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TITLE

Troubleshooting Unreliable Modem Connections

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TOPIC

When a successful dial-up connection is unexpectedly interrupted, Apple Remote Access responds:

"You have been disconnected."

And when similar circumstances prevent the connection from completing:

"The connection attempt failed. The activity log may have suggestions for fixing problems."

If this becomes a recurring problem, use this troubleshooting path to help identify solutions.

DISCUSSION

The occasional lost connection is to be expected given the nature of the technology and the typical operating conditions. An unreliable connection is suggested when disconnects occur more frequently, often shortly after the connection has been established.

Note: Where Open Transport/PPP is installed, substitute "PPP control panel" for "Remote Access control panel" throughout the instructions that follow.

Step One: Check the idle timeout and protocol settings

If the disconnect always occurs after a specific interval of time, or only after a period of network (Internet) inactivity, the problem may be related to either the "disconnect if idle" setting of Remote Access or the idle timeout policy of the Internet Service Provider (ISP).

a. Open the Remote Access control panel, click the Options button, then click the Connection tab. Click the "disconnect if idle" checkbox to disable it if necessary, or enter a larger number. Most ISP's will terminate the connection after similar periods of idleness. Check with your ISP for specifics.

b. Click the Protocol tab. It should be set correctly for the type of connection in use. Standard dial-up Internet connections use the PPP protocol, not the Apple Remote Access Protocol (ARAP). The hardware or software setups of some Internet Service Providers may not permit connections when the protocol is set to Automatic.

Step Two: Check for physical connection issues

If the disconnect can be encouraged by moving the modem or its associated cables, check them for secure connections and signs of damage.

Try a different, known-good telephone cable if available, then test using a direct modem-to-outlet connection. If movement still breaks the connection, seek service.

Step Three: Configure the Modem control panel

Configure the Modem control panel to use the modem script appropriate for the modem. Apple-branded internal modems use these scripts, by computer:

Computer	Modem Script
Power Macintosh G3 (Blue & White)	PowerMac G3 Internal 56K, PowerMac G3 Int56K (v.34 Only)

PowerBook G3 Series	PowerBook G3 Internal 56K, PowerBook G3 Int56K (v.34 Only)
iMac	iMac Internal 56K, iMac Internal 56k (v.34 Only)
Power Macintosh G3 & Power Macintosh 6500	Apple/GV 56K
PowerBook 3400 & PowerBook G3	PowerBook 3400/G3 Internal 33.6
Geoport Telecom Adapter (internal or external)	Geoport/Express Modem

Figure 3: Modem control panel.

Step Four: Disable call waiting

When an ongoing modem connection is interrupted by a call waiting tone signifying an incoming call, the modem will usually disconnect. Disconnects related to call waiting are random and don't usually occur only at precise intervals or always shortly after connecting.

If call waiting is enabled on the telephone line used by the modem, open the Remote Access control panel and enter *70,, before the telephone number. The extra comma, signifying an additional pause, is optional but occasionally necessary to allow the command sufficient time to be acknowledged.

If your line requires pulse dialing, use 1170,, instead. Call waiting will only be disabled for the duration of the connection.

Your local telephone company may require different numbers or may not automatically provide this feature.

Step Five: Troubleshoot interoperability issues between modems

Where modems of different makes, models, firmware/flash-ROM revisions, and chipsets are concerned, one modem may have an incompatible method of implementing a connection that it has negotiated with the other modem, or the negotiation itself may fail. For example, if a modem cannot sustain the current connection speed but is unable to successfully negotiate a slower connection with the other modem, the connection will incur excessive transmission errors, decreasing throughput and potentially forcing a disconnect.

a. If your modem can be flash-ROM upgraded via software, apply the most recent modem update available. Apple 56K modem updates are available online. The latest firmware code may make the two modems more compatible--or less.

b. Disable 56K protocols in favor of V.34. Limiting the modem in this way may reduce or eliminate the need for the modem to make as many adjustments in response to poor line conditions, potentially sidestepping interoperability issues altogether. This change is incorporated into the "V.34 Only" modem scripts available for some Apple 56K modems. A variety of other modem manufacturers supply similar ARA modem scripts for their modems. If you are connecting to the internet using software that does not use modem scripts, supply the software with a V.34 initialization string appropriate for your modem. Your ISP may be able to assist you, or you can teach yourself the proper initialization string by studying the AT command guide provided with your modem or available online from the manufacturer.

c. Ask your ISP whether different modems are available via an alternate dial-in number, or switch to an ISP that provides different modems (call them first, as they may already know of issues they are having supporting the modem you are using). Perhaps borrow a friend's Internet account, obtain a trial membership with another ISP, or **connect to a PPP test server** if you know of one. If all else fails, you may wish to go so far as to try a different modem yourself--one that your ISP recommends for best compatibility.

