

Modem Software Questions

File: Modem Software Questions.sxw

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This document gives answers to some frequently asked questions about software. For more general modem-related questions, see "Modem Frequently Asked Questions", file mfaq.doc.

The answers in this document generally assume that the user has a 28800 bit/s or faster Maestro modem which supports V.34 and has a Conexant (formerly Rockwell) chipset. If that is not the case, then some modification of the advice given may be necessary, particularly the modem commands related to setting the maximum carrier speed. Some Maestro modems have a Lucent chipset. If something in this document refers to Lucent-based modems, then that will be noted. All 33.6k and 56k speed modems support V.34.

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Communications Software

Setting Up HyperTerminal

Q. When I try to use HyperTerminal (shipped as standard with Windows 9X/NT), it is all very confusing. How do I set it up so I can use it to do a basic modem test?

A. HyperTerminal is a "terminal program". Whatever you type on the keyboard goes out to the modem, whatever characters are received from the modem are shown in the terminal window, just the way it was with an old-fashioned dumb terminal. If HyperTerminal is not present on your copy of Windows, go to the Control Panel, Add/Remove Programs, Windows Setup, Communications, Details. Ensure that HyperTerminal is ticked. Click OK, then follow any further prompts from Windows.

Do Start, Programs, Applications (then Communications, in Win 98), click HyperTerminal. The HyperTerminal folder will pop up on screen, there will be various icons visible, such as "AT&T Mail". Note that the program HyperTerminal is not running at this stage, only the HyperTerminal folder is visible.

Double-click the icon Hypertrm.exe (the .exe may not be visible, depending on preferences set), the icon looks like a little computer monitor with a small yellow telephone. A HyperTerminal logo will come up, then a mostly white window will appear with a box entitled "Connection Description", asking you to enter a name. Enter the name "Direct to Modem" and press Enter. A "Phone Number" box will pop up.

Use the down arrow on the "Connect using:" line and click "Direct to Com x" line in the drop down list. For "Com x" substitute whichever com port your modem is connected to. Click "OK". A "COMx Properties" box will pop up.

Change Bits per second: to 115200 by clicking the down arrow, scrolling down the list and clicking 115200. The other settings will be Data bits: 8, Parity: none, Stop bits: 1, Flow control: Hardware. Click OK. You will see a mostly white screen. The white part is the "terminal window". Above it is the title bar, the menu bar and the tool bar. Below the terminal window is the status bar.

An important button in the tool bar is the Disconnect button, which is the fourth one along. Clicking it is equivalent to doing the menu selection Call, Disconnect. Try it. The word "Disconnected" will appear in the status bar. HyperTerminal will turn off DTR (pin 20) on the com port. Provided the modem has been properly initialised, the DTR light on the modem will go off, as well. Typing any character on the keyboard will make DTR come back on and the word "Connected" will appear in the status bar. If the modem was in data mode (that is, connected to another modem) when DTR went off, the modem would hang up.

Click File in the Menu bar, then Properties, a Direct to Modem box will pop up. Click Settings. Change the Emulation to ANSI, by clicking the down arrow and selecting from the list which drops down. Click OK. The box disappears. Click View in the Menu bar, then Font, a Font box will pop up. Click Terminal to select Terminal font, then click OK. The box disappears. You may resize the HyperTerminal Window to your taste by dragging any edge or corner. You may move it by dragging the title bar. Make sure you can see the Status bar just below the terminal window. Click File, Save.

The current settings in HyperTerminal will be saved in the file "Direct to Modem.ht" in the HyperTerminal folder, with an icon which looks like a red telephone and a small yellow telephone.

HyperTerminal is now set up to send commands to the modem and display responses from the modem on screen. If at any time you have quit from HyperTerminal and you wish to return to HyperTerminal to issue more commands to the modem, double-click the Direct to Modem icon in the HyperTerminal folder. Then issue the command string "ATZ" and press Enter. The modem should respond OK. Then you can issue more commands to the modem.

Now you are ready to do the "Basic Modem Test" procedure given in "Modem Frequently Asked Questions".

EasyLink Installation

Q. When I try to install EasyLink V1.1 or add the EasyFax printer driver, I get "Error 8095" or "Error 8097". What can I do?

A. What has happened is that you are missing a few files (such as Unidrv.dll) and the installation program could not find them. The easiest way to get them there is:

1. Uninstall EasyLink using Add/Remove Programs in the Control Panel. Delete any EasyFax Printer Driver out of the Printers folder. To get to the Printers folder, click Start, Settings, Printers.
2. Open the folder C:\Program Files and delete the folder "Maestro", if it is there. Find and delete from your system any files called "apfsendf.driv".
3. Click Start, Settings, Printers. You will see the Printers folder. See whether a printer "HP LaserJet Series II" is already present. If it is not, install it on LPT1, using the Add Printer wizard. Do not change the suggested printer name. Do not make it the default printer. Do not print a test page. Just make sure the printer is there in the Printers folder. Close the Printers folder.
4. Reinstall EasyLink. The EasyLink setup program will work with the defaults, except for the com port setting. When the setup program prompts, select the com port which the modem is plugged into. Most computers have two com ports, COM1 and COM2. Most modems are installed on COM2. Select COM2 if you do not know which com port your modem is on.
5. Click Start, Settings, Printers and check that the printer "EasyFax Printer Driver" has appeared in your Printers folder. If it has not, click Start, Programs, EasyLink 1.1, Install EasyFax Printer Driver. Then recheck that the printer "EasyFax Printer Driver" has appeared in your Printers folder. Close all open windows.

That will normally get EasyLink installed without error messages. If EasyLink will still not install and run error free, then you could use Microsoft Fax for faxes. That shipped with Windows 9X, but is difficult to set

up correctly. You could use HyperTerminal (also shipped with Windows 9X/NT) as a terminal program. It is preferable to get optional different software from Maestro, such as QuickLink Message Center, which should install without error.

