



Digital Acoustic Echo Cancellation

EchoStop™ is an advanced acoustic echo canceler developed for use with conferencing systems such as group audio and videoconferencing systems, cellular car phones, online communication software and more.

EchoStop allows true full duplex communication over the conferencing system, even when the system is used in large spatial environments that may be vulnerable to long reverberation times. The algorithm's unique multi-band processing and seamless residual echo suppression capabilities provide clear communication, even in highly reverberant environments. EchoStop also incorporates noise reduction algorithms to reduce the background noise of both the input (microphone) and the output (loudspeaker), thus preventing the accumulation of interfering noise over multi-point conferencing systems.

What causes the problem? The acoustic signal that resonates from loudspeakers in a typical conferencing system travels back into the microphone (input source) and is received by the other end of the conference as a reflected echo. In the most extreme situations, when the microphone and loudspeaker are in close proximity to each other and the person speaking is a few meters away from the microphone, the echoed signal may be much stronger than the signal of interest (the speakers). This situation is typical of videoconferencing settings or with speaker phones where the conferencing system is placed at one end of the room and the speakers sit around the conferencing table. The returning echo will be extremely strong and will be accompanied by reflection from the walls of the room. The reflection may still be significant after a very long time, up to 200 milliseconds or more. This echo, together with its accompanying reflections, needs to be eliminated from the outgoing signal, especially due to the high sensitivity of the human ear to echoes.

Long reflection (or reverberation) times require the implementation of very long filters, which is accomplished by Andrea Electronics' EchoStop through a unique multi-band process, allowing very long memory with fast reaction time. Another unique feature of EchoStop integration is its ability to work together with a directional input microphone beam, which can be steered. In some applications, like that of a group conferencing situation, a directional input microphone beam will follow the speaker to provide better audio quality. The constant movement of the beam makes it difficult for the echo canceler to adapt quickly enough to the changing situation. EchoStop is designed to overcome this problem by allowing a separate convergence mechanism to address each specific direction.

The Solution - The unique features of Andrea Electronics' EchoStop technology allow for a full duplex conversation over a conferencing communication channel with superior voice input capabilities and uncompromised audio quality.



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