Line Noise Essay, Research Paper

Line Quality Guide

Achieving a reliable Internet connection as close to 56K as possible is something every Internet user strives to achieve. However, due to line conditions and phone companies, the dream of every surfer is shattered into something reminiscent of 5 year old 33.6 technology.

The general rule of thumb is that to obtain speeds greater than 33.6, one must live within 2-3 miles of the telephone company’s switch box. The further out, the more degraded the connection speed becomes.

Connections speeds suffer especially in rural areas and old houses where some phone wiring has not been changed since the 1950’s.

The phone company must maintain certain standards of line quality going to your home. However, the trouble arises because of the discrepancy in the phone company’s definition of “quality lines” and the quality needed for an Internet connection. Some phone companies will say your lines are in good shape merely if you have a dial-tone and can successfully make a call. Yet, to obtain a near-56K connection, much more precision is required in determining line quality.

So just how good are your lines? The proceeding instructions will help you get an estimate of your line quality.

First, do the obvious and make sure the modem has been updated with the latest drivers.

NOTE: If Windows reports you are connecting at speeds of 38400, 57600, or 115200, these are Port BPS numbers (the transfer rate between the computer and the modem) not Connect BPS (the transfer rate between the modem and the ISP). This is usually caused by incorrect drivers, generic drivers, or incorrect Modem Initialization Strings.

The method of obtaining the decibel values works best with a 3com, USRobotics, and Rockwell modems/chipsets. It may or may not work with other types of modems.

The following is the HyperTerminal approach to retrieving modem statistics. If you have trouble with HyperTerminal or prefer an alternative approach, you might try using Tony’s Modem Check available at http://808hi.com/56k/modemchk.htm

First disconnect from the Internet. Launch HyperTerminal by going to Start -\* Programs -\* Accessories -\* Communications -\* HyperTerminal. Then open Hypertrm.exe. If HyperTerminal is not installed, it can be added at Control Panel -\* Add/Remove Programs -\* Windows Setup -\* Communications.

It will prompt you for a friendly name for your connection, followed by the phone number to dial. Enter your ISP’s access number and dial. Once connected, your ISP may prompt you for a username and password. Type three plus signs (+++) and do not press Enter–it will carriage return itself in a few seconds.

Now, try each of the following commands:

ATI11

ATI3

ATI4

ATI6

ATI7

AT&V

AT&V1

ATY11

AT#UD

Each will display statistics about your modem, drivers, and last connection. Do not panic if some display “Error”, these commands don’t work with every modem.

NOTE: Some modems may not Echo properly, which means that you may not see any text you type on the screen. Just type the commands as you normally would and the terminal should still display the results.

Look for the command that displays a screen like the following:

Freq Level (dB)

300 27

450 21

600 21

750 21

900 21

1050 21

1200 21

1350 21

1500 21

1650 21

1800 21

1950 22

2100 22

2250 22

2400 23

2550 23

2700 23

2850 24

3000 24

3150 26

3300 28

3450 31

3600 43

3750 58

Take the dB value for 3750 and subtract the value of 3300. In this case it is 58 – 28 = 30. Now, if the calculated value is less that 18 dB, your line is very good quality. If is is larger than 18 dB, then there is noise that can greatly reduce your connection speed.

In the example above, the 30 dB difference means that there is significant line noise, and in practice, the best connection I have achieved on that line is 26400.

If there is a significant amount of noise on your line, first try checking the cord between the computer and wall jack. Make sure that cord is short as possible (a standard 6′ cord is ideal). Make sure it is not wound up or tangled among other electrical cords. A phone line surge protector is a very good idea, but try bypassing it and seeing how much noise reduction you get without it in your phone circuit.

Unplug all other phones in the house from their jacks and see if that reduces the line noise. Remember, you must reconnect to your ISP each time you want refreshed dB statistics.

Pick up a phone in the house, set it to its loudest volume setting, press “1″ to get rid of the dial tone, and listen for any crackling, popping, or hissing.

If so, call your phone company and have them run a “Static Check” on your line. The Static Check is usually free, but if you request a technician to make a house call and look at your line, it runs around $30. This may be a worthwhile investment if it can add a good 10 Kbps to your connection.

If you are feeling desperate, you might even try rewiring the cable between the jack and the phone box outside yourself.

In most cases, if the lines are very poor, an analog connection is faster and more reliable than a digital one. If you cannot break speeds of 33.6 with a 56 K modem, call up your ISP and ask if they have an analog number. If not, go into your dialer’s properties and add 3 commas after the ISP’s phone number (ie. 555-5555,,,) This will cause it to skip the 56K handshake and force an 33.6 analog connection.

In the example calculation above (the one with the 30 dB difference), the modem on that connects 4.8K faster on an analog connection than a digital one. But remember, the highest speed that can be achieved with an analog connection is 33.6K, so if you are connecting faster than that, remain digital.

The dB information will probably have no effect in persuading the phone company to lay a new fiber-optic trunk to your house, but it can be a useful tool in diagnosing connection trouble