Exhibit E

User's Manual

C-ONE TECHNOLOGY CORP.,

FCC ID.:LXLC1VFM5614R

Rockwell 56k PCMCIA Modem Card

56Kbps Fax/Modem PC Card

User's Guide

Version 1.0   VMFXMD-56RA

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Chapter 1. Introduction

Congratulations on your purchase of the Fax/Modem PC Card. The high performance Fax/Modem PC Card lets you easily access information, Email, remote offices, on-line service, and Internet Websites at error-free high speeds. If you purchased the Modem 56K PC card, you will get data download speed at up to 56kbps. In this chapter, we will provide you an overview of the Fax/Modem PC Card.

General Description

The Fax/Modem PC Card supports the fastest and most reliable download speeds available today over standard analog telephone lines and allows you to download JAVA applets, multimedia files, video images, and Web pages at the fastest data rates.

Send and receive Group III faxes at 14,400 bps with group faxing capabilities. Use this PC card to create professional fax-on-demand system with the included feature-rich, easy-to-install communication software.

The card features low power consumption, and innovative power management resulting in battery life increase of your portable computers. It is the best choice for data communication requirements on your mobile computers.

Features

- PCMCIA 2.1, JEDIA 4.2 PC Card 95 compliant
- Support ITU-T V.90 & K56flex
- Up to 56Kbps download data transmission
- 14,400bps send & receive Fax
- Plug-and-Play, Easy Installation. Hot swapping and card insertion.
- V.42 and MNP 2-4 Error Correction
- V.42bis and MNP 5 Data Compression
- Auto fall back down to 300bps autosynch
- Asynchronous, full duplex

- Very low power consumption with power management: Auto sleep and wake-up
- Feature-rich Fax/Data communication software package included
- V.80 and Rockwell Video ready synchronous access modes support Host-based communication protocols
- Voice/audio mode(option)
- VoiceView alternating voice and data (option)
- Analog Cellular direct connect (option)
- GSM direct connection (option)

System Requirements

The minimum and recommended system requirements for the Fax/Modem PC Card are as follows:

- A PC Notebook/Computer equipped with a PCMCIA Release 2.1 or later, Type II slot.
- 4MB or higher of RAM (computer memory).
- Card and socket services software (recommended).
- A Standard residential (analog) RJ-11 phone line.
- DOS, Windows 3.1, Windows for Workgroup 3.11, Windows 95, Windows NT 3.51 or higher, or OS/2 Warp.

Package Contents

- This User's Guide
- One Type II PCMCIA Fax/Data Modem PC Card
- FAX & Data Communications software with manual *
- Configuration diskette
- Cable for connecting to the PCMCIA card and RJ11 Jack

Chapter 2. Installation

This chapter will provide you with instructions on installing Fax/Modem PC
Card. Before you begin, note the operating system you are using.

Hardware Installation
Installing the modem in the computer is a simple operation that involves the
following:

1. If your notebook/computer has only one PCMCIA slot, and another PC
    Card has already been inserted, carefully remove it from the slot. If your
    notebook/computer has multiple PCMCIA slots, you may use any
    available PCMCIA slot for the Fax/Modem PC Card.

2. Firmly insert the Fax/Modem PC Card into the PCMCIA slot, with the
    68-pin connector facing the PCMCIA slot. Use the arrow on the label as
    a guide for proper insertion.

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*Note: The key-guided slots will not allow incorrect insertion, therefore
do not force the PC Card into the PCMCIA slot.*

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3. Firmly insert the enclosed cable into the Fax/Modem PC Card. The keyed
    connector will not allow incorrect insertion.

4. Insert the other end of the cable with the RJ-11 connector into a standard
    telephone outlet.

Software Installation
After installing the Fax/Modem PC Card using the above instructions, you
need to install the software necessary to communicate with the Fax/Modem.
This section provides the necessary instructions to configure the Fax/Modem
PC Card for the following operating system or environment.

*   Dos and Windows 3.1x
*   Windows 95
*   Windows NT 3.51 or higher
*   OS/2 Warp

Dos and Windows 3.1x

Most notebook/computer comes ship with some form of Card and Socket Services software (refer to the reference manual that come with your computer). To determine if you have Card and Socket Services software, insert the Fax/Modem PC Card into the PCMCIA slot after you have finished booting your computer. If the computer beeps, the Card and Socket Services software is loaded.

If the computer does not beep, check the computer screen as it is booting. If you see card Services" or similar verbiage, the Card and Socket Services Software is loaded.

Next, you need to determine whether the Fax/Modem PC Card is configured by the Card and Socket Services Software. When the Fax/Modem PC Card is configured, the Fax/Modem PC Card will be assigned a COM port. Please refer to your Card and Socket Services software reference manual or README file on how to determine COM port setting (IRQ and I/O). The COM port setting will be useful for all Data and Fax Communication software.

If you do not have Card and Socket Services software, follow the procedures for *Installing the Point Enabler* software driver in this Chapter.

Windows 3.1 and Windows for Workgroup 3.11 do not require any special drivers to communicate with the Fax/Modem PC Card once you have been configured by the Card and Socket Services or the Point Enabler. If you purchase a version of the Fax/Modem with data communication software, install it now using the following steps:

1. Turn on the computer, run Windows, and insert your communication software diskette.
2. Choose the Run command from the File menu in Windows Program Manager.
3. At the prompt, type: `a:\setup`

4. Follow the on screen instructions to install the communications software on your computer.

5. These complete your installation.

If you have questions about the software installation, refer to the communications software User's Guide.

Windows 95

This section provides you with the following simple instructions for installing the Fax/Modem PC Card for Windows 95.

1. Turn on the computer and let Windows 95 boots-up.

2. After Windows 95 boots-up, insert the Fax/Modem PC Card into the PCMCIA slot (refer to *Hardware Installation*).

3. Windows 95 will display a pops-up window saying **New Hardware Found**.

4. Insert the installation disk into your computer and choose "Driver from disk provided by hardware manufacturer" and click the OK button.