Cannot Use EasyLink

Q. I get errors every time I try to use EasyLink. I have Microsoft Works or some other program incompatible with EasyLink. What can I do?

A. EasyLink is incompatible with MS Works. I do not know why that is, but if you have MS Works, then you cannot use EasyLink at all. EasyLink is also incompatible with Windows 3.X, Windows NT or Windows 2000.

It is recommended that you get QuickLink Message Center III from us. QLMC is our standard upgrade over EasyLink. QLMC has no problems with MS Works. On the one distribution CD-ROM, there are versions for Windows 3.1, 9x, NT/2000. There are Conexant and Lucent versions. QLMC is a capable and reliable Voice/Fax/ Terminal program for Windows. It supports distinctive ring, for example, Telstra's Faxstream Duet. It will also do adaptive answering. It sends and receives faxes. It can make a voice modem act like an answering machine. The terminal window supports a variety of terminal emulations and has a script language. QLMC is available direct from us for only \$20.00 plus \$7.00 postage. That is an excellent deal, similar software would be \$99 in the shops. Please quote your modem model number and serial number when you order. Please call Maestro Sales to make the arrangements.

Multi Player Games

Q. I'm trying to play a modem-to-modem game and I am having trouble getting an initialisation string that works. I have a Maestro modem, my friend has another brand. The game documentation says that it wants Flow Control, Error Correction and Data Compression all turned off. What do I do?

A. Game authors sometimes suggest turning off all sorts of useful modem features. For the Maestro modem, it is recommended that either:

(1) You leave your modem operating at full performance (recommended). Port settings: 115200 bit/s (port speed, baud rate), 8 data bits, no parity, 1 stop bit, RTS/CTS hardware flow control. Use DTR false to hang up. Init string:

```
AT&F&D2
```

(2) Alternatively, say you still insist on turning off buffering, flow control, error correction, data compression and retrain capability (not recommended). Chop your carrier speed right back so that phone line defects do not bother you all that much. Make sure the modem at the other end is set similarly. Port settings: 2400 bit/s (port speed, baud rate), 8 data bits, no parity, 1 stop bit, no flow control. Use DTR false to hang up. For a Conexant-based modem, use the init string:

```
AT&F&D2&K0%E0&Q0+MS=2,0
```

For a Lucent-based modem, use the init string:

```
AT&F&D2&K0%E0&Q0+MS=V22B,0
```

Make sure the modem at the other end is set similarly to yours. If you get to see the connection report then you could add "S95=45" to the init string to turn on more connection reporting. See the sections in the modem manual about register S95 for details. Disconnect all other telephonic devices from the telephone line (at both ends). Turn off call waiting (#43#).

If you can't use DTR being driven false by the computer to force hang up, take out "&D2" from the Conexant init string; in the Lucent init string, change "&D2" to "&D0".

You can use any ordinary terminal program (such as HyperTerminal) to experiment. Turn on local echo and outgoing CR->CR/LF translation, in the software. Set the suggested port parameters, issue the suggested init string, then see the modem response "OK". One end dials with an "ATDTnnn" command string, where nnn is the phone number of the answering modem. The other end answers with an "ATA" command string. Then you can conduct a "teletype conversation", send files to each other using Zmodem, etc. Once you have got it all sorted out using a terminal program, set up the game the same way.

Fax Software

Setting Up Fax Software

Q. I have installed my fax software, but what settings should I use?

A. Fax standards are now fairly well sorted out. There were ill-fated Group 1 and Group 2 standards. All modern fax machines and fax modems are Group 3. Group 3 modems can have Class 1 and Class 2 command sets. Class 1 can support error correction. All recent fax modems implement the same Class 1 and 2 command sets, so a generic Class 1 or Class 2 fax driver will almost always work.

Most fax software auto-detects the modem type, you do not need to specifically set it. If you do set it, choose "Class 1" at first. Some older 386-class computers work better with "Class 2", only select that if you are having trouble with Class 1. Class 2 was rather ill-fated, it was overly complex and gave no real improvement in performance. It is not present on all Maestro modem models.

Accept the initialisation string given by the manufacturer for fax. Usually, the initialisation string in fax software is actually a secondary initialisation string, so nothing is needed in it. Use hardware flow control. The Station ID -- also known as the Transmitting Subscriber Identifier -- should be set to the full international phone number of a fax machine or fax modem to which you would like return faxes sent to. For example, here at Maestro, the Station ID is set to "+612 6230 3142". Regarding the "+612",

international numbers are traditionally prefixed by a "+". The country code for Australia is 61. The STD code here is "02", but the leading "0" is not used in international numbers, only the "2". The "0" is actually a long distance access code, within Australia.

Much American software has a little quirk. The "Local Area Code" should be set to nothing, all blank. That is because if the software sees a phone number beginning with the local area code, it will automatically not dial those digits. That used to work fine in USA, but now causes trouble, including here in Australia. The "Long Distance Code" should also be set to blank.

Also set your banner. The banner appears at the top of every fax you send. Make it informative. Try sending a Quick Fax to someone.

QuickLink Receiving Faxes

Q. I have installed my Maestro modem and QuickLink Message Center III. The modem works fine for the Internet and sending faxes, but does not receive faxes properly, using QLMC. How can I fix that?

A. That is something to do with "TAPI", which is a modem-related part of Windows. Alas, TAPI is broken, presumably Microsoft will get it fixed one of these years. The answer is to set QuickLink Message Center (QLMC) to point at the com port directly. Then TAPI does not cause any trouble. Click Start, Settings, Control Panel. Double-click Modems. Click Diagnostics. Take careful note of what com port the modem is installed on. Close all open windows.

