES NOT have a phone number associated with it on the server, your communications program uses its built-in dialing facility.

- If you choose a pool for redirection, and the pool DOES have a phone number associated with it, the server dials the number when you establish your connection.

- If you choose a phone number for redirection, and the number is defined on the PC, the Server allocates the first available port and dials the number on behalf of the PC.

Viewing Redirected COM port

To determine the current state of the 9 COM ports recognized by Dial-Out, view the 'ComPort Assignments' area in the Dial-Out window.

Note: Although Dial-Out supports COM ports 1 to 9, many Windows communications programs allow only COM ports 1 to 4 in their setup. In this case, you are limited to using the ports listed in the communications program. In all cases, check the documentation for the communications program to determine whether the program lets you set up COM ports higher than 4.

Any of the following descriptions can appear in the 'COM Port Assignments' area:

Description	Explanation
Local	This port is not being redirected.
Pool name	Any request made by a communications program to this port is redirected to the pool specified.
Port name	Any request made by a communications program to this port is redirected to the port specified.
Phone number	During dial-out, the server assigns an available port. The phone number provided, is passed to the server. The server dials the number and then completes the connection request.

Making the Dial-Out Call

Dial-Out operates in the background when you use your communications program to dial-out. During the dial-out process, you need to select what COM port you want to use for your current call. If you choose a redirected COM port, Dial-Out software automatically redirects the call to a modem located on the server.

Knowledge Required

To make the dial-out call, you need to know how to operate your communications program. You should also be aware of which COM ports have been redirected. See "Redirecting the COM ports" on page 35 for details.

Preparing for Dial-Out

Before you make the dial-out call from your PC, clarify the following information:

- make sure that the PC is attached to the network when the PC is turned on.

- make sure a Windows-supported communications program is loaded on the PC.

How to Make the Call

To dial-out from the PC:

1. Start up the communications program from within Windows.

2. Make sure that the communications program is set up to use the intended COM port.

3. Use the communications program in the normal way, as if it was using a local modem.

4. When you are finished using the modem, release it so that other users can access it. The PC has sole access to the specified modem until one of the following situations occurs:

   a) you close the communications program,

      or

   b) you instruct the communications program to use a different COM port,

      or

   c) an 'inactivity timeout' limit expires, based on the dial-out configuration settings. If you have previously set a time-out limit, the modem disconnects automatically at the end of the specified period of time. See Chapter 2 for details on the inactivity timeout setting.

Viewing the Status of the Modem

Modem Panel is a Dial-Out feature which displays simulated modem panel lights on your screen. The panel lights indicate the status of the modem being used for the current dial-out call. You can choose whether you want the panel lights to appear when you are using the communications program.

The panel lights are illustrated below.
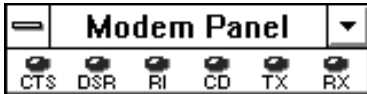
RX (Receive Data) Lights up when the server modem is receiving data.

TX (Transmit Data) Lights up when the server modem is sending data.

CD (Carrier Detect) Lights up when the server modem has successfully connected with a remote modem.

RI (Ring Indicator) Lights up when there is an incoming data transmission.

DSR (Data Set Ready) Lights up when the server modem is ready.

CTS (Clear to Send) Lights up when the modem is ready to receive data from the communications program.

Displaying the Panel Lights

You can choose to display the panel lights, in either of the following ways:

- Automatically, upon start-up of your communications program.

    To display the panel automatically, enter a checkmark in the 'Minimize when port not open' box on the **Modem Panel Options** window. See "Customizing the Panel Lights" below.

- Manually each time you run your communications program.

    To display the panel manually, double-click on the Modem Panel icon (within the group where you installed Dial-Out).

Customizing the Panel Lights

Use the **Modem Panel Options** window to customize the appearance of the panel lights.

To view the **Modem Panel Options** window:

1. Display the panel lights on your screen. See "Displaying the Panel Lights" in the above section.

2. Center the mouse pointer on the panel lights and double-click. (DO NOT center the pointer on the title bar.) The **Modem Panel Options** window appears.
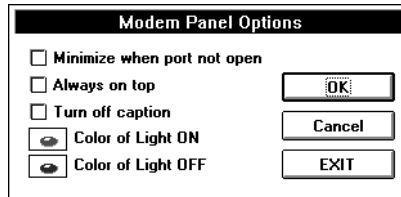
A description of the **Modem Panel Options** window appears next.

Modem Panel Options Window

Area	Explanation
Minimize when port not open	Check this box if you want the panel lights to minimize when the user is not using the communications program. A checkmark means that the panel lights will appear automatically whenever the communications program starts up.
Always on top	Check this box if you want the panel lights to always stay on top of other windows. If this box is not checked, other windows can cover the panel.
Turn off caption	Check this box so that the panel lights appear without a title caption. The caption normally displays the name of the port, if a port is being monitored.
Color of Light ON/OFF	Select the colors you want the panel lights to display when they are on and off.
End Modem Panel	Ends the current display of panel lights.

Chapter 4: **Setting Up Dial-Out in Windows NT and Windows 95**

Overview

This chapter contains information on installing and configuring the Dial-Out software to use in Windows NT and Windows 95. For information on making a dial-out call, refer to chapter 5. The activities documented in this chapter include:

- Installing the software.

- Configuring the software settings

Installing the Software

The installation program for the Dial-Out guides you through the installation process. The installation wizard will make the following changes:

- It copies files from the CD-ROM to the user specified drive and directory based on choices you make during the installation.

- It creates the necessary program group and icons.

- It modifies all appropriate system files and registry information.

Preparing for Installation

Before you install the Dial-Out software:

- Verify that the PC meets the equipment and software requirements as mentioned in chapter 1.

- If your PC is running NT version 4.0, it is recommended that you install Service Pack 3 or higher.

Installing from CD-ROM

To install the software from the CD-ROM:

1. Place the CD-ROM in the CD-ROM drive.

2. Click on **Start**, and select **Run**.

3. In the **Run** dialog box, type:

    d:\setup

4. Click **OK**.

5. Follow the installation wizard instructions to complete a first-time installation or to upgrade the user's existing version. At the end of the installation, you will be prompted to re-start your computer for changes to your system files and registry can take effect.

Configuring the Dial-Out Settings

Once installation of Dial-Out is complete, the software has been automatically configured with 'default' settings. As part of the default settings, a Dial-Out connection icon for the first available COM port should have been created alongside the "**Create New Connection**" wizard icon. It may be necessary to change some of the default settings under the following conditions.

*   If the server settings change.

*   If the communications program on the PC changes.

Preparing for Configuration

Before you configure the Dial-Out settings, ensure that:

*   Dial-Out has been properly installed on the PC.

*   The PC used for configuration is attached to the network (see **Note**).

*   A Windows NT communications program has been properly installed on the PC.

*   One or more RAS servers are properly installed on the network and have ports configured for dial-out so that the user can dial-out from his PC. (see **Note**).

Note: This is required only if you intend to use the modem pool/resources **Browse** feature within each re-directed COM port configuration to select the modem pool/resource for that re-directed COM port).

Having the PC and properly configured RAS server with dial-out is required only when actually using a communications program to dial-out from the PC.

Configuration Steps

To configure the Dial-Out software on your PC:

1. Double-click on the Dial-Out icon in the My Computer folder on your desktop (or the folder you specified during set-up).

    or

    Click on **Start**, select **Programs**, select **Dial-Out** and then **Dial-Out**. The Dial-Out window appears and contains the Create New Connection wizard and all of your communication ports.

    There are also four pull-down menus:

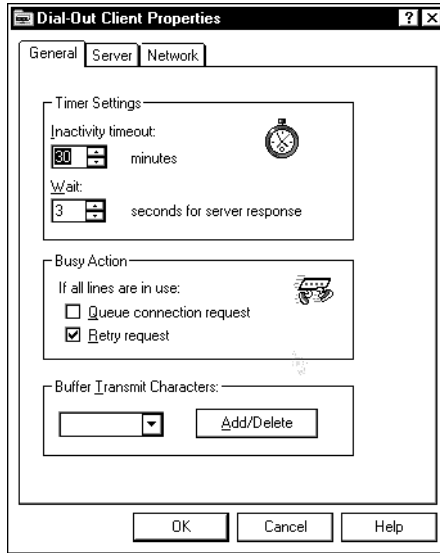   **File**

    View

    Client

    Help

2. a) To modify entire client specific settings, refer to **Dial-Out Client Properties**.

    b) To add a new Dial-Out port, refer to **Creating a New Connection**.

    c) To modify the settings for an existing Dial-Out port, refer to **Dial-Out Port Settings**.

    d) To delete a Dial-Out port (redirected COM port), refer to **Deleting a Dial-Out Port**.

3. Review or change the configuration settings. Refer to the appropriate section in this chapter for details.

4. Select **OK** from each screen when configuration changes have been completed or select **Cancel** if you wish to discard the changes

5. Click **File**, then **Close** if you want to close the Dial-Out window.

6. You will be asked to restart your computer after creating a new connection (re-directing another COM port) for Dial-Out. Please note that only one re-directed COM port can be active at a time!.

Dial-Out Client Properties

From the **Client** menu in the Dial-Out window, click **Client Properties**. In the
Dial-Out Client Properties window you can change these settings:

```
┌─────────────────────────────────────────────────┐
│ ▣ Dial-Out Client Properties              ? ✕    │
├─────────────────────────────────────────────────┤
│ ┌─General┐ Server │ Network │                    │
│ │                                                 │
│ │ ┌─Timer Settings──────────────────────────┐   │
│ │ │ Inactivity timeout:           ⧖          │   │
│ │ │ [30] ⬍  minutes                          │   │
│ │ │ Wait:                                    │   │
│ │ │ [3]  ⬍  seconds for server response      │   │
│ │ └──────────────────────────────────────────┘   │
│ │ ┌─Busy Action─────────────────────────────┐   │
│ │ │ If all lines are in use:      ▱          │   │
│ │ │ ☐ Queue connection request               │   │
│ │ │ ☑ Retry request                          │   │
│ │ └──────────────────────────────────────────┘   │
│ │ ┌─Buffer Transmit Characters:─────────────┐   │
│ │ │ [        ▼]   [ Add/Delete ]            │   │
│ │ └──────────────────────────────────────────┘   │
│ │                                                 │
│ │           [ OK ]  [ Cancel ]  [ Help ]          │
│ └─────────────────────────────────────────────────┘
```

General Properties

Timer Settings

Inactivity timeout

This setting determines how many minutes your computer will stay connected to a shared modem
before inactivity causes it to disconnect from the modem. The range is 0-99 minutes, with a
default setting of 30 minutes. Set your Inactivity timeout to 0 (zero), if you want to ensure that
you never lose a connection because of inactivity,

Wait

This setting determines how many seconds your computer will wait for a response from a
RAS server, before a dialog box indicates that the server is busy or unavailable. The dialog box
offers the chance to either retry or cancelthe connection request. The range is 0-99 seconds, with
a default setting of 3 seconds.

