External Modem
User's Manual

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Contents

CHAPTER 1
BEFORE YOU BEGIN

1.1 Features

These Fax/Data/TAM Modems combine the features of a 56000(receive only)/33600/28800/14400/9600 bps data modem and a 14400/9600 bps FAX modem. Your new Fax/Data/TAM Modem gives your personal computer the ability to send and receive FAX messages over the telephone line like a standard FAX machine. Your Fax/Data/TAM Modem also allows your PC to communicate with other personal computers, terminals or BBS's (Bulletin Board Systems) through the data modem functions.

When used as a data modem your Fax/Data/TAM Modem uses the standard AT command set and is fully compatible with ITU-T V.42, V.42bis, V.34, V.32bis, V.32, V.22bis, V.23, V.22, V.21, MNP 2-5, Bell 103, 212A and V.90. When used as a Fax/Data/TAM Modem it communicates with all ITU-T Group 3 FAX machines and is compatible with ITU-T V.27ter, V.29 and V.17. Switching between DATA mode operation and FAX mode operation of your Fax/Data/TAM Modem is done through its firmware, no hardware settings are required.

The communication software, which should be used, depends on the kind of machine that you are going to communicate with. If you are going to call a FAX machine then you must use the Fax software. If the machine that you are going to communicate with is a modem then you must use a data modem communications software.

Note: This manual is written to be used for several models of Fax/Data/TAM Modems. Some of the information in this manual may not apply to your Fax/Data/TAM Modem.

All the description in this manual about Caller ID, V.90 and Fax class 1 applies only to the models which support these functions.

1.2 Package Contents

Before installation, please check the items of your package. The package should include the following items:

- The External Modem
- Quick Installation
- Installation CD

If any of the above items are missing, please contact your supplier.

1.3 Minimum System Requirements

Before installation, please check that your computer complies with the following requirements:

- Pentium MMX CPU 166 or above (Recommended CPU: Intel Pentium MMX , AMD K6 MMX, Cyrix 6x86 MMX)
- 16MB RAM
- Operating System: Windows 95$^{©}$/ 98$^{©}$ /Me$^{©}$/2000$^{©}$ /XP$^{©}$
- CD-ROM drive

CHAPTER 2
HARDWARE INSTALLATION

2.1 Connecting Your Modem

Note: For safety, before installing and uninstalling your modem, please make sure the telephone line is UNPLUGGED from your modem.

Step 1:   Power off your computer.

Step 2:   Connect one end of the RS-232 serial cable to the modem and the other to your computer's serial port.
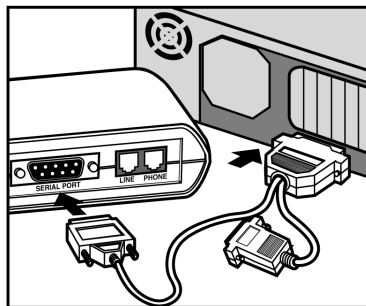
Note: Connect the male end of the RS-232 cable to the modem's serial port and the female end to your computer. Choose suitable 9-pin or 25-pin female connector according to your computer's serial port.

Step 3:   Plug one end of the RJ-11 phone cord into the **LINE** jack on the modem, and plug the other end into your phone jack.
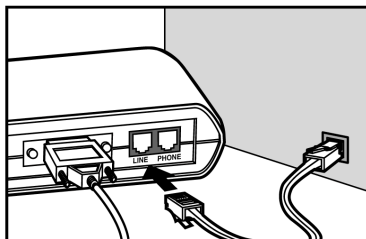
Step 4:   **For model with PHONE port only.** If you want to use a telephone on the modem's phone line while the modem is not used , plug the telephone's cord into the modem's **PHONE** jack.
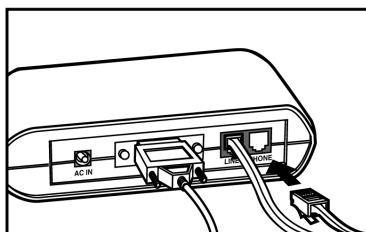
Step 5:   Plug the AC adapter into the modem's **AC IN** jack, and plug the other end into an electrical outlet.
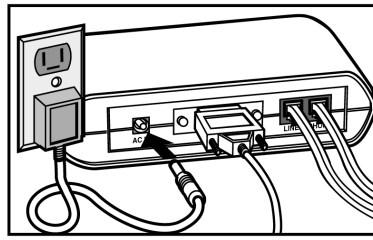
Step 6:   When connection is finished, power on your modem before you power on your PC.

The diagram below illustrates the typical external modem connection:

EXTERNAL MODEM
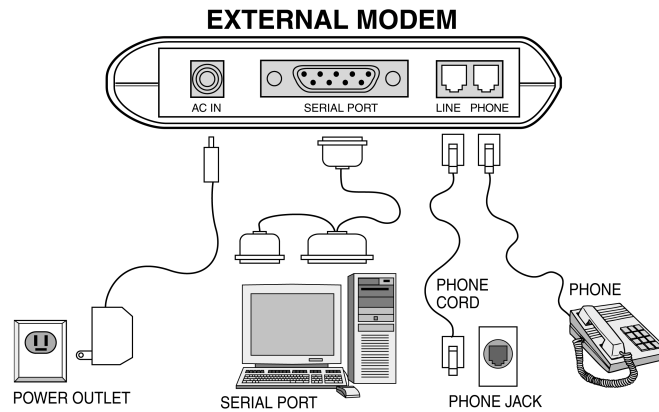
2.2 LED Indicators

After hardware installation, turn on the modem and then your computer. The PWR, HS, and MR LEDs should illuminate. The description of the LED indicators on the front panel are listed below (from left to right) :

MR	Modem Ready/ Self-testing	**On**: Power on **Flash**: Self-testing/ In diagnostic mode
HS	High Speed Speeds	**On**: Operating speed at 24000bps or higher
CD	Carrier Detect	**On**: Receiving a data carrier signal from remote modem
OH	Off Hook	**On**: Modem off hook **Off**: Modem on hook
SD	Send Data	**Flash**: Transferring data from the modem
RD	Receive Data	**Flash**: Receiving data to the modem
TR	Terminal Ready	**On**: Modem is on (unless setup by AT commands)
AA	Auto-answer	**On:** Set up to answer incoming calls
PWR	Power	**On**: power on

CHAPTER 3
DRIVER INSTALLATION

After hardware installation, turn on your modem and then power on your PC. Follow the instructions below to install the drivers for the modem.

3.1 Driver Installation for Windows 95

Step 1: Start Windows 95. The **Update Device Driver Wizard** appears. Insert the provided Installation CD into your CD-ROM drive. Click **Next**.

Step 2: Windows will be unable to locate a driver. Click **Other Locations**.

Step 3: Click **Browse** to locate the path of the driver: **x:\Driver\Win9x** (where x is your CD-ROM drive) and click **OK**.
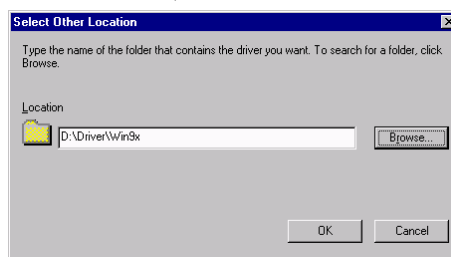
Step 4: Windows will find the location of driver; click **Finish**.

Step 5: If **Copying Files** window appears, click **Browse** to locate the path of the driver: **x:\Driver\Win9x** (where x is your CD-ROM drive) and click **OK**.

Step 6: Windows will continue to detect another device. Click **Next** and then repeat steps 2-4 to complete driver installation.

When you are done with driver installation, you will need to specify the country where you locate upon different telecommunication regulations/ laws. Please proceed to "**3.6 Country Selection**" on page 15 for instructions.

3.2 Driver Installation for Windows 98

Step 1:   Start Windows 98. The **Add New Hardware Wizard** appears announcing the detecting of a new hardware. Click **Next**. Insert the provided Installation CD into your CD-ROM drive.
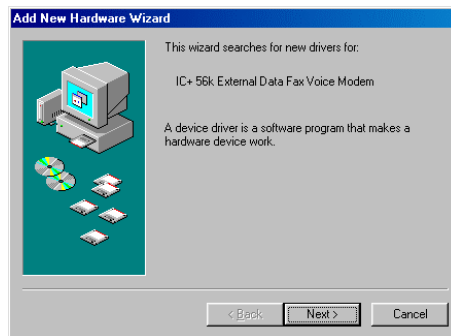
Step 2:   Select **Search for the best driver for your device** and click **Next**.

Step 3:   Check **Specify a location**. Click **Browse** to locate the path of the driver: **x:\Driver\Win9x** (where x is your CD-ROM drive) and click **OK**. Click **Next**.

Step 4:   When Windows finds the driver file for the device, click **Next**.

Step 5:   If **Copying Files** window appears, click **Browse** to locate the driver file and click **OK**.

Step 6:   Click **Finish**.

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Step 7: Windows will continue to detect another device. Click **Next**.

Step 8: With **Search for the best driver for your device** checkbox selected, click **Next**.

Step 9: Again, select **Specify a location** checkbox and the location should be: **x:\Driver\Win9x** where x is your CD-ROM drive. Otherwise, repeat step 3 to specify the location. Click **Next**.

Step 10: When Windows finds the driver file, click **Next**.

Step 11: If **Insert Disk** window appears, click **Browse** to locate the driver file and click **OK**.

Step 12: Click **Finish** to complete the installation.

When you are done with driver installation, you will need to specify the country where you locate upon different telecommunication regulations/ laws. Please proceed to "**3.6 Country Selection**" on page 15 for instructions.

