EXHIBIT   C

User Manual

Contents
M 3-5614 PM3

Section One - Introduction

This new series of modems represents a new generation of PC communication peripheral devices, combining high speed Data, Fax, Voice* , Full-Duplex Speakerphone* and SVD* (Simultaneous Voice and Data) functions into a single device. **56000 modem can even make your download speed from central ISP (Internat Service Provider) upto 56000bps. This high performance modem connects your computer to all popular modems and fax machines in use today.

This manual provides installation and operation instructions for your modem. Also included in this manual are lists and descriptions of the standard AT command set, S-registers, and troubleshooting tips. Be certain to read *Section Two - Installing The Modem* thoroughly before performing the actual installation.

1.1   Modem Features and Compatibility

Your modem is compatible with the following standards.

- **V.90(56Kbps down stream only)
- **K56flex™(56Kbps down stream only) • V.80 (Video Ready Mode)
- V.34 (33600 bps)   • V.32bis (14400 bps)
- V.32 (9600 bps)   • V.22bis (2400 bps)
- V.22 (1200 bps)   • Bell 212A (1200 bps)
- Bell 103 (300 bps)   • V.17 (14400 bps FAX)
- V.29 (9600 bps FAX)   • V.27ter (4800 bps FAX)
- V.21 Channel-2 (300 bps FAX)   . • V.42bis (data compression)
- V.42 (error correction)   • MNP 5 (data compression)
- MNP 2-4 (error correction)   • EIA/TIA 602 AT Command set
- TIA/EIA 578 Class 1 Fax Command set
- TIA/EIA 578 Class 1.0 Fax Command set

*Notes: * Voice, Speakerphone, SVD and PnP are optional features which may not be available on your modem. ** 56,000 download feature is for 56000 modem only. If your modem doesn't support those features, please disregard the relative section of the manual. The speed of 56Kbps limits to download from an ISP, while upload remains 33.6Kbps. Current FCC regulations, however, limit download speeds to 53Kbps. For peer-to-peer communication, the speed remains at 33.6Kbps.*

1.2 Contents of Your Package

- One modem
- One software manual
- One AC power adapter (external modem only)
- Warranty Registration Card
- Communication software diskette(s)
- One telephone cable

Notes: Please contact the place of purchase if any of the listed items are missing from your package.

1.3 Where To Go From Here

If you have difficulties getting your modem to work, read *Section 2.2.1 and Section 4* to find information on COM ports and IRQ's, as well as answers to frequently asked questions. *Sections 5 through 10* contain material such as AT commands, S-register, and Result-codes to use as references when needed.

We recommend thoroughly reading the software manual to become familiar with the functions and features provided by the communication software. The software manual includes detailed information on all common modem functions. Understanding how the software works will help to provide many years of trouble-free modem operation. Additionally, you may also use any other communication software commercially available.

If you have an external modem, proceed to *Section 2.1* for installation instructions. If installing an internal modem, proceed to *Section 2.2*

Section Two - Installing The Modem

2.1 External Modem Installation

The following steps provide instructions for installing your external modem. You will also need a RS232 serial cable to make the connection to your computer. For IBM compatible computers equipped with a 25-pin serial port, you will need a standard 25-pin to 25-pin "straight-through" serial cable. If you have a 9-pin serial port on your PC, use a 9-pin to 25-pin "IBM AT" type serial cable. For Macintosh computers, use only a high speed Macintosh serial cable, which supports hardware flow control signals.

1. Turn off the computer.
2. Plug the male (25 pins) end of the serial cable into the connector marked RS-232 on the back of the modem (see Figure 2-1).
3. Plug the other end of the serial cable into your computer's serial port

(COMx; x=1,2,3... on IBM and compatible PCs).

4. Plug the telephone cable into the connector marked LINE on the back of the modem.

5. Plug the other end of the telephone cable into a telephone wall jack.

6. Make sure to verify the modem power switch is in the off position (located on the front panel). Plug the AC adapter's power cord into the connector marked POWER on the back of the modem.

MIC

SPK
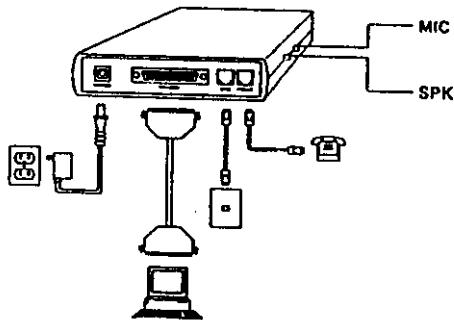
Figure 2-1 External Modem

7. Plug the transformer end of the AC adapter into a standard AC wall outlet

8. Optionally connect : (1) your telephone to the modem's PHONE connector. Lift the handset and listen for a dial tone to check for a working connection.(2) a speaker to the modem's SPK connector, and (3) a microphone to the modem's MIC connector.

9. Turn on the modem. The modem should perform a self-test, and then be ready for use. You may now turn on your computer.

Note: The SPK and MIC jacks are optional feature which may not be available on your modem.