5. Choose the correct drive letter (probably A:\) and click on the OK button.

6. When Windows 95 configures the Fax/Modem, you will hear a double beep.

Your installation is now complete. To test your modem and determine the COM port setting, follows the following instructions:

1. Go to the Control Panel by clicking on the START button located on the lower-left end of the screen, select *Settings* and click on *Control Panel*.

2. Double Click on **Modem** icon. Check the COM port that Windows 95 assigned to your Fax/Modem by highlighting the Fax/Modem driver and clicking on the PROPERTIES button.

Note: *The default connection preferences should be:*
   Data Bits: 8
   Parity: None
   Stop Bits: 1

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3. You may test your Fax/Modem by clicking on the *Diagnostic* page clicking on the MORE INFO button.

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Note: If the Fax/Modem does not respond, try changing the COM port setting. Refer to Chapter 4 for Troubleshooting

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If you purchase a version of the Fax/Modem with data communication software, install it now using the following steps:

1. Insert your communication software diskette.
2. Choose the Run command from the START menu.
3. At the prompt, type: `a:\setup`
4. Follow the on screen instructions to install the communications software on your computer.
5. These complete your installation.

If you have questions about the software installation, refer to the communications software User's Guide.

Windows NT 3.51 or higher
Windows NT does not require any special drivers to communicate with the Fax/Modem; everything is already built into the operating system.

If you purchase a version of the Fax/Modem with data communication software, refer to the communications software User's Guide for installation.

OS/2 Warp
OS/2 Warp does not require any special drivers to communicate with the Fax/Modem; everything is already built into the operating system. This section provides you with the following simple instructions for installing the Fax/Modem PC Card for OS/2 Warp.

1. Ensure that OS/2 Warp is properly setup with the PCMCIA controller chipset.

> **Note:** *It is very important that this information is correct. If the wrong PCMCIA chipset information is selected your modem will not work properly. Your computer manufacturer will be able to supply you with this information.*

2. Insert the Fax/Modem PC Card.
3. OS/2 Warp will auto detect the Fax/Modem PC Card.

> **Note:** *If the modem does not respond properly, you will need to uninstall the PCMCIA support in OS/2, reboot the system and reinstall PCMCIA support.*

4. These complete your installation.

If you purchase a version of the Fax/Modem with data communication software, refer to the communications software User's Guide for installation.

Installing the Point Enabler

The Fax/Modem PC Card Point Enabler software, provided in the Configuration Diskette, let your computer directly interface with the Fax/Modem PC Card. You are only required to use the Point Enabler if:

- your computer does not have a Card and Socket Services Software.
- your Card and Socket Services Software fails to configure the Fax/Modem PC Card.
- more conventional memory is required to run application softwares.

The Fax/Modem Point Enabler will enable the card directly with the following PCMCIA controllers:

Intel 82365SL Controller (and ExCA Compatible controllers)
Vadem 465 and family
VLSI 82C146 ELC PCMCIA controller
Cirrus CL-PD671X and CL-PD672X families
DataBook TCIC-2/N Controller and family
OKI MSM60802GS-K
ThinkPad 720 Intel for MCA Variant
Sharp Controller
Socket Services 1.0+, 2.0+

To install the Fax/Modem Point Enabler,
1. Insert the Fax/Modem Configuration Diskette into the floppy drive.
2. At the C:\> prompt, type:
   ```
   cd\ <enter>
   ```
3. Copy the Point Enabler driver to your hard drive by typing:
   ```
   copy a:\cardsc.exe c: <enter>
   ```

CARDSC.EXE does not terminate and stay in resident, therefore it will not take up any memory from your PC. CARDSC.EXE can be activated in a DOS command or in the AUTOEXEC.BAT file as follows:
   a) DOS command line:
        C:\> CARDSC.EXE /I=I /C=c /M=m /S=s
   b) AUTOEXEC.BAT file:
        C:\CARDSC.EXE /I=I /C=c /M=m /S=s

The valid options and the default assigned value are as follows:
   I/O port options (default c=2, COM2)
        c = 1 then base port = 3F8h COM1
        c = 2 then base port = 2F8h COM2
        c = 3 then base port = 3E8h COM3
        c = 4 then base port = 2E8h COM4
   IRQ options (default i=3)
        i = 3, 4, 5, 10, 11, 12, 15
   MEMORY options (default m=D0)
        m = C0 - DF
   SOCKET options (default s=0)
        s = 0, 1, 2, 3
   /U will unload the driver when run from DOS prompt
   /H or ? will display the Help messages

To install CARDSC.EXE without the Card and Socket Services software, to save conventional memory, you have to disable the Card and Socket Services software from your system. Please refer to your system documentation to remark all PCMCIA lines in your CONFIG.SYS, AUTOEXEC.BAT and SYSTEM.INI files.

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> **Note:** The default IRQ setting is set to 3, however if you set IRQ to 5, notebooks with built-in sound chips may also be using this interrupt. In this situation, it is best to configure the Fax/Modem PC Card to a higher interrupt, such as 7, to avoid any conflicts.

COM Port and IRQ Settings

The most common I/O and IRQ settings use in communications software are as fellows:

Port	I/O Address(Hex)	IRQ
COM1	3F8	4
COM2	2F8	3
COM3	3E8	4
COM4	2E8	3

If your notebook computer has two serial ports, then COM1 and COM2 will not be available for your use. You may then need to choose COM3 with a different IRQ other than 3 and 4. Sharing of IRQ will cause system conflict, therefore it is strongly not recommended.

If your system does not have any available IRQ, and you do not use the COM2 on your notebook computer, you may disable it in your BIOS setting, please refer to your notebook reference manual for farther instructions.

