



**ISA 33.6 KBPS**

**ISA 33.6/56 KBPS**

**Plug and Play Data/Fax Modems**

*Installation Guide*

**OPTIONS**

*by IBM*

## **First Edition (July 1997)**

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## ***Safety: Read First***

**ATTENTION:** Read the Safety Information in the Appendix, page 3-1, before installing this product.

**DO NOT** print this page—replace with World Wide 'Read First' translations.

## *About This Book*

This manual contains information on two different modems:

ISA 33.6KBPS Plug and Play Data/Fax Modem

ISA 33.6/56KBPS Plug and Play Data/Fax Modem

Unless otherwise noted, information in this manual applies to both of these products. The manual is divided into the following parts:

**Part 1:** Abbreviated installation instructions in the following languages:

**English      French      Spanish**

**Part 2:** Product information, installation and usage Information

**Part 3:** Service, warranty, notices and trademarks information

**Note:** The illustrations in this manual might be slightly different from your hardware.

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# Part 1: Quick Installation Guide

This chapter will walk you through the installation of your internal modem. Before getting started, make sure that you have the following items that were included with your package;

- Modem
- RJ11 Phone Cord
- Support diskette containing drivers and/or information
- This Guide

In addition, you will need a Phillips head screwdriver or a 1/4" Hex screwdriver.

Be sure that you have an available 8- or 16-bit expansion slot in your computer.

## Installation

There are two parts to the installation of your modem: hardware and software. Hardware is the modem itself, which will be installed inside of your computer. You should install the modem *before* you install the software that you will use with the modem.

No software is provided with your modem. In order to use the communications capabilities of the modem, you need to use software that comes with your Operating System (for example, Windows Fax and Hyperterm for Windows 95 or Faxworks and Hyperaccess Lite for

OS/2), or use a specific application provided by your system administrator.

## Plug and Play Feature

Your new modem features Plug and Play installation. In addition, the modem can be easily installed without using the Plug and Play feature.

Plug and Play allows a computer to configure the modem's settings automatically. Your computer sets the configuration for the modem and your software applications automatically adjust to that configuration. Note that for this to work, your applications must be Plug and Play aware.

OS/2 Version 4 and the Windows 95 operating environment support Plug and Play. Configuring your new modem for operation with OS/2 or Windows 95 is addressed in the next section.

Once your system sets the configuration, it will use this configuration every time you turn on your machine.

The modem comes preconfigured with Plug and Play enabled. In order to deactivate the Plug and Play capability of the modem, you must reconfigure the modem's jumpers. The next section of this chapter will explain how to locate and change the COM port and IRQ settings.

## Standard Configuration

Your modem was shipped with jumpers set for Plug and Play operation. If you are installing your modem in a Plug and Play system, such as Windows 95 or OS/2 Warp Version 4, you may continue to “Installing the Modem” on page 1-4. If you wish to select non-Plug and Play operation, continue on with the next section.

## Configuring with Jumpers

For non-Plug and Play operation, the modem can be configured manually for COM port and IRQ selection by placing jumpers on the adapter board. If you wish to configure the modem manually, continue with the following section.

## Locating the Jumpers

Using the drawing of the modem shown in Figure 1, find where the COM port and IRQ jumpers are located on your modem.

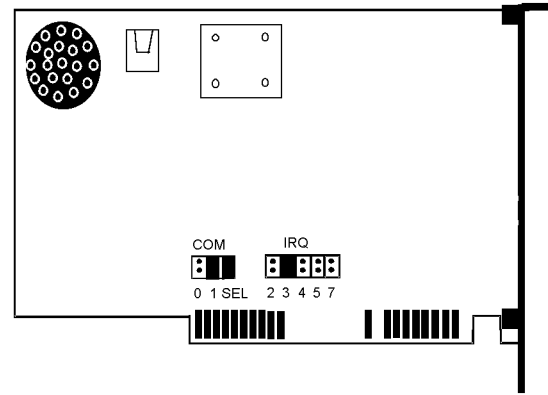


Figure 1. Jumper Locations on the Modem



## Plug and Play Configuration

Make sure that all of the connectors on the COM port and IRQ jumper blocks are removed. Your jumpers should look like the following illustration.

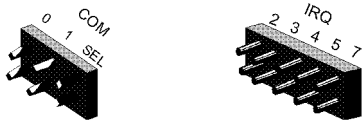


Figure 2. Jumper Appearance for Plug and Play

To change the settings on your modem, lift the black plastic pieces and placethem on the contacts to match the desired settings.

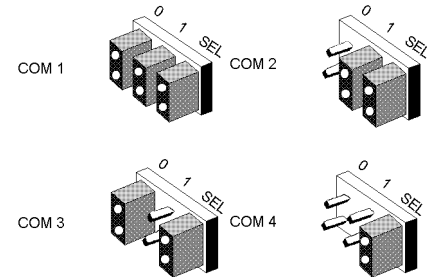


Figure 3. COM Port Jumper Settings

The following is a list of recommended combinations of COM port and IRQ settings when *not* using Plug and Play:

COM 1, IRQ 4	COM 2, IRQ 3
COM 3, IRQ 4	COM 4, IRQ 3

## **Installing the Modem**

1. **Review the safety information provided at the end of this document before beginning the installation.**
2. Turn off and unplug your computer and any peripheral devices, such as a printer.
3. Remove the computer's cover. Refer to the computer manual, if necessary, to see which rear panel screws to remove before sliding the cover off.
4. Unscrew and remove the solid bracket at the back of any available ISA expansion slot.
5. Insert the modem board into the slot you have chosen, with the gold leads on the modem board's edge firmly in the slot's groove.
6. Once the modem is in place, screw the bracket at the back of the modem firmly to the computer's rear panel. This ensures that the modem board is firmly in place.
7. Replace the computer cover and all its screws. Reattach all cables and power cords.
8. If you currently have a phone plugged into the wall jack, disconnect it. Plug one end of the phone cable that came with the modem into the TELCO jack at the rear of the modem. Plug the other end of the cable into the wall jack.

### Installation Details

#### Configuring with Windows 95

The IBM ISA Plug and Play modems were developed after the first shipments of Windows 95. Therefore, these modems may not be in your Windows 95 modem list. The following steps will install the necessary components so that Windows 95 will recognize the ISA Plug and Play modem.

**Note:** This note applies to *both* ISA Plug and Play modems, although the diagrams shown are for the ISA 33.6/56KBPS Plug and Play Data/Fax Modem.