2.1.1 Indicator Lights

Your modem (external model only) features LED indicators on the front panel that report modem status:

MR	Modem Ready	On when modem is ready to work
TR	Terminal Ready	On when DTR signal is active
SD	Send Data	On when modem is transmitting data to remote modem
RD	Receive Data	On when modem is receiving data from remote modem
OH	Off Hook	On when modem is off hook
CD	Carrier Detect	On when remote carrier has been detected
RS	Request to Send	On when RTS signal is active
CS	Clear to Send	On when CTS signal is active

This completes the external modem installation. Proceed to *Section 3* for information on installing and configuring your communication software.

2.2 Internal Modem Installation

The following steps provide instructions for installing your internal modem.

CAUTION: Before removing the cover from your computer, turn off and unplug the computer and all attached external peripherals. Prior to removing the modem from its antistatic bag, discharge any static electricity from your body by touching any metal surface.

1. Turn off the computer and unplug it from the AC outlet.
2. Remove the computer's cover, in accordance to its owner's manual.
3. Select any available ISA bus slot. The modem will work in either 8 or 16 bit slots.
4. Unscrew and remove the slot cover. Set the screw aside for later use.
5. For non-PnP installation, please read thoughout *Section 2.2.1* to set the proper COM port and IRQ. For PnP installation, please set the short caps to PnP mode. (Refer to Table 2-1~2-3)
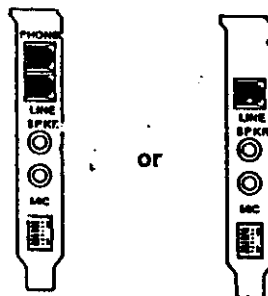6. Carefully insert the modem into the se-

Figure 2-2

lected slot. Apply even pressure until the modem is firmly seated.

7. Secure the bracket with the screw saved earlier. Store the slot cover for future use.

8. Replace the computer cover and plug in your computer. Reconnect all cables.

9. Connect the telephone cable into the modem's **LINE** connector. Attach the other end into the telephone wall jack (see Figure 2-2).

10. Optionally connect: (1) your telephone to the modem's **PHONE** connector. Lift the handset and listen for a dial tone to check for a working connection. (2) a speaker to the modem's **SPK** connector, and (3) a microphone to the modem's **MIC** connector.

This completes the internal modem installation.

2.2.1 COM (COMmunication) Port and Interrupt Settings (Internal Modem Only)

The modem requires a COM port to communicate with the computer system. Most computers are equipped with one or more COM ports on the rear panel. Your modem does not connect to these COM ports, but connects to the internal expansion bus on your computer. The internal modem will therefore be assigned its own COM port number. The COM port assignment is selected via jumpers located on your modem (*see Figure 2-3 to Figure 2-5 for jumper location). Note that the internal modem can not be assigned a COM port number that is already in use by another device in your computer. Since most PCs contain 2 built-in COM ports, we suggest that you assign your internal modem as either COM4 or COM 3. Your modem is factory configured to use COM4.

An IRQ (interrupt request) is a signal generated by an I/O device (e.g., modem) that notifies the computer of incoming data. Your modem is capable of generating IRQs 3, 4, and 5 (selected via jumpers on non-Plug and Play models). **I/O devices in your computer can share an IRQ with another device as long as the two devices are not functioning simultaneously.** Example: a mouse may be connected to COM1 using IRQ4 while COM3 is a modem using the same IRQ.

The following diagrams and charts are to be used when the COM port or IRQ settings need to be changed from the factory default setting.

For Plug and Play (PnP) models, the Com port and IRQ settings are automatically assigned by the operating system. As an option, some models will allow for the cards to be configured manually, via jumpers. Please see *Table 2-1 to Table 2-3 for jumper configuration. All default settings are printed in bold text.

Note: * Your model number showed on the little white tag on your internal modem which showed WS-56(33)14xx3, xx represents different models. You can refer to the Figures and Tables with your model number.
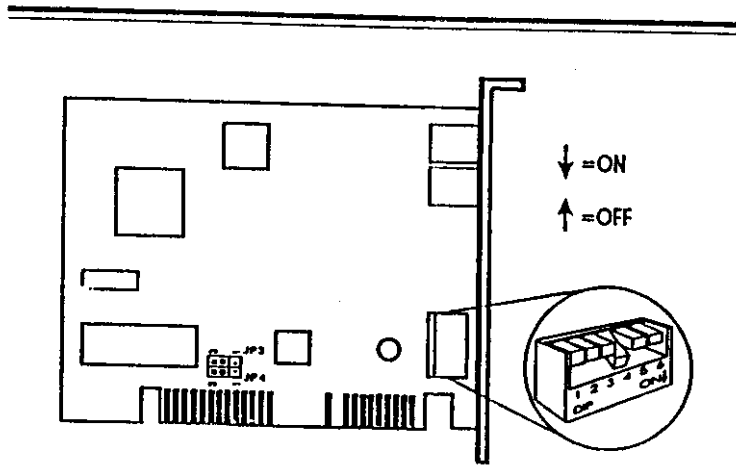
Figure 2-3 COM/IRQ Jumper Location

for Model# WS-5614JS3(G)