3.3 Driver Installation for Windows Me

Step 1:   Start Windows Me. The **Add New Hardware Wizard** appears. Insert the Installation CD into your CD-ROM drive. Select **Specify the location of the driver (Advanced)** and then click **Next**.
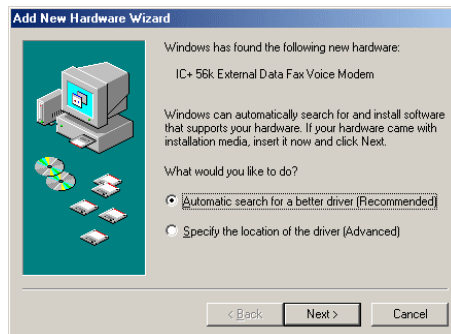
Step 2:   With **Search for the best driver for your device** selected, uncheck the **Removable Media** checkbox and then check only the **Specify a location** checkbox. Click **Browse** to locate the path of the driver: **x:\Driver\WinME** (where x is your CD-ROM drive) and click **OK**. Click **Next**.

Step 3:   Windows will find the driver for the device. Click **Next** to continue.

Step 4:   Click **Finish**.

Step 5:   Windows will continue to detect another device. Select **Specify the location of the driver (Advanced)** and then click **Next**.

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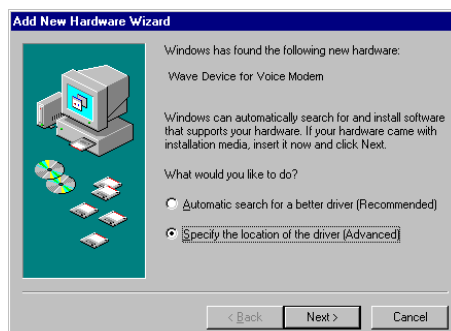
Step 6:   Again, select **Search for the best driver for your device** and check only the **Specify a location** checkbox. The location should be: **x:\Driver\WinME** where x is your CD-ROM drive. Otherwise, repeat step 2 to specify the location. Click **Next**.

Step 7:   Windows will find the driver for the device. Click **Next** to continue.

Step 8:   When installation is complete, click **Finish**.
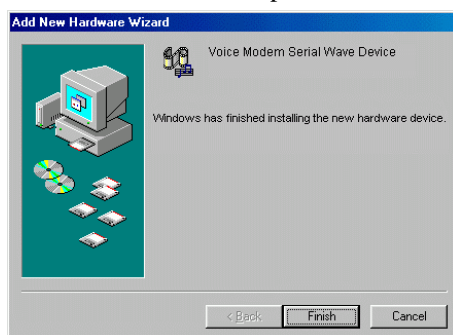
When you are done with driver installation, you will need to specify the country where you locate upon different telecommunication regulations/ laws. Please proceed to "**3.6 Country Selection**" on page 15 for instructions.

3.4 Driver Installation for Windows 2000

Step 1:   Start Windows 2000. Windows will detect a new hardware device, click **Next** to continue.
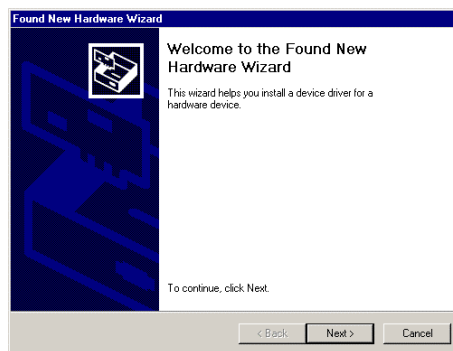
Step 2:   Select **Search for a suitable driver…** and click **Next**.
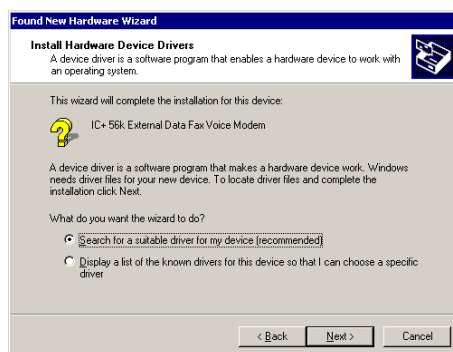
Step 3:   Insert the Installation CD into your CD-ROM drive. Check ONLY **Specify a location** and click **Next**.
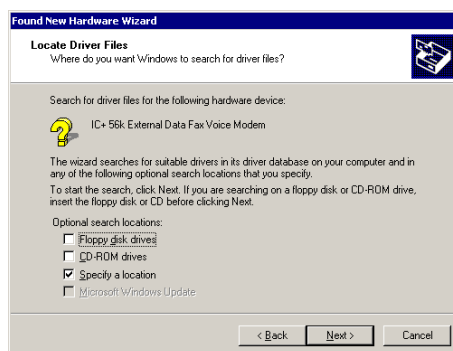
Step 4:   Click **Browse** to locate the path of the driver: **x:\Driver\W2K** (where x is your CD-ROM drive) and click **OK**.

Step 5:   When Windows finds the location of the driver, click **Next**.

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Step 6:   If **Digital Signature Not Found** window appears, click **Yes** to continue.
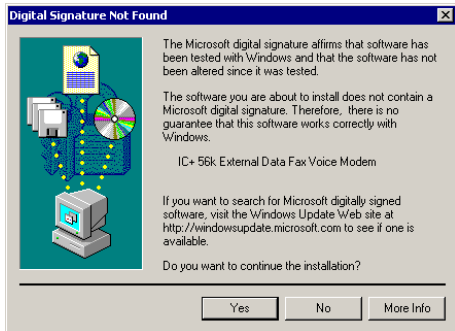
Step 7:   Click **Finish**. When **Found New Hardware** screen appears, wait for completing the installation.


When you are done with driver installation, you will need to specify the country where you locate upon different telecommunication regulations/laws. Please proceed to "**3.6 Country Selection**" on page 15 for instructions.

3.5 Driver Installation For Windows XP

Start Windows XP and insert the provided CD into your CD-ROM drive to start driver installation.

Step 1   When **Found New Hardware Wizard** screen appears, select **Install from a list or specific location (Advanced)** and click **Next**.

Step 2   With **Search for the best driver in these locations** selected, select ONLY **Include this location in the search**. Click **Browse** to specify the path to **X:\Driver\WinXP** where X is your CD-ROM drive letter and click **Next**.
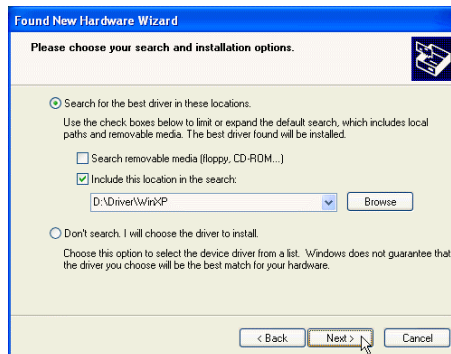
Step 3   If compatibility prompt message appears, click **Continue Anyway**.

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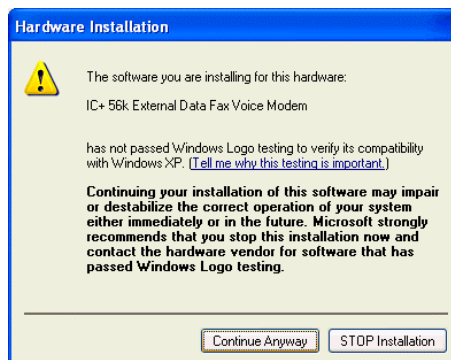
Step 4   Click **Finish**. When **Found New Hardware** screen appears, wait for completing the installation.
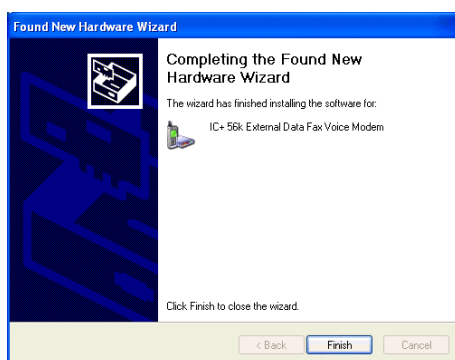
When you are done with driver installation, you will need to specify the country where you locate upon different telecommunication regulations/ laws. Please proceed to "**3.6 Country Selection**" on page 15 for instructions.

3.6 Country Selection

Before starting the modem, you may need to specify the country where you locate upon different telecommunication regulations/ laws.

Step 1: Click **Start**, point to **Settings** and then click on **Control Panel**. Double-click the **Modem Regional Settings** icon.

Step 2: The utility will start detecting automatically. You may click on the drop down arrow to reset your country and then click **OK**.
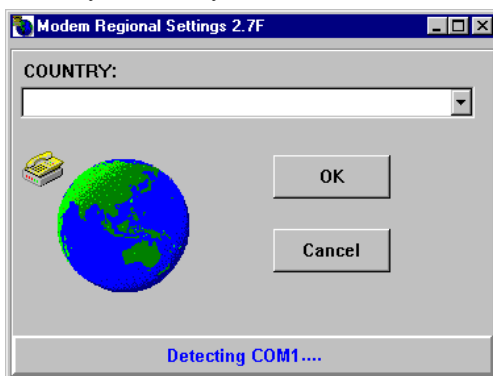
Step 3: Wait for resetting. When resetting is finished, the following window will appear. Click **OK** to finish your country selection.
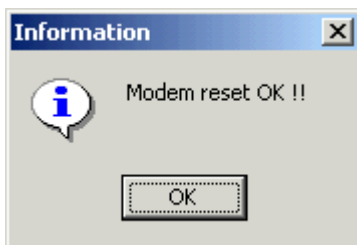
3.7 Verify that Your Modem is Properly Installed

3.7.1 For Windows 95/98/Me

Step 1:   Click **Start**, point to **Settings** and then click on **Control Panel**. Double-click the **Modems** icon.

