3Com U.S. Robotics®

56K PROFESSIONAL MESSAGE MODEM

User's Guide and Reference

PN 1.024.1915-00

This manual covers installation and operating instructions for the following modem:

3Com U.S. Robotics 56K* Professional Message Modem external

* IMPORTANT! In accordance with the ITU standard for V.90 transmissions and 3Com 56K x2 technology, this modem is capable of 56 Kbps downloads. However, the download speeds you experience may be lower due to varying line conditions and other factors. Uploads from users to server equipment travel at speeds up to 31.2 Kbps. An analogue phone line compatible with the ITU V.90 standard or 3Com 56K x2 technology, and an Internet provider or corporate host site with the ITU V.90 standard or 3Com 56K x2 technology are necessary for these high-speed downloads. See **http://www.3com.com/56k** for details.

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WELCOME TO 56K* INFORMATION ACCESS

The International Telecommunication Union (ITU) decides the technical protocols that communications devices must use to operate with each other. Modems that comply with ITU standards can "talk" to other standards-compliant modems and fax machines worldwide.

The ITU has determined a worldwide standard for 56K modem technology, V.90. With a 3Com U.S. Robotics modem, you can get 56K Internet access from any service provider who offers the ITU V.90 standard or 3Com 56K technology. 3Com is working with providers everywhere to quickly upgrade their service to the ITU V.90 standard.

* In accordance with the ITU standard for V.90 transmissions and 3Com 56k x2 technology, this modem is capable of 56 Kbps downloads. However, the download speeds you experience may be lower due to varying line conditions and other factors. Uploads from users to server equipment travel at speeds up to 31.2 Kbps. An analogue phone line compatible with the ITU V.90 standard or 3Com 56K x2 technology, and an Internet provider or corporate host site with the ITU V.90 standard or 3Com 56K x2 technology are necessary for these high-speed downloads.
See **http:// www.3com.com/56k** for details.

PRODUCT FEATURES

Modulation Schemes

ITU-T V.90
3Com 56K technology
ITU-T V.34+
ITU-T V.34
ITU-T V.32 bis
ITU-T V.32
ITU-T V.23
ITU-T V.22 bis
ITU-T V.22
Bell 212A
ITU-T V.21
Bell 103

Error Control and Data Compression Schemes

ITU-T V.42
ITU-T V.42 bis
MNP 2-5

Fax Modulation Schemes

ITU-T V.17
ITU-T V.29
ITU-T V.27ter
ITU-T V.21

Fax Standards

EIA 578 Class 1 FAX
EIA 592 Class 2.0 FAX

V.90/x2 Front Channel Link Rates

28000, 29333, 30666, 32000, 33333, 34666, 36000, 37333, 38666, 40000, 41333, 42666, 44000, 45333, 46666, 48000, 49333, 50666, 52000, 53333, 54666, 56000

V.90/x2 Back Channel Link Rates

4800, 7200, 9600, 12000, 14400, 16800, 19200, 21600, 24000, 26400, 28800, 31200, 33600

V.34+ Link Rates

4800, 7200, 9600, 12000, 14400, 16800, 19200, 21600, 24000, 26400, 28800, 31200, 33600

V.32 bis Link Rates

4800, 7200, 9600, 12000, 14400

Additional Link Rates

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

Fax Link Rates

2400, 4800, 7200, 9600, 12000, 14400

Summary of Features

Key Features of the 56K Professional Message Modem

The 56K Professional Message Modem is the first product to incorporate a digital answering machine, built-in speakerphone and external modem into one design. The 56K Professional Message Modem also features a bank of flash memory that allows you to receive fax and voice messages without the intervention of the PC. Voice messages can be received even when the PC is not switched on. Voice messages can be retrieved from a remote location or locally by using buttons on the top of the modem.

The 56K Professional Message Modem comes with specially designed application software. This product is not just a normal voice/ fax/ data modem. The software includes all features needed to manage both the 56K Professional Message Modem in answering machine mode and the normal fax and voice message mode.

In order to use the fax feature of the modem, refer to the instructions for faxing that accompany your software application.

56K Professional Message Modem

- Offers 3Com's proprietary 56K technology which allows download capability up to 56 Kbps.
- Offers features of an answering machine through the six push buttons on the top of the modem.
- Works as a full-duplex speakerphone even in the absence of the PC.
- Is a feature-enhanced external modem with added Flash Memory to store messages when your PC is off.
- Provides the full functionality of a standard 3Com brand modem.
- Retains incoming fax and voice messages and therefore is not just a pass through device.

- Is capable of receiving and storing incoming fax and voice messages without any DTE (Data Terminal Equipment) intervention.
- Allows you to forward your faxes to a predefined phone number.
- Has Caller ID.
- Can transfer stored messages to the DTE at a later time.
- Enables remotely stored voice messages to be accessed through a dial-up connection or by using the push buttons on the top of the modem.
- Offers a built-in condenser microphone.
- Includes software designed specifically for use with the 56K Professional Message Modem. The software allows the user to take full advantage of all features in the product. Other software can be used for all standard modem functions. We recommend using the software delivered with the product.

Flash ROM Upgradable

56k Professional Message Modem supports software download through flash memory. You can quickly and easily download the most recent updates and upgrades.

Personal Voice Mail

The supplied communications software enables business-quality voice messaging system with single or multiple mailboxes for use in the home or office. You can customise voice message greetings like a standard answering machine, and even access your fax and voice messages remotely.

Your modem will auto-detect incoming fax, voice, and data calls and switch functions accordingly. Up to one hundred documents can be pre-configured for distribution via the Fax on Demand facility.

Answering Machine Features

Before You Begin

Your new Professional Message Modem is set up from the factory as an answering machine with the fax capability disabled. In order to use the fax features, a PC is necessary to adjust default settings. Also, you will need to set a password, using a PC, for use with the remote feature of the modem. Refer to the software package to choose your 4-digit password.

It is also necessary to record a Personal Greeting Message and Secondary Message to use with the Professional Message Modem. The following section provides full instructions of how to achieve this.

Personal Greeting Message

Your personal greeting message can be recorded in three ways using the Professional Message Modem (PMM):

1) From the software application,
2) From the modem buttons, and
3) Remotely.

You may use either the internal microphone (hands-free mode) or the connected handset (handset mode) from both the software application and the modem buttons. If you wish to record your Personal Greeting Message remotely, you must use the handset of a remote touch tone phone.

1) Recording your personal greeting message using the software application

Hands-free mode

1. Within the Independent Mode Greeting Screen, click **Record**, and recite your personal greeting message.

If the recording limit of 15 seconds is reached, the recording will stop and a dialogue window will display a warning message.

2. Click **Stop** when you have finished.
3. To listen to your message, press **Play** from the supplied software application.
4. Once you have recorded your personal greeting message, click **Download** to send your personal greeting message to the modem.
5. If you pick up the handset before clicking **Stop**, the message will not be recorded. You cannot switch back and forth between the handset mode and the hands-free mode during the recording process.

Handset mode

1. Select **Handset** as the Input device from within the Independent Mode Greeting screen.
2. Pick up your handset before clicking **Record** in the software application.
3. Click **Record**, and recite your personal greeting.

If the recording limit of 15 seconds is reached, the recording will stop and a dialogue window will display a warning message.

4. Click **Stop** when you have finished.
5. To listen to your message, press the **Play** button from within the application software.
6. Once you have recorded your personal greeting message, click **Download** to send your personal message to the modem.

Make sure you have completed your personal message before hanging up the handset or clicking **Stop**, otherwise your message will not be recorded. Once you have started recording your message with the handset, you cannot switch to hands-free mode.

2) Recording your personal greeting message using the modem buttons

Hands-free mode

1. Press **REC/>>**, hold for 2 SECONDS, listen for the tone, release the button, and recite your message.

2. Press **STOP/PLAY** when you have finished your personal message.
3. Your message will automatically play back after a tone.

A tone will sound if the recording limit is reached.

Handset mode

1. Pick up your handset before pressing **REC/>>.**
2. Press **REC/>>**, hold for 2 SECONDS, listen for the tone, release the button, and recite your message.
3. Press **STOP/PLAY** when you have finished your personal message.
4. Your message will automatically play back after a tone.

A tone will sound if the recording limit is reached.

If you hang up the handset during the recording session, your message will not be recorded.

3) Recording your personal greeting message remotely

1. Pick up the handset of your touch tone telephone and dial the number of the phone line to which your modem is connected.
2. Enter your 4-digit password using the keypad on your touch tone phone.
3. Press **7**, listen for the tone, and recite your message.
4. Press **0** when you have finished.
5. Your message will automatically play back after a tone.

A tone will sound if the recording limit is reached.

If you hang up during the recording session, your message will not be recorded. You will have three chances to enter the correct password. A tone will sound when you have incorrectly entered your password. After the third incorrect attempt, your modem automatically disconnects.

Secondary Message

You can record a second message, which will be played instead of your personal greeting message, when your message box is full. This additional message is recorded using the supplied software application.

You may use either the internal microphone (hands-free mode) or the connected handset (handset mode from the application software).

Hands-free mode

1. Within the Independent Mode Message Full Screen, click **Record**, and recite your secondary message.

If the recording limit of 15 seconds is reached, the recording will stop and a dialogue window will display a warning message.

2. Click **Stop** when you have finished.
3. To listen to your message, press **Play** from the supplied software application.
4. Once you have recorded your secondary message, click **Download** to send your secondary message to the modem.
5. If you pick up the handset before clicking **Stop**, the message will not be recorded. You cannot switch back and forth between the handset mode and the hands-free mode during the recording process.

Handset mode

1. Select **Handset** as the Input device from within the Independent Mode Message Full Screen.
2. Pick up your handset before clicking **Record** in the software application.
3. Click **Record**, and recite your secondary message.

If the recording limit of 15 seconds is reached, the recording will stop and a dialogue window will display a warning message.

4. Click **Stop** when you have finished.

5. To listen to your message, press the **Play** button from within the application software.
6. Once you have recorded your secondary message, click **Download** to send your secondary message to the modem.
7. Make sure you have completed your entire message before hanging up the handset or clicking **Stop**, otherwise your message will not be recorded. Once you have started recording your message with the handset, you cannot switch to hands-free mode.

Voice Message Retrieval

Voice messages can be retrieved in three ways:

1) From the software application,
2) From the modem buttons, and
3) Remotely.

Messages will be stored on the PC only when retrieving them through the software application. Messages can be transferred from the modem's memory to your PC using your software application.

Messages can be played back through either the internal speaker (hands-free mode) or the connected handset (handset mode) from the software application and the modem buttons. Remotely, recorded messages can be played back using the handset of a remote touch-tone telephone.