	COM Port (address)	IRQ	DIP1	DIP2	DIP3	DIP4	DIP5	DIP6	JP3	JP4
	1 (03F8)	4	ON	ON	OFF	OFF	ON	OFF		
Non	2 (02F8)	3	OFF	ON	OFF	ON	OFF	OFF		
PnP	3 (03E8)	5	ON	OFF	OFF	OFF	OFF	ON	2-3	2-3
Mode		4	ON	OFF	OFF	OFF	ON	OFF	short	short
	4* (02E8)	2	OFF	OFF	ON	OFF	OFF	OFF		
		3*	OFF	OFF	OFF	ON	OFF	OFF		
PnP mode			OFF	OFF	OFF	OFF	OFF	OFF	1-2 short	1-2 short

Table 2-1 COM/IRQ Jumper Settings

for Model# WS-5614JS3(G)

2.3 Testing Your Modem

To confirm that the modem is working properly after installation, run a modem communication program and set the software for the correct modem COM port (internal modem factory defaults to COM4). At the software's terminal mode prompt, type AT followed by the ENTER key. The modem should respond by displaying an OK (or 0). The OK (or 0) response indicates that the modem is working properly. If the modem does not return the proper response, refer to *Section 2.2.1* for information on COM Ports and IRQ setting for *Section 5* for troubleshooting information.

2.4 Using Your Modem

Common modem functions (i.e. dialing, file transfer, faxing) are performed by using communication software in conjunction with the modem. *The communication software included with your modem provides a user friendly interface for all common modem functions and should be sufficient for all of your communication needs.* The modem may also perform basic communication functions (such as dialing) via the AT commands. A list and description of all AT commands appears in *Section 6*. Since the communication software is designed to shield the user from the difficult and cumbersome AT commands, we strongly suggest that all modem operations be performed via the software.

Section Three - Software Installation

3.1 Using The Internal Modem With Microsoft Windows 3.1

It is very important that you *configure Windows 3.1 to recognize the Internal modem after Installation or when the modem's COM/IRQ settings have been changed.* Your internal modem has been designed to provide flexible hardware configurations to satisfy different systems requirements. For example you may change the modem's operating setting from COM4/IRQ3 (default) to COM3/IRQ5 to avoid hardware conflicts with other serial devices in your system. *After installation or setting changes, make sure Windows is properly configured before running your Windows communicaion software.*

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3.2 Using the modem with Win95

For PnP models, when the computer is first turned on after the installation of the new modem, the system will ask for the driver diskette. Insert the provided disk and follow system instructions to complete the installation. *Win95 should recognize the internal modem after installation.* Please consult **Section 5** should you encounter any difficulties.

3.2.1 Non-PnP Modems in Win95

1. Click **Modem** icon in **Control Panel.**
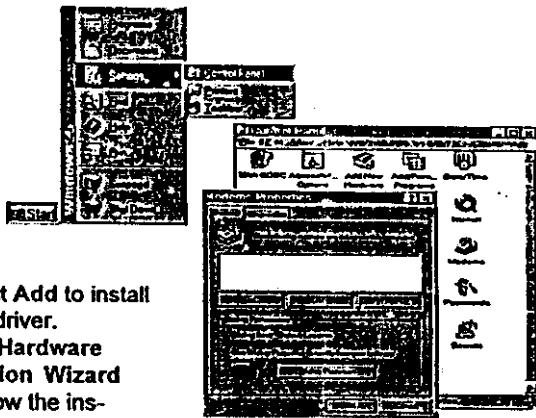
2. Select **Add** to install modem driver.
3. Run **Hardware Installation Wizard** and follow the instructions. Autodetect hardware and modem by Wizard are re-commanded
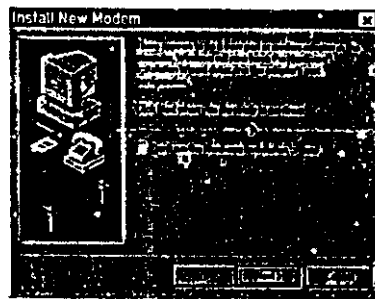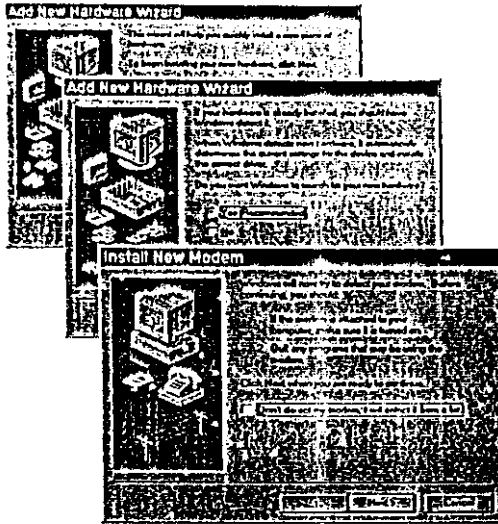
4. Insert the provided driver diskette click Have Disk when the wizard is asking to choose model number.
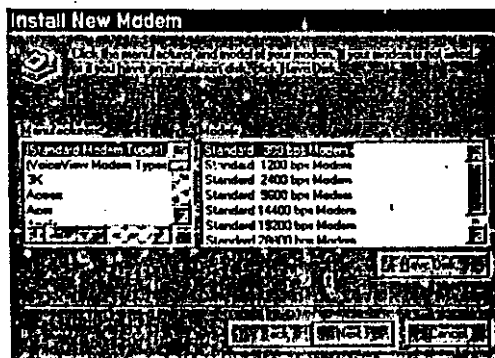
5. Select the appropriate model number for proper driver (see table 2-4). The Model number is showed on the little white tag on your internal modem or on the bottom of your external modem showed WS-XXXX.
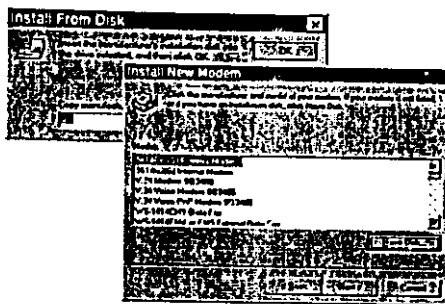
Model Number	Device
WS-5614Ex3(G)	5614Ex3(G) External Modem
WS-5614Jx3(G)	5614Ix3(G) Internal Modem
WS-5614PM3(G)	WS-5614PM3 Fax Data
M1-5614PM3(G)	M1-5614PM3 Fax Data
WS-5614PS3(G)	WS-5614PS3 Voice Fax Data FDSP
M1-5614PS3(G)	M1-5614PS3 Voice Fax Data FDSP