Busy Action

When all lines are in use:

Queue connection request

Choose this setting if you want this computer to "wait in line" for a busy modem to become available.

Retry request

Choose this setting if you want to see a dialog box that lets you try again to connect, or cancel, your connection request.

Note: If you select Queue connection request as your busy action (described above),
it is a good idea to ensure that the check box for Retry request is also selected.
The dialog box that Retry brings up makes it easy to cancel your queued
connection if you decide to stop waiting inline for a busy modem.

Buffer Transmit Characters

If you want to add or change buffer transmit characters for connecting to shared modems, click Add/
Delete. Enter you transmit characters or delete the unwanted ones and then click **OK** when finished.
Buffer **transmit** characters are equivalent to buffer **trigger** characters in other versions of the Dial-
Out software.
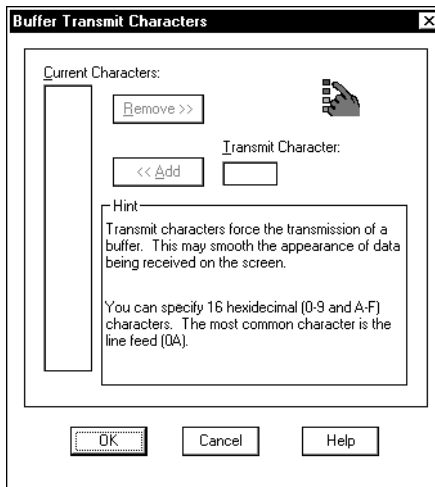
Click **OK** when you are finished changing client settings, or click **Cancel** to exit without saving changes.

Server Properties
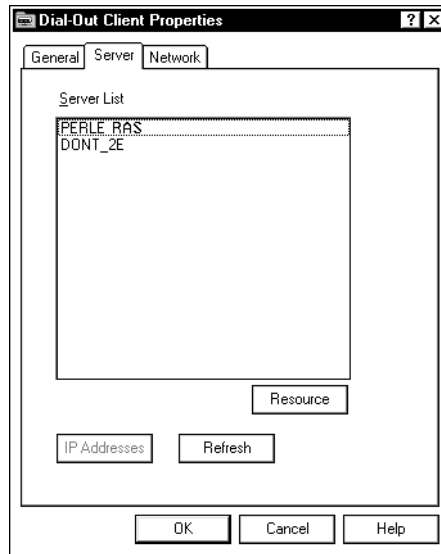
Server List

The Server List window will display all active servers on the network that have Dial-Out resources or Pools configured.

Note: After an initial Dial-Out software installation, the PC must be re-started before any servers may be successfully found and displayed in this window.

Resource

To display a list of modem resources or pools for a particular server, first select the server in the Server List window and click on the **Resource** button.
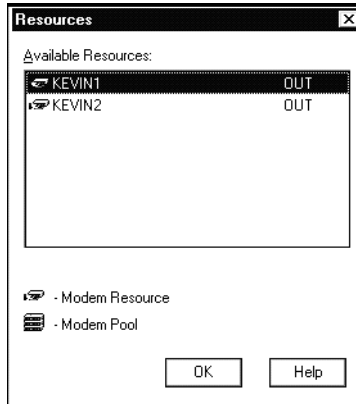
The status of the modem resources or pools will be displayed alongside the name with one of the possible status:

AVAIL - Resource is currently active and free to use.

INUSE - Resource is currently active, but is in use by another client.

OUT - Resource is currently inactive (no modem or powered off)

IP Addresses

The "**IP Addresses for Direct Polling**" window can be viewed and modified by clicking on the **IP Addresses** button.
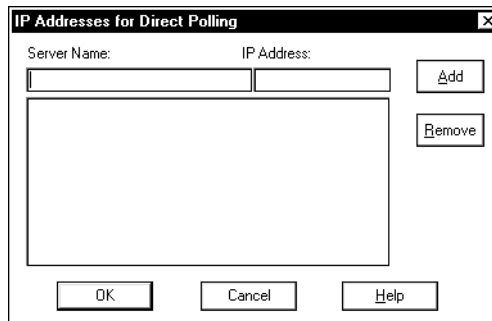
IP Addresses for Direct Polling

When IP routers are configured NOT to route IP broadcast messages, the Dial-Out software is unable to detect the presence of any RAS servers that are NOT on the local LAN segment.

The Direct IP Address Polling feature enables the user to configure the IP addresses of the servers that are on the remote LAN segments. The Dial-Out software can poll these addresses directly so that the servers can be found.

To add RAS IP addresses to the polling list:

1. Enter the RAS server's name in the **Server Name** field. The name consists of up to 15 alpha-numeric characters.

2. Enter the **IP Address** for the server in dotted decimal notation.

3. Click the **Add** button. The entry will be added to the list. The list is sorted alphabetically according to the **Server Names**.

4. Click **OK**. The list of addresses will be stored on the Dial-Out PC's hard disk in a file called **remhosts.ini**.

5. The **List Server** window will re-appear. The Dial-Out program will now send messages directly to the addresses contained in the IP address list. If a response is received then the server name will be added to the list.

To remove RAS server IP addresses from the polling list:

1. Select the entries in the IP Address list that you want to remove. The **Ctrl** and **Shift** keys can be used to select multiple entries.

2. Click the **Remove** button. The entries will be removed from the list.

3. Click **OK** to save the new list to the **remhosts.ini** file.

> **Remhosts.ini File**
>
> This file contains the list of IP addresses for Direct Polling. It is located in the installation directory for the Dial-Out program (default is C:\Program Files\Dialout). The **IP Addresses for Direct Polling** dialog box reads and writes this file.

Each entry is kept on an individual line. The server name starts in the first column followed by the IP address. If the server name contains any spaces, then the entire server name will be enclosed in quotes. The server name and the IP address will be separated by at least one space or tab character.

Refresh

To prompt the Dial-Out software to query for all servers configured for Dial-Out and to refresh the Server List, click the **Refresh** button. A "busy" window will appear while the action is in progress. Sometimes, depending on LAN delays or new RAS servers being brought onto the network, you may have to **Refresh** the server list in order to see the servers.

Network Properties

Dial-Out for Windows NT and Windows 95 supports both the **TCP/IP** and **IPX/SPX** protocols.
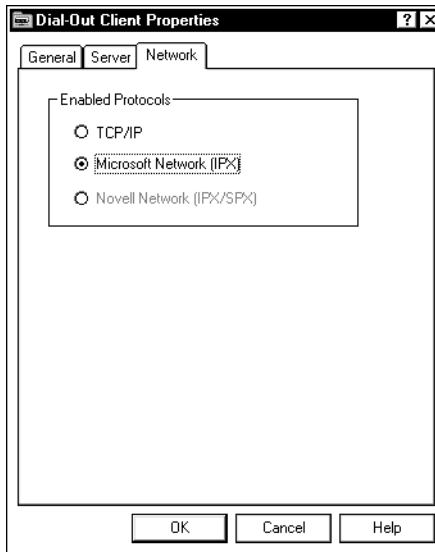
Enabled Protocols

The Microsoft Network (IPX) and Novell Network (IPX/SPX) options in Windows 95 will NOT both be available to choose from at any one time. Dial-Out automatically checks your Windows 95 registry to determine which IP or IPX network protocol you have enabled and only allows selections from those. For Windows NT users, you may select either version of the IPX/SPX protocol to use, since there is really only one IPX/SPX supplied network driver that contains BOTH Microsoft and
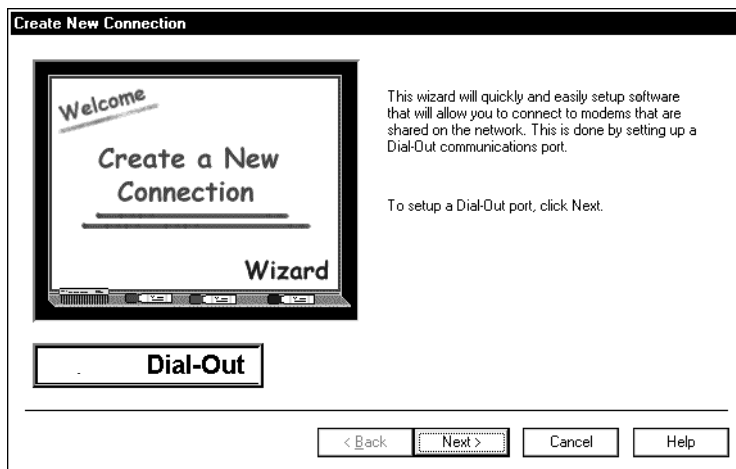
Novell extensions.

If you change network protocols, you will be prompted to re-start you computer before the change will take effect

Creating a New Connection

Double click on the Create New Connection icon in the Dial-Out window. The wizard will guide you through the following steps to create a new connection point.

Welcome Window

This wizard makes it easy for you to use a modem that is connected to a RAS server that is configured for dialing out. Click **Next** if you want to set up a Dial-Out port.

Type a Description
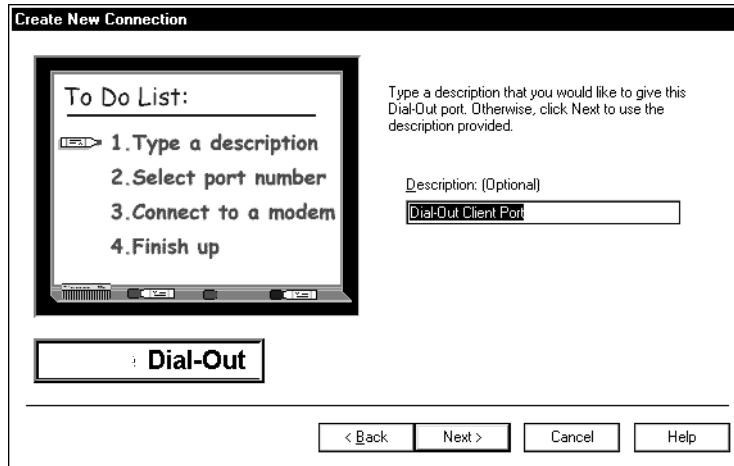
Type in a description of the communications port you plan to set up. The description you enter here will be visible from the **Details** view of the Dial-Out window. It could be helpful to enter a description of the modem's location or baud rate. By default, the field contains the description of "Dial-Out Client Port". Since this description is optional, you can even delete the default text and leave the description blank if you prefer. Click **Next** to continue.

