Answer on Question #52544, Programming, Other

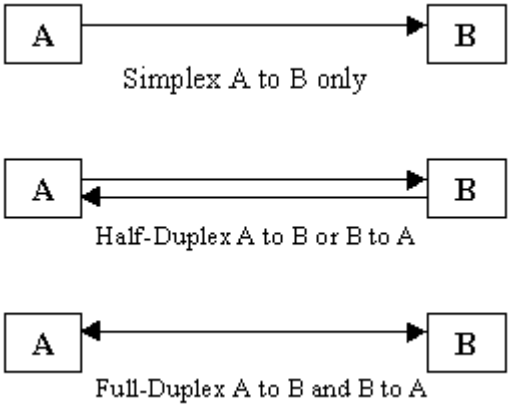
Task:

Discuss the difference between full duplex and half duplex transmission.

Answer:

Half-Duplex: Half-duplex data transmission means that data can be transmitted in both directions on a signal carrier, but not at the same time. For example, on a local area network using a technology that has half-duplex transmission, one workstation can send data on the line and then immediately receive data on the line from the same direction in which data was just transmitted.

Full-Duplex: Full-duplex data transmission means that data can be transmitted in both directions on a signal carrier at the same time. For example, on a local area network with a technology that has full-duplex transmission, one workstation can be sending data on the line while another workstation is receiving data. A full-duplex link can only connect two devices, so many such links are required if multiple devices are to be connected together.



The Difference between Half and Full Duplex

"Duplex" simply means you're able to send and receive data (most often the human voice) from the same device whether that be with your phone, 2-way radio, or PC.

Half-duplex devices let you send and receive, but only one-way at a time, like walkie-talkie. You have to push the talk button to send message, but as long as you are holding the talk key, you cannot hear what anyone else is saying. You must release the button to receive. That's the big problem with the old-fashioned speakerphone: it's only a step up from a walkie-talkie. In essence, it pushes a virtual TALK button every time you start to speak and cuts off the person on the other end. When you've finished speaking, the speakerphone then transmits what the person on the other end is saying. Those cut-off sentences and stop-start conversations can be frustrating to say the least. Two-way radio etiquette has you saying "over" when you're finished speaking so whoever's on the other end knows they can begin speaking.

Corded or cordless phones are full-duplex devices letting you and your caller speak simultaneously without any dropouts in either one of your voices.

It's when you use a hands-free speakerphone that you really appreciate full duplex. Conventional speakerphones must shut the speaker off when the mic is activated so as not to pick up your caller's voice and transmit it along with yours causing an echo effect. When you speak, you can't hear what your caller is saying. This problem is really compounded if both of you are using conventional speakerphones. A full-duplex device digitizes the signal coming out of its speaker

(your caller's voice). It then edits this info out of the signal it's transmitting (your voice) using a built-in digital processor similar to those found in PCs. This eliminates echo effect and more importantly, does away with the on-off mic/speaker dilemma. Full-duplex devices do all of this virtually instantaneously so your calls sound natural and free-flowing. It's this technology that differentiates high-end conferencing systems from ordinary, half-duplex speakerphones.

If you're using your PC to talk on the internet, it's best to install a full-duplex sound card in your PC. Because internet talk has a host of obstacles specific to the medium it must overcome—bandwidth, internet traffic, connection speed—why add the frustration of stop-start, half-duplex conversations? The time and cost of a full-duplex sound card are worth it.