Chapter 3. Basic AT Commands

When using a Fax and Data Communication software, the software will auto-configure the AT commands for you. If you would like to operate the modem directly from the terminal mode, the instructions in this section will provide you with the basic concepts of asynchronous AT commands.

Guidelines

A modem can respond to the stream of characters from an attached computer or terminal (DTE) in two ways. If the characters are data, the modem converts them to analog form and passes them on to the telephone line. If the characters are commands, the modem responds to the commands.

In order to command the modem manually, you must use a terminal, terminal emulation software, or communication software in terminal mode. When the modem starts up, it is in command mode, and interprets characters arriving from the DTE as commands. The following section describes the modem command format and the proper procedure for entering command and the typical modem response to those commands.

◊ With a few minor exceptions, all modem commands always begin with the letters **AT** (for *attention*) and end with an " *Enter* " key (the " +++ " command and the " / " command are the exceptions and will be explained in this section).

◊ Multiple commands can be given on one command line, except that the number of characters on one command line should not exceed 40.

◊ Spaces created by using the " *Space* " bar are not counted as characters and are ignored by the modem.

◊ Most commands are executed immediately and can not be aborted once the " *Enter* " key is typed.

◊ The modem acknowledges a valid AT command by returning the message " OK " to the DTE. It acknowledges an invalid command by returning " ERROR ".

Note: As long as the modem is in command mode, no data is transmitted over the phone line.

Basic Modem Commands

The following section describes the basic modem command and response formats.

Note: The modem commands are shown in bold letters and the response is shown in italics.

AT&F *OK*	**Restore Factory Configuration** This command resets all modem settings to factory default settings.
ATZ *OK*	**Soft Reset and Reset Profile** This command retrieves the setting for the modem from one of the stored profiles. This command also resets modem firmware and restores it to a known setting.
ATE1 *OK*	**Command Echo** Normally the modem *echoes* the characters that are typed. To check if the commands are received properly by the modem, you may turn the echo on and check the responses. E1 enables the echo. E0 disables the echo by the modem.
A/ *OK*	**Re-execute Command** This command tells the modem to repeat the last command it has executed. The response could be OK or any other valid response that depending on the last command executed. This command is helpful for redialing. This command is not proceeded by the AT prefix or end by the Enter key.
+++ *OK*	**Escape Command** This command is useful to get the attention of the modem and to accept commands from the keyboard when it is on line. When the modem is on line, it transmits all characters from the keyboard to the remote station. It does not interpret any of the characters as a modem command. To get the modem's attention, just

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	type +++ quickly. The modem will respond with OK. Now you have a choice of either returning back to on line with the ATO command or terminate the call with ATH command.

Dialing Telephone numbers

ATDT###-#### (where ###-#### is the phone number) *CONNECT 115200*	**Dial Command** This command is useful for dialing and establishing a connection with a remote PC or a computer with a modem. The D command tells the modem to dial a number and the letter T tells the modem to dial in tone mode. The telephone number follows the T. Once the modem has finished dialing, it waits for the remote modem to answer and then proceeds with the connection. It returns the code CONNECT 115200 when the connection is established successfully. Once the connection is unsuccessful, the result code will be NO CARRIER.
ATDT9,123-4567	**Dial Modifiers** The comma (,) modifier in a dial string tells the modem to pause for a number of seconds. The dial modifier is useful when you need to wait for the second dial tone on a PBX.
ATDT9W123-4567	The W modifier tells the modem to wait and look for a second dial tone. This is useful when a second dial tone must be present in order for the call to be successful.
ATS0=0 *OK* *RING* *RING*	**Answering a Call** You may command the modem to answer a call either automatically or manually. One of the S registers, S0, determines the number of rings required for the modem to answer. By setting the S register to 0, you may make the modem completely ignore the call, but the call will register on the screen as the rings occur.

ATS0=2	By setting the S register to any non-zero value, you can dictate the number of rings needed for the modem to answer the call.
OK	
RING	
RING	
CONNECT 115200	

Establishing a Connection Manually

ATA	**Manual Answer**
CONNECT 115200	This command allows you manually answer a call or to retrieve an incoming call and then switch to data connection.

Multiple Commands Entry

AT&FS0=1&W1&Y1	**Respective Commands**
CONNECT 115200	• &F configures the modem for factory defaults. • S0=1 configures the modem to answer after one ring. • &W1 saves the active configuration to user profile 1. • &Y1 configures the modem to use NVRAM user profile 1 as the power-up defaults.

A complete list of AT commands Summary appears in Appendix A. Refer to 'Basic AT Command Set Description' in this Chapter, for a detailed description of the modem command set.

Result Codes

The modem responds to commands and to activity on the telephone line by sending short messages called result codes to the DTE. The most familiar result codes are *OK*, acknowledging acceptance and execution of a command, and *ERROR*, acknowledging an invalid command. Other common result codes reporting line activities are *RING*, *BUSY*, *NO CARRIER*, and the *CONNECT* message indicating successful connection

with another modem, which is usually followed by the data rate of the connection.

S Registers

Hayes compatible modems store most of their configuration information in 8-bit status registers, or S Registers. You may modify many features of the modem operation by writing directly to these registers, by using AT commands provided for this purpose. An S Register Summary appears in Appendix B.

Basic 'AT' Command Set Description

Command	Default	Parameters/Description
A/	none	Re-execute Command: This command re-executes the last 'AT' command string stored in the command buffer . The A/ command is the only command not preceded by 'AT' and ended by a carriage return.
A	none	Answer Command: This command causes the modem to immediately go off-hook and initiate an answer mode handshake without waiting for an incoming ring signal.
Bn	1	Select CCITT or Bell: This command selects Whether the modem is configured as a CCITT or BELL modem n = 0 Selects CCITT V.22 when the modem is at 1200 bps n = 1 Selects Bell 212A when the modem is at 1200 bps, and Bell 103J when the modem is at 300 bps. *
Cn	1	Carrier Control: This command is reserved for selecting between controlled carrier or constant carrier modes. This modem supports only constant carrier mode. n = 0 Transmit carrier always off (returns an ERROR message) n = 1 Normal transmit carrier *

D	None	Dial Command: This command causes the modem to immediately go off-hook as an originating modem and dial a telephone number with corresponding dial modifiers as parameters that define how the modem should dial the telephone number.

