InModem336™

Your Internal Communication Solution

- High Speed Data up to 33.6Kbps
- The solution to desktop clutter
- Built in error correction
- Nationwide Customer Support

When you choose a NetComm modem, you get a lot more than you expect. Not only do you get the latest technology from the leading Australian modem manufacturer, but packed in with your modem you'll find all the software you need to get up and running.

CLICK TO CONNECT TO THE 'NET
NET CONNECT
FOR THE LATEST UPDATES

Version B
April 1997

NetComm®

Contents

Legal & Regulatory Information

Copyright Information

Australian Customer Information

Austel (The Australian Telecommunications Authority) requires you to be aware of the following information and warnings:

Users may experience minor audio distortion when using this product. This distortion may be generated by the low bit rate for voice sampling when using either the headset or hands free operation.

Some of the modem default settings have been selected to comply with Austel technical specifications. If you intend to change any default settings you must comply with the following rules:

- ❏ The modem must not answer an incoming call less than two seconds after the first ring signal. As a "rule-of-thumb" your modem should be set so it answers incoming calls after the second ring (ATS0=2).
- ❏ If Busy signal detection is switched off, the modem must not attempt more than two automatic redials and must wait at least two seconds before redialling.
- ❏ If Busy signal detection is switched on, the modem must not attempt more than nine automatic redials and must wait at least two seconds before redialling.
- ❏ If, after redialling the maximum number of times, the modem is still unable to establish a connection you must wait 30 minutes before attempting to redial.
- ❏ The use of Bell standard 103 and 212A is not permitted in Australia. Use of these modes will cause your modem to lose its permit status.

Changing the default values of the modem, in such a way as to cause your modem to operate in a non-compliant manner when connected to a telecommunications network operated by a carrier, is contrary to the Telecommunications Act 1991 and may result in penalties of $12,000.

New Zealand Customer Information

New Zealand Telecom requires you to be aware of these important warnings:

This equipment may not necessarily provide for the effective hand-over of a call to or from a telephone connected to the same line.

The operation of this equipment on the same line as telephones or other equipment with audible warning devices or automatic ring detectors will give rise to bell tinkle or noise and may cause false tripping of the ring detector. Should such problems occur, the user is not to contact Telecom Faults Service.

The telephone associated with the authorised apparatus must be permitted for connection to the New Zealand public telephone network.

The transmit level from this device is set at a fixed level and because of this there may be circumstances where the device does not give its optimum performance. Before reporting such occurrences as faults, please check the line with a standard Telepermitted telephone, and do not report a fault unless the telephone performance is impaired.

If your modem ever suffers physical damage that causes its internal parts to become exposed, it should be disconnected from the phone line immediately. The modem must then be repaired before reconnection to the phone line is permissible.

Should it be necessary to physically move your modem, disconnect it from the phone line or earthing lead before disconnecting the power connection. When reconnecting your modem, reconnect the power or earthing lead before reconnecting it to the phone line.

Some parameters required for compliance with Telecom's PTC Specifications are dependent on the equipment connected to the RS 232 port. The connected equipment shall be set to operate within the following limits for compliance with Telecom Specifications:

1. Equipment connected to the RS 232 port shall be certified to meet the requirements of Reg. 18 of the New Zealand Wiring Regulations 1976.

2. When the user manually initiates a call, via equipment connected to the RS232 port, the equipment shall operate within the following restrictions:

   a. Not more than 5 call attempts shall be made to the same number within a one hour period.

   b. There shall be at least 60 seconds between call attempts.

   c. Not more than a total of 10 call attempts shall be made to the same number for any single manual call initiation.

   d. Automatic calls to different numbers shall be not less than 5 seconds apart.

FAILURE TO MEET THE ABOVE REQUIREMENTS MAY NEGATE THE USER RIGHTS UNDER THE TELECOM TERMS OF SERVICE.

When operating in V.22bis or V.22 mode over some older telephone exhanges, it may be necessary to issue the &G2 command.

Setting the S0 register (auto-answer) to S0 = 1 or to values greater than 5 will render this equipment non-compliant with the Telepermit requirements.

This equipment does not provide a guard tone with the V.22 and V.22bis answer modes. In some circumstances this could cause interference with the telephone network signalling systems, and could result in lost calls. Telecom will not accept responsibility should such problems occur. Such occurrences will be rare.

The preferred method is to use DTMF tones (ATDT...) as this is faster than pulse (decadic) dialling, and is available on most New Zealand telephone exchanges. Where DTMF is not available and decadic must be used, your communications software must be set up to record numbers according to the following translation table as the modem is not directly compatible with the New Zealand (10-N) Reverse dialling standard.

Number to be dialled	Number to program into computer
0	0
1	9
2	8
3	7
4	6
5	5
6	4
7	3
8	2
9	1

Note that where DTMF dialling is used, the numbers should be entered normally.

Installation for Windows 95™

If you are installing your InModem 336 in Windows 3.1x or DOS, refer to the Installation for Windows 3.1x or DOS section.

☞ Some computer companies will void the warranty on a computer if a customer installs another device into it. If you are unsure of this, please contact your dealer for assistance and information.

- Turn your computer off, and remove the cover from your computer. This will allow access to the ISA expansion slots where your InModem 336 may be installed.
- On your InModem 336 there are gold pins marked with A1, A2 and IRQ. If there are any small, plastic covers (Jumpers) over any of these pins, these must be removed. These pins should only be covered if you are using Windows 3.1x or DOS, and are not needed when using Windows 95™.
- Within your computer, choose a vacant ISA expansion slot and unscrew the metal backing panel so that the modem can be inserted. Keep the screw, as it will be used to secure the modem in position. If you do not have a free ISA expansion slot, you may have to remove a card that is already installed. Please refer to your modem or computer dealer for more information on this.
- Hold your InModem 336 by the edges and gently push it into the slot. Make sure it is fully inserted and resting correctly against the computer chasis. Use the screw to secure the modem in the computer.
- Replace the cover on your computer and power on your computer.
- Connect the supplied telephone cable between your modem and the telephone wall socket. If you do not use the supplied line cable, your modem's approval may be void.

☞ Do not connect your modem to a digital telephone line or digital PABX. Check with your telephone service provider to ensure that the line you wish to use is suitable for use with your InModem 336.

The InModem 336™ is Plug and Play Windows 95™ compatible and will configure automatically once Windows 95™ is started.

Installing modem drivers for Windows 95™

When using your InModem 336 with Windows 95™, you need to install a modem driver. When Windows 95™ loads, the InModem 336 will be detected and the following screen will appear:

1. Choose the "Driver from disk provided by hardware manufacturer" option and click on the OK button.
2. Insert the NetComm® CD ROM† into your CD ROM drive and specify the appropriate drive. Your modem driver files will be installed automatically and you are now ready to install your software and use your modem.

☞ The NetComm® CD ROM also contains a Scripts Pack which includes drivers for games and 3rd party communications programs. Frequently Asked Questions (FAQs) and support information can also be found on the CD ROM.

Installation for Windows™ 3.1x or DOS™

Before you install your NetComm® InModem 336™, you must identify the number of COM (serial) ports your computer has.

To configure a COM port, refer to your computer's manual or run MSD to check how many COM ports exist in your computer. MSD is the Microsoft Diagnostics tool provided with DOS and Windows 3.11. It allows you to identify the hardware configurations that exist on your machine. Refer to your DOS or Windows 3.11 manual for assistance with this program. Once you have identified the number of COM ports your computer has, you can begin to install your InModem 336. You may:

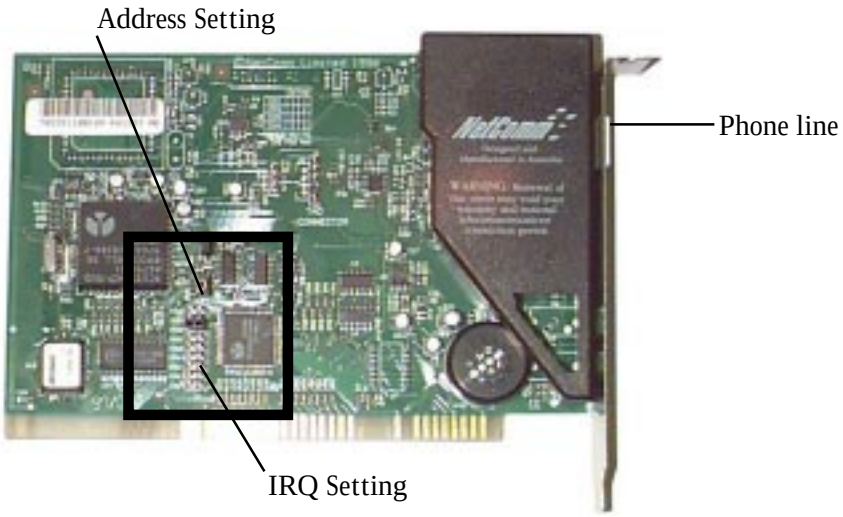
- Configure your modem to a COM port that is not already installed in your machine, or

- Choose to replace an existing COM port. This means that you will have to disable one of the com ports that is currently configured in you computer - please refer to your computer manual or contact your computer dealer for this

  Jumper configuration option:

COM PORT SETUP			MODEM JUMPERS	
PORT	ADD	**IRQ**	**A1**	**A2**
COM1	03F8	4	1	1
COM2	02F8	3	1	2
COM3	03E8	4	2	1
COM3	03E8	5	2	1
COM4	02E8	3	2	2
COM4	02E8	5	2	2

When you have chosen the COM port that you wish to configure your InModem 336 to, change the jumpers on the modem for the appropriate COM port.



Configuring a COM Port

You are now ready to install your InModem 336:

- Switch your computer OFF and remove the cover from your computer to access the slots.
- Select a vacant expansion slot.
- Hold your modem by the edges and gently push it into the slot. Press lightly until it is fully inserted.
- Use the retaining screw to secure the modem.
- Connect the telephone cable to the modem.
- Replace your computer cover and switch on your computer.
- Now install your Communications software (refer to the Read Me First).

☞ Do not connect your modem to a digital telephone line or PABX. Check with your telephone service provider to ensure that the line that you wish to use is suitable for your InModem 336.

Distinctive Ring

The NetComm InModem 336 is able to discriminate between three different types of rings. This is useful if you purchase the Telstra Duet service. With Telstra® Duet™, two phone numbers are shared for one telephone line. One is for voice and the second is for your modem. To enable the modem to answer only when your modem number is dialled, issue the command: AT-SDR=4 S0=2 (This can be saved with AT&W). For most users, AT-SDR=4 will be suitable.

☞ Do not set Auto Answer for less than two rings when Distinctive Ring is enabled.

Distinctive Ring Commands

AT-SDR=n,x where n=0 to 7, default=0, x=0 Disable Distinctive Ring response suffix; x=1 Enable Distinctive Ring response suffix (default)

AT-SDR=0 Any ring detected and reported as "RING"

AT-SDR=1,1 Single ring detected and reported as "RING1"

AT-SDR=1,0 Single ring detected and reported as "RING"

AT-SDR=2,1 Double ring detected and reported as "RING2"

AT-SDR=2,0 Double ring detected and reported as "RING"

AT-SDR=3,1 Single and double ring detected and reported as "RING1" or "RING2"

AT-SDR=3,0 Single and double ring detected and reported as "RING"

AT-SDR=4,1 Triple ring detected and reported as "RING3"

AT-SDR=4,0 Triple ring detected and reported as "RING"

AT-SDR=5,1 Single and triple ring detected and reported as "RING1" or "RING3"

AT-SDR=5,0 Single and triple ring detected and reported as "RING"

AT-SDR=6,1 Double and triple ring detected and reported as "RING2" or "RING3"

AT-SDR=6,0 Double and triple ring detected and reported as "RING"

AT-SDR=7 Any ring detected and reported as "RING1" or "RING2" or "RING3"

☞ Use AT-SDR=4 for Telstra's Duet service. Do not set Auto Answer below 2 when Distinctive Ring is enabled.

The AT Commands

The AT commands are a group of special commands recognised by your modem. These commands derive their name from the letters AT, which are used to prefix commands. Before continuing:

- Run your communications software and enter local mode (or terminal mode) at 38400 bps.

The Attention Code

An AT (sometimes known as the ATtention code) usually precedes all commands being sent to the modem. It is used to gain the modem's attention, informing it that you are about to send a command. For example:

- Type the command: ATI9 <E>

  Your modem's firmware identity message will appear on your computer screen. If you type I9 only, your modem will not respond. If you type ATI9, your modem will report an ERROR.

You may enter the attention code in all upper case, or all lower case letters, such as: AT *or* at

Multiple Commands

You may place multiple modem commands after an AT provided the total number of characters does not exceed 40. For example, a valid command to display the modem's firmware identity twice is:

- Type in the command: ATI9I9 <E>

  An AT is not required in front of the second I9 command. You only need one attention code for each command line. To make this command more readable, you can add spaces between the two commands:

- Type in the command: AT I9 I9 <E>

  The modem will execute the command as if the spaces are not there.

The Repeat Command

The Repeat command is used to re-execute the last command issued to the modem. Issue the ATI9 command and the modem's firmware identity code is displayed on the screen.

- Type: A/

  The identity code appears again.

You don't have to type AT before the Repeat command. You also do not have to press the ENTER key. This is one of the few modem commands which do not require you to type AT before it, or to press the ENTER key after it. The A/ command is intended primarily for re-dialling a telephone number that was previously engaged.

Response Codes

Your modem is capable of telling you, with on screen messages, what it is doing. These messages are known response codes or result codes, and you will see them from time to time.

For example:

After a command is successfully executed, the response is: OK

After a connection is established, the response is: CONNECT

Dialling

The AT commands may be used to initiate dialling with the modem. Your modem does not require a telephone handset to be connected to it in order to dial.

The D (Dial) command is used to initiate a telephone call. The most basic form of the D command is:

ATD number

where the number is the telephone number you are dialling.

Having set your communications software for 38400 bps operation:

- Type: ATD01234 <E>

  Your modem dials the number '01234'. You may substitute this number for the the number of an information service or bulletin board.