1. Configure the modem for Plug and Play operation by removing all of the connectors from the modem's jumpers and installing the modem in an open slot of your computer.
2. Turn your computer on.
3. When Windows 95 reboots, you should see the **New Hardware Found** screen, shown in Figure 10

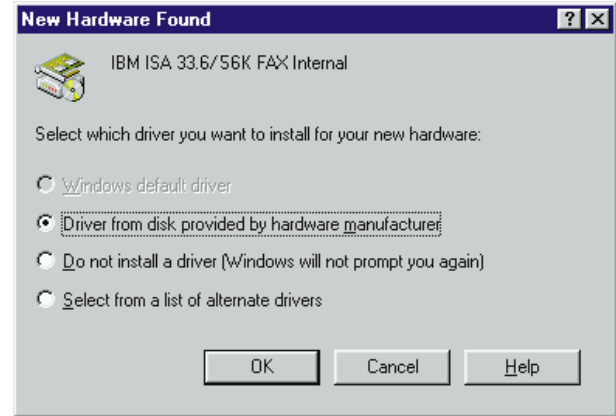


Figure 10. New Hardware Found Dialog

If you do not see this screen, then go to Step 12 on page 2-2.

4. Select the option **Driver from disk provided by hardware manufacturer**.
5. Click on **OK**.

6. You will see the following:

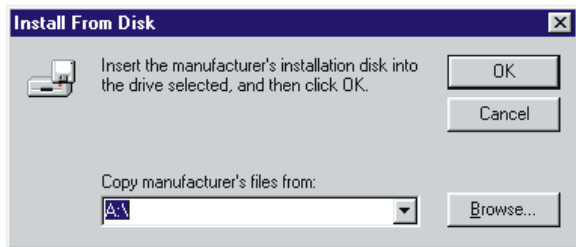


Figure 11. Install from diskette

7. Insert the diskette provided with the modem into diskette drive **A:**.

8. Click on **OK**. You will then see a panel similar to:

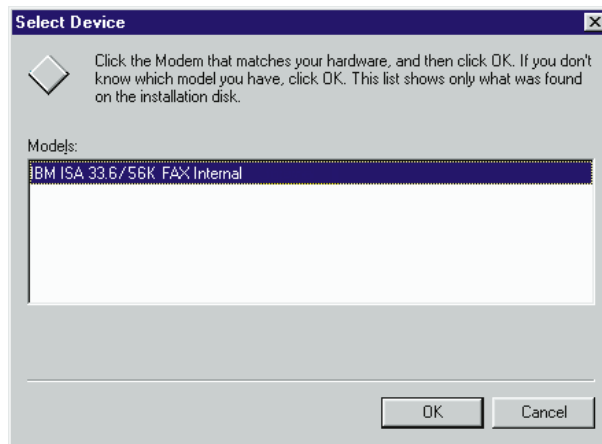


Figure 12. Select Device

9. The modem should be selected and highlighted.
10. Click on **OK**. Windows 95 will load the modem's INF file to your hard drive and return to the main screen.
11. Click on **OK**.
12. Double click on the modem icon in the **Control Panel** to open the **Modem** folder. The IBM ISA Plug and Play modem should be listed.

13. Click on **Properties**, and make note of the **COM** port your modem is using.
14. Click on **Cancel** and close the folder.  
**Note:** If you change any of the modem's properties, you may have to click on **OK** instead of **Cancel**.

## Configuring with OS/2 Version 4

After removing all the connectors from the modem's jumpers and installing the modem, turn your computer on. Then follow these steps:

1. Go to an OS/2 command line
2. Type **RMVIEW /DC**, followed by the **Enter** key.
3. You should see something like the following:

```
Detected Hardware Function: IBM ISA 33.6/56K Modem
PnP Device ID: IBM0032
PnP Compatible Device ID: none
```

```
I/O = 0X03E8 Len = 8 Flg = EXCLUSIVE Addr Lines = 10
IRQ Level = 5 PCI Pin = NONE Flg = EXCLUSIVE
```

4. If the value pointed to by the **I/O** parameter in the previous step is *not* 0X03F8 or 0X02F8, then you will need to make some changes to your **CONFIG.SYS** file. Otherwise, you are finished.
5. You need to change the line in your **CONFIG.SYS** file that contains the **COM.SYS** entry to add support for the serial port. This is accomplished by adding the following parameter to the **COM.SYS** statement, (*N,Address,Irq*). In the case above, we would change the **CONFIG.SYS** line to read:  
**DEVICE=C:\OS2\BOOT\COM.SYS (3,3E8,5)**

## Configuring for other operating environments

The following operating environments *do not* support Plug and Play.

- Any version of PC-DOS
- OS/2 V3.0 (or earlier)
- Windows 3.11 (or earlier)
- Windows for Workgroups
- Windows NT 4.0 (or earlier)

In order to use the modem with these environments, the modem's jumpers must be set to a valid COM setting/IRQ setting. Review instructions from the previous sections on setting the modem's jumpers.

# Command Reference

## Introduction

The Command Reference section includes information about the following:

- Command Summary
- S-Registers

## Command Summary

- Type commands in either upper or lower case, not a combination. Use the Backspace key to delete errors. (You cannot delete the original AT command since it is not stored in the modem buffer.)
- If a command has numeric options and you don't include a number, zero is assumed. For example, if you type ATB, the command ATB0 is assumed.
- Every command except A/ and +++ must begin with the AT prefix and be entered by pressing a carriage return (Enter key).
- The maximum command length is 60 characters. The modem doesn't count the AT prefix, carriage returns, or spaces.