Dial Modifiers:

0 to 9	Dialing Digits
A,B,C, D,*,#	Tone Dial Characters
P	Pulse Dial --- Configures the modem to use pulse dialing to dial a telephone number.
R	Reverse Originate Mode --- Places the modem in answer mode. This modifier should be the last character in the dialing string (e.g., ATDT 123-45678R)
S=n	Dial NVRAM Telephone Number --- Causes the modem to dial a telephone number previously stored in the NVRAM with the AT&Zn = x (n=0 to 3) number command.
T	Tone Dial --- Configures the modem to use DTMF tones to dial a telephone number.
W	Wait for Dial Tone --- Causes the Modem to look for dial tone for a specified amount of time. If no dial tone in the amount of time specified by the S-register S6, the modem will then process the next command in the dial string.
,	Pause --- Causes the modem to pause or delay implementing the next parameter in the dial string by the time specified in S-register S8.

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		!	Flash Hook --- Causes the modem to go on-hook for 0.75 seconds.
		@	Wait for Quiet Answer --- Causes the modem to wait for specified amount of time (S-register S7) followed by 5 seconds of silence be-fore processing the next dial modifier.
		;	Return to Idle State – Causes the modem to enter on-line command mode without initiating a data modem handshake (used for phone directory auto- dialers).
		-, ( )	Ignored by Modem -- These four characters are ignored by the modem.
En	1	Command Echo: This command selects whether the modem echoes 'AT' commands back to the host in either on-line command mode. n = 0 Echo disabled n = 1 Echo enabled *	
Hn	0	Disconnect(Hang-Up): This command is used to control the telephone line relay (OHREL*) and causes the modem to either hang-up or pick-up the telephone line. n = 0 Hang-up telephone line (go on-hook)* n = 1 Pick-up telephone line (go off-hook)	
In	0	Identification: This command causes the modem to send product code and hardware setup information to the DTE. n = 0 Report product code * n = 1 Report computed checksum n = 2 Report OK n = 3 Report firmware version, basic model, code n = 4 Report response programmed by an OEM n = 5 Report the country code parameter	

		n = 6 Report modem data pump model and internal version
Ln	1	Speaker Volume: The command selects the modem speaker volume. n = 0 Low speaker volume n = 1 Low speaker volume* n = 2 Medium speaker volume n = 3 High speaker volume
Mn	1	Speaker Control: This command specifies when the speaker is turned on and off. n = 0 Speaker is always off n = 1 Speaker is on during call establishment, but is off when receiving carrier* n = 2 Speaker is always on n = 3 Speaker is off when receiving carrier and during dialing, but on during answering
Nn	1	Automode Enable: The command enables or automode detection. The parameter value, is written to S31 bit 1. n = 0 Automode detection is disable. A subsequent handshake will be conducted according to the contents of S37 or, if S37 is zero, according to the most recently sensed DTE speed n = 1 Automode detection is enable. A subsequent handshake will be conducted according the automode algorithm supported by the modem. The command is also equivalent to F0*
On	0	Go On-line: This command causes the modem to return back to on-line data mode from on-line command mode. n = 0 Go on-line. * n = 1 Go on-line and initial a retrain sequence.

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P	none	Select Pulse Dialing: This command configures the modem to use pulse dialing next time the modem dials a telephone number.
Qn	0	Quiet Result Control: This command selects whether the modem will send result codes to the DTE. n = 0 Result codes enabled * n = 1 Result codes disabled
Sn	none	Read/Write S-Register: The modem selects an S-Register, performs an S-Register read or write function, or reports the value of an S-Register n Establishes S-Register n as the last register accessed n = v Sets S-Register n to the value n n? Reports the value of S-Register n
T	none	Set Tone Dial Default: This command configures the modem to use DTMF tones next time the modem dials a telephone number. (See P)
Vn	1	Result Code Form: This command selects the sending of short-form or long-form result codes to DTE. The parameter, if valid, is written to S14 bit 3. n = 0 Enables short-form result codes. Line feed is not issued before a short-form result code n = 1 Enables long-form result codes. *
Wn	0	Connect Message Control: This command Controls the format of CONNECT messages. The Parameter value, if valid, is written to S#! bits 2 and 3. n=0 Upon connection, the modem reports only the DTE speed.* n=1 Upon connection, the modem reports the line speed, the error correction protocol, and the DTE speed, respectively.

		n=2 Upon connection, the modem reports the DCE speed.
Xn	4	Extended Result Code: This command selects which subset of the result messages will be used by the modem to inform the DTE of the results of commands. n = 0 Report basic call progress result codes i.e.: OK, CONNECT, RING, NO CARRIER (also, for busy, if enabled, and dial tone not detected), NO ANSWER and ERROR n = 1 Report basic call progress result codes and connections speeds, i.e.: OK, CONNECT, RING, NO CARRIER (also, for busy, if enabled, And dial tone not detected), ERROR and NO ANSWER n = 2 Report basic call progress result codes and connections speeds, i.e.: OK, CONNECT, RING, NO CARRIER (also, for busy, if enabled, And dial tone not detected), ERROR and NO ANSWER and CONNECT XXXX n = 3 Report basic call progress result codes and connections speeds, i.e., OK, CONNECT RING, NO CARRIER, ERROR and NO DIALING, NO ANSWER and CONNECT XXXX n = 4 Report all call progress result codes and connection speeds, i.e., OK CONNECT, RING, NO CARRIER,NO ANSWER and CONNECT XXXX, BUSY, NO DAILING and ERROR* (XXXX = rate)