+ If your modem receives a character from your computer while dialling is being performed, it immediately hangs up, sends a NO CARRIER response message to the computer and returns to local command state.

After a few seconds the message CONNECT appears on the screen.

If a NO CARRIER message appears, your modem has not been able to make a connection. Check your communications software is set for 38400 bps operation and your modem is correctly connected to your computer and the telephone line. You may use the A/ command to redial.

To hang up the modem, type an escape sequence (+++). The modem responds with an OK message.

- Type: ATH <E>

  The modem hangs up.

Dial Modifiers

Dial modifiers are characters that can be included in a phone number to make the modem perform special tasks while dialling.

For example, not all modems are connected to a dedicated telephone line. Some users have their modems connected to PABXs. To allow users of PABXs to operate their modems successfully, dial modifiers are supported on the modem.

Most PABXs require you to dial 0 or 9 (in order to obtain an outside line) and wait for a dial tone before dialling the actual phone number.

Using dial modifiers, you can successfully dial the phone number 12345 through a PABX using the command:

ATD0,12345

The , (comma) dial modifier causes the modem to pause for a short time after

dialling 0. This allows most PABXs sufficient time to obtain a line before dialling.

The factory default delay for the , modifier is two seconds. You may change the length of this delay if necessary. Its length is determined by the value in S Register 8.

Another method of making the modem wait for a dial tone is to include the W dial modifier. The W modifier causes the modem to examine the phone line to ensure a dial tone has been applied before dialling starts:

ATD0W12345

If the modem does not detect a dial tone within the time specified by S Register 7, the modem returns to local command state and sends a NO DIALTONE message to the computer (if either the X2 or X4 commands have been issued).

Due to differences with some older telephone exchanges, dial tone detection may not be possible with your modem. Your modem will only recognise dial tones between 200 Hz and 600 Hz.

If your telephone line supports tone dialling then a useful dial modifier is the T modifier. Inserting a T modifier before the number you are dialling causes the modem to tone dial that number. For example:

ATDT12345

This causes the modem to dial the phone number 12345.

The modem also supports a P dial modifier which allows it to pulse dial. These modifiers may be placed at any point in the number you are dialling and they may be intermingled in the same number.

For example, your telephone line may be connected to a PABX that supports tone dialling internally, but only pulse dialling externally. You could overcome this problem by using the T and P dial modifiers in the following way:

ATDT0,P12345

The modem tone dials 0 to request an external line, waits for the PABX to obtain the line and then pulse dials 12345.

Although most telephone exchanges support tone dialling, there are still a few pulse only exchanges. If you can hear a continuous dial tone when you lift the handset, you will probably be able to tone dial. If you are in any doubt, use pulse dialling. The modem will automatically pulse dial if you have not previously included either the T or P modifiers in your phone numbers. Exchanges that support tone dialling generally support pulse dialling as well.

More information about dial modifiers can be found in the Commands Section of this guide.

☞ Pulse dialling may not be supported in New Zealand.

Hanging Up

The H command is used to hang up the modem. After you have finished communicating with another computer you must hang up your modem. Similarly, you must hang up the phone after calling another person. If you don't, no one will be able to call you and you may even be charged for the length of time the phone was off the hook.

To hang up your modem:

- Type: ATH <E>

  The modem will return an OK response message.

Stored Number Dialling

Your modem has the ability to store phone numbers which may be dialled at a later time. This is similar to 'abbreviated dialling', which may be supported by your telephone.

To store a phone number use the &Z command. For example:

- Type: AT&Z1=012345 <E>

  The phone number 012345 will be stored as phone number one.

The S dial modifier is used to dial a phone number that has been stored in your modem:

- Type: ATDS=1 <E>

  The modem will dial stored phone number one.

☞ Do not include an AT, D command, or S dial modifier in the stored phone number.

Answering Calls

As well as dialling other modems, your modem can answer calls made to it by other modems.

S Register 0 contains the number of rings the modem will wait before answering a call. If a value of 4 is placed in S Register 0, the modem will answer an incoming call immediately after the fourth ring. If a 0 value is placed in S Register 0, the modem will *not* answer an incoming call.

If the phone does ring, and verbal response codes are selected (ATV1), the modem will issue RING messages until the number of rings stored in S Register 0 is reached. The modem will then go on line, transmit an answer tone, and attempt to connect to the calling modem.

As soon as a connection is established, the modem will send a CONNECT message to your computer and enter on-line state in answer mode.

Selecting Speeds

The following section describes how to select line and terminal speeds for your modem.

Terminal Speeds

Your modem has the ability to communicate with your computer at various speeds. The modem offers two speed modes: variable speed mode and constant speed mode.

Constant speed mode forces your modem to maintain the terminal speed that was selected when you dialled another modem, even if the connection speed made with the other modem does not match the terminal speed of your modem and computer.

For example, if your modem connected to another modem at 33600 bps and its terminal speed is 38400 bps, the modem will maintain its terminal speed at 38400 bps. Because of this, you must select flow control between the modem and your computer. To select constant speed mode:

- Type: AT\N0 <E>

For more details on constant speed mode and flow controls, see the \N, +MS and &K commands.

☞ Some computers cannot cope with receiving data at speeds above 19200 bps. If you wish to run at high speeds, you should install a COM port that has a 16550 chip in place of your regular COM port. The 16550 chip allows your computer to accept data at very high speeds.

Variable speed mode allows your modem to automatically adjust its terminal speed to match the line speed. For example, if your modem connected to another modem at 19200 bps and its terminal speed is 38400 bps, the modem will automatically change its terminal speed to 19200 bps (and, thus, you or your software would have to change the speed of your computer to 19200 bps).

To select variable speed mode:

- Type: AT\N1 <E>

For more details about the variable speed mode, see the \N command.

Flow Control

Your modem supports RTS/CTS and XON/XOFF flow control. Flow control ensures that data is not *lost* between your computer and your modem.

Flow control is only available when the modem is configured for constant speed mode (AT\N0), reliable mode (AT\N2) or auto-reliable modes (AT\N3). Flow control is ignored when your modem is configured for variable speed mode (AT\N1) or is in local command state.

RTS/CTS Flow Control

RTS/CTS flow control takes place when the modem and computer manipulate the CTS (Clear To Send) and RTS (Request To Send) signals to stop and start data flow. This form of flow control is recommended if supported by your computer and communications software, as it does not interfere with file transfer protocols.

☞ In order for flow control to operate correctly between your computer and the modem, the appropriate form of flow control must be selected with your communications software. See your communications software manual for details. You must also have a modem cable that connects the RTS and CTS signals of your modem to your computer.

RTS/CTS flow control is selected with the &K3 command.

XON/XOFF Flow Control

XON/XOFF flow control takes place when the modem and communications software transmit XON and XOFF characters to start and stop data flow. This form of flow control is only recommended when your computer or communications software does not support RTS/CTS flow control. The ASCII values of the XON/XOFF characters are 17 (DC1) and 19 (DC3) respectively.

XON/XOFF flow control is selected with the &K4 command.

☞ XON/XOFF flow control should not be used with the XModem, YModem or SEAlink file transfer protocols.

Configuring the Modem

Your modem allows you to tailor its operating parameters to suit your own particular requirements. The modem uses S Registers to alter the configuration profile. Each S Register contains a decimal value to represent a time delay, an ASCII character or the number of times the phone should ring before the modem answers it (the interpretation of each value differs with each S Register).

The modem allows you to save the contents of the S Registers and certain communication settings in non-volatile memory (&W). This means the entire configuration profile will be retained after you have switched your modem off.

The modem also has factory default settings stored internally, allowing you to change the communication settings and S Register values and then recall the configuration profile stored in your modem when you originally purchased it.

The factory defaults have been selected so most users will be able to make immediate use of their modem, without the need to change any S Register values.

You may restore your modem to its factory defaults at any time:

- Type: AT&F&W <E>

Viewing the Current Configuration

The &V and \S commands allow you to view the current configuration of your modem. When you issue the &V or \S command, your modem sends a list of the current AT command and S Register settings to your computer.

☞ Not all commands and S Registers are displayed when you issue the &V command. It is intended to be compatible with Hayes modems. Use the \S command to list all the commands and S Registers in your modem.

MNP10EC

Your NetComm InModem 336™ supports MNP10EC, which is an extension to MNP10 providing Enhanced Cellular capability. MNP10EC is designed specifically to be used with the cellular/mobile telephone network. MNP10EC has superior handling on cellular links to combat line impairments not encountered on standard telephone lines.

When using the NetComm InModem 336™ with MNP10EC and a mobile telephone, it is recommended that, for optimum performance, the remote modem must also be MNP10EC compatible. If the remote modem is not MNP10EC compatible, but supports MNP10, MNP10 will be used. However, a small degradation in performance may occur.

Automatic Enabling MNP10EC

MNP10EC can be automatically enabled only with supporting V.34 modems. MNP10EC will be automatically enabled at each end of the line if a V.34 MNP10EC modem (MNP10EC enabled) calls a V.34 MNP10EC modem (MNP10EC disabled).

The NetComm InModem 336™ is capable of automatic enabling. With V.32bis modems there is no automatic enabling of MNP10EC. If you are originating/answering a data call from or to an MNP10EC modem connected to a mobile telephone, ensure that MNP10EC is enabled on your modem. For cables to connect your mobile telephone to your modem, please check with your mobile telephone dealer

AT Commands for MNP10EC (only one command is required for setup).

AT-SEC=i,x
where i=0 (MNP10EC disabled) or 1 (MNP10EC enabled), default=0.

Where x is the transmitted power in -dBm from 10 to 30, default =10 and is suitable for the majority of connections

Suggested Modem Configuration for MNP10EC link:

Base phone: AT&F-SEC=1,18
Cellular phone: AT&F-SEC=1

It is recommended that for fax transmissions over a mobile phone the modem be configured to operate at 9600bps or 7200bps.

Which Error Correction Do I Use?

Your modem supports the following combinations of error correction and data compression.

With such a choice, you may be wondering which combination you should be using. The table below shows the relative performance of each combination of error connection and data compression.

If you are connecting to various makes and models of modems, V.42/V.42bis auto-reliable mode is probably the best alternative (default). V.42/V.42bis auto-reliable mode will also connect to another modem that supports MNP with V.42bis data compression. For overseas or cellular connections, use MNP 10 or MNP10EC if possible.

Increasing Data Throughput with Error Correction & Data Compression

Data throughput refers to the amount of data being transferred. Error correction and data compression allow you to increase data throughput in comparison to if error correction and data compression were not selected.

To allow error correction and data compression to operate with the highest possible throughput, the terminal speed of your modem (the speed it communicates with your computer) must be higher than the line speed (the speed it communicates with the remote modem).

The best way to operate with error correction and data compression is to set your communications software speed to 38,400 bps, 38,400 bps, 57600 bps or higher with flow control. RTS/CTS flow control is the preferred form of flow control. Your communications software must also be set to use the same type of flow control. By default the modem is configured with error correction, data compression and RTS/CTS flow control enabled.

☞ For communications above 19,200 bps, a 16550 serial card is required.

Error Correction

This section examines the error correction and data compression features of your modem. The modem offers both V.42 (LAP-M) and MNP® (Microcom Networking Protocol™) error correction protocols. These protocols allow data errors to be detected by the receiving modem, provide flow control between remote systems and improve the overall throughput of data transfers.

Your modem also supports V.42bis and MNP 5 data compression. V.42bis is a high performance data compression enabling you to speed up, theoretically by four times, data throughput on some types of data. MNP5 allows you to speed up data throughput by up to two times on some types of data.

☞ Australian Modems: Before dialling into some AUSTPAC V.22 or V.22bis services, error correction *must* be disabled using the \N0 command.

Error Correction Protocols

Two types of error correction protocols are offered by your modem; V.42 (or LAP-M) and MNP.

☞ Error correction protocols are not available when a V.23 connection is established.

V.42 is an international standard for error correction between modems. V.42 ensures any errors introduced into your data by telephone line noise is automatically corrected before it is received by your computer. Because V.42 is a ITU-T standard, it has become very popular in modems all over the world. V.42 also supports a fallback mode to MNP, in order to remain compatible with modems introduced prior to V.42.

Before V.42 existed, MNP was the de-facto standard for modem error correction. MNP classes 2-4 are supported by your modem for error-correction (an additional class of MNP is supported for data compression). Because MNP is a far less complex error correction protocol than V.42, it out-performs V.42. The section titled “Which Error Correction Do I Use?” provides more information about the performance and compatibility merits of V.42 and MNP.

The \N command is used to select the type of error correction used by your modem.

Data Compression

Two forms of data compression are supported by your modem; V.42bis and MNP 5.

V.42bis is based on the Lempel-Ziv compression technique (similar to the techniques used by PC compression programs) and can work with both V.42 and MNP. V.42bis is very good at compressing data that has repetitions of sequences of characters. For example, in an English sentence there are usually repetitions of 'ions' or 'ings' or 'ere'; V.42bis works by creating a library of these repetitions and substituting small symbols for them. V.42bis is also able to switch off data compression if the type of data being sent is unsuitable for compression.

MNP 5 is MNP's stable-mate; it uses 'run length encoding' and a variation of the Huffman compression technique. It can double your data throughput on some types of data and MNP 5 works best when there are lots of characters repeated in sequence or a particular character repeated. For example, if you have a file which contained 50 zero characters in sequence MNP 5 will do a good job of compressing them (in some instances, better than V.42bis) – this is run length encoding. Or, if you had a text file where every second character was an 'i' and the other characters were random, MNP 5 would again out-perform V.42bis (in this instance, Huffman coding provides superior compression). However, MNP 5 does not employ V.42bis' automatic switching techniques.

If the data you are sending is not suitable for compression (for example, an application file or a graphics file), it can actually take longer to send than if data compression was not being used.

For this reason, it is best to use V.42bis whenever possible. If the modem you connect to does not support V.42bis, it is best not to use MNP 5 unless you are only transferring plain text information. If possible, use one of the many popular data compression programs available for computers to compress applications, graphics and other non-text files.

The %C command is used to select the type of data correction used by your modem.