**Note:** Defaults are shown in *italics*.

## Command Set

- \$** Displays a basic command list; online help.
- A** Manual Answer: goes off hook in answer mode. Pressing any key aborts the operations.
- A/** Re-executes the last issued command. Used mainly to redial. This does not require the AT prefix or a Carriage Return.
- Any key** Aborts off-hook dial/answer operation and hangs up.
- AT** Required command prefix, except with A/, +++ and A>. Use alone to test for OK result code.
- Bn** U.S./ITU-T answer sequence.
- B0** *ITU-T V.25 answer sequence*
- B1** U.S. answer tone

<b>Dn</b>	Dials the specified phone number. Includes the following:
<b>P</b>	Pulse (rotary) dial
<b>T</b>	<i>Tone dial</i>
<b>,</b>	(Comma) Two-second pause; linked to S8 register
<b>;</b>	(Semicolon) Return to Command mode after dialing
<b>!</b>	(Exclamation point) Flashes the switch hook
<b>/</b>	Delays for 125 msec. before proceeding with dial string
<b>W</b>	Wait for second dial tone (X3 or higher); linked to S6 register
<b>@</b>	Dials, waits for quiet answer, and continues (X3 or higher)
<b>R</b>	Originates call using answer (reverse) frequencies
<b>#,*</b>	Extended touch tone pad tones
<b>L</b>	Dials the last-dialed number.
<b>DSn</b>	Dials the phone number string stored in NVRAM at position n (n = 0-3). Phone numbers are stored with the &Zn=s command.
<b>D\$</b>	Displays a list of Dial commands.
<b>En</b>	Sets local echo.
<b>E0</b>	Echo OFF
<b>E1</b>	<i>Modem displays keyboard commands</i>

<b>Fn</b>	Sets online local echo of transmitted data ON/OFF.
<b>F0</b>	Local echo ON. Modem sends a copy of data it sends to the remote system to your screen.
<b>F1</b>	<i>Local echo OFF. Receiving system may send a remote echo of data it receives.</i>
<b>Hn</b>	Controls ON/OFF hook.
<b>H0</b>	Hangs up (goes on hook)
<b>H1</b>	Goes off hook
<b>In</b>	Displays the following information.
<b>I0</b>	Four-digit product code
<b>I1</b>	Results of ROM checksum
<b>I2</b>	Results of RAM self test
<b>I3</b>	Product type
<b>I4</b>	Current modem settings
<b>I5</b>	Nonvolatile memory (NVRAM) settings
<b>I6</b>	Link diagnostics
<b>I7</b>	Product configuration
<b>Ln</b>	Controls speaker volume.
<b>L0</b>	Low
<b>L1</b>	Low
<b>L2</b>	<i>Medium</i>
<b>L3</b>	High



<b>Mn</b>	Operates speaker.	<b>Vn</b>	Displays verbal/numeric result codes.
<b>M0</b>	Speaker always OFF	<b>V0</b>	Numeric codes
<b>M1</b>	<i>Speaker ON until CONNECT</i>	<b>V1</b>	<i>Verbal codes</i>
<b>M2</b>	Speaker always ON		
<b>M3</b>	Speaker ON after dial, until CONNECT		
<b>On</b>	Returns online.		
<b>O0</b>	Returns online		
<b>O1</b>	Returns online and retrains		
<b>P</b>	Sets pulse dial (for phone lines that don't support touch-tone dialing).		
<b>Qn</b>	Displays/suppresses result codes.		
<b>Q0</b>	<i>Displays result codes</i>		
<b>Q1</b>	Quiet mode; no result codes		
<b>Q2</b>	Displays result codes only in Originate mode		
<b>Q3</b>	Displays result codes only in Ring mode.		
<b>Sr.b=n</b>	Sets bit .b of register r to n (0/OFF or 1/ON).		
<b>Sr=n</b>	Sets register r to n.		
<b>Sn?</b>	Displays contents of S-Register n.		
<b>S\$</b>	Displays a list of the S-Registers.		
<b>T</b>	Sets tone dial.		

**Xn** Sets result code displayed. Default is X4.

**Xn Setting**

Result Codes	X0	X1	X2	X3	X4
0/OK	•	•	•	•	•
1/CONNECT	•	•	•	•	•
2/RING	•	•	•	•	
3/NO CARRIER	•	•	•	•	•
4/ERROR	•	•	•	•	•
5/CONNECT 1200		•	•	•	•
6/NO DIAL TONE			•		•
7/BUSY				•	•
8/NO ANSWER ♦				•	•
10/CONNECT 2400		•	•	•	•
13/CONNECT 9600		•	•	•	•
18/CONNECT 4800		•	•	•	•
20/CONNECT 7200		•	•	•	•
21/CONNECT 12000		•	•	•	•
25/CONNECT 14400		•	•	•	•
43/CONNECT 16800			•	•	•
85/CONNECT 19200			•	•	•
91/CONNECT 21600			•	•	•

**Result Codes**

	X0	X1	X2	X3	X4
99/CONNECT 24000			•	•	•
103/CONNECT 26400			•	•	•
107/CONNECT 28800			•	•	•
151/CONNECT 31200			•	•	•
155/CONNECT 33600	•	•	•	•	•
180/CONNECT 33333 <b>56K only</b>	•	•	•	•	•
184/CONNECT 37333 <b>56K only</b>	•	•	•	•	•
188/CONNECT 41333 <b>56K only</b>	•	•	•	•	•
192/CONNECT 42666 <b>56K only</b>	•	•	•	•	•
196/CONNECT 44000 <b>56K only</b>	•	•	•	•	•
200/CONNECT 45333 <b>56K only</b>	•	•	•	•	•
204/CONNECT 46666 <b>56K only</b>	•	•	•	•	•
208/CONNECT 48000 <b>56K only</b>	•	•	•	•	•
212/CONNECT 49333 <b>56K only</b>	•	•	•	•	•
216/CONNECT 50666 <b>56K only</b>	•	•	•	•	•
220/CONNECT 52000 <b>56K only</b>	•	•	•	•	•
224/CONNECT 53333 <b>56K only</b>	•	•	•	•	•
228/CONNECT 54666 <b>56K only</b>	•	•	•	•	•
232/CONNECT 56000 <b>56K only</b>	•	•	•	•	•
236/CONNECT 57333 <b>56K only</b>	•	•	•	•	•

◆Requires @ in dial string; replaces NO CARRIER

Result Codes	Functions				
	X0	X1	X2	X3	X4
Adaptive Dialing			•	•	•
Wait for 2nd Dial Tone (W)			•		•
Wait for Answer (@)				•	•
Fast Dial			•		•