The number of voice messages is indicated by a tone for each new voice message. For example, if you have 4 new messages, you will hear 4 tones.

Fax messages will not be indicated by a tone.

1) Retrieving voice messages using the software application

Hands-free mode

1. Select **Microphone** and **Modem Speaker** as the respective Input & Output devices from within the supplied application software.

2. Click **Play** to play back your message through the internal speaker.
3. Click **Stop** to end message playback.
4. Playback stops automatically at the end of the message.

Handset mode

1. Select **Handset** as the Input & Output device from within the supplied application software.
2. Pick up your handset before clicking **Play**.
3. Click **Play** to playback your message.
4. Hang up the handset to stop the play back of your message.

2) Retrieving voice messages using the modem buttons

Hands-free mode

1. Press **STOP/PLAY** to playback your stored message(s).
2. Stop message playback by pressing **STOP/PLAY** again.

Playback stops automatically at the end of the message(s).

Handset mode

1. Pick up your hand set before clicking **STOP/PLAY**.
2. Click **STOP/PLAY** to play back your message(s).
3. Hang up the handset to stop the play back of your message(s).

If you want to switch to hands-free, press **SPKR** on the modem before you hang up the handset and continue playing the message(s).

Playback stops automatically at the end of the message(s).

Playback ends by hanging up the handset. In the hands-free and handset modes, press **REC/>>** to skip to the next message and press **DEL/<<** to repeat the current message. Use **Volume up (Δ)** and

Volume down (∇) to adjust the volume in the hands-free and handset modes.

3) Retrieving voice messages remotely

1. Pick up the handset of your touch tone telephone and dial the number of the phone line to which your modem is connected.
2. Enter your 4-digit password after the tone.
3. If the password is correct, the number of new messages will be indicated by that number of tones.

OPTION	ACTION
9	Repeat the new message count.
1	Playback all new messages.
2	Playback all stored messages, new and old.
3	Skip to next voice message.
6	Repeats current voice message.
0	Stop message playback and continue with any of the options.
*****	Hang up the handset to end remote operation.

Your PMM automatically hangs up after 15 seconds, if no buttons are pressed.

Deleting Messages

The Professional Message Modem memory has limited space to store messages. If this limit is reached during the reception of a message, the message is cut off and flagged. No new messages will be stored until the old messages are erased. You can free up memory space in three ways:

1. Load the supplied application software to retrieve and erase all the voice and/ or fax messages in memory,
2. Press **DEL/<<** on the modem buttons for 2 SECONDS, and
3. Remotely by pressing **44** on your touch tone phone.

In the last two options, deletion is denied if the memory has any new messages that have not been retrieved. If you are trying to delete your messages and you still have new voice messages and/or new/old fax messages, this request will be denied.

Only if ALL of your old voice messages are checked and there are no new fax messages in memory will you be able to delete your messages and free up memory in your modem.

The delete function erases all messages in memory. You cannot delete select messages.

Speakerphone Features

The Professional Message Modem works as a speakerphone. You can receive incoming calls by pressing **SPKR**. You may use the connected handset to dial out. You can switch between handset and speakerphone any time using **SPKR**. If the handset is hung up before pressing **SPKR**, the call will be aborted.

The **Volume up (Δ)** and **Volume down (∇)** will be the only buttons working in the speakerphone mode; **STOP/PLAY**, **REC/>>** and **DEL/<<** will not work in speakerphone mode.

Facsimile (Fax) Features

Fax Forwarding

Faxes can be forwarded to a predefined phone number. The faxes will continue to be forwarded until the feature is disabled. The faxes can be redirected to a different number at any time by changing the predefined number through the software application.

The fax forwarding feature is controlled through the software application or remotely.

1) Fax forwarding using the software application

Set the phone number in the application (number is stored in the flash memory of the modem) and then enable/disable using the applicable button.

2) Fax forwarding remotely

(remote control is limited only to the enable/ disable feature as follows)

a) Enter your password and from the **Main** menu, press ⑤ to toggle the enable/disable fax forwarding feature.

Confirmation of the enabling/disabling of this feature will be indicated by an opening/closing tone.

Facsimile (Fax)

A call answered with the handset or speakerphone button,
which turns out to be a fax, will not be lost, if you press the **STOP/PLAY** button for 2 SECONDS.

Independent Mode Facsimile (Fax) Forwarding

Faxes can be forwarded to a predefined phone number. The faxes will continue to be forwarded until the feature is disabled. The faxes can be redirected to a different number

at any time by changing the predefined number through the software application. The Independent mode fax forwarding feature is controlled through the software application or remotely.

1) Setup Independent Fax mode

Set the phone number in the application (number is stored in the flash memory of the modem) and then enable/disable using the applicable button.

2) Fax forwarding dial up control

(remote control is limited only to the enable/disable feature as follows)

a) Enter your password and from the **Main** menu, press ⑤ to toggle the enable/disable fax forwarding feature.

b) Confirmation of the enabling/disabling of this feature will be indicated by playing an opening/closing tone.

Manual Reception of a Fax Call

A call answered with the handset or speakerphone button, which turns out to be a fax, will not be aborted, if you press the **STOP/PLAY** button for 2 SECONDS. This allows the modem to automatically receive the incoming fax.

Caller ID Feature

The Caller ID feature discloses the identification of the caller prior to answering the call. You can enable/disable this feature through the software application, where a window is provided to reveal the caller. (Caller ID service may have to be purchased separately from your telephone company.)

Toll Saver Feature

The Professional Message Modem is generally set to answer after a certain number of rings (usually 3 to 6). With the toll saver feature enabled, the modem will detect new voice messages in memory and answer with 2 rings less than the preset number of rings. If there are no new messages or the toll saver feature is disabled, the modem will answer after the preset number of rings.

Number of Preset Rings	Number of rings with toll saver enabled or with new voice messages
3*	2
4	2
5	3
6	4

*PTT requirement of certain countries requires that the modem answer after 2 rings.

Modem Push Buttons

SPKR
Speakerphone

1) Switch between hands-free and handset modes during playback
2) Answer incoming calls as a speakerphone
3) Switch between speakerphone and handset modes

STOP/PLAY
Stop/Play

1) Stop and start the playback of voice messages
2) Stop recording your personal message
3) Stop playback of your personal message
4) Initiate fax session—see Aborted Fax Call

DEL/<<
Delete/Repeat

1) Erase messages,
2) Repeats the current message.

REC/>>
Record/Fast Forward

1) Record your personal message,
2) Skip to the next message.

Δ and ∇

Volume up/Volume down

1) Control the volume during personal message playback in hands-free mode,
2) Control the volume during message playback in hands-free mode, and
3) Control the volume of the speakerphone.

Front Panel Lights

The PMM has five LEDs—two of which are bicolor (red/green).

PWR/MEM (Bicolor LED)
Power/Message Memory

1) Constant **red** indicates that auto answer is off and the modem will not answer any calls when the PC is off.
2) Constant **green** indicates that auto answer is on and your modem is ready to accept messages when the PC is off.
3) Rapid **green** and rapid **red** flashes indicate that the message memory is full.

MSG (Bicolor LED)
Message

1) Blinks **red** once for each new fax message
2) Blinks **green** once for each new voice message.

3) Solid **amber** indicates that you have retrieved your messages, but that they have not been deleted from memory.

RD
Received Data

Flickers **red** when the modem is receiving data.

SD
Send Data

Flickers **red** when the modem is sending data.

OH
Off Hook

Constant **red** when the modem is off-hook.

Telephone Handset DTMF Digits for Remote Message Retrieval

Digit(s)	Function
1	Starts playback of all new voice messages
2	Starts playback of all stored voice messages (new and old)
3	Skips to the next voice message
44	Deletes all old voice messages in memory
5	Enables/disables fax forwarding feature
6	Repeats the current voice message
7	Records personal message
8	Not used
9	Repeats the new message count
0	1) Stops playback of all voice messages 2) Stops the recording of your personal message 3) Stops playback of your personal message
*	Hangs up the modem
#	Not used

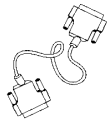
INSTALLATION OF THE PROFESSIONAL MESSAGE MODEM WITH WINDOWS 95

You will need these items from your 3Com U.S. Robotics Professional Message Modem box:

modem

phone lead

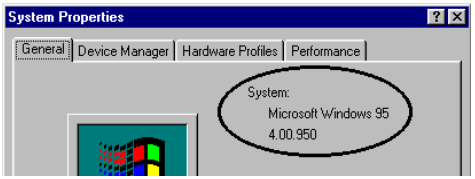
power adaptor



serial cable

Determining Your Version of Windows 95

1. Click the **My Computer** icon on your desktop with the right mouse button.
2. Click **Properties**.
3. In the "System Properties" screen, look at the system information under the **General** tab (circled in the screen image). The number following the text "Microsoft Windows 95" will end with "950," "950a," or "950b." This indicates your version of Windows 95.



Write down your version of Windows.

Windows 95 version _____

Click **OK**.

How to Connect the Modem to the Computer

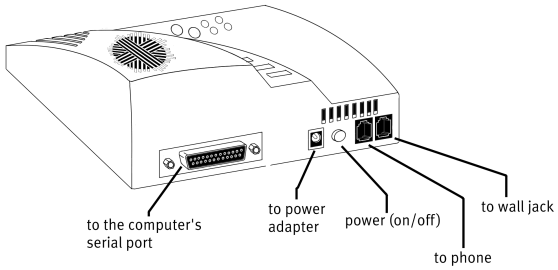
1. Turn off your computer and any attached devices, such as a printer, monitor, keyboard, and mouse.
2. Connect the serial cable to the modem and to the computer. When looking for your serial port on the back of your computer, look for ports labeled COM, MODEM, RS-232, or SERIAL. Do not select AUX, GAME, LPT, or PARALLEL.

Remember which serial port you selected. This information will be necessary when installing your communications software.

3. Plug one end of the phone cord into the TELCO jack and the other end into a phone wall jack.

The phone jack you use must be for an ANALOGUE phone line. Most office phones are wired through DIGITAL lines. Be sure you know which type of line you have. The modem will be damaged if you use a digital phone line.

4. Plug the power adaptor that came with the modem into a standard wall jack and insert its plug into the power jack on the modem.
5. If you wish to use your modem and phone through the same phone wall jack, plug your phone's cord into the modem's PHONE jack. Use an adaptor cable if necessary.