Reliable Mode

Reliable mode allows the modem to use error correction to connect to another modem. If the modem you attempt to connect to does not support a compatible method of error correction, your modem will hang up and return a NO CARRIER message.

Use \N2 to select V.42/MNP reliable mode, \N4 to select V.42-only reliable mode or \N5 to select MNP-only reliable mode.

Auto-Reliable Mode

Auto-reliable mode allows your modem to use V.42 or MNP if the remote modem also supports these. If the remote modem does not support a compatible type of error correction, your modem will fallback to constant speed mode.

\N3 selects V.42/MNP auto-reliable mode.

Special Connect Messages

Your modem supports special CONNECT messages for connections made with either reliable or auto-reliable modes. When the modem connects in either reliable or auto-reliable mode, one of the following messages will be sent to your computer.

NUMERIC	VERBAL	DESCRIPTION
01	CONNECT	300bps connection with error correction
05	CONNECT 1200	1200 bps connection with error correction
10	CONNECT 2400	2400 bps connection with error correction
11	CONNECT 4800	4800 bps connection with error correction
12	CONNECT 9600	9600 bps connection with error correction
13	CONNECT 7200	7200 bps connection with error correction
14	CONNECT 12000	12000 bps connection with error correction
15	CONNECT 14400	14400 bps connection with error correction
59	CONNECT 16800	16800 bps connection with error correction
16	CONNECT 19200	19200 bps connection with error correction
61	CONNECT 21600	21600 bps connection with error correction
62	CONNECT 24000	24000 bps connection with error correction
63	CONNECT 26400	26400 bps connection with error correction
64	CONNECT 28800	28800 bps connection with error correction
91	CONNECT 31200	31200 bps connection with error correction
84	CONNECT 33600	33600 bps connection with error correction

By default, your modem generates standard CONNECT messages for both normal and error-corrected connections. If the X0 command has been issued, the CONNECT will be the only 'error correction' response code generated, regardless of the connection speed.

Other connect message may also be generated by your modem. Refer to the description of S Register 95 for details.

Improving Performance with MNP 10

MNP 10 is neither an error correction or data compression technique. MNP 10 works in conjunction with error correction and data compression to improve the performance of your modem when operating with poor or varying quality telephone lines (as sometimes found with overseas or cellular telephone connections).

With MNP 10 operating, your modem can automatically resize the MNP packets, depending upon the line quality. When an MNP connection is established, data is transferred in small 'chunks' known as packets. When the line quality drops, MNP 10 reduces the size of packets being transferred in order to maintain data throughput. MNP 10 will increase the packet size to take advantage of improved line quality.

If the line quality becomes very good or very bad, MNP 10 can automatically step between line speeds. MNP 10 attempts to use the highest speed applicable to the quality of the telephone connection. If the telephone line quality drops while you are connected to another MNP 10 modem, thus introducing errors into your data, and the smallest packet size is being used, the modems will 'step-down' in speed until the error rate become acceptable. Similarly, if the line quality improves and the modems are using the largest packet sizes, the modems will 'step-up' in speed until the best compromise of error rate and line speed is found.

MNP 10 will also make multiple attempts at establishing an error-corrected connection to another modem (more so than MNP 2-4). This gives you a better chance of making a connection when operating with poor line quality. If the telephone line drops out, MNP 10 will attempt to reconnect up to the maximum time permitted by your country's telecommunications rules. Thus, if there is a short line drop-out, MNP 10 will provide minimal interruption whereas other modems will disconnect entirely.

MNP is the only type of error correction allowed with MNP 10 and is only available when connected to another modem that supports MNP 10.

The J and K dial modifiers, and the -K command may be used to select MNP 10 operation.

Speed Changes

Although MNP 10 is able to cope with bad telephone connections, your modem must be able to first make a connection with another modem before it can make use of MNP 10. For this reason you may wish to use the AT*H1 command to force your modem to connect at 1200 bps and then 'upshift'. Most telephone lines will cope with V.32 or V.32bis connections, however connecting at 1200 bps will ensure you make a connection.

When MNP 10 changes line speed (either up or down) there will be a slight interruption to your communications. For this reason you should always use flow control to ensure data is not lost when MNP 10 changes line speed.

Modem AT Commands

Your modem has a number of specific commands that control and enhance its operation. To access and change these commands open a local terminal connection with your modem using your preferred communications software, such as Cooee, and type the letters AT followed by the specific command and press <Enter>. The AT commands are case insensitive and may be entered in either lower or capital letters.

Within Cooee, open the 'Data Folder' and double-click the 'Local Service' icon. This will open a terminal session and allow AT commands to be sent to the modem.

Example: AT&V<ENTER>

Will view the active and stored profiles of the modem.

■ indicates the default settings

+++ Escape Sequence

When the modem is in the on-line state (that is, your modem is communicating with a remote modem), issuing an escape sequence will force it to return to on-line command state (that is, your modem is communicating with your computer), without disconnecting.

Unlike the other commands, you should not type AT before the escape sequence, nor type a carriage return after it. Instead, wait a full second before you type the escape sequence and then a full second after typing it. As soon as the modem returns to local command state, it will respond with the message: OK

This waiting period before and after the escape sequence is called the Escape Sequence Guard Time. This allows the modem to distinguish the escape sequence from the normal flow of information between modems.

You can change the *character* used for the escape sequence by changing the value of S Register 2.

You can change the *length* of the escape sequence guard time by changing the value of S Register 12.

Options

+++ Return to local command state

See Also

S Register 2 Escape Sequence Character
S Register 12 Escape Sequence Guard Time A/ Repeat Last Command

A/ Repeat Last Command

This command orders the modem to re-execute the last command you entered.

Unlike other commands, the Repeat Last Command should not be preceded by an AT, nor followed by a carriage return.

This command must be typed on one line by itself.

Options

A/ Repeat last command

AT= Set S Register Value

This command allows you to set the value of the last S Register selected using the ATSn command.

The command is in the form:

AT=n

where n is the value to be placed in the S Register.

Until another S register is selected, the value of the last selected S Register can be read with the AT? or ATSn? command and changed with the AT= or ATSn= commands.

If a value is not specified in the AT= command, the selected S Register is set with a value of 0 (zero).

Examples

- Type: ATS0=4 <E> Sets S Register 0 with a value of 4
- Type: AT=2 <E> Sets S Register 0 with a value of 2

See Also

Sn? command Display S Register Value
? command Display S Register Value
Sn command Select an S Register
Sn= command Set S Register Value

Default

0

AT? Display S Register Value

This command allows you to display the value of the last S Register selected using the ATSn command.

The command is in the form:

AT?

Until another S Register is selected, the value of the last selected S Register can be read with the AT? command and changed with the AT= or ATSn= commands.

Options

AT? Display value of last selected S Register

Examples

- Type: ATS0=5 <E> Sets S Register 0 with a value of 5
- Type: AT? <E> Displays the value of S Register 0

See Also

Sn? command Display S Register Value
= command Set S Register Value
Sn command Select an S Register
Sn= command Set S Register Value

ATA Answer

This command allows you to manually answer an incoming call.

When an incoming call is received, the modem will send a RING response code to your computer. When you see the ring message:

- Type: ATA <E>

  or

- Wait for the modem to automatically answer on the number of rings set by S Register 0

Your modem will then attempt to connect to the calling modem. The F command selects which communication standard your modem will use to connect to the remote modem.

If a connection cannot be established with the calling modem within the time period specified in S Register 7, your modem will hang up and send a NO CARRIER message to your computer.

Examples

ATA Answer an incoming call

See Also

F command Select Communication Standard
S Register 0 Rings Before Answer
S Register 7 Wait Time for Carrier

ATBn Low-Speed Communications

This command selects whether Bell or ITU-T standards will be used for 300 bps and 1200 bps communications.

The communications standards are:

B0	ITU-T V.21 at 300 bps ITU-T V.22 at 1200 bps
B1	Bell 103 at 300 bps Bell 212A at 1200 bps

Options

ATB0 Select ITU-T communications
ATB1 Select Bell communications

☞ Check your command card for factory defaults and shipping defaults.

See Also

A command Answer
D command Dial
F command Select Communications Standard
S Register 7 Wait for Carrier

ATD Dial

This command allows you to dial a telephone number. The basic dialling command is:

ATD followed by the telephone number.

For example:

To dial the number (01) 234-5678

- Type: ATD012345678 <E>

You may use hyphens, spaces or parentheses. They will be ignored by the modem, but they will make it easier to read the command line.

For example:

- Type: ATD (01) 234-5678 <E>

☞ D command must be the final command on a command line, unless you use the ; (semi-colon) dial modifier. (The ; must follow immediately after the last digit of the number).

Dial modifiers may be included in the dial command.

Examples

ATD12345 Dial number 12345
ATD(1)2-345 Dial number 12345

Dial Modifiers

Dial modifiers enable you to change the characteristics of dialling. (Definitions for all modifiers appear on the following pages.)

Modifier	Meaning
,	Pause
;	Return to local command state
@	Wait for quiet answer
!	Hook flash
^	Disable calling tones
J	Perform an MNP10 connection
K	Enable power level adjustment during MNP10 connections
L	Redial last phone number
P	Use pulse dialling
S=n	Dial stored phone number n
T	Use tone dialling
W	Wait for dial tone

, pause

This modifier orders the modem to pause before dialling the rest of the phone number. This is useful when using a PABX and you need to dial a number to connect to an outside line.

For example: If you must dial 0 to connect to an outside line before dialling (01) 234-5678

- Type: ATD0,012345678 <E>

The length of the pause is determined by the value in S Register 8.

P or T use Pulse or Tone dialling

Your modem can use either pulse (decadic) or tone (DTMF) dialling. The P dial modifier orders the modem to use pulse dialling. The T dial modifier orders the modem to use tone dialling.

If you are not sure which dialling is used by your phone, lift up the handset and listen. If you hear a continuous dial tone, you probably can use tone dialling. Normally, only older telephone exchanges do not support tone dialling.

If you are still in doubt, use pulse dialling. Most exchanges supporting tone dialling also support pulse dialling, although the reverse is not always true.

Contact the supplier of your telephone line if you wish to have tone dialling accessible on your line.

! Hook flash

The ! dial modifier issues a hook flash signal — the modem hangs up for a short period.

Hook flashes are commonly used with PABXs to transfer calls.

For example:

To dial 0, hook flash and then dial 12345:

- Type: ATD0!12345 <E>

; return to local command state

This modifier orders the modem to return to local command state — without disconnecting — after it has dialled the number.

You may use this modifier to communicate with mainframe computers which require a security code to be dialled. Your modem dials the number of the mainframe computer and then immediately returns to local command state. Another ATD command can then be used to generate the tones required for the security code.

The ; used in conjunction with the M2 command, allows you to return to local command state with the speaker turned on, allowing you to monitor the progress of the call at the remote modem.

The ; must be the last character in the dial string. For example:

- Type: ATD1234567;

L re-dial last phone number

This modifier instructs the modem to re-dial the valid phone number. The L must be immediately after the D. Any characters following the L will be ignored.

For example:

- Type: ATD765432 <E>

  The phone number 765432 will be dialled.

- Type: ATDL <E>

  The phone number 765432 will be re-dialled.

- Type: ATDL1234567 <E>

  The phone number 765432 will be re-dialled. The number 1234567 will be ignored.

@ wait for quiet answer

The @ modifier orders the modem to wait for one or more rings within the time specified by S Register 7, followed by a period of five seconds of silence occuring some time before dialling the remaining numbers in a phone number.

The default value of S Register 7 is 30. Using this default, the modem will dial the first number, listen for a period of five seconds silence during the next 30 seconds and then, if the silence is detected, dial the next part of the number.

If five seconds of continuous silence is not detected, the modem will hang up and return a message: NO ANSWER

If the phone number is engaged, the modem will return a message: BUSY

This modifier is useful for remote access databases which require an identification code to be tone dialled before those databases generate an answer tone.

For example:

To tone dial a remote database on 999-1234, wait for a five-second silence and then tone dial an ID code of 1234:

- Type: ATDT9991234@1234 <E>

S=n dial stored phone number *n*

Your modem allows you to store phone numbers in non-volatile memory. The S dial modifier enables you to dial these phone numbers.

The *n* indicates which stored number you want to dial. To store numbers, use the &Z command. Check your command card to see how many numbers may be stored in your modem.

For example:

To dial the stored number two:

- Type ATDS=2 <E>

J MNP10

The J dial modifier causes your modem to attempt an MNP10 connection for that call only.

For Example:

- Type: ATDJ012345 <E>

  Your modem dials and attempts an MNP10 connection.

Your modem will attempt an MNP10 connection at the highest connection speed, regardless of the *H command.

K MNP10 power level

The K dial modifier allows MNP10 automatic power level adjustment for this call only. Normally MNP10 power level adjustment is switched on and off with the)M command.

^ call tones

The ^ dial modifier allows you to switch off calling tones for a data call.

W wait for dial tone

The W modifier causes the modem to wait for a dial tone before dialling. If the modem does not detect a dial tone within 30 seconds, it returns a NO DIALTONE message, hangs up and returns to local command state.

You can change the dial tone waiting period from the default period of 30 seconds by changing the value in S Register 6.

☞ When using the W modifier, the length of time your modem waits for a dial tone is determined by the value contained in S Register 6 (Wait for Dial Tone).

If the modem receives any characters from the computer while it is waiting for a dial tone, it will hang up, return to local command state and issue a NO CARRIER message.

For example:

To wait for a dial tone and then dial 012-3456:

- Type: ATDW0123456 <E>

See Also

&Z command Store Phone Number
S Register 6 Wait Time for Dial Tone
S Register 8 Length of Dial Pause

ATE Echo

The E command allows you to select whether the characters you type at your keyboard (while in the local command state) will be echoed back to your computer screen by the modem.

Options

- ATE0 Disable local command state echo
- ATE1 Enable local command state echo

Range

0-1

ATH Hang Up

The H command forces the modem to hang up.

The H0 command (Hang up) is used to terminate a call.

The H1 command (Go off hook) can be used to make your modem appear as busy to a remote modem trying to dial in.