Select Port Number
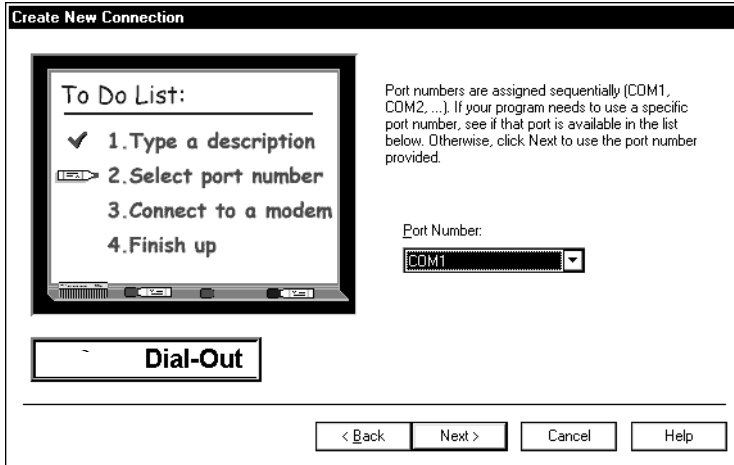
Select the COM port number to which you want to assign the shared modem. Since COM port numbers are assigned sequentially, Dial-Out shows the first available port. If your communications program requires a specific port, click the arrow to the right of the drop-down list box and select that port. Click **Next** to continue.

Connect to a Modem
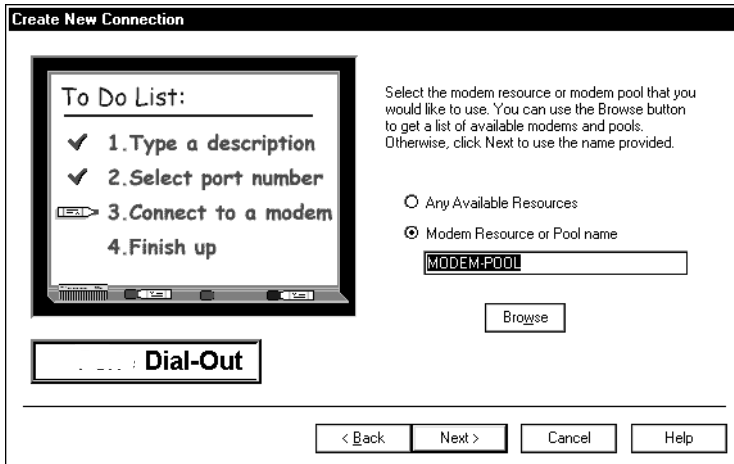
Click **Browse** to select the modem resource or modem pool you would like your port to use. The **Browse for Connection** window opens, and searches the network for all available modem

resources. You can click **Refresh** any time you want to perform another search. Select a modem resource name or pool name, then click **OK**. Click **Next** to continue.

> *Note:* If a modem resource name has been assigned to more than one port on any RAS server, the name appears one time in the Browse list. Likewise, if the same modem pool name has been assigned on multiple RAS servers, the pool name will appear only one time in the Browse list. If one of these resource or pool names are used for redirection, the Dial-Out software will use the first available resource or pool with that name.

Finish
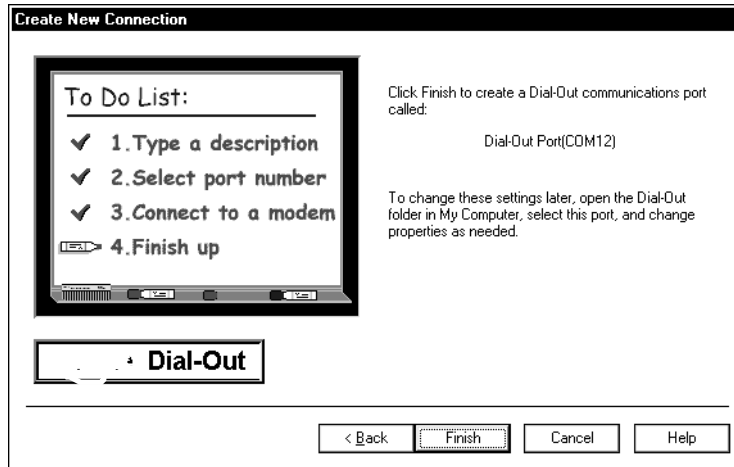
Click **Finish** to accept the port description and COM port number you have chosen, or click **Back** to go back and make a different selection in any of the wizard windows. Note that you can also change these settings later, as described in the on-screen text. Click **Finish**. If the **Confirm Restart** dialog box appears, you must restart your computer to make these settings take effect. Click **Yes** to restart now, or **No** if you would rather restart the computer later.

Dial-Out Port Settings

Right click on an existing Dial-Out port icon and select settings. This window shows the settings for the client Dial-Out COM port you have selected.
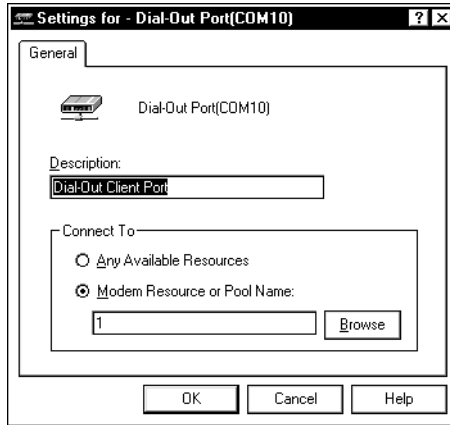
Dial-Out Port Description
You can change the description you entered for this port.
Connect To
Under **Connect To**, you can review or change the shared modem or modem pool this port connects to. Click **Browse** to see a list of all shared modem resources or modem pools currently available on your network or click on **Any Available Resources** to connect to the first available resource on your server(s). Click **OK** when you are finished making changes.

Browse for Connection

The **Browse for Connection** window searches the network for all modem resources currently available on your network. You can click **Refresh** any time you want to perform another search. When you find the modem resource or modem pool you want to use, select it and click **OK**.

Note: If a modem resource name has been assigned to more than one port on any RAS server, the name appears one time in the Browse list. Likewise, if the same modem pool name has been assigned on multiple RAS servers, the pool name will appear only one time in the Browse list. If one of these resource or pool names are used for redirection, the Dial-Out software will use the first available resource or pool with that name.

Deleting a Dial-Out Port

To remove a Dial-Out port (redirected COM port), right-click on the Dial-Out port icon and select **Delete**.

Dial-Out User's Guide

Chapter 5: **Dialing Out in Windows NT and Windows 95**

Overview

This chapter provides guidelines for making dial-out calls, once the Dial-Out for software has been properly installed and configured. Refer to Chapter 4 for Dial-Out software installation and configuration.

The activities documented in this chapter include:

- Explaining the redirection of the COM ports.

- Making the dial-out call.

- Viewing the modem status and Dial-Out port(s) configuration.

Redirecting the COM Ports

The communications program that you normally run under Windows NT OR Windows 95, usually sends data to the serial port (COM port) that is physically attached to the PC. The data is then transmitted to its destination via a modem attached to the same COM port.

With the Dial-Out software installed, the data sent by the communications program is 'redirected' over the local area network (LAN) to a selected shared modem port or pool on a RAS server. From that point, the data is sent via the attached modem to the appropriate destination. The redirection of specific COM ports is done by Dial-Out's **Create New Connection** wizard as explained in chapter 4. The wizard program gives the user a list of all COM ports available for redirection. Instructions on how to remove redirected COM ports are given in chapter 4.

Frequently, users redirect COM ports only once, prior to dialing out for the first time. The Redirected COM ports(s) remain in effect until you modify their configuration. Only one redirect COM port can be active at a time. If you need to run another communications program that uses a different redirected COM port than the one that is currently active under another program, you must disconnect or terminate that program before starting up the other. Otherwise, an error will be posted indicating that the requested redirected COM port is unavailable or busy.

Making the Dial-Out Call

Dial-Out operates in the background when you use your communications program to dial-out. During the dial-out process, you need to select what COM port you want to use for your current call. Most communications program will ask you to select which modem or COM port you want to use initially, and then save the setting for future use unless you alter the setting at a future date. If you choose a redirected COM port, the Dial-Out software automatically redirects the call to an available dial-out modem located on a RAS server.

Preparing for Dial-Out

Before you make the dial-out call from your computer, ensure that:

- The PC is properly attached to the local area network when powered on.
- There is a Windows NT or Windows 95 communications program properly loaded and configured on the PC.

How to Make the Call

Now that you have a COM port ready to use, follow these steps:

When you want to use a shared modem – for example, to connect to the Internet – open a communications program on the Dial-Out client computer (such as HyperTerminal, or an Internet dialer).

If this is the first time you have used Dial-Out, you may see a message that says a modem is not installed – or a message asking you to install a modem, even though you do not have one attached to this computer. You must follow the modem installation procedure, because it places modem configuration information directly onto your computer's hard drive. This is required even though you will be using the shared modem over the network. Click Yes to let your communications program automatically detect the modem that your Dial-Out COM port is set up to use over the network. When the correct modem type appears, select it, save your changes and exit the program. If it cannot detect the correct modem type, you can try selecting Standard Modem as the type.

1. **Close** the communications program, and **restart** your computer.

2. Open your communications program again and dial out. The communications program will see the shared modem just as if it were located on your desktop.

3. When you are finished using the modem, release it so that other users can access it. The PC has sole access to the specified modem until one of the following situations occurs:

   - You close the communications program

- You close the communications program and restart it or another using a different COM port

- An inactivity timeout has occurred based on the client dial-out configuration setting. Refer to chapter 4 for setting this parameter.

Viewing Modem Status and Dial-Out Port Icons

Viewing Modem Status

For client computers, Dial-Out provides a graphical method of viewing the activity of the modem you are using. The **Modem Status** feature displays a small window that looks just like the light panel on a modem. The lights are dark red when inactive and light red when active.

There are six lights, each labeled with two letters:

   RI – Ring Indicator

   CD – Carrier Detect

   RD – Receive Data

   SD – Send Data

   TR – Transmit Ready

   CS – Clear to Send
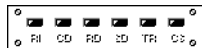
The Modem Status is only visible under the following conditions:

- Dial-Out is properly configured and running with a redirected COM port

- A communications program is configured to use a redirected COM port

- The Dial-Out **Service Manager** has been started and both the **Always on Top** and **Automatic modem status display** options have been selected. Refer to **Changing Modem Status Properties** for explanations of both options.

Changing Modem Status Properties

Right-click the Dial-Out Service Manager icon that displays in your system tray (the lower right corner of your screen). Select Status Properties from the menu that appears. There are two options in the Modem Status Properties window:

Automatic modem status display

This check box, selected by default, ensures that any time your computer is using a Dial-Out COM port, the Modem Status window displays on your desktop.

Always on top

When this check box is selected, the Modem Status window always displays on top of anything else you have open on your desktop, so that you never lose sight of the modem's activity.

Note: When you pass the mouse cursor over the Modem Status window, the COM port number it is using displays.

Viewing Dial-Out Port Icons

View buttons

How your Dial-Out ports are displayed in the Dial-Out window depends on which of these four view buttons is selected.

Large icons

Displays files as large icons (this is the default setting).

Small icons

Shows files as small icons, and the icons display in wrapping columns; you must scroll to the right to see them all.

List

Shows files as small icons, but displays them in one continuous column, so you must scroll down to see them all.

Details

Shows the port number, its description and its resource name.

Chapter 6: **Setting up Dial-Out in DOS**

Overview

This chapter includes the activities for setting up Dial-Out in DOS. For information on making a dial-out call in DOS, see Chapter 7.