Note: If you are prompted with **Location Information** screen, enter your area code and then exit the screen.
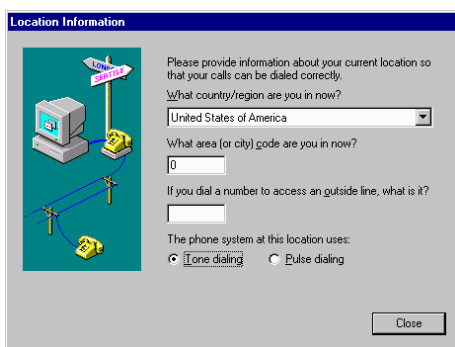
Step 2:   Highlight the **IC+ 56k External Data Fax Voice Modem** and then click on **Diagnostics** tab.
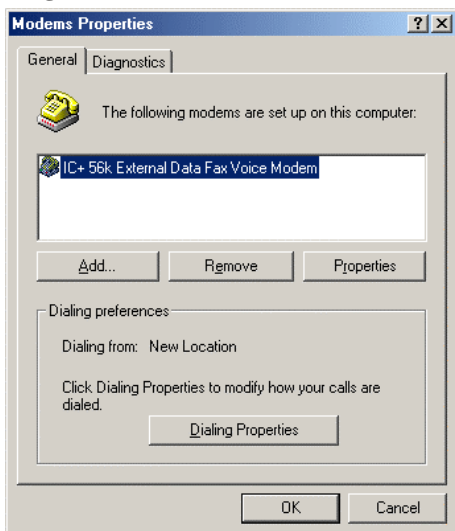
Step 3:   Highlight the COM port used by your modem and click on **More Info…**.
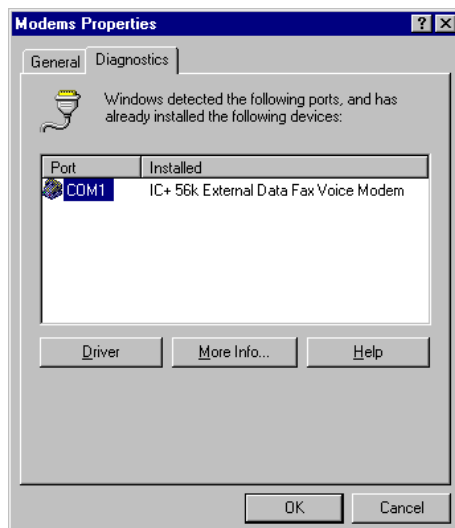
Step 4:   Wait for communication with your modem.
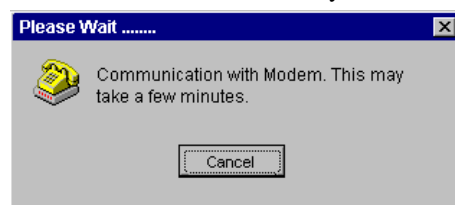
Step 5:   If your modem is properly installed, the command response should appear in the box as the following.

Congratulations! You have successfully installed the modem hardware and its driver.
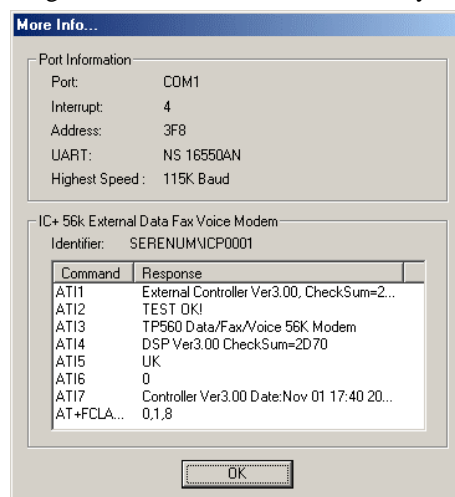
Note: If your modem fails to respond, you will see an error message. Make sure your modem is properly installed and turned on. If your modem still fails to respond, you may need to remove the driver and reinstall again.

3.7.2 For Windows 2000/XP

Note: The configuration steps are the same in Windows 2000 and Windows XP. The graphics here assume a Windows 2000 environment.

Step 1:   Click **Start**, point to **Settings** and then click on **Control Panel**. Double-click the **Phone and Modem Options** icon.

Note: If **Location Information** is not provided yet, you will see the screen below. Enter your location information and then click **OK**.
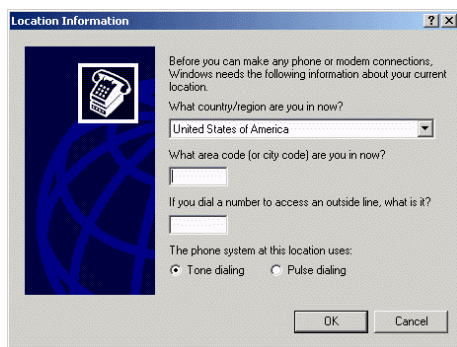
Step 2:   In **Phone And Modem Options** window, click on **Modems** tab. Highlight the **IC+ 56k External Data Fax Voice Modem** and then click on **Properties**.
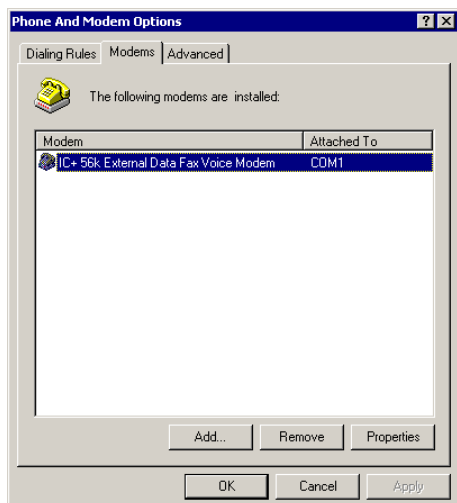
Step 3:   Click on **Diagnostics** tab and then click on **Query Modem**.
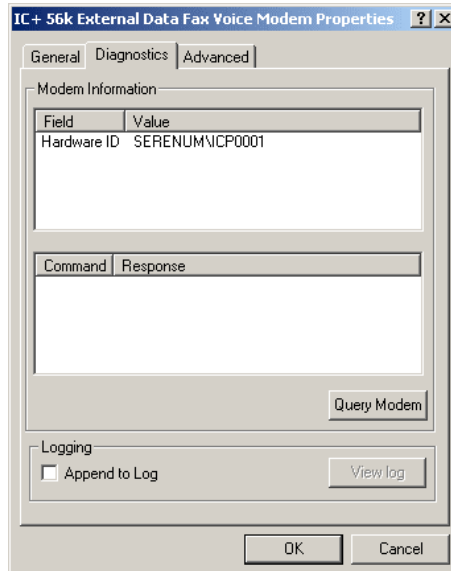
Step 4:   Wait for communication with your modem.
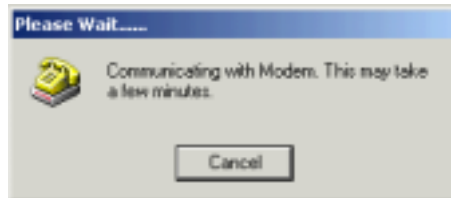
Step 5:   If your modem is properly installed, the command response should appear in the box
           as the following.

           Congratulations! You have successfully installed the modem hardware and its driver.
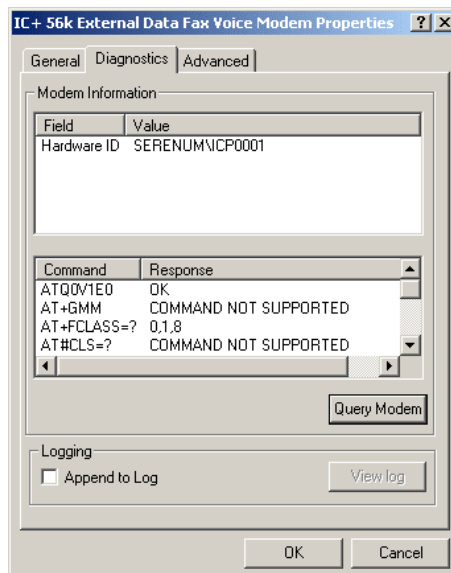
Note: If your modem fails to respond, you will see an error message. Make sure your modem
is properly connected. Switch your modem off and on, and try again. If your modem still fails
to respond, you may need to remove the driver and reinstall again.

CHAPTER 4
DRIVER UNINSTALLATION

4.1 Uninstallation from Windows 95/98/Me

Step 1:   On the desktop, click on **My Computer** and right-click on **Properties**.
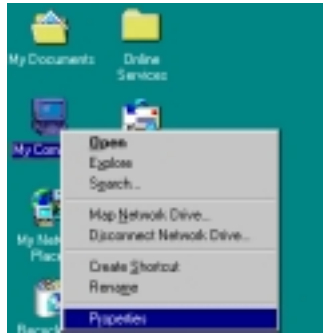
Step 2:   Click on **Device Manager** tab and then double-click the **Modem** icon. Highlight **IC+ 56k External Data Fax Voice Modem** and then click on **Remove** .
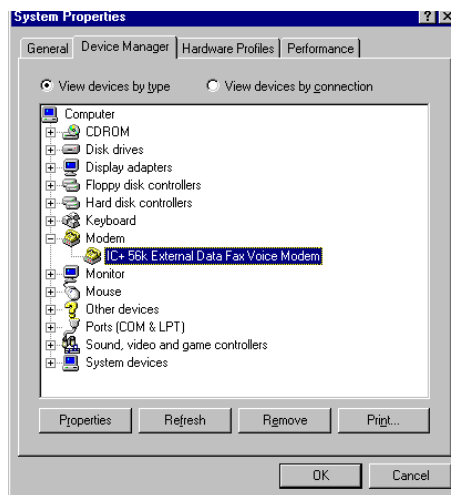
Step 3:   When confirm message appears, click **OK**.
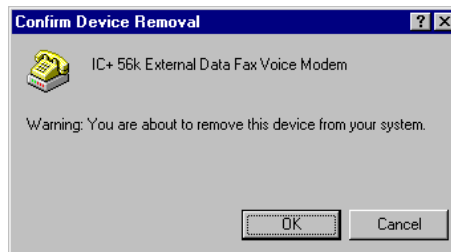
Step 4:   You will return to **System Properties** window and find that your modem is removed from the hardware list.
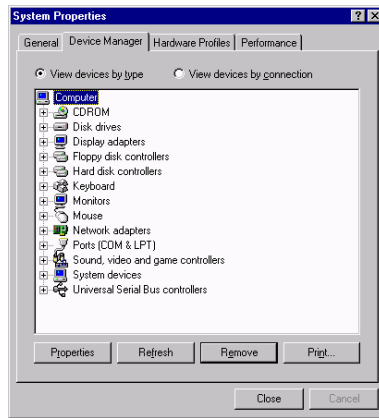
4.2 Uninstallation from Windows 2000

Step 1:   Click **Start**, point to **Settings** and then click on **Control Panel**. Double-click the **Add/Remove Hardware** icon.