Start QLMC. Click Setup, Modem. In the "Select a modem" field, set "Direct to COMx", where COMx is whatever com port the modem is on. Click OK. Close and restart QLMC. Try receiving another fax.

Distinctive Ring with QuickLink and Lucent

Q. I have a Lucent-based Maestro modem, such as a Companion 56k Series 3. I have installed QuickLink Message Center III V3.2.3. I have followed the advice given in the previous answer to point QLMC directly at the com port which the modem is plugged into. I have distinctive ring enabled on my telephone line (with Faxstream Duet or Multiple Subscriber Number) and I can hear the different ring cadences on a telephone plugged into the line. I have set QLMC to use distinctive ring, but the modem always does what I have set for Ring A in QLMC, regardless of which ring has been received. It ignores the settings for Ring B, Ring C and Ring D. How can I make QLMC distinctive ring work properly?

A. The problem is caused by errors in the file HARDWARE.INI shipped with QLMC V3.2.3.

To correct the problem, do as follows: Close all open windows, close all running applications, especially QLMC. Double-click My Computer, you should see icons for all your drives. Double-click the icon with (C:) in the name, you should see the contents of Drive C, including many folders. Double-click the "Program Files" folder, double-click the "QuickLink Message

Center III" folder. Click View, Details. You should now see an alphabetically sorted list of folders and files. Scroll down to the file HARDWARE.INI. You may see the filename as just "Hardware", that is fine, that is the file you want, you just have Windows set to hide file extensions.

Using the RIGHT mouse button drag the icon for HARDWARE.INI slightly to the right, making sure no file other than HARDWARE.INI is highlighted. A menu will appear when you release the right mouse button. Left-click "Copy Here". A new file called "Copy of HARDWARE.INI" will be created. You have now backed up HARDWARE.INI, so that if something goes wrong, you can reverse out of your changes.

Go back to the original HARDWARE.INI and double-click it. Windows Notepad should start up, with the contents of HARDWARE.INI loaded.

Towards the end of HARDWARE.INI, there should be some text reading as follows:

```
RingCadenceA=20,40
RingCadenceB=8,4,8,40
RingCadenceC=4,2,4,2,8,40
RingCadenceD=
```

Modify that to read:

```
RingCadenceA=4,26
RingCadenceB=4,2,4,20
RingCadenceC=2,4,2,4,2,16
RingCadenceD=2,4,2,2,4,16
```

Do not alter any other parts of the file. Check your work carefully. Do not allow any mistakes to remain. Click File, Save. Exit from Notepad. Close all open windows.

You have now set QLMC such that:

```
Ring A = DR4 -- Ring cadence with single ring.
Ring B = DR0 -- Normal Australian double ring, as used for voice.
Ring C = DR7 -- Three short rings, for faxes under Faxstream Duet.
Ring D = DR6 -- MSN2, two short rings and a long.
```

Start QLMC. Click Setup, Preferences and set the action QLMC will take on the various rings, to be whatever you want QLMC to do.

For example, say you have Faxstream Duet and you want the modem to collect faxes on your fax number and ignore rings on the normal voice number. Set Ring A, Ring B and Ring D all to Ignore ring. Set Ring C to Fax only. Click OK. Test for proper operation by calling in to your various numbers, using a different telephone line.

Distinctive Ring on EasyFax

Q. I have the Telstra Faxstream Duet distinctive ring service enabled, with two telephone numbers on the one telephone line. The voice number produces the normal Australian double ring (Telstra calls it DR0). The fax number produces the fax ring, three short rings (DR7). How do I set up EasyFax Receiving so

that the modem will only answer on the fax ring and ignore the voice ring?

A. EasyFax is only suitable for Conexant-based modems. The basic requirement is that the modem command "-SDR=4" should be sent to the modem as part of the initialisation before commencing fax receiving.

Do Start, Programs, EasyLink 1.1, EasyFax Receiving. You will see the EasyFax Receiving Setup and Log window. Change the Modem Initial String to:

AT&F-SDR=4

Click Receive. The Fax Status window should appear and, after a few seconds, show "Status: Waiting for incoming call". If the Status line does not read that, click Cancel then click Receive again, that will usually fix it. The Status line must be correct to receive faxes.

You can use other programs while waiting for an incoming fax. The Fax Status window can be minimised by right-clicking on a blank spot in the taskbar (which has the Start button), then clicking Minimize All Windows.

Internet Software

Internet Voice

Q. Does Internet voice software need a voice modem to work?

A. No. With Internet voice software, the user speaks into a microphone plugged into the sound card. The CPU in the computer compresses the digital data stream from the sound card to a data rate low enough to go through the modem. The data goes out over the Internet to another user (via the modem at each end). The other user's CPU converts the data back to a form suitable for their sound card and they hear the first user speaking. All this happens simultaneously in both directions, thereby achieving voice telephony over the Internet. A perfectly normal voice conversation can occur, but since it is over the Internet, no long distance telephony charges are incurred. This technique is becoming more and more popular for International voice calls.

Any voice features in the modem slumber unused. The modem is being used just to transfer digital data, the job it is best at. Internet voice software is now of good useable quality, but it generates a heavy data load, so a high speed and reliable modem will help.

Some ISPs have computers set up, running Internet voice software, with a link to their local telephone system, so the person you are calling does not even need their own computer. They just get what appears to be a quite normal telephone call from you. They neither know nor care that some of the distance has been spanned by the Internet. However, you do need an ISP with suitable equipment in the same local call zone as your intended call recipient.

Internet Voice and Browsing

Q. Can I still do web browsing or other things on the Internet when I am using Internet voice software?

A. Yes. When Internet voice software is running, other Internet applications, such as web browsing or game playing can happen at the same time. The network software adaptively shares the data capacity of the modem between all running applications.