Step Six: Reduce signal interference & distortion

The telephone network path between modems must be sufficiently free of noise and frequency distortion to permit a stable connection. The modem analyzes these line impairments as they affect the quality of the transmission signal. Poor signal quality causes transmission errors, reduced throughput, reduced connection speed, and dropped connections.

a. Experiment with eliminating potential sources of line impairments in the home:

- Any device connected to any telephone outlet, especially if used by the modem, and even if on a different line: telephones, including cordless telephones and their base stations, answering machines, fax machines, caller ID boxes, and other modems

- Telephone line splitters, cable extenders, faulty or overly long telephone cables (shorter is better)
- Surge protectors, including those that offer telephone line protection
- Alarm systems, especially those that are connected to the telephone system
- Computer equipment, including speakers
- Fluorescent light fixtures and light dimmers
- Satellite dish receivers
- Appliances such as air conditioners, refrigerators, dryers, microwave ovens, and televisions
- Any AC power source and related cabling
- All other things electrical, including problems with the premises wiring: loose or corroded connections, too many splices or bridges, insulation deterioration and exposed wiring, non-twisted pair telephone wiring

Start with a direct, unobstructed, modem-to-outlet connection using a short, high-quality telephone cable. As a way of confirming the problem prior to isolating it any further, there is the option of testing with a direct connection to the external telephone box located at the back or side walls of the residence. It provides one or more standard telephone jacks supplying the home telephone connections but bypassing most impairments inside.

b. Listen for noise. Because the telephone company is only obligated to provide voice-quality phone lines, it is unlikely to address the many and varied off-premises sources of line impairments that can affect the connection but don't cause audible noise. Connect a telephone to the wall jack used by the modem, then pick up the line, dial the number 1 to stop the dial tone, and listen. Contact the telephone company if the line is not quiet (loud hiss, pops, static, voices), but first disconnect other telephone devices and check again.

c. Use a local dial-in number to your Internet Service Provider. Long distance and 800 numbers aren't typically a concern, but may cause the call to be routed through more facilities, indirect paths, and different carriers with different types of equipment and lines. Local calls may be auto-forwarded in the same manner, but most reputable ISP's don't engage in this practice.

If daunted by these varied and uncertain possibilities, consider carrying the computer to a local Apple service provider for testing on analog lines of confirmed quality.

Step Seven: Configure the Extensions Manager control panel for Mac OS All

Realistically, these last two steps are unlikely to address this particular kind of problem. Nevertheless, the possibility that extensions troubleshooting or clean installing will resolve is one that cannot be discounted, so be sure to try these if all else fails.

a. Open the Extensions Manager control panel and select whichever Mac OS All set is available from the Selected Set menu. For example: Mac OS 8.6 All, iMac All, and so on.

b. If the modem requires any of its own extensions (excluding fax or telephony extensions), ensure they are installed and enabled. Enabled extensions show an "x" in the adjacent checkbox. Extensions Manager will ask to duplicate the Mac OS All set before additional extensions can be enabled. Allow it to do so.

Of the modems that shipped with Apple computers, the following require the extensions listed in order to respond:

Modem	Extensions
Apple 56K modem (but not Apple/GV 56K modem)	iMac Modem Extension, PowerMac G3 Modem, or PowerBook G3 Series Modem, depending upon the computer
Geoport Telecom Adapter	Apple Telecom Modem, Express Modem Tool, Geoport for Power Macintosh, Geoport Telecom Adapter, Geoport Serial Driver, Serial Extension (PM 6100/7100/8100 only), Shared Library Manager, Shared Library Manager PPC, and the Express Modem control panel
PowerBook 3400/G3 Internal Modem/Ethernet 33.6 card	PowerBook 3400 Ethernet extension and PowerBook 3400 Modem extension, or just the PowerBook 3400/G3 Modem extension

c. Close Extensions Manager and restart the computer. If the symptom does not recur, perform extensions troubleshooting to isolate the problem extensions. It may only be necessary to correctly configure the software that used them.

Step Eight: Perform a Clean Install or Clean Restore

The Mac OS may be damaged. Perform a clean install or clean restore of the operating system. If there is any connectivity software or modem software to be installed separately, do so immediately afterward. If the problem continues, there is likely a hardware problem requiring service.

EXTENDED Information - Apple Internal Use - Service Providers and Support Professional

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