Step 2:   Click **Next**.

Step 3:   Select the **Uninstall/Unplug a device** option and then click **Next**.
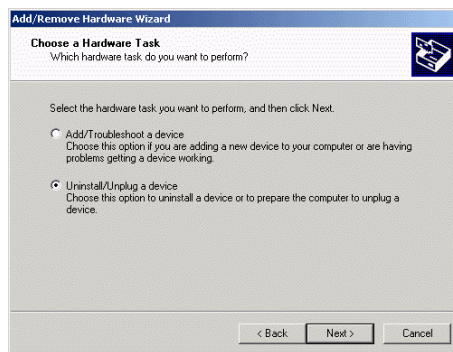
Step 4:   Select **Uninstall a device** and then click **Next**.
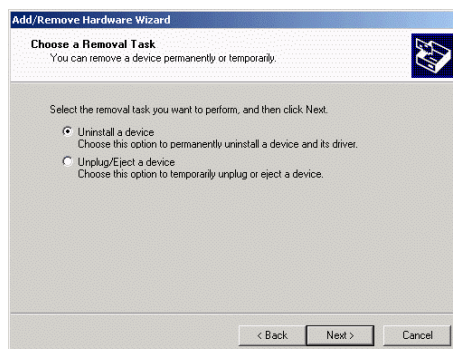
Step 5:   Highlight **IC+ 56k External Data Fax Voice Modem** from your device list and
then click **Next**.
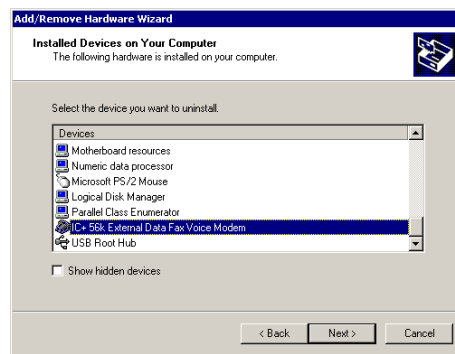
Step 6:   Select **Yes, I want to…** and then click **Next**.
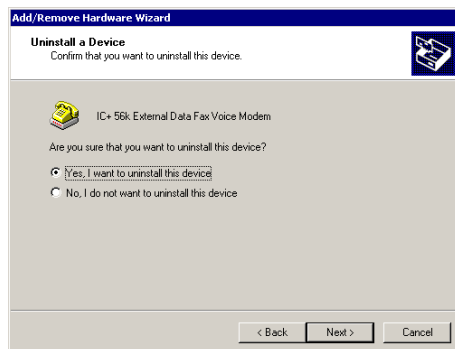
Step 7:   Click **Finish** to complete uninstallation.

4.3 Uninstallation from Windows XP

Step 1   Click **Start** menu, point to **Settings** and then click on **Control Panel**. On the Control Panel, double-click the **System** icon.

Step 2   Click **Hardware** tab and then click **Device Manager**.
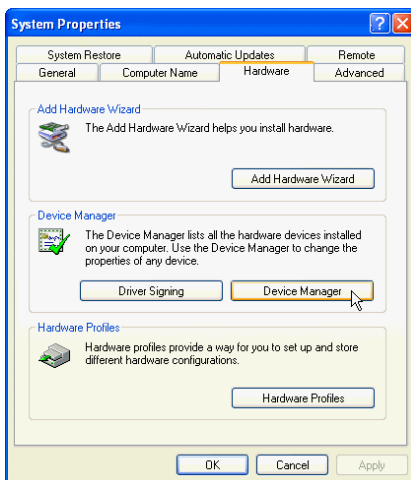
Step 3   Double-click **Modems** and right-click **IC+ 56k External Data Fax Voice Modem**. Select **Uninstall** from the context menu.
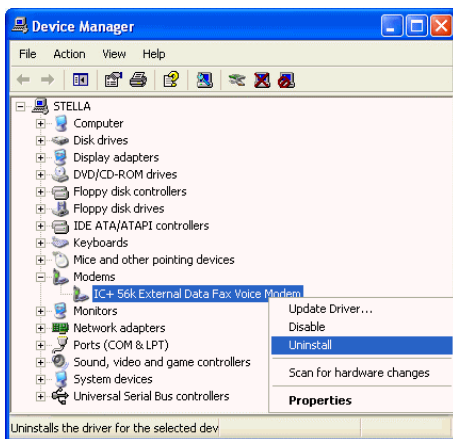
Step 4   When confirm message appears, click **OK**.
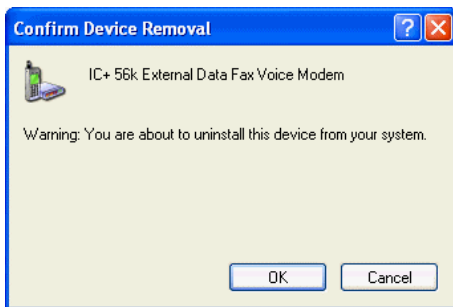
Step 5   You will find the modem has been removed from the hardware list and the uninstallation is finished.

CHAPTER 5
COMMAND REFERENCE

This chapter includes all commands, S-Registers supported by the modem. Before using the commands, make sure your communications software package provides the function of operating the modem through its interna1 commands. If your software does not support the function, ignore this chapter.

More than one command can be placed on a single line and, if desired, separated with spaces for readability. Once the carriage return (**Enter**) key is pressed, the command line will be executed. A line with no carriage return is ignored. If you come across terms that you don't understand, consult the glossary. Words in **boldface type** are command names, commands, or default settings. Carriage returns (Enter) are noted with <CR> or [ENTER]; this does not mean to enter these characters literally; but instead to press the **Enter** key.

The modem accepts either upper or lower case characters in the command line and ignores any space within or between commands. Typing errors can be corrected with the **Backspace** key. Exceptions are noted in the description of specific commands.

Variables (r and x) are listed in italics. Punctuation symbols (**, ; ! @**) use as dial modifiers are listed alphabetically according to their English names at the beginning of Section 5.2 where two commands are separated by a slash, either command will have the same effect. For example, if the command is listed as **B0/B**, issuing either **B0** or **B** will have the same effect.

Note: Except for the **A/** command and the + + + escape command described in Section 5.3, all commands must be prefixed with the attention code **AT**. For instance, the **A** command (below) would be entered as: "**AT A <CR>**". Without the **AT** prefix, the command line cannot be executed. Once entered, AT cannot be deleted with the **Backspace** or **Delete** keys.

5.1 AT Commands

5.1.1 Basic Command Set

A   **Go On-line in Answer Mode (For FAX Mode)**

This command instructs the modem to go off-hook immediately and then make a handshake with the remote modem. Handshaking is not available during leased line operation.

Bn   **Select Protocol to ITU-V.22 or Bell 212A**

   B0/B   Selects ITU-V.22 protocol once the command line prefix **AT** has been entered at the 1200 bps data rate.

   B1   Selects BELL 212A protocol once the command line prefix **AT** has been entered at the 1200 bps data rate. (Default)

D   **Go On-line in Originate Mode**

D instructs the modem to go off-hook immediately and automatically dial the number contained in the dial string following **D**. The dial string may contain any of the dial modifiers contained in the following section. The **D** command without a dial string is usually used to switch from voice conversation to data communication or to call a remote modem in leased-line operation mode.

En   **Command Echo**

E0/E	Disables command echo.
E1	Enables command echo. (Default)

Hn   Hang Up

H0/H	Goes on-hook. (hangs up)
H1	Goes off-hook. (ready to dial)

In   Identification

I0/I	Report the product code.
I1	Report the hardware checksum.
I2	Report " TEST OK!".
I3	Report "TP560 Data/Fax/Voice 56K Modem).
I4	Report Firmware Version.
I5	Report the country.
I6	Report Local Phone Status.

Ln   Control Speaker Volume

L0/L	Low volume.
L1	Low volume.
L2	Medium volume. (Default)
L3	High volume.

Mn   Monitor Speaker On/Off

M0/M	Speaker is always off.
M1	Speaker is off while receiving carrier. (Default)
M2	Speaker is always on.
M3	Speaker disabled while dialing.

Nn   Automode Enable

N0/N	Automode detection is disabled.
N1	Automode detection is enabled.(Default)

On   Return to On-Line Data Mode

O0/O	Enters on-line data mode without a retrain. Handling is determined by the Call Establishment task. Generally, if a connection exists, this command connects the DTE back to the remote modem after an escape (**+++**).(Default)
O1	Enters on-line data mode with a retrain before returning to on-line data mode.
O2	Enters on-line data mode with a rate re-negotiation before returning to on-line data mode.

P   Set Pulse Dial as Default

Causes the modem to assume that all subsequent dial commands are pulse dials. You may omit the "
P " from the dial strings.

Q   Result Code Display

Determines whether the modem sends the result codes to the DTE.

Q0/Q   Enables result codes to the DTE (Default).

Q1   Disables result codes to the DTE.

T   Set Tone Dial as Default

Causes the modem to assume that all subsequent dial commands are tone dial.

Vn   Select Word or Digit Result Codes

V0/V   Displays result codes in digital format.

V1   Displays result codes in verbose format. (Default)

W   Connect Message Control

This command controls the format of CONNECT messages.

W0/W   Upon connection, the modem reports only the DCE speed (e.g., CONNECT 19200).
          Subsequent responses are disabled.

W1   Upon connection, the modem reports the line speed, the error correction protocol, and the DTE
          speed, respectively. Subsequent responses are disabled.

W2   Upon connection, the modem reports the DCE speed (e.g., CONNECT 14400). Subsequent
          responses are enabled.(Default)

W3   Upon connection, the modem reports the line speed, the error correction protocol, and the DTE
          speed, respectively. Subsequent responses are enable.