Of course, it is easy to fully load the modem under those circumstances, then one or more applications may become starved for throughput. Internet voice software will give better audio quality if it has more bits per second of throughput that it is allowed to use.

Internet Voice and SVD

Q. Now that Internet voice software is so popular, is it still a good idea to use Simultaneous Voice and Data (SVD) built into the modem?

A. No. SVD allowed you to have one telephone link carrying both a voice conversation and data at the same time. However, the voice and data could only go between the same two points. There are severe tradeoffs between voice quality and data throughput. SVD is difficult to set up. SVD can always be done better, just by using two telephone links, one for voice, one for data.

There are two kinds of SVD, AudioSpan SVD (ASVD) and Digital SVD (DSVD). ASVD uses a special modem modulation, but it is not really much use, the audio quality is poor, the data carrier speed is limited to 4800 bit/s and it is difficult to set up. It was never popular and its popularity is declining due to improvements in Internet voice software. DSVD gave better audio quality and data carrier speed, but was expensive to implement, needing an extra chip built into the modem. To do DSVD, both connected modems must support it, but DSVD modems are very rare. Our later high-end Executive series modems were the only ones which ever had DSVD. There were DSVD firmware problems. We only sold a few DSVD modems. DSVD is also heading for obsolescence, due to Internet voice software.

Internet voice gives you DSVD without needing a special modem. The computer does the mixing between voice and data. The modem is being used purely as a pathway for digital data, the job it is best at.

Thus ASVD and DSVD built into modems have become less and less popular. So those modem features are not really important. It is possible that we may never release another modem with DSVD. We include ASVD simply because it costs almost nothing, not because there is actually any significant customer demand for that feature.

Reported Speed has got Slower

Q. When I pass the mouse over the bottom right corner of the Netscape screen a message appears stating "x bytes sent y bytes received @ 31200 bps". When I was using the "Standard 28800 bps Modem"

modem type that comes with Windows this rate was 38400 bps. Why has it got slower?

A. The old modem type was reporting the port speed, a matter of no particular importance, provided it is fast enough. I recommend a port speed of 115200 bit/s, with RTS/CTS hardware flow control. The port speed is the speed through the com port, between the computer and the modem.

The new modem type is reporting the RX carrier speed, which is much more interesting. The RX carrier speed is the raw receive speed in bit/s over the telephone line. There is also TX, the raw transmit carrier speed over the telephone line, but Windows does not report that. The throughput of useful data is usually limited by RX, so higher RX is better. However, if RX is too high, the signal quality goes bad and a large proportion of the potential throughput is lost, due to retransmissions of packets. So there is an optimum RX. Similarly, there is an optimum TX.

It can take some experimentation to find these optimum RX and TX carrier speeds. RX and TX are controlled by numeric parameters in a +MS command, which is sent to the modem before connecting. The +MS command is put in the Extra settings string.

Measuring Throughput

Q. How do I measure the maximum possible throughput of useful data when I am connected to my ISP?

A. To measure throughput, pick an already compressed file (for example a ZIP file) of several megabytes on your ISP and download it. Downloading a file which is already compressed by software means that the modem's built in data compression can do nothing extra, so does not confuse the results. Choose a time of the day when the ISP is lightly loaded. Make sure the file is local to your ISP, or at a site known to have excellent high speed links with your ISP, so the limiting factor between it and you is your telephone line. Use an FTP program, not a browser. Browsers sometimes seem to be inefficient when doing downloads. Do not do anything else with your computer while the download is happening.

The FTP program should give you a box showing average throughput in thousands of bytes per second (kB/s). A better way of measuring actual throughput is to time how long the download takes in seconds, then compute:

$\langle \text{actual throughput in B/s} \rangle = \langle \text{file size in bytes} \rangle / \langle \text{download time in seconds} \rangle$

The expected throughput is RX/10 bytes/second, where RX is the receive carrier speed in bit/s. For example, say you have RX=40000, the expected throughput would be 40000/10 = 4000 B/s = 4 kB/s. You might see a little lower than that due to overheads in Internet protocols.

The actual throughput should be 95% or more of the expected throughput. Lower efficiency than that indicates that something is wrong.

Supervise Children on Internet

Q. I want to supervise my children accessing the Internet. Is there any software for that?

A. Yes. There is a lot of parental control software available with a variety of features. One very good place to find out is your local Tucows mirror. To find that, go to the website:

<http://www.tucows.com/>

Then find your local mirror site (that is, the nearest Tucows "affiliate"). Go to that site. Bookmark the site. Then click the operating system you are using (for example, Windows 95/98) and look for "Parental Control" amongst Security software. Click on that. You will see a list of possible programs. You may download the software you want straight away for free.

Win 9X/NT Performance

Dial-Up Networking and 56k

Q. I have a 56k modem and Windows 9X/NT. I am connecting to an ISP known to have 56k central site modems. I am getting unexpected hang ups. How do I fix that?

A. The standard rule is: If trouble, go DOWN in carrier speed. So, try reducing the carrier speed, using a +MS command in the Extra settings string. That should give you a more reliable connection. You may need to control RX, TX or both. What can happen is that a modem initially connects at a too high carrier speed, then it has bad signal quality, leading to poor throughput of useful data. If you help the modem by initially limiting the carrier speed, then that tends not to happen.

Briefly, the strategy is to initially connect at a low carrier speed and check that throughput is good. Then gradually go up one step at a time until things go bad again then back off one step.

Double-click My Computer, double-click Dial-Up Networking. In the Dial Up Networking window, click the connection to your ISP. In the File menu, click Properties. Make sure that the correct Maestro modem type is set in "Connect using". Click Configure. The setting in "Maximum speed" is the port speed in bit/s. Make sure 115200 is set. "Only connect at this speed" should be not checked.