**Yn** Selects power-on/reset default configuration.

**Y0** *Default is profile 0 setting in NVRAM*

**Y1** *Default is profile 1 setting in NVRAM*

<b>Zn</b>	Resets modem.	<b>&amp;Cn</b>	Controls Carrier Detect (CD) signal.
<b>Z0</b>	Resets modem to NVRAM profile selected by Y command	<b>&amp;C0</b>	CD override
<b>Z1</b>	Resets modem to NVRAM profile 0	<b>&amp;C1</b>	<i>Normal CD operations</i>
<b>Z2</b>	Resets modem to NVRAM profile 1	<b>&amp;Dn</b>	Controls Data Terminal Ready (DTR) operations.
<b>Z3</b>	Resets modem to factory default profile 0 (&F0)	<b>&amp;D0</b>	DTR override
<b>Z4</b>	Resets modem to factory default profile 1 (&F1)	<b>&amp;D1</b>	Reserved
<b>Z5</b>	Resets modem to factory default profile 2 (&F2)	<b>&amp;D2</b>	<i>Normal DTR operations</i>
<b>&amp;\$</b>	Displays a list of ampersand (&) commands.	<b>&amp;Fn</b>	Loads a read-only (non-programmable) factory configuration.
<b>&amp;An</b>	Enables/disables ARQ codes.	<b>&amp;F0</b>	Generic template
<b>&amp;A0</b>	ARQ result codes disabled	<b>&amp;F1</b>	<i>Hardware flow control template</i>
<b>&amp;A1</b>	ARQ result codes enabled	<b>&amp;F2</b>	Software flow control template
<b>&amp;A2</b>	V- modulation indicator added	<b>&amp;Gn</b>	Sets Guard Tone.
<b>&amp;A3</b>	<i>Protocol indicators added LAPM/MNP/NONE (error control) and V42bis/MNP5 (data compression)</i>	<b>&amp;G0</b>	<i>No guard tone, U.S. and Canada</i>
<b>&amp;Bn</b>	Sets modem's serial port rate.	<b>&amp;G1</b>	550 Hz guard tone, some European countries, requires B0 setting.
<b>&amp;B0</b>	Variable, follows connection rate	<b>&amp;G2</b>	1800 Hz guard tone, U.K., requires B0 setting
<b>&amp;B1</b>	<i>Fixed serial port rate</i>	<b>&amp;Hn</b>	Sets Transmit Data(TD) flow control (also see &Rn)
<b>&amp;B2</b>	Fixed in ARQ mode, variable in non-ARQ mode	<b>&amp;H0</b>	Flow control disabled
		<b>&amp;H1</b>	<i>Hardware flow control, Clear to Send (CTS)</i>
		<b>&amp;H2</b>	Software flow control, XON/XOFF
		<b>&amp;H3</b>	Hardware and software flow control

**&In** Sets Receive Data (RD) software flow control (see also &Rn).

- &I0** *Software flow control disabled*
- &I1** XON/XOFF signals to your modem and remote system
- &I2** XON/XOFF signals to your modem only

**&Kn** Enables/disables data compression.

- &K0** Data compression disabled
- &K1** *Auto enable/disable*
- &K2** Data compression enabled
- &K3** MNP5 compression disabled

**&Mn** Sets Error Control (ARQ) 1200 bps and higher.

- &M0** Normal mode, error control disabled
- &M4** *Normal/ARQ*
- &M5** ARQ mode

**&Nn** Sets connect speed. If connection cannot be established at this speed, the modem will hang up.

- &N0** *Variable rate*
- &N1** 300 bps
- &N2** 1200 bps
- &N3** 2400 bps
- &N4** 4800 bps
- &N5** 7200 bps
- &N6** 9600 bps
- &N7** 12,000 bps
- &N8** 14,400 bps
- &N9** 16,800 bps
- &N10** 19,200 bps
- &N11** 21,600 bps
- &N12** 24,000 bps
- &N13** 26,400 bps
- &N14** 28,800 bps
- &N15** 31,200 bps
- &N16** 33,600 bps
- &N17** 33,333 bps **56K modem only**
- &N18** 37,333 bps **56K modem only**
- &N19** 41,333 bps **56K modem only**
- &N20** 42,666 bps **56K modem only**
- &N21** 44,000 bps **56K modem only**
- &N22** 45,333 bps **56K modem only**
- &N23** 46,666 bps **56K modem only**
- &N24** 48,000 bps **56K modem only**
- &N25** 49,333 bps **56K modem only**
- &N26** 50,666 bps **56K modem only**

**&N27** 52,000 bps **56K modem only**  
**&N28** 53,333 bps **56K modem only**  
**&N29** 54,666 bps **56K modem only**  
**&N30** 56,000 bps **56K modem only**  
**&N31** 57,333 bps **56K modem only**

**Note:** When &N is used in conjunction with &U, &N sets the highest speed at which your modem will connect, and &U sets the lowest speed at which the modems will connect. The factory default settings for these values should be sufficient for most users.

**&Pn** Sets pulse (rotary) dial make/break ratio.

**&P0** U.S./Canada ratio, 39%/61%  
**&P1** U.K. ratio, 33%/67%

**&Rn** Sets Receive Data (RD) hardware flow control, Request to Send (RTS) (see also &In and &Hn).

**&R1** Modem ignores RTS  
**&R2** *Received Data to computer only on RTS*

**&Sn** Controls Data Set Ready (DSR) operations.

**&S0** *DSR override; always ON*  
**&S1** Modem controls DSR

**&Tn** Begins test modes.

**&T0** Ends testing  
**&T1** Initiates Analog Loopback  
**&T3** Initiates Local Digital Loopback  
**&T4** Enables Remote Digital Loopback  
**&T5** *Prohibits Remote Digital Loopback*  
**&T6** Initiates Remote Digital Loopback  
**&T7** Initiates Remote Digital with self-test and error detector  
**&T8** Initiates Analog Loopback with self-test and error detector

**&Un** Sets floor connect speed when **&Un** is set greater than 0. **&Nn** is the ceiling connect speed. See **&Nn**.

**&U0** Disabled  
**&U1** 300 bps  
**&U2** 1200 bps  
**&U3** 2400 bps  
**&U4** 4800 bps  
**&U5** 7200 bps  
**&U6** 9600 bps  
**&U7** 12,000 bps  
**&U8** 14,400 bps  
**&U9** 16,800 bps  
**&U10** 19,200 bps  
**&U11** 21,600 bps  
**&U12** 24,000 bps  
**&U13** 26,400 bps  
**&U14** 28,800 bps  
**&U15** 31,200 bps  
**&U16** 33,600 bps  
**&U17** 33,333 bps **56K modem only**  
**&U18** 37,333 bps **56K modem only**  
**&U19** 41,333 bps **56K modem only**  
**&U20** 42,666 bps **56K modem only**  
**&U21** 44,000 bps **56K modem only**  
**&U22** 45,333 bps **56K modem only**  
**&U23** 46,666 bps **56K modem only**  
**&U24** 48,000 bps **56K modem only**  
**&U25** 49,333 bps **56K modem only**  
**&U26** 50,666 bps **56K modem only**