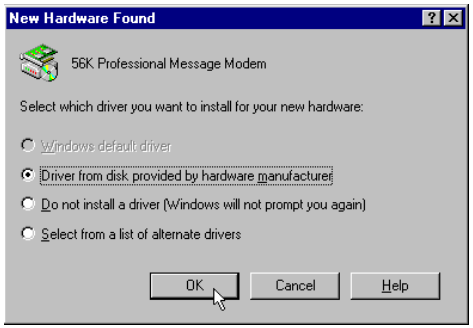
6. Plug the power cords, cables, and peripherals back into the computer and turn on the computer.
7. Start Windows 95.

Installing Modem Drivers with Windows 95:

Versions 950 and 950a

Moving Through the "New Hardware Found" Screens

1. When Windows 95 restarts, it should detect the modem. If it does, you will see the following screen.



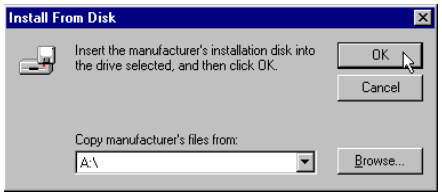
Click **Driver from disk provided by hardware manufacturer**. Then click **OK**.

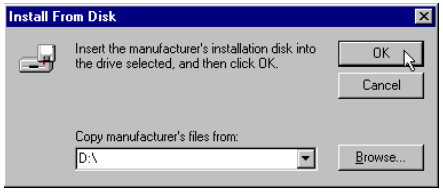
If this screen does not appear, refer to "If Plug and Play Does Not Detect Your Modem" on page 45.

2. When you see the **Install from Disk** screen,

- If you have a disk that contains your modem's drivers, insert the disk into your disk drive, usually **A**.
- If you have a CD-ROM that contains your modem's drivers, insert the CD-ROM into your CD-ROM drive, usually **D**.

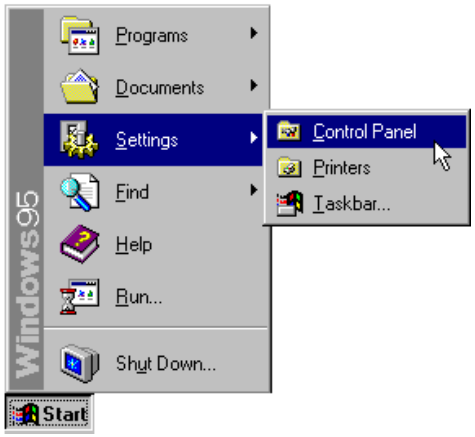
If your disk drive or CD-ROM drive is a different letter, type that letter instead of **A** or **D**.



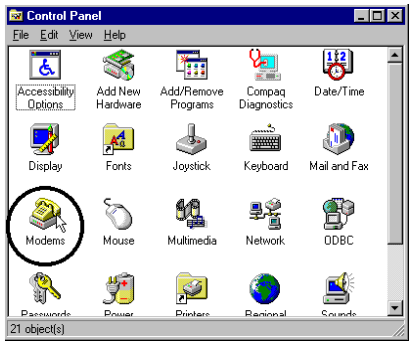


Click **OK**. Windows will install the drivers for your new modem.

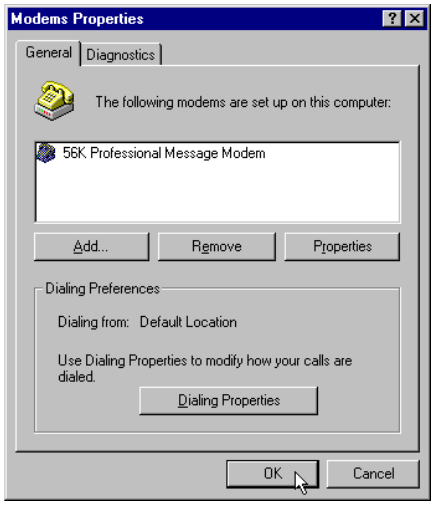
3. Once Windows finishes loading the information from your disk or CD-ROM, verify that the modem installation was a success. When your desktop returns, click the Windows **Start** button and point to **Settings**. Then click **Control Panel**.



4. Double-click the **Modems** icon (circled in the screen image below).



5. In the "Modems Properties" screen, you should see **56K Professional Message Modem** listed. This indicates that your new Professional Message Modem is installed correctly.



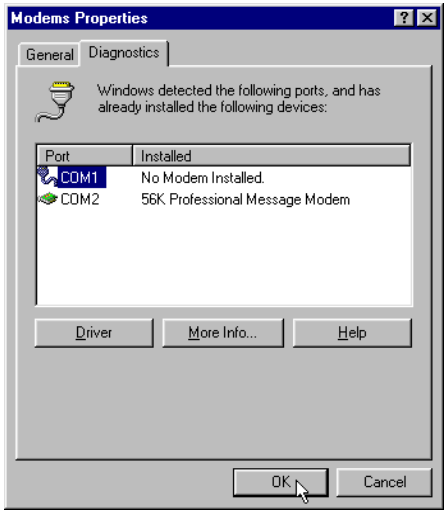
If this screen does not appear, refer to "If Plug and Play Does Not Detect Your Modem" on page 45.

6. Next, click the **Diagnostics** tab at the top of the "Modems Properties" screen. Write down the COM setting for your modem in the space below. You may need to know this setting when you install your communications software.

COM Port_____

7. Click **More Info**….

The modem's status screens should appear in the box. Click **OK**.



Be sure to install software after the modem is installed.

Turn to "Software Installation" on page 34 for information about installing communications software.

Congratulations!
You are ready to start using your 3Com U.S. Robotics Professional Message Modem

Installing Modem Drivers with Windows 95: Version 950b

Using the Update Device Driver Wizard Screens

1. When you see the following screen,

   - If you have a disk that contains your modem's drivers, insert the disk into your disk drive, usually **A**.
   - If you have a CD-ROM that contains your modem's drivers, insert the CD-ROM into your CD-ROM drive, usually **D**.

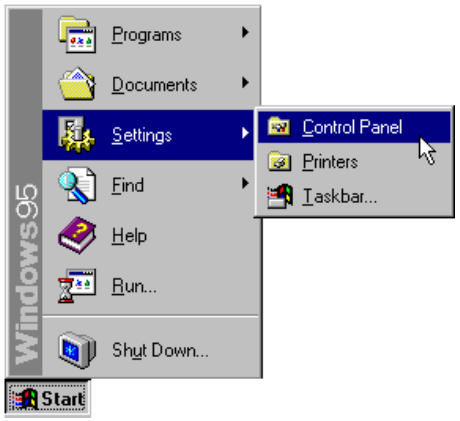
   If your disk drive or CD-ROM drive is a different letter, type that letter instead of **A** or **D**.

Click **Next**.

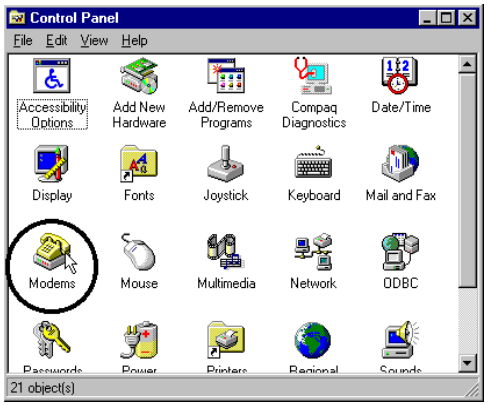
If this screen does not appear, refer to "If Plug and Play Does Not Detect Your Modem" on page 45.

2. When you see the following screen, click **Finish**. Windows will copy files to your hard drive.

3. When Windows is finished copying files, verify that the modem installation was a success. Click the Windows **Start** button and point to **Settings**. Then click **Control Panel**.



4. Double-click the **Modems** icon (circled in the screen image below).



5. In the "Modems Properties" screen, you should see **56K Professional Message Modem** listed. This means that your modem is installed correctly.

If this screen does not appear, refer to "If Plug and Play Does Not Detect Your Modem" on page 45.

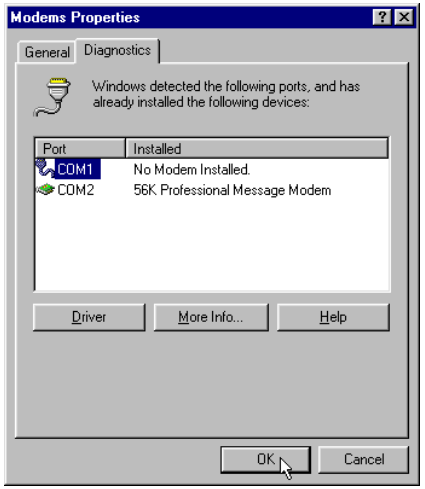
6. Next, click the **Diagnostics** tab at the top of the "Modems Properties" screen. Write down the COM setting for your modem in the space. You may need to know this setting when you install your communications software.

COM Port_____

Click **OK**.

7. Click **More Info**….

The modem's status screens should appear in the box. Click **OK**.



Be sure to install software after the modem is installed.

Turn to “Software Installation” on page 34 for information about installing communications software.

Congratulations!
You are ready to start using your
3Com U.S. Robotics
Professional Message Modem

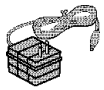
INSTALLATION OF THE PROFESSIONAL MESSAGE MODEM WITH WINDOWS 3.X

You will need these items from your 3Com U.S. Robotics Professional Message Modem box:


modem


phone lead


serial cable


power adaptor

How to Connect the Modem to the Computer

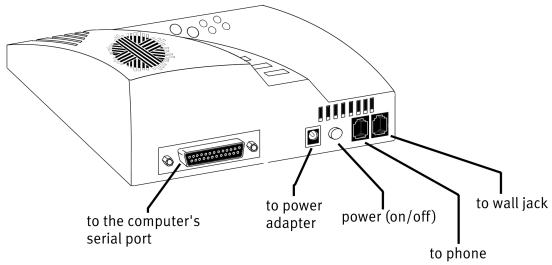
1. Turn off your computer and any attached devices, such as a printer, monitor, keyboard, mouse.
2. Connect the serial cable to the modem and to the computer. When looking for the serial port on the back of your computer, look for ports labeled COM, MODEM, RS-232, or SERIAL. Do not select AUX, GAME, LPT, or PARALLEL.

Remember which serial port you selected. This information will be necessary when installing your communications software.

3. Plug one end of the phone cord into the TELCO jack and the other end into a phone wall jack

The phone jack you use must be for an ANALOGUE phone line. Most office phones are wired through DIGITAL lines. Be sure you know which type of line you have. The modem will be damaged if you use a digital phone line.

4. Plug the power adaptor that came with the modem into a standard wall jack and insert its plug into the power jack on the modem.
5. If you wish to use your modem and phone through the same phone wall jack, plug your phone's cord into the modem's PHONE jack. Use an adaptor cable if necessary.