Xn   Extended Result Codes

This command selects which subset of the result messages will be used by the modem to inform the
DTE of the results of commands.

Blind dialing is enabled or disabled by country parameters. If the user wishes to enforce dial tone
detection, a "**W**" can be placed in the dial string(see **D** command). Note that the information below is
based upon the default implementation of the **X** results table.

If the modem is in facsimile mode (**+FCLASS=1**) , the only message sent to indicate a connection is
CONNECT without a speed indication.

X0/X   CONNECT result code is given upon entering online data state. Dial tone and busy detection
          are disable.

X1   CONNECT<text> result code is given upon entering online data state. Dial tone and busy
          detection are disable.

X2   CONNECT<text> result code is given upon entering online data state. Dial tone detection is
          enabled, and busy detection is disable.

X3   CONNECT<text> result code is given upon entering online data state. Dial tone detection is
          disabled, and busy detection is enable.

| **X4** | CONNECT\<text> result code is given upon entering online data state. Dial tone and busy detection are enable.(Default) |

Z   Reset

Zn, which must be placed at the end of the command line, resets the active configuration of the modem to the stored configuration saved in nonvolatile RAM, hangs up the modem, and clears the command buffer.

| **Z0/Z** | Resets the modem and loads stored configuration 0. |
| **Z1** | Resets the modem and loads stored configuration 1. |

5.1.2 Commands Preceded by &

&Cn   Select DCD Options
| **&C0/&C** | Maintains an ON status for the Data Carrier Detect (DCD). |
| **&C1** | Uses the actual state of the carrier from the remote modem for DCD. (Default) |

&Dn   Select DTR Options

Determines actions taken by the modem in relation to the Data Terminal Ready (DTR) signal of the serial port.

&D0/&D	DTR is ignored. Allows operation with DTEs that do not provide DTR.
&D1	DTR drop is interpreted by the modem as if the escape sequence has been entered. The modem returns to the command state without disconnecting.
&D2	DTR drop causes the modem to hang up. Auto answer is inhibited. (Default)
&D3	DTR drop causes the modem to perform a soft reset as if the Z command were received.

&F   Fetch Factory Configuration

| **&F** | Load Factory Setting. |

&Gn   Select Guard Tone

&G0/&G	Disable guard tone. (Default)
&G1	Select 550Hz-guard tone.
&G2	Select 1800Hz-guard tone.

&Kn   DTE/Modem Flow Control

Determines how the modem controls the flow of data between the local DTE and the modem. When the modem terminal buffer is nearly full, the modem will either send an XOFF or drop CTS to stop the data flow. When the buffer is nearly empty, the modem will either send an XON or raise CTS to start the data flow.

&K0/&K	Disable DTE/DCE flow control.
&K3	Enable RTS/CTS DTE/DCE flow control. (Default)
&K4	Enables XON/XOFF DTE/DCE flow control.
&K5	Enable RTS/CTS and transparent XON/XOFF DTE/DCE flow control.

&Pn   Select Pulse Dial Make/Break Ratio

| **&P0/&P** | Sets a 39/61 make/break ratio @ 10 pps. (Default) |
| **&P1** | Sets a 33/67 make/break ratio @ 10 pps. |

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    &P2   Sets a 39/61 make/break ratio @ 20 pps.

    &P3   Sets a 33/67 make/break ratio @ 20 pps.

&Rn   **CTR Signal Select**

Determines whether CTR operates in accordance with the EIA-232-D specification or remains ON

    &R1/&R   CTR will become active when RTS is On.

    &R0   CTS is always ON. (Default)

&Sn   **DSR Option**

Determines whether DSR operates in accordance with the EIA-232-D specification or remains ON

    &S0/&S   DSR is always ON. (Default)

    &S1   DSR will become active after answer tone has been detected and inactive after the carrier
has been lost.

&Un   **Protocol Selection**

    &U0/&U   V.90 mode.(Default)

    &U1   V.34 mode.

    &U2   V.32bis/V.32/V.22bis mode.

&V   **View Configuration Profiles**

    &V   Displays the active configuration profile.

&W   **Store the Current Configuration to Nonvolatile RAM**

    &W0/&W   Writes the current active configuration to profile 0 in nonvolatile RAM. (Default)

    &W1   Writes the current active configuration to profile 1 in nonvolatile RAM.

&Yn   **Select the Default Profile**

    &Y0/&Y   Uses profile 0 on power-up. (Default)

    &Y1   Uses profile 1 on power-up.

&Zn   **Store Telephone Numbers (n=0to2)**

&Zn Store one of four dial strings (including a telephone number) of up to 31 digits in nonvolatile RAM.

For example: to store the telephone number 002852117 to RAM location 1, issue the following command:
Command:AT&Z1=002852117<CR>

5.1.3 Commands Preceded by *

*In   **Connect Speed Selection**
    *I0   Selects connect speed 1200bps
    *I1   Selects connect speed 2400bps
    *I2   Selects connect speed 4800bps
    *I3   selects connect speed 7200bps
    *I4   Selects connect speed 9600bps

*I5	Selects connect speed 12000bps
*I6	Selects connect speed 14400bps
*I7	Selects connect speed 16800bps
*I8	Selects connect speed 19200bps
*I9	Selects connect speed 21600bps
*I10	Selects connect speed 24000bps
*I11	Selects connect speed 26400bps
*I12	Selects connect speed 28800bps
*I13	Selects connect speed 31200bps
*I14	Selects connect speed 33600bps (Dafault)

select V.90

*I1	Selects connect speed 28000bps
*I2	Selects connect speed 29333bps
*I3	selects connect speed 30666bps
*I4	Selects connect speed 32000bps
*I5	Selects connect speed 33333bps
*I6	Selects connect speed 34666bps
*I7	Selects connect speed 36000bps
*I8	Selects connect speed 37333bps
*I9	Selects connect speed 38666bps
*I10	Selects connect speed 40000bps
*I11	Selects connect speed 41333bps
*I12	Selects connect speed 42666bps
*I13	Selects connect speed 44000bps
*I14	Selects connect speed 45333bps
*I15	Selects connect speed 46666bps
*I16	Selects connect speed 48000bps
*I17	Selects connect speed 49333bps
*I18	Selects connect speed 50666bps
*I19	Selects connect speed 52000bps
*I20	Selects connect speed 53333bps
*I21	Selects connect speed 54666bps
*I22	Selects connect speed 56000bps (Dafault)

---

*Gn   **User Abort Selection**

   *G0/*G   Enables key abort feature.(Default)

   *G1   Disables key abort feature.

---

*Hn   **Auto Retrain Selection**

   *H0/*H   Disables auto retrain

   *H1   Enables auto retrain.(Dafault)

5.1.4 Commands Preceded by \

\Nn   **Operation Mode Control**

Selects the operating mode to be used during connection

   \N0   Selects Normal (speed buffering) Mode.

\N1	Selects Direct (pass-through) Mode.
\N2	Selects MNP or disconnect mode.
\N3	Selects MNP or Buffer.
\N4	Select V.42 without ODP&ADP phase detection, MNP or buffer.
\N5	Select V.42 with ODP&ADP phase detection, MNP or buffer.(Dafault)
\N6	Select V.42 without ODP&ADP or disconnect.
\N7	Select V.42 with ODP&ADP or disconnect.

\Vn   Single Line Connect Message Enable

The single line connect message format can be enabled or disabled by the \Vn command as follows:

\V0	Disable protocol result code appended to DCE speed. (Default)
\V1	Eisable protocol result code appended to DCE speed.

5.1.5 Commands Preceded by %

%C   Enable/Disable Data Compression

Enables or disable data compression negotiation. The modem can only perform data compression on an error-corrected link.

%C0	Disables data compression.
%C1	Enables V.42bis/MNP 5.(Default)

5.2 Dial Modifiers

This section describes all of the dial modifiers that are used in dial strings.

@   Answer

"**@**", placed after a phone number, this modifier tells the modem to wait for 5 seconds of silence before dialing the next number in the dial string. **@** is usually used to access a secure computer system that provides a silent answer as permission for further entrance.

,   Pause

"**,**", placed anywhere in the dial string, tells the modem to pause for the number of seconds specified by S-register S8 before processing the rest of the dial string.

!   Initiate a Hookflash

"**!**", placed anywhere in the dial string, tells the modem to initiate a hookflash, which means to hang up for 0.5 seconds and then go off-hook again before processing the rest of the dial string. This modifier allows access to PBX features like call transferring .

;   Return to Command State after Dialing

"**;**", which must be placed at the end of the dial string, returns to the command state after dialing the number placed ahead of it. A long telephone number would overflowthe 40 character command buffer if placed all in one command line, so it must be broken into two or more command lines. Each part

includes part of the number, and all but the last command line end with the "**;**" followed by a carriage return.

---

^   Tone Control

Toggles calling tone enable/disable:applicable to current dial attempt only.

P   Pulse Dialing

P, placed ahead of a number, tells the modem to dial a number using pulse dialing.

S   Dial a Stored Number

S is used to dial one of four numbers stored in nonvolatile memory. For example, instead of entering a dial string, you can use this command:

> Command: **ATDS=1<CR>**

T   Touchtone Dialing

T, placed ahead of a number, tells the modem to dial a number using touchtone dialing.

W   Wait for Dialtone

W, placed after a number, tells the modem to wait up to 30 seconds to detect a one-second continuous dialtone before dialing the next number. **W** is most often used in a PBX system to wait for the dialtone of an outside telephone line.

5.3 Commands Not Preceded By AT

Two commands, A/ and +++, are neither preceded by the attention code **AT** nor followed by a carriage return.

A/   Repeat Command

A/ repeats the execution of the last command line stored in the command buffer. If the last command line is invalid, the ERROR result code will appear on the screen. Note that **A/** cannot be preceded by **AT**; if it is, ERROR will appear on the screen.

+++   Escape

+++ followed by AT <CR> allows the modem to escape from the data mode to the on-line command state (command state without breaking the established connection.)

To escape, stop transmitting data, wait at least one escape guard time (the default time is one second), and then enter three consecutive escape characters (the default character is +) followed by AT <CR>.