**&U27** 52,000 bps **56K modem only**  
**&U28** 53,333 bps **56K modem only**  
**&U29** 54,666 bps **56K modem only**  
**&U30** 56,000 bps **56K modem only**  
**&U31** 57,333 bps **56K modem only**

**&Wn** Writes current configuration to NVRAM templates.

**&W0** Modifies the NVRAM 0 template (Y0)  
**&W1** Modifies the NVRAM 1 template (Y1)

**&Yn** Sets break handling.

**&Y0** Destructive, but doesn't send break  
**&Y1** *Destructive, expedited*  
**&Y2** Nondestructive, expedited  
**&Y3** Reserved

**&Zn=s** Writes phone number string *s* to NVRAM at position *n* (*n* = 0-3).

**&Zn=L** Writes last executed dial string to NVRAM at position *n* (*n* = 0-3).

**&Zn?** Displays the phone number stored at position *n* (*n* = 0-3).

**<Ctrl>C** Cancels the display of the help screens.

**<Ctrl>K** Cancels the display of the help screens.

**<Ctrl>S** Pauses help screens.

**+++** Escapes to online-command mode.

## S-Registers

To change a setting, use the ATSr=n command, where r is the register and n is a decimal value from 0-255 (unless otherwise indicated).

Register	Default	Function
S0	0	Sets the number of rings on which to answer in Auto Answer Mode. When set to 0, Auto Answer is disabled.
S1	0	Counts and stores the number of rings from an incoming call (read only).
S2	43	Stores the ASCII decimal code for the escape code character. Default character is "+."
S3	13	Stores the ASCII code for the Carriage Return character <CR>.
S4	10	Stores the ASCII decimal code for the Line Feed character <LF>.
S5	8	Stores the ASCII decimal code for the Backspace character <BS>.
S6	2	Sets the number of seconds the modem waits for dial tone before dialing.
S7	60	Sets the number of seconds the modem waits for a carrier or answers before returning on-hook and sending a No Carrier result code.
S8	2	Sets the duration, in seconds, for the pause (,) option in the Dial command.
S9	6	Sets the required duration, in tenths of a second, of the remote modem's carrier signal before recognition by your modem.

Register	Default	Function
S10	7	Sets the duration, in tenths of a second, that the modem waits after loss of carrier before hanging up. This guard time allows the modem to distinguish between a line hit, or other disturbances that momentarily break the connection, from a true disconnect (hang up) by the remote modem. While we don't recommend connecting the modem to a line with call waiting, if you have it, you may wish to adjust this setting upward to prevent the modem from misinterpreting the second call signal as a disconnect by the remote modem. A better alternative is to ask your phone company how to temporarily disable call waiting (usually *70). For example: ATDT *70 phone number. <b>Note:</b> If you set S10 = 255, the modem will not hang up when carrier is lost. Dropping DTR hangs up the modem.
S11	70	Sets the duration and spacing, in milliseconds, for tone dialing.
S12	50	Sets the duration, in fiftieths of a second, of the guard time for the escape code sequence.



Register	Default	Function																											
S13	0	<p>Bit-mapped register. Select the bit(s) you want on and set S13 to the total of the values in the Value column. For example, ATS13 = 17 enables bit 0 (value is 1) and bit 4 (value is 16).</p> <table border="1"> <thead> <tr> <th>Bit</th> <th>Value</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>Reset when DTR drops.</td> </tr> <tr> <td>1</td> <td>2 *</td> <td>Reset non-MNP transmit buffer from 1.5K to 128 bytes.</td> </tr> <tr> <td>2</td> <td>4</td> <td>Set backspace key to delete.</td> </tr> <tr> <td>3</td> <td>8</td> <td>On DTR signal, auto dial the number stored in NVRAM at position 0.</td> </tr> <tr> <td>4</td> <td>16</td> <td>At power on/reset, Auto Dial the number stored in NVRAM at position 0.</td> </tr> <tr> <td>5</td> <td>32</td> <td>Reserved.</td> </tr> <tr> <td>6</td> <td>64</td> <td>Reserved.</td> </tr> <tr> <td>7</td> <td>128</td> <td>Disconnect on escape code.</td> </tr> </tbody> </table> <p>* The 1.5K-byte non-ARQ buffer allows data transfer with Xmodem- and Ymodem-type file transfer protocols without using flow control. The 128-byte option lets remote users with slower modems keep data you're sending from scrolling off their screens. When remote users send your computer an XOFF (Ctrl-S) and you stop transmitting, the data in transit from your modem's buffer doesn't exceed the size of their screen. This is also very helpful in situations when a remote modem/printer application is losing characters.</p>	Bit	Value	Result	0	1	Reset when DTR drops.	1	2 *	Reset non-MNP transmit buffer from 1.5K to 128 bytes.	2	4	Set backspace key to delete.	3	8	On DTR signal, auto dial the number stored in NVRAM at position 0.	4	16	At power on/reset, Auto Dial the number stored in NVRAM at position 0.	5	32	Reserved.	6	64	Reserved.	7	128	Disconnect on escape code.
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7	128	Disconnect on escape code.																											
S14	0	Reserved.																											

Register	Default	Function																											
S15	0	<p>Bit-mapped register setup. To set the register, see instructions for S13.</p> <table border="1"> <thead> <tr> <th>Bit</th> <th>Value</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>Disable ARQ/MNP for V.22.</td> </tr> <tr> <td>1</td> <td>2</td> <td>Disable ARQ/MNP for .22bis.</td> </tr> <tr> <td>2</td> <td>4</td> <td>Disable ARQ/MNP for V.32/V.32bis.</td> </tr> <tr> <td>3</td> <td>8</td> <td>Disable MNP handshake.</td> </tr> <tr> <td>4</td> <td>16</td> <td>Disable MNP level 4.</td> </tr> <tr> <td>5</td> <td>32</td> <td>Disable MNP level 3.</td> </tr> <tr> <td>6</td> <td>64</td> <td>MNP incompatibility.</td> </tr> <tr> <td>7</td> <td>128</td> <td>Disable V.42 operation.</td> </tr> </tbody> </table>	Bit	Value	Result	0	1	Disable ARQ/MNP for V.22.	1	2	Disable ARQ/MNP for .22bis.	2	4	Disable ARQ/MNP for V.32/V.32bis.	3	8	Disable MNP handshake.	4	16	Disable MNP level 4.	5	32	Disable MNP level 3.	6	64	MNP incompatibility.	7	128	Disable V.42 operation.
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0	1	Disable ARQ/MNP for V.22.																											
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0	1	Reserved.																											
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S17	0	Reserved																											
S18	0	Test timer for &T loopback testing. Sets the time in seconds of testing before the modem automatically times out and terminates the test. When set to 0, the timer is disabled. Valid range is 1-255.																											
S19	0	Sets the duration, in minutes, for the inactivity timer. The timer activates when there is no data activity on the phone line; at time-out the modem hangs up. S19 = 0 disables the timer.																											
S20	0	Reserved																											