Click Connection, Advanced. Click the Extra settings string, then change it to (Conexant-based modem):

%U1+MS=,,40000,1,,24000

For a Lucent-based modem, change the Extra settings string to:

+MS=V90C,0,0,24000,0,40000

Turn on the log file. Save settings and delete any existing modem log file (normally found in C:\Windows). For Windows 95, the modem log file is modemlog.txt. For Windows 98, the modem log file has the same name as the Windows modem type, with

a .txt extension. For example, "Maestro V.90 56k Modem.txt".

The Extra settings string above limits TX to a maximum of 24000 bit/s, RX to a maximum of 40000 bit/s. Those are good starting figures for most telephone lines.

Try another Internet session, checking for reliability and performance. After you have hung up, check in the modem log file and see what RX carrier speed you got. RX is reported in the line "CARRIER nnn", where nnn is RX. If you got RX=40000 and your Internet session was satisfactory, try going up in RX. Change 40000 in the Extra settings string to 44000. Allowable K56flex speeds are all integer multiples of 2000 bit/s. Allowable V.90 speeds are more complicated, see the chapter about the +MS command in the Jetstream user guide, file Jetgid22.doc in \Docs on the Maestro CD-ROM. That file is also available from the Maestro website, click on Support. If you have a Jetstream or Woomera modem, you should already have a printed book with details of the +MS command in it.

If you encounter problems with unexpected hang ups, or measure poor throughput, then further reduce RX. For details of how to measure throughput, see the section "Measuring Throughput" in this document. You may also need to try reducing TX.

As a last resort, you may need to force V.34 modulation, see the section "Dial-Up Networking and V.34" in this document. Also see the document "Modem Frequently Asked Questions", file Mfaq.doc, for more discussion of performance problems.

When you have completed all testing, turn off the modem log file, if you wish.

Dial-Up Networking and V.34

Q. I have a V.34 modem (or want to force V.34 modulation on a 56k modem) and Windows 9X/NT. I am getting unexpected hang ups. How do I fix that?

A. The advice is the same as in the section "Dial-Up Networking and 56k", but the +MS command to force V.34 is different. For Conexant-based modems, in the Extra settings string, try:

```
+MS=11,0,,24000
```

For Lucent-based modems, set the Extra settings string to:

```
+MS=V34,0,,24000,,24000
```

That will force V.34 modulation at a maximum carrier speed of 24000. That limit applies to both TX and RX. That should be a conservative figure for most telephone lines. Allowable V.34 carrier speeds are all integer multiples of 2400 bit/s, up to a maximum of 33600 bit/s. So, the next step up above 24000 would be 26400, and so forth.

Testing in Dial-Up Networking

Q. How do I test for carrier speed, signal quality and line level in Dial-Up Networking?

A. To get a good reliable connection with satisfactory throughput and avoid problems like "protocol failure", it is advisable to have a Signal Quality figure of 40 or below. The test procedure given here applies to modem models based on a Conexant chipset.

Exit from all running applications and close all open windows. Double-click My Computer, Dial-Up Networking. Right-click the icon for your ISP. Left-click Properties in the menu which appears. Make sure you have the correct modem type selected in "Connect using". Click Configure, Options. Make sure "Bring up terminal window before dialing" is off, no tick. Turn on, with a tick, "Bring up terminal window after dialing". "Operator assisted or manual dial" should be off. "Display modem status" should be on. Click OK. Click OK. You should get back to the Dial-Up Networking system folder.

Start your Internet connection. After the modem dials and negotiates, a black Post-Dial Terminal window will appear. You might see the welcome banner from your ISP in there, or just a flashing cursor. Re-size the window nice and big by dragging a corner.

Type +++ (just +++ do not press Enter). The remote system should echo those three characters, so you should see them. Then you should see "OK" on the next line. That comes from your modem and indicates that you have entered on-line command mode. Type:

```
AT%Q%L\V10
```

Note carefully, modem command echo will be turned off by Windows at this time, so you will NOT SEE the characters as you type them in. You are typing blind. It is all right to type in lower case. Be careful typing, that is letter O on the end of the command string, not digit 0. Then press Enter. The modem will respond with something like:

```
025
```

```
015
```

```
CONNECT 115200/V90/LAPM/V42BIS/  
28800:TX/50667:RX
```

The first number is the Signal Quality number (SQ=25, in this case), write that down. The second number is Line Level (LL=15), write that down, too. The last line reports: port speed, modulation, error correction, data compression, TX and RX, respectively. Write down TX and RX (TX=28800, RX=50667).

A handy alternative command is:

```
AT&V10
```

That gives a more comprehensive report, but it is still quite easy to find TX, RX, SQ and LL.

A good way of recording results neatly is to make a table with five columns: Service, TX, RX, SQ, LL. The service column is wide to allow remarks. Each row in the table corresponds to one test.

Now that you have the figures you want, try to return to your Internet session. Press Enter. You should get a prompt from the remote system. If you do not, try pressing Enter a few times. If no prompt or any other

response occurs, the ISP has neglected to turn off the escape sequence on their own modem. Their modem saw the +++ from you and is now uselessly sitting there in on-line command mode waiting for a command which it will never get. The only thing you can do is hang up, then dial again.

One way of dealing with the escape sequence problem is to initially enter a username then do +++ at the password prompt. Passwords should never be echoed in plain-text, so the ISP should take the +++ and echo something else, or nothing. Thus, their modem should not enter on-line command mode, then after you have seen the results from your modem, you should be able to press Enter and get another prompt from the remote system.