When you issue the H1 command, the modem goes off-hook but will *not* generate carrier or answer tones.

Options

- ATH0 Hang up
  ATH1 Go off-hook

Range

0, 1

ATI Indentity

Your modem contains an identity message, also known as the firmware identity code.

You can use the I command to display these codes.

Options

- ATI0 Display numeric identity code
  ATI1 Reports OK or ROM checksum number.
  ATI3 Returns ROM and revision level.
  ATI4 Display Hayes=compatible coded strings containing product and feature specific information.
  ATI9 Display product identity and revision level.

Range

0-6

ATL Speaker Volume Control

Your modem has a volume control which allows you to adjust the volume of its internal speaker.

Your modem is preset for comfortable listening levels in a normal office environment, so most users will not need to change the preset volume of their modem.

There are three speaker volume levels:

0,1	Low volume level
2	Medium volume level
3	High volume level

To adjust the volume level:

- Type: ATL0 <E>

  (or type 1,2,3 as appropriate)

Options

ATL0	Low volume level
ATL1	Low volume level
ATL2	Medium volume level
■ ATL3	High volume level

See Also

M command Monitor

Range

0-3

ATM Monitor

Your modem has a built-in speaker enabling you to monitor the progress of calls.

You can listen for dial tones, busy signals, a successful connection to another modem, or someone answering your call.

The M command controls the operation of the speaker.

Options

	ATM0	Speaker is always off
■	ATM1	Speaker is on whenever the modem is dialling or answering a call. When a connection is established, the speaker is switched off.
	ATM2	Speaker is always on
	ATM3	Speaker is on after dialling until a connection is established

See Also

L Command Speaker Volume Control

Range

0-3

ATN Automode

The N command allows you to select automode. When your modem is in automode, it connects to the remote modem at the highest speed the remote modem supports.

The N1 command is equivalent to the F0 command.

Options

ATN0 Disable automode

■ ATN1 Enable automode

See Also

F Command Select Communications Standard

Range

0, 1

ATO Return to On-Line State

The O command enables you to return to on-line state from local command state.

When you are on-line (connected to a remote computer), anything you type is sent on to the remote computer. If you want to send commands to your modem, you must return to local command state by typing the escape sequence (+++). When you are ready to return to on-line state, use the O command.

If you have established a connection and are encountering a large number of data errors in your communications, use the ATO1 command to go on line and force an equaliser retrain. (An equaliser retrain conditions the phone line frequencies to reduce the levels of interference and improve data transmission.) The ATO1 command is not available during V.21, V.23 or Bell 103 connections.

☞ Retrains cannot overcome noise on the line. Error correction should be used to overcome line noise.

If you are not connected to another modem when you use an ATO command, the modem will attempt to answer an incoming call (as if you typed the ATA command).

☞ The O command must be the last command on the command line.

Options

■ ATO0 Enter on-line state
ATO1 Enter on-line state and force equaliser retrain

Examples

- Type: +++ Your modem will return to local command state.
- Type: ATO <E> Your modem will return to on-line state.

Range

0-1

ATP Set Dialling to Pulse

Your modem can use either pulse (decadic) or tone (DTMF) dialling.

The P dial modifier orders the modem to use pulse dialling.

If you are not sure which type of dialling is used by your phone, lift up the handset and listen. If you hear a continuous dial tone, you probably can use tone dialling. Normally, only older telephone exchanges do not support tone dialling.

If you are still in doubt, use pulse dialling. Most exchanges supporting tone dialling also support pulse dialling, although the reverse is not always true.

Contact the supplier of your telephone line if you wish to have tone dialling accessible on your line.

The factory default is ATT. This default dialling parameter is stored by using the &W command.

Options

ATP Select pulse dialling

See Also

&W command Store Active Profile
T command Set Dialling to Tone
Dial Modifiers - P Use Pulse Dialling
Dial Modifiers - T Use Tone Dialling

ATQ Quiet (Suppress Response Codes)

Your modem has a variety of messages or response codes which it sends in response to various commands.

Examples of these codes are the OK and CONNECT messages.

The Q command allows you to switch these messages on and off.

If you switch the messages off, no response codes will be displayed on your screen — with the exception of responses from the ATSn? command and AT&V command.

Options

- ATQ0 Send response codes to the screen
  ATQ1 Do not send response codes to the screen

See Also

Sn? command Display S Register Value
V command Verbal Response Codes
X command Response Codes/Call Progress

Range

0-1

ATSn Select an S Register

This command selects an S Register.

The command is in the form:

ATSn

where n is the number of the S Register you wish to select.

Until another S Register is selected the value of n can be read with the AT? command and changed with the AT= or ATSn= command.

Examples

ATS2 Select S Register 2

See Also

Sn? command	Display S Register Value
AT? command	Display S Register Value
AT= command	Set S Register Value

ATSn? Display S Register Value

The Sn? command allows you to read the value of an S Register.

The command is in the form:

ATSn?

where n is the number of the S Register you want to read.

For example:

The number of times the modem will allow the phone to ring before answering an incoming call is determined by the value in S Register 0. To see the current value of this register:

- Type: ATS0? <E>

Examples

ATS2? Display the value contained in S Register 2

See Also

Sn= command Set S Register Value
&V command View Configuration Profile

ATS= Set S Register Value

The Sn= commands allows you to change the value of an S Register.

The format for the command is:

ATSn=x

where n is the number of the S Register whose value you wish to change and x is the value you wish to place in the register.

For example:

The character interpreted as being a Carriage Return is determined by the value in S Register 3.

The default value of this register is 13. To change this value to 15:

- Type: ATS3=15 <E>

Default values and the permissible range of values for each S Register are detailed in the S Register section of this guide.

Examples

ATS2=2 Set S Register 2 with a value of 2

See Also

Sn? command Display S Register Value

ATT Set Dialling to Tone

Your modem can use either pulse (decadic) or tone (DTMF) dialling.

The T dial modifier orders the modem to use tone dialling.

If you are not sure which dialling is used by your phone, lift up the handset and listen. If you hear a continuous dial tone, you probably can use tone dialling. Normally, only older telephone exchanges do not support tone dialling.

If you are still in doubt, use pulse dialling. Most exchanges supporting tone dialling also support pulse dialling, although the reverse is not always true.

Contact the supplier of your telephone line if you wish to have tone dialling accessible on your line.

The factory default is ATT. This default dialling parameter is stored by using the &W command.

Options

- ATT Select tone dialling

See Also

P command Set Dialling to Pulse
&W command Store Active Profile
Dial Modifiers P Use Pulse Dialling
Dial Modifiers T Use Tone Dialling

ATV Verbal Response Codes

Your modem can display either verbal or numeric response codes in response to various commands. The V command enables you to select which type of response codes you want displayed.

See Appendix A for a full list of the response codes supported by your modem.

Options

ATV0 Numeric response codes

■ ATV1 Verbal response codes

See Also

X command	Response Codes/Call Progress
Q command	Quiet (Suppress Response Codes)

Range

0, 1

ATW Connection Message Control

The W command allows you to decide whether your modem will report its line speed or terminal speed when it connects to another modem.

Options

	ATW0	The CONNECT message reports the terminal speed
	ATW1	The CARRIER message reports the line speed, the PROTOCOL message reports the error correction mode and the CONNECT message reports the terminal speed
■	ATW2	The CONNECT message reports the line speed

See Also

V command Verbal Response Codes
X command Extended Response Codes
S Register 95 Extended Response Codes

Range

0-2

ATX Response Codes

The X command enables you to choose which response codes will be displayed.

The basic response codes for all modems are:

Verbal	Numeric	Meaning
OK	0	Command accepted and executed
CONNECT	1	Carrier detected and connection established
RING	2	Ringing signal detected
NO CARRIER	3	Carrier lost or not detected
ERROR	4	Command line longer than 40 characters or timeout

Depending on the modem you are using, other extended response codes are also available.

You can choose to display only basic response codes or you can display sets of extended response codes, depending on the capabilities of your modem.

☞ Response Code 8 (NO ANSWER) is controlled by the Wait For Quiet Answer dial modifier.

Options

ATX0 Display response codes 0-4, 8, 33, 35, +F4
ATX1 Display response codes 0-5, 8-23, 33, 35, +F4
ATX2 Display response codes 0-6, 8-23, 33, 35, +F4
ATX3 Display response codes 0-23, 33, 35, +F4
■ ATX4 Display all response codes

See Also

Q command Quiet (Suppress Response Codes)
V command Verbal Response Codes
S Register 95 Extended Response Codes
W command Connection Messages Control

Range

0-4

ATY Long Space Disconnect

The Y command controls how the modem will react when it receives a break (or Long Space) from a remote modem.

When Long Space Disconnect is enabled, if your modem receives a break (or long space) from the remote modem for a period equal to or greater than 1.6 seconds, your modem will disconnect.

If the ATH command is issued, or DTR goes low (after the &D2 command has been issued), your modem will send a 4-second break to the remote modem before hanging up.

With Long Space Disconnect disabled, the modem will ignore break sequences from the remote modem and will not generate breaks when the modem hangs up.

The Y command has no effect if error correction is enabled.

Options

- ATY0 Disable long space disconnect
  ATY1 Enable long space disconnect

See Also

H command Hang up
&D command Controlling Data Terminal Ready

Range

0, 1

ATZ Recall Stored Profile

Your modem is supplied with a default operating settings. You can change these settings temporarily by issuing commands while you are working, or permanently by using the &W command to store changes you've made in non-volatile memory.

The Z command causes the modem to fetch the stored User profile from non-volatile memory and store it in the active profile area. An OK response code is returned.

+ The Z command must be the last command on a line.

Options

- ATZ0 Restore User profile 0
  ATZ1 Restore User profile 1

See Also

&F command	Restore Factory Defaults
&V command	View Active Configuration
&W command	Write Configuration

Range

0, 1

AT&C Controlling Data Carrier Detect

DCD is an RS-232 interface signal to indicate to a terminal or a computer that the modem is receiving a carrier signal from a remote modem. This signal is on (or asserted) when your modem is receiving a valid carrier signal from a remote modem.

The &C command enables you to control how DCD will operate.

Options

	AT&C0	DCD signal is always on
■	AT&C1	DCD signal responds to remote modem

We recommend &C0 for UNIX computers which require DCD to be asserted when issuing commands to the modem.

Range

0-1

AT&D Controlling Data Terminal Ready

DTR is an RS-232 signal used to indicate to the modem whether your local computer is ready to communicate. The &D command, in conjunction with the &Q setting, is used by the modem to determine how it will react when the DTR signal goes low.

Options

AT&D0 &Q0, &Q5, &Q6 The modem ignores the DTR signal and acts as if it is asserted (the modem assumes the computer is ready to communicate).
&Q1, &Q4 The modem hangs up and returns to local command state whenever DTR goes low. Auto-answer is not affected.
&Q2, &Q3 The modem hangs up, returns to local command state and disables auto-answer whenever DTR goes low. The computer must assert DTR before dialling or answering may occur.

AT&D1 &Q0, 1, 4, 5, 6 If DTR is lowered, the modem returns to local command state (as if an escape sequence has been typed). &Q2, &Q3 The modem hangs up, returns to local command state and disables auto-answer whenever DTR goes low.

■ AT&D2 &Q0 - &Q6 The modem hangs up, returns to local command state and disables auto-answer whenever DTR goes low. The computer must assert DTR before dialling or answering may occur.

AT&D3 &Q0, 1, 4, 5, 6 If DTR is low, the modem hangs up, sends a NO CARRIER message, returns to local command state and initialises itself with the values stored in non-volatile memory.
&Q2, &Q3 The modem hangs up, returns to local command state and disables auto-answer whenever DTR goes low.

☞ S Register 25 determines how long DTR must be low before the modem recognises it as such.

See Also

&Q Command
S Register 25
Asynchronous Mode
DTR Detection

Range

0-3

AT&F Restore Factory Defaults

Your modem comes with factory default settings for all communications settings and S Registers. The &F command enables you to restore the factory default values.

This command does not alter stored User profiles or stored phone numbers. You *must* use the &W command if you wish to save the factory default values to non-volatile memory (a User profile), and thus preserve these values when you switch the modem off.

Options

■	AT&F0	Restore profile 0 factory defaults
	AT&F1	Restore profile 1 factory defaults

See Also

&V command	View the Active Configuration
Z command	Restore Configuration
&W command	Save Configuration
&Y command	Select Stored Profile

AT&G Guard Tone

The &G command controls the generation of guard tones during V.22 and V.22bis connections. A guard tone is a predetermined frequency generated by the modem to supervise the communications path.

☞ In some countries it is desirable to use &G2. Contact the supplier of your telephone line for advice. Do not use this command unless required to do so by your telephone line supplier.

Options

■	AT&G0	Do not generate guard tones
	AT&G1	Reserved
	AT&G2	Generate guard tones of 1800Hz

Range

0-2

AT&K Flow Control

The &K command enables you to select the type of flow control used between your modem and the local computer. You may want to do this to prevent possible data loss resulting from buffer overflow.

Using flow control guarantees that data buffers in your modem and computer won't overflow. Your modem and your terminal or computer must be using the same type of flow control.

Flow control is only available when your modem is configured for constant speed mode or reliable or auto-reliable modes and is operating in on-line state. Flow control will be ignored when your modem is configured for variable speed mode (AT\N1) or is in local command state.

Options

	AT&K0	Flow control disabled
■	AT&K3	RTS/CTS (hardware) flow control. The modem and computer use the CTS (Clear to Send) and RTS (Request to Send) signals on the RS-232 serial connection to control data flow.
	AT&K4	XON/XOFF (software) flow control. The modem and computer use the XON and XOFF characters (DC1 and DC3) to control the flow of data.

Range

0, 3, 4

AT&Q Connection Mode

The &Q command enables you to select asynchronous operation.

During asynchronous transmissions, the time between characters being sent may vary, and the characters are delimited by start and stop bits to co-ordinate data transfer.

The &Q and equivalent &M commands may be used interchangeably.