Register	Default	Function
S21	10	Sets the length, in 10-millisecond units, of breaks sent from the modem to the computer; applies to MNP or V.42 mode only.
S22	17	Stores the ASCII decimal code for the XON character.
S23	19	Stores the ASCII decimal code for the XOFF character.
S24	0	Reserved
S25	20	Sets the duration, in hundredths of a second, that DTR must be dropped so that the modem doesn't interpret a random glitch as a DTR loss. (Most users will want to use the default; this register is useful for setting compatibility with older systems running under older operating software.)
S26	0	Reserved

Register	Default	Function
S27	0	Bit-mapped register setup. To set the register, see instructions for S13.
		<b>Bit Value</b> Result
		<b>0 1</b> Enables ITU-T V.21 modulation at 300 bps for overseas calls; in V.21 mode, the modem answers both overseas and domestic (U.S. and Canada) calls, but only originates V.21 calls. (Default Bell 103)
		<b>1 2</b> Enables unencoded (non-trellis coded) modulation in V.32 mode; rarely used part of ITU-T Recommendation V.32.
		<b>2 4</b> Disables V.32 modulation.
		<b>3 8</b> Disables 2100 Hz answer tone to allow two V.42 modems to connect more quickly.
		<b>4 16</b> Enables V.23 fallback mode.
		<b>5 32</b> Disables V.32bis mode.
		<b>6 64</b> Reserved.
		<b>7 128</b> Software compatibility mode. This setting disables the codes and displays the 9600 code instead. The actual rate of the call can be viewed on the ATI6 screen. Used for unusual software incompatibilities. Some software may not accept 7200, 12000 and 14400 bps or greater result codes.
S28	0	Eliminates the V.32 answer tones for a faster connection.
		<b>8</b> Default item, all times are in tenths of seconds.
		<b>255</b> Disables all connections except V.32 at 9600 bps.

Register	Default	Function																											
S29	20	Sets the duration, in tenths of a second, of the V.21 answer mode fallback timer.																											
S30	20	Reserved																											
S31	128	Reserved																											
S32	2	Bit mapped register setup. To set the register, see the instructions for S13.																											
		<table border="1"> <thead> <tr> <th>Bit</th> <th>Value</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>V.8 Call Indicate enabled</td> </tr> <tr> <td>1</td> <td>2</td> <td>Enables V.8 mode</td> </tr> <tr> <td>2</td> <td>4</td> <td>Disable V.FC modulation</td> </tr> <tr> <td>3</td> <td>8</td> <td>Disable V.34 modulation</td> </tr> <tr> <td>4</td> <td>16</td> <td>Disable 33.6 kbps support</td> </tr> <tr> <td>5</td> <td>32</td> <td>Reserved</td> </tr> <tr> <td>6</td> <td>64</td> <td>Reserved</td> </tr> <tr> <td>7</td> <td>128</td> <td>Reserved</td> </tr> </tbody> </table>	Bit	Value	Result	0	1	V.8 Call Indicate enabled	1	2	Enables V.8 mode	2	4	Disable V.FC modulation	3	8	Disable V.34 modulation	4	16	Disable 33.6 kbps support	5	32	Reserved	6	64	Reserved	7	128	Reserved
Bit	Value	Result																											
0	1	V.8 Call Indicate enabled																											
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3	8	Disable V.34 modulation																											
4	16	Disable 33.6 kbps support																											
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S33	0	Bit mapped register setup. To set the register, see the instructions for S13.																											
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Bit	Value	Result																											
0	1	Disable 2400 symbol rate.																											
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3	8	Disable 3000 symbol rate.																											
4	16	Disable 3200 symbol rate.																											
5	32	Disable 3429 rate.																											
6	64	Reserved.																											
7	128	Disable shaping.																											

Register	Default	Function																											
S34	0	Bit mapped register setup. To set registers, see instructions for S13.																											
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Bit	Value	Result																											
0	1	Disable 8S-2D trellis encoding.																											
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2	4	Disable 32S-2D trellis encoding.																											
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4	16	Disable non-linear coding.																											
5	32	Disable TX level deviation.																											
6	64	Disable Pre-emphasis.																											
7	128	Disable Pre-coding.																											
S35-S37	Reserved																												
S38	0	<p>Sets an optional delay, in seconds, before a forced hang-up and clearing of the Transmit buffer when DTR drops during an ARQ call. This allows time for a remote modem to acknowledge receipt of all transmitted data before it is disconnected. The modem immediately hangs up when DTR drops.</p> <p>This option only applies to connections terminated by dropping DTR. If the modem receives the ATH command, it ignores S38 and immediately hangs up.</p>																											
S39-S40	Reserved																												
S41	0	Bit mapped register setup. To set registers, see instructions for S13.																											
		<table border="1"> <thead> <tr> <th>Bit</th> <th>Value</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>Distinctive ring enabled.</td> </tr> </tbody> </table>	Bit	Value	Result	0	1	Distinctive ring enabled.																					
Bit	Value	Result																											
0	1	Distinctive ring enabled.																											
S42	0	Reserved																											

# *Modem Specifications*

The IBM ISA Plug and Play Data/Fax Modems meet the following specifications:

## **Data Communications**

Maximum Throughput: 115,200 bps

x2-compatible **56K modem only**

ITU-T V.34+

ITU-T V.34

ITU-T V.32bis

ITU-T V.32

ITU-T V.22bis

ITU-T V.22

ITU-T V.21

Bell 212A

ITU-T V.21

Bell 103

## **Error Control and Data Compression**

ITU-T V.42

ITU-T V.42bis

MNP 2-5

## **Fax Modulation Techniques**

ITU-T V.17

ITU-T V.29

ITU-T V.27ter

ITU-T V.21

## **Fax Standards**

EIA 578 (Class 1)