6. Plug the power cords, cables, and peripherals back into the computer and turn on the computer.
7. Start Windows 3.x.

Be sure to install software after the modem is installed.

Turn to “Software Installation” on page 33 for information about installing communications software.

Congratulations!

You are ready to start using your
3Com U.S. Robotics
Professional Message Modem

SOFTWARE INSTALLATION

Voice Fax, and Data Software (communications software) allows you to send and receive faxes directly from your computer desktop. You can build your own fax directory, send faxes to specified groups of fax numbers, select individual cover pages when necessary, and send individual faxes without exiting your word processing program. Communications software allows you to change settings and issue commands to your modem.

Additionally, voice communications software lets you connect to Bulletin Board Systems (BBS) and other online data providers. Take advantage of this access to enter a new world of information and entertainment.

Windows 95

1. Insert the communications software disk or CD-ROM into your disk drive or CD-ROM drive.
2. Go to the Windows **Start** menu and select **Run**.
3. In the **Run** dialog box, type **A:\setup.exe** or **D:\setup.exe** and press **ENTER**. If your disk drive or CD-ROM drive is a different letter, type that letter instead of **A** or **D**.
4. Then click **OK**.
5. Follow the on-screen instructions to install your Voice Fax, Data, and Telecommunications Software.

Windows 3.x

1. Insert the communications software disk or CD-ROM into your disk drive or CD-ROM drive.
2. In Program Manager, click **File** and select **Run**.
3. In the text box, type **A:\setup.exe** or **D:\setup.exe** and press **ENTER**.

   If your disk drive or CD-ROM drive is a different letter, type that letter instead of **A** or **D**.
4. Then click **OK**.
5. Follow the on-screen instructions to install your Voice Fax, Data, and Telecommunications Software.

Refer to your software manual for the specific installation instructions. The software's installation program will ask you questions about the modem you are using. You may need the following information when installing a communications software package.

Type of Modem

Most communications software programs will ask you to select the type of modem you are using. Select a 3Com U.S. Robotics high speed modem. If that selection is not listed, pick Courier Dual Standard, V.32 bis, or V.34.

Initialisation String

For hardware flow control, a fixed serial port rate, and full result codes and the PMM answer machine feature disabled (PWR/MEM LED = red), type:

AT&F1+MCA=0 and then press **ENTER**.

If you must use software flow control, type:

AT&F2+MCA=0 and then press **ENTER**.

Flow Control

- For hardware flow control (highly recommended), select **RTS/CTS**.
- For software flow control, select **XON/XOFF**.

Disable the type of flow control (hardware or software) that you are not using.

Upon exit of the non-supplied software, execute the supplied application software to re-initialise all the answer machine functionality if required.

UART - Universal Asynchronous Receiver Transmitter (External Modems Only)

If you are running Windows 3.x or you have upgraded your system from Windows 3.x to Windows 95, you can run MSD to determine your UART setting. In DOS, type **MSD** at the Windows directory and then press **ENTER**.

Follow the on-screen instructions to access the COM port settings panel. In this panel you should find the UART chip used. Match the UART type listed in MSD with the serial rate listed in the chart. Select this serial rate in any fax/data programs you use.

If this is your UART...	Select this serial rate
16550	115.2 or 57.6 Kbps
16450	38.4 Kbps
8250	19.2 Kbps

Do not select a 28,800, 14,400, or 12,000 bps serial port rate if offered. Your modem will not work correctly with any of these settings. Fix or lock the serial port (baud) rate. If it's referred to as autobaud, select OFF.

Congratulations!

You are now ready to start using your

U.S. ROBOTICS MODEM UPDATE WIZARD

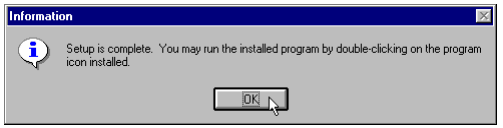
Your CD-ROM includes the U.S. Robotics Modem Update Wizard. This software is designed to quickly update your modem to a newer version of its current code

You can also obtain this software from our World Wide Web page **http://www.3com.com.au**

Complete the instructions in the “Software Installation" section on page 34 of this manual before installing the Modem Update Wizard.

Installation

1. Insert the CD into your CD-ROM drive.
2. Click the Windows **Start** menu and point to **Programs**. Point to **Connections CD**. Then click **Connections CD**.
3. From the main **Connections CD** menu, click the **Customer Support** button.
4. Click the **Modem Update Wizard** button.
5. Follow the on-screen instructions to complete the installation.
6. This screen indicates that the setup is complete. Click **OK**



Updating

1. Click the Windows **Start** button. Point to **Programs**. Then point to **U.S. Robotics Modem Update Wizard** and click the **Modem Update Wizard** selection. (Note: The number that the software dials to connect to the Modem Update Wizard may not be free of charge.)
2. Follow the on-screen instructions to complete the update process.

WARNING! To avoid the risk of damaging your modem, do not turn off the modem while it is being updated.

Congratulations!

Enjoy the benefits of your updated 3ComU.S. Robotics Professional Message Modem!

TROUBLESHOOTING

Read This First!

1. Click Windows **Start**, point to **Settings**, and click **Control Panel**.

2. Double-click the **Modems** icon.

3. Click the **Diagnostics** tab.

4. Click the **COM port** that your modem is assigned to, so that it is highlighted. If you do not see your modem on this screen, you need to shut down the computer and uninstall the modem. Exit out of the **Modems Properties** screen by clicking **Cancel**. Click **Start**, **Shut Down**, select the **Shut down the computer?** option, and then click **Yes**. When your computer has shut down, turn it off and unplug it from its power outlet. Unplug its serial cable from the computer's COM port. Reinstall your modem following the directions in the "External Modem Installation with Windows 95" chapter, but use a different COM port.

5. Highlight your modem and click **More Info**. You should see a list of the modem's ATI commands. Click **OK** and exit out of all open screens. If the ATI commands do not appear, your modem is not properly installed. Reinstall your modem following the directions in the "Installation of the Professional Message Modem with Windows 95" chapter on page 19.

PROBLEM
The computer or software will not recognise the modem.

POSSIBLE SOLUTION

Make sure the modem is plugged in and turned on. Use only the power adaptor included with your modem.

POSSIBLE SOLUTION

You may not be entering modem commands in the proper manner. Type in all upper case (AT) or all lower case (at).

POSSIBLE SOLUTION

The COM port may not be enabled. Refer to your computer's manual for information about enabling COM ports (usually involves altering the bios settings, motherboard jumpers, and the operating system).

POSSIBLE SOLUTION

You may be using the wrong serial cable with your external faxmodem. Make sure you are using an RS-232 modem cable. You will need to make sure you are using a 25-pin male to 25-pin female if your COM port is a 25-pin port, or a 25-pin male to 9-pin female if your COM port is a 9-pin port.

PROBLEM
The modem will not go off hook to dial or does not answer the phone.

POSSIBLE SOLUTION

You may have plugged your modem's phone cord into a digital line. Plugging your modem's phone cord into a digital phone line can damage the modem. Call your phone company if you are unsure whether or not your phone line is digital.

POSSIBLE SOLUTION

You may have plugged your modem's phone cord into the wrong jack on the modem. Make sure the phone cord is plugged into a jack labeled with  .

POSSIBLE SOLUTION

You might have a bad phone cord connection to your modem. The phone cord should be plugged into the jack labeled  on the modem and the wall phone jack. The phone cord should be no longer than 12 feet in length. Use the phone cord included with your modem if possible.

POSSIBLE SOLUTION

You may have devices between the modem and the phone jack. There should be no line splitters, fax machines, or other devices between the modem and the wall jack.

POSSIBLE SOLUTION

Your software may not have auto answer enabled. Enable the auto answer feature. In your communication software's terminal mode, type **ATS0=1** and press **ENTER**. You need to enable auto answer before every session unless you alter your software's initialisation string to permanently enable auto answer.

POSSIBLE SOLUTION

You may be using the wrong power adaptor for your modem. Use only the power adaptor that came with your modem.

PROBLEM
Both modems sound like they are exchange carrier signals, but fail to establish a connection.

POSSIBLE SOLUTION

You may have a poor line connection. Place the call again. Calls are routed differently each time.

PROBLEM
Your 56K modem cannot achieve a 56K Internet connection.

POSSIBLE SOLUTION

Your modem is capable of receiving data at speeds up to 56 Kbps and sending data at speeds up to 31.2 Kbps. However, the download speeds you experience may be lower due to varying line conditions. An analogue phone line compatible with ITU-T V.90 or 3Com 56K technology, and an Internet provider or corporate host site compatible with ITU-T V.90 or 3Com 56K technology are necessary for these high-speed downloads. Check **http://www.3com.com/56k** for a list of ISPs that observe ITU-T V.90 and/or offer 3Com 56K technology.

POSSIBLE SOLUTION

The phone lines in your area may not be 56K compatible. Call your phone company to find out if your phone line is compatible with ITU-T V.90 and/or is compatible with 3Com 56K technology.

POSSIBLE SOLUTION

You may have devices between the modem and the phone jack. There should be no line splitters, fax machines, or other devices between the modem and the wall jack.

PROBLEM
Errors are constantly occurring in your V.17 fax transmissions.

POSSIBLE SOLUTION

Your modem initialisation string may be insufficient for fax transmissions. In terminal mode, type the following initialisation string: **AT&F&H3&I2&R2S7=90** then press **ENTER**.

POSSIBLE SOLUTION

There may be a Terminate and Stay Resident (TSR) program (such as a screen saver or virus scanner) running in the background, disrupting data communications. Disable any Terminate and Stay Resident (TSR) programs running in the background. If you have software running as a TSR, check the software's manual for information about disabling its ability to operate as a TSR.

POSSIBLE SOLUTION

Your baud rate may be set too high. In your communications software, lower the baud rate to 9600, 7200, or 4800.

POSSIBLE SOLUTION

You may be trying to fax a compressed file. Decompress the file using the application with which it was compressed. Then open it in the application with which it was created. Select your fax software as the printer and then print the file.

PROBLEM
Your communications software fails to initialise the modem.

POSSIBLE SOLUTION

Your software's port settings may be incorrect. Make sure the software's port settings match those for your modem.

POSSIBLE SOLUTION

Make sure the modem is plugged in and turned on. Use only the power adaptor included with the modem.

POSSIBLE SOLUTION

(External modems only) Make sure that you are using an RS-232 modem cable.