Assuming you do get a prompt, respond appropriately to the prompt. If you have not put in your username yet, a password prompt can be ignored, by just pressing Enter. Eventually, by responding correctly to prompts, you should get to the point where the remote system says something like, "Starting PPP. Your IP address is nnn" where nnn is a number. Then you see about half a line of gibberish which repeats every few seconds. That is PPP trying to start. As soon as you see something like that (there are many variations), then press function key 7 (F7). Windows should fiddle around for a few seconds then announce that you are connected. Start your web browser and check that everything is working normally.

If the signal quality is less than 40, that is OK. If over 40, further reduce RX, by changing the maximum RX allowed in the +MS command, in the Extra settings string. If SQ is under 40, try a higher RX. Stop when you have the highest RX which still routinely gives you SQ less than 40.

When you have finished testing, feel free to turn off the Post-Dial Terminal window and go back to connecting to your ISP without it.

"No response from Modem" Dialog Box

Q. In Windows, I keep getting a dialog box saying "No response from Modem". What can I do?

A. There are several possible reasons for this:

1. Modem switched off or unplugged.
2. Error in Extra settings string.
3. Wrong com port is selected.
4. Wrong modem type is selected.
5. Wrong port speed has been selected.
6. Modem has crashed internally.
7. Windows has turned off result codes.
8. Faulty com port or faulty modem.
9. Other Windows problems.

These factors are discussed below.

1. Modem switched off or unplugged.

This is the most common case. Check that the modem has lights on or display activity. Check the plug pack power supply is correctly plugged in. Some modem models have a speaker socket on the back which is

easily confused with the power inlet. The power switch on the modem should be on. Make sure that data cable from the modem to the computer is correctly plugged in at both ends.

2. Error in Extra settings string.

If there is a mistake in your Extra settings string, the modem will respond "ERROR" when Windows sends the string to the modem. That can be seen in the modem log file. BUT then Windows LIES to you and reports no response from the modem. Try clearing the Extra settings string or changing it to something known to be correct. If you are uncertain whether an Extra settings string is correct, try it in a terminal program, such as EasyLink Terminal or Windows HyperTerminal. When you do, do not forget to put in the "AT" needed at the beginning of the command string. An Extra settings string does not have the "AT", since Windows puts it in automatically.

3. Wrong com port is selected.

If the computer is trying to talk to the modem on a com port which the modem is not plugged into, then it will not work. This often happens when someone moves their computer and when they put it back together again, they accidentally swap over the connectors used for the mouse and the modem. The mouse keeps on working because Windows automatically searches all com ports for it. Alas, Windows is not so smart with the modem. Either change the com port selected in Control Panel, Modems, Properties, or, swap the connectors over again.

4. Wrong modem type is selected.

If the wrong modem type is selected in Windows, some unusual initialisation string could be sent to the modem. That string might have a command in it which the modem does not recognise, then the modem will respond "ERROR". Then Windows will lie that it is receiving no response from the modem. Fix the modem type selected in the Connect using field. How nice it would be if Windows could have truthful and informative error messages.

5. Wrong port speed has been selected.

Some older modems cannot cope with higher port speeds, then they do not respond to commands. For example, the maximum port speed of the old metal case Super Executive is 38400 bit/s. The port speed is in the Maximum speed field. All recent Maestro modems can cope with a port speed of 115200 bit/s.

Some faulty com ports have been observed which work fine at low port speeds, but fail at higher port speeds. For example, you may have a 56k modem, able to take a port speed of 115200 bit/s, but when testing in Control Panel, Modems, Diagnostics, select com port, More Info, you found that the Highest Speed is shown as "56K Baud". That means that the maximum port speed is 57600 bit/s, so set that in the "Maximum speed" field of your software. For Windows Dial-Up Networking, right-click the icon for your ISP, left-click Properties. Make sure you have the correct modem type set in Connect using. Click Configure. Set

Maximum speed to 57600. Click OK. Click OK. Try your Internet connection again.

Do not tolerate a faulty com port. Get your computer repairer to replace the port as soon as possible.

6. Modem has crashed internally.

A modem has its own little CPU which can crash just like any CPU can. This is most likely to happen if the modem is having difficulty getting connected. If you are hearing the white noise sound, that happens just before the modem speaker cuts off, multiple times, that is a bad sign. Once the modem has crashed, the only way to make it recover is to power it off then on. Try reducing the carrier speed. That will usually allow the modem to connect easily and it will not crash. Start a terminal program and see if the modem is still answering commands. If it is, it has not crashed. If it will not answer commands, but recovers when modem power is turned off then on again, then a crash probably happened. Later firmware is often less crash-prone than earlier firmware. Do an AT+I3 command, write down the result, then call Maestro Technical Support to see if you have the latest firmware.

7. Windows has turned off result codes.

Some early versions of Windows 95 seemed to have a habit of turning off command echo (E0) and result codes (Q1), then sending a command to the modem and finding no response from the modem. Turning the modem off then on will restore command echo (E1) and result codes (Q0), then Windows stops complaining about no response.

For internal modem users, an alternative to switching the modem off and on is to start a terminal program, then issue the command string "ATZ", the modem should respond "OK". Command echo and result codes should be restored. Exit from the terminal program and retry the software which was giving the "No response" box.

8. Faulty com port or faulty modem.

The modem has no hope of doing anything for you unless the com port in the computer is working perfectly. Then the modem must be working properly. Try doing a basic modem test, as explained in "Modem Frequently Asked Questions". That may in turn refer you on to doing a simple port test. That will resolve whether it is the com port or the modem at fault.

9. Other Windows problems.

Sometimes a basic modem test works well, but some Windows program, for example, Dial-up Networking will not work. Try reinstalling the program which is having trouble. As a desperation measure, totally reinstall Windows.