Table 2-4
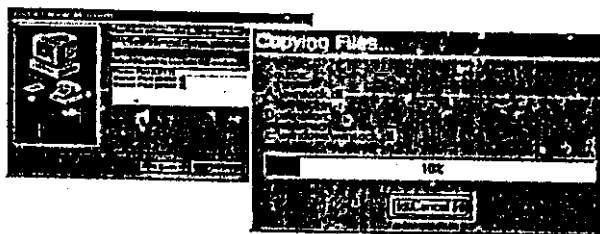
6. The file will then be accessed, and the name should now appear on the list of choices.

If you have difficulties getting your modem to work, read *Section 2.2.1 and Section 5* to find information on COM ports and IRQ's, as well as answers to frequently asked questions.

3.3 Using SVD function

The modem can provide SVD features optionally that allow Simultaneous Voice and Data transmit through one single telephone line. This high technology feature enables user to do voice conversation with remote end while sharing data or playing interactive game.

To operate in SVD mode, both the local modem and remote modem must be enabled to support SVD mode. A handset or microphone/speaker must be attached to the modem connectors in addition to the phone line. Please reference following example to enables this function.

Example 1:

Local Modem		Remote Modem		Comments
DTE	DCE	DTE	DCE	
AT&F		AT&F		*Reset modems*
	OK		OK	
T#VLS=0 AT#VLS=0		*Select telephone handset*		
(or AT#VLS=6)		(or AT#VLS=6)		*(or microphone/speaker)*
	OK		OK	*for voice conversation*
AT-SMS=2		AT-SMS=2		*Enables SVD function*
	OK		OK	
ATDTxxxx				*Dial remote modem to make SVD connection*
			RING	*Remote modem response*
		ATA		*to RING by answering*
CONNECT 28800		CONNECT 28800		
				SVD connection is established. user can start

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data transmission and
voice conversation at
anytime

Example 2 :

Local Modem		Remote Modem		Comments
DTE	DCE	DTE	DCE	
				User have establish
				voice converastion
				and both handsets are
				off hook
AT&F		AT&F		*reset modems*
	OK		OK	
AT-SMS=2		AT-SMS=2		*Enables SVD function*
	OK		OK	
ATD				*Local modem start*
				data negotiation
			RING	*Remote modem response*
				to RING by answering
		ATA		
	CONNECT 28800		CONNECT 28800	
				SVD connection is
				established and user
				can resume voice
				conversation

Note : The handset will be silenced suring the negotiation period

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Section Four - Installing and Configuring Communication Software

Install the communication software according to the software user's manual. Be certain that your software is configured to communicate with the modem on the same COM port and IRQ line used by the modem.

You may be prompted by the software to configure certain communication parameters. We suggest the following settings:

Baud Rate: 57,600 bps	Data bits: 8
Parity: None	Stop bit: 1
Flow Control: RTS/CTS	Initialization string: AT&F

The AT commands used by the modem are compatible with the command set used by Intel modems. Select a Rockwell modem type if prompted by your data communications software. Select **Generic Class** or Rockwell modemtype when prompted by your FAX or Voice software.

4.1 Accessing the Fax/ Voice/ Speakerphone/ DSVD Function*

The Fax, Voice, Speakerphone and DSVD functions of your modem are application driven and are accessed only through application software. **Consult your software manual regarding procedures on using these features.**

Many types of Voice software support recording and playback of voice files. To recordor playback voice with your modem, attach a telephone to the modem, or, optionally, attach a speaker and microphone to your modem's SPKR and MIC connectors. Follow the instructions provided with your Voice software to record and playback voice files.

4.2 Using Your Modem

Common modem functions (i.e.dialing, file transfer, faxing) are performed by using communication software in conjunction with the modem

The modem may also perform basic communication functions (such as dialing) via the AT commands. A list and description of all AT commands appear in *Section Six*. Since the communication software is designed to shield the user from the difficult and cumbersome AT commands, we strongly suggest that all modem operations be performed via the software.

The communication software included with your modem provides a user friendly interface for all common modem functions and should be sufficient for

all of your communication needs.

Section Five - Troubleshooting

Your modem is designed to provide reliable and trouble-free function-ality. However, should you experience any difficulty, the information contained in this section will assist you in determining and resolving the source of the problem. If you can not resolve your situation after reading this chapter, contact your dealer or vendor for assistance.