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Yn	0	Long Space Disconnect: This command controls whether the modem will send silence to the remote modem before disconnecting and disconnect after seeing 1.6 seconds of silence from the remote modem. n = 0 Disables long space disconnect * n = 1 Enables long space disconnect. The modem disconnects after receiving 1.6 seconds of silence from the remote modem. Additionally, after receiving an 'ATHO' command, the modem will send at least 4 seconds of silence before hanging up.
Zn	none	Soft Reset and Restore Profile: The modem performs a soft reset and restores (recalls) the configuration profile according to the parameter supplied. n = 0 Soft resets and restore stored profile 0 n = 1 Soft resets and restore stored profile 1
&Cn	1	RLSD (DCD) Option: The modem controls the RLSD output in accordance with the parameter supplied. The parameter value, if valid, is written to s21 bi 5 n = 0 RLSD remains ON at all times. n = 1 RLSD follows the state of the carrier.*
&Dn	2	Data Terminal Ready (DTR) Option: This command interprets the ON to OFF transition of the DTR signal from the DTE in accordance with the parameter supplied. The parameter value, if valid, is written to S21 bit 3 and 4 n = 0 Interpret DTR NO-to-OFF transition per &Qn n = 1 Interpret DTR NO-to-OFF transition per &Qn n = 2 Interpret DTR NO-to-OFF transition per &Qn* n = 3 Interpret DTR NO-to-OFF transition per &Qn

&F	none	Restore Factory Configuration: The modem loads the factory default configuration (profile). The factory default are identified for each command and in the S-Register description. n = 0 Restore factory configuration 0 n = 1 Restore factory configuration 1
&Gn	0	Select Guard Tone: The modem generates the guard tone selected by this command according to the parameter supplied. The parameter value, if valid, is written to S23 bits 6 and 7 n = 0 Disable guard tone. * n = 0 Disable guard tone. n = 2 Enable 1800-Hz guard tone.
&Jn	0	Telephone Jack Control: This command is included only for compatibility and performs no function except to load the S-Register. The Parameter value, if valid. Is written to S21 bit 1 n = 0 &J0 command* n = 1 &J1 command
&Kn	3	Flow Control: This command defines DTE/DCE flow control mechanism. The parameter value, if valid, is written to S39 bits 0,1, and 2. n = 0 Disable flow control n = 3 Enable RTS/CTS flow control* n = 4 Enable XON/OFF flow control n = 5 Enable transparent XON/OFF flow control n = 6 Enable both RTS/CTS and XON/OFF flow control
&Ln	0	Leased Line Operation: This command Request leased line or dial-up operation n = 0 Requests dial-up operation. Dial-up operation continues

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&Mn	0	n = 0 Selects direct asynchronous operation* n = 1 Selects synchronous connect mode with async off-line command mode n = 2 Selects synchronous connect mode with async off-line command mode and enable DTR dialing of directory zero n = 3 Selects synchronous connect mode with async off-line command mode and enable DTR to act as Talk/Data switch
&Pn	0	Select Pulse Dial Make/Break Ratio: This command determines the make/break ratio used during pulse dialing. n = 0 Selects 39%-61% make/break ratio at 10 pulses second.* n = 0 Selects 33%-67% make/break ratio at 10 pulses second. n = 0 Selects 39%-61% make/break ratio at 20 pulses second. n = 0 Selects 33%-67% make/break ratio at 20 pulses second.*
&Qn	0	Sync/Async Mode: This command is an extension of the &M command and is used to control the connection modes permitted. It is used in conjunction with S36 and S48 n = 0 Select direct asynchronous mode.* n = 1 Select Sync connect mode with async off-line command mode. n = 2 Select Sync connect mode with async off-line command mode and enables DTR dialing of directory 0 n = 3 Select Sync connect mode with async off-line command mode and enables DTR to act as Talk/Data switch n = 4 Select Autosync mode. n = 5 The modem will try to negotiate an error-corrected link n = 6 Select asyn operation in normal mode

&Rn	1	RTS/CTS :The selects how the modem controls CTS.CTS operation is modified if hardware flow control is selected N = 0 CTS tracks RTS or acts per V.25 n = 1 CTS is always active.*
&Sn	0	Data Set Ready (DSR) Override: This command selects how the modem will control DSR. n = 0 DSR will remain on at all times * n = 1 DSR will become active after answer tone has been detected and inactive after the carrier has been lost .
&Tn	0	Test and Diagnostics: The modem will perform Selected test and diagnostic functions according to the parameter supplied. A test can be run only when in an asynchronous operation in non-error-correction mode. n = 0 Terminates any test in progress * n = 1 Initial local analog loopback n = 2 Returns ERROR n = 3 Initial local digital loopback n = 4 Allow remote digital loopback n = 5 Disallow remote digital loopback request n = 6 Request an RDL without self-test n = 7 Request an RDL with self-test n = 8 Initial local analog loopback with self test
&V	none	Display Current Configuration and Stored Profiles: Reports the current configuration .The stored profiles, and the first fours stored telephone numbers. Example: AT&V