PROBLEM

If Plug and Play (PNP) does not detect your modem. You have installed the modem and Windows has restarted, but you see only your normal desktop. You do not see any screens indicating new hardware has been detected.

POSSIBLE SOLUTION

The Plug and Play installation was not successful. Try the following:

1. Click **Start** and click **Shut Down**.
2. When asked if you wish to shut down your computer, click **Yes**.
3. When Windows indicates that it is safe to turn off your computer, turn it off.
4. Wait 15 seconds before turning the computer back on.
5. Windows may detect your modem upon this restart, even if it did not detect the modem during the initial installation.
   - If you see screens indicating that new hardware has been detected by Windows, follow the on-screen instructions to install the modem.
   - If you do not see the new hardware screens, continue with step 6.
6. Click Windows **Start**
7. Point to **Settings**

8. Click **Control Panel**.

9. Double-click the **System** icon.

10. Click the **Device Manager** tab on the "System Properties" screen.

11. Look for "Other Devices" or "Unknown Devices" in the list that appears.

    - If you do not see either of these options in the list, contact customer support for technical assistance.
    - If you do see one of these options, double-click the option and continue with step 12.

12. If the description that appears matches the modem you are trying to install, click **Remove**. If it does not, contact customer support for technical assistance.

13. Click **OK** when Windows asks if you wish to remove the device.

14. Restart the computer and continue with the on-screen instructions. If the computer does not detect the modem after this second restart, contact customer support for technical assistance.

GLOSSARY

Cross references are printed in **boldface**. Cross references with items in the Data Commands found in the "Technical Reference" section, are printed in *italics.*

analogue loopback
A modem self-test in which data from the keyboard or an internal test pattern is sent to the modem's transmitter, turned into analog form, looped back to the receiver, and converted back into digital form.

analog signals
A variety of signals and wavelengths that can be transmitted over communications lines such as the sound of a voice over the phone line. These signals are in contrast with **digital signals**.

answer mode
The mode used by your modem when answering an incoming call from an originating modem. The transmit/receive frequencies are the reverse of the originating modem, which is in **originate mode**.

application
A computer program designed to perform a specific function, such as a word processing or organizing data into a spreadsheet.

ARQ
Automatic Repeat reQuest is a general term for a function that automatically allows your modem to detect flawed data and retransmit it. See **MNP** and **V.42**.

ASCII
American Standard Code for Information Interchange is a code used to represent letters, numbers, and special **characters,** such as $, !, and /.

asynchronous transmission
Data transmission in which the length of time between transmitted **characters** may vary. Since the time lapses between transmitted characters are not uniform, the receiving modem must be signaled as to when the data bits of a character begin and then they end. The addition of **start/stop bits** to each character serves this purpose.

auto answer
In this setting the modem can pick up the phone line when it detects a certain number of rings. See S-register S0 in the “Technical Reference” section.

autodial
A process where your modem dials a call for you. The dialing process is initiated by sending an *ATDT* (dial tone) or *ATDP* (dial pulse) command followed by the telephone number to dial. Autodial is used to dial voice numbers. See command *Dn.*

baud rate
A term used to measure the speed of an analog transmission from one point to another. Although not technically accurate, baud rate is commonly used to mean **bit rate**.

binary digit
A 0 or 1, which reflects the use of the binary numbering system. It is used because the computer recognizes either of two states, OFF or ON. The shortened form of binary digit is bit.

bit rate
This refers to the number of **binary digits**, or bits, transmitted per second (**bps**). It is also referred to as transmission rate. Communications channels using telephone channel modems are established at set bit rates, commonly 2400, 4800, 9600, 14,400, 28,800 and higher.

bits per second (bps)
This is the bits (**binary digits**) per second rate. Thousands of bits per second are expressed as kilobits per second or kbps.

buffer
A memory area set aside to be used as temporary storage during input and output operations. An example is the modem's command buffer.

byte
A group of **binary digits** stored and operated upon as a unit. In user documentation, the term usually refers to 8-bit units or **characters**. One kilobyte (KB) is equal to 1,024 bytes or characters; 640 KB indicates 655,360 bytes or characters.

carrier
A tone signifying a connection the modem can alter to communicate data across telephone lines.

character
A representation, coded in **binary digits**, of a letter, number, or other symbol.

characters per second (CPS)
A data transfer rate generally estimated from the **bit rate** and the **character** length. For example, at 2400 bps, 8-bit characters with **start/stop bits** (for a total of ten bits per character) will be transmitted at a rate of approximately 240 characters per second (cps). Some **protocols**, such as error-control protocols, employ advanced techniques such as longer transmission **frames** and **data compression** to increase cps.

class 1 and 2.0
International standards used between fax **application** programs and faxmodems for sending and receiving faxes.

cyclic redundancy checking (CRC)
An error-detection technique consisting of a test performed on each block, or **frame,** of data by both sending and receiving modems. The sending modem inserts the results of its tests in each data block in the form of a CRC code. The receiving modem compares its results with the received CRC code and responds with either a positive or negative acknowledgment.

data communications
A type of communications in which computers are able to exchange data over an electronic medium.

data compression table
A table containing values assigned for each **character** during a call under **MNP**5 data compression. **Default** values in the table are continually altered and built during each call: The longer the table, the more efficient **throughput** gained.

data mode
The mode in which the faxmodem is capable of sending and receiving data files. A standard modem without fax capabilities is always in data mode.

DCE
Data Communications Equipment (or Circuit-Terminating Equipment) is equipment such as dial-up modems that establish and control the data link via the telephone network.

default
Any setting assumed, at startup or reset, by the computer's software and attached devices. The computer or software will use these settings until changed by the user or other software.

detect phase
In the **ITU-T** V.42 error-control **protocol**, the first stage in establishing if both modems attempting to connect have **V.42** capability.

dictionary
The term used for compression codes built by the **V.42** ***bis*** data compression algorithm.

digital loopback
A test that checks the modem's RS-232 interface and the cable that connects the **terminal** (computer) and the modem. The modem receives data (in the form of **digital signals**) from the computer or terminal, and immediately returns the data to the screen for verification.

digital signals
Signals that are discrete and uniform. In this manual, the term refers to the **binary digits** 0 and 1. These signals are in contrast with **analog signals**.

DTE
Data Terminal (or Terminating) **Equipment** is a computer that generates or is the final destination of data.

duplex
Duplex indicates a communications channel capable of carrying signals in both directions. See **half duplex**, **full duplex**.

Electronic Industries Association (EIA)
This association is a group which defines electronic standards in the U.S.

error control
A variety of techniques that check the reliability of **characters** (**parity**) or blocks of data. **V.42** and **MNP** error-control **protocols** use error detection (**CRC**) and retransmission of flawed **frames** (**ARQ**).

facsimile
A method for transmitting the image on a page from one point to another. This is commonly referred to as fax.

fax mode
The mode in which the faxmodem is capable of sending and receiving files in a **facsimile** format. See definitions for **V.17, V.27ter, V.29**.

flow control
A mechanism that compensates for differences in the flow of data into and out of a modem or other device. See commands *&Hn, &In, &Rn.*

frame
A **data communications** term for a block of data with header and trailer information attached. The added information usually includes a frame number, block size data, error-check codes, and Start/End indicators.

full duplex
These signals will flow in both directions at the same time over one line. In microcomputer communications, may refer to the suppression of the online **local echo**.

half duplex
These signals will flow in both directions, but only one way at a time. In microcomputer communications, may refer to activation of the online **local echo**, which causes the modem to send a copy of the transmitted data to the screen of the sending computer.

Hz
Hertz is a frequency measurement unit used internationally to indicate cycles per second.

ITU-T
An international organization that defines standards for telegraphic and telephone equipment. For example, the Bell 212A standard for 1200 bps communication in North America is observed internationally as ITU-T **V.22**. For 2400 bps communication, most U.S. manufacturers observe V.22 bis.

LAPM
Link Access Procedure for Modems is an error-control **protocol** defined in **ITU-T** Recommendation V.42. Like the **MNP** protocols, LAPM uses **cyclic redundancy checking** (**CRC**) and retransmission of corrupted data (**ARQ**) to ensure data reliability.

local echo
A modem feature that enables the modem to display keyboard commands and transmitted data on the screen. See command *En*.

MNP
Microcom Networking Protocol is an error-control **protocol** developed by Microcom, Inc., and now in the public domain. There are several different MNP protocols, but the most commonly used one ensures error-free transmission through error detection (**CRC**) and retransmission of erred **frames**.

modem
A device that transmits/receives computer data through a communications channel such as radio or telephone lines. It also changes signals received from the phone line back to **digital signals** before passing them to the receiving computer.

off/on hook
Modem operations that are the equivalent of manually lifting a phone receiver (taking it off-hook) and replacing it (going on-hook).

online fall back/fall forward
A feature that allows a high-speed, error-control modem to monitor line quality and fall back to the next lower speed in a defined range if line quality diminishes. As line conditions improve, the modem switches up to the next higher speed.

originate mode
The mode used by your modem when initiating an outgoing call to a destination modem. The transmit/receive frequencies are the reverse of the called modem, which is in **answer mode**.

parity
A simple error-detection method that checks the validity of a transmitted **character**. Character checking has been surpassed by more reliable and efficient forms of error checking, including **V.42** and **MNP 2-4 protocols**. Either the same type of **parity** must be used by two communicating computers, or both may omit parity.

protocol
A system of rules and procedures governing communications between two or more devices. Protocols vary, but communicating devices must follow the same protocol in order to exchange data. The format of the data, readiness to receive or send, error detection and error correction are some of the operations that may be defined in protocols.

RAM
Random Access Memory is memory that is available for use when the modem is turned on, but that clears of all information when the power is turned off. The modem's RAM holds the current operational settings, a **flow control buffer**, and a command **buffer**.

remote digital loopback
A test that checks the phone link and a remote modem's transmitter and receiver.

remote echo
A copy of the data received by the remote system, returned to the sending system, and displayed on the screen. Remote echoing is a function of the remote system.

ROM
Read Only Memory is permanent memory, which is not user-programmable.

serial transmission
The consecutive flow of data in a single channel. Compare it to parallel transmissions where data flows simultaneously in multiple channels.

start/stop bits
These signaling bits are attached to a **character** before and after the character is transmitted during **asynchronous transmission**.

terminal
A device whose keyboard and display are used for sending and receiving data over a communications link. This device differs from a microcomputer or a mainframe in that it has little or no internal processing capabilities.

terminal mode
Software mode that allows direct communication with the modem. This mode is also known as command mode.

throughput
The amount of actual user data transmitted per second without the overhead of **protocol** information such as **start/stop bits** or **frame** headers and trailers. Compare it with **characters per second**.