The setup activities documented in this chapter include:

1. Installing the software.

2. Configuring the dial-out settings.

Installing the software

The installation program for Dial-Out provides step-by-step instructions to guide you through installation of the software. The installation process makes the following changes:

- it copies files from the CD-ROM to the specified drive and directory based on the choices you make during installation

- it modifies all appropriate system files (not applicable if you install to a network drive).

Knowledge Required

The person who is installing the software requires knowledge of the PC working environment and network configuration to answer questions during the installation. Frequently, the network administrator is responsible for installing Dial-Out software. If the dial-out user is installing the software, they need to consult the network administrator when they are preparing for installation.

Preparing for installation

Before you install the Dial-Out software:

- Determine whether the PC meets the equipment requirements for the DOS software installation. See Chapter 1 for equipment requirements.

- Make sure that the dial-out user has installed a DOS communications program supporting INT14 (Interrupt 14) or NASI (Netware Asynchronous Services Interface) program standards. See Appendix B for a list of 3rd party communications programs.

- Determine which type of installation you want to perform. The following types of installation are available:

  a) Use the CD-ROM to install the software to the dial-out user's hard drive.

     or

  b) Use the CD-ROM to install the software to a network drive. This method permits the network administrator to install the software to a shared drive and then pre-configure the settings to be used by all dial-out users. See *c)* for subsequent installations on user PCs. See "Pre-Configuration" on page 67.

     Note: The installation program automatically detects if you are installing to a network drive, in which case, it does not modify any system files on your PC.

     or

  c) Install the software from a shared network drive to the dial-out user's hard drive. This type of installation does not require the CD-ROM. If using this method, ensure that the network administrator has performed installation *b)* first.

Installing from CD-ROM

To install the software from the CD-ROM to either the user's hard drive or a network drive:

1. Place the CD-ROM in the CD-ROM drive.

2. At the DOS prompt, type:

    `d:\dos\doclnt\english\install`

3. Perform the installation by following the prompts that appear on the screen.

Installing from network drive

To install Dial-Out from a network drive to the dial-out user's hard drive:

1. At the Command Line, type:

    `[drive]\[installation directory]\install`

    Example:

    `j:\pdialout\install`

2. Click **OK**.

3. Follow the screen instructions to complete a first-time installation or to upgrade the user's existing version. The setup program allows you to customize the installation.

4. At the end of the installation, restart the computer so changes to the system files can take effect.

Configuring the Dial-Out Settings

Once installation is complete, the software on the user's PC is automatically configured with 'default' settings. These configuration settings control how the PC communicates with the server when the user dials out. You may need to change some or all of the 'default' settings to ensure they meet the dial-out requirements of the user and the network.

Normally, configuration is a one-time activity, following installation. However, it may be necessary to reassess the settings under the following conditions:

- If the server settings change.

- If the communications program on the PC changes

- To achieve peak network efficiency.

Knowledge Required

The person configuring the PC requires a knowledge of the PC working environment and network configuration, to enter or select the correct information. Frequently, the network administrator is responsible for configuring the settings. Depending on the type of installation, the network administrator either pre-configures the settings on a network drive or configures the settings directly on the user's PC.

If the dial-out user is configuring the settings, they need to consult with the network administrator, before they begin the configuration process.

Preparing for configuration

Before you configure the user's PC for dial-out, ensure the following preliminary work has been completed:

- Dial-Out has been installed either on a network drive or on the user's PC.

- The PC used for configuration is attached to the network.

- A DOS communications program has been installed on the user's PC. The DOS program must support the INT14 or NASI standards.

- One or more RAS Servers are installed on the network.

- The network administrator has configured one or more servers so that the PC has access to the server for dial-out purposes.

Pre-Configuration

Pre-configuration applies only to Dial-Out software that has been installed on a network drive. 'Pre-configuration' means that the network administrator configures the dial-out settings on the network drive, before installing the software to each user's PC. Once the settings are properly configured, each user can then install the 'pre-configured' version of Dial-Out software on their PC's hard drive. This approach allows the network administrator to standardize the dial-out settings for all users, in one operation.

Pre-Configuration Steps

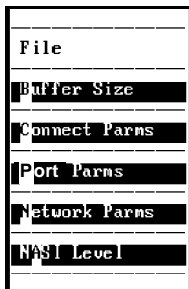To pre-configure Dial-Out installed on a network drive:

1. Change to the network drive where the Dial-Out software is installed.

2. Follow the normal "Configuration Steps" below.

Configuration steps

Use the Dial-Out Setup program to configure the user's PC for dial-out, as follows:

1. Change to the directory where the Dial-Out software is installed. The default is **\pdialout.**

2. At the DOS prompt, type:

   pdsetup

3. Press **Enter**. The main Dial-Out Setup screen appears.

4. Verify the parameter file name is correct or type the correct file name. Press **Enter**.

   Note: Leave the default parameter file name unless you have a specific reason to change it.

5. Select a parameter set number or create a new set number. The set number is associated with the selected parameter file. Each parameter file can hold up to 99 sets.

   Note: The different parameter sets enable you to set up different operating environments. However, it is recommended that you use a single parameter set, i.e. set '1'. If you use a parameter set other than '1', you need to specify the set number on the Command Line when you load the "Pdialout" program.
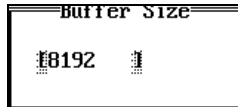
6. Press **Enter**.

7. Choose an item from the menu. The menu lists the different categories of configuration settings, as shown below:

```
 _____
|                   |
| File              |
|_____|
|███████████████████|
|█Buffer Size      █|
|_____|
|█▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔█|
|█Connect Parms    █|
|_____|
|█▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔█|
|█Port Parms       █|
|_____|
|█▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔█|
|█Network Parms    █|
|_____|
|█▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔▔█|
|█NASI Level       █|
|_____|
```

8. Review or change the configuration settings. See the following pages for more details on configuration.

9. To choose a different configuration category, press **ESC** to return to the menu.

10. When you have finished configuring the software for dial-out, choose **Save** from the **File** menu.

11. From the **File** menu, choose **Quit** or press **ESC** on your keyboard to exit the Dial-Out Setup program.

Configuring Buffer Size

From the menu, choose **Buffer Size** to enter the number of bytes to be reserved as space for buffers.
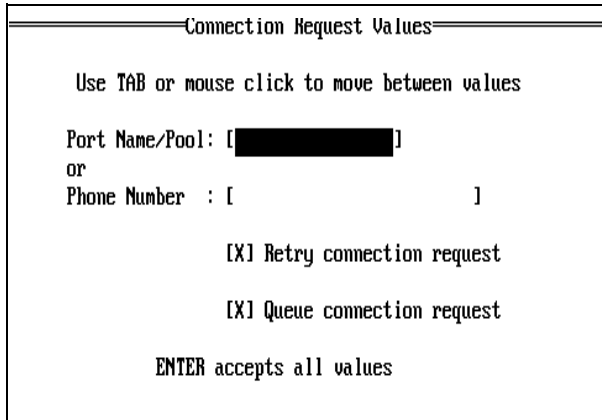
```
═══Buffer Size═══
 [8192   ]
```

A description of the Buffer Size screen appears below.

Buffer Size Screen

Area	Explanation
Buffer size	Buffers are storage areas used to hold information sent to and from the server. Consider the following implications before you make any changes to the default setting.
	• Lower the number to reduce the buffer space in the PC.
	• Increase the number to provide more buffer space in the PC. This change allows the system to process the communication data more efficiently, because there will be fewer situations when the system needs to wait for data.
	The default installation setting is '8192' bytes.
	The minimum setting is '6144'. The maximum setting is '65535'.

Configuring Connection Settings

From the menu, choose **Connect Parms** to identify the ports, pools or phone number being used for dial-out. The network administrator can provide the appropriate information.

```
╔═══════════════════Connection Request Values═══════════════════╗
║                                                                ║
║     Use TAB or mouse click to move between values              ║
║                                                                ║
║     Port Name/Pool: [███████████████]                          ║
║     or                                                         ║
║     Phone Number  : [                      ]                   ║
║                                                                ║
║                     [X] Retry connection request               ║
║                                                                ║
║                     [X] Queue connection request               ║
║                                                                ║
║                  ENTER accepts all values                      ║
║                                                                ║
╚════════════════════════════════════════════════════════════════╝
```

Details about the Connection Request Values screen appear next.

Connection Request Values Screen	
Area	**Explanation**
Port/Pool name	Choose either this option or the phone number option, but not both. Enter the port or pool name to be used for dialing out from the user's PC. This port or pool can be located on any server in the network. Enter one of the following names, as provided by the network administrator. • the name of a specific port being requested. • the name of a pool. A 'pool' is a collection of ports having common characteristics so that the ports are, in effect, interchangeable. If a pool or port name is configured on more than one server, the Dial-Out software will choose the first available port with the specified port or pool name. The maximum length of a pool or port name is 16 characters, unless the user's communications program supports NASI standards (see Note below). *For NASI users only:* If the user's communications program supports NASI standards, do not exceed the following lengths: • for a pool name, the maximum is 8 characters • for a port name, the maximum is 14 characters.

Connection Request Values screen (cont'd)	
Area	**Explanation**
Phone Number	Choose this option or the port/pool name option, but not both. Enter the complete phone number. If you choose this option, the server performs the dialing function, instead of the communications program.
	When a phone number is chosen for redirection, the Dial-Out program will choose any available port on any server configured for dial-out.
Retry Connection Request	An X indicates that the PC is to automatically retry the connection request.
	When a user starts up their communications program, the PC automatically requests a connection to a server port. If the server is unavailable or busy when the PC requests the connection, the user sees a message, asking if they want the PC to automatically retry the request.
	The default installation setting is Yes (X).
Queue Connection Request	An X indicates that the server is to place the connection request in a dialing queue.
	When a user starts up their communications program, the PC automatically requests a connection to a server port. If the server is unavailable or busy when the PC requests the connection, the user sees a message, asking if they want the PC to place the connection request in a queue.
	The default installation setting is Yes (X).

Configuring Port Parameters

From the menu, choose **Port Parms** to configure the settings for the ports and the modem that will be allocated to the user (when the user's PC makes a connection request). The default settings use the server definitions for the allocated port. Do not alter these settings unless you need to override the server settings (for example, the communications program might require specific port settings). If you are in doubt about which settings to use, retain the default settings.

```
════════════════════════════Port Parameters════════════════════════
  [ ] Use Server Defaults

┌[ Data Bits ]────  ┌[ Stop Bits ]───  ┌[ Parity ]────
  ( ) 6               (*) 1               (*) NONE
  ( ) 7               ( ) 2               ( ) ODD
  (*) 8                                   ( ) EVEN
                                          ( ) MARK
                                          ( ) SPACE

┌[ Baud Rate ]────                   ┌[ Flow Control ]────
                                       ( ) No Flow
  19200  ↑                             (*) Xon/Xoff
  38400  ■                                [11H] Xon
  57600  ↓                                [13H] Xoff
                                       ( ) Hardware
```

Details of the Port Parameters screen appear next.