		Active Profile: B1 E1 L1 M1 N1 Q0 T V1 W0 X4 Y0 &C1 &D2 &G0 &J0 &K3 &Q5 &R1 &S0 &T5 &X0 &Y0 S00:000 S01:000 S02:043 S03:013 S04:010 S05:008 S06:002 S07:060 S08 :002 S09:006 S10:014 S11:095 S12:050 S14:170 S16:000 S18:000 S21: 048 S22:118 S23:021 S25:005 S26:001 S27:064 S36:007 S37:000 S38:020 S46:138 S48:007 S95:000 Stored Profile 1: B1 E1 L1 M1 N1 Q0 T V1 W0 X4 Y0 &C1 &D2 &G0 &J0 &K3 &Q5 &R1 &S0 &T5 &X0 S00:000 S01:000 S02:043 S03:013 S04:010 S05:008 S06:002 S07:060 S08 :002 S09:006 S10:014 S11:095 S12:050 S14:170 S16:000 S18:000 S21: 048 S22:118 S23:021 S25:005 S26:001 S27:064 S36:007 S37:000 S38:020 S46:138 S48:007 S95:000 Stored Profile 0: B1 E1 L1 M1 N1 Q0 T V1 W0 X4 Y0 &C1 &D2 &G0 &J0 &K3 &Q5 &R1 &S0 &T5 &X0 S00:000 S01:000 S02:043 S03:013 S04:010 S05:008 S06:002 S07:060 S08 :002 S09:006 S10:014 S11:095 S12:050 S14:170 S16:000 S18:000 S21: 048 S22:118 S23:021 S25:005 S26:001 S27:064 S36:007 S37:000 S38:020 S46:138 S48:007 S95:000 Telephone Numbers: 0= 1= 2= 3= OK

&V1	none	Display Last Connection Statistics: Display the last connection statistics in the following format: Termination Reason ....Link Disconnect or local Request Last TX data rate .... 33600 bps Highest TX data rate...........33600 bps Last RX data rate ....33600 bps Highest RX data rate...........33600 bps ERROR correction Protocol...LAPM Data Compression.............V42Bis Line Quality....................030 Highest SPX RX state ....068 Highest SPX TX state 067
&Wn	None	Store Current configuration: This command causes the modem to store a subset of the active profile command and S-register configuration into the NVRAM user pro-file 'n'. n = 0 Store current configuration as profile 0 n = 1 Store current configuration as profile 1
&Xn	0	Select Synchronous Clock Source: Select the source of the transmit clock for synch mode of operation n = 0 Select internal timing.* n = 1 Select external timing. n = 2 Select slave receive timing.
&Yn	0	Designate a Default Reset Profile: Select which user profile will be after a hard reset. n =0 Select profile 0 * n = 1 Select profile 1
&Zn=x	none	Store Telephone Number: The modem can store up to four telephone numbers and each telephone number dial string can contain up to 34 digital. x =0,9,a,b,c,d,#,*,T,P,R,W,@,,,!,;n = 0-3

3-16 Basic AT Commands

Chapter 4. Troubleshooting

This chapter will provide you with solutions to some frequently asked questions when installing and operating the Fax/Modem PC Card. Please note that certain solutions may only apply to some operating system or communication software.

If you cannot find the solution to your problem after reading this chapter, please contact your computer manufacturer or the vendor from which you purchased the modem.

Note: Beside referring to the solutions listed in this chapter, you should also refer to the communications software User's Guide for more solutions to software problems.

Why is my modem not responding? My communication software can not find my modem.

♦ Check that the Fax/Modem PC Card is completely inserted into the PCMCIA slot. If you have Card and Socket Services software loaded, your computer should beep when the card is inserted.

♦ If your notebook/computer has more than one serial port, the COM port setting assigned to the Fax/Modem PC Card may have a conflict with the built-in serial port or modem. Check your computer BIOS setup, if you do not plan to use the built-in serial port, you may disable it (refer to your notebook/computer manual for more instructions).

♦ If you are using Windows 3.1x and the IRQ has been set to IRQ other than 3, 4, and the IO has been set to IO other than 3F8, 2F8, 3E8, 2E8, you will need to configure the COM port setting located in the Control Panel (refer to your Window manual for more instructions).

♦ Check that you have loaded the Point Enabler software driver, if you do not have Card and Socket Services software (refer to installing Point Enabler for more instructions).

I can not hear my modem's speaker making any sound when I am connecting to another modem.

♦ Check that you have not turn-off the modem's speaker. To turn it back on, you may issue the AT command " ATM1 " in a terminal mode (refer to Chapter 3, *Basic AT Commands*), or you may add ' M1' to the initialization string in your communication software.

♦ Check that your notebook/computer's speaker is not disable (refer to your notebook/computer manual for more instructions).

♦ If you are using Windows 95. refer to its manual or help file on how to turn-on or increase the volume of the modem's speaker.

My modem failed to dial when my communication software tries to dial.

♦ Make sure that the Fax/Modem cable is secured to the Fax/Modem PC Card, and the RJ11C plug is firmly inserted into the phone jack.

♦ Check with your phone company that your phone line is analog. The Fax/Modem PC Card does not operate with digital or PBX phone line.

♦ Check that you have dialed the correct number, and the number you dial will have a modem answering.

♦ If there is another phone extension in the same line, make sure that it is not used by someone else.

♦ Make sure that the number you dial is available and not busy.

I can not get a connection after dialing.

♦ Check that the data-bits, parity and stop bit is set up according to your communication software specifications. Some BBS may use a different setting, so check with your BBS before dialing.

♦ The problem could be on the modem at the other end, try dialing another number.

♦ Make sure that the Fax/Modem cable is secured to the Fax/Modem PC Card, and the RJ11C plug is firmly inserted into the phone jack.

4-2 Troubleshooting

Error occurred when I try to download a data file.

♦ Try to connect the modems at a slower baud rate (refer to the communication software's manual for more instructions).

♦ Try setting the flow control of the communications software to hardware (RTS/CTS) (refer to the communication software's manual for more instructions), which will cause your computer to pause long enough for the file to download. Or you may set it in a terminal mode by typing the AT command " AT&K3 " or add " &K3 " to the initialization string of your communication software (refer to Chapter 3, *Basic AT Commands*).

Occasionally, my modem gets disconnected in the middle of a connection.

♦ If there is another phone extension in the same line, make sure that it is not used by someone else.

♦ If you have signed up for call waiting feature with your phone company, call your phone company's support hot-line on how to temporarily disable this feature. In most cases, you will need to add " *70 "before your dial number.

