AppleTalk Remote Access: V.32bis Modem Issues

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TOPIC ---

This article provides useful information for writing AppleTalk Remote Access (ARA) scripts for various V.32bis modems. It also contains information about the hardware handshaking cable that must be used between the Macintosh and modem.

DISCUSSION ---

Notes

- This discussion assumes that you already know how AppleTalk Remote Access scripts function and that you know how to write scripts.

- The command syntax is in the AppleTalk Remote Access Modem Scripting Language Guide. You can order the guide from APDA at 800-282-2732 (USA), 800-637-0029 (Canada), or 408-562-3910 (International).

When configuring the modem in your AppleTalk Remote Access script, you should:

- Use a fixed DTE speed, preferably 19,200 bps.

  V.32bis lets the modems retrain the line at a different baud rate if the line quality degrades (fallback is allowed to 12,000, 9600, and 7200 bps). If the modem connects at a lower speed and the line quality improves, V.32bis lets the modems retrain at the highest common speed available. Since you cannot change the serial port speed once you have established a connection, you should set the DTE to the highest common speed.

- Configure the modem for "Normal" or buffered mode, so that the line speed can vary from the DTE speed.

  This, again, is because V.32bis lets the line speed vary during a connection. If the modem is buffering the line from the DTE, you won't

be affected by any changes in line speed. If you do not use buffering ("Direct" mode), the modems will likely disconnect instead of retraining to a lower baud rate -- although this depends on your particular modem's implementation.

- Use the "CommunicatingAt" command to signal ARA with the actual line speed when a connection is made at lower speeds (9600 or 2400 baud).

  ARA uses the CommunicatingAt command to set internal timers, so it's important that ARA knows what the actual line speed is going to be.

  If the modems re-negotiate the line speed as described above, ARA may hit a timeout condition and drop the line. Since you cannot re-issue the CommunicatingAt command once you're connected, there is not much you can do about this. If you are in an area with poor quality telephone lines, you might consider setting CommunicatingAt to a lower value, but this may cause your performance to suffer. So, it's best to set CommunicatingAt to your line speed and don't worry about it.

- Enable CTS hardware handshaking once you have connected with the other modem, and ensure that you have the proper cable (see cable description at end of article).

  This is especially critical when connecting to V.32 (9600 baud) and V.22/V.22bis/Bell 212A (2400 baud) modems because of the difference between the line speed and the DTE speed. Since the Macintosh always will be communicating with the modem at 19,200 bps, there will be many points in any given connection when the modem won't be able to transmit data as fast as the Macintosh can send data. This also occurs when using V.32bis (14,400 bps maximum). If the modem cannot signal the Macintosh to stop sending data, those data packets will be discarded by the modem, and the error-correcting protocols in ARA need to detect the lost packets and have them re-transmitted. Since this is what ARA is designed to do, the user will not perceive any connection problems, but performance will suffer. With V.32 or slower modems, this will be compounded because you are communicating at a lower data rate.

Cable Information

This cable is needed to use AppleTalk Remote Access with V.32bis modems:

Din-8	DB-25
1 (DTR)	4,20 (RTS, DTR)
2 (CTS)	5 (CTS)*
3 (TxD-)	2 (TD)
4 (SG)	7 (SG)
5 (RxD-)	3 (RD)
6 (TxD+)	Not Connected
7 (GPi)	8 (DCD)
8 (RxD+)	7 (SG)

*Normally 2 (CTS) -> 6 (DSR) on some Macintosh serial cables.

- One consequence of using this cable is that DSR (or DCD) from the modem is no longer connected to the Macintosh. This does not let your Macintosh communications software use the DSR (or DCD) signal to detect carrier loss. And, since the Macintosh serial driver does not support the GPi input, you are sort of stuck, unless your communications software does use the GPi input, or Apple builds GPi support into the serial driver.

- Since DTR and RTS are connected together, the modem must be configured to ignore DTR (usually the &D0 command) when using this cable with other communications applications. Otherwise, when RTS handshaking from the Macintosh is used, the modem will drop the connection the first time the Macintosh de-asserts RTS.

- If you need to use DTR to make the modem disconnect, RTS handshaking cannot be used to control the flow of data from the modem to the Macintosh. CTS handshaking (from the modem to the Macintosh) is available. This is what ARA does to force the modem to hang up, and, at the same time, the modem can signal the Macintosh to stop sending data. This assumes that the Macintosh can always accept data from the modem. This is not true if the Macintosh is talking to the modem at 57.6 Kbps with V.32bis or V.42bis. There are times when the Macintosh needs to signal the modem to stop sending data.

In summary, with this cable:

- If you want to use RTS hardware handshaking, you cannot use DTR to control the modem. You need to use other methods to force the modem to disconnect.

- If you want to control the modem with DTR, you cannot use RTS hardware handshaking, so the Macintosh must be able to accept data from the modem at all times or must be able to recover if data is lost.

In either case, you can use CTS hardware handshaking, so the modem can signal the Macintosh to discontinue sending data.

For more information, including a sample AppleTalk Remote Access V.32bis script with comments, search on "AppleTalk Remote Access and V.32bis".

If you have access to AppleLink, look for AppleTalk Remote Access script files posted in the Software Sampler.

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