Options

	AT&Q0	Asynchronous direct mode The modem will connect in the asynchronous mode and remain in the asynchronous on-line state when a connection is established. Flow control is not available when this command is selected.
	AT&Q1	Reserved
	AT&Q2	Reserved
	AT&Q4	Reserved
■	AT&Q5	Error-corrected mode

The modem will establish an error-corrected connection based upon the \N setting.

AT&Q6 Asynchronous buffered mode

The modem will connnect in the asynchronous mode and remain in the asynchronous on-line state when a connection is established

See Also

\N command Error Correction Mode

Range

0-2, 4-6

AT&R RST/CTS Control

The &R command allows you to determine the relationship between the RTS (Request to Send) and CTS (Clear to Send) signals.

Options

	AT&R0	CTS mimics the state of RTS CTS acts according to V25bis handshake
■	AT&R1	CTS is always ON CTS drops only if required by flow control

Range

0-1

AT&S Controlling DSR

DSR is an RS-232 signal used by the modem to indicate to your computer or terminal that it is ready to communicate with it.

The &S command allows the state of the DSR (Data Set Ready) signal to be controlled by the modem.

Options

- AT&S0 DSR signal is always asserted
  AT&S1 DSR is raised when an answer tone is detected (after the modem dials) and is lowered when the remote carrier disappears.

Range

0-1

AT&V View Active & Stored Profiles

The &V command allows you to display the Active profile and the two stored (User) profiles of your modem. This shows the settings of AT commands, S Registers and stored telephone numbers.

☞ The &V command must be the last command on the command line.

The following is a sample of the &V command output:

Options

AT&V View active and stored configuration profiles

AT&W Store Active Profile

The &W command allows you to save the current Active profile — including communications settings and S Register values — into one of the two profiles in the modem's non-volatile memory.

The current speed and parity being used between the modem and your computer are also stored. The values contained in the modem's non-volatile memory will be loaded when the modem is next switched on.

Option

■	AT&W0	Save active profile in profile 0
	AT&W1	Save active profile in profile 1

See Also

Sn=x command	Set S Register
Z command	Reset
&F command	Restore Factory Defaults
&Y command	Select Stored Profile on Power-up

Range

0-1

AT&Y Select Stored Profile

The &Y command determines which stored (User) profile is selected as the Active profile when the modem is switched on.

Options

- AT&Y0 Select stored profile 0 on power up
  AT&Y1 Select stored profile 1 on power up

See Also

&W command Store Active Profile

Range

0-1

AT&Z Store Phone Number

The &Z command enables you to store phone numbers in your modem's non-volatile memory. Check your modem Command Card to learn how many phone numbers may be stored in your modem.

The command takes the form &Zn=x, where x is the phone number you want to store and n indicates which of the stored phone numbers it will be saved as. If the n=x portion of the command is not present, the characters following &Z are treated as the phone number and/or modifiers and are stored as phone number zero.

Stored numbers may contain up to 45 characters, including dial modifiers. Do *not* include, in the stored phone number: an AT, a D (Dial) command or an S (Stored number) dial modifier

AT&Z2=P0,T12345

Store the following as stored number two; pulse dial 0, wait for two seconds to obtain an outside line and then tone dial 12345

AT&Z12345

Store the phone number 12345 as stored phone number zero

D command Dial (and S dial modifier)

AT%C Compression Control

Data compression is a technique used to reduce the size of data being transmitted without losing any of the original information.

Compressed data must be decoded at the receiving end of the communications path in order to extract the original information.

Full details on the subject of data compression can be found in the Error Correction Section of this guide.

☞ When selecting a data compression mode, error correction must also be selected. (See the \N command for details of error correction.)

Options

	AT%C0	Compression disabled
	AT%C1	MNP 5 compression enabled
	AT%C2	V.42bis data compression enabled
■	AT%C3	V.42bis data compression enabled with fallback to MNP5

Examples

AT%C3\N3 Select V.42bis with auto-reliable error correction
AT%C1\N3 Select MNP5 with auto-reliable error correction

See Also

\N command Error correction

Range

0-3

AT%E Auto Retrain

The %E command allows an originating modem to automatically retrain its communications equalisers during connections, or change the speed at which it is connected to another modem.

If %E1 is selected to enable auto-retrain, your modem will attempt to retrain for a maximum of 30 seconds. It is not available during V.21, V.23, Bell 103 or Bell 212 connections.

Options

	AT%E0	Disable line quality monitor and auto-retrain during connections
	AT%E1	Enable line quality monitor and auto-retrain during connections
■	AT%E2	Enable line quality monitor and fallback/fall forward
	AT%E3	As for %E1, but hang up immediately when line quality reaches hang up threshold (fast hang-up)

Range

0, 1

AT%L Display Line Signal Level

The %L command allows you to display the received signal level. The value returned is a 3-digit number, for example:

009 = -9 dBm

043 = -43 dBm

Options

AT%L Display received signal level

Examples

- Type: AT%L <E>

  The line signal level is displayed.

AT%Q Line Signal Quality

The %Q command allows you to display the line signal quality.

This command is not applicable to V.21, V.23 or Bell 103 connections.

Options

AT%Q Display line signal quality

Examples

- Type: AT%Q <E>

  A number representing the line signal quality is displayed. The nearer the displayed value is to zero, the better the line quality. 5 to 20 is normal.

AT\A MNP Block Size

The \A command allows you to select the maximum block size to be used by your modem over an MNP error-corrected connection.

Options

	AT\A0	64 character block size
■	AT\A1	128 character block size
	AT\A2	192 character block size
	AT\A3	256 character block size

Range

0-3

AT\B Generate Break

The \B command is used to send a break sequence to the remote modem.

The length of the break sequence may be set from 0.1 seconds to 0.9 seconds. The default length of breaks generated by the modem is 0.3 seconds.

The \K command determines how the modem will react when a break sequence is received.

Options

AT\B4 Generate a break sequence 0.4 seconds long

See Also

\K command Break Control

Range

1-9

Default

3

AT\G Modem - modem flow control

The \G command allows you to select XON/XOFF flow control between modems during a non-error correcting connection, even though there may be no flow control from modem to computer.

During an error-corrected connection, the \G setting will be ignored however the &K setting remains in force.

Options

- AT\G0 Disable modem to modem XON/XOFF flow control
  AT\G1 Enable modem to modem XON/XOFF flow control

See Also

&K command Flow Control

Range

0, 1

AT\K Break Control

The \K command determines how the modem will react when a break sequence is sent from your computer or received from the remote modem.

During error corrected connections the modem sending the break determines how the receiving modem will react. During non-error corrected connections, the receiving modem determines how it will react.

The default break control setting is \K5.

The following tables show how the modem will react when it receives a break sequence from either the remote modem or your computer.

Options

\B command Generate Break

Range

0-5

Default

\K5

AT\L MNP Block/Stream Mode

The \L command allows you to select block or stream modes for an MNP connection.

Options

- AT\L0 Select stream mode for MNP connection
  AT\L1 Select interactive block mode for MNP connection

See Also

\N command Error Correction Mode

Range

0, 1

AT\N Error Correction Mode

The \N command allows you to select the error correcting mode your modem is to use when a connection is established. AT\N0 selects *constant speed mode*, enabling the modem to use different terminal and line speeds.

Your modem (depending on the model) supports constant terminal speeds between 300 bps and 115,200 bps. With constant speed selected the modem could connect with a remote system using V.22 (1200 bps) while communicating with your computer at 9600 bps.

Selecting constant speed mode also means the modem will *not* modify its terminal speed when answering incoming calls.

☞ It is necessary to select flow control (&K command) between the modem and your computer when you use constant speed mode.

AT\N1 selects *variable speed mode*. With variable speed mode selected, the modem adjusts its terminal speed to match line speed.

If the terminal speed is higher than the modem's maximum line speed, the modem will attempt to connect using its highest speed.

☞ Flow control will be ignored when your modem is configured for variable speed mode or is in local command state. Flow control is only available when the modem is configured for constant speed mode or reliable or auto-reliable modes and is operating in on-line state.

When answering, the modem automatically adjusts its terminal speed to match the standard used by the calling modem.

☞ With variable speed mode selected, your modem's terminal speed should not be changed once connected to another modem.

The \N command will return an ERROR message if used while the modem is off-hook.

Options

AT\N0	Constant speed mode
AT\N1	Variable speed mode

	AT\N2	V.42/MNP Reliable mode, disconnect if MNP not supported by remote modem.
■	AT\N3	V.42/MNP Auto-reliable mode, fallback to constant speed mode if MNP not supported by remote modem.
	AT\N4	V.42 Reliable mode, disconnect if V.42 not supported by remote modem.
	AT\N5	MNP Reliable mode, disconnect if MNP not supported by remote modem.

See Also

B command	Communications Standard
&K command	Flow Control

Range

0-5

AT\S Display Active Configuration

The \S command allows you to display the current active configuration. The following is a sample of the \S command output:

Options

AT\S Display Active configuration

AT\V Error Correction Response

The \V command allows you to select the error correction response codes when an error corrected connection is established. With error correction response codes enabled, the following messages are returned when a connection is established using error correction:

NUMERIC	VERBAL	DESCRIPTION
01	CONNECT	300bps connection with error correction
05	CONNECT 1200	1200 bps connection with error correction
10	CONNECT 2400	2400 bps connection with error correction
11	CONNECT 4800	4800 bps connection with error correction
12	CONNECT 9600	9600 bps connection with error correction
13	CONNECT 7200	7200 bps connection with error correction
14	CONNECT 12000	12000 bps connection with error correction
15	CONNECT 14400	14400 bps connection with error correction
59	CONNECT 16800	16800 bps connection with error correction
16	CONNECT 19200	19200 bps connection with error correction
61	CONNECT 21600	21600 bps connection with error correction
62	CONNECT 24000	24000 bps connection with error correction
63	CONNECT 26400	26400 bps connection with error correction
64	CONNECT 28800	28800 bps connection with error correction
91	CONNECT 31200	31200 bps connection with error correction
84	CONNECT 33600	33600 bps connection with error correction

☞ These messages are only generated if W0 or W1 is selected (display DTE speed).

Options

AT\V0	Disable error correction response codes
AT\V1	Enable error correction response codes

Range

0-1

See Also

X command
W command

AT*H MNP10 Connection

This command determines the initial MNP 10 connection speed, prior to upshifting or downshifting.

For poor quality connections, use a slow connection speed to ensure the initial connection is established.

Use *H1 for cellular connections and *H2 for poor-quality land-line connections.

Options

■	AT*H0	MNP10 initial connection at the highest possible speed
	AT*H1	MNP10 initial connection at 1200 bps (V.22)
	AT*H2	MNP10 initial connection at 4800 bps (V.32)

Range

0-2

AT#C Calling Tone

The #C command determines whether the modem will generate V.25 calling tones when operating in originate mode.

V.25 calling tones are generated as a measure of courtesy if the telephone number you dial is answered by a person rather than a modem or other electronic device. It also allows an electronic device to select the appropriate operating mode.

V.25 tones indicate to the answerer of a call that a modem in data mode (not fax) is the originator of the call.

Options

- #C0 Calling tone disables
- ■ #C1 Calling tone controleld by dial modifier "n"

See Also

X command Response codes
D command F or ^ dial modifiers

Range

0-1

AT)M MNP 10 Power-level adjust

This command allows MNP 10 to control the transmit power of the modem during MNP 10 cellular connections.

Options

AT)M0	Disable auto power level adjustment during an MNP 10 connection. Power level adjustment will occur if cellular operation is requested by the remote modem.
AT)M1	Allow auto power level adjustment during an MNP 10 connection.

☞)M1 should not be used in conjunction with *H2.

See Also

@M command	MNP 10 Power Level
*H command	MNP 10 Connection
-K command	MNP Extended Services
K Dial Modifier	MNP 10 Power Level

Range

0-3

AT@M MNP10 Cellular Power Setting

This command sets the initial transmit power for cellular MNP10 connections.

For cellular MNP10 connections, the transmit power of the modem may change to suit line conditions.

For landline MNP10 connections, the transmit power of the modem remains at the level set in the factory.

Options

- AT@M0 -26 dBm
  AT@M1 -30 dBm
  AT@M2 - AT@M10 -10 dBm
  AT@M11 - AT@M31 -11 dBm to -31 dBm respectively

Example

@M20 Set power level to -20 dBm
@M8 Set power level to -10 dBm

See Also

)M commandMNP10 Power Level
K Dial Modifier

Range

0-31

AT-K MNP Extended Services

The -K command allows your modem to switch to MNP10, in preference to V.42, if the other modem indicates it supports MNP10. This occurs automatically when the modems establish a connection.

Options

- AT-K0 Disable V.42 to MNP10 conversion
  AT-K1 Enable V.42 to MNP10 conversion
  AT-K2 Enable V.42 to MNP10 conversion without MNP indication during the answer phase

Range

0-2

AT-Q MNP10 Speed Fallback

The -Q command permits the modem to fallback from a V.32bis or V.32 connection with MNP 10, to a V.22bis or V.22 MNP 10 connection.

MNP 10 has the ability to make decisions regarding line quality and will request a change in speeds if it decides the phone line is not of sufficient quality to maintain the current connection speed.

Options

AT-Q0 Disable fallback to V.22bis or V.22

■ AT-Q1 Enable fallback to V.22bis or V.22 with MNP 10

Range

0-1

AT-SEC MNP10 Enhanced Cellular

MNP10EC can be automatically enabled only with supporting V.34 modems. MNP10EC will be automatically enabled at each end of the line if a V.34 MNP10EC modem (MNP10EC enabled) calls a V.34 MNP10EC modem (MNP10EC disabled).

The NetComm InModem 336™ is capable of automatic enabling.

With V.32bis modems there is no automatic enabling of MNP10EC. If you are originating/answering a data call from or to an MNP10EC modem connected to a mobile telephone, ensure that MNP10EC is enabled on your modem. For cables to connect your mobile telephone to your modem, please check with your mobile telephone dealer

AT Commands for MNP10EC (only one command is required for setup).

AT-SEC=i,x
where i=0 (MNP10EC disabled) or 1 (MNP10EC enabled), default=0.