Port Parameters screen	
Area	**Explanation**
Use Server Defaults	An X indicates that the server port is to be set up using the settings from the server. If no X appears, the settings which are used, are the ones entered on this screen and on the Network Values screen.
	The default installation setting is Yes(X).
Data Bits **and** **Stop Bits**	Select the data bits and stop bits that match both of the following settings:
	• the setting used at the calling destination (contact the destination site to verify this information)
	and
	• the setting in the communications program.
	Note: You cannot select either data bits or stop bits if there is an X in the 'Use Server Defaults' box.
	The default installation settings are '8' data bits and '1' stop bit.
Parity	Select a parity type that matches both of the following settings:
	• the setting at the calling destination (contact the destination site to verify this information)
	and
	• the setting in the communications program.
	Note: You cannot select a parity setting if there is an X in the 'Use Server Defaults' box.
	The default installation setting is 'NONE'.

Port Parameters screen (cont'd)	
Area	**Explanation**
Baud rate	Select the baud rate of the port being used for the call. Select the maximum speed supported by both the modem and communications program.
	You cannot select a port speed if there is an X in the 'Use Server Defaults' box.
	The default installation setting is '38400'.
Flow Control options	Select whether or not you want to use flow control and, if so, the type of flow control. 'Flow control' regulates the flow of data between the communications program and the server modem. Match the setting to the communications program.
	Select one of the following options:
	• No flow control.
	• Xon/Xoff flow control (to use the software flow control). The Xon/Xoff fields display standard industry values. You should never need to change these values.
	• Hardware flow control. This is the preferred option if the communications program supports it.
	The default installation setting is 'Hardware Flow Control'.

Configuring Network Values

From the menu, choose **Network Parms** to configure the Network settings. The settings on this screen (excluding Inactivity Timeout and Server Response Timeout) can affect responsiveness between the PC and the server. Retain the Network default settings, unless the type of transmission specifically requires different settings.

```
╔═══════════════════════Network  Values═══════════════════════╗
║          Use TAB or mouse click to move between values       ║
║ Inactivity Timeout     : [30]     (mins)                     ║
║ Server Response Timeout: [6    ]  (secs)                     ║
║ Packet size            : [140]    (bytes)                    ║
║ Character Timeout      : [60   ]  (msecs)                    ║
║ Packet Timeout         : [720  ]  (msecs)                    ║
║                                                              ║
║                                                              ║
║ Enter up to 16 trigger characters in decimal or             ║
║ hexadecimal (value followed by the letter H)                ║
║                                                              ║
║ [   ]  [   ]  [   ]  [   ]  [   ]  [   ]  [   ]  [   ]        ║
║ [   ]  [   ]  [   ]  [   ]  [   ]  [   ]  [   ]  [   ]        ║
║                                                              ║
║               ENTER accepts all values                      ║
║                                                              ║
╚══════════════════════════════════════════════════════════════╝
```

Details about each area in the Network Values screen appear next.

Network Values screen

Area	Explanation
Inactivity Timeout	Enter the duration of the inactivity time-out, in minutes. 'Inactivity timeout' is the amount of time you allow a connection to be maintained without any activity over the port.

The default installation setting is '30' minutes.

The minimum setting is '0' (zero) meaning 'no inactivity timeout'. The maximum is '99'. |
| **Server Response Timeout** | Enter the duration of the server response timeout, in seconds. 'Server response timeout' is the amount of time you allow for the server to answer the user's request for a port, before ending the request. The dial-out user receives a message when a server response timeout occurs.

Note: Limit any changes in the server response timeout setting, to situations where the network contains multiple 'bridges' or special configurations. Such situations can lengthen the network response time.

The default installation setting is '6' seconds

The minimum setting is '0'. The maximum is '65535'. |
| **Packet size** | Enter the size of individual network transmissions. 'Packets' are blocks of data transmitted on a network. Due to the following implications, do not make any changes to the default setting unless you have a specific reason:

• Setting the number lower increases the frequency of network transmissions, because packets are always sent when they are full. This change results in higher network traffic.

• If you change the packet size, review the setting for the Packet timeout.

The default installation setting is '140' bytes.

The minimum setting is '1'. The maximum is '512'. |

Network Values screen (cont'd)

Area	Explanation
Character timeout	Enter the duration of the character timeout, in milliseconds. 'Character timeout' is the maximum amount of time that can elapse without a character being sent. The packet is transmitted after the time period has elapsed. Consider the following implications before you make any changes to the default setting: • Set the number lower to improve the responsiveness of the system. However, this change may result in higher network traffic. • To ensure this setting is valid, make sure the number is lower than the Packet timeout number. Network packets are always sent when they are filled, or if the Packet timeout expires. See "Packet timeout" below. The default installation setting is '60' milliseconds. The minimum setting is '0' (zero). The maximum is '65535'.
Packet timeout	Enter the duration of the packet timeout, in milliseconds. 'Packet timeout' is the maximum amount of time that a packet will wait for data before the packet is sent. Packet timeout begins to count down when the first character is placed in a packet. Consider the following implications before you make any changes to the default setting: • Lower the number, if the typical data transmission is smaller than a packet. Lowering the number can improve the responsiveness of the system. The default installation setting is '720' milliseconds. The minimum setting is '0' (zero). The maximum is '65535'.

Network Values screen (cont'd)

Area	Explanation
Trigger characters	Set trigger characters only if you have specific communications needs. They are not for general use.
	A 'trigger' is a character that forces the transmission of a network packet. Data characters accumulate in packets when they are transmitted over the network. These packets are forwarded under one of the following circumstances:
	• when a packet is filled
	• when a character timeout occurs
	• when a packet timeout occurs
	• when a trigger character is encountered.
	Boxes 1 to 16
	Enter a single character in each of the boxes. You can enter any number of characters to a maximum of 16.
	The default installation setting is not to have any trigger characters (boxes 1 to 16 are empty).
	Example:
	If you frequently make file transfers and you know that each block of transmitted data ends with a consistent and unique character, you can define the end character as a trigger. The trigger ensures that each block of data is sent immediately.

Configuring the NASI Level

From the menu, choose **NASI Level** to indicate the correct version of NASI (if the communications program supports the NASI standards). The following display appears.

```
════════NASI Specification Level (2 or 3)════════

  [2]
```

Details about the NASI Specification Level screen appear next.

NASI Specification Level

Area	Explanation
Nasi level	If the user's communications program supports NASI, select one of the two available options. The primary difference between the two options involves the connect signal.
	• '2' indicates that the NASI standards conform to specifications in the Novell NASI API Reference, dated September, 1988. If you are unsure which option to choose, select '2'.
	• '3' indicates that the NASI standards conform to specifications in Novell version 3. If you have had trouble getting or maintaining a connection, try selecting '3'.
	The default installation setting is '2'.

Dial-Out User's Guide

Chapter 7: **Dialing Out in DOS**

Overview

This chapter contains information about the required activities for dialing out in DOS. For information on setup of the Dial-Out software in DOS, see Chapter 6.

This chapter includes:

- A list of dial-out activities

- Information on setting up a batch file to simplify your dial-out activities in DOS.

- A list of the keywords and options you require to perform dial-out activities in DOS. See "Command Line Usage for Pdialout" later in this chapter.

Knowledge Required

A dial-out user should know how to operate the DOS communications program installed on the PC.

Preparing for Dial-Out

Before making the dial-out call, clarify the following information:

- Make sure that the PC is attached to the network when the PC is turned on.

- Make sure a DOS communications program is loaded on the PC. The DOS communications program must have a NASI or INT14 interface.

Dial-Out Activities

To dial-out in DOS, you perform dial-out activities in this order:

1. Load Dial-Out

2. Choose a server port or pool

3. Make the dial-out call

4. Disconnect the port

5. Unload Dial-Out

Loading the Dial-Out program

Load the Dial-Out program, as follows:

1. Type:

   pdialout

2. Press **Enter**.

   Note: *a)*   If the directory containing the Dial-Out software is not in the DOS path, type the full path name before the above command.

   b)   If you load your communications program at this point, you are connected to the default pool, port or phone number that is configured for your PC.

   c)   If you are using a parameter set other than set '1', specify the set number on the command line. For more details, see "Configuration Steps" in Chapter 6.

Choosing a Server Port

If you want to connect to the default pool, port or phone number defined in the configuration settings, you do not need to complete this activity. To choose a server port or pool, use the Select option as follows:

1. At the Command Line, type:

   pdialout select

2. Press **Enter**. The Port/Pool Selection screen appears.

```
      Pool/Port Name Selection                    Server Names

Name                 Type     State
                                                      PERLE
NULL                 Pool
POOL1                Pool
PORT1                Line     Avail




Select entry for connection

Enter   to Select      ESC      to Quit
↑↓      to Scroll      PgUp/Dn New Page
Home    First Page     End      Last Page
```

3. Choose a group or port name belonging to the applicable server. Press **Enter** to establish a connection to the port.

Making the Dial-Out Call

Dial-Out operates in the background when the user runs the communications program. To make the dial-out call:

1. Start up the communications program.

2. Make sure that the communications program is set up to use INT14 or NASI.

3. Use the communications program in the normal way, as if it was using a local modem.

Disconnecting the Port

When you are finished using the server port or pool, disconnect the port so that other users can access the modem. The PC has sole access to the specified modem until one of the following situations occurs:

•   **The user releases it, as follows:**

a) At the Command Line, type:

    pdialout release

b) Press **Enter**.

or

•   **An 'inactivity timeout' limit expires,**

The inactivity timeout corresponds to the configuration settings in the Dial-Out software. The modem disconnects automatically at the end of the specified period of time. See Chapter 4 for details on the inactivity timeout setting.

Unloading Dial-Out

The Dial-Out program will stay in memory until you unload it. To unload the program:

1. At the Command Line, type:

    pdialout u

2. Press **Enter**.

Using Dial-Out from a batch file

Since the procedures for making a dial-out call are almost always the same, most users prefer to set up a batch file to perform the following activities:

- Loading the dial-out software with all the appropriate options

- Running the communications program

- Unloading the dial-out software.

The following is a sample of a batch file that performs the above functions.

```
REM Change to Dialout working directory.
CD\PDIALOUT
REM
REM Startup Dialout software and connect to POOL1.
PDIALOUT CONNECT POOL1
REM
REM Start Communications program.
MYCOMM
REM
REM Release modem.
PDIALOUT RELEASE
REM
REM Unload Dialout software.
PDIALOUT U
```

Dial-Out User's Guide

Command Line Usage for Pdialout

The main program for using Dial-Out in a DOS environment is the PDIALOUT.EXE program. This program permits you to select a pool or port, connect, and then end the connection. You can start up the PDIALOUT.EXE program by typing in the program name followed by a keyword (or a set of keywords and options). Each function requires a different combination of keywords and options.