5.1 Modem does not respond to commands.

1. Make sure the modem is not configured with a conflicting COM port and IRQ setting (see Section 2.2.1). Your modem can not be configured as COM4 (recommended) if another device in your system is also configured as COM4. Similarly, IRQ settings may not overlap.
2. Make sure the communication software is configured with the correct COM and IRQ settings (same COM port and IRQ as the modem). Your com-munication software will not be able to send or receive any data if it is not configured to match the COM and IRQ settings for the modem.
3. Make sure the modem is properly initialized by the communication software. Your modem may have been improperly initialized by the software because you have selected an incorrect modem type. You may also be prompted to enter an initialization string* by the software. Use AT&F as your initialization string.
4. If you are running Microsoft Windows 3.1, make sure that the modem is properly configured in Windows (see Section 3)

5.2 Modem dials but does not connect.

1. Make sure the IRQ setting is identical on both the modem AND the software.
2. Make sure the phone line is working properly. A noisy line will prevent proper modem operation.

5.3 Modem makes a connection but no data appears on your screen.

1. Make sure all communication parameters (baud rate, data, stop, and parity bits) are properly configured and are identical on both sides. Be certain hardware flow control (RTS/CTS - default) is enabled in both the modem and the communication software.
2. Press the ENTER key several times. The remote system may be waiting to receive your data before it begins.
3. Make sure the correct terminal emulation mode is being used in the

software (refer to software manual).

5.4 Modem experiences errors while on-line with a remote modem

1. Make sure Call Waiting is turned off.
2. Make sure RTS/CTS hardware flow control is enabled (do not use XON/XOFF software flow control when transferring binary files).
3. Make sure the data speed is not faster than your computer's capability. Most IBM compatibles are capable of 19,200 bps under DOS and Windows 3.x. Operating at higher speeds under Windows requires a faster CPU (386 or better).

5.5 Modem exhibits poor voice record or playback.

1. Make sure the correct modem type is selected in the Voice/FAX software.
2. Make sure your computer is fast enough to handle voice operations (38.4 Kbps). Voice operations are CPU intensive and require a 386/33 or better CPU when running under MS Windows.

Section Six - AT Command Set

6.1 Executing Commands

Your modem is in Command Mode upon power-on and is ready to receive and execute "AT" commands. The modem remains in Command Mode until it makes a connection with a remote modem. Commands may be sent to the modem from an attached terminal or a PC running a communication program.

This modem is designed to operate at common DTE speeds ranging from 115.2 Kbps to 300 bps. All commands and data must be issued to the modem using one of the valid DTE speeds.

6.2 AT Commands & Format

All commands must begin with the AT prefix, followed by the command letter and ended with the ENTER key. All default settings are printed in bold text. Spaces are allowed in the command string to increase command line readability but are ignored by the modem during command execution. All commands may be typed in either upper or lower case, but not mixed. A command issued without any parameters is considered as specifying the same command with a parameter of "0".

Example: ATL[ENTER]

This command causes your modem to lower its speaker volume.

6.3 AT Commands

Note: The default value of some AT Commands listed below could vary with country.

All default settings are printed in bold text.

6.3.1 Basic AT commands

Command	Function	Command	Function
A	Answer incoming call	L1	Low speaker volume
A/	Repeat Last command. Do not preceed A/ with AT or follow with ENTER	L2	Medium speaker volume
		L3	High speaker volume
		M0	Speaker always off
Dn	0 - 9, A-D, # and *	M1	Speaker on until carrier detected
	L Redial last number		
	P Pulse dial	M2	Speaker always on
	T Tone dial	M3	Speaker off during dialing, on until carrier detected
	W Wait fo second dial tone ·		
	, Pause	O0	Return to Data Mode
	@ wait for 5 seconds of silence	O1	Initiate a retrain and return to Data Mode
	! flash	P	Pulse dial
	; return to command mode after dialing	Q0	Result code enabled
		Q1	Result code disabled
	& wait for AT&T bong tone	Sr?	Read S-register r. Refer to Chapter 7 for details
E0	Command echo disabled	Sr=n	Set S-register r to value n. Refer to Chapter 7 for details
E1	Command echo enabled		
+++	Escape characters - switch from Data Mode to Command Mode	T	Tone dial
		V0	Numeric responses
		V1	Text responses
H0	Modem on-hook (hang-up)	X0	Enables CONNECT result code only. Dial tone and busy detection are disabled
H1	Modem off-hook (make busy)		
In	Report Identification Information (n=0-7)		
		X1	Same as X0 plus all CONNECT responses/blind dialing
L0	Speaker OFF		

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Command	Function
X2	Enables all CONNECT <speed> result code. Dial tone detection is enabled, but busy detection is disabled
X3	Enables all CONNECT <speed> result code. Dial tone detection is disabled. but busy detection is enabled
X4	Enables all CONNECT <speed> result code. Dial tone and busy detection are both enabled
Z	Reset and recall configuration profile
&C0	Carrier detect always ON
&C1	Turn on CD when remote carrier is present
&D0	DTR signal ignored
&D1	Modem return to Command Mode after DTR toggle
&D2	Modem hangs up and return to Command Mode after DTR toggle
&F	Load factory default configuration profile
&G0	Guard tone disabled
&G1	Guard tone disabled
&G2	1800Hz guard tone enabled
&P0	Set pulse dial to 39%/61% make/break ratio @ 10 pps
&P1	Set pulse dial to 33%/67% make/break ratio @ 10 pps
&P2	Set pulse dial to 39%/61% make/break ratio @ 20 pps
&P3	Set pulse dial to 33%/67% make/break ratio @ 20 pps
&V	Report current configuration and stored profile
&W	Store current configuration
%E0	Line quality monitor disabled
%E1	Line quality monitor enabled
%L	Display line signal level
%Q	Dispaly line signal quality