The modem will return to the command state and send the **OK** result code to the screen. Note that the escape command is the only command that can be recognized by the modem in the one-line state; it cannot be recognized in the command state.

5.4 S Register Reference

Your modem has status registers. These registers are memory locations inside your modem which control your modem's operation. You usually do not have to worry about setting any register because the default values work for most applications.

The S registers are summarized in 5.4.1, along with their default values. Registers denoted with an " * " may be stored in one of the two user profiles by entering the **&Wn** command. One of these profiles may be loaded at any time by using the **Zn** command.

The factory default values are stored in ROM and are loaded into the active configuration at power-up or by the **Zn** command. In addition, the designated default profile is subsequently loaded, and may change some of the factory default values. The designated default profile can be changed by entering the **&Yn** command, where 'n' is one of the two possible user profiles. The factory defaults can be loaded at any time by entering the **&F** command.

5.4.1 Register Summary

Important: The contents of the following registers are for reference.
The following chart summarizes your modem's registers:

Reg.#	Range	Unit	Default Dec	Hex	Description
S0	0 - 255	rings	0	00h	Number of rings before auto-answer.
S1	0 - 55	rings	0	00h	Ring count.
S2	0 - 255	ASCII	43	2Bh	Escape character code.
S3	0 - 127	ASCII	13	0Dh	Command terminator (<CR>character).
S4	0 - 127	ASCII	10	0Ah	Line feed character.
S5	0 - 127	ASCII	8	08h	Backspace character.
S6	3 - 7	seconds		06h	Wait time for blind dialing.
S7	1 - 255	seconds		60h	Wait time for carrier after dial.
S8	1 - 255	seconds		02h	Pause time for comma (dial delay).
S9	1 - 255	1/10 sec.	6*	06h	Carrier detect response time.
S10	1 - 255	1/10 sec.	14*	0Eh	Lost carrier to hang-up delay.
S11	50 - 255	1/1000 sec.	95	5Fh	DTMF Tone Duration.
S12	0 - 255	1/50 sec.	50*	32h	Escape code timing.
S14	[Bit Mapped Options]				
S21	[Bit Mapped Options]				
S22	[Bit Mapped Options]				
S23	[Bit Mapped Options]				
S25	0 - 255	seconds	5*	05h	Dalay to DTR.
S26	0 - 255	1/100 sec	1*	01h	RTS to CTS Delay Interval.
S29	[Bit Mapped Options]				
S30	0 - 255	10 s	0*	00h	Inactivity Disconnect Timer.
S95	[Bit Mapped Options]				
S96	[Bit Mapped Options]				
S97	[Bit Mapped Options]				
S98	[Bit Mapped Options]				
S99	0 - 255		2	16	Energy detection threshold.

5.4.2 Glossary of the S Registers

S0   Number of Rings Before Auto Answer

S0 determines the number of rings that must be received before the modem automatically answers an incoming call. For example, when **S0=3**, the modem automatically answers after the third ring. When **S0=0**, the modem does not automatically answer an incoming call; it stays on-hook until the **A** command is issued manually to answer the incoming call.

> **Range:**   0 - 255 rings

S1   Ring Counter

S1 automatically increments its value by one each time the modem receives a ring while in the command state. **S1** is reset to zero if no ring is detected within **8** seconds.

Range: 0 - 255 rings

S2   **Escape Character**

S2 holds the decimal value of the ASCII character used as the escape character. The default value corresponds to an ASCII '+'. A value over 127 disables the escape process, i.e., no escape character will be recognized.

Range: 0 - 255, ASCII decimal.

S3   **Line Termination Character**

S3 sets the decimal value of the command line and result code terminator character. Pertains to asynchronous operation only.

Range: 0 - 127, ASCII decimal.

S4   **Response Formatting Character**

S4 sets the decimal value of the character generated by the modem as part of the header, trailer, and terminator for result codes and information text, along with the S3 parameter. If the value of S4 is changed in a command line, the result codes issued in response to that command line will use the new value of S4. The Response Formatting character is output after the Line Termination character if verbose result codes are used.

Range: 0 - 127, ASCII decimal.

S5   **ASCII Value of Backspace Character**

S5 stores the ASCII value of the backspace character. The backspace is used to edit a command line. If your computer does not recognize the default as a backspace, change the value.

Range: 0 - 127, ASCII decimal.

S6   **Wait Time before Blind Dialing**

S6 controls how long the modem waits after it goes off-hook before it dials the first digit of the telephone number. The modem always pauses for at least 3 seconds, even if **S6** is set to less than 3 seconds.

Range: 3 - 7 seconds.

S7   **Wait for Carrier after Dial**

S7 controls how long the modem waits for a carrier signal from a remote modem after originating a call or from the calling modem after going off-hook when answering a call.

S7 also controls how long the modem waits for a one-second continuous dialtone after dialing a number followed by the **W** dial modifier. If the modem detects a one-second continuous dialtone within the specified wait time, it proceeds to dial.

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Range: 1 - 255 seconds.

S8   Pause Time for Comma

S8 controls how long the modem pauses when a comma "**,** " is encountered in a dial string while executing a dial command.

Range: 1 - 255 seconds.

S9   Carrier Detect Response Time

S9 determines how long a carrier signal must be present for the modem to confirm it. The longer the response time, the easier it is for the modem to correctly recognize a carrier without mistaking other signals or transient noise on the line as a carrier.

Range: 1 - 255 tenths of a second.

S10   Lost Carrier To Hang Up Delay

S10 sets the length of time, in tenths of a second, that the modem waits before hanging up after a loss of carrier. This allows for a temporary loss of carrier without causing the local modem to disconnect. When **S10** is set to 255, the modem functions as if a carrier is always present.

The actual interval the modem waits before disconnecting is the value in **S10** minus the value in **S9**. Therefore, the value in **S10** must be greater than that in **S9**, or else the modem disconnects before it recognizes the carrier.

Range: 1 - 255 tenths of a second.

S11   DTMF (Touch-tone) Tone Duration

S11 sets the duration of tone in DTMF dialing. This value has no effect on pulse dialing.

Range: 50 - 255 milliseconds.

S12   Escape Guard Time

S12 determines the escape guard time. The escape guard time is the minimum waiting time required before and after entering the escape code (three consecutive escape characters) in the on-line state. It is also the maximum waiting time allowed between any two consecutive escape characters. If the waiting time before or after the escape code is shorter than the guard time, or if the waiting time between consecutive escape characters is longer than the guard time, then the modem does not recognize the escape command and stays on-line.

If the escape guard time is set at 0 second, it is impossible to return the modem to command state.

Range: 0 - 255 fiftieths of a second.

S14   Bit Mapped Options

Bit	Value	Description
bit 0 (E)	0	Disabled.
	1	Enabled.
bit 2 (Q)	0	Disabled.
	1	Enabled.

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bit 3 (V)	0	Numeric.
	1	Verbose.
bit 4,5 (&P)	00	39/61 make to break ratio/10pps
	01	33/67 make to break ratio/10pps
	10	39/61 make to break ratio/20pps
	11	33/67 make to break ratio/20pps
bit 6(P or T)	0	T (Tone dial).
	1	P (Pulse dial).
bit 7	0	Answer mode.
	1	Originate mode.

S21   Bit Mapped Options

Bit	Value	Description
bit 0	[RESERVED]	
bit 2	0	**&R0**.
	1	**&R1.**
bit 3,4	00	**&D0.**
	01	**&D1**.
	10	**&D2**.
	11	**&D3**.
bit 5	0	**&C0**.
	1	**&C1**.
bit 6	0	**&S0**.
	1	**&S1**.

S22   Bit Mapped Options

Bit	Value	Description
bit 0,1	00	Select **L0**.
	01	Select **L1**.
	10	Select **L2**.
	11	Select **L3**.
bit 2,3	00	Select **M0**.
	01	Select **M1**.
	10	Select **M2**.
	11	Select **M3**.
bit 4,5,6	000	Select **X0**.
	001	Select **X1**.
	010	Select **X2**.
	011	Select **X3**.
	100	Select **X4**
bit 7	[RESERVED]	

S23   Bit Mapped Options

Bit	Value	Description
Bit 0,1,2,3	0000	Communications rate = 300 bps.
	0001	Communications rate = 600 bps.
	0010	Communications rate = 1200 bps.
	0011	Communications rate = 2400 bps.
	0100	Communications rate = 4800 bps.
	0101	Communications rate = 9600 bps.
	0110	Communications rate = 19200 bps.
	0111	Communications rate = 38400 bps
	1000	Communications rate = 57600 bps
	1001	Communications rate = 115200 bps
bit 4,5	00	Even parity.
	01	None parity.
	10	Odd parity.
	11	Mark parity.
bit 6,7	00	**&G0**.
	01	**&G1**.
	10	**&G2**

S25   Delay to DTR

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S25 serves two purposes. When the modem is operating in synchronous mode 1, the value assigned to **S25** specifies the length of time the modem waits after a connection has been made before examining DTR. This allows the modem to ignore an ON-to-OFF transition of DTR, giving the user time to disconnect the modem from the asynchronous terminal and attach it to a synchronous terminal, without forcing the modem back to the asynchronous command mode. During this time, the value for **S25** is read in whole seconds.

Range: 0 - 255 (0.01 second)

S26   RTS to CTS Delay Interval

Pertains to synchronous operation only. When CTS tracks RTS (**&R0**) and the modem detects an ON-to-OFF transition on RTS, this register sets the time delay before the modem turns CTS to ON.

Range: 0 - 255 hundredths of a second

S29   Bit Mapped Options

Bit	Value	Description
bit0-4	(n)	**AT*I (n)**
bit 5,6,7	000	**AT&U0**
	001	**AT&U1**
	010	**AT&U2**

S30   Inactivity Disconnect Timer

This register determines the length of time, in seconds, the modem waits before disconnecting when no data is sent or received. This function is only applicable to buffer mode.