A list of the appropriate keywords and their descriptions appear in the screen illustrated below.

```
                Brief Description of Command Line Usage

 PDIALOUT [?] [I] [U] [Filename[=Set]] [SELECT] [CONNECT] [RELEASE]
          [/NNAS] [/NGI14] [/NAC14]

    ?                   Displays this help screen
    I                   Displays copyright and version number
    U                   Unloads PDIALOUT from memory
    Filename[=Set]      Loads PDIALOUT with configuration file
                        as Filename and Set as PARSET number
    SELECT              Selects possible Pool/Port Names for connection
    CONNECT [Name]      Requests connection to Pool/Port Name
    RELEASE             Requests release of connected Port Name
    /NNAS               Disables the use of NASI
    /NGI14              Disables the use of INT14
    /NAC14              Suppresses the automatic INT14 connection

    Parameters in the first row are all exclusive except that
    SELECT or CONNECT [Name] may follow Filename[=Set].
```

Chapter 8: **Setting Up Dial-Out in Linux**

Overview

This chapter contains information on installing and configuring the Dial-Out software to use in Linux. For information on making a dial-out call, refer to chapter 9.
The activities documented in this chapter include:

- Installing the software.

- Configuring the software settings.

- Running the driver software.

Note: Most operations involving installation, configuration and control of the dial-out software require you to be logged in as **root** or have root privileges.

Installing the Software

The procedure for installing the dial-out software in Linux consists of the following steps:

- Preparing for installation.

- Patching, configuring and compiling the kernel.

- Creating new special character devices.

- Installing the software RPM.

Note: These are general instructions that apply to a typical Linux system. Certain aspects of the installation may change, such as the location of files, depending on the Linux distribution used and the preferences of you or the system administrator.

Preparing for Installation

Before you install the Dial-Out software:

- Verify that the PC meets the equipment and software requirements as mentioned in chapter 1.

- Make sure that you have up to date source for the kernel installed. If you need to install it, the source should be available with your Linux distribution. If not, it can be obtained from **http://www.kernel.org** or other major Linux web sites. To find out what version of the kernel you are running you can use the command **uname -r**

Patching, configuring and compiling the kernel

A portion of the Dial-Out software is a driver that must be directly compiled into the Linux kernel, or compiled and installed as a kernel loadable module. For additional information on patching, configuring and compiling the kernel, see the **README** file in the kernel source directory. Another very useful document is the **Kernel-HOWTO**. This document may already be installed on your system in **/usr/doc/HOWTO**, or a similar directory, or it may be included in your distribution package. Otherwise is can be obtained from **http://www.linuxdoc.org** and its mirror sites.

With the source for your Linux kernel installed on your system, perform the following steps to install the kernel portion of the dial-out software:

1. Copy the driver patch file **2.patches.tgz** to an empty temporary directory, for example /**usr/src/patches**

2. Uncompress the patch file using the command **tar zxpvf 2.patches.tgz** . This will create patch files for various kernel versions

3. Change to the directory containing the kernel source: **cd /usr/src/linux**

4. Use the patch command to update the kernel with the patch file that matches the version of the source: **patch -p1 < /usr/src/patches/2-2.2.14.patch** (substitute the path and file name of the patch file that applies to you). If there isn't a patch that matches your kernel version, you can either update your kernel by using newer sources that there is a patch for, or try a patch version that is close to your kernel version. If the patch installs without errors, it will probably work.

5. Configure the kernel using **make config** or **make menuconfig** or **make xconfig** . In the **Character devices** section, you will have to enable **Non-standard serial port support** and then also select **USSP support**. You can choose to install USSP support either directly into the kernel, or as a loadable module.

6. The kernel and modules can now be rebuilt and installed using the standard methods.

7. The dial-out patch files and the directory they were in can be deleted if desired.

Creating New Special Character Devices

New special character device node files need to be created for control and use of the Dial-Out software. This can be done using the **mknod** command. One node is needed for control purposes:

   mknod /dev/ussp_ctl c 10 189

The remaining nodes are for the device names used by the user communications programs. One is required for each port number configured for dial-out:

   mknod /dev/ttyUx c 208 x

Replace each **x** with the number of the configured port. For example, for port 0 use the command:

   mknod /dev/ttyU0 c 208 0

These commands only have to be entered once to create each device. The names will be permanent unless they are subsequently deleted.

Installing the Software RPM

Other than the kernel patches, the Dial-Out software is packaged as RPM (*R*PM *P*ackage *M*anager) files. These can be installed, uninstalled, queried, verified, etc. using the **rpm** command and other tools designed to handle RPM files. More information on using **rpm** can be found in the rpm manual page (**man rpm**). There is also an **RPM-HOWTO** document. This document may already be installed on your system in **/usr/doc/HOWTO**, or a similar directory, or it may be included in your distribution package. Otherwise it can be obtained from **http://www.linuxdoc.org** and its mirror sites. There are many additional sources of RPM information available.

Three RPM files are provided for Dial-Out:

dialout-dynamic-x.x-x.i386.rpm and **dialout-static-x.x-x.i386.rpm**
(x.x-x will be replaced with the version number)

   Only one of these should be installed. They each contain a daemon that runs in user space to handle the port(s), an X program for configuration, and an X program that shows the state of the modem signals, like the LEDs on a real modem.

   The difference between the two packages is that the dial-out configurator in the dynamic one uses libraries from the Gnome desktop environment. It should work if you have Gnome installed, or you install the required libraries. The static package has the required library functions linked in, so it doesn't need the Gnome libraries. The static configurator requires much more disk space and memory than the dynamic one, although memory should not be a problem because the configurator is not run continuously. More information on Gnome can be obtained from

http://www.gnome.org

Use RPM to install one of these packages. For example:

rpm -ivh dialout-dynamic-1.0-1.i386.rpm

dialout-x.x-x.src.rpm
(x.x-x will be replaced with the version number)

This is source code RPM for dialout-dynamic-x.x-x.i386.rpm and dialout-static-x.x-x.i386.rpm

Source code is provided under the terms of the GPL (*G*nu *P*ublic *L*icence). You should only need to use the source if you wish to build for a different processor architecture, or want to make changes to the code.

Configuring the Dial-Out Settings

The Dial-out driver software configures itself by reading the contents of a special text file. The provided dial-out configuration program can be used to create and edit this file. The program will be installed in the **/usr/sbin** directory. It is an X client that must be run in the X Windows System environment. If you installed the dynamic RPM, the program will be called **config** . If you installed the static RPM, the program will be called **config-static** .

Preparing for Configuration

Before you configure the Dial-Out settings, ensure that:

- Dial-Out has been properly installed on the PC.

- You know the DNS names or IP addresses of the servers that you wish to connect to. You also need to know the names of the ports or pools that will be used, unless you intend to connect to any available resource on a server.

- If you want the program to check that the server names are valid, the PC should be connected to the network and the domain name server should be configured and available.

Starting the Configuration Program

Start the configuration program by running **config** if you installed the dynamic RPM or **config-static** if you installed the static RPM. One optional parameter can be provided, which is the path and name of the file which will contain the configuration. If the parameter is not given, the default file **/etc/cfg** will be used. You will also have the option of saving the file under a different name from within the configuration program.

Note: The configuration file can reside on a networked drive and be shared by more than one PC. This may simplify administration of Dial-Out for many users.

When the configuration program is started, it will read in the configuration file if it exists and then bring up the main window.

The Main Configuration Window

The main configuration window lists the ports that have been configured and allows ports to be edited, added, and deleted. It also has two pull-down menus: **File** and **Help**
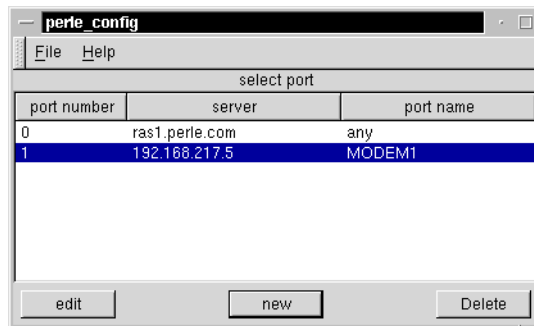
File Menu

The File pull-down menu contains the following selections:

Main Configuration Window - File Menu	
Menu Item	**Explanation**
Open	Brings up a dialog window to specify a new file to open. A warning will pop up if unsaved changes are present in the currently opened file.
Save	Saves configuration under the current file name.
Save **A**s...	Brings up a dialog window to specify a file name to save the configuration to.
E**x**it	Exits the configuration program. A warning will pop up if there are unsaved changes. You will be reminded to restart the dial-out daemon if changes were made and saved.

Help Menu

The **Help** pull-down menu contains the following selections:

Main Configuration Window - Help Menu	
Menu Item	**Explanation**
Manual	Brings up the online help for the configuration program.
About	Displays the version, authors and other information about the program.

Port Configuration Entries

The Main Configuration Window displays a list of the local port numbers configured and the corresponding server name and port name for each. You can select an entry and then press the **edit** button to modify it., or the **delete** button to delete it. Pressing the **new** button allows a new port entry to be created. Using the **edit** or **new** button will bring up the **Edit configuration** window.

The Edit Configuration Window

This window contains entry fields for the port number and the corresponding server name and port

name on the server. It also has a button to allow changing the advanced configuration options for the port.
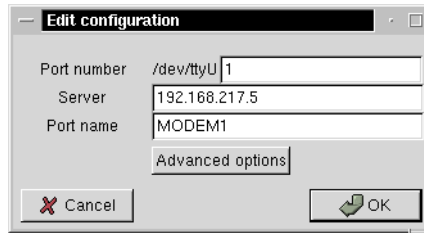
The fields in this window are as follows:

Edit Configuration Window Fields

Field	Explanation
Port number	This is the numeric portion of the device name that will be used by the communication program. The full device name is formed by adding /dev/ttyU in front of the number.
Server	The DNS name or IP address of the server.
Port name	The name of the modem port as configured in the server. This can also be a pool name. If the special name **any** is used in this field, any available dial-out port on the specified server will be used.

Once the required changes have been made, the **OK** button can be used to keep the new values and close the window. The values will be checked for validity. Also, if the Server field contains a DNS name, the domain name server will be queried to see if the name can be properly resolved. If not, a warning will pop up. This is only a warning and it can be ignored if it is because the DNS is not available or is not yet configured.

The **Cancel** button will close the window and discard any changes that were made

Using the **Advanced options** button will bring up a window that will allow the setting of more advanced parameters for the port.