Where x is the transmitted power in -dBm from 10 to 30, default =10 and is suitable for the majority of connections

Suggested Modem Configuration for MNP10EC link:

Base phone: AT&F-SEC=1,18

Cellular phone: AT&F-SEC=1

It is recommended that for fax transmissions over a mobile phone the modem be configured to operate at 9600bps or 7200bps.

AT:E V.32 Compromise Equaliser

This command switches on or off the V.32 compromise equaliser.

When operating over cellular connections, it may be desirable to switch off the V.32 compromise equaliser. For dial-up lines, the equaliser should be switched on.

Options

	AT:E0	Disable the V.32 compromise equaliser
■	AT:E1	Enable the V.32 compromise equaliser

Range

0-1

AT+MS Select Modulation

The +MS command selects the modulation, optionally enables or disables automode, and optionally specifies the lowest and highest connection rates using one to four subparameters. The command format is:

+MS= <mod> [,[<automode>][,[<min_rate>][,[<max_rate>]]]]<CR>

Subparameters not entered (enter a comma only or <CR> to skip the last subparameter) remain at their current values.

The maximum speed in bps of the modulation is bound by the DTE speed in bps. If the DTE speed exceeds the maximum capable by the selected modulation, then the DTE speed has no effect in limiting the resultant modulation speed on connection. If the DTE speed is less than the maximum capable modulation, then, (resulting connection modulation speed) < (DTE speed)

For example:

1. DTE speed: 19200 bps

   Modem configuration: +MS=11, 1, 300, 33600

   Maximum obtainable modulation speed: 19200 bps

2. DTE speeds 38400 bps

   Modem configuration: +MS=11, 1 300, 33600

   Maximum obtainable modulation speed: 33600 bps

This feature allows the modulation over the telephone line to be more reliable and give better throughput, since the maximum throughput obtainable is governed by the DTE speed.

<mod>

A decimal number which specifies the preferred modulation (automode enabled) or the modulation (automode disabled) to use in originating or answering a connection. The options are:

<mod>	Modulation	Possible Rates (bps)	Notes
0	V.21	300	
1	V.22	1200	
2	V.22bis	2400 or 1200	
3	V.23	1200	
9	V.32	9600 or 4800	
10	V.32bis	14400, 12000, 9600, 7200, or 4800	
11■	V.34	33,600, 31,200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, or 2400	
64	Bell 103	300	
69	Bell 212	1200	

The modem may also automatically switch to another modulation (automode), subject to the following constraints:

- The modem may not be able to automatically switch from the current modulation (specified by <mod>) to some other modulation. For example, there is no standard way to automode from Bell 103 to V.23.

- The DTE may disable automode operation (see <automode> below).

- . The DTE may constrain the range of modulations available by specifying the lowest and highest rates (see <min_rate> and <max_rate> below).

<automode>

Automode is an optional numeric value which enables or disables automatic modulation negotiation using V.8 or V.32 bis Annex A. The options are:

The default value is 1, which enables automode. Note, however, there are modulations for which there is no automatic negotiation, for example:Bell 212 (<mod> = 69).

For <automode> = 0 (automode disabled, i.e., fixed modulation):

- If <max_rate> is within the rates supported by the selected modulation, the selected rate is that specified by <max_rate>. For example:

  +MS=9,0,1200,4800 selects V.32 4800 bps fixed rate.

- If <max_rate> is greater than the highest speed supported by the modulation specified by <mod>, the starting rate is the highest rate supported by the

selected modulation. For example:

+MS=9,0,2400,14400 selects V.32 9600 or 4800 bps.

- To select fixed mode operation (or emulate issuance of the N0S=x command sequence) specify the <max_rate> and <min_rate> to be the same requested speed, and <mod> to be the modulation for that speed. For example:

+MS=11,0,16800,16800 selects V.34 16800 bps fixed mode (no comparable S37 command).

+MS=9,0,12000,12000 selects V.32 bis 12000 bps fixed mode (same as N0S37=10).

For <automode> = 1 (automode enabled, i.e., automatically selected speed and modulation):

The modem connects at the highest possible rate in accordance with V.8, or V.32 bis Annex A if V.8 is not supported by the remote modem.

- If <max_rate> is greater than the highest rate supported by the modulation specified by <mod>, the modem automodes down from the highest rate of the selected modulation. For example:

  +MS=10,1,1200,24000 selects automoding down from V.32 bis 14400 bps.

- To emulate issuance of the N1S37=x sequence command, specify the modulation and the rate to start automoding down from using <mod> and <max_rate>, respectively. Set <min_rate> to 300 to allow automoding all the way down to V.21 300 bps. For example:

  +MS=11,1,300,16800 selects automode starting at V.34 16800 bps (no comparable S37 command).

  +MS=9,1,300,12000 selects automode starting at V.32 12000 bps (same as N1S37=10).

<min_rate>

Is an optional number which specifies the lowest rate at which the modem may establish a connection. The value is decimal is decimal coded, in units of bps, e.g., 2400 specifies the lowest rate to be 2400 bps. The default is 300 for 300 bps.

<max_rate>

Is an optional number which specifies the highest rate at which the modem may establish a connection. The value is decimal coded, in units of bps, e.g., 14400 specifies the highest rate to be 14400 bps. The default is 33600 for 33600 bps.

+MS? Reporting selected options

+MS=? Reporting supported options

Nn Automode

1. Use of the Nn command is not recommended but is provided for compatibility with existing communication software.

2. This command is product dependant. Please check your command card to see if this command is supported by your model.

AT+MS? Reporting Selected Options

The modem can send a string of information to the DTE consisting of selected options:

Options

+MS?

Example

+MS: 11,1,300,33600 (show default values)

See Also

+MS=? Reporting supported options
+MS Select modulation

Range

+MS: <mod>,<automode>,<min_rate>,<max_rate>

☞ This command is product dependant. Please check your command card to see if this command is supported by your model.

AT+MS=? Reporting Supports Options

The modem can send a string of information to the DTE consisting of supported options:

Options

+MS=?

Example

+MS: (0, 1, 2, 3, 8, 10, 64, 69, 74), (0,1) (300-33600), (300-33600)

See Also

+MS?	Reporting selected options
+MS	Select modulation

Range

+MS: (list of supported <mod> values), (list of supported <automode> values), (list of supported <min_rate> values), (list of supported <max_rate> values).

☞ This command is product dependant. Please check your command card to see if this command is supported by your model.

S Registers

Your modem contains a number of registers — memory stores — which define the modem's operating characteristics. These registers are called *Special Registers* or *S Registers*.

This section of the User Guide shows you the function and usage of each S Register, how to check the current contents of your S Registers, how to change S Register settings and how to save the settings in non-volatile memory.

Reading and Changing S Registers

The Read Register command (Sn?) enables you to check the current contents of an S Register.

For example:

To check how long the modem will wait for a dial tone before starting to dial, you would check S Register 6. To do this:

- Type: ATS6? <E>

The modem displays the current contents of the S Register 6.

If you want to change the register setting, use the Set Register command (Sn=x).

For example:

To change the setting of your modem, so the modem waits five seconds for a dial tone before starting to dial:

- Type: ATS6=5 <E>

S Register Settings and Modem Memory

Your modem comes configured with a set of default values for each of the special registers. Any changes you make using the Sn=x command will only last while the modem is switched on.

Once you switch the modem off, these changes are lost and the next time the modem is switched on, the factory-set default values are in effect.

To understand this, consider the following. Modems use three different types of memory chips:

1 RAM chips that only hold information in their memory while the modem has power supplied to it. You can easily change information in RAM.

This memory is used to temporarily store any changes you make to Commands or S Registers during a communications session.

2 ROM chips that have their data placed into them at the factory. They retain their information when the power is switched off. You cannot make changes to information stored in ROM chips. Information such as factory default settings for S Registers is stored in your modem's ROM chips.

3 Non-volatile memory retains data without requiring power. You can change the data in non-volatile memory by using a special command (&W) to write the current settings to memory. This memory can be used to provide a more permanent storage of changes you make to the settings of your modem.

Any parameter stored in RAM takes precedence over any other stored in non-volatile memory or ROM. Any parameter stored in non-volatile memory takes precedence over those stored in ROM.

If you have not made any changes to your modem's settings since it was unpacked after purchase, the default parameters in ROM control the modem.

If you have made changes and stored them in non-volatile memory — using the Write Configuration (&W) command — those settings that have been changed take precedence over those in ROM, even after switching the modem off and on.

Temporary changes — made during a communications session — to values using any AT command, are stored in RAM and take precedence until you switch the modem off.

To use the current S Register settings with the Write Configuration command (&W):

- Type: AT&W <E>

To return to the original factory default settings:

- Type: AT&F <E>

☞ Re-loading the factory default settings with AT&F will not save these default settings to non-volatile memory. To save factory defaults to non-volatile memory so they can be used again, after switching the modem off and on, follow the &F command with the Write Configuration (&W) command.

To reset and store all settings to the factory default:

- Type: AT&F

Setting Bitmapped Registers

Some of the S Registers used by your modem are 'bitmapped' registers. With most of the S Registers in your modem, you simply select the value you wish to place in the register and then do so, using the ATSn= command.

Bitmapped registers require a little more effort. To change the setting of a bitmapped register, you must first find out the value in the S Register, change the value of the appropriate 'bit' and then place the new value into the S Register. Sound complicated? It's easy once you try a few examples.

For this example, we'll use S Register 80. When you turn to the description of S Register 80, you'll see this table:

If you wish to switch on security in your modem (which is controlled by bit 7), you would:

- Type: ATS80? <E>
- Note down the value returned by S Register 80

- Using the table, find the correct value with bit 7 set to 1

  Bit 7 is the left-most number in the binary sequence (bits are number 0 through 7, right to left).

- If the value 21 is returned by the modem (binary value 00010101), you should program the value 149 (binary value 10010101) into S Register 80.

In the case of S Register 80, you need to switch your modem off and on before the changes come into effect. Not all bitmapped S Registers require you to do this. The description of each bitmapped S Register tells whether you need to switch the modem off and on.

ATS0 Rings Before Answer

S Register 0 contains a decimal value (from 0-255) indicating the number of rings the modem will wait before answering an incoming call.

If you place a value of 0 in this S Register, auto-answer operation will be disabled.

Examples

ATS0=0 Disable auto-answer
ATS0=4 Wait four rings before answering an incoming call

☞ Australian Modems: This register must not contain a value of 1.

Range

0-255

Default

2

ATS1 Ring Count

S Register 1 contains a decimal value (from 0-255) indicating the number of rings detected.

S Register 1 is incremented each time a ring is detected. It will be cleared if no ring occurs within 8 seconds of the last ring.

Range

0-255

Default

0

ATS2 Escape Character

S Register 2 contains the ASCII values of the character which forms the escape sequence.

The default value for this register is 43. The modem will recognise three + characters (+++) as the escape sequence.

Setting this register to a value greater than 127 disables the modem's recognition of the escape character.

Examples

ATS2=36 Recognise three $ ($$$) characters as the escape sequence
ATS2=64 Recognise three @ (@@@) characters as the escape sequence

See Also

S Register 12 Escape Sequence Guard Time

Range

0-255

Default

43 (the + character)

ATS3 Carriage Return Character

S Register 3 contains the ASCII value of the character recognised by the modem as the Carriage Return character in local command state.

Example

ATS3=127 Recognise the DEL character as the carriage return

Range

0-127

Default

13

ATS4 Line Feed Character

S Register 4 contains the ASCII value of the character recognised by the modem as the Line Feed character.

Example

ATS4=13 Recognise the Carriage Return character as the line feed

Range

0-127

Default

10

ATS5 Backspace Character

S Register 5 contains the ASCII value of the character recognised by the modem as the Backspace character.

Examples

ATS5=27 Recognise the ESC character as the backspace

Range

0-255

Default

8

ATS6 Dial Tone Wait Time

S Register 6 determines how long the modem will wait for a dial tone after going off-hook and before dialling, or when the W dial modifier is included in a dial command.

This register contains a value indicating the number of seconds the modem will wait for a dial tone. This provides slow telephone exchanges the opportunity to apply a dial tone to the line before the modem attempts to dial.

Example

ATS6=5 Wait five seconds for a dial tone before dialling.

Range

4-7

Default

4

ATS7 Wait for Carrier

S Register 7 contains a value, in seconds, equivalent to the length of time the modem will wait for a carrier signal after dialling. If a carrier is not detected within the time specified in this register, the modem will hang up and return a NO CARRIER message.

Examples

ATS7=20 Wait 20 seconds for a connection

Range

1-60

Default

30

ATS8 Pause Dial Modifier Delay

S Register 8 contains the time in seconds the modem will wait when it encounters a comma (the pause dial modifier) in a dialling sequence.

Examples

ATS8=4	Wait four seconds when a comma is encountered in the dialling sequence

See Also

D command Dial (and , modifier)

Range

1-7

Default

4

ATS9 Carrier Detect Response time

S Register 9 contains the length of time, in tenths of a second, the modem will wait before asserting the DCD (Data Carrier Detect) signal, after a carrier has been detected.

The longer the time taken before asserting DCD, the less chance of line noise being mistaken by the modem as a carrier signal.

If you have previously issued an AT&C0 command, the modem will assert the DCD signal regardless of the presence of a carrier signal from the remote system.

Examples

ATS9=9	Wait 0.9 seconds after detecting a carrier before connecting to the phone line (asserting DCD).

See Also

&C command	Controlling Data Carrier Detect

Range

1-255

Default

6

ATS10 Lost Carrier/Hang Up Delay

S Register 10 contains the amount of time, in tenths of a second, the modem will wait after the carrier has been lost before hanging up.

If a value of 255 is placed in this register, the modem will not hang up after the carrier is lost from the remote modem. In this case, you must use the H command to hang up.

Examples

ATS10=12 Wait 1.2 seconds after losing carrier before hanging up

Range

1-255

Default

18

ATS11 DTMF Tone Timing

S Register 11 contains the time, in thousandths of a second, of the duration and spacing of tones when tone dialling (DTMF tones).

The value in this register does not affect pulse dialling.