Check that you have a Maestro modem type installed in Windows. Go to Control Panel, Modems. Click Add, Don't detect, manufacturer Maestro Digital Communications, model Maestro Executive 288, select the correct com port, finish the installation.

Maybe getting the latest Win 9x/NT driver file from our Internet site might improve things. Maybe changing to a 16550 com port could be good.

The real cause of such problems is in the design of Windows. If you like, Maestro can check your modem and make sure it is working 100%, send it back to Maestro. This service is free if the modem is still under warranty.

Setting the Stored Profile

Q. I am worried that something in my stored profile might be causing trouble. How do I send a reasonable initialisation string to the modem, get back OK, then save the settings in stored profile 0?

A. To do this, start a terminal program, set the port to: speed 115200 bit/s, 8 data, no parity, 1 stop, RTS/CTS hardware flow control. Send the following initialisation string to the modem:

```
AT&FT&D2S91=14S95=45
```

Press Enter and the modem should respond "OK", then issue "AT&Y0&W&V". You should see a display of the current profiles. A Lucent-based modem has only one profile. When the modem is powered up, it restores its active profile from stored profile 0 (assuming &Y0 is set). So, power off then on, or sending ATZ, will restore reasonable settings to the active profile.

Dial-Up Networking Example

Q. How do I control the carrier speed in Windows 9X Dial-Up Networking, using the +MS command?

A. Initially try a low and conservative carrier speed, such as V.34 at 24000 bit/s. For a Conexant-based modem, put into the Extra settings string:

```
+MS=11,0,,24000
```

For a Lucent based modem, put into the Extra settings string:

```
+MS=V34,0,,24000,,24000
```

To get to the Extra settings string, in Dial-Up Networking, right-click your ISP's icon, left-click Properties. Click Configure, Connection, Advanced, then in the Extra settings string itself. Then you may modify the Extra settings string. Be warned that the Extra settings string is actually stored in the Modem Properties, not the ISP icon, so it will change everywhere that particular modem name is used in the Connect using field. You can see the currently set up modem names in Control Panel, Modems. If you want multiple Extra settings strings to play with, set up multiple modem names in Control Panel, Modems. Having multiple names set up for the one modem does no harm, Windows copes with that quite happily.

Performance should be moderate with excellent reliability. Then try higher carrier speeds, such as 31200. For a Conexant-based modem, change Extra settings to:

```
+MS=11,0,,31200
```

For a Lucent-based modem, change Extra settings to:

```
+MS=V34,0,,31200,,31200
```

If that works fine, and you have a 56k modem, try 56k modulation again. For a Conexant-based 56k modem, make Extra settings:

```
+MS=,0,,36000,1,,24000
```

For a Lucent-based 56k modem, make Extra settings:

```
+MS=V90C,0,,24000,,36000
```

That sets RX to a maximum of 36000 bit/s and TX to a maximum of 24000 bit/s. That should be conservative. See the chapter all about the +MS command, in your modem documentation, for more details on what allowable TX and RX speeds you can set. It is better to err on the low side than the high side.

Lucent-based modems do not have user control over the data transmit level.

In Conexant-based modems, it may help to experiment with the data transmit level. That is controlled by register S91. The default is S91=14. However, say you wanted to try S91=15, then your Extra settings string might be:

```
S91=15+MS=,0,,36000,1,,24000
```

Some experimentation may be necessary to find working settings.

Win 9X/NT Installation

Cannot Install

Q. I cannot see how to set up my modem in Windows 9X/NT. What do I do?

A. Most of the time, all that is necessary is to plug the modem in, turn it on, put the Maestro CD-ROM into the CD-ROM drive, restart the computer, then follow the prompts. That is the standard Plug and Play (PnP) procedure. If PnP is working, that will get the correct modem type set up in Windows. Then that correct modem type should be selected in the "Connect using" field in modem-related software, such as Dial-Up Networking.

For more detailed instructions, read the file called Readme.wri on the Maestro CD-ROM. To get to that file, first put the green-and-purple Maestro CD-ROM into your CD-ROM drive. Then double-click My Computer. You should see a window with icons for various drives in it. Double-click your CD-ROM drive icon (usually Drive D). You will see some folders and files including a file called Readme.wri. You might see the name as just Readme, that is the same thing. Double-click on that. Wordpad should start and show you the title "Maestro CD-ROM Installation". Click File, Print, OK. The document should be printed. Close Wordpad. Follow the instructions in the document.

There is another document, called Mininstall.txt, which is in the folder \Inf on the Maestro CD-ROM. Print that file if you are still having trouble setting up your modem in Windows.

Modem Model Selection

Q. I have been having trouble setting up my Maestro modem in Windows Control Panel, Modems, then manually selecting the modem from a list. I am not sure which manufacturer or model to select. I can't find my particular modem model number. What should I do?

A. Sometimes many modem models are covered by only one Windows modem type. That is why modem model numbers are not put in the modem type.

Jetstream and Companion modem types are equivalent. The manufacturers "Maestro Digital Communications", "Maestro Pty Ltd" and "Modem Research Pty Ltd" all refer to us. The INF file for Maestro Digital Communications is shipped with Windows 9X, that was a very early version of our INF file, but still quite usable. In the latest INF file, Maestro Pty Ltd has all modem models. Modem Research Pty Ltd is now gone. Select the model with the closest feature set to your own modem, based on the brief description given where the modem model number should be.

Wave Device Driver for Voice Modem

Q. When I installed my voice modem, Windows said it had found new hardware - a wave device for voice modem, but I was unable to locate a driver for this, nor set it up correctly. Where is the driver?

A. That .wav driver for the modem is not so important, since all it allows you to do is play .wav files through the modem, which is a task better left to the sound card.