EIA 592 (Class 2.0)

## **Download Datalink Speeds (x2)56K modem only**

33333, 37333, 41333, 42666, 44000, 45333, 46666, 48000,

49333 50666, 52000, 53333, 54666, 56000, 57333

## **Upload Datalink Speeds (x2)56K modem only**

14400, 16800, 19200, 21600, 24000, 26400, 28800, 31200

## **V.34+ Datalink Speeds**

4800, 7200, 9600, 12000, 14400, 16800, 19200, 21600,

24000, 26400, 28800, 31200, 33600

## **V.32bis Datalink Speeds**

4800, 7200, 9600, 12000, 14400

## **Other Datalink Rates**

300, 1200/75(V.23), 1200, 2400

## **Fax Datalink Rates**

2400, 4800, 7200, 9600, 12000, 14400

## Safety Information



**DANGER**

To avoid a shock hazard, do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.

To avoid shock hazard:

- The power cord must be connected to a properly wired and earthed receptacle.
- Any equipment to which this product will be attached must also be connected to properly wired receptacles.



**DANGER**

Pour éviter tout risque de choc électrique, ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.

Pour éviter tout risque de choc électrique :

- Le cordon d'alimentation doit être branché sur une prise d'alimentation correctement câblée et mise à la terre.

- D'autre part, tout le matériel connecté à ce produit doit également être branché sur des prises d'alimentation correctement câblées et mises à la terre.



**PELIGRO**

Para evitar peligro de descargas, no contacte o desconecte ningún cable, ni realice ninguna instalación, mantenimiento o reconfiguración de este producto durante una tormenta eléctrica. Para evitar peligro de descargas:

- El cable de alimentación debe estar conectado a una toma de alimentación adecuadamente cableada y con toma de tierra.
- Cualquier equipo al cual se conecte este producto debe estar también conectado a tomas de alimentación adecuadamente cableadas.

Cuando sea posible, utilice una mano para conectar o desconectar los cables de señal para impedir que se produzcan posible descargas eléctricas al tocar dos superficies con potencial eléctrico distinto.



## **DANGER**

When using your telephone equipment basic safety precautions should always be followed to reduce the risk of fire, electrical shock, and injury to persons, including the following:

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

## ***Appendix B.***

### ***Help and Service Information***

Before calling, please prepare for your call by following these steps.

---

#### **Step 1: Troubleshooting**

The modem was completely tested for proper operation at the factory before it was packaged for shipment. If you are having problems, you might be able to solve the problem yourself. Make sure that the fol

- Make sure that your telephone cord is plugged correctly from the modem to the telephone jack.
- Ensure that your communications software is installed properly.
- Verify that your communications software's IRQ and I/O settings match the settings of the modem.
- Your modem will not function when connected to a digital telephone system. Digital telephone systems may be used at business locations, but are not used in residences. If you are unsure as to whether or not your telephone system is digital, check with your telecommunications coordinator.

---

#### **Step 2: Preparing for the Call**

To assist the technical support representative, have available as much of the following information as possible:

1. Computer manufacturer and computer model
2. Option name: ISA 33.6KBPS Plug and Play Data/Fax Modem or ISA 33.6/56KBPS Plug and Play Data/Fax Modem
3. Proof of purchase
4. Exact wording of the error message (if any)
5. Description of the problem
6. Hardware and software configuration information for your system
7. If possible, be at your computer. Your technical support representative might want to walk you through the problem during the call.

If possible, be at your computer. Your technical support representative might want to walk you through the problem during the call.

---

#### **Step 3: Placing the Call to IBM**

Technical support is available during the warranty period to answer any questions about your new IBM option. Support response time will vary depending on the number and nature of calls received.

For the support telephone number and support hours by country, refer to the following table or to the enclosed technical support insert. If the number is not provided in the table or insert, contact your IBM reseller or IBM marketing representative.

<i>Support 24 hours a day, 7 days a week</i>	
Canada	1-800-565-3344
Puerto Rico	1-800-772-2227
United States	1-800-772-2227



## Appendix C. About x2 Technology

This section of the manual provides you with information concerning x2 technology that is used in the ISA 33.6/56KBPS Plug and Play Data/Fax Modem. Note that this section is *not* applicable to the ISA 33.6KBPS Plug and Play Data/Fax Modem. This section is intended as an overview of x2 and how it operates. It is not intended to give a full technical description of the technology and methods.

### Quick Overview

x2 technology takes advantage of the fact that the worldwide telephone network is becoming more and more a digital environment. Using this fact, x2 allows data to be transferred to your x2 capable modem at much greater speeds than standard analog modems.

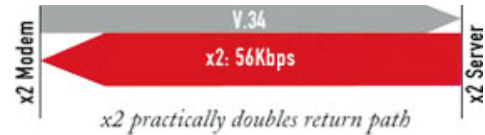
*(Due to the wide variety of conditions that exist in the telephone network, some locations may be unable to use x2 connections. Under these conditions, the modem will connect at V.34 speeds.)*



Typically, the only analog portion of the phone network is the phone line that connects your home to the telephone company's central office (CO). Over the past two decades the telephone companies have been

replacing portions of their original analog networks with digital circuits. But the slowest portion of the network to change has been the connection from your home to the CO. That connection will likely be analog for some years to come.

x2 takes advantage of the typical network configuration found when an analog subscriber connects to a digitally connected server. Because it bypasses the analog-to-digital conversion in the downstream path, x2 can use nearly all of the available 64K network bandwidth. (Upstream data, typically less speed sensitive, travels at the standard V.34 rate.)



The result is a completely new kind of transmission technique. Based on "encoding" rather than "modulation," it can give you quicker download speeds than were possible with earlier V.34 modems. What's more, with standard V.42 bis compression, x2 can download at speeds up to 115.2K.

## **x2 Connection Requirements**

In order to use **x2** connections, your telephone and server requirements are:

1. **Digital at one end.**

One end of an **x2** connection must terminate at a digital circuit, meaning a "trunk-side" channelized T1, ISDN PRI (over a T1 or E1 line), or ISDN BRI.

Line-side T1 will not work because additional analog-to-digital and digital-to-analog conversions are added. In a trunk-side configuration, once the user's analog call is converted to digital and sent through the carrier network, the call stays digital until it reaches an **x2** server modem through a T1, PRI or BRI circuit.