6.3.2 V.25ter AT commands

Command	Function
+GMI	Report manufacturer ID
+GMM	Report model ID
+GMR	Report revision ID
+GSN	Report product serial number ID
+GOI	Report global object ID
+GCAP	Report complete capability list
+IFC=a,b	Set DTE-modem local flow control
	Parameter a specifies the local flow control from modem to DTE,where
	0=Disabled
	1=Enables XON/XOFF
	2=Enables RTS
	Parameter b specifies the local flow control from DTE
	to modem, where
	0=Disabled
	1=Enables XON/XOFF
	2=Enables CTS
	The default is +IFC=2,2
+ILRR=0	Local port rate reporting disabled
+ILRR=1	local port rate reporting enabled ·
+MS=a,b,c,d,e,f	Select Modulation
	Parameter a specifies the modulation protocol as B103, B212, V21, V22, V22B, V23C, V32, V32B, V34 or K56FLEX,V90
	Parameter b specifies automodeoperation, where0=autoode

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Command	Function	Command	Function

disabled,
1=automode enabled.
Parameter c specifies the lowest transmit speed for connection.
Parameter d specifies the highest transmit speed for connection.
Parameter e specifies the lowest receive speed for connection.
Parameter f specifies the highest receive speed for connection.
The default is +MS= K56, 1, 75,33600,75,56000

+MR=0 Modulation connection reporting disabled

+MR=1 M o d u l a t i o n connection reporting enabled

+ES=a,b,c

Select error control and synchronous access mode
Parameter a specifies the initial requested mode when modem originates a call, where
0= initiate call with direct mode
1= initiate call with normal mode
2= initiate call with V.42 without detection phase
3= initiate call with V.42 with detection phase
4= initiate call with MNP mode
6= initiate call with V.80 synchronous access

mode
Parameter b specifies the acceptable fallback mode when modem originates a call, where
0= LAPM,MNP or normal mode
2= LAPM or MNP mode
3= LAPM mode only
4= MNP mode only
Parameter c specifies the acceptable fallback mode when modem answers a call or specifies V.80 synchrounous access mode where
1= Normal mode
2= LAPM,MNP or normal mode
4= LAPM or MNP mode
5= LAPM mode only
6= MNP mode only
8= answer call with V.80 synchronous access mode
The default is +ES=3,0,2

+ER=0 Error control reporting disabled

+ER=1 Error control reporting enabled

+DS=a,b,c,d

Select data compression parameter
Parameter a specifies the desired direction of data compression, where
0= data compression disabled
1= both direction data compression enabled
Parameter b specifies whether or not the modem

Command	Function	Command	Function
	should continue to operate if the result is not obtained, where 0=don't disconnect Parameter c specifies the maximum number of		dictionary entries. Parameter d specifies the maximum length to be negotiates. The default is +DS=3, 0, 2048, 32
		+DR=0	Data compression reporting disabled
		+DR=1	Data compression reporting enabled

Section Seven - S Register Summary

Table 7-1 shows the registers, their functions, and their default values. Some registers can have their values changed by commands. If you use a command to change a register value, the command remains in effect until you turn off or reset your modem. Your modem then reverts to the operating characteristics specified in its non-volatile memory. Refer to Section 6 for information on how to use the AT commands to manipulate the S registers.

Note: The default value and range of some S-registers listed below could vary with country.

Table 7-1 S - Registers

Register	Function	Range/units	
S0	Auto-answer Ring	0-255 /rings	0
S1	Ring counter	0-255 /rings	0
S2	Escape code character	0-255 /ASCII	43
S3	Carriage return character	0-127 /ASCII	13
S4	Line feed character	0-127 /ASCII	10
S5	Backspace character	0-32, 127 /ASCII	8
S6	Dial tone wait time	2-255 /seconds	2
S7	Remote carrier wait time	1-255 /seconds	50
S8	Comma pause time	0-255 /seconds	2
S10	Carrier loss time	1-255 /0.1 second	14
S11	Touch-tone dialing speed	50-255 /milliseconds	95
S12	Escape character guard time	0-255 /0.02 second	50

Section Eight - Result Code Summary

BASIC RESPONSE CODES

OK	0	CONNECT	1
RING	2	NO CARRIER	3
ERROR	4	CONNECT 1200	5
NO DIALTONE	6	BUSY	7
NO ANSWER	8	CONNECT xxxxx*	1
DELAYED	24	BLACKLISTED	32
FAX	33	DATA	35
+FCERROR	+F4		

Note: * For x1, x2, x3 and x4 the modem send this result code when the
DTE   speed is   xxxxx bps

Section Nine - Support and Service

If after consulting Section 2.2.1 and trying the recommended troubleshooting tips you are still unable to isolate or resolve a problem, you should immediately: (1) consult with your dealer, (2) contact Technical Support Center at the number provided in the Warranty Card. To obtain service for this product, follow the Return Merchandise Authorization Procedure as outlined in the Warranty Card.