Nonetheless, support can be installed. The files maewav.inf (for Conexant-based modems) and maewav3.inf (for Lucent-based modems) are available on the Maestro CD-ROM (in the \Inf folder), and on our FTP site (at <ftp://ftp.maestro.com.au/Win95NT/Inf>). Copy the files into the C:\Windows\Inf folder. That folder is normally hidden, so you may need to make it visible by clicking on View, Options, View, Show all files.

Restart the computer and when the box about the wav device appears, click "Select from a list of alternate drivers", then select the manufacturer "Maestro Pty. Ltd.". If you cannot find the manufacturer "Maestro Pty. Ltd.", you still do not have the files in the right place. The model "Maestro Modem Serial Wave Device" will be automatically shown. Click OK.

Windows should then stop complaining about the wave device. If that does not work, you have encountered a bug in Windows; alas only Microsoft can fix that.

Modem INF File Does Not Work

Q. When I try to install the latest modem INF files, Win9X still does not let me use the correct modem type and I have to revert to the Win95 "Standard 28800

bps Modem". This is after following your installation instructions. What is the problem?

A. Alas, a very few people do seem to be having trouble with the new INF files. It is uncertain why this is happening. Even later INF files may help, but they are not available yet. Please check our Web site for an announcement when a new version is ready.

In the meantime, check most carefully that there is a copy of the latest version of all the INF files in the folder C:\Windows\Inf, or preferably, in C:\Windows\Inf\Other. Some of the INF files may have been renamed by some early versions of Windows 95 to Oemxx.inf, where xx is some number. Check those files as well. INF files are just text files and you may inspect one by double-clicking on it, then Notepad will automatically start. The version number is normally given in a comment near the top of the file.

As a last resort, you can use the Maestro INF file shipped with Windows 95. In Control Panel, Modems, General, click Add to install a new modem type. Select "Don't detect my modem ...", click Next. Select the manufacturer "Maestro Digital Communications", model "Maestro Executive 288", click Next. Select the COM port which the modem is plugged into, click Next. Click Finish. You may then select that modem type in all native Windows 95 modem-related applications.

It is not particularly necessary is to upgrade the INF files to the latest version, it gives you more convenient access to a few extra modem features, the basic performance of the modem is unaffected.

Auto Detect Routine Malfunctions

Q. I have a Companion MR336FVE which is installed with the correct driver which I downloaded from your Internet site, however Windows keeps telling me I have a new 33.6 modem each time it boots. I cancel this and then it then tells me I have a wave modem device through auto detect, which according to the system is already correctly installed. Can you help?

A. Do not click Cancel, Windows interprets that as meaning "Ask me again later". Click Next. Then keep on clicking Next until Windows gives up trying to install a driver. Maybe installing the Windows "Service packs" might help. Installing a later version of Windows might help.

Windows 9X System Resources

Q. In Windows 9X, how do I set COM3 to its usual I/O address range and use IRQ5?

A. Do Start, Settings, Control Panel and double-click System. Click Device Manager, double-click Ports (COM & LPT), click COM3. If there is no COM3 present, quit back to the Control Panel and double-click Add New Hardware, then add a standard communications port. You will not have control over the system resources at that stage, just accept whatever Windows puts up. When you have COM3 selected, click Properties, Resources. You will see the system

resources used by COM3. Input/Output Range should read 03E8 - 03EF. Interrupt Request should read 05. If they are not correct they must be changed. Let us suppose that the Interrupt Request is wrong. Select Interrupt Request and click Change Setting. Alas, Microsoft has introduced something called "Setting based on: Basic configuration n", where n is some number. You will need to pick a Basic configuration number where Windows will allow you to change the Interrupt Request to what you want. There does not appear to be any way to tell which Basic configuration works. It is just a matter of trial and error. Basic configuration 5 seems to work. When Change Setting works, set the Interrupt Request to 5. Click OK. Recheck most carefully, that the Input/Output Range and Interrupt Request settings are as you want them. The Conflicting device list should read: No conflicts. If there are conflicts, you will need to review the cause and decide how to resolve the conflicts. That is a matter beyond the scope of this document. Once the resources are as expected, click OK a few times to save the settings. Restart Windows. Go back into Control Panel and recheck the settings.

Linux

Drivers for Companion 56k Internal PCI

Q. Can I get Linux drivers for my Companion 56k internal PCI modem?

A. Yes, but you must be running Linux version 6.1 or later. The driver is available on the web at:

<http://www.linmodems.org/>

Drivers for Externals

Q. Can I get Linux drivers for my Maestro external modem?

A. No special drivers are required. Your Maestro external modem is a full featured modem with its own controller built in. It wakes up ready to accept and do AT commands. Just do the normal three step process to get connected, just like on any high-end modem. That is:

1. Set the com port parameters to something reasonable. I recommend: port speed 115200 bit/s, 8 data bits, no parity, 1 stop bit, RTS/CTS hardware flow control, use DTR false to hangup.

2. Send a reasonable initialisation string to the modem and get back OK. For Jetstream external modems, I recommend:

```
AT&FT&D2S91=14S95=45
```

3. Send a dial command to the modem and get back a connection report.

Then the modem enters data mode and it acts like a transparent magic box, it transfers bytes from computer

to computer, without error, in both directions simultaneously. The modem neither knows nor cares what the meaning of the bytes is. What usually happens then is that the remote system gives you a "Username?" prompt and you carry on from there.

The three step process is so simple and easy that you can do it by manually typing characters and seeing the responses in a terminal program. Most terminal programs will let you save your settings for steps 1 and 2, so they get done for you automatically when you start the terminal program. So all you have to do is start the program, then type in the dial command and press Enter. Quite a few will allow you to save the dial command on a function key, so it is even easier, start the program, hit the function key. I most strongly recommend you get a terminal program and have a play with it to reassure yourself how utterly simple it is to make a modem dial and connect.