Examples

ATS11=20 Space tones at 0.120 second intervals

Range

70-255

Default

95

ATS12 Escape Sequence Guard Time

The Escape Sequence Guard Time is the time delay required immediately before and after entering an escape sequence.

For your modem to distinguish the escape sequence from ordinary data, there must be a period of silence both before and after the escape sequence is entered.

If the Escape Sequence Guard Time is one second and the escape sequence character has been defined as +, for the modem to recognise an escape sequence you must maintain silence on the line for one second, then type +++ in rapid succession, and then maintain another second's silence.

The guard time is in units of 20 milliseconds (or 1/50 of a second).

☞ S Register 12 is also used to time the period between the escape sequence characters as they are typed. If the period between the first and second escape characters or second and third escape characters being entered is greater than the value in S Register 12, the modem will not recognise the escape sequence.

Examples

ATS12=100	Maintain silence on the line for 2 seconds before and after entering the escape sequence

See Also

S Register 2	Escape Sequence Character

Range

0-255

Default

50

ATS18 Test Timer

S Register 18 contains the length of time, in seconds, that the modem will perform tests initiated with any of the &T commands.

You can terminate any test by issuing an AT&T0 command, or by allowing the time in the Test Timer to expire.

Placing a value of 0 in S Register 18 disables the Test Timer, forcing you to use an AT&T0 command to terminate tests.

Examples

ATS18=30 Terminate test after 30 seconds

See Also

&T command Self Test

Range

0-255

Default

0

ATS24 Sleep Mode Inactivity Time

S Register 24 defines the number of seconds of inactivity by your computer or the telephone line before the modem enters 'sleep mode'. Sleep mode is particularly useful for laptop computers to save the drain on batteries.

The sleep mode inactive time is automatically limited to 5 seconds if S Register 24 is set to less than 5. Sleep mode is disabled if S Register 24 is set to 255.

Examples

ATS24=30 Set sleep mode inactive time to 30 seconds.
ATS24=255 Disable sleep mode.

Range

0-255

Default

0

ATS25 DTR Detection

S Register 25 determines the time, in hundredths of a second, the DTR (Data Terminal Ready) signal must remain high or low before the modem will recognise a change in the DTR state.

In synchronous mode, the value in S Register 25 is interpreted as the number of seconds that DTR must remain high or low.

Examples

ATS25=8	DTR must remain low for 0.08 seconds before the modem will recognise loss of DTR

See Also

&D command	Controlling DTR

Range

0-255

Default

5

ATS29 Hook Flash Modifier Delay

S Register 29 defines the time, in tenths of a second, that your modem will wait before going on-hook after a hook flash (!) dial modifier is encountered in a dial string.

Examples

ATS29=5	Wait 0.5 seconds before going on-hook after encountering a ! in the dial string.

See Also

! Dial Modifier	Hook Flash
D command	Dial

Range

0-255

Default

0

ATS30 Inactivity Timer

S Register 30 defines the time, in tens of seconds, that your modem will wait before disconnecting an inactive line.

During an error-corrected connection, the timer will be reset when any data is transmitted or received. In other modes, the timer will be reset only when data is transmitted.

Examples

ATS30=30 Wait 5 minutes (300 seconds) before disconnecting an inactive line.

Range

0-255

Default

0

ATS32 XON Character

S Register 32 contains the ASCII value of the character recognised by the modem as the XON character to be used in XON/XOFF flow control.

Examples

ATS32=18 Recognise the DC2 character as the XON character

Range

0-255

Default

17

ATS33 XOF Character

S Register 33 contains the ASCII value of the character recognised by the modem as the XOFF character to be used in XON/XOFF flow control.

Examples

ATS33=20 Recognise the DC4 character as the XOFF character

Range

0-255

Default

19

ATS38 Delay Before Forced Hangup

S Register 38 determines the delay, in seconds, before your modem hangs up after receiving an H command or DTR goes low.

If S Register 38 is set to a value less than 255, your modem will wait the specified number of seconds for the remote modem to acknowledge receipt of all data being transmitted by your modem before disconnecting. If the time expires before all data is sent, your modem will disconnect and send a NO CARRIER response code to indicate that transmit data was lost.

If S Register 38 is set to 255, your modem will not hang up until all data has been transmitted or the connection is lost.

Examples

ATS38=30	Wait 30 seconds before hanging up after an H command has been issued

Range

0-255

Glossary

A

ACK (Acknowledge)

Control Character transmitted by a receiving device as an affirmation to a sending device.

Alphanumeric

Roman Letters (alphabetic) and Arabic numbers (numeric).

Amplitude

The height of a waveform measured in volts.

Amplitude Modulation (AM)

Transmission of information by varying the amplitude of a carrier signal.

Analog Data

Data in the form of continuously variable physical qualities. Compare with Digital data.

Analog signal

A signal such as voice or music that varies in a continuous manner (smooth transitions to different levels).

ANSI

American National Standards Institute, primary standards development body in the USA.

ASCII

American Standard Code for Information Interchange. Pronounced *as-kee*. A code by which alphanumeric, punctuation and control characters, commonly found on computer keyboards, are each assigned a unique value between 0-127 (decimal).

Asynchronous

A data transmission in which the time between characters may vary. Characters are delimited by start and stop bits.

Attenuation

The loss of power through transmission equipment, lines or other communication devices.

Auto answer

A modem capability that allows automatic pick-up — by the modem — when the phone answers.

Auto dial

The ability to make a connection with another modem automatically. (To dial a number automatically. usually using a stored number.)

Auto range

The ability of a modem to range over several modem standards to determine the standard of the calling modem.

B

Bandwidth

The range of signal frequencies that are accepted or passed by a circuit or network. (The normal bandwidth on a telephone line is 3100Hz.)

Baseband

The frequency band occupied by a signal in its original or unmodulated form.

Baud

This term represents the number of signal elements per second. Because a signal element can represent more than one bit, this term is not equivalent to BPS (bits per second), although it is often used in this way. Compare with bit rate.

Baud Rate

Number of discrete signalling events per second; not necessarily the same as bits per second. For example, a V22bis, 2400 bps modem uses a 600 baud by 4-bit encoding scheme.

Baudot Code

Code for transmitting data using five bits to represent a single character.

BBS

An acronym for Bulletin Board System. See Bulletin Board.

Binary

A number system with a base of two, using the digits 0 and 1. Commonly used in computers since the values 0 and 1 can easily be represented as OFF and ON in electrical circuits.

Binary Synchronous Communications (BSC or BiSync)

A communications protocol developed by IBM which has become an industry standard. It uses a defined set of control character sequences for synchronized transmission of data.

Bit

The smallest piece of information in a binary number system. The word stands for Binary digIT.

Bit rate

The speed at which bits are transmitted, usually expressed as bits per second (BPS).

Block

Group of characters treated as a unit for the purpose of data transmission.

BPS

An acronym for Bits Per Second. Transmission rate of binary numbers. Compare with Baud.

Break

A special, non-data signal used by computer equipment to interrupt some processes.

Buffer

Temporary storage area used to compensate for a difference in the rate of data flow into and out of a device.

Bulletin Board

A generic term covering a wide variety of on line information services. Many bulletin boards are open to the public, run at no cost to users and provide the ability to download public domain software and exchange electronic mail.

Byte

A grouping of bits to specify a single character usually consisting of eight consecutive bits. See also Bit.

C

Carrier signal

An analog signal of known specifications, such as level and frequency, which is modulated by another signal containing information to be transmitted. This is the high-pitched sound you can hear when you first connect to a remote system.

Carrier Detect

An RS-232 interface signal from the modem to a terminal or personal computer indicating that the modem is receiving a signal from a remote modem. See also DCD.

Channel

An electronic communications path. A voice grade channel generally ranges from 300 to 4000 Hz.

Character

A letter, number or other symbol contained in a message or used in a control function. See Byte.

Character Set

The characters that can be coded or used by a particular machine.

Clear to Send (CTS)

An RS-232 control signal sent by the DCE to indicate that the DTE may begin a transmission.

Code

A predefined set of rules specifying the way data is to be represented by the transmitting and receiving device.

Common Carrier

Telephone company that furnishes communications services to the general public.

Conditioning

The addition of equipment to a leased voice-grade line to improve the transmission characteristics of the line.

Conferencing

A form of bulletin board that allows real-time communication between multiple users. In the U.S.A., conferencing systems have been established to allow large numbers of individuals to simultaneously discuss a wide range of specialised topics and interests.

Connector

A physical devices, such as a plug, socket or jack, used to connect one hardware component of a system to another. A connector may also be called a port.

Connect Time

The amount of time spent on line with an information service.

Console

Part of a computer system, usually a video display terminal, used by the operator to communicate with the computer.

Contention

Condition arising when two or more devices try to transmit at the same time using the same channel.

Control Character

Any character assigned as ASCII numeric code less than the SPACE character. These characters are used to initiate a control function on the receiving device.

Also a symbol you can create by pressing one of your computer's keys while holding down the Control key. These symbols are not usually printed, and are generally used to control screen formatting and cursor positioning.

CPU

Central Processing Unit. The computer hardware which processes software instructions to control the computer system and its peripherals.

CRT

Cathode Ray Tube. This term is commonly used to stand for the video display terminal.

CTS

An acronym for Clear To Send. This signal is generated by a modem in response to RTS to indicate that a communications channel has been established and that data can be sent.

Cyclic Redundancy Check

An error-detection technique in which a data validation value is mathematically

derived from a block of data and transmitted at the end of the block. The receiving end recomputes the value and if it matches the value sent, the data is assumed to be valid (error-free). If not, the receiver notifies the transmitter that an error has occurred and the block is retransmitted.

D

Data

Any type of information, such as numbers, letters and symbols, that can be processed by a computer.

Database

A source or collection of information. In the context of communications, a dial-up service from which users can exchange or retrieve information.

Data Bits

The actual characters being transmitted between two computers when asynchronous communications is being used. Usually 7 or 8 data bits are used.

Data Communications

A broad term covering any exchange of information between computers or similar systems over telephone lines.

Data Communications Equipment

Equipment that is used to access a communications network. The DCE provides all the functions required to establish, maintain and terminate a connection, and provides the signal conversion required for communications between the Data Terminal Equipment (DTE) and the telephone network.

With RS-232 connections, the modem is generally the DCE device while the computer or terminal connected to a modem is generally the DTE device. See also Data Terminal Equipment.

Data Compression

An encoding technique which provides for the transmission of fewer data bits without the loss of information. The receiving end expands the data received to its original form.

Data Set

See Data Communictions Equipment and Modem.

Data Set Ready (DSR)

An RS-232 control signal used to indicate the readiness of the DCE (Usually a modem) to accept data from the DTE (usually a terminal or computer).

Data Terminal Equipment (DTE)

The equipment which provides the data source and/or receiving end of a data transmission link. The DTE may be a CRT or teletype terminal, a personal computer, a printer, a front-end processor to a large mainframe computer or any other device which can transmit or receive data. With RS-232 connections the designation of DTE or DCE determines which device is responsible for generating certain control signals. See also Data Communications Equipment.

Data Terminal Ready (DTR)

An RS-232 control signal used to indicate the readiness of the DTE for data transmission.

DCD

An acronym for Data Carrier Detect. See also Carrier Detect.

DCE

An acronym of Data Communications Equipment. See Data Communications Equipment.

Decibel (dB)

Unit of measure indicating the logarithmic ratio of output signal power to input signal power.

Dedicated Line

A communications line which is not dialled. Also known as a leased or private line.

Default

A value, action or setting that is automatically used by a computer system when no other explicit information has been given.

Demodulate

To recover the information being transmitted by a modulated signal. For example, a conventional radio receiver demodulates an incoming broadcast signal top convert it into sound emitted by a speaker. See also Modulate and Modem.

Device

A piece of equipment connected to a computer — maybe a Fax Card or Modem.

Dial-up

Establishing a temporary connection to a remote system or computer via the public switched telephone network.

Dial Tone

A call progress signal returned by a telephone switching machine to indicate that it is ready to accept a telephone number.

Dibit

A grouping of two bits.

Digital Signal

A signal composed of discrete signal levels as opposed to the continuous signal levels of an analog signal.

Direct Keying

In videotex terminology direct keying refers to accessing a page by specifying its page number rather than using index pages.

Distortion

Undesired change in a signal's original waveform resulting from the characteristics of the transmission circuits or other external influences.

Downloading

See Software Downloading.

DTE

An acronym of Data Terminal Equipment. See Data Terminal Equipment.

Double-Digit Keying

Pressing two number keys in rapid succession to access a page in a videotex system. The first number accesses an intermediate index (see Intermediate Page) which in turn accesses the page. See also Single-Digit Keying.

Dumb Terminal

Terminals that do not contain an intelligent microprocessor and usually send data one character at a time.

Duplex Transmission

Independent, simultaneous, two-way transmission.

E

EBCDIC

Extended Binary Coded Decimal Interchange Code. An eight bit code used primarily by IBM equipment.

Echo

The re-transmission of characters received by either the modem or remote system back to the DTE.

Echoplex

Method of verification of transmitted data by echoing the characters transmitted back to the source device for verification. Echoplex is sometimes called remote echo and, erroneously, half-duplex.

EEPROM

Electronically Erasable Programmable Read Only Memory.

EIA

Electronic Industries Association. Organisation in the USA that sets standards for the functional characteristics of electronic interfaces.

Electronic Mail

A means by which users of a particular bulletin board or videotex system can send messages to other users of that system. Some dial-up services deal exclusively with providing electronic mail facilities.

E-MAIL

See Electronic Mail.

ENQ

Control character used to enquire as to the identification or status of a remote device.

Even Parity

Even parity refers to the addition of a 0 value or 1 value bit to the data bits which form a character to cause an even number of 1 value data bits to be sent. See also Parity.

ETX

Control character which indicates the End of Text in a transmitted message.

F

Firmware

Computer program stored permanently in Read Only Memory.

Forward Error Correction (FEC)

Technique of transmitting additional information with the original data so that if small errors are detected the correct information can be recreated by the receiving end without requiring a re-transmission.

Frame

See Block.

Frequency Modulation (FM)

A method of transmitting information by varying the carrier frequency.

