



**Logitek Electronic Systems, Inc.**

Technical Bulletin

July 27, 2011

John Davis, CBNT

## Introduction to Mix Minus

One of the most common questions to Logitek Support involves the mix minus system. This guide will explain what a mix minus is, how we create one, and explain how to use two special related features.

### **Overview**

A mix minus bus is a mix bus minus a particular source. More than one source may be removed from a particular bus as needed.

These are common uses for Mix Minus:

- Removing the caller from a program feed to a phone hybrid so the caller doesn't hear themselves echo back
- Removing a remote source such as an ISDN or POTS codec from a program feed so the remote does not hear themselves echo back
- Removing a remote truck from the program bus feeding a television IFB system so the reporter doesn't hear themselves echo back
- Removing the studio mics from a program bus feeding a television IFB system so the talent doesn't hear themselves in the earpiece.

The most common bus a mix minus is derived from is Program, however any mix bus, including cue and all aux busses may be used to create a mix minus. The deciding factor in what bus to use is which busses are turned on at the console and what mix bus needs to be heard with the source removed.

Why is Program the most common mix bus? Usually, you want the phone hybrid or codec to hear everything that is on the air so the caller or remote can respond to what is being said.

With 24 available mix minus busses in the Logitek system, there are sufficient mix minuses available that each piece of remote equipment can get its own mix minus. In turn, that allows remotes to hear each other

and respond to each other during a broadcast provided that you have enough return audio paths between studio and remote.

### ***Special Feature: Bus Always On***

The default state is for the mix minus bus to be silent unless the source is selected. Bus Always On will force the mix minus bus to play the selected mix bus minus the source even if the source's fader is off on the console. In the case of remote IFB where someone is dialing in before being put on the air and you want them to hear program for confidence, check this box.

This feature is commonly used for ISDN and POTS codecs and television IFB.

### ***Special Feature: Add Mic When Off***

The default state of the mix minus bus is to be silent until the source is selected. Add Mic When Off will send audio from whatever is routed to the Talkback Mic input to the mix minus output until the source is turned on. When the source is turned on, the feed switches to mix minus.

This is commonly used with telephone hybrids so the operator may use the console as a speakerphone, placing the caller in cue and speaking into the microphone. This also allows for offline recording of phone calls, so the mic fader and phone fader do not need to be turned on or potted up to reduce the chances of inadvertently broadcasting an off-air phone conversation.

Anything can be routed to the talkback mic input, not just a microphone. Stations with multiple studio mics commonly route 3 mics into Mixer A and then feed Mixer A Out to the Talkback Mic to send all 3 mics down the line.

Other stations will enable Independent Bus Switching and Pre-Fader Aux Bus on an auxiliary bus and then route the output of that aux bus to Talkback Mic. Then, an operator just needs to select that aux bus on the board (without needing to turn on the fader or turn up the pot) to select what the caller hears while off the air. This allows the morning show to select multiple microphones and audio players to feed to the caller while recording bits, while after the morning show is over the unused sources can be turned off to prevent phone recordings from sounding like they were recorded in a hollow room when the studio is virtually empty.

## ***How to Set It Up On an Audio Engine***

First, decide which mix minus bus you wish to use, from 1 to 24.  
Second, decide which mixing bus you wish to subtract a source from.  
Third, decide which source(s) is (are) to be removed.

Once you know those three things, you can proceed to AE Config. Go to the Input Settings page. Click on the line number of the source you wish to assign to the mix minus bus. Enter the bus number in the Mix Minus Bus box. For example, if the phone hybrid is to be assigned to mix minus 1, type a 1 in the box.

*Tip: If multiple phone hybrids are used in a studio, assign them to separate mix minus busses if there are multiple inputs. For example, the Telos 2 x 12 has two inputs and two outputs, so two mix minus busses should be used. On the other hand, the Comrex STAC has two outputs but only one input because it handles feeding caller audio internally. Therefore, only one mix minus bus is used, and the same mix minus bus number should be assigned to each hybrid.*

Go to the System Page. On the mix minus grid, place a checkmark on the line for the desired mix bus (ie Program) in the column of the mix minus number.

For example, if you want mix minus 1 to be derived from Program, check the Program box under 1. To enable Bus Always On, check that box in the same column. To enable Add Mic When Off, check that box in the same column.

*Tip: Don't check both "Bus Always On" and "Add Mic When Off" boxes in the same column. The end result will be that the bus will always be on and the mic can't be added since it never turns off. Choose one feature or the other.*

Finally, route the audio to the output. On the Surface Settings page, click on the yellow Output Selections tab and set the tick marks to route the proper mix minus bus to the output that feeds the phone or remote equipment.

A full reset must be performed after making any adjustments to the mix minus grid on the System Page in AE Config before the engine will properly set up the mix minus bus.