The Edit Advanced Options Window

This window contains entry fields for advanced options for the port currently being configured.
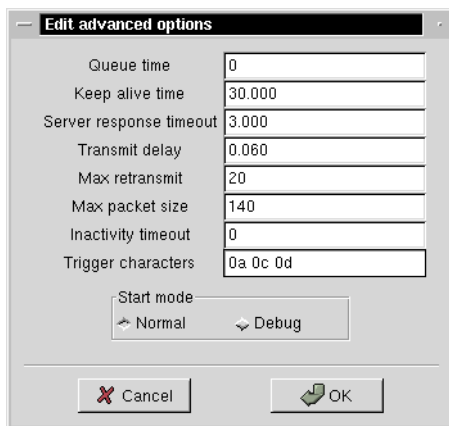
The fields in this window are as follows:

Edit Advanced Options Window Fields

Field	Explanation
Queue time	A value of 0 in this field specifies that no connection queueing is to be done. A none zero value specifies the number of seconds to wait for a connection request that has been queued to become available. See "Queue Request" on page 7 for a description of this option.
Keep alive time	This is the interval, in seconds, that a "keep alive" message will be sent to the server to let it know that the connection is still valid.
Server response timeout	The time, in seconds, to wait for an acknowledgement response from the server for a sent message, before the message is re-sent. See also the "Max retransmit" field below.

Edit Advanced Options Window Fields

Transmit delay	The driver receives data from the communications program as a stream of individual characters, but the data is sent to the server in packets. This value is the time, in seconds, that the driver will wait before sending a packet, that is not filled, to the server after the first character is placed in the packet.
Max retransmit	The maximum number of times that a message that is not acknowledged will be re-sent to the server. See also the "Server response timeout" field above.
Max packet size	The maximum number of characters that will be sent in a packet to the server.
Inactivity timeout	The number of seconds that can elapse with no user data sent or received before the connection is dropped. A value of 0 in this field means the connection will not time out.
Trigger characters	If any of the characters specified in this field, is received from the communications program, to be sent to the server modem, it will cause the contents of the current packet buffer, including the character, to be sent immediately. Each character is entered as its two digit hexadecimal value. The values are separated with spaces.
Start mode	The dial-out software creates a process for each port that has been configured. If **Normal** is selected, then these processes will be started in the background. **Debug** should only be selected for one port and will cause its process to be run in the foreground, to aid in solving problems with the software.

Any changes made can be kept by using the **OK** button. The fields will be checked for valid content and then the window will close. Using the **Cancel** button will close the window and discard any changes made.

Running the Driver Software

The are two components of the driver software that handles the Dial-Out ports.

1. The kernel driver

2. The user space daemon

The Kernel Driver

The dial-out kernel driver will either be built directly into the kernel, or be created as a loadable module. This depends on the option chosen for **USSP support** when configuring the kernel. See "Patching, configuring and compiling the kernel" on page 88 for more information.

If USSP support is compiled into the kernel then it is available at all times and does not have to be enabled.

If USSP support is built as a module then it will have to be loaded in order for dial-out to function. You can use the command **modprobe ussp** to load the kernel driver module. The command **lsmod** will display the currently loaded modules and should include a reference to ussp if it was loaded correctly.

The User Space Daemon

Dial-Out requires a daemon process to be running in user space for each dial-out port that has been configured. The command to start these daemon processes is in the **/usr/sbin** directory and is called **dialout** . The command can be followed by one optional parameter, which is the path and name of the configuration file to use. If the parameter is not given, the default file **/etc/cfg** will be used. The USSP kernel driver (see above) must be available before starting the daemon.

If the configuration file is modified, the changes will only take effect if the daemon processes are ended and then restarted, so that changed file can be read. To end all of the processes at once, the command **killall dialout** can be used. Make sure that none of the dial-out ports is in use before doing this.

Note: Due to the protocol used between the dial-out client and the server, only one port at a time can be active between any given client/server pair (based on their IP addresses). If more than one configured port on the PC is to be in used at the same time, then each active port must be on a different server.

Chapter 9: **Dialing Out in Linux**

Overview

This chapter provides guidelines for making dial-out calls, once the Dial-Out for software has been properly installed and configured. Refer to Chapter 8 for Dial-Out software installation and configuration.

The activities documented in this chapter are:

- Using dial-out with communications programs.
- Viewing the modem status.

Using Dial-Out with Communications Programs

The communications software that you normally run under Linux usually uses one of the local serial ports that are physically attached to the PC. The data is then transmitted to its destination via a modem attached to the same port. If an internal modem is used then the port will be part of the modem.

The local serial ports are usually named **/dev/ttyS0** through to **/dev/ttyS3** and the communications software should have a way of setting the device name that it will use. Changing the setting to one of the configured dial-out port names, such as **/dev/ttyU0**, will cause the software to use a server modem in the same way as a locally attached one. When the port is opened by the communications software the dial-out driver will establish a connection to the server to allow the use of its modem.

Viewing Modem Status

For client computers, Dial-Out provides a graphical method of viewing the activity of the modem you are using. A modem status application called **leds** is located in the **/usr/X11R6/bin** directory. This is an X client that runs in the X Windows System environment. It requires one parameter which is the name of the serial device to be monitored. For example: **leds /dev/ttyU0** . The application displays a small window that simulates like the light panel on a modem. The indicators are grey when the signal is inactive and yellow when active.

There are eight indicators, each labeled with three letters:

RXD – Receive Data

TXD– Transmit Data

DCD – Carrier Detect

RNG – Ring Indicator

RTS – Request to Send

CTS – Clear to Send

DTR – Data Terminal Ready

DSR – Data Set Ready

The window also contains the name of the device being monitored and a button labeled **quit** that can be used to end the application.

Appendix A: **Troubleshooting**

This appendix contains information to help you solve problems you might encounter when using the Dial-Out software with your communications program.

What to Check First

When you encounter a problem in making a dial-out call, check the following items first.

- ☑ Is the dial-out software installed on the user's PC?

- ☑ Does the user's PC conform to the system requirements? See "Equipment & Environment" in Chapter 1.

- ☑ Has the RAS Server been configured to provide the user with dial-out access?

- ☑ Is the user's PC attached to the network?

- ☑ Is a server port available for dialing out? All ports may be busy.

- ☑ Have you recently changed your communications program? If so, either the Dial-Out software or the communications program may require re-configuration.

Problems & Solutions

Questions	Answers	Windows 3.x, Windows 95, Windows NT or DOS users
1. When I dial-out through my communications program, why can't I establish a connection?	Make sure that the Port or Pool names appearing in the Dial-Out program are typed correctly. If the names aren't correct, the PC won't be able to locate the pools or ports that are set up on the server. Windows users refer to the Dial-Out window to view the port, resource & pool names. DOS users refer to the Pool/Port Selection screen.	all

Questions	Answers	Windows 3.x, Windows 95, Windows NT or DOS users
2. When I use my communications program to connect to a Bulletin Board Service (BBS), why is the connection dropped immediately?	Make sure that you have set the Flow Control properly, as follows: a. Set the flow control in the Dial-Out software to be the same as your communications program **or** choose the server default as the flow control for the Dial-Out software. See "Configuring Port Settings" in Chapters 2 and 4. **and**	Windows 3.x Windows 95 DOS
	b. If your communications program contains an initialization string of the modem, make sure the initialization string is the same as the flow control set in the Dial-Out software.	Windows 3.x Windows 95 DOS
	c. For Windows NT, the RAS server default is used but certain communication programs such as Hyperterminal allow you to set the port flow control. Ensure these settings match the ones configured on the RAS server.	Windows NT
4. When I dial-out through my communications program, a connection is established but half of the data is missing or my screen freezes up. Why?	Same as the answer to question 2.	all

Questions	Answers	Windows 3.x, Windows 95, Windows NT or DOS users
5. When I perform file transfers through my communications program, the program reports errors in the transmission. Why?	Same as the answer to question 2.	all
6. When I have queueing turned on and I'm using a 32-bit Windows 95/NT-compatible communications program, the queueing message comes up and I click OK. After that, my communications program doesn't operate. What's wrong?	This is normal behavior with 32-bit Windows 95/NT communications programs. You'll find that when the modem becomes available, the communications program will be usable. Meanwhile, you can still use other Windows 95/NT programs when your communications program is queueing. *Note:* 16-bit Windows communications programs running in Windows 95 behave differently; they're minimized during queueing.	Windows 95 / Windows NT
7. I have chosen to display the Modem Panel on my screen during dial-out. However, the Modem Panel doesn't show the correct modem status. Why?	Try reconfiguring the NASI level setting in the Dial-Out software. For example, if it is set at '2', try changing it to '3'.	Windows 3.1

Questions	Answers	Windows 3.x, Windows 95, Windows NT or DOS users
8. I have a high-speed modem but the INT14 communication software limits the speed to 9600. Why doesn't Dial-Out software support a higher communication speed.?	Dial-Out software supports speeds up to 115,200 but the communication software that you are using only supports the basic INT14 speeds. To use a faster speed than 9600 you require a communications program that supports the extended INT14 speeds that Dial-Out uses. Alternatively, a NASI compatible communications program will allow you to achieve speeds of 115, 200.	Windows 3.x or DOS
9. Can I load the Dial-Out software in upper memory?	Yes, you can load the Dial-Out software into upper memory, using DOS 5.0 or any other memory manager. Choose the Load High command.	DOS
10. I want to write a batch file to automatically load the Dial-Out software and then invoke my communications program when a modem is connected? Is there a way that I can verify that I have a modem connection?	Yes. Configure the Connection Settings in Dial-Out so that the Retry Connection Request box is selected. If the modem is unavailable, or busy when the PC requests the connection, the user sees a message, asking if they want the PC to retry the connection. If you see this message, you will know you do not have a connection.	DOS
11. After I load the Dial-Out software and then use my NASI communications program, I get an error message "Invalid open request detected by RAS". Why?	NASI programs do not make use of the connection settings within Dial-Out. Use the connection and menu options that are built into the NASI program.	DOS

Error Messages

Note: These messages do not apply to Windows NT. See the online help for Windows NT error messages.

Error Message	When it occurs	Cause	Solution
"Initialization failure"	During system start-up (DOS users only)	The configuration file is invalid or the network is not available at the time.	Make sure the network drivers are loaded. When the software is successfully loaded, it displays the message "Initialization Completed".
"Command line contains invalid parameter syntax"	During system start-up (DOS users only)	A syntax error in the command line used to invoke the Dial-Out software. **or** The requested file is not present.	Re-enter the command using the proper syntax. Refer to the Command Line Usage screen for the correct command syntax. To access the above screen type: **pdialout ?**

Error Message	When it occurs	Cause	Solution
Parameter Errors • "Could not open the requested parameter file" • "The requested parameter set does not exist" • "There is a syntax error in this keyword" • "This is an invalid keyword" • "Too many values specified for this keyword" • "Bad value for keyword" • "Required keyword is missing or has invalid value" • "Required keyword has been duplicated" • "No parameter file found" • "No keywords supplied on this statement" • "Read error processing the parameter file" • "No parameter file found"	When a user is configuring Dial-Out settings. (Windows & DOS users)	There is a syntax error in the command line used to invoke the Dial-Out software. **or** The requested file is not present.	*DOS users*: Re-enter the command using the proper syntax. Refer to the Command Line Usage screen for the correct command syntax. To access the above screen type: **pdialout ?** Windows users: Reinstall the Dial-Out software to add all required files.