♦ The modem at the other end may hang-up or disconnect the connection.

When the modem is connecting to another modem, it reports a higher baud-rate than it really should be.

♦ The Fax/Modem PC Card is default to report the modem-to-computer baud-rate when it responds to " CONNECT ". However, you may set you Fax/Modem to report the modem-to-modem baud rate instead by typing the AT command " ATW2 " in a terminal mode or add " W2 " to the initialization string of your communication software (refer to Chapter 3. *Basic AT Commands*, for more instructions).

After connected to a BBS, the text on the screen is not legible.

♦ Some BBS may use a different to setting for the data-bits, parity and stop bit. so check with your BBS before dialing. The two most common settings are: 8 data bits, NO parity, and 1 stop bit (8, N, 1) or 7 data bits, EVEN parity, and 1 stop bit (7,E,1).

- You may have a poor phone line conditions which generate too much noise. Try hanging-up and dialing-up again, if the problem perceive. call your phone company for assistance, or you may try connecting at a lower baud-rate (refer to your communication software for more instructions).

4-4 Troubleshooting

Appendix A. AT Commands Summary

Basic Data Modem 'AT' Commands

Command		Default	Parameters/Function
A/	**	none	Re-execute command
A		none	Answer
Bn	*	1	Select CCITT or Bell
Cn		1	Carrier control
D		none	Dial command
En	*	1	Command echo
Hn		0	Disconnect
In		0	Identification
Ln	*	2	Speaker volume control
Mn	*	1	Speaker control
Nn	*	1	Automode Enable
On		0	Go On-line data mode
P	*	none	Select pulse dialing
Qn	*	0	Quiet result code control
Sn		none	Select an S-register
Sn=x		none	Write to an S-register
Sn?		none	Read from an S-register
T	*	none	Set tone dial default
Vn	*	1	Result code form
Wn		0	Connect message control
Xn	*	4	Extended result codes
Yn	*	0	Long space disconnect
Zn		0	Soft reset and restore profile
&Cn	*	1	RLSD (DCD) option
&Dn	*	2	DTR option
&Fn		none	Restore factory configuration
&Gn	*	0	Select guard tone
&Jn		0	Telephone jack control
&Kn		3	flow control
&Ln		0	Leased line operation
&Mn	*	0	Asynch/synch mode selection
&Pn	*	0	Pulse dial make/break ratio

&Qn	*	0	Asynch/synch mode
&Rn		none	RTS/CTS option
&Sn	*	0	DSR override
&Tn		0	Test and Diagnostics
&Vn		none	Display current configuration and stored profile
&V1		none	Display last connection statistics
&Wn		0	Stored current configuration
&Xn		0	Select synchronous clock source
&Yn	*	0	Designate a default reset profile
&Zn=x		none	Store telephone number
%En	*	2	Enable/disable line quality monitor Auto-retrain or fallback/fall forward
%L	*	none	Line signal level
%Qn		none	Line signal quality
%7		none	Plug and play serial number
%8		none	Plug and play vendor ID and product number
\Kn		none	Break control
\N0		none	Select normal speed buffered mode
\N1		none	Select direct mode
\N2		none	Select reliable link mode
\N3		none	Select auto reliable mode
\N4		none	Force LAMP mode
\N5		none	Force MNP mode
+MS		none	Select modulation

Fax Class 1 Commands

Command	Function
Service Class ID	
+FCLASS=n	Service class
Fax Class 1 Commands	
+FAE=n	Data/fax auto answer
+FRH=n	Receive data with HDLC framing
+FRM=n	Receive data
+FRS=n	Receive silence

A-2 AT Commands Summary

+FTH=n	Transmit data with HDLC framing
+FTM=n	Transmit data
+FTS=n	Stop transmission and wait

Fax Class 2 Commands

Command	Function
Service Class ID	
+FCLASS=n	Service class
Fax Class 2 Action Commands	
D	Originate a call
A	Answer a call
+FDT	Data Transmission
+FET=n	Transmit page punctuation
+FDR	Begin or continue phase C receive data
+FK	Session Termination
Fax Class 2 DCE Responses	
+FCON	Facsimile connection response
+FDCS:	Report current session
+FDIS:	Report remote identification
+FCFR	Indicate confirmation to receive
+FTSI:	Report the transmit station ID
+FCSI:	Report the called station ID
+FPTS:	Page transfer status
+FET:	Post page message response
+FHNG	Call termination with status
Fax Class 2 Session Parameter	
+FMFR?	Identify manufacturer
+FMDL?	Identify model
+FREV?	Identify revision
+FDCC=	DCE capabilities parameters
+FDIS=	Current session parameters
+FDCS=	Current session results
+FLID=	Local ID string
+FCR=	Capability to Receive
+FPTS=	Page transfer status

+FTH=n	Transmit data with HDLC framing
+FTM=n	Transmit data
+FTS=n	Stop transmission and wait

Fax Class 2 Commands

Command	Function
Service Class ID	
+FCLASS=n	Service class
Fax Class 2 Action Commands	
D	Originate a call
A	Answer a call
+FDT	Data Transmission
+FET=n	Transmit page punctuation
+FDR	Begin or continue phase C receive data
+FK	Session Termination
Fax Class 2 DCE Responses	
+FCON	Facsimile connection response
+FDCS:	Report current session
+FDIS:	Report remote identification
+FCFR	Indicate confirmation to receive
+FTSI:	Report the transmit station ID
+FCSI:	Report the called station ID
+FPTS:	Page transfer status
+FET:	Post page message response
+FHNG	Call termination with status
Fax Class 2 Session Parameter	
+FMFR?	Identify manufacturer
+FMDL?	Identify model
+FREV?	Identify revision
+FDCC=	DCE capabilities parameters
+FDIS=	Current session parameters
+FDCS=	Current session results
+FLID=	Local ID string
+FCR=	Capability to Receive
+FPTS=	Page transfer status

Error Correction Commands

Command	n value	Function
%Cn	0	Disable data compression
	1	Enable MNP 5 data compression
	2	Enable V.42 bis data compression
	3*	Enable both V.42 bis and MNP 5 data compression
\An	0	Set max. block size in MNP to 64
	1	Set max. block size in MNP to 128
	2	Set max. block size in MNP to 192
	3*	Set max. block size in MNP to 256
\Bn	1~9	Transmit break to remote (default n=3)

* Value saved in NVRAM.