Range: 0 - 255 tenths of a second

S95   Bit-Mapped Options

Bit	Value	Description
bit 0,1	0 0	**W0**.
	0 1	**W1**.
	1 0	**W2**.
	1 1	**W3**.
Bit 2	0	**\V0**.
	1	**\V1**.
Bit 3	0	**N0**.
	1	**N1**.
Bit 4-7	(n)	***On**.

S97   Bit-Mapped Options

Bit	Value	Description
bit 0,1,2	000	**\N0**.
	001	**\N1**.
	010	**\N2**.
	011	**\N3**.
	010	**\N4**.
	011	**\N5**.
	110	**\N6**.
	111	**\N7**.
Bit 7	0	**%C0**.
	1	**%C1**.

S98   Bit-Mapped Options

Bit	Value	Description

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bit 0,1	0 0	***H0**.
	0 1	***H1**.
Bit 2	0	***G0**.
	1	***G1**.
Bit 4-6	000	**&K0**.
	011	**&K3**.
	101	**&K4**.
	110	**&K5**.

S99　　Energy detection threshold

This register can use in Call Progress Mode (CPM) for dial tone detection threshold. The default value is 16 This register determine the detection threshold for call progress tone.

bit 0,1	0 0	***H0**.
	0 1	***H1**.
Bit 2	0	***G0**.
	1	***G1**.
Bit 4-6	000	**&K0**.
	011	**&K3**.
	101	**&K4**.
	110	**&K5**.

CHAPTER 6
MODEM REFERENCE

6.1 Troubleshooting

This chapter describes common problems in the installation, configuration and regular usage of your Fax/Data/TAM Modem. To test the Fax/Data/TAM Modem, a communication software package is needed and the package must include a mode that allows you to operate your Fax/Data/TAM Modem by directly issuing internal commands to the modem.

Follow the procedures in the following sections to resolve these common problems:

No Response From Your Modem

1. If you are using the internal add-on card modems, make sure that the COM port address you have set your modem to corresponds to the appropriate selection in the communications software which you are using.

2. Issue the **ATZ** command to reset your modem. The returned result code should be "0" or "K" depending on what communications program you are using. Your modem is OK if you get one of these responses. If there is no response after issuing the **ATZ**<CR>, continue to the next step.

3. Check if there are any other interface cards in your computer that use the same COM port address as your modem. If so, you must set your modem to another COM port address.

4. Issue the command: AT&F&W <CR>, if a "0" or "K" result code is displayed on the screen, your modem is OK. Otherwise, contact your dealer for assistance.

Your Modem Does Not Connect After It Has Dialed a Phone Number

The problem may have several causes. The phone line may be too noisy or the telephone cord may be poor. Try the line with a regular phone. Also the remote modem may not recognize your modem baud rate.

You Can Transmit After You Have Connected to the Remote Modem

In this case, check the communication parameters of the remote modem, then configure your software to the same number of data bits, stop bit, and parity.

6.2 Result Codes

The modem sends a response to the user via the screen after a command is issued. As shown in the figure below, there are two forms for each result code: Modem Response code and digit code.

Response	Digital	n value in ATXn					Description
		0	1	2	3	4	
OK	0	x	x	x	x	x	Command executed without errors
CONNECT	1	x	x	x	x	x	Connect to another modem
RING	2	x	x	x	x	x	Detect an incoming ring
NO CARRIER	3	x	x	x	x	x	Carrier lost or never detected
ERROR	4	x	x	x	x	x	Invalid command or invalid character
CONNECT 1200	5		x	x	x	x	Connection established at 1200 bps
NO DIALTONE	6			x		x	Dial tone not detected within timeout
BUSY	7				x	x	Detected a busy tone after dialing
NO ANSWER	8				x	x	No ringback or quiet answer was detected.
CONNECT 300	9	x	x	x	x		Connection established at 300 bps
CONNECT 2400	10	x	x	x	x		Connection established at 2400 bps
CONNECT 4800	11	x	x	x	x		Connection established at 4800 bps
CONNECT 9600	12	x	x	x	x		Connection established at 9600 bps
CONNECT 7200	13	x	x	x	x		Connection established at 7200 bps
CONNECT 12000	14	x	x	x	x		Connection established at 1200 bps
CONNECT 14400	20	x	x	x	x		Connection established at 14400 bps
CONNECT 19200	21	x	x	x	x		Connection established at 19200 bps
CONNECT 38400	22	x	x	x	x		Connection established at 38400 bps
CONNECT 57600	23	x	x	x	x		Connection established at 56700 bps

CONNECT 115200	24	x x x x	Connection established at 115200 bps
CONNECT 1200TX/75RX	25	x x x x	V.23 established:transmit at 75 bps, receive at
1200 bps			
CONNECT 75TX/1200RX	26	x x x x	V.23 established:transmit at 1200 bps, receive
at 75 bps			
CONNECT BELL 300	28	x x x x	Connection established at Bell 300 bps
CONNECT V21	29	x x x x	Connection established at V.21 300 bps

(Display DCE speeds by ATW0 and ATW2)

CONNECT 16800	15	x x x x	Connection established at 16800 bps
CONNECT 19200	16	x x x x	Connection established at 19200 bps
CONNECT 21600	17	x x x x	Connection established at 21600 bps
CONNECT 24000	21	x x x x	Connection established at 24000 bps
CONNECT 26400	30	x x x x	Connection established at 26400 bps
CONNECT 28800	31	x x x x	Connection established at 28800 bps
CONNECT 31200	32	x x x x	Connection established at 31200 bps
CONNECT 33600	33	x x x x	Connection established at 33600 bps

(V.90 mode)

CONNECT 28000	34	x x x x	Connection established at 28000 bps
CONNECT 29333	35	x x x x	Connection established at 29333 bps
CONNECT 30666	36	x x x x	Connection established at 30666 bps
CONNECT 32000	37	x x x x	Connection established at 32000 bps
CONNECT 33333	38	x x x x	Connection established at 33333 bps
CONNECT 34666	39	x x x x	Connection established at 34666 bps
CONNECT 36000	40	x x x x	Connection established at 36000 bps
CONNECT 37333	41	x x x x	Connection established at 37333 bps
CONNECT 38666	42	x x x x	Connection established at 38666 bps
CONNECT 40000	43	x x x x	Connection established at 40000 bps
CONNECT 41333	44	x x x x	Connection established at 41333 bps
CONNECT 42666	45	x x x x	Connection established at 42666 bps
CONNECT 44000	46	x x x x	Connection established at 44000 bps
CONNECT 45333	47	x x x x	Connection established at 45333 bps
CONNECT 46666	48	x x x x	Connection established at 46666 bps
CONNECT 48000	49	x x x x	Connection established at 48000 bps
CONNECT 49333	50	x x x x	Connection established at 49333 bps
CONNECT 50666	51	x x x x	Connection established at 50666 bps
CONNECT 52000	52	x x x x	Connection established at 52000 bps
CONNECT 53333	53	x x x x	Connection established at 53333 bps
CONNECT 54666	54	x x x x	Connection established at 54666 bps
CONNECT 56000	55	x x x x	Connection established at 56000 bps

6.3 Application Examples

6.3.1 Dialing a Remote Modem

Command line: ATDP9WT002, (886)-7128423<CR>

This command line instruct the modem to dial a remote modem through a PBX. The modem first use pulse dialing to dial 9 (the access code of the PBX), wait for outside dial tone, and then use touch tone dialing to dial 002 once a one-second continuous dial tone is detected within 30 seconds, pause for 2 seconds (if S8=2) and then dial 8867128423.

6.3.2 Dialing a Stored Number

Command line: AT&Z2=T03,709394<CR>

Command line: **ATDS=2<CR>**

The first command line store the dial string T03, 709394 to the 3rd location in NVRAM. Afterwards you can use the second command line to dial this stored number. The dial string T03, 709394 will appear on the screen to indicate the number being dialed.

6.3.3 Manual Answer an Incoming Call

Command line: **ATA <CR>**

The factory setting of the S-register S0 is S0=0. This condition disables the auto answer capability so that you must issue an ATA command to answer a call. At power up, your modem always monitors if there are incoming rings. If incoming rings are detected, your modem will display result codes on the screen as :

RING

:

:

RING

Seeing that, you may issue the ATA command to answer the call. This command must be entered within the quiet interval between any two rings.

6.3.4 Auto Answer an Incoming Call

Command line: AT S0=2 &W &Y <CR>

Auto answer can be enabled by changing the setting of the S-register S0 to a value between 1 and 255. In the above command line, S0=2 instructs the modem to answer an incoming call automatically after the 2nd ring. The &W command writes this configuration to profile 0 in NVRAM. &Y command instruct the modem to load profile 0 as the active configuration on power-up. The last two commands make S0=2 the default value at power-up or reset.

This example also shows the insertion of space between two neighboring commands to make the command line more readable.

6.3.5 Voice to Data Switch

Command line: ATA <CR> or ATX1D <CR>

If you are talking with a remote modem user through the telephone set and want to initiate data communication with the remote modem, follow the procedures below:

1. You or the remote user issue an ATA command first to switch to data communication.
2. When the person on the other end hears an answer tone from the phone, issues an ATX1D command (X1 to disable the dial tone monitor) to instruct the modem to go off-hook and wait for a carrier. If connection is successful, the CONNECT XXXX result code will be displayed on the screen. Now you can hang up your phone and begin data communication with the remote modem.

APPENDICES

Appendix A: Caller ID Commands (Optional)

+VCIDn - Caller ID (Enables or disables Caller ID.)
This command only apply to models which support the Caller ID function.

+VCID=0   Disables Caller ID.(Default.)

+VCID=1   Enables Caller ID with formatted presentation to the DTE. The modem will present the data items in a <Tag><Value> pair format. The expected pairs are data, time, caller code (telephone number), and name.

+VCID=2   Enables Caller ID with unformatted presentation to the DTE. The modem will present the entire packet of information, excluding the leading U's, in ASCII printable hex numbers.

Result Codes:
OK   n=0, 1 or 2.
ERROR   Otherwise.
Inquiries :
+VCID?   Retrieves the current Caller ID mode from the modem.

+VCID=?   Returns the mode capabilities of the modem in a list with each element separated by commas.