Section Ten - Specifications

Modulation std.:	V.90, 56flex™, V.34, V.32bis, V.32, V.29, V.27ter, V.22bis, V.23, V.22, V.21, V.17, Bell212/103
Compression:	V.42bis, MNP Class 5
Error Correction:	V.42, MNP Class 2-4
Host Interface:	ISA 16 bit bus
COM ports:	1, 2, 3, 4
IRQ lines:	2, 3, 4, 5, 7*, 10*, 11*, 12*
FAX Group:	Group III
FAX Command:	EIA/TIA 578 class 1
VOICE Command:	Rockwell (Optional)
Transmit level:	-10 dBm +/- 1 dB (Vary with country)
Sensitivity:	-43 dBm
UART:	16550 compatible
Power:	.75 W max
Temperature:	0 to 55 degrees C, operating; -20 to 80 degrees C, non-

operating

Note: * *IRQ7, IRQ10, IRQ11 and IRQ 12 are support for Plug and Play model only*

Section Eleven - Telecom Notices

11.1 FCC Compliance

This equipment complies with Part 68 of the FCC Rules. On this equipment is a label that contains, among other information, the FCC registration

number and Ringer Equivalence Number (REN) for this equipment. You must, upon request, provide this information to your telephone company.

If your telephone equipment causes harm to the telephone network, the Telephone Company may discontinue your service temporarily. If possible, they will notify in advance. But, if advance notice isn't practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect proper operation of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

The FCC prohibits this equipment to be connected to party lines or coin-telephone service.

In the event that this equipment should fail to operate properly, disconnect the equipment from the phone line to determine if it is causing the problem. If the problem is with the equipment, discontinue use and contact your dealer or vendor.

11.2 FCC Class B Statement

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

measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the 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

Notice: 1) Shielded cables, if any, must be used in order to comply with the emission limits. 2) Any change or modification not expressly approved by the Grantee of the equipment authorization could void the user's authority to operate the equipment.

11.3 DOC Compliance Information

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

Before installing this equipment, users ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

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

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

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

NOTICE: The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used

by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the sum of the Load Numbers of all the devices does not exceed 100.

11.4 U.K. Compliance Information

This modem is approved by the Secretary of State at the Department of Trade and Industry for connection to a single exchange line of the public switched telephone network run by certain licensed public telecommunication operators or systems connected there to. (Direct exchange lines only, not shared service or 1-1 carrier systems.)

This modem is also suitable for connection to Private Automatic Branch Exchanges(PABX's) which return secondary proceed indication.

If this modem is to be used with a PBX which has extension wiring owned by BT, connection of the modem th the PBX can only by carried out by BT; or by the authorized maintainer of the PBX unless the authorised maintainer has been given 14 days written notice that the connection is to be made by another person, 2nd that period of notice has expired.

This modem is suitable for use only on telephone lines provided with Loop-Disconnect or Multi-Frequency Dialling facilities.

Users of this modem are advised that the approval is for connection to the PSTN via the telephone line interface supplied with it. Connection of a modem to the PSTN by any other means will in validate the approval.

There is no guarantee of correct working in all circumstances. Any difficulties should be referred to your supplier.

Some network operators require that intended users of their network request permission to connect and for the installation of an appropriate socket.

11.5 Ringer Equivalence Number

The ringer equivalence number of this modem is 1.

REN is a guide to the maximum number of apparatus that can be simultaneously connected to one telephone line. The REN value of each apparatus is added together, and should not exceed 4. Unless otherwise marked, a telephone can be assumed to have a REN of 1.

11.6 Approved Usage

This modem is only approved for use of the following facilities:

☐ Storage of telephone numbers for retrieval by a predetermined code.

☐ Detection of initial proceed indication

☐ Automatic calling/Automatic answering

☐ Tone detection

☐ Operation in the absence of secondary proceed in dication

☐ Loudspeaking facility.

This modem is NOT suitable for use as an extension to a payphone.

This modem is not approved for connection to UK private speechband services.

This modem does not support automatic redial function.

Any other usage will invalidate the approval of your modem, if, as a result, it then ceases to conform to the standards against which approval was granted.

The approval of this modem is INVALIDATED if the apparatus is subject to modification in any material way not authorised by the BABT or if it is used with, or connected to external software that has not been formally accepted by BABT.

11.7 Storage of Numbers

It is advisable to check the telephone numbers stored in your modem immediately after programming.

In order to prevent the mis-direction of calls and network interference, please ensure that all manually programmed telephone numbers are correctly entered.

The number you enter to dial may optionally contain a PAUSE character to allow this modem to operate with a PABX. This takes the form:

ACCESS DIGIT+PAUSE CHARACTER+NUMBER TO BE DIALLED

where the access digit is the number you have to dial to get an outside line, the pause character for this modem is a "," (comma). The pause character inserts a 2 second delay.

Safety Notices

External Model

This modem is approved for use with an external class II power supply with an input rating of 240Vac/50HZ and an output rating of 12Vac/1.23A.