V.8
The **ITU-T** standard specification that covers the initial handshaking process.

V.17 fax
An **ITU-T** standard for making **facsimile** connections at 14,400 bps, 12,000 bps, 9600 bps, and 7200 bps.

V.21
An **ITU-T** standard for modems operating in asynchronous mode at speeds up to 300 bps, **full-duplex**, on public-switched telephone networks.

V.22
An **ITU-T** standard for modem communications at 1200 bps, compatible with the Bell 212A standard observed in the U.S. and Canada.

V.22 bis
An **ITU-T** standard for modem communications at 2400 bps. The standard includes an automatic link negotiation fallback to 1200 bps and compatibility with Bell 212A/V.22 modems.

V.23
An **ITU-T** standard for modem communication at 1200 bps with a 75 bps back channel. This standard is used in the U.K.

V.27ter
An **ITU-T** standard for **facsimile** operations that specifies modulation at 4800 bps, with fallback to 2400 bps.

V.29
An **ITU-T** standard for **facsimile** operations that specifies modulation at 9600 bps, with fallback to 7200 bps.

V.32
An **ITU-T** standard for modem communications at 9600 bps and 4800 bps. V.32 modems fall back to 4800 bps when line quality is impaired.

V.32 bis
An **ITU-T** standard that extends the V.32 connection range: 4800, 7200, 9600, 12,000, and 14,400 bps. V.32 *bis* modems fall back to the next lower speed when line quality is impaired, fall back further as necessary, and also fall forward (switch back up) when line conditions improve.
See **online fall back/fall forward**.

V.34
An **ITU-T** standard that currently allows data rates as high as 28,800 bps.

V.34+
An enhancement to **V.34** that enables data transfer rates as high as 33,600 bps.

V.42
An **ITU-T** standard for modem communications that defines a two-stage process of detection and negotiation for **LAPM error control**.

V.42 bis
An extension of **ITU-T** V.42 that defines a specific data compression scheme for use during V.42 connections.

V.90
The ITU-T standard for 56 Kbps modem communications.

Xmodem
The first of a family of **error control** software **protocols** used to transfer files between modems. These protocols are in the public domain and are available from many bulletin board services.

Xon/Xoff
Standard **ASCII** control **characters** used to tell an intelligent device to stop/resume transmitting data.

Ymodem
An error-checking **protocol** that can send several files of data at a time in 1024-**byte** (1K) blocks. This protocol can use either checksums or CRC for error checking.

Ymodem G
This is similar to the **Ymodem**, except it relies on the modem for error checking, which makes it faster.

Zmodem
This is similar to **Xmodem** and **Ymodem**, except it includes batch transfer, the ability to recover from a partially complete transfer, an autostart feature, and improved efficiency.

TECHNICAL REFERENCE

Modem Push Buttons

Symbol	Meaning	Function
SPKR	Speakerphone	1) Answer incoming calls as a speakerphone 2) Switch between speakerphone and handset modes 3) Switch between hands-free and handset modes during playback
STOP/ PLAY	Stop/Play	1) Start and stop the playback of voice messages 2) Stop recording your personal message 3) Stop playback of your personal message 4) Initiates fax session
DEL/<<	Delete/Repeat	1) Erase the messages 2) Repeats the current message
REC/>>	Record/ Fast Forward	1) Record your personal message 2) Skip to the next message
Δ ∇	Volume up/ Volume down	1) Control volume during personal message playback in hands-free mode 2) Control volume during message playback in hands-free mode 3) Control volume of the speakerphone

Telephone Handset DTMF Digits for Remote Message Retrieval

Digit(s)	Function
1	Starts playback of all new voice messages
2	Starts playback of all stored voice messages (new and old)
3	Skips to the next voice message
44	Deletes old voice messages in memory
5	Enables/disables fax forwarding feature
6	Repeats the current voice message
7	Records personal message
8	Not used
9	Repeats the new message count
0	1) Stops playback of all voice messages 2) Stops the recording of your personal message 3) Stops playback of your personal message
*	Hangs up the modem
#	Not used

Front Panel Lights

Symbol	Meaning	Status
PWR/ MEM	Power/ Message Memory	Bicolor LED: 1) Constant **red** indicates that auto-answer is off and the modem will not answer any calls when the PC is off. 2) Constant **green** indicates that auto-answer is on and the modem is ready to receive voice and fax messages when the PC is off. 3) Flashes **green** or **red** rapidly to indicate that the message memory is full.
MSG	Message	Bicolor LED: 1) Blinks **red** once for each new fax message. 2) Blinks **green** once for each new voice message. 3) Solid **amber** indicates that you have retrieved your messages, but that they have not been deleted from memory.
RD	Received Data	Flickers **red** when the modem is receiving data.
SD	Send Data	Flickers **red** when the modem is sending data.
OH	Off Hook	Constant **red** when the modem is off hook.

Typing Commands

- In terminal mode, type commands in either upper or lower case, not a combination. Use the Backspace key to delete errors. (You cannot delete the original AT command because it is stored in the modem buffer.)
- If a command has numeric options and you do not include a number, zero is assumed. For example, if you type **ATB**, the command ATB0 is assumed.
- Every command except **A/**, **+++**, and **A>** must begin with the AT prefix and be entered by pressing **ENTER**.
- The maximum command length is 58 characters. This does not include the AT prefix, carriage returns, or spaces.

All defaults are based on the &F1—Hardware Flow Control template when the modem is shipped. Defaults are listed in italics.

Basic Data Commands

<control key>S
Stop or restart help screens.

<control key>C *or*
<control key>K
Stop help screens.

$ Use in conjunction with *D, S,* or *&* commands (or just AT) to display a basic command list; online help.

A Manual Answer goes off hook in answer mode. Pressing any key aborts the operations.

A/ Re-executes the last issued command. Used mainly to redial. This does not require the AT prefix or a Carriage Return.

A> Re-executes the last issued command continuously, until the user intervenes or the command is executed forever. Does not require the AT prefix or a Carriage Return.

Any key Aborts off-hook dial/answer operation and hangs up.

AT Required command prefix, except with A/, +++, and A>. Use alone to test for OK result code.

B*n* **U.S./ITU-T answer sequence**

B0	*ITU-T answer sequence*
B1	U.S. answer tone

D*n* **Dials the specified phone number, includes the following:**

0-9	Numeric digits
#, *	Extended touch-tone pad tones
L	Dials the last dialed number
P	Pulse (rotary) dial
R	Originates call using answer (reverse) frequencies
S*n*	Dials the phone number string stored at position *n* (*n* = 0–3). Phone numbers are stored with the &Z*n*=s command
T	Tone dial

D*n* (Continued)

,	(Comma) Pause, see the definition of the S8 register to which it is linked
;	(Semicolon) Return to Command mode after dialing
“	(Quotation Marks) Dials the letters that follow (in an alphabetical phone number)
!	(Exclamation point) Flashes the switch hook
/	(Back Slash) Delays for 125 ms. before proceeding with dial string
W	Waits for second dial tone (X2 or X4); linked to S6 register
@	(At Symbol) Dials, waits for quiet answer, and continues (X3 or higher)
$	(Dollar Sign) Displays a list of Dial commands

E*n* **Sets local echo**

E0	Echo OFF
E1	*Modem displays keyboard commands*

F*n* **Sets online local echo of transmitted data ON/OFF**

F0	Local echo ON; modem sends a copy of data, it sends to the remote system to your screen
F1	*Local echo OFF; receiving system may send a remote echo of data it receives*

H*n* **Controls ON/OFF hook**

H0	Hangs up (goes on hook)
H1	Goes off hook

I*n* **Displays the following information:**

I0	Four-digit product code
I1	Results of ROM checksum
I2	Results of RAM checksum
I3	Product type
I4	Current modem settings
I5	Stored memory settings
I6	Link diagnostics
I7	Product configuration
I9	Plug and Play information
I11	Extended link diagnostics

M*n* **Operates speaker**

M0	Speaker always OFF
M1	*Speaker ON until CONNECT*
M2	Speaker always ON
M3	Speaker ON after dial, until CONNECT

O*n* **Returns online**

O0	Returns online
O1	Returns online and retrains

P **Sets pulse dial (for phone lines that do not support touch-tone dialing)**

Q*n* **Displays/suppresses result codes**

Q0	*Displays result codes*
Q1	Quiet mode; no result codes
Q2	Displays result codes only in Originate mode

S*r*.*b*=*n* **Sets bit .*b* of register *r* to *n* (0/OFF or 1/ON)**

S*r*=*n* **Sets register *r* to *n***

S*r*? **Displays contents of S-Register *r***

S$ **Displays a list of the S-Registers**

T **Sets tone dial**

V*n* **Displays verbal/numeric result codes**

V0	Numeric codes
V1	*Verbal codes*

X*n* **Sets result code displayed, default is X4**

(Note: Result codes 0 through 155 are for 33.6 products and V.90 products. Result codes above 155 apply only to V.90 products.)

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

*Requires @ in dial string; replaces NO CARRIER

X*n* (Continued)	X*n* Setting				
Result Codes	X0	X1	X2	X3	X4
91/CONNECT 21600		•	•	•	•
99/CONNECT 24000		•	•	•	•
103/CONNECT 26400		•	•	•	•
107/CONNECT 28800		•	•	•	•
151/CONNECT 31200		•	•	•	•
155/CONNECT 33600		•	•	•	•
256/CONNECT 28000		•	•	•	•
260/CONNECT 29333		•	•	•	•
264/CONNECT 30666		•	•	•	•
268/CONNECT 32000		•	•	•	•
180/CONNECT 33333		•	•	•	•
272/CONNECT 34666		•	•	•	•
276/CONNECT 36000		•	•	•	•
184/CONNECT 37333		•	•	•	•
280/CONNECT 38666		•	•	•	•
284/CONNECT 40000		•	•	•	•
188/CONNECT 41333		•	•	•	•

X*n* (Continued)	X*n* Setting				
Result Codes	X0	X1	X2	X3	X4
192/CONNECT 42666		•	•	•	•
196/CONNECT 44000		•	•	•	•
200/CONNECT 45333		•	•	•	•
204/CONNECT 46666		•	•	•	•
208/CONNECT 48000		•	•	•	•
212/CONNECT 49333		•	•	•	•
216/CONNECT 50666		•	•	•	•
220/CONNECT 52000		•	•	•	•
224/CONNECT 53333		•	•	•	•
228/CONNECT 54666		•	•	•	•
232/CONNECT 56000		•	•	•	•
Adaptive Dialing			•	•	•
Wait for 2nd Dial Tone (W)			•		•
Wait for Answer (@)				•	•
Fast Dial			•		•

