Sharing RS232 Communication Among Several Devices

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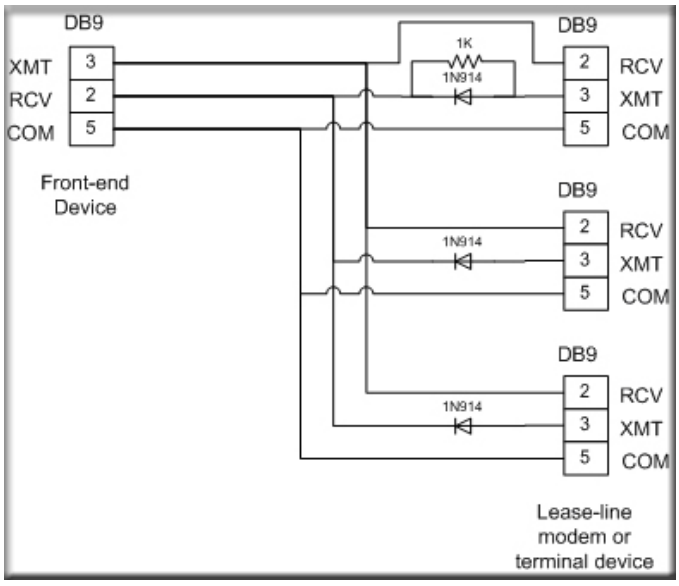
A not uncommon field challenge is to establish two-way communication from a central device to a group of slave devices. An example would be a central system connected to a group of field controllers. If these controllers are distributed via telephone lease-lines, then one will typically find a single RS232 device that needs to communicate to multiple RS232 modems. This presents a problem, because the RS232 signal was not designed to allow devices to be wired in parallel. The quiescent state of the XMT line is nominally -12v, so paralleling multiple devices will cause the inactive devices to mask communication from an active device. This occurs because the RS232 active signal must be pulled positive to a nominal 12v, but at least 3v. The brute force solution to this problem is to procure a piece of hardware that accepts one RS232 source and parallels it to four or eight RS232 ports. The disadvantage of this is (1) the cost of the additional hardware; and (2) the additional complexity it adds to the communication network.

An alternate solution is to put diodes on the slave device XMT line. However, the front-end device will need to see some of the negative voltage that is blocked by the diode. Therefore, one of the slave devices will have a resistor in parallel with the diode: this supplies the required negative voltage to the front-end device, but will not interfere with an active device's communication. In general, any slave device may be chosen to accept the diode, but one could measure with a DVM to find the device whose quiescent signal is most negative and select that one by preference. A value of 1K ohms seems to work fairly well for networks with two to four devices. It is possible that with many devices the value would need some tweaking, but I have never needed to do so.



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