It is supplied with an A.C. Adapter which Meets the above specification. You must ensure that it is installed correctly and powered on before you connect the telephone line cord to the network.

The interfaces for the connection of other equipment, including the external power supply, use Safe Extra Low voltages (SELV) only. SELV is a voltage that does not exceed 42.4V peak a.c or 60V d.c. You are advised to ensure that only equipment with a similar SELV interface is connected to this modem. If in doubt, please consult a qualified engineer before connecting other equipment

11.8 Internal " AT " Bus Model

This modem is designed to operate with a low voltage+5V dc (200ma) and -5Vdc (20ma) supply taken from the computer's power buss. Care must be taken to ensure that the host computer is capable of supplying sufficient power for the modem and all other auxiliary apparatus drawing power from the host before you install the modem.

The interface to the host computer uses Safe Extra Low Voltages (SELV) only. SELV is a voltage that does not exceed 42.4V peak a.c or 60Vd.c. You are advised to ensure that this modem is installed only in host equipment which has a similar SELV interface.If in doubt, please consult a qualified engineer before installation.

It is a condition of approval that this modem is not installed in Personal Computers which have installed in them other adapters which either generate or make use of voltages in excess of the SELV limits above.

11.9 Requirements for PC cards

The approval of the internal modem card is conditional on the following:
 (a) The power required by the computer should not exceed the power specification as stated in the Technical Reference Manual of the PC when all internal cards are installed.
(b) The power requirements of this modem card are: ,
 [Voltage tolerances] 5V±5%,-5V±5%
 [Maximum power consumption] +5V/380mA,-5V/40mA
(c) The protective barrier must not be removed before installation to the computer. The Relevant Equipment shall be installed such that with the exception of the host bus connector, a clearance distance of 2.0 mm and a creepage distance of 2.4mm is maintained between the Relevant Equipment and all other parts of the host including any expansion cards

which use or generate a voltage less than 250v (rms or dc); the creepage distance shown in brackets applies where the local environment within the host is subject to conductive pollution or dry non-conductive pollution which could become conductive due to condensation.
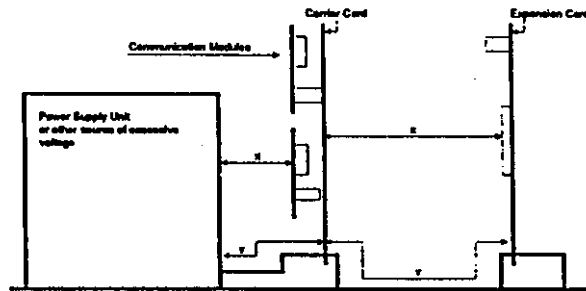
X: Clearance distance >2.0mm
Y: Creepage distance >2.4mm

(d) For a host or other expansion cards fitted in the host using or generating voltages greater than 250v (rms or dc), advice from a competent telecommunications safety engineer must be obtained before installation of the Relevant Equipment

(e) If in doubt the user must obtain advice from a competent telecommunications safety engineer

(f) The analogue telecommunications interface is intended to be connected to telecommunication network voltage (TNV) circuits which may carry dangerous voltages. The telephone cord(s) shall remain disconnected from the telecommunications system until the card has been installed within a host which provides the necessary protection of the operator. If it is subsequently desired to open the host equipment for any reason, the telephone cord(s) shall be disconnected prior to effecting access to any internal pars which may carry tlelcommunication network voltages.

11.10 AUSTRALIAN Compliance Information

All telecommunications devices are required to hold Austel permits, ensuring their safety and interoperability with the Australian telecommunications network. To provide compliance with Austel's technical standards, please ensure the following AT commands are maintained:

ATB0 (ITU/CCITT operation)

AT&G0 (no guard tone)

AT&P1 (33/66 pulse dial make/break ratio)

Ats0=0 or ATS0>1 (no answer or answer greater than 1 ring)

ATS6=n (blind dial delay-acceptable range 2-5 seconds)

ATS11=95 (DTMF period between 70-255ms)

A total of 3 call attempts are allowed to a telephone number, with a minimum period between calls of 2 seconds. If the call does not connect after 3 attempts, 30 minutes mast expire before automatic redailling may be initiated.

Failure to set the modem (and any associated communications software) to the above settings may result in the modem being non compliant with Austel standards. Under these circumatances a permit would no longer be valid, with the user subject to significant perialties under the telecommunications Act.

Safety warning:

This card must be used with the pc screw cows lid. Telecommunications netword voltages exist inside the pc and telecommunications line connection must be removed before opening the pc.

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┌─────────────────────────────────────────────────────────────┐
│                         WARNING                              │
│  FOR SAFETY REASONS, ONLY CONNECT AUSTEL APPROVED/           │
│  AUSTEL PERMIT EXEMPTED MICROPHONE TO THE MIC. PORT.         │
└─────────────────────────────────────────────────────────────┘
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INFORMATION TO THE USER
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This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

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

   --Reorient or relocate the receiving antenna.

   --Increase the separation between the equipment and receiver.

   --Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

   __Consult the dealer or an experienced radio/TV technician for help.

This booklet is available from the US government Printing Office *washington, DC 20402, Stock NO. 004-000-00345-4.

CAUTION: Any changes of modifications not expressly approved by the grantee of this device could void the users authority to operate the equipment.