Error Message	When it occurs	Cause	Solution
• "Error creating network descriptor file" • "Error reading network descriptor file"	When the Dial-Out program is being loaded. (Windows 3.1 & DOS users)	The data file could not be accessed or created.	Verify that the PC or the server has 'write' access to the disk and that the disk is not full.
"Put Device= [path]PDIALOUT in SYSTEM.INI[386enh]"	When the Dial-Out program is being loaded. (Windows 3.1 users only)	Dial-Out has determined that a required DEVICE= parameter is missing from the SYSTEM.INI file. This error prevents the PC from running under Windows.	Reinstall the Dial-Out software.
"All RAS servers are busy or unavailable."	When a user is making a dial-out call. (Windows 3.1 & DOS users)	All ports are being used by someone else or have been taken out of service.	Wait for an available server. **Note:** If you know that a port is available, verify the port, pool and server names are spelled correctly in the Connection settings of Dial-Out.
"Activity time-out, connection has been terminated"	When a user is making a dial-out call. (DOS users only)	Inactivity at the PC has lasted longer than specified in the dial-out configuration settings. Consequently, the PC and server are no longer connected.	Press F1 to acknowledge the message. Exit the communications program and then restart it.

Error Message	When it occurs	Cause	Solution
"Connection request queued by a RAS server."	When a user is making a dial-out call. (Windows & DOS users)	When the requested server modem is busy, the request is queued and this message is displayed.	Wait for the modem to become available or press F2 to cancel queuing.

Appendix B: **3rd Party Communications Programs**

This chapter lists the names of some common Windows communications programs as well as DOS programs that are compatible with Dial-Out. Many other communications programs are also available. If the user's communications program is not listed in this appendix, the following general guidelines may help you decide on the program's compatibility with Dial-Out software:

- Dial-Out software is fully compatible with Windows-based programs.

- Dial-Out software works with DOS programs supporting the NASI or INT14 standards. However, when using DOS programs, the Redirect feature of dial-out is not fully available. If there is any doubt about the program's compatibility, contact the manufacturer of the communications program to ask if it supports NASI or INT14 standards.

Windows Programs

There are many manufacturers that offer standard Windows-based communications programs. Such programs are widely available, and as such no list is provided for the more common Windows-based programs.

If the user has a specific need to use NASI or INT14 standards, some Windows programs support those standards. In such situations, the Dial-Out software is specifically installed for use with NASI or INT14. The programs listed below are Windows programs which support NASI or INT14 standards.

Windows Products	Manufacturers	Supported Standards
Crosstalk for Windows	Digital Communications	INT14
Minisoft 92 for Windows	Minisoft	NASI
Procomm Plus for Windows	Datastorm Technologies	INT14
Mirror III for Windows	Softklone	INT14

DOS Programs

If you are using a DOS communications program with Dial-Out software, the communications program must provide support for the NASI or INT14 standards. For information on specific products, refer to the list below.

DOS Products	Manufacturers	Supported Standards
BLAST Professional DOS	BLAST Inc.	NASI
BLAST Professional Server	BLAST Inc.	NASI
CIM	Compuserve	NASI
Citrix A+ Remote	Citrix Systems	NASI
Co-Session LAN	Triton Technologies	INT14
Co/Session LAN II	Triton Technologies	NASI
Crosstalk Mark IV	Digital Communications	NASI, INT14
Crosstalk 16, Net	Digital Communications	NASI
DynaComm Asynch	FutureSoft	NASI
EM220	Diversified Computer Systems	NASI
EM320	Diversified Computer Systems	NASI

DOS Products	Manufacturers	Supported Standards
EM4010	Diversified Computer Systems	NASI
EM4105	Diversified Computer Systems	NASI
KEAterm	Diversified Computer Systems	NASI
Lexis/Nexis	Mead Data Central	INT14
LEXUS 2000 LAN	Lexis/Nexis	NASI
Minisoft 92	Minisoft	NASI
Mirror III LAN	Softklone	NASI, INT14
PC Anywhere	Symantec Corporation	INT14
PC Anywhere LAN	Symantec Corporation	INT14
PC Anywhere IV LAN	Symantec Corporation	NASI
PCTERM	Crystal Point	NASI
PolyCom	Polycom	NASI
PolyStar	Polycom	NASI
PolyNet	Polycom	NASI
Procom+ Network	Datastorm Technologies	NASI,INT14
Reachout (Modem version)	Ocean Isle Software	NASI,INT14
Reachout (Network version)	Ocean Isle Software	NASI,INT14

DOS Products	Manufacturers	Supported Standards
Reflection	Walker, Richer & Quinn	NASI
Reflection 1 +	Walker, Richer & Quinn	INT14
Relay Gold LAN	Microcom	NASI
Smartcomm Exec	Hayes	NASI
Smartcom Exe	Hayes	NASI
Smartcom III	Hayes	NASI
SmartTerm	Persoft	NASI
SmartTerm 320	Persoft	NASI
SmartTerm 340	Persoft	NASI
SmartTerm 470	Persoft	NASI
Softerm PC	Softronics	NASI
Softterm Modular	Softronics	NASI
Westlaw/Westmate	West Publishing Co.	INT14

FAX Software and Dial-Out

FAX Modem Classes

Class 1 refers to a fax modem standard designed to be an extension of the Hayes AT command set that permits computers to send and receive faxes using fax modems. This standard requires that most of the fax protocol work and image generation be handled by the software, and the basic communication handled by the modem. This standard is very sensitive to network traffic and maintaining the fax connection.

Class 2 refers to a more recent fax modem standard designed to be an extension of the Hayes AT command set that permits computers to send and receive faxes using fax modems. This higher-level standard lets the modem handle much of the fax protocol work and basic communication, freeing the software to manage the session and image generation.

Class 2.0 refers to the final version of the standard.

Because of the long time between (over two years) the availability of the first drafts of the Class 2 standard and this final approved standard, the "2.0" extension is used to distinguish this final version from the draft. This final version is not widely supported with the significant exception of U.S. Robotics and ZyXEL. See ITU-T T.32.

Dial-Out

Since Class 1 modems are very sensitive to network traffic they are not reliable in a Dial-Out situation. If you are using Dial-Out you can not use Class 1 modems.

Both Class 2 and Class 2.0 type modems will work with the Dial-Out.

Software Compatibility

Since Class 2.0 took so long to be published many companies implemented Class 2 support only in their FAX software. This software will not recognize a Class 2.0 modem and will assume it is a Class 1. This will not work with Dial-Out.

For example, Delrina WinFax Version 7.x does not work with the newer USR modems. It will default the modem to Class 2. However version 8 or later of WinFax supports both Class 2 and Class 2.0.

In conclusion, if you wish to use FAX software with a class 2.0 modem in a Dial-Out environment, you must ensure that the software supports the Class 2.0 modem specification.

Using DOS-based Programs under Windows 95

DOS-based communications programs using INT-14 or NASI will run under Windows 95 if Novell's Client Software for DOS and Window 3.x is installed. As well, the Windows 95 Network software must be disabled to avoid conflicts with the DOS software.

The steps to install and run DOS-based programs are:

1. Disable the Windows 95 Networking software:

    a) Open the **Network** dialog box on the PC by clicking the **Network** icon in the **Control Panel**.

    b) Select each network component and click **Remove.**

    c) Restart the PC.

2. Open up a DOS window and click the MS-DOS icon in the top left corner and select **Properties** from the pull-down menu. The MS-DOS Prompt Properties window appears.

3. Make sure the Program tab is active, click the **Advanced** button and check the **Prevent MS-DOS programs from detecting Window**s option.

4. Click **OK** twice to return to the DOS prompt. Exit the DOS window and then open it again.

5. Install Netware 16-bit Client for DOS and MS Windows. This will provide an IPX protocol in an ODI environment. Enter **YES** when asked to install support for MS Windows.

6. Load the Netware software. An example of the commands are:

    ```
    lsl
    ne2000           ; This is your network card driver program.
    ipxodi
    netx
    ```
    or
    ```
    vlm
    ```

7. Run the Dial-Out installation program to install the DOS software. For details, refer to the installation instructions in Chapter 6.

8. Load and run the Dial-Out program from DOS as explained in Chapter 7.

9. Install and run the DOS-base communication program.

Glossary

buffers

Storage areas used to hold information sent to and received from the server.

character timeout

The maximum amount of time that can elapse without a character being sent.

COM port

A port attached to communications hardware that connects to another hardware unit, for example, a modem. It is also a name commonly associated with the RS-232 serial I/O connectors on an IBM PC.

connection timeout (Windows)

See definition for 'server response timeout'.

DOS

(Disk Operating System) The operating system developed by IBM (PC DOS) and Microsoft (MS DOS) for PCs.

driver

System software such as the dial-out driver that lets applications communicate with hardware.

flow control

Regulates the flow of data between the communications program and the modem. Match the setting to the communications program.

inactivity timeout

The amount of time you allow a connection to be maintained without any activity over the port.

INT14

(Interrupt 14) A networking communications protocol used with asynchronous communications servers. Also known as EBIOS (Extended BIOS) INT 14.

Linux

A UNIX like operating system originally developed by Linus Torvalds. It runs on Intel based PCs and also many other processor architectures.

modem

A signal conversion device used to convert digital signals from a computer into analog signals that can be transmitted across the telephone network. The term 'modem' is an abbreviation for 'modulator-demodulator'. A pair of modems is used to transfer data between computers.

NASI

(NetWare Asynchronous Services Interface) A Novell networking communications protocol for sharing asynchronous services such as modems.

Netware

Novell's Network Operating System (NOS) which includes a set of protocols that provides network services and utilities.

network

A group of computer systems and other devices that communicate with one another over the same wire.

packet

A block of data transmitted on a network.

packet timeout

The maximum amount of time that a packet will wait for data before the packet is sent.

parity

A type of error-checking, to minimize distortions in data transmission caused by line disturbances.

pool

A collection of modems which have common characteristics so that they are, in effect, interchangeable.

port

A specific phone line used to transmit data from the server modem to the destination.

RAS

Remote Access Server.

serial port

See definition for 'COM port'.

server

Used in this guide to refer to a RAS Server installed on your network. In general, it is a hardware unit or system that has been specifically configured to provide a service, usually to a group of workstations known as 'clients'.

server response timeout (DOS)

The amount of time allowed for the server to answer the user's request for a port, before ending the request. The dial-out user receives a message when a server response timeout occurs. Same as 'Connection timeout' in the Windows version of Dial-Out.

terminate-and-stay-resident

(TSR) A program that is loaded into memory, where it stays after it finishes running, unless it is specifically removed or the computer is turned off.

trigger

A character that forces the transmission of a network packet. Data characters accumulate in packets when they are received from the phone line or sent from the modem. A packet is sent when a trigger character is encountered, when a character timeout or packet timeout occurs, or when the packet is filled.

USSP

Stands for User Space Serial Port. The term used to describe the method used to provide Dial-Out in Linux. A small driver in the kernel allows the bulk of the dial-out interface to be handled by a daemon process running in user space.

Windows

A graphics-based operating system developed by Microsoft Corporation. In this guide, the term "Windows" refers to the Windows 3.1 operating systems.

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