

Mix Minus What?

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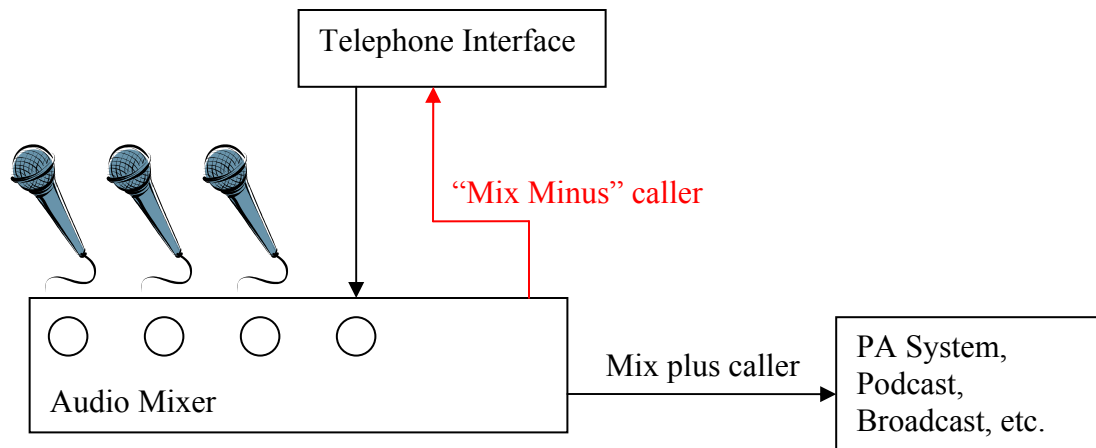
Mix Minus is an audio signal that is carefully designed to avoid feedback and echo in a conference or telephone interface application.

Here is a typical scenario:

Three people are at a conference talking on separate microphones. There is a fourth person participating in the conference over a telephone link. The conference is in front of a large audience, so the three microphones are mixed together and played over the PA system. The phone participant's voice is also added to the mix to be played over the PA system.

And now, the problem: What audio signal do you send *to* the phone participant? If you send the same mix that you are playing over the PA, you would complete a circle of audio from the caller back to the caller. This is a potential source of feedback and annoying echo.

The solution is to create a special mix to send to the phone link. This would be a "Mix" of the three microphones, "Minus" the phone participant.



I won't get into the details of how to create the Mix Minus signal. We have product specific information in our individual user guides. This short explanation was written to help shed some light on this potential source of trouble. If you can get by with using one input to your telephone hybrid, you probably won't have a need for mix minus. The conference application illustrated above is a little more advanced than our typical support call, but the same rules apply. Either way, there is one simple rule that must be followed; Do not send caller audio back to the caller.

"I thought a Digital Hybrid would solve this problem."

A digital hybrid phone line interface is the best choice for bringing a telephone call into a conference or interview. The digital hybrid will prevent the three microphones from echoing

back through the phone line, and returning mixed with the caller audio. Simply stated, the digital hybrid has the ability to remove the transmit audio (the three microphones) from the audio coming in from the phone line (caller's voice). If you inadvertently mix the caller's voice back into the transmit mix (three mics + the caller), the digital hybrid will try to remove the caller's voice from the caller's voice. This results in a confusing mess of echos and a "talking into a barrel" sound.

Mix Minus may sound complicated but it is really just a simple rule, kind of like keeping a microphone away from your PA speakers. Feedback through a phone line brings the same annoying result, it's just a bit harder to resolve.