2. **x2 support at both ends.**

**x2** must be supported on both ends of the connection, by the client modem as well as by the remote access server or modem pool at the host end. If you are in doubt as to whether or not your connection supplier uses **x2**, check with your Internet service provider.

3. **One Analog-to-Digital conversion.**

There can only be one analog-to-digital conversion in the phone network along the path of the call between the **x2** server modem and the client modem. If the line is a channelized T1, it must be "trunk-side" and not "line-side." With line-side service from the phone company, there typically is an additional analog-to-digital conversion.

## **Limitations**

**x2** products are capable of 56Kbps downloads; however, due to FCC rules which restrict power output of your service provider's modems, current download speeds are limited to 53Kbps in the US. Actual speeds may vary depending on line conditions. An **x2**-capable analog phone line and **x2** capable service provider are necessary for these high speed downloads.

# Appendix D.

## Product Warranty

The following warranty information applies to products purchased in the United States, Canada, and Puerto Rico. For warranty terms and conditions for products purchased in other countries, see the enclosed Warranty insert, or contact your IBM reseller or IBM marketing representative.

International Business Machines Corporation

Armonk, New York, 10504

### Statement of Limited Warranty

*The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you originally purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. If you have any questions, contact IBM or your reseller.*

**Machine:** ISA 33.6KBPS Plug and Play Data/Fax Modem

**Warranty Period\*:** Five Years

**Machine:** ISA 33.6/56KBPS Plug and Play Data/Fax Modem

**Warranty Period\*:** Five Years

*\*Contact your place of purchase for warranty service information.*

### Production Status

Each Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously

installed. Regardless of the Machine's production status, IBM's warranty terms apply.

### The IBM Warranty for Machines

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if authorized by IBM, will provide warranty service under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

For IBM or your reseller to provide warranty service for a feature, conversion, or upgrade, IBM or your reseller may require that the Machine on which it is installed be 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many of these transactions involve the removal of parts and their return to IBM. You represent that all removed parts are genuine and unaltered. A part that replaces a removed part will assume the warranty service status of the replaced part.

If a Machine does not function as warranted during the warranty period, IBM or your reseller will repair it or replace it with one that is at least functionally equivalent, without charge. The replacement may not be new, but will be in good working order. If IBM or your reseller is unable to repair or replace the Machine, you may return it to your place of purchase and your money will be refunded.

If you transfer a Machine to another user, warranty service is available to that user for the remainder of the warranty period. You should give your proof of purchase and this Statement to that user. However, for Machines which have a life-time warranty, this warranty is not transferable.

## Warranty Service

To obtain warranty service for the Machine, you should contact your reseller or call IBM. In the United States, call IBM at **1-800-772-2227**. In Canada, call IBM at **1-800-565-3344**. You may be required to present proof of purchase.

IBM or your reseller will provide certain types of repair and exchange service, either at your location or at IBM's or your reseller's service center, to restore a Machine to good working order.

When a type of service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item. Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service. You also agree to ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange.

You agree to:

1. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
2. where applicable, before service is provided —
  - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provide,
  - b. secure all programs, data, and funds contained in a Machine, and
  - c. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

## Extent of Warranty

### 3-18 IBM ISA Plug and Play Data/Fax Modems

IBM does not warrant uninterrupted or error-free operation of a Machine.

The warranties may be voided by misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, removal or alteration of Machine or parts identification labels, or failure caused by a product for which IBM is not responsible.

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1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages or loss, up to the greater of U.S. \$100,000 or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR LOSSES OR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF IBM OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU.

## *Appendix E.*

### *Notices*

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## Electronic Emission Notices

### Federal Communications Commission (FCC) Statement

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

IBM is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## Industry Canada Class B Emission Compliance Statement

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

### Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

### Federal Communications Commission (FCC) and Telephone Company Requirements

1. This adapter complies with Part 68 of the FCC rules. A label is affixed to the adapter that contains, among other things, the FCC registration number, USOC, and Ringer Equivalency Number (REN) for this equipment. If these numbers are requested, provide this information to your telephone company.
2. The REN is useful to determine the quantity of devices you may connect to your telephone line and still have those devices ring when your number is called. In most, but not all areas, the sum of the RENs of all devices should not exceed five (5). To be certain of the number of devices you may connect to your line, as determined by the REN, you should call your local telephone company to determine the maximum REN for your calling area.
3. If the adapter causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance; if advance notice is not practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.
4. Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your

equipment. If they do, you will be given advance notice to give you an opportunity to maintain uninterrupted service.

5. If you experience trouble with this product, contact your authorized reseller, or call IBM. In the United States, call IBM at **1-800-772-2227**. In Canada, call IBM at **1-800-565-3344**. You may be required to present proof of purchase.

The telephone company may ask you to disconnect the adapter from the network until the problem has been corrected, or until you are sure the adapter is not malfunctioning.

6. No customer repairs are possible to the adapter. If you experience trouble with the adapter, contact your Authorized Reseller or see the Diagnostics section of this manual for information.
7. This adapter may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. Contact your state public utility commission or corporation commission for information.
8. When ordering network interface (NI) service from the local Exchange Carrier, specify service arrangement USOC RJ11C.



## Canadian Department of Communications Certification Label

**NOTICE:** The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

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

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

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

**NOTICE:** The LOAD NUMBER (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop

may consist of any combination of devices subject only to the requirement that the sum of the LOAD NUMBERS of all the devices does not exceed 100.

## Étiquette d'homologation du ministère des Communications du Canada

**AVIS :** L'étiquette du ministère des Communications du Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme à certaines normes de protection, d'exploitation et de sécurité des réseaux de télécommunications. Le ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunications. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêchent pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être effectuées par un centre d'entretien canadien autorisé désigné par le fournisseur. La compagnie de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause d'un mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

**Avertissement :** l'utilisateur ne doit pas tenter de faire ces raccordements lui-même, il doit avoir recours à un service d'inspection des installations électriques ou à un électricien, selon le cas.

**AVIS :** L'INDICE DE CHARGE (IC) assigné à chaque dispositif terminal indique, pour éviter toute surcharge, le pourcentage de la charge totale qui peut

être raccordé à un circuit téléphonique bouclé utilisé par ce dispositif.  
L'extrémité du circuit bouclé peut consister en n'importe quelle combinaison de dispositifs pourvu que la somme des INDICES DE CHARGE de l'ensemble des dispositifs ne dépasse pas 100.





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