Y*n* **Selects power-on/reset default configuration**

Y0	*Use profile 0 setting*
Y1	Use profile 1 setting
Y2	Use factory configuration 0
Y3	Use factory configuration 1
Y4	Use factory configuration 2

Z **Resets modem**

Z0	Resets modem to profile selected by Y command or dip 7
Z1	Resets modem to profile 0
Z2	Resets modem to profile 1
Z3	Resets modem to factory default profile 0 (&F0)
Z4	Resets modem to factory default profile 1 (&F1)
Z5	Resets modem to factory default profile 2 (&F2)

Extended Data Commands

&$ **Displays a list of ampersand (&) commands**

&A*n* **Enables/disables additional result code subsets, see X*n***

&A0	ARQ result codes disabled
&A1	ARQ result codes enabled
&A2	V.32 modulation indicator added
&A3	*Protocol indicators added¾ LAPM/MNP/NONE (error control) and V.42* bis*/MNP5 (data compression)*

&B*n* **Manages modem's serial port rate**

&B0	Variable, follows connection rate
&B1	*Fixed serial port rate*
&B2	*Fixed in ARQ mode, variable in non-ARQ mode*

&C*n* **Controls Carrier Detect (CD) signal**

&C0	CD override
&C1	*Normal CD operations*

&D*n* **Controls Data Terminal Ready (DTR) operations**

&D0	DTR override
&D1	DTR toggle causes online Command mode
&D2	*Normal DTR operations*
&D3	Resets on receipt of DTR

&F*n* **Loads a read-only (non-programmable) factory configuration**

&F0	Generic template
&F1	*Hardware flow control template*
&F2	Software flow control template

&G*n* **Sets Guard Tone**

&G0	*No guard tone, U.S. and Canada*
&G1	550 Hz guard tone, some European countries, requires B0 setting
&G2	1800 Hz guard tone, U.K., requires B0 setting

&H*n* **Sets Transmit Data (TD) flow control, see also &R*n***

&H0	Flow control disabled
&H1	*Hardware flow control, Clear to Send (CTS)*
&H2	Software flow control, Xon/Xoff
&H3	Hardware and software flow control

&I*n* **Sets Receive Data (RD) software flow control, see also &R*n***

&I0 *Software flow control disabled*
&I1 Xon/Xoff signals to your modem and remote system
&I2 Xon/Xoff signals to your modem only

&K*n* **Enables/disables data compression**

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

&M*n* **Sets Error Control (ARQ) for connections at 1200 bps and higher**

&M0 Normal mode, error control disabled
&M1 Reserved
&M2 Reserved
&M3 Reserved
&M4 *Normal/ARQ*
&M5 ARQ mode

&N*n* **Sets connect speed, if connection cannot be made at this speed, the modem will hang up. When used in conjunction with &U*n* and &U*n* is greater than 0, &N*n* sets the ceiling connect speed. &U*n* sets the floor connect speed. (See also the table in the &U*n* section.)**

Note: &N17 through &N39 apply only to V.90 products.

&N0 *Connection speed is determined by the remote modem*
&N1 300 bps
&N2 1200 bps
&N3 2400 bps
&N4 4800 bps
&N5 7200 bps
&N6 9600 bps
&N7 12,000 bps
&N8 14,400 bps
&N9 16,800 bps
&N10 19,200 bps
&N11 21,600 bps
&N12 24,000 bps

&N*n* (Continued)

&N13	26,400 bps
&N14	28,800 bps
&N15	31,200 bps
&N16	33,600 bps
&N17	28,000 bps
&N18	29,333 bps
&N19	30,666 bps
&N20	32,000 bps
&N21	33,333 bps
&N22	34,666 bps
&N23	36,000 bps
&N24	37,333 bps
&N25	38,666 bps
&N26	40,000 bps
&N27	41,333 bps
&N28	42,666 bps
&N29	44,000 bps
&N30	45,333 bps
&N31	46,666 bps
&N32	48,000 bps
&N33	49,333 bps
&N34	50,666 bps
&N35	52,000 bps
&N36	53,333 bps
&N37	54,666 bps
&N38	56,000 bps

&P*n* **Sets pulse (rotary) dial make/break ratio**

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

&R*n* **Sets Receive Data (RD) hardware flow control, Request to Send (RTS), see also &H*n***

&R0	Reserved
&R1	Modem ignores RTS
&R2	*Received Data to computer only on RTS*

&S*n* **Controls Data Set Ready (DSR) operations**

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

&T*n* **Begins test modes**

&T0	Ends testing
&T1	Analog Loopback
&T2	Reserved
&T3	Local Digital Loopback
&T4	Enables Remote Digital Loopback
&T5	*Prohibits Remote Digital Loopback*
&T6	Initiates Remote Digital Loopback
&T7	Remote Digital with self-test and error detector
&T8	Analog Loopback with self-test and error detector

&U*n* **When set above 0, the value chosen from the table sets the floor connect speed (the lowest acceptable connect speed). If a connection cannot be made at or above this speed, the modem will hang up. This command can also be used in conjunction with &N*n*.**

Note: &U17 through &U39 apply only to V.90 products.

	&N=0	**&N>0**
&U=0	Connects at best possible speed between your modem and the remote modem. Note: These factory default settings should be sufficient for most users.	Connects at a speed at or below &N*n*.
&U>0	Connects at any speed faster than the value &U*n*.	Connects at any speed between &N*n*. and &U*n*.

&U*n* (Continued)

&U0	*No restrictions on the minimum speed for the connection*
&U1	300 bps
&U2	1200 bps
&U3	2400 bps
&U4	4800 bps
&U5	7200 bps
&U6	9600 bps
&U7	12,000 bps
&U8	14,400 bps
&U9	16,800 bps
&U10	19,200 bps
&U11	21,600 bps
&U12	24,000 bps
&U13	26,400 bps
&U14	28,800 bps
&U15	31,200 bps
&U16	33,600 bps
&U17	28,000 bps
&U18	29,333 bps
&U19	30,666 bps
&U20	32,000 bps
&U21	33,333 bps
&U22	34,666 bps
&U23	36,000 bps
&U24	37,333 bps
&U25	38,666 bps
&U26	40,000 bps
&U27	41,333 bps
&U28	42,666 bps
&U29	44,000 bps
&U30	45,333 bps
&U31	46,666 bps
&U32	48,000 bps
&U33	49,333 bps
&U34	50,666 bps
&U35	52,000 bps
&U36	53,333 bps
&U37	54,666 bps
&U38	56,000 bps

&W*n* **Writes current configuration**

- &W0 Modifies the storage 0 template (Y0)
- &W1 Modifies the storage 1 template (Y1)

&Y*n* **Sets break handling**

- &Y0 Destructive, but does not send break
- *&Y1 Destructive, expedited*
- &Y2 Nondestructive, expedited
- &Y3 Nondestructive, unexpedited

&Z*n*=*s*Writes phone number string *s* at position *n* (*n* = 0–3)

&Z*n*=L Writes last executed dial string at position *n* (*n* = 0–3)

&Z*n*? Displays the phone number stored at position *n* (*n* = 0–3)

&ZL? Displays the last executed dial string

#CID=*n* **Controls Caller ID feature**

- *#CID=0 Caller ID disabled*
- #CID=1 Caller ID enabled with formatted information
- #CID=2 Caller ID enabled with unformatted information

+++ Escapes to online-command mode

S-Registers

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

Register	Default	Function
S0	0	Sets the number of rings on which to answer in Auto Answer Mode When set to 0, Auto Answer is disabled
S1	0	Counts and stores the number of rings from an incoming call S0 must be greater than 0
S2	43	Stores the ASCII decimal code for the escape code character Default character is + A value of 128 – 255 disables the escape code
S3	13	Stores the ASCII code for the Carriage Return character Valid range is 0 – 127
S4	10	Stores the ASCII decimal code for the Line Feed character Valid range is 0 – 127
S5	8	Stores the ASCII decimal code for the Backspace character A value of 128–255 disables the Backspace key's delete function
S6	2	Sets the number of seconds the modem waits before dialing If X*n* is set to X2 or X4, this is the time-out length if there is not a dial tone

Register	Default	Function
S7	60	Sets the number of seconds the modem waits for a carrier May be set for much longer duration if, for example, the modem is originating an international connection
S8	2	Sets the duration, in seconds, for the pause (,) option in the Dial command
S9	6	Sets the required duration, in tenths of a second, of the remote modem's carrier signal before recognition by the modem
S10	14	Sets the duration, in tenths of a second, that the modem waits to hang up after loss of carrier. This guard time allows the modem to distinguish between a line disturbance from a true disconnect (hang up) by the remote modem. Note: If you set S10 = 255, the modem will not hang up when carrier is lost Dropping DTR hangs up the modem
S11	70	Sets the duration and spacing, in milliseconds, for tone dialing
S12	50	Sets the duration, in fiftieths of a second, of the guard time for the escape code sequence (+++)
S13	0	Bit-mapped register Select the bit(s) you want on and set S13 to the total of the values in the Value column For example: ATS13 = 17 enables bit 0 (value is 1) and bit 4 (value is 16)

Bit	Value	Result
0	1	Reset when DTR drops
1	2	Reset non-MNP transmit buffer from 1.5K to 128 bytes*
2	4	Set backspace key to delete
3	8	On DTR signal, autodial the number stored at position 0
4	16	At power on/reset, autodial the number stored at position 0

Register	Default	Function

S13 (Continued)

Bit	Value	Result
5	32	Reserved
6	64	Disable quick retrains
7	128	Disconnect on escape code

*The 1.5K-byte non-ARQ buffer allows data transfer with Xmodem- and Ymodem- type file transfer protocols without using flow control

The 128-byte option lets remote users with slower modems keep data you are sending from scrolling off their screens

When remote users send your computer an Xoff (Ctrl-S) and you stop transmitting, the data in transit from your modem's buffer does not exceed the size of their screen

This is also very helpful in situations when a remote modem/printer application is losing characters

S14 0 Reserved

S15 0 Bit-mapped register setup

To set the register, see instructions for S13

Bit	Value	Result
0	1	Disable ARQ/MNP for V.22
1	2	Disable ARQ/MNP for V.22 bis
2	4	Disable ARQ/MNP V.32/V.32 bis