Formatted Form Reporting

The modem presents the data in the <tag>=<value> pair format as described in the table below.Spaces are present on both sides of the equal sign.

TAG	Description
DATE	DATE=MMDD where MM is the month number(01 to 12) and DD is the day number (01..31).
TIME	TIME=HHMM where HH is the hour number (00 to 23) and MM is the minute number (00 to 59).
NMBR	NMBR=<number> or P or O where <number> is the telephone number of the caller, where P indicates that the calling number information is not available since the originating caller as requested private service, and where O indicates that the calling number information is not available or out of service at the calling location.
NAME	NAME=<listing name> where <listing name> is the subscription name.
MESG	MESG=<data tag><length of message><data><checksum> in printable ASII hex numbers. This tag indicates a data item not listed above. The message is only possible for Multiple Message Format.

Notes:
1. The modem does not present any Caller ID information if the DCE detects a checksum error in the Caller ID packet.

2. In the event of an unrecognized data tag, the modem will present the data in ASCII hex numbers following the MESG tag.

Example of Formatted Form Reporting

1. The following example illustrates the standard Caller ID message packet.
   ```
   RING
   DATE = 0321
   TIME = 1405
   NMBR = 504551234
   NAME = A N OTHER
   RING
   RING
   ```
2. The following example illustrates the case where the tag of the packet is not recognized by the modem.
   ```
   RING
   ```

MESG = 06034242431
RING
RING

Unformatted Form Reporting

The modem presents all information and packet control information found in the message. The modem, however, excludes the leading U's (channel seizure information) from the presentation. The packet is presented in ASCII printable hex numbers, the modem does not insert spaces, or line feeds, for formatting between bytes or words of the packet. The modem does not detect the checksum of the packet.

Example of Unformatted From Reporting

RING
0412303332323234303539313435353132333435
RING
RING

Appendix B: Technical Specifications

Data Rates(bps)

V.90: 56000, 54667, 53333, 52000, 50667, 49333, 48000, 46667, 45333, 42667, 41333, 40000, 38667, 37333, 36000, 34667, 33333, 32000, 30667, 29333, 28000 (Receive only)

Compatibility

(Data) ITU-T V.90, V.34, V.32 bis, V.32, V.22 bis and V.22
Bell: 212A

(Fax) ITU-T V.17, V.29, V.27 ter, and V.21 ch 2

Command Set Enhanced 'AT' command set, Fax Class 1command

Flow Control Xon/Xoff, Hardware RTS/CTS

Data Compression V.42bis, MNP5

Error Correction V.42, MNP 2-4

Operation Maximum 56000 bps/download and 33600 bps/download with 28800, 26400, 24000, 21600, 19200, 14400, 9600, 4800, 2400 and 1200 bps auto fallback

Audio Monitor With software-controllable volume control

Guard Tone 550/1800 Hz

Command Buffer 30 characters

Extra Memory 4 x 36 digits

Transmit Level -11(+/-2)dBm

Receive Sensitivity -32(+/-2)dBm

Appendix C: Quick Reference

A	Go On-line in Answer Mode
Bn	Select Protocol to ITU-V.22 or Bell 212A
D	Go On-line in Originate Mode
En	Command Echo
Hn	Hang Up
In	Identification
Ln	Control Speaker Volume
Mn	Monitor Speaker On/Off
Nn	Automode Enable
On	Return to On-line Data Mode
P	Set Pulse Dial as Default
Q	Result Code Display
Sn	Reading and Writing to S Registers
T	Set Tone Dial as Default
Vn	Select Word or Digit Result Codes
Wn	Current Message Control
Xn	Extended Result Codes
Zn	Reset
&Cn	Select DCD Options
&Dn	Select DTR Options
&F	Fetch Factory Configuration
&Gn	Select Guard Tone
&Kn	DTE/Modem Flow Control
&Pn	Select Pulse Dial Make/Break Ratio
&Rn	CTS Signal Select
&Sn	DSR Option
&Un	Protocol Selection
&V	View Configuration Profiles
&Wn	Store the Current Configuration to Nonvolatile RAM
&Yn	Select the Default Profile
&Zn	Store Telephone Numbers (n=0 to 2)
*In	Connect Speed Selection
*Gn	User Abort Selection
*Hn	Auto Retrain Selection
\Nn	Operation Mode Control
\Vn	Single Line Connect Message Enable
%Cn	Enable/Disable Data Compression
@	Answer
,	Pause
!	Initiate a Hookflash
;	Return to Command State after Dialing
^	Tone Control
P	Pulse Dialing
S	Dial a Stored Number
T	Touchtone Dialing
W	Wait for Dialtone
A/	Repeat Command
+++	Escape

Appendix D: Glossary

ASCII	An acronym for American Standard Code for Information Exchange. ASCII is a seven-bit code which defines 128 standard characters, including control characters, letters, numbers, and symbols. An extra 128 characters comprise the extended ASCII set.
Baud Rate	The transmission rate between two serial devices, e.g., modems, fax machines, etc. Measured in Bits Per Second.
Blind Dialing	In blind dialing, the modem continues to dial, regardless of the existence of a dialtone, ring, or busy signal.
BPS	Bits Per Second; the number of bits that can be transmitted in one second.
Carrier Signal	The analog data signal that a modem sends over telephphone wires.
COMx	Where (x = 1, 2, 3, or 4), COMx is the name(address) of serial communications ports on personal computers. Each serial port in a personal computer has a different number.
CTS	Clear To Send.
Default	The assumed value that is used for a command parameter when no other value is explicitly provided.
DCD	Data Carrier Detect.
DCE	Data Communication Equipment.
DTE	Data Terminal Equipment.
DTMF	Dual Tone Multi-Frequency (for touchtone dialing).
DTR	Data Terminal Ready.
FSK	Frequency Shift Keying.
Make/Break Ratio	The ratio of the off-hook (make) to on-hook (break) interval is the make/break ratio in pulse dialing.
Modem	A combination of the words MOdulator and DEModulator. Modems transform digital data into analog signals and back again.
Nonvolatile Memory	An area of memory inside the modem where the default configuration profile is stored. Values recorded in this memory will not be lost when the power is turned off.
Off-Hook	The condition when the modem has picked up the telephone line.
Off-Line Command State	A modem state in which the modem accepts, interprets and executes commands from an asynchronous computer or terminal.
On-Hook	The condition when the modem has not picked up the telephone line; the telephone is hung up.
On-Line	A carrier signal link with a remote modem has been established; communication is in progress.
On-Line State	A modem state in which the modem is connected with a remote modem. Data can be sent or received from the remote modem in this state. No commands will be accepted from the modem except the escape command which will bring the modem into the on-line command state.
On-Line Command State	A modem state in which the modem can accept or execute commands from an asynchronous computer or terminal while remaining connected with the remote modem. The user can return the modem to the on-line state by issuing the **AT0n** command or put it into the off-line command state by issuing command such as **ATZ** or **ATH**.
Parity	An error-checking method by which the modem verifies that the data just sent is correct.
Pps	Pulse per second.

Profile	A list of default settings.
Protocol	A technical specification for serial communications; the protocols supported by the modem are listed in Appendix B.
PSK	Phase Shift Keying.
Pulse Dialing	A dialing form in which each digit is represented by a series of pulses. Rotary telephones all use pulse dialing.
QAM	Quadrature Amplitude Modulation.
Result Codes	The response the modem returns to the screen upon executing a command.
RAM	Random Access Memory.
ROM	Read-Only Memory. A chip inside the modem which stores the factory default settings. This memory cannot be changed.
RTS	Request To Send.
RX	Reception.
S Register	RAM locations in the modem which store the active configuration.
Serial Port	See COMx.
TCM	Trellis-Coded Modulation.
Touchtone Dialing	A dialing format in which each digit is represented by a musical frequency.
TX	Transmission.

Appendix E: ASCII CODE TABLE

Decimal	Hex	Value	Decimal	Hex	Value	Decimal	Hex	Value	Decimal	Hex	Value
000	00	NUL	032	20	(space)	064	40	@	096	60	'
001	01	SOH	033	21	!	065	41	A	097	61	a
002	02	STX	034	22	"	066	42	B	098	62	b
003	03	ETX	035	23	#	067	43	C	099	63	c
004	04	EOT	036	24	$	068	44	D	100	64	d
005	05	ENQ	037	25	%	069	45	E	101	65	e
006	06	ACK	038	26	&	070	46	F	102	66	f
007	07	BEL	039	27	'	071	47	G	103	67	g
008	08	BS	040	28	(	072	48	H	104	68	h
009	09	HT	041	29	)	073	49	I	105	69	i
010	0A	LF	042	2A	*	074	4A	J	106	6A	j
011	0B	VT	043	2B	+	075	4B	K	107	6B	k
012	0C	FF	044	2C	,	076	4C	L	108	6C	l
013	0D	CR	045	2D	-	077	4D	M	109	6D	m
014	0E	SO	046	2E	.	078	4E	N	110	6E	n
015	0F	SI	047	2F	/	079	4F	O	111	6F	o
016	10	DLE	048	30	0	080	50	P	112	70	p
017	11	DC1	049	31	1	081	51	Q	113	71	q
018	12	DC2	050	32	2	082	52	R	114	72	r
019	13	DC3	051	33	3	083	53	S	115	73	s
020	14	DC4	052	34	4	084	54	T	116	74	t
021	15	NAK	053	35	5	085	55	U	117	75	u
022	16	SYN	054	36	6	086	56	V	118	76	v
023	17	ETB	055	37	7	087	57	W	119	77	w
024	18	CAN	056	38	8	088	58	X	120	78	x
025	19	EM	057	39	9	089	59	Y	121	79	y
026	1A	SUB	058	3A	:	090	5A	Z	122	7A	z
027	1B	ESC	059	3B	;	091	5B	[	123	7B	{
028	1C	FS	060	3C	<	092	5C	\	124	7C		
029	1D	GS	061	3D	=	093	5D	]	125	7D	}
030	1E	RS	062	3E	>	094	5E	^	126	7E	~
031	1F	US	063	3F	?	095	5F	_	127	7F	∎