MNP 10 Commands

Command	n value	Function
)Mn	0~2	Enable cellular power level adjustment
*Hn	0~2	Link negotiation speed
-Kn	0*	Disables V.42 LAMP to MNP 10 conversion
	1	Enables V.42 LAMP to MNP 10 conversion
	2	Enables V.42 LAMP to MNP 10 conversion detection only
-Qn	0~1	Enable fallback V.22 bis/V.22
-SEC=n	0	Disable MNP 10 EC
	1	Enable MNP 10 EC and set transmit level 0 to 30 (0 to −30 dbm)
@Mn	0~30	Initial cellular power level setting
:En	0~1	Compromise equalizer enable command

*Value saved in NVRAM.

Cellular Commands

Command	Function
^C2	Download cellular phone driver
^I	Identify cellular phone driver
^T6	Indicate status of cellular phone

Audio Span & DSVD Commands

Command	n value	Function
-SMS=n	x	Audiospan/DSVD/DATA mode select and automatic mode select enable X =0 Data mode 1 DSVD mode 2 AudioSpan mode 3 Automatic mode select (default)
	y	Min. data speed with audio for audiospan
	z	Max. data speed with audio for audiospan
	t	Symbol rate t =0 Auto selection (default)
-SEC=n	0~1	Enable/disable DSVD n = 1 Enable DSVD (default)
-SQS=n	x	Select audiospan modulation mode x = 0 V.61 =1 ML144 =2 ML288
	y	Select audiospan automatic modulation Y = 0 Disable audiospan automodulation = 1 Enable audiospan automodulation
@Mn	0~30	Initial cellular power level setting
:En	0~1	Compromise equalizer enable command

A-6 AT Commands Summary

Appendix B. S Register Summary

Register		Default	Function
S0	*	0	Rings to auto-answer
S1		0	Ring counter
S2	*	43	Escape character
S3		13	Carriage return character
S4		10	Line feed character
S5		8	Backspace character
S6	*	2	Wait time for dial tone
S7	*	50	Wait time for carrier
S8	*	2	Pause time for dial delay modifier
S9	*	6	Carrier detect response time
S10	*	14	Carrier loss disconnect time
S11	*	95	DTMF tone duration
S12	*	50	Escape prompt delay
S13		None	Reserved
S14	*	138	General bit mapped option status
S15		None	Reserved
S16		0	Test mode bit mapped options status (&T)
S17		None	Reserved
S18	*	0	Modem test timer
S19		0	Autosync options
S20	*	0	Autosync HDLC address or BSC sync character
S21	*	52	V.24/general bit mapped options status
S22	*	117	Speaker/result bit mapped options status
S23	*	62	General bit mapped options status
S24	*	0	Sleep inactivity timer
S25		5	Delay to DTR off
S26		1	RTS-to-CTS delay
S27	*	73	General bit-mapped options status
S28	*	0	General bit-mapped options status
S29		70	Flash dial modifier time

S30		0	Disconnect inactivity timer
S31	*	194	General bit-mapped options status
S32		17	XON character
S33		19	XOFF character
S36	*	7	LAPM failure control
S37	*	0	Line connection speed
S38		20	Delay before forced hang-up
S39	*	3	Flow control bit mapped options status
S40	*	104	General bit-mapped options status
S41	*	195	General bit-mapped options status
S46	*	138	Data compression control
S48	*	7	V.42 negotiation control
S82		128	LAMP break control
S86			Call failure reason code
S91		10	PSTN transmit attenuation level
S92		10	Fax transmit attenuation level
S95	*	0	Result code message control

●   Value saved in NVRAM.

B-2 S Register Summary

Appendix C. FCC Regulations

FCC Certification
The United States Federal Communication Commission (FCC) and the Canadian Department of Communications have established certain rules governing the use of modems and other electronic equipment.

FCC Part 68 Registration
The modem is registered with the FCC as compliant with the rules of Part 68, and use of this modem is subject to the following restrictions:

1. The Federal Communication Commission FCC has established rules which permit this device to be directly connected to the telephone network. Standardized jacks are used for these connections. This equipment should not be used on party lines or coin phones.

2. If this device is malfunctioning, it may also be causing harm to the telephone network; this device should be disconnected until the source of the problem can be determined and until repair has been made. If this is not done, the telephone company may temporarily disconnect service.

3. The telephone company may make changes in it's facilities, equipment, operation and procedures; if such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes. You will be advised of your right to file a complaint with the FCC.

4. If the telephone company requests information on what equipment is connected to their lines, inform them of:
   a. The telephone number to which this unit is connected.
   b. The ringer equivalence number.
   c. The USOC jack required.
   d. The FCC Registration number.

Items (b) and (d) are indicated on the label. The Ringer Equivalence Number (REN) is used to determine how many devices can be connected to your telephone line. In most areas, the sum of the REN of all the devices on any one line should not exceed 5.0. If too many devices are attached, they may not ring properly.

FCC Part 15 Registration

This modem complies with Part 15 of FCC rules. Operation is subject to the following two conditions:

1) This device may not cause harmful interface, and

2) this device must accept any interface received, including interface that may cause undesired operation.

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

Note: *Changes or modifications not expressly approved by manufacturer could void the user's authority to operate the equipment.*