Register	Default	Function		
S15 (Continued)		**Bit**	**Value**	**Result**
		3	8	Disable MNP handshake
		4	16	Disable MNP level 4
		5	32	Disable MNP level 3
		6	64	MNP incompatibility
		7	128	Disable V.42 operation
		To disable V.42 detect phase, select the total of the values for bits 3 and 7. (S15=136{the sum of values 8 and 128})		
S16	0	Reserved		
S17	0	Reserved		
S18	0	Test timer for &T loopback testing Sets the time in seconds of testing before the modem automatically times out and terminates the test When set to 0, the timer is disabled Valid range is 1-255		
S19	0	Sets the duration, in minutes, for the inactivity timer The timer activates when there is no data activity on the phone line; at time-out the modem hangs up S19 = 0 disables the timer		
S20	0	Reserved		
S21	10	Sets the length, in 10-millisecond units, of breaks sent from the modem to the computer; applies to MNP or V.42 mode only		

Register	Default	Function
S22	17	Stores the ASCII decimal code for the Xon character
S23	19	Stores the ASCII decimal code for the Xoff character
S24	0	Reserved
S25	20	Sets the duration, in hundredths of a second, that DTR must be dropped so that the modem does not interpret a random glitch as a DTR loss Most users will want to use the default This register is useful for setting compatibility with older systems running under older operating software
S26	0	Reserved
S27	0	Bit-mapped register setup To set the register, see instructions for S13

Bit	Value	Result
0	1	Enables ITU-T V.21 modulation at 300 bps for overseas calls; in V.21 mode, the modem answers both overseas and domestic (U.S. and Canada) calls, but only originates V.21 calls Default is Bell 103
1	2	Enables unencoded (non-trellis coded) modulation in V.32 mode
2	4	Disables V.32 modulation
3	8	Disables 2100 Hz answer tone to allow two V.42 modems to connect faster
4	16	Enables V.23 fallback mode
5	32	Disables V.32 *bis* mode

Register	Default	Function		
S27 (Continued)		**Bit**	**Value**	**Result**
		6	64	Disable V.42 selective reject
		7	128	Software compatibility mode This setting disables the codes and displays the 9600 code instead The actual rate of the call can be viewed on the ATI6 screen Used for unusual software incompatibilities Some software may not accept 7200, 12,000, and 14,400 bps or greater result codes
S28	0	Eliminates the V.32 answer tones for a faster connection		
	8	Default item, all times are in tenths of seconds		
	255	Disables all connections except V.32 at 9600 bps		
S29	20	Sets the duration, in tenths of a second, of the V.21 answer mode fallback timer		
S30	0	Reserved		
S31	128	Reserved		
S32	2	Bit-mapped register setup To set the register, see the instructions for S13		
		Bit	**Value**	**Result**
		0	1	V.8 Call Indicate enabled
		1	2	Enables V.8 mode
		2	4	Reserved
		3	8	Disable V.34 modulation

Register	Default	Function		
S32 (Continued)		**Bit**	**Value**	**Result**
		4	16	Disable V.34+ modulation
		5	32	Disable 56K modulation
		6	64	Disable V.90 modulation.
		7	128	Reserved.
S33	0	Bit-mapped register setup To set the register, see the instructions for S13		
		Bit	**Value**	**Result**
		0	1	Disable 2400 symbol rate
		1	2	Disable 2743 symbol rate
		2	4	Disable 2800 symbol rate
		3	8	Disable 3000 symbol rate
		4	16	Disable 3200 symbol rate
		5	32	Disable 3429 symbol rate
		6	64	Reserved
		7	128	Disable shaping
S34	0	Bit-mapped register setup To set registers, see instructions for S13		
		Bit	**Value**	**Result**
		0	1	Disable 8S-2D trellis encoding
		1	2	Disable 16S-4D trellis encoding

Register	Default	Function		
S34 (Continued)		**Bit**	**Value**	**Result**
		2	4	Disable 32S-2D trellis encoding
		3	8	Disable 64S-4D trellis encoding
		4	16	Disable non-linear coding
		5	32	Disable TX level deviation
		6	64	Disable Pre-emphasis
		7	128	Disable Pre-coding
S35-S37		Reserved		
S38	0	Sets an optional delay, in seconds, before a forced hang-up and clearing of the Transmit buffer when DTR drops during an ARQ call. This allows time for a remote modem to acknowledge receipt of all transmitted data before it is disconnected. The modem immediately hangs up when DTR drops. This option only applies to connections terminated by dropping DTR. If the modem receives the ATH command, it ignores S38 and immediately hangs up.		
S39-S40		Reserved		
S41	0	Reserved		
S42	0	Reserved		

Fax Commands

+FCLASS=*n* **Sets the mode of operation**

FCLASS=0	*Data mode*
FCLASS=1	Group 3 Facsimile Service Class 1mode
FCLASS=2.0	Group 3 Facsimile Service Class 2.0 mode

FCLASS? **Displays the current FCLASS mode**
(see mode descriptions above)

+FCLASS=? **Displays the FCLASS mode options**
(see mode descriptions above)

+FTS=*n* **Stops the fax transmission**
Then the modem waits for a specified time before **OK** appears on screen. The pause is set in 10 millisecond intervals. *n* is the number of 10 millisecond intervals that pass before **OK** appears. (*n*=0-255)

+FRS=*n* **Makes the modem wait for a specified length of silence before sending OK to the screen**
The pause is set in10 millisecond intervals. *n* is the number of 10 millisecond intervals that pass before **OK** appears. (*n*=0-255)
Note: This command terminates with **OK** when either the specified amount of silence is detected or when the user types anything (which is ignored).

Fax Commands (Continued)

+FTM=*n* **Transmits data using the modulation specified by *n***
(*n* = 3, 24, 48, 72, 96, 97, 98, 121, 122, 145, or 146)
Note: See the "Screen Messages" table at the end of this section for an explanation of messages that appear in response to this command.

+FRM=*n* **Receives data using the modulation specified by *n***
(*n* = 3, 24, 48, 72, 96, 97, 98, 121, 122, 145, or 146)
Note: See the "Screen Messages" table at the end of this section for an explanation of messages that appear in response to this command.

+FTH=*n* **Transmits data framed in the HDLC protocol using the modulation specified by *n***
(*n* = 3, 24, 48, 72, 96, 97, 98, 121, 22, 145, or 146)
Note: See the "Screen Messages" table at the end of this section for an explanation of messages that appear in response to this command.

+FRH=*n* **Receives data framed in the HDLC protocol using the modulation specified by *n***
(*n* = 3, 24, 48, 72, 96, 97, 98, 121, 122, 145, or 146)
Note: See the "Screen Messages" table at the end of this section for an explanation of messages that appear in response to this command.

Screen Messages

Numeric Message	Text Message	Description
0	OK	The previous command has been processed successfully.
1	CONNECT	The modem has just connected to another modem.
2	RING	Reports the receipt of a network altering ring.
3	NO CARRIER	No carrier is being received from the modem.
4	ERROR	The previous command line has not been recognized or was completed abnormally.
5	NO DIAL TONE	(Optional) Dial tone was not received within the time-out period.
6	BUSY	(Optional) A busy signal was deleted.
64	CONNECT/FAX	(Optional) The modem has established a fax connection. This response is used only when the fax mode is selected.

The Serial Interface

The serial interface is a standard developed by the Electronic Industries Association (EIA). It defines the signals and voltages used when data is exchanged between a computer and a modem or serial printer.

The entire standard covers many more functions than are used in most data communications applications. Data is transmitted between the devices over a shielded serial cable with a 25-pin male (DB-25) connector to the modem and a 25-pin, 9-pin, 8-pin, or custom-built connector to the computer.

FCC regulations require the use of a shielded cable when connecting a modem to a computer to ensure minimal interference with radio and television.

Pin assignments are factory-set in the U.S. Robotics modem to match the standard DB-25 assignments in the following table. DB-9 connectors for IBM/AT-compatible computers should be wired at the computer end of the cable as shown in the DB-9 column.

Serial Interface Pin Definitions

DB-25	DB-9	Circuit	Function	Signal Source Computer/Modem
1	—	AA	Chassis Ground	Both
2	3	BA	Transmitted Data	Computer
3	2	BB	Received Data	Modem
4	7	CA	Request to Send	Computer
5	8	CB	Clear to Send	Modem
6	6	CC	Data Set Ready	Modem
7	5	AB	Signal Ground	Both
8	1	CF	Carrier Detect	Modem
12	—	SCF	Speed Indicate	Modem
20	4	CD	Data Terminal Ready	Computer
22	9	CE	Ring Indicate	Modem

SPECIAL NOTES - AUSTRALIAN USERS

Compliance Warning

Applications software shall be configured so that no more than 3 attempts are made to establish a connection to a given number. (**Note:** If the modem can detect service tones, up to ten attempts can be made.) There must be at least 2 seconds between call attempts. If the call sequence is unsuccessful, there shall be a delay of at least 30 minutes before attempting to call the number again.

Use of factory default settings will result in the modem being operated in a non-compliant manner. Failure to set the modem and any application software used with the modem, to the values mentioned in the command restrictions paragraph, will result in the modem being operated in a non-compliant manner. Consequently, there would be no permit in force for this equipment and the Telecommunications Act 1991 prescribes a penalty of $12,000 for the connection of non-permitted equipment.

Interconnecting Ports

Interconnection circuits should be such that the equipment continues to comply with the requirements of AS3260 1.2.8.5 for SELV circuits.

Command Restrictions

The modem commands shown below have their default values and range limits set to meet Austel approval requirements. These settings are different from the ones listed in the "Technical Quick Reference" section of the *User's Guide & Reference* found on our support Web page.

Command	Description	Default	Range
B	Bell/ITU-T	B0	B0 only
&G	Guard Tone	&G2	&G2 only
&P	Pulse Dial Ratio	&P0	&P0 only
S0	Auto Answer	3	0, 3-5
S6	Pre-Dial Pause	3	2-5
S7	Wait for Carrier	60	20-255
S8	Dial Pause	2	2-255
S11	Tone Dial Speed	85	70-255
S27	Bit-Mapped Register 1		0-255

Australian Safety Instructions

(Internal Modems Only)

- The modem card must only be used in data terminal equipment (DTE), e.g., computer, that has a screw down cover/lid. As unsafe voltages (TNV) exist on the modem card, disconnect the modem card from the telephone line while the cover (lid) of the DTE (computer) is removed.
- Installation of the modem card in a DTE (computer) which does not require a tool to open the cover (lid), will render the product approval permit void.
- During installation of the modem card, care must be taken. There should be at least 2mm of air gap between the modem card and other components within the DTE (computer) in which the modem card is installed.
- Please attach the label provided with the modem card to your DTE (computer). The label reads:

Disconnect the telephone line before opening the cover (lid) of the DTE (computer). Do not connect the customer equipment (modem) to the telephone line, while the cover (lid) of the DTE (computer) is open