Frequency Shift Keying

A form of frequency modulation in which the frequency of the carrier is shifted between two frequencies to represent digital data.

Front-end Processor

Computer equipment designed primarily for communications control associated with a large mainframe.

Full Duplex

Data transmission which allows data to flow in two directions at the same time.

G

Gateway

An electronic connection of some type, generally transparent to the user, by which multiple computers can be connected together.

Graphics

Information in the form of pictures or images. Also, the display of pictures or images on a computer's display screen.

Guard Band

Narrow frequency band left unused between adjacent channels to minimize interference.

H

Half Duplex

Data transmission in which data may flow in either direction at one time, but not both directions simultaneously. Transmission direction is alternatively switched to allow two way flow of data.

Handshake

A predetermined interchange of signals between two devices to establish conditions for a transfer of data.

Hardware

The electronic or electro-mechanical devices in a computer system as opposed to the programs or software.

Hardware Handshaking

The use of special RS-232 signals to halt or commence the flow of data between two computers or terminals, between computers and modems or between facsimile machines. See also Software Handshaking, RTS and CTS

Harmonics

Frequencies which are integer multiples of some fundamental frequency.

Harmonic Distortion

A line impairment caused by equipment which distorts the original signal at multiples of the same fundamental frequency.

Hexadecimal Numbers

A number system with a base of 16. The first ten digits are represented by 0-9 while the last six digits are represented by A-F. Hexadecimal numbers can be easily translated from binary numbers and are easier for humans to understand and read than

are binary numbers.

HDLC

High Level Data Link Control. Communications protocol developed by the International Standards Organization.

Header

In communications protocols, this is the control information that precedes the message or text portion of a block of data.

Hertz (Hz)

Unit of frequency, one cycle per second.

Horizontal Redundancy Checking (HRC)

Technique in which redundant information is included with a block of data for validating the transmitted data at the receiving end.

Host Computer

A computer that manages information for many terminals. A host computer may be mainframe, minicomputer or a microcomputer.

I

ID Name

See ID Number.

ID Number

A security code, used mainly with remote systems that either charge a subscription fee, allow the purchasing of goods and services on line or both. The code is known only to the user and protects the user from unauthorised access to her/his account. See also Password.

Input

Information transferred into a computer from some external source, such as the keyboard, a disk drive, a modem or a scanner. Also, the act or process of transferring such information.

Input/Output Device

A device that transfers information into or out of a computer.

Interface

A physical point of interconnection between two devices where electrical signal levels, timing, handshaking and pin numbers are defined. The devices, rules or convention by which one component of a system communcates with another.

Interference

Undesirable disturbances or distortions in a data transmission signal.

Intermediate Page

An index page which, when used with another index page, allows users to perform double-digit keying.

I/O

Input/Output. The transfer of information into and out of a computer.

ISO

International Standards Organization.

J

Jack

A socket used for telephone line or other electrical connections.

K

Kermit

Kermit is a file transfer protocol developed for operating systems which could not

support the XModem protocol. Kermit was developed at Columbia University in 1981.

Keying

Videotex systems only. Refers to pressing of numeric keys to access an item from an index.

L

LED

Acronym for light emitting diode. See Light Emitting Diode.

Light Emitting Diode

A diode which glows when a current flows through it. Often used as an indicator light.

Link

A circuit or transmission path, including all equipment, between a sender and a receiver.

Local Echo

A method of communication in which your modem or software displays data locally on your screen, without relying on the host computer to echo the characters back.

Log on

To connect to or access a bulletin board or videotex system.

Log Off

To disconnect from a bulletin board or videotex system.

Longitudinal Redundancy Check

Error detection technique that consists of a byte where each bit is calculated on the

basis of the parity of all bits in the block in the same position.

Loopback

Directing signals back toward the source at some point in the communications path.

M

Mailbox

A term used to describe the holding, by a bulletin board, videotex or electronic mail system, of electronic messages (mail) for a user. Usually, the system will announce if the user has any unread mail when she/he logs on.

Mainframe

Large scale computer system composed of a large number of peripherals and comprehensive software.

Mark

One of the two possible states of a binary data element. The closed circuit and idle condition in a teleprinter circuit. Also see Space.

Modem

Modulator/Demodulator. A device to convert data from a computer or terminal into a form suitable for transmission across a telephone system.

Modem Eliminator

A usually passive device which takes the place of a modem between a local terminal which requires a modem and a computer.

Modulate

To modify or alter a signal so as to transmit information. For example, conventional broadcast radio transmits sound by modulating the amplitude (Amplitude Modulation, or AM) or the frequency (Frequency Modulation, or FM) or a carrier signal. See also Demodulate and Modem.

Monitor

A program or device used to observe an operation without interfering with the operation.

Multidrop Line

Single communications circuit interconnecting many stations (nodes) each containing terminal devices.

Multiplex

To interleave or simultaneously transmit two or more messages on a single channel.

N

NAK

Negative Acknowledgement. This control character indicates that the last block transmitted was in error and that the receiver is expecting a re-transmission.

Node

A point of interconnection on a circuit.

Noise

Random electrical signals introduced by components of the circuit or natural disturbances which can produce errors in transmission.

Null Modem

See Modem Eliminator.

O

Odd Parity

Odd parity refers to the appending of a 0 or 1 value bit to the data bits of a character to ensure that an odd number of 1 value bits are sent. See also Even Parity and Parity.

Off line

Describes equipment and activities connected to, but not currently accessible by, a computer.

On line

Describes activities and equipment currently connected to an accessible by a computer.

P

PABX

Private Automatic Branch Exchange. An automatic switchboard for handling large concentrations of telephones (extensions).

Packet

Group of bits including data and control elements that are transmitted as a whole.

Packet Switched Network

System where messages are transmitted in packets, each individually addressed and routed through the network.

Packetised Ensemble Protocol (PEP)

A patented data transmission technique used by the TrailBlazer modem to transmit data at up 18000 bps on the switched telephone network.

Parity

A simple method of error checking by which the number of data bits received are added together to ensure that the correct number have been received. Most bulletin boards do not use any parity checking.

Password

A second-level security device, generally being a set number of characters. The length and types of passwords used with bulletin boards varies from one system to another. On most videotex systems a four character password is used. See also ID Number.

PBX

See PABX.

PEP

See Packetised Ensemble Protocol.

Peripheral

(Or peripheral device). A device, such as a video monitor, disk drive, printer or modem, used in conjunction with a computer. Often (but not necessarily) physically separate from the computer and connected to it by wires, cables or some other form of interface.

Phase Modulation (PM)

A method of modulating the carrier wave based on the data by varying the phase relationship of the signal elements.

Point-to-point

A connection between two points as opposed to a multipoint or multidrop line.

Port

The point of connection, usually a physical connector, between a computer and a peripheral device, another computer or a network.

PROM

Programmable Read Only Memory.

Propagation Delay

The time required for a signal to travel from one end of a circuit to another.

Protocol

A set of conventions controlling the timing and format of data communications between two pieces of communications equipment.

Protocol Convertor

Device that converts from one protocol to another.

Public Domain Software

Software from which its author has relinquished copyrights. This software is free of charge and may be distributed for non-commercial purposes. Many bulletin boards and videotex systems carry public domain software for users to download. See also Shareware.

Public Switched Network

Telephone system providing circuit switching to many customers.

Pulse

An abrupt and relatively short change in voltage, either positive or negative, resulting in the conveyance of data in a circuit.

Q

Quadrature Amplitude Modulation (QAM)

A modulation technique which employs both amplitude and phase modulation to encode multiple bits in a single element.

R

RAM

Random Access Memory.

Received Line Signal Detector

See Carrier Detect.

Redundancy Check

Technique of error detection involving the transmission of additional data related to the message so that the receiving device can determine if the data transmitted is valid (error-free).

Remote System

Usually a bulletin board or videotex system that registered users or the public can dial up and communicate with via modem.

Request to Send

RS-232 control signal by the DTE to inform the DCE that it is ready to transmit data. When used for flow control between the DTE and the modem, this signal indicates to the modemthat the DTE is ready to accept data.

Ring Indicator

RS-232 control signal used by the DCE to inform the DTE that it is receiving a ringing signal.

ROM

Read Only Memory.

RS-232C

Frequently shortened to RS-232. A standard which defines the physical and electrical interface between Data Communications Equipment and Data Terminal Equipment. The most commonly used interface between modems and computers. Also known as ITU-T V24.

RTS

An acronym for Request To Send. This signal is generated by the terminal or computer indicating that it requires to send data to the modem. Used mainly in half-duplex communications.

S

SDLC

The standard Synchronous Data Link Control protocol used by IBM for products

which conform to its System Network Architecture.

Serial Data

Data transmission in which each bit of information is sent sequentially through a single data path.

Shareware

An extension of public domain software. Individuals can obtain copies of software for free from bulletin boards or other computer users. If the software is useful to them, they are encouraged to send a small fee to the program's author, usually for a printed manual, registration and any software updates that are available. See also Public Domain Software.

SIG

An acronym for Special Interest Group. Groups of user's who share an interest in a particular topic. Often SIGs set up bulletin boards, available only to SIG members.

Simplex

Data communications in one direction only.

Single-Digit Keying

Refers to videotex systems where you only need to press one numeric key from an index. See also Double-Digit Keying.

Software

Computer program or set of computer programs held in storage, and loaded into RAM for execution.

Software Downloading

Known as software downloading or teleloading on videotex systems and downloading on some bulletin boards. Refers to the transferring of software from a remote system to your computer.

Software Handshaking

A method of controlling the flow of data between two computers or terminals. Special control characters are sent from one terminal to the other in order to halt or re-commence the flow of data. See also Hardware Handshaking.

Space

One of the two possible states of a binary data element. The open circuit condition in a teleprinter circuit. Also see Mark.

Special Interest Group

See SIG.

Start Bit

When a character is transmitted asynchronously to another computer, a start bit always precedes the actual data. Seven or eight data bits, an optional parity bit and a stop bit will follow.

Stop Bit

The last bit or element transmitted in asynchronous transmission of a character to return the circuit to an idle state. One or two stop bits are sent at the end of each character of data.

Synchronous

A data transmission in which the time between characters is fixed by synchronising the transmitting and receiving communications equipment. The clock signal is typically derived from the data stream in order to maintain synchronisation.

Sysop

System Operator. This is the person or organisation who controls and maintains a videotex or bulletin board system. Most bulletin board systems display the name of their individual sysops when you first log on.

T

Telecommunications

The transmission of information across long distances, such as over telephone lines.

Tele-downloading

See Software Downloading.

Teleload

See Software Downloading.

Teletext

A non-interactive information system that was the predecessor to videotex systems. Teletext terminals consist of a specially modified television set and keypad to provide 24 lines of 40 column colour text and graphics. Connection is made to teletext systems by specially assigned television broadcast channels, hence the need to use a television set. Videotex terminals cannot access the information contained in a teletext system.

Terminal

An input/output device consisting of a typewriter-like keyboard and a display device, used for communicating with a large computer. Any device capable of sending and/or receiving data over a communications channel.

Terminal Emulation

Refers to the type of ASCII terminal your software will imitate (the control characters used to perform certain screen and cursor movement tasks vary from one terminal to another).

Text

The message portion of a data block in synchronous data transmissions.

Turnaround Time

The time required to reverse the direction of transmission when operating in half duplex mode.

U

Upload

Refers to sending files or text from the user's computer to another user, a bulletin board or videotex system. (Many bulletin boards that offer public domain software encourage users to upload their own programs so that other users can download them).

V

Vertical Redundancy Check (VRC)

A method of character parity checking.

Videotex

An interactive information system which is also known as Videotext or Viewdata. Videotex systems usually operate over switched telephone lines and allow 40 columns by 24 lines of colour text and graphics to be displayed on the screen. Information is arranged in pages, each page having a unique page number. Well known videotex systems include Prestel (Britain), Discovery 40 (Australia), and Minitel (France). See also Teletext.

Videotext

See Videotex.

Voice Grade Line

Channel with a frequency range of 300 to 3400 Hz suitable for the transmission of speech or data in analog form.

X

XModem

A communications protocol developed in the late '70s by Ward Christensen to perform error checking on data being sent between two computers.

XON/XOFF

Special control characters used to control the flow of data between your computer and a remote system. See Software Handshaking.

Y

Y Modem

An extension of the original XModem transfer protocol. Added features included transfer of file names, multi-file transfers, increased reliability of error checking and increased data throughput.

Z

ZModem

Designed to rectify some of the limitations associated with YModem as well as providing support for high speed, packet and network communications environments.

Specifications

Dimensions

Height: 107mm
Length: 132mm
Width: 23mm

Communications

33,600bps
31,200bps
ITU-T V.34 (2400-28,800bps)
ITU-T V.32bis (14,400bps)
ITU-T V.32bis (12,00bps)
ITU-T V.32 (9600bps)
ITU-T V.32 (7200bps)
ITU-T V.32 (4800bps)
ITU-T V.22bis (2400bps)
ITU-T V.22 (1200bps)
ITU-T V.23 (1200/75bps)
ITU-T V.21 (300bps)
Bell 212A (1200bps)
Bell 103 (300bps)
ITU-T V.17 (fax 12,000-14,400bps)
ITU-T V.29 (fax 7200-9600bps)
ITU-T V.27ter (fax 2400-4800bps)

Terminal Speeds

300bps - 115,200bps

Power

Supplied via computer expansion slot

Command Sets

AT commands (async mode only)
EIA Class 1 fax commands

Data Formats

Asynchronous: 7/8 data bits

Flow Control

RTS/CTS or XON/XOFF

Error Correction

V.42, MNP 2-4, MNP10, MNP10EC

Data Compression

V.42bis, MNP 5

Environmental

Operating: 0° to +45° C
Non-operating: -20° to +60° C

Humidity

Operating: 10% to 90% non-condensing
Non-operating: 5% to 90% non-condensing

Initialisation String

A suggested general purpose Init String for most communications programs:
AT&F-K0#C0S7=60

Contact Information

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Phone:	1 800 642 067or 9878 7473 in the